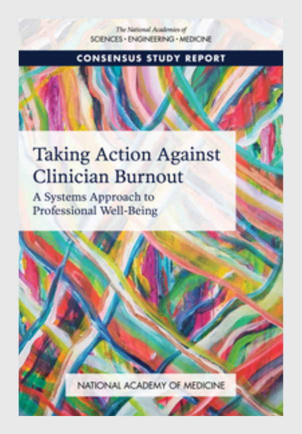

Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being (2019)

DETAILS

334 pages | 6 x 9 | PAPERBACK
ISBN 978-0-309-49547-9 | DOI 10.17226/25521

CONTRIBUTORS

Committee on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being; National Academy of Medicine; National Academies of Sciences, Engineering, and Medicine

SUGGESTED CITATION

National Academies of Sciences, Engineering, and Medicine 2019. *Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25521.

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Taking Action Against Clinician Burnout

A Systems Approach to Professional Well-Being

Committee on Systems Approaches to Improve Patient Care
by Supporting Clinician Well-Being

NATIONAL ACADEMY OF MEDICINE

THE NATIONAL ACADEMIES PRESS
Washington, DC
www.nap.edu

THE NATIONAL ACADEMIES PRESS 500 Fifth Street, NW Washington, DC 20001

This activity was supported by contracts between the National Academy of Sciences and Accreditation Council for Graduate Medical Education, American College of Occupational and Environmental Medicine, American Hospital Association, Arnold P. Gold Foundation, Association of American Medical Colleges, BJC HealthCare, Cedars-Sinai Medical Center, The Doctors Company Foundation, Duke University Hospital, Gordon and Betty Moore Foundation, Johns Hopkins Health System, Josiah Macy Jr. Foundation, Keck School of Medicine of the University of Southern California, Medical College of Wisconsin, Montefiore Medicine, The Mont Fund, The Ohio State University, The State University of New York System, Tulane University, University of Florida, University of Illinois Hospital and Health Sciences System, University of Massachusetts Medical School, University of Michigan, University of New Mexico Health Sciences Center, University of North Carolina at Chapel Hill, University of Utah Health, University of Virginia Medical Center, University of Virginia School of Medicine, Vanderbilt University Medical Center, Washington University School of Medicine, Yale New Haven Health System, and Yale School of Medicine. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project.

International Standard Book Number-13: 978-0-309-49547-9
International Standard Book Number-10: 0-309-49547-4
Digital Object Identifier: https://doi.org/10.17226/25521
Library of Congress Control Number: to come

Additional copies of this publication are available from the National Academies Press, 500 Fifth Street, NW, Keck 360, Washington, DC 20001; (800) 624-6242 or (202) 334-3313; http://www.nap.edu.

Printed in the United States of America

Suggested citation: National Academies of Sciences, Engineering, and Medicine. 2019. *Taking action against clinician burnout: A systems approach to professional well-being*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25521.

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COMMITTEE ON SYSTEMS APPROACHES TO IMPROVE PATIENT CARE BY SUPPORTING CLINICIAN WELL-BEING

PASCALE CARAYON (*Co-Chair*), Leon and Elizabeth Janssen Professor, Director of the Wisconsin Institute for Healthcare Systems Engineering, University of Wisconsin–Madison
CHRISTINE K. CASSEL (*Co-Chair*), Senior Advisor on Strategy and Policy, Professor of Medicine, University of California, San Francisco
ELISABETH BELMONT, Corporate Counsel, MaineHealth
NEIL A. BUSIS, Director, Community Neurology, and Director, General Teleneurology Program, University of Pittsburgh Medical Center
M. LYNN CRISMON, Dean, James T. Doluisio Regents Chair and Behrens Professor of Pharmacy, College of Pharmacy, and Professor, Department of Psychiatry, Dell Medical School, The University of Texas at Austin
LISELOTTE DYRBYE, Professor of Medicine and Medical Education, Co-Director, Program on Physician Well-Being, Mayo Clinic
POOJA KINKHABWALA, Endocrinology Fellow, Larkin Community Hospital
WANDA LIPSCOMB, Senior Associate Dean for Diversity and Inclusion, Associate Dean for Student Affairs, Associate Professor of Psychiatry, College of Human Medicine, Michigan State University
SARANYA LOEHRER, Head of Innovation, Institute for Healthcare Improvement
M. A. J. LEX MacNEIL, Founding Dean and Professor, College of Dental Medicine-Illinois, Midwestern University (Retired)
JOSÉ A. PAGÁN, Chair and Professor, Department of Public Health Policy and Management, College of Global Public Health, New York University
SHARON H. PAPPAS, Chief Nurse Executive, Emory Healthcare and Professor, Nell Hodgson Woodruff School of Nursing, Emory University
CYNDA HYLTON RUSHTON, Anne and George L. Bunting Professor of Clinical Ethics, Berman Institute of Bioethics and School of Nursing, Johns Hopkins University
TAIT SHANAFELT, Associate Dean, Chief Wellness Officer, and Jeanie and Stew Ritchie Professor of Medicine, Stanford Medicine
GEORGE THIBAULT, Former President, Josiah Macy Jr. Foundation, and Daniel D. Federman Professor of Medicine and Medical Education Emeritus, Harvard Medical School
VINDELL WASHINGTON, Chief Medical Officer, Blue Cross and Blue Shield of Louisiana

MATTHEW B. WEINGER, Director, Center for Research and Innovation in Systems Safety, Professor, Vanderbilt University Schools of Medicine and Engineering, Staff Physician, Veterans Affairs Tennessee Valley Healthcare System

Study Staff

Board on Health Care Services, Health and Medicine Division, National Academies of Sciences, Engineering, and Medicine

LAURA AIUPPA DENNING, Study Director
MARC MEISNERE, Associate Program Officer
RAJBIR KAUR, Senior Program Assistant (*until October 2019*)
MICAH WINOGRAD, Senior Finance Business Partner
SHARYL J. NASS, Board Director

Board on Human-Systems Integration, Division of Behavioral and Social Sciences and Education, National Academies of Sciences, Engineering, and Medicine

HEATHER KREIDLER, Associate Program Officer (*until July 2019*)
TOBY WARDEN, Board Director

Title: Woven
Artist: Tia Calvert (Rochester, MN)

Artist Statement:

Working at a health care organization, I see the effects of burnout, but I also see resiliency in our providers. Woven represents the intricacies, layers, and complexities of feeling burnt out while serving patients. It doesn't happen all at once, but builds over time. The shimmering threads represent life and hope that is embedded in each provider; the spirit of serving; and the belief that you will make a difference. All of these aspects woven together are the essence of the provider.

This artwork was submitted as part of the National Academy of Medicine's Expressions of Clinician Well-Being, an art exhibition that collected insights directly from clinicians, patients, loved ones, and organizations working to prevent burnout and promote well-being. For more information on the exhibition, please visit nam.edu/expressclinicianwellbeing.

Reviewers

This Consensus Study Report was reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise. The purpose of this independent review is to provide candid and critical comments that will assist the National Academies of Sciences, Engineering, and Medicine in making each published report as sound as possible and to ensure that it meets the institutional standards for quality, objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process.

We thank the following individuals for their review of this report:

PATTI ABBOTT, University of Michigan School of Nursing
MOHAMMED ALI, Rollins School of Public Health, Emory University
ALAN BALCH, National Patient Advocate Foundation
DAVID W. BATES, Brigham and Women's Hospital and Partners Healthcare System
CARLOS DEL RIO, Rollins School of Public Health, Emory University
CASWELL A. EVANS, JR., College of Dentistry, University of Illinois at Chicago (Retired)
EVE KERR, Veterans Affairs Ann Arbor Healthcare System and University of Michigan
EILEEN LAKE, University of Pennsylvania
CATHERINE LUCEY, University of California, San Francisco

NAJM MESHKATI, Viterbi School of Engineering, University of Southern California
WILLIAM M. SAGE, The University of Texas at Austin School of Law and Dell Medical School
THOMAS SCHWENK, University of Nevada, Reno
CHRISTINE SINSKY, American Medical Association
PAUL C. TANG, IBM Watson Health

Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations of this report, nor did they see the final draft before its release. The review of this report was overseen by **MARLA E. SALMON,** University of Washington, and **DON EUGENE DETMER,** University of Virginia School of Medicine. They were responsible for making certain that an independent examination of this report was carried out in accordance with the standards of the National Academies and that all review comments were carefully considered. Responsibility for the final content rests entirely with the authoring committee and the National Academies.

Acknowledgments

We, the members of the National Academies of Sciences, Engineering, and Medicine's Committee on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being, wish to express our sincere gratitude to the many individuals and groups who helped with this report.

The committee appreciates the generous funding support extended by these sponsors: Accreditation Council for Graduate Medical Education, American College of Occupational and Environmental Medicine, American Hospital Association, Arnold P. Gold Foundation, Association of American Medical Colleges, BJC HealthCare, Cedars-Sinai Medical Center, The Doctors Company Foundation, Duke University Hospital, Gordon and Betty Moore Foundation, Johns Hopkins Health System, Josiah Macy Jr. Foundation, Keck School of Medicine of the University of Southern California, Medical College of Wisconsin, Montefiore Medicine, The Mont Fund, The Ohio State University, The State University of New York System, Tulane University, University of Florida, University of Illinois Hospital and Health Sciences System, University of Massachusetts Medical School, University of Michigan, University of New Mexico Health Sciences Center, University of North Carolina at Chapel Hill, University of Utah Health, University of Virginia Medical Center, University of Virginia School of Medicine, Vanderbilt University Medical Center, Washington University School of Medicine, Yale New Haven Health System, and Yale School of Medicine.

Over the course of the study, we received valuable information and insight from a number of individuals with expertise in fields related to systems approaches to clinician burnout and professional well-being. Thank you to the presenters at our public meetings:

David Bates, *Brigham and Women's Hospital and Partners HealthCare System*
Jay Bhatt, *American Hospital Association*
Molly Coye, *AVIA*
Andy Gettinger, *The Office of the National Coordinator for Health Information Technology*
Mira Irons, *American Board of Medical Specialties*
Darrell G. Kirch, *Association of American Medical Colleges*
Richard I. Levin, *Arnold P. Gold Foundation*
Barry Marx, *Centers for Medicare & Medicaid Services*
Matthew McHugh, *Center for Health Outcomes and Policy Research, School of Nursing, University of Pennsylvania*
Robert McLellan, *Dartmouth-Hitchcock Medical Center*
Marc Moss, *University of Colorado School of Medicine*
Thomas J. Nasca, *Accreditation Council for Graduate Medical Education*
Marc Overhage, *Cerner Corporation*
Laura Punnett, *University of Massachusetts at Lowell*
William C. Rupp, *The Doctors Company Foundation*
Stephen C. Schoenbaum, *Josiah Macy Jr. Foundation*
Kelley Skeff, *Stanford University School of Medicine*
Emily Yoder, *Centers for Medicare & Medicaid Services*

Many within the National Academies were helpful to study staff. We would like to thank Lauren Shern (Health and Medicine Division Executive Office); Greta Gorman, Nicole Joy, and Tina Seliber (communications and report production). We also appreciate the valuable assistance from Rebecca Morgan (National Academies Research Center); Dana Korsen and Stephanie Miceli (Office of News and Public Information). This report was also made possible by the leadership and support of the staff of the National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience, including Victor Dzau, Michael McGinnis, Charlee Alexander, Kyra Cappelucci, Ivory Clarke, Laura DeStefano, Imani Rickerby, Samantha Phillips, and Mariana Zindel.

Preface

Twenty years ago, in its two landmark reports, *To Err Is Human: Building a Safer Health System* and *Crossing the Quality Chasm: A New Health System for the 21st Century*, the Institute of Medicine (IOM) called for dramatic attention to the issue of patient safety and more broadly quality of care. The reports led to major changes in the design of health care work systems and processes to improve quality of care, and reduce preventable patient harm. This report, *Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being*, is a critical follow-up to these major reports and other reports in the IOM's Quality Chasm Series, as it calls attention to the safety, health, and well-being of health care clinicians. We were pleased to co-chair the work of this consensus study committee, as our respective areas of expertise—bioethics, professionalism, and quality of care and human factors and systems engineering in health care—are both essential to understanding this complex phenomenon.

The report has two major overarching themes. First, clinician burnout is a major problem; the report calls for immediate action. Health care is going through many dramatic changes (related to technology, regulation, policy, societal trends) that have profound impact on health care delivery and consequently the organizations that deliver care and the people who work within them to care for patients. In this rapidly changing and stressful environment, the rates of burnout among clinicians are alarming. Clinicians are motivated and guided by professional oaths and values that are challenged by these profound changes in the external environment, in health care organizations, and in learning and work environments. This creates real or perceived dissonance of values and mismatch of resources with job demands experienced by clinicians. Clinician burnout is bad for both clinicians and patients. Emotional exhaustion, depersonalization, and loss of sense of professional efficacy—the three dimensions of burnout—are detrimental to quality of care. Clinician burnout is also costly for organizations experiencing workforce shortages and difficulty retaining high-quality clinicians. Clinicians suffering burnout are poor teachers and role models for students and trainees, extending these concerns throughout the learning environment. The report calls for immediate action by health care organizations, health professions educational institutions, and health care policy, regulatory, and standards-setting entities.

Second, clinician burnout is a complex multi-factorial problem that is not easily solved; the report recommends a systems approach to reducing clinician burnout and fostering professional well-being. Multiple work system factors contribute to clinician burnout (e.g., high workload, administrative burden, poorly designed technologies) and stem from decisions or actions taken at various levels in health care: the local frontline care delivery level, health care organizations, and multiple policy and regulatory actors in the external environment. The report shows that multiple interacting factors produce imbalances in job demands and resources experienced by clinicians at all stages of their professional development and career. Humanism and professionalism are two major motivating factors for most clinicians, and many aspects of the modern work environment conflict with these fundamental ethical norms. Regulatory and institutional policies, payer requirements, and intrusive, difficult technologies all challenge the basic ethical motivations that are essential to professional fulfillment of the human beings who are central to high-quality patient care. Therefore, work system transformation with meaningful, effective involvement of clinicians is necessary at multiple levels to tackle the critical problem of burnout. Health care organizations have a key role in this transformation; they need to adopt systems design principles to reduce clinician burnout and foster professional well-being.

In the context of these overarching themes, the report highlights specific key issues of clinician burnout that need to be addressed:

- Clinician burnout needs to be tackled early in professional development, and special stressors in the learning environment need to be recognized.
- Stakeholders in the external environment have an important role to play in preventing clinician burnout as their decisions can result in increased burden and other demands that affect clinician burnout. Every attempt at alignment and reduction of requirements to reduce redundancy is essential.
- Technology can either contribute to clinician burnout (e.g., poorly designed electronic health record technologies) or potentially reduce clinician burnout (e.g., well-functioning patient communications,

clinical decision support) if it is well designed, implemented, and integrated into clinical workflow. The report reiterates several recommendations of previous IOM and National Academies of Sciences, Engineering, and Medicine reports to improve usability, workflow integration, and interoperability of health information technology.

- Medical societies, state licensing boards, specialty certification boards, and medical education and health care delivery organizations all need to take concrete steps to reduce the stigma for clinicians of seeking help for psychological distress, and make assistance more easily available.

There were areas where the study committee wished we could go further but found insufficient evidence to support strong recommendations. One of those areas is interventions. The evidence for system interventions that significantly address clinician burnout is limited. Some organizational interventions (e.g., changes to clinical work processes) can reduce clinician burnout, and individual interventions (e.g., stress management) may also be effective, but they do not address some of the core work system factors that contribute to clinician burnout. In light of the limited evidence base, the study committee was not able to provide specific recommendations for system interventions. The report strongly recommends that health care organizations create, implement, and evaluate their own interventions by using a systematic approach to reducing clinician burnout, use rigorous methods of evaluating burnout and burnout risk, and do so while openly sharing their lessons learned with other health care organizations. The report also calls for investment in research on organizational interventions.

As co-chairs of the study committee, we thank all the members of the committee for their individual and group contributions. In our experience, neither of us has seen such intense dedication and level of contribution of volunteer committee members. We learned a great deal from this diverse group, and are extremely grateful for the opportunity to work with them. None of the work of the committee would have been possible without the professional staff of the National Academies, led by the study director, Laura Aiuppa, in collaboration with Marc Meisnere, Rajbir Kaur, Heather Kreidler, and other National Academies staff. Both personally and on behalf of the study committee, we thank them for a truly collaborative, incredibly effective, and productive process.

Pascale Carayon and Christine Cassel,
Co-Chairs
Committee on Systems Approaches to
Improve Patient Care by Supporting
Clinician Well-Being

Contents

APPENDIXES

Acronyms and Abbreviations

AACN	American Association of Critical-Care Nurses
AAMC	Association of American Medical Colleges
ABMS	American Board of Medical Specialties
ACA	Patient Protection and Affordable Care Act of 2010
ACGME	Accreditation Council for Graduate Medical Education
ACP	American College of Physicians
ADA	Americans with Disabilities Act
AI	artificial intelligence
AMA	American Medical Association
AMIA	American Medical Informatics Association
ANCC	American Nurses Credentialing Center
APM	Alternative Payment Model
APN	advanced practice nurse
APP	advance practice provider
AUC	Appropriate Use Criteria
CHIP	Children's Health Insurance Program
CMA	certified medical assistant
CME	continuing medical education
CMS	Centers for Medicare & Medicaid Services
CPOE	computerized physician order entry
CQMC	Core Quality Measure Collaborative
CREW	Civility, Respect, and Engagement at Work

EHR	electronic health record
FDA	U.S. Food and Drug Administration
FSMB	Federation of State Medical Boards
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HCD	human-centered design
HCO	health care organization
HCP	health care professional
HFE	human factors engineering
HHS	U.S. Department of Health and Human Services
HIE	health information exchange
HIPAA	Health Insurance Portability and Accountability Act of 1996
HITECH	Health Information Technology for Economic and Clinical Health Act
HWE	healthy work environment
ICU	intensive care unit
IM-ITE	Internal Medicine In-Training Examination
IOM	Institute of Medicine
IT	information technology
MACRA	Medicare Access and CHIP Reauthorization Act of 2015
MBI	Maslach Burnout Inventory
MIPS	merit-based Incentive Payment System
MOC	maintenance of certification
NAM	National Academy of Medicine
NQF	National Quality Forum
ONC	The Office of the National Coordinator for Health Information Technology
PACT	Patient Aligned Care Team
PCMH	patient-centered medical home
PDMP	prescription drug monitoring program
PES-NWI	Practice Environment Scale of the Nursing Work Index
PHW	Physician Worklife Study

SaMD	software as a medical device
SAMHSA	Substance Abuse and Mental Health Services Administration
TEFCA	Trusted Exchange Framework and Common Agreement
USMLE	United States Medical Licensing Examination
VA	U.S. Department of Veterans Affairs
WHO	World Health Organization

Summary

In the 20 years since publication of the landmark Institute of Medicine studies *To Err Is Human: Building a Safer Health System* and *Crossing the Quality Chasm: A New Health System for the 21st Century* many strategies have been employed to improve the safety and quality of health care in the United States. Improving the performance of the U.S. health care system to achieve the goals of better population health, enhanced patient care experiences, and lower health care costs depends in large part on clinicians, the health care professionals who provide direct patient care.[1]

Delivering safe, patient-centered, high-quality, and high-value health care requires a clinical workforce that is functioning at the highest level. However, there is growing recognition among health care system experts that clinician well-being, so essential to the therapeutic alliance among clinicians, patients, and families, is eroding because of occupational stress. The high rates of burnout reported among U.S. health care clinicians, and clinical students and trainees ("learners"), are a strong indication that the nation's health care system is failing to achieve the aims for system-wide improvement.

Burnout is a syndrome characterized by high emotional exhaustion, high depersonalization (i.e., cynicism), and a low sense of personal accomplishment from work. Research shows that between 35 and 54 percent of U.S. nurses and physicians have substantial symptoms of burnout; similarly, the prevalence of burnout ranges between 45 and 60 percent for medical students and residents. Burnout among health care clinicians and learners has been most studied in the medical and nursing professions; however, a growing understanding of the epidemiology and etiology of the syndrome

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[1] See Chapter 2 for a discussion of the target population of clinicians in the report.

suggests that burnout among all types of clinicians and learners is a growing public health concern. The high rate of clinician and learner burnout is a strong signal to health care leaders that major improvements in the clinical work and learning environments have to become a national and organizational priority.

A growing body of research suggests that the changing landscape of the U.S. health care system—how care is provided, documented, and reimbursed—has had profound effects on clinical practice and consequently on the experiences of clinicians, learners, patients, and their families. Many mounting system pressures have contributed to overwhelming job demands for clinicians (e.g., workload, time pressures, technology challenges, and moral and ethical dilemmas) and insufficient job resources and supports such as adequate job control, alignment of professional and personal values, and manageable work–life integration. A chronic imbalance of high job demands and inadequate job resources can lead to burnout. The job demand–resources imbalance in health care is exacerbated by the increasing push for system performance improvement, which leads to greater administrative burden, production pressures, and shifts in financial incentives and payment structures; by technology implementation that hinders rather than supports patient care; by changing professional expectations; as well as by standards and regulatory policies that are insufficiently aligned with the delivery of high-quality patient care or professional values. Intensifying these and other health system pressures on the clinical workforce is the explosive increase in the amount of medical information and data collected and the growing demand for health care as the U.S. population ages, including care and services for chronic conditions and social care,[2] in the face of an existing shortage of health professionals in many areas.

Burnout has high personal costs for individual workers, but it also has high social and economic costs for their organizations and for society as a whole. The personal consequences of burnout for clinicians and learners include occupational injury, problematic alcohol use, and the risk of suicide. In addition, career regret and sub-optimal professional development are other consequences experienced by learners. Stressors associated with burnout are also threats to professionalism, the fundamental ethical norms that are essential to the professional fulfillment of clinicians and learners and to the delivery of high-quality care. Clinician and learner burnout adversely affects the quality of patient care. Clinician burnout is associated with an increased risk of patient safety incidents and malpractice claims, poorer quality due to low professionalism, reduced patient satisfaction, and diminished and ineffective communication between patients and clinicians. Clinician and learner burnout also puts a strain on health care

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[2] Social care addresses health-related social risk factors and social needs.

organizations by increasing clinician absenteeism, presenteeism (working while sick), and turnover and by reducing individual productivity. These effects also have profound consequences for the adequacy of the U.S. health care workforce overall.

There is a strong imperative to take a systemic approach to burnout that focuses on the structure, organization, and culture of health care. A systems approach incorporates thorough knowledge of the stakeholders, their goals and activities, the technologies they use, and the environment in which they operate. Many different aspects of the health care environment have to work together in an integrated way to prevent, reduce, or mitigate burnout and improve professional well-being. To this end, the National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience (Action Collaborative)[3] requested that the Board on Health Care Services of the National Academies of Sciences, Engineering, and Medicine (the National Academies) undertake a consensus study to examine the scientific evidence regarding the causes and consequences of clinician burnout as well as potential systems approaches to improving patient care by supporting clinician well-being (see Chapter 1, Box 1-3 for the complete Statement of Task). The National Academies appointed a committee of 17 subject-matter experts to address this task. Over the course of the 18-month study, the committee gathered evidence, reviewed and deliberated on that evidence, and developed recommendations on designing systems to reduce clinician burnout and foster professional well-being.

CONCEPTUAL FRAMEWORK

To achieve the dual objective of addressing burnout and well-being and improving patient care, the committee concluded that it will be necessary to consider clinician burnout and professional well-being in the context of a broader system.[4] The committee's framework for a systems approach to clinician burnout and professional well-being reflects theories and principles from the fields of human factors and systems engineering, job and organizational design, and occupational safety and health. The committee developed a model to articulate the systems aspects of clinician burnout and professional well-being (see Figure S-1), describe the interactions of the system levels (see Figure S-2), and identify the work system factors that influence burnout and professional well-being (see Figure S-3).

The committee's systems model has three levels—frontline care delivery, health care organization, and the external environment—that together

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[3] See https://nam.edu/initiatives/clinician-resilience-and-well-being (accessed October 1, 2018).

[4] The concepts articulated in the framework are intended to address burnout and professional well-being in health care clinicians and learners.

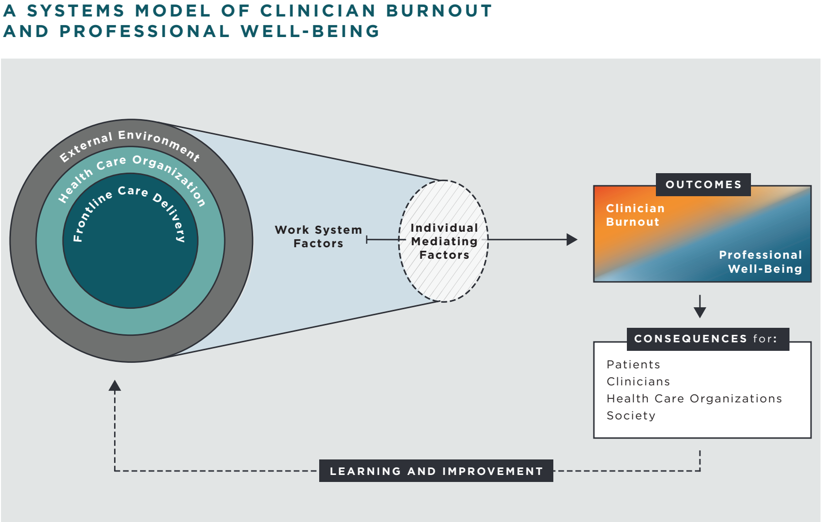
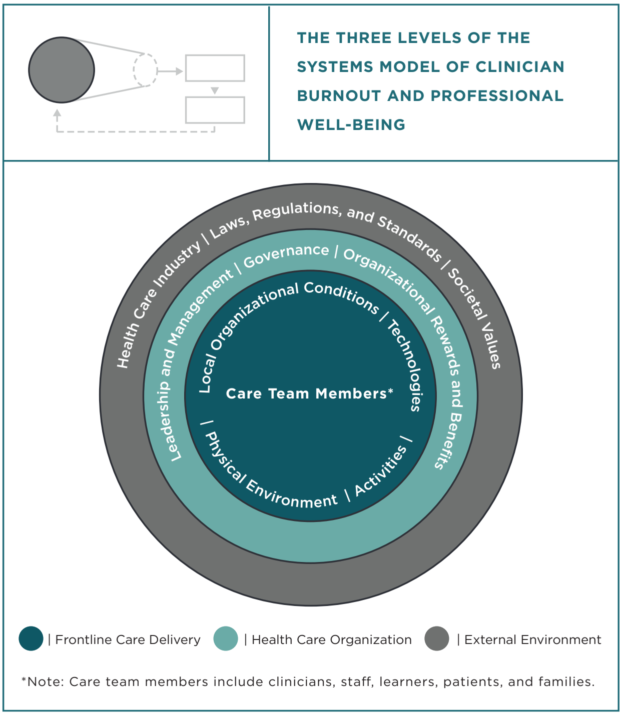
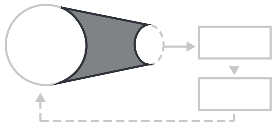


FIGURE S-1 The systems model of clinician burnout and professional well-being.



*Note: Care team members include clinicians, staff, learners, patients, and families.

FIGURE S-2 The three levels of the systems model of clinician burnout and professional well-being.



WORK SYSTEM FACTORS OF THE SYSTEMS MODEL OF CLINICIAN BURNOUT AND PROFESSIONAL WELL-BEING

Work System Factors include:

Job Demands
- Excessive workload, unmanageable work schedules, and inadequate staffing
- Administrative burden
- Workflow, interruptions, and distractions
- Inadequate technology usability
- Time pressure and encroachment on personal time
- Moral distress
- Patient factors

Job Resources
- Meaning and purpose in work
- Organizational culture
- Alignment of values and expectations
- Job control, flexibility, and autonomy
- Rewards
- Professional relationships and social support
- Work–life integration

FIGURE S-3 Work system factors of the systems model of clinician burnout and professional well-being.

influence each other and the work system factors contributing to burnout and professional well-being. Other factors, unique to each individual (personality, coping strategies, resilience, social support), mediate the effects of these work system factors on clinician burnout and professional well-being. The outcomes of the work system factors on clinicians (i.e., burnout or professional well-being) have consequences for patients, clinicians, health care organizations, and society. To reduce clinician burnout and foster professional well-being, learning and continuous improvement processes are necessary for identifying, evaluating, and implementing effective improvements at all levels of the system.

Frontline care delivery is the “work system” where interactions among the care team, including clinicians, learners (i.e., trainees and students), patients and families, and support staff occur. Members of the care team perform activities using various tools and technologies according to the policies, procedures, resources, and infrastructure determined by the health care organization. Organizational conditions include how members of the care team perceive the organizational culture. The health care organization, the second level of the systems model, broadly applies to all types of care-providing entities and is composed of numerous elements, including organizational culture, payment and reward systems, the management of human capital/human resources, leadership and management style, and organizational policies. The third level of the system model is the external environment, which includes political, market, professional, and societal factors. This level contains opportunities and constraints that influence decisions and actions at the health care organization level and the work done by clinicians at the frontline care delivery level.

Decisions made at the three levels of the system have an impact on the work factors that clinicians experience. Figure S-3 shows the work system factors, conceptualized as job demands and job resources that may contribute to clinician burnout and professional well-being when there is a chronic imbalance of these factors.

The different systemic factors that can cause burnout or adversely affect professional well-being are context-dependent—factors in one setting may not be present in another. The main drivers for burnout among learners are found in the learning environment and include grading schema, sub-optimal clinical experiences, inadequate preparation and support, supervisor behaviors, peer behaviors, and a lack of autonomy. Among clinicians, the job demands that contribute to burnout relate to workload and time pressure, the intrinsic aspects of clinical work (e.g., moral distress), and work inefficiencies (e.g., administrative burden, inadequate technology usability). Clinician's job resources include tangible and intangible resources within the work environment, such as meaning in work, job control, and the availability of social support from peers and supervisors. The work system is influenced by the organization and includes job structure, local culture, values and expectations, leadership, and the amount of individual job control (e.g., flexibility or autonomy). Despite the many positive benefits, the negative impact of health information technology, including electronic health records, on care delivery, workflow, workload, and burnout is well documented. In addition, many factors within the external health care environment perpetuate the complex landscape of legal, regulatory, standards requirements, and expectations that influence the levels of stress in the everyday work of clinicians. Overall, information on clinicians' experience of job demands and job resources may be used as feedback to change (or redesign) the system elements at each of the three levels of the system.

While many health care stakeholders are initiating important actions to address the burnout problem, there is little research indicating how effective they are in reducing burnout (and even less concerning their effectiveness in improving well-being or patient care). The committee's systems framework emphasizes the identification of interventions aimed at tackling the critical factors contributing to burnout as a way of fostering an improved state of professional well-being while improving patient care. There is evidence that interventions focused on work organization can mitigate burnout; thus, health care organizations are a powerful determinant and have a critical role to play in reducing clinician burnout. The evidence also indicates that individual-focused strategies may be beneficial and can be an effective part of larger organizational efforts but that, on their own, they do not sufficiently address clinician burnout.

The committee concluded there is a need to provide health care organizations with guidelines for designing, implementing, and sustaining professional well-being systems in their organizations in order to mitigate the multitude of factors contributing to burnout (see Box S-1).

The committee identified a number of gaps in the existing research literature and outlined an agenda with the following objectives:

- Build an epidemiologic foundation to better understand the prevalence of burnout across clinical professions;

BOX S-1
Guidelines for Designing Well-Being Systems

Values, Systems Approach, and Leadership

- Align organizational structures and processes with organizational and workforce values (respect, justice, compassion, diversity of views).
- Use a systems approach to proactively improve professional well-being while supporting patient care.
- Engage and commit leadership at all organizational levels to address clinician burnout and improve professional well-being.

Work System Redesign

- Enhance the meaning and purpose of work and deliver value to patients.
- Provide adequate resources and environment (e.g., staffing, scheduling, workload, opportunities to learn, greater job control, usable technologies, adequate physical environment) to support clinicians' work.
- Design work systems that encourage and facilitate relational care (team work), collaboration, communication, and professionalism.

Implementation

- Build infrastructure for a well-being system that has adequate organizational resources, processes, and structures; continually learns and improves; and is accountable.
- Design reward systems that align with organizational and professional values to support professional well-being.
- Nurture (establish and sustain) organizational culture that supports change management, psychological safety, vulnerability, and peer support.
- Use human-centered design processes (see Chapter 2) to co-design, implement, and continually improve solutions and interventions that address clinician burnout.

- Define professional fulfillment and well-being to better understand how these constructs relate to enhanced personal, professional, and societal outcomes;
- Identify work system factors, learning environment factors, and individual mediating factors that contribute to burnout or that promote professional well-being;
- Better understand the implications of clinician burnout and professional well-being for patients, clinicians, learners, health care organizations, and society; and
- Evaluate system interventions designed to mitigate burnout and promote well-being across professions.

A multi-pronged approach involving all stakeholders to address research barriers is critical to realizing viable and sustainable strategies for improving professional well-being.

RECOMMENDATIONS

Based on its collective assessment of the available evidence, the committee concluded that taking action to address burnout requires a bold vision for redesigning clinical systems—one which focuses on the activities that patients find important to their care and which enables and empowers clinicians to provide high-quality care. Central to the committee's vision for the way forward is an emphasis on the human aspects of care—putting patients, families, caregivers, clinicians, and staff at the center of focus; demonstrating compassion for patients, clinicians, and other care team members; and deriving professional goals and actions from the needs of patients. To lay the foundation for progress, the committee recommends that health care system stakeholders pursue the following six goals (listed in Box S-2) and associated actions as described below.

Goal 1. Create Positive Work Environments: Transform health care work systems by creating positive work environments that prevent and reduce burnout, foster professional well-being, and support quality care.

Health care organizations have a vitally important role in creating and maintaining positive work environments that clinicians find to be safe, healthy, and supportive and that foster ethical and meaningful practice. Health care organizations can enable the delivery of high-value health care by addressing burnout and its impact on the safety, health, and job satisfaction of the clinical workforce. Health care organizations should focus on adopting fundamental principles for redesigning work systems (see Box S-1) to prevent and reduce clinician burnout and foster professional well-being.

BOX S-2
Goals for Eliminating Clinician Burnout and Enhancing Professional Well-Being

1. Create Positive Work Environments: Transform health care work systems by creating positive work environments that prevent and reduce burnout, foster professional well-being, and support quality care.
2. Create Positive Learning Environments: Transform health professions education and training to optimize learning environments that prevent and reduce burnout and foster professional well-being.
3. Reduce Administrative Burden: Prevent and reduce the negative consequences on clinicians' professional well-being that result from laws, regulations, policies, and standards promulgated by health care policy, regulatory, and standards-setting entities, including government agencies (federal, state, and local), professional organizations, and accreditors.
4. Enable Technology Solutions: Optimize the use of health information technologies to support clinicians in providing high-quality patient care.
5. Provide Support to Clinicians and Learners: Reduce the stigma and eliminate the barriers associated with obtaining the support and services needed to prevent and alleviate burnout symptoms, facilitate recovery from burnout, and foster professional well-being among learners and practicing clinicians.
6. Invest in Research: Provide dedicated funding for research on clinician professional well-being.

The active engagement of clinicians and patients is essential to the efforts of health care organizations to create positive work environments, including efforts to prioritize actions, procedures, and policies that will deliver the greatest value to direct patient care.

Recommendation 1A Health care organizations should develop, pilot, implement, and evaluate organization-wide initiatives to reduce the risk of burnout, foster professional well-being, and enhance patient care by improving the work environment. To accomplish this, they should:

- Commit their executive and board leadership to monitor and continuously improve the clinical work environment. Specifically, governing boards should hold organizational leaders accountable for creating and maintaining a positive and healthy work environment.
- Create and maintain, at the health care organization executive level, a leadership role and function responsible for improving and sustaining professional well-being across the organization. This leader and his or her team should strengthen coordination across all organizational programs, especially those that deal with patient care quality and safety and with occupational safety.

- Align the design of interventions to prevent and reduce burnout and promote professional well-being with desired organizational values such as respect, justice, ethical practice, compassion, and diversity.
- Assess the foreseeable impact of business and management decisions on the work environment. Specifically, health care organization leaders should evaluate how decisions may affect clinicians' job demands (e.g., additional clerical and administrative burden on clinicians, competing demands on clinicians, unnecessary stress) and job resources (e.g., supportive managers and leaders, useful and usable technologies, effective teamwork), patient care quality and safety, and levels of burnout within the organization. Decisions and their implementation should be adjusted accordingly
- Hold leaders at all levels of the organization accountable for improving the work environment within their scope of responsibility.

Recommendation 1B To guide new systems that have been designed to promote professional well-being and patient care quality, health care organizations should adopt and apply the following principles that improve the work environment and balance job demands and job resources.

- Enhance meaning and purpose in work, and optimize workload and task distribution.
- Facilitate and incentivize interprofessional teamwork, collaboration, communication, and professionalism.
- Establish and sustain an organization-wide and unit-level culture that supports psychological safety and facilitates participatory decision making and peer support.
- Align incentives, compensation, and reward systems for clinicians and work units with organizational and professional values.
- Provide access to resources, such as coaching and adequate time for professional and personal development, to support clinicians in managing stress and adapting to change.

Recommendation 1C Health care organizations should routinely measure and monitor clinician burnout and ameliorate the work system factors that erode professional well-being. To accomplish this, they should:

- Use validated measurement tools to assess the extent of burnout in their organization and the potential contributory factors relevant to their system. It is essential to identify data capture strategies that minimize burden and protect clinicians' privacy and address any stigma or pressure that clinicians may perceive related to measurement or reporting.

- Accurately assess total workload and the complexity of the work expected of clinicians (including continuing professional education, maintenance of certification, required institutional learning modules, and work performed outside of scheduled hours). For clinicians in academic institutions, this assessment of work should include clinical work, research and scholarship, teaching, and service activities required to meet criteria for academic promotion. Clinical work involves cognitive processes, decision making, teams, and social interactions that need to be considered to optimize clinician workload so that it is sustainable.
- Obtain clinician and patient input to identify and eliminate documentation and other administrative burdens in the organization that are not mandatory and contribute little or no value to patient care. Assess opportunities to utilize clinical assistants or nonclinical staff to perform the work.
- Conduct reporting, at a minimum annually, overseen by the governing board, on the professional well-being of the organization's clinicians, including the outcomes of interventions. These reports should be targeted internally, including to leadership, managers, and clinicians.
- Use the data to guide system-oriented efforts to prevent and reduce clinician burnout and improve professional well-being as part of a continuous learning and improvement process in which data are shared transparently within the organization.

Goal 2. Create Positive Learning Environments: Transform health professions education and training to optimize learning environments that prevent and reduce burnout and foster professional well-being.

Health professions educational institutions, affiliated clinical training sites, accreditors, and related external organizations have a responsibility to create and maintain positive learning environments that support the professional development and well-being of students and trainees (learners). Evidence indicates that there is a need to promote professional well-being and address burnout early in professional development. Health professions educational institutions should work together with health care organizations to ensure that efforts to prevent and reduce burnout are coordinated across the work and learning environments.

Recommendation 2A Health professions educational institutions and affiliated clinical training sites should develop, pilot, implement, and evaluate initiatives to improve the learning environment and support learner professional well-being. To accomplish this, they should:

- Commit their executive and board leadership to the improvement of the learning environment. Specifically, governing boards should provide the resources necessary to create and maintain a positive learning environment and then hold educational leadership accountable. At the executive level, educators should designate a leadership role and function responsible for improving and sustaining learner professional well-being across the organization and across the continuum of learners. These efforts should be coordinated with individuals charged with improving the clinical environment where learners interact with clinical teachers.
- Ensure that workload, rewards and incentives, and the professional development of faculty and other educators of health professional learners promote positive role model behaviors and the professional development and professional well-being of learners.
- Enhance the ability of learners to contribute meaningfully to patient care while learning, and implement strategies that build relationships among and between learners, faculty, and other health professionals with the intent to build social support and interprofessional practice.
- Create systems of learner evaluation that fairly evaluate competencies while mitigating undue stress and promoting a collaborative learning environment, including criterion-based grading and a consideration of pass–fail grading.
- Provide resources for learners to promote and support their own personal and professional well-being. Establish and sustain a system-wide culture that promotes help-seeking behaviors and supports psychological safety.

Recommendation 2B Health professions educational institutions and affiliated clinical training sites should routinely assess the learning environment and factors that erode professional well-being and contribute to learner burnout. The data should guide systems-oriented efforts to optimize the learning environment, prevent and reduce learner burnout, and improve professional well-being. Health professions educational institutions should:

- Use validated measurement tools to assess the extent of the burnout problem and the potential contributory factors relevant to their system. It is essential to identify data capture strategies that minimize response burden, protect individual privacy, and address any stigma or pressure that learners may perceive related to measurement or reporting.

- Accurately assess the total clinical and academic workload expected of learners (including preparation for licensure examinations and required institutional and professional learning activities) with the goal of achieving a reasonable workload that is sustainable.
- Conduct at least annual reporting, overseen by the leadership of the health professions education institution and affiliated clinical training sites, on the professional well-being of its learners, including the outcomes of interventions taken to improve learner professional well-being. These reports should be targeted internally, including to leadership, learners, and faculty.
- Ensure that barriers to participation in professional well-being assessments are effectively addressed. It is essential for health professions educational institutions to protect learners' privacy and address any stigma or pressure that learners may perceive related to assessment or reporting.
- Use the data to guide systems-oriented efforts to prevent and reduce learner burnout and improve professional well-being as part of a continuous learning and improvement process where data are shared transparently across learners' health professions educational institutions and affiliated clinical training sites.

Recommendation 2C Accreditors, regulators, national educational organizations, health professions educational institutions, and other related external entities should partner to support the professional well-being and development of learners. To accomplish this, they should:

- Commit, at the highest level, to identifying, implementing, and continuously evaluating strategies that optimize learner professional well-being and development.
- Support the discovery and implementation of evidence-based approaches to reduce the risk of learner burnout and optimize learner professional well-being while simultaneously ensuring the appropriate development of competencies, skills, professionalism, and ethical standards.
- Engage and commit leadership at all levels to curbing learner educational debt, with such strategies as improving access to scholarships and affordable loans and building new loan repayment systems.
- Assess the foreseeable impact of decisions on learner professional well-being. Specifically, accreditors and administrators of licensure

and certifying examinations should evaluate how their policies may affect learner professional well-being and willingness to seek emotional support.

Goal 3. Reduce Administrative Burden: Prevent and reduce the negative consequences on clinicians' professional well-being that result from laws, regulations, policies, and standards promulgated by health care policy, regulatory, and standards-setting entities, including government agencies (federal, state, and local), professional organizations, and accreditors.

Health care laws, regulations, policies, and standards in the United States are numerous and, as a whole, immensely complex, and imposed by many entities that are considered part of the external environment. The associated burden of the myriad requirements on clinicians is well documented and includes regulations and standards for the oversight of U.S. clinicians, specifically those addressing payment policies, clinical documentation, quality measurement and reporting, prescription drug monitoring, privacy rules and procedures, pre-authorization forms, and professional and legal requirements for licensure, board certification, professional liability, and health information technology.

Administrative burden is a barrier to quality care that diminishes patient care experiences and contributes to the risk of clinician burnout. Health care policy makers, regulators, and standards-setting bodies have a responsibility to identify and eliminate policies, rules, and processes that impede a clinician's ability to perform productive work necessary for quality patient care and that negatively affect the clinician–patient relationship. These entities should engage clinicians and patients in the process to identify and eliminate health care laws, regulations, policies, standards, and administrative processes that contribute little or no value to patient care.

Recommendation 3A Health care policy, regulatory, and standards-setting entities at the federal and state levels, such as the U.S. Department of Health and Human Services' Centers for Medicare & Medicaid Services and The Office of the National Coordinator for Health Information Technology, the National Quality Forum, state legislatures, professional boards, and departments of health, should systematically assess laws, regulations, policies, and standards to determine their effects on clinician job demands and resources as well as the effects on patient care quality, safety, and cost. To accomplish this, these entities should:

- Allocate the necessary resources to support assessment of the effects of regulations, policies, and standards on clinicians in various care settings. Formal assessment should be conducted both prior to and following implementation in order to evaluate how the requirements affect clinician workload and whether they are redundant or conflict with other requirements. Regulations, policies, and standards should then be modified accordingly based on these findings.

- Apply human-centered design and human factors and systems engineering approaches in developing regulations, policies, and standards, including those related to payment and performance to minimize the potential risk for adverse effects on clinicians and patients.
- Periodically review laws, regulations, policies, and standards related to the clinical work environment for alignment and usability with new technology.
- Align licensure standards and enable broad license reciprocity for all clinicians regulated by states.

Recommendation 3B Health care policy, regulatory, and standards-setting entities, in conjunction with health care organizations, should appreciably reduce documentation requirements and adopt approaches to documentation and reporting that incorporate human-centered design and human factors and systems engineering approaches and that also are technology enabled. To facilitate this:

- Payers and health care organizations should promote the development and use of technology to streamline documentation for billing and quality reporting, with the goal of decreasing to the greatest extent possible clinicians' workload and non-patient, care-related work.
- Professional certification and health care accrediting entities should coordinate efforts to align documentation requirements, streamline reporting, and eliminate redundant processes and requirements that contribute to unnecessary burden.

Goal 4. Enable Technology Solutions: Through collaboration and engagement of vendors, clinicians, and expert health information technology system developers, optimize the use of health information technologies to support clinicians in providing high-quality patient care.

Many challenges of health information technology (IT) are reported to affect clinician professional well-being, including problems with the usefulness and usability of health IT tools, their poor integration into clinical workflow, difficulty sharing information among clinical team members and settings, and limitations in supporting clinical decision making. Despite nascent industry and regulatory efforts to improve health IT design and evaluation, many clinicians find these technologies excessively challenging and time consuming to use. Strategies are needed in which vendors, clinicians, health care organizations, regulators, and policy makers in the broader external environment can work together to address the current challenges and support the integration of new technologies and approaches with the overarching goal of improving patients', caregivers', and clinicians' care experiences and outcomes.

Recommendation 4A Stakeholders should engage clinicians in the design and deployment of health information technology (IT), including electronic health records, using human-centered design and human factors and systems engineering approaches to ensure the effectiveness, efficiency, usability, and safety of the technology. For example:

- Regulators should use rigorous human factors usability and safety criteria to evaluate and certify health IT.
- Health IT vendors and health care organizations should design and configure systems to improve the clinical work environment, including attention to cognitive load and workflows that reduce the demand of clinical documentation and automate non-essential tasks.
- Health IT vendors, health care organizations, and regulators should closely monitor implemented technology for negative consequences and should have an existing mitigation plan to address them as they arise.
- Policy makers and organizational leaders should create incentives for, and lower barriers to, the development and implementation of new ideas, approaches, and technologies that have the promise of enhancing professional well-being as well as improving the quality of care.

Recommendation 4B Federal and state policy makers should facilitate the optimal flow of useful information among all members of the health care community through regulation and rule making. Health information sources should be shared efficiently, safely, and securely, including but not limited to electronic health records, electronic pharmacy records, digital health applications, medical devices, and quality data repositories.

Recommendation 4C Federal policy makers, in collaboration with private-sector health information technology companies and innovators and other relevant stakeholders, should develop the infrastructure and processes that will lead to a truly patient-centered and clinically useful health information system. This would be an electronic interface that gives the entire care team, including the patient, the ability to collect and use timely and accurate data to achieve high-quality care. A major goal of this new health information system should be to allow clinicians to focus on optimizing patient and population health, while adjuvant processes and technologies derive, to the extent possible, the essential business, administrative, and research data necessary to deliver high-value care efficiently and effectively.

Goal 5. Provide Support to Clinicians and Learners: Reduce the stigma and eliminate the barriers associated with obtaining support needed to prevent and alleviate burnout symptoms, facilitate recovery from burnout, and foster professional well-being among learners and practicing clinicians.

Research shows that stigma (negative perceptions, attitudes, and discrimination) associated with seeking emotional and mental health help is pervasive in American society. Such stigma thrives in the health professions because of the culture and training, the perceptions of health professionals, and the expectations and responses of health care organizations, licensure boards, and other external organizations. Reducing stigma and eliminating barriers to help-seeking are critical to improving the professional well-being of clinicians and learners.

Recommendation 5A State licensing boards, health system credentialing bodies, disability insurance carriers, and malpractice insurance carriers should either not ask about clinicians' personal health information or else inquire only about clinicians' current impairments due to any health condition rather than including past or current diagnosis or treatment for a mental health condition. They should be transparent about how they use clinicians' health data and supportive of clinicians in seeking help.

Recommendation 5B State legislative bodies should create legal protections that allow clinicians to seek and receive help for mental health conditions as well as to deal with the unique emotional and professional demands of their work through employee assistance programs, peer support programs, and mental health providers without the information being admissible in malpractice litigation.

Recommendation 5C Health professions educational institutions, health care organizations, and affiliated training sites should identify and address those aspects of the learning environment, institutional culture, infrastructure and resources, and policies that prevent or discourage access to professional and personal support programs for individual learners and clinicians.

Goal 6. Invest in Research: Provide dedicated funding for research on clinician professional well-being.

The compelling evidence of the alarmingly high rates of burnout and its negative effects on the health care system and patient care requires the expansion and support of research and innovation in this area. Such support can be achieved through the collaborative efforts of government bodies and organizations charged with improving care quality and patient safety, improving the patient experience, reducing health care costs, and supporting the professional development of learners and clinicians in the health professions.

Recommendation 6A By the end of 2020 federal agencies, including the Agency for Healthcare Research and Quality, the National Institute for Occupational Safety and Health, the Health Resources and Services Administration, and the U.S. Department of Veterans Affairs, should develop a coordinated research agenda to examine:

- Organizational, learning environment, and health care system factors that contribute to occupational distress and threaten or promote the professional well-being of health care learners and practicing professionals;
- The implications of clinician and learner distress and degraded professional well-being on health care and workforce outcomes as well as personal outcomes; and
- Potential system-level interventions to improve clinician and learner professional well-being and help those with burnout to recover.

These federal agencies should commit funding to implement this research agenda. The amount of this funding should be commensurate with the magnitude of the problem and its impact on the health care delivery system. A particular area of focus should be the support of rigorous prospective empirical studies, including multi-center randomized controlled trials, of system-level interventions.

Recommendation 6B Federal agencies, including the Agency for Healthcare Research and Quality, the National Institute for Occupational Safety and Health, the Health Resources and Services Administration, and the U.S.

Department of Veterans Affairs, should pursue and encourage opportunities for public–private partnerships among a broad range of stakeholders, such as health professional associations, foundations, payers, health care industry, health care organizations, health professions educational institutions, and professional liability insurers, to support research on clinician and learner professional well-being and burnout. Organizations need to be willing to test, learn, and share in order to accelerate the pace of change. A public–private partnership should support the creation and ongoing management of a national registry of evidence-based interventions to facilitate research and innovation beneficial to every stakeholder with responsibility for eliminating clinician and learner burnout and improving professional well-being.

1

Introduction

> “Burnout comes from loss of connection to our patients, to ourselves, and to those we love. Too often in health care today we focus on tasks—on doing the appropriate tests and making the right diagnosis, when what our patients want and what we truly crave is to feel connected.”
>
> (She Knows You Are Coming, Jay Kaplan)[1]

In the 20 years since publication of the landmark Institute of Medicine (IOM) studies *To Err Is Human: Building a Safer Health System* (IOM, 2000) and *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001) many strategies have been employed to improve the safety and quality of health care in the United States. Improving the performance of the U.S. health care system to achieve the goals of better population health, enhanced patient care experiences, and lower health care costs (Berwick et al., 2008; Sikka et al., 2015; Whittington et al., 2015) depends in large part on clinicians, the health care professionals who provide direct patient care.[2] Delivering safe, patient-centered, high-quality, and high-value health care requires a clinical workforce that is functioning at the highest level. However, there is growing recognition among health

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[1] Excerpted from the National Academy of Medicine’s Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Jay Kaplan, visit https://nam.edu/expressclinicianwellbeing/#/artwork/257 (accessed January 30, 2019).

[2] See Chapter 2 for a discussion of the target population of clinicians in the report.

care system experts that clinician well-being, so essential to the therapeutic alliance among clinicians, patients, and families, is eroding because of occupational stress (Bodenheimer and Sinsky, 2014; Sikka et al., 2015; Street et al., 2009). The high rates of burnout reported among U.S. health care clinicians, and clinical students and trainees ("learners"), are a strong indication that the nation's health care system is failing to achieve the aims for system-wide improvement.

Although occupational stress can take multiple forms, professional burnout, a syndrome characterized by high emotional exhaustion, high depersonalization (i.e., cynicism), and a low sense of personal accomplishment from work, is the best-studied phenomenon (Bodenheimer and Sinsky, 2014; Schaufeli et al., 2009; Shanafelt et al., 2012, 2014). Extensive research has found that between 35 and 54 percent of U.S. nurses and physicians have substantial symptoms of burnout (Aiken et al., 2002b, 2012; McHugh et al., 2011; Moss et al., 2016; Shanafelt et al., 2009, 2012, 2015, 2019); similarly, the prevalence of burnout ranges between 45 and 60 percent for medical students and residents (Dyrbye et al., 2014; West et al., 2011). Burnout among health care clinicians and learners has been most studied in the medical and nursing professions; however, a growing understanding of the epidemiology and etiology of the syndrome suggests that burnout among all types of clinicians and learners is a growing public health concern (Jha et al., 2019). The high rate of clinician and learner burnout is a strong signal to health care leaders that major improvements in the clinical work and learning environments have to become a national and organizational priority.

A growing body of research suggests that the changing landscape of the U.S. health care system—how care is provided, documented, and reimbursed—has had profound effects on clinical practice and consequently on the experiences of clinicians, learners, patients, and their families. As the committee summarizes in the report, many mounting system pressures have contributed to overwhelming job demands for clinicians (e.g., workload, time pressures, technology challenges, moral and ethical dilemmas) and insufficient job resources and supports such as adequate job control, alignment of professional and personal values, and manageable work–life integration. A chronic imbalance of high job demands and inadequate job resources can lead to burnout. The job demand–resources imbalance in health care is exacerbated by the increasing push for system performance improvement (which leads to greater administrative burden, production pressures, and shifts in financial incentives and payment structures); by technology implementation that hinders rather than supports patient care; by changing professional expectations; as well as by standards and regulatory policies that are insufficiently aligned with the delivery of high-quality patient care or professional values. Intensifying these and other health system pressures on the clinical workforce is the explosive increase in the amount of medical information and data collected and the growing demand for health care as the U.S. population ages, including care and services for chronic conditions (Irving, 2017) and social care[3] (NASEM, 2019a), in the face of an existing shortage of health professionals in many areas (Gruca et al., 2018; IHS Markit, 2017; Zhang et al., 2018).

Burnout resulting from chronic workplace stress is not a new phenomenon among clinicians or among other workers. However, the common perception that a job in the health care professions is generally associated with socioeconomic benefits may actually be a barrier to recognizing and addressing the wide-ranging effects of clinician burnout. Several decades of research on the characteristics, the causes, and the outcomes of burnout clearly show that burnout has high personal costs for individual workers, but it also has high social and economic costs for their organizations (Maslach, 2018) and for society as a whole. For example, in health care, studies have found strong links between clinician burnout and unprofessional behavior leading to undesirable patient experiences (Windover et al., 2018). Clinicians with burnout are at least twice as likely to report they have made a major medical error in the past 3 months as those without burnout, and they are also more likely to be involved in a malpractice litigation suit (Panagioti et al., 2018; Shanafelt et al., 2010; West et al., 2006, 2009). Physicians with burnout are more likely to reduce their clinical work hours, at least twice as likely to leave their job, and, worse yet, five times more likely to leave medicine altogether (Dyrbye et al., 2013; Hamidi et al., 2018; Linn et al., 1985; Shanafelt et al., 2009; Willard-Grace et al., 2019; Windover et al., 2018). Approximately 2,400 physicians leave the workforce each year, with professional burnout the largest factor influencing a decision to leave medicine early (Sinsky et al., 2017). Not only does this affect access to care, but an estimated $4.6 billion in societal costs related to physician turnover and reduced clinical hours is attributable to burnout each year in the United States (Han et al., 2019). This figure does not account for the additional societal cost of burnout in other health care clinicians, which, to the committee's knowledge, has not been estimated. These and other consequences of burnout are further discussed in Chapters 3 and 8.

There is growing momentum for taking action to improve the quality and safety of health care by addressing clinician and learner burnout (Aiken et al., 2002a; Dzau et al., 2018; Jha et al., 2019; Lake et al., 2019; Noseworthy et al., 2017; Perni, 2017; Shanafelt et al., 2017b). Catalyzing collective action to reduce burnout and improve clinician well-being is the core goal of the National Academy of Medicine's (NAM's) Action Collaborative on Clinician Well-Being and Resilience, which was developed

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[3] Social care addresses health-related social risk factors and social needs (NASEM, 2019a).

in collaboration with the Accreditation Council for Graduate Medical Education and the Association of American Medical Colleges. The calls to accelerate progress toward improving professional well-being among clinicians build on the current focus of professionalism in health care. Clinicians are intrinsically motivated and committed to providing patients with high-quality, patient-centered care (Chassin and Baker, 2015; Madara and Burkhart, 2015). It is when the health care system makes it difficult for clinicians to "fulfill their ethical commitments and deliver the best possible care" that work takes a personal toll (Dzau et al., 2018, p. 312).

Given the importance of burnout to health care quality and safety and the pervasiveness of burnout, there is a strong imperative to take a systemic approach to reduce it, focusing on the structure, organization, and culture of health care (Dzau et al., 2018; Shanafelt and Noseworthy, 2017; Shanafelt et al., 2017b). A systems approach incorporates thorough knowledge of several factors, including the stakeholders, their goals and activities, the technologies they use, and the environment in which they operate. In designing and implementing effective systems-focused interventions, it is crucial to consider the fact that health care is a "complex adaptive system" in which the complex interplay of all of these factors affects system outcomes (NASEM, 2018; Plsek and Greenhalgh, 2001; Rouse, 2008). The *Crossing the Global Quality Chasm: Improving Health Care Worldwide* (NASEM, 2018) report provides general principles for building a new health care system that consider the complex adaptive nature of the health care system (see Box 1-1).

A systems framework to improving health care more generally was the focus of a 2005 National Academy of Engineering and IOM report (NAE and IOM, 2005). The World Health Organization further advanced systems thinking as the standard in health system interventions and evaluation design by providing tools and guidance (De Savigny and Adam, 2009). More recently, a 2014 President's Council of Advisors on Science and Technology report promoted the greater use of systems-engineering principles as a way of enhancing U.S. health care (PCAST, 2014). The subjects of recent systems-oriented approaches to complex public health issues have included diagnostic error (NASEM, 2015), global health care quality (NASEM, 2018), tobacco use (IOM, 2015), obesity (IOM and NRC, 2015), cancer control (NASEM, 2019b), and a variety of case studies (Kaplan et al., 2013).

Creating healthy and safe care systems for the nation's patients and clinicians is a complex endeavor. Many factors over time have contributed to the current state. "Fixing" a single variable in the system, such as the electronic health record, will not solve the burnout problem by itself, nor will it be sufficient to gain the deep understanding necessary for a comprehensive solution. Many different aspects of the health care environment have to work together in an integrated way to prevent, reduce, or mitigate

BOX 1-1
Proposed New Design Principles to Guide Health Care Developed by the Committee on Improving the Quality of Health Care Globally

1. Systems thinking drives the transformation and continual improvement of care delivery.
2. Care delivery prioritizes the needs of patients, health care staff, and the larger community.
3. Decision making is evidence based and context specific.
4. Trade-offs in health care reflect societal values and priorities.
5. Care is integrated and coordinated across the patient journey.
6. Care makes optimal use of technologies to be anticipatory and predictive at all system levels.
7. Leadership, policy, culture, and incentives are aligned at all system levels to achieve quality aims and promote integrity, stewardship, and accountability.
8. Navigating the care delivery system is transparent and easy.
9. Problems are addressed at the source, and patients and health care staff are empowered to solve them.
10. Patients and health care staff co-design the transformation of care delivery and engage together in continual improvement.
11. The transformation of care delivery is driven by continuous feedback, learning, and improvement.
12. The transformation of care delivery is a multidisciplinary process with adequate resources and support.
13. The transformation of care delivery is supported by invested leaders.

SOURCE: NASEM, 2018.

burnout and improve professional well-being (Shanafelt and Noseworthy, 2017; Shanafelt et al., 2017b). Systems-oriented strategies will need to include making improvements in clinician workload and clinical workflow, providing more usable technologies that are focused on clinicians' needs, and developing organizational structures and processes that better support clinicians and the interdisciplinary care teams in which they work (Andela et al., 2017; Bodenheimer and Willard-Grace, 2016; Catt et al., 2005). Individually focused interventions, such as group discussions and mindfulness education, can be complementary to system interventions (Krasner et al., 2009; Panagioti et al., 2017; West et al., 2014).

There is a serious problem of burnout among health care professionals in this country, with consequences for both clinicians and patients (e.g., safety), health care organizations (e.g., productivity), and society (e.g., cost of care) (Panagioti et al., 2018; Shanafelt et al., 2017a; West et al., 2018). This report by the Committee on Systems Approaches to Improve Patient

Care by Supporting Clinician Well-Being synthesizes current knowledge about the prevalence, causes, and consequences of clinician burnout and makes recommendations on how best to design systems approaches to reduce clinician burnout and support professional well-being.

ORIGIN OF THE TASK AND COMMITTEE CHARGE

The NAM's Action Collaborative on Clinician Well-Being and Resilience (Action Collaborative) was launched in January 2017 in response to alarming rates of stress, burnout, and suicide among U.S. clinicians. The Action Collaborative is a network of more than 190 organizations committed to reversing these trends and improving clinician well-being. The leadership of the Action Collaborative requested that the Board on Health Care Services of the National Academies of Sciences, Engineering, and Medicine undertake a consensus study that would serve as one approach to achieving the Action Collaborative's goals for addressing clinician burnout and well-being. The Action Collaborative has three goals: (1) to raise the visibility of clinician stress, burnout, depression, moral injury, and suicide; (2) to improve the baseline understanding of the challenges to clinician well-being; and (3) to advance evidence-based, multidisciplinary approaches to improving patient care by caring for the caregiver. The Action Collaborative's working groups meet regularly to identify strategies for improving clinician well-being at both the individual and systems levels.[4]

With support from a broad coalition of sponsors (see Box 1-2), the study was launched in June 2018. The charge to the committee was to examine the scientific evidence on clinician burnout and well-being and to make recommendations about systems approaches to reduce burnout and improve well-being, including providing a research agenda to address areas of uncertainty (see Box 1-3).

An independent committee was appointed with a broad range of expertise, including in clinical care, health care systems and administration, health information technology, health care quality, health professional education, systems engineering/organizational science, human-systems integration, human factors and ergonomics, health care policy and financing, oversight of clinical documentation, burnout, research methodology, implementation science, and medical ethics. Brief biographies of the 17 members of this Committee on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being are presented in Appendix A.

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[4] For more information about the Action Collaborative and to view the many resources developed on the topic of clinician well-being, please visit https://nam.edu/initiatives/clinician-resilience-and-well-being (accessed October 1, 2018).

BOX 1-2
Sponsors of Taking Action Against Clinician Burnout: A Systems Approach to Improving Professional Well-Being

Accreditation Council for Graduate Medical Education
American College of Occupational and Environmental Medicine
American Hospital Association
Arnold P. Gold Foundation
Association of American Medical Colleges
BJC HealthCare
Cedars-Sinai Medical Center
Doctors Company Foundation, The
Duke University Hospital
Gordon and Betty Moore Foundation
Johns Hopkins Health System
Josiah Macy Jr. Foundation
Keck School of Medicine of the University of Southern California
Medical College of Wisconsin
Montefiore Medicine
Mont Fund, The
Ohio State University, The
State University of New York System, The
Tulane University
University of Florida
University of Illinois Hospital and Health Sciences System
University of Massachusetts Medical School
University of Michigan
University of New Mexico Health Sciences Center
University of North Carolina at Chapel Hill
University of Utah Health
University of Virginia Medical Center
University of Virginia School of Medicine
Vanderbilt University Medical Center
Washington University School of Medicine
Yale New Haven Health System
Yale School of Medicine

METHODS OF THE STUDY

The committee deliberated during four 2-day, in-person meetings and many conference calls that took place between October 1, 2018, and May 31, 2019. At two of the meetings speakers were invited to inform deliberations and members of the public were given the opportunity to offer comments and suggestions. The speakers provided valuable input to the committee on a broad range of topics, including burnout, moral distress, resilience, workplace health and safety, the nursing work environment, patient safety, technology in health care, clinical documentation requirements, administrative burden, and the usability of electronic health records. A number of experts and organizations provided written input to the committee on an array of topics. In addition, the committee completed an extensive search of the peer-reviewed literature, ultimately considering more than 4,000 articles. The search targeted English-language articles published since 2000 concerning

BOX 1-3
Charge to the Committee on Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being

An ad hoc committee under the auspices of the National Academies of Sciences, Engineering, and Medicine will examine the scientific evidence regarding the causes of clinician burnout as well as the consequences for both clinicians and patients and interventions to support clinician well-being and resilience. The committee will examine components of the clinical training and work environment that can contribute to clinician burnout in a variety of care settings as well as potential systems interventions to mitigate those outcomes. The committee will identify promising tools and approaches to support clinician well-being, identify gaps in the evidence base, and propose a research agenda to address areas of uncertainty. In developing its report, the committee will consider key components of the health care system, including

- factors that influence clinical workflow, workload, and human–systems interactions;
- the training, composition, and function of interdisciplinary care teams;
- the ongoing movement toward outcomes-based payment and quality improvement programs;
- current and potential use and impact of technologies and tools such as electronic health records and other informatics applications; and
- regulations, guidance, policies, and accreditation standards that define clinical documentation and coding requirements, as well as institutional expectations and interpretations of those requirements.

The committee may develop a conceptual framework that encapsulates its findings and will issue a report with recommendations for system changes to streamline processes and manage complexity, minimize the burden of documentation requirements, and enhance workflow and teamwork to support the well-being of all clinicians and trainees on the care team, prevent clinician burnout, and facilitate high-quality patient care.

U.S. and international health care professionals. International papers about physicians and nurses were referenced in some instances when the data were particularly strong or filled a void. In particular, because there were limited data on dentists and pharmacists, the committee had to rely more on research conducted in settings outside of the United States. The committee also reviewed grey literature, including publications by professional associations, government agencies, and business and industry. See Chapter 9 for a discussion about the gaps in the literature and the areas needing further research.

CONCEPTUAL FRAMEWORK

The study's Statement of Task (see Box 1-3) places emphasis on "systems approaches" to achieve the dual objective of improving patient care and addressing clinician burnout and well-being. To help orient and organize its work, the committee developed a conceptual framework that harnesses systems thinking and design principles with the goal of fostering healthy and safe care systems for the nation's clinicians and patients. In Chapter 2 the committee describes this framework and presents a systems model of clinician burnout and professional well-being, which is discussed and elaborated on throughout the report.

Target Population, Health Care Organizations, and Educational Institutions

Clinicians and Learners

The Statement of Task refers to "all clinicians and trainees on the care team." In the committee's framework, the term "clinicians" is used to refer to health care professionals who provide direct patient care. The term "learners" includes students and trainees, who learn and work within various and diverse settings, including classrooms, laboratories, and clinical settings.

After reviewing the literature, the committee found that much of the evidence is related to physicians and nurses. Although physicians and nurses are the focus of most of the available published research, there is limited but consistent evidence that burnout is also a significant problem among pharmacists, dentists, nurse practitioners, and physician assistants. Furthermore, the available evidence suggests that burnout is present to varying degrees in other health care professionals and clinicians (e.g., genetic and mental health counselors, perfusionists, respiratory therapists).

The evidence provided in the literature about burnout informed the development of the committee's framework. On the basis of this evidence, the committee determined it was important to develop a framework that shines a light on many fundamental aspects of the health care system that are barriers to healthy work and learning environments. The principles that define the committee's framework are based on theories and constructs from systems science (see Chapter 2, Box 2-2) that are applicable to various types of workers and workplaces. Based on the available literature the committee believes that many evidence-based approaches used by high-functioning systems and healthy work environments in other domains are relevant to health care inclusive of all clinicians. Because the factors contributing to burnout or affecting well-being will vary by clinical profession, organization, and even by individuals in the same work environment, the committee's report does not provide a prescriptive approach, but rather offers health care leaders and other stakeholders guidance to improve the well-being of clinicians in all disciplines to the extent they are relevant and meaningful to the local context. The committee's framework is intended to be dynamic—it includes a learning feedback loop, by which the system can adapt to new or different inputs. These inputs can include new information and data about clinician characteristics or other variables that future research studies suggest are important. The next steps in understanding and acting on clinician burnout more broadly is to use the framework as a platform for expanding research and pilot projects relating to other disciplines and a myriad of other areas, as discussed in Chapter 9, A Research Agenda to Advance Clinician Well-Being. Like the early IOM studies about safety and quality (IOM, 2000, 2001), this report sets the stage for much subsequent work.

Health Care Organizations and Educational Institutions

In the report, the term "health care organization" (HCO) broadly applies to all types of care-providing entities—from single clinician offices to large, integrated health systems. All HCOs comprise people, processes, and resources that are part of a system that delivers care services to meet the health needs of patients. "Health professions educational institutions" refers to organizations that provide health care professional education and training (e.g., professional schools, undergraduate and graduate programs, sponsoring health care organizations). These organizations are a system comprising people, processes, and resources that provide structure, guidance, and support for learning.

Connections Heal Patients and Clinicians[a]

We have experienced firsthand the extraordinary pressures facing students, clinicians, patients, and families surrounding health care delivery. We were immersed at two ends of the health care spectrum—our daughter's last year of medical school, and my mother's struggle with lung cancer. We couldn't help but notice the … medical students and residents were under pressure to learn and perform, magnified by daunting hours and exhaustion. We watched the pressures on my mother's care team, as they searched for ways to manage her disease while giving her hope … and patiently listening to anxious loved ones as they tried to cope. I witnessed my daughter's 3-day vigil at her grandmother's bedside … knowing that as a physician she would face this scene hundreds of times again. Ironically, she missed her final class on death and dying … living it instead. And though we often wilted under the pressure we felt, we were awed by the compassion and resilience of the clinicians. They "managed" the pressure, even embraced it. It gave us strength. For clinicians, … my hope would be that they can find both strength and balance in their role, knowing the value they bring to the patients they care for and the lives they touch.

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[a] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Angela Sanders, visit https://nam.edu/expressclinicianwellbeing/#/artwork/214 (accessed January 30, 2019).
SOURCE: Under Pressure, Angela Sanders.

ORGANIZATION OF THE REPORT

The committee organized this report into 10 chapters. Chapter 2 defines the concepts of burnout, professional well-being, and resilience. It further describes the committee's systems approach and conceptual framework for addressing clinician burnout and professional well-being, which are grounded in the theories and principles of human factors and systems engineering, job and organizational design, and occupational safety and health. Chapter 3 discusses the prevalence and consequences of clinician burnout. Chapter 4 describes the contributing factors of clinician burnout and professional well-being in terms of job demands and job resources as well as the individual clinician factors that mediate burnout. Chapter 5 focuses on health care organizations, interventions that target burnout in the workplace, and the principles with which health care organizations can design well-being systems. Chapter 6 describes how the external environment (including the health care industry, laws, regulations, standards, and societal values) can contribute to workplace stress. Chapter 7 discusses current and future health information technology, how stakeholders across all levels can work to improve it, and the potential of emerging technologies to reduce some of the burdens that contribute to burnout. Chapter 8 discusses the prevalence and consequences—as well as the contributing factors—of burnout among students and trainees of the health professions. Chapter 9 discusses the gaps in the current research on burnout and well-being and proposes a research agenda to advance the field. Chapter 10 details the committee's main conclusions and recommendations for reducing clinician burnout and improving professional well-being.

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2

A Framework for a Systems Approach to Clinician Burnout and Professional Well-Being

> "There is hope that we can change this culture and not drive [clinicians] to extremes in which they cause harm to themselves or inadvertently cause harm to patients as a result of a system that is making it harder for them to do what drove them to medicine in the first place—to heal."
>
> (Bridging the Gap, Zohal Ghulam-Jelani)[1]

To consider approaches for improving patient care by supporting the professional well-being of clinicians, the committee developed a conceptual framework that clarifies the structure and dynamics of the system in which clinicians work and reveals potential levers for change. The committee's framework for a systems approach to clinician burnout and professional well-being is based on theories and principles from the fields of human factors and systems engineering, job and organizational design, and occupational safety and health. Throughout the report, the committee applies this framework to examine many important aspects of the current system and to identify strategies that will foster healthy and safe care systems for the nation's patients and clinicians. To set the context for the rest of the report, this chapter presents the definitions of burnout, professional well-being, and resilience; gives an overview of systems approaches informing

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[1] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Zohal Ghulam-Jelani, visit https://nam.edu/expressclinicianwellbeing/#/artwork/347 (accessed January 30, 2019).

the committee's framework; and presents the committee's systems model of burnout and professional well-being.

DEFINITIONS OF BURNOUT, PROFESSIONAL WELL-BEING, AND RESILIENCE

"Burnout," "well-being," and "resilience" are three distinct terms used in the Statement of Task and, more broadly, in the scientific and popular literature about issues in the work environment for clinicians. Fundamentally, burnout is an obstacle to professional well-being. That said, the absence of burnout does not necessarily indicate the presence of overall well-being. The World Health Organization (WHO) declared that "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 2006, p. 1). Well-being is a function of complex interplay of physical, emotional, mental, social, and spiritual factors that interact with the ecosystem within which the person resides. In psychology and related fields there is no agreement about the number of factors that constitute well-being (Gander et al., 2016). Many of the same factors that contribute to burnout in some clinicians may lead to other forms of diminished well-being in others (Chari et al., 2018).

In this report, the committee focuses on burnout as a barrier to professional well-being (defined further below). The committee acknowledges that the absence of burnout does not by itself result in a state of professional well-being. However, the committee believes that addressing the drivers of burnout (as well as barriers to well-being and optimal performance) is critical to assisting clinicians reach the goal of professional well-being and will also help health systems in which clinicians work or train reach their maximum potential. The committee acknowledges that there are significant differences in how vulnerable individual clinicians are to burnout because personal resilience and other individual and contextual factors influence each individual's capacity and approaches to dealing with work-related stress (discussed further in Chapter 4). Below, the committee defines the concepts of burnout, professional well-being, and resilience in relation to the study approach.

Connections Heal Patients and Clinicians[a]

We choose medicine as a profession in order to help other human beings. It is the connection between practitioner and patient that becomes the foundation of the healing relationship and it is exactly that bond which has inherent in it both the possibility of clinician and patient well-being and the risk of burnout. Too often we think of the doctor-patient relationship as a one-way street. The truth is that we receive as much from our patients as we give to them.

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[a] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Jay Kaplan, visit https://nam.edu/expressclinicianwellbeing/#/artwork/257 (accessed January 30, 2019).
SOURCE: She Knows You Are Coming (poetry), Jay Kaplan, New Orleans, LA.

Burnout

Burnout is a work-related phenomenon studied since at least the 1970s (Schaufeli et al., 2009). It is a well-established construct that has been the subject of thousands of publications, most focused on professionals who directly serve other individuals (e.g., human service workers, also referred to as the "helping professions"). In 1976 Christina Maslach, a social psychology researcher, further developed the concept after conducting a series of interviews of human service workers (Maslach, 1976), leading ultimately to the definition that burnout is a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al.,

1996) (see Box 2-1). Although Maslach's definition of burnout and the accompanying measurement tool, the Maslach Burnout Inventory (MBI), are the most widely used approaches (Schaufeli et al., 2009), researchers have conceptualized and defined burnout in various other ways as well. All of these approaches agree on at least one thing, however—that the key feature of burnout is mental exhaustion due to occupation-related factors (Salvagioni et al., 2017).

Consistent with these previous definitions, WHO recently updated its definition of burnout to this:

> Burn-out is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: (1) feelings of energy depletion or exhaustion; (2) increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and (3) reduced professional efficacy. Burn-out refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life.

Burnout has an ICD-11 (*International Classification of Diseases, Eleventh Revision*) code of QD85. It should be noted that WHO defines burnout as a problem associated with employment rather than as an individual mental health diagnosis and that it is considered to be distinct from mood disorders (WHO, 2019).

BOX 2-1
Key Dimensions of Burnout

The three key dimensions of burnout are overwhelming exhaustion, feelings of cynicism and detachment from the job, and a sense of ineffectiveness and lack of accomplishment.

Exhaustion is the physical and emotional response of stress. Emotions associated with exhaustion include feeling overextended by work demands and depleted of emotional and physical resources that support replenishment and recovery.

Cynicism represents the interpersonal aspect of burnout and refers to a negative, callous, or excessively detached response to various aspects of the job, usually resulting in a negative reaction to people, loss of idealism, and the dehumanization of others.

Inefficacy refers to feelings of incompetence and a lack of achievement and productivity in work and represents the self-evaluation aspect of burnout.

SOURCE: Maslach and Leiter, 2017.

Burnout is generally considered to be a context-dependent phenomenon that is due to work-related stressors and that primarily affects professional attitudes and behaviors, although it can have ramifications on the personal front as well. It differs from depression, which is a mental health diagnosis that has well-defined diagnostic criteria and is context-independent (Melnick et al., 2017). In North America, burnout is considered to be a work-related syndrome, whereas in Europe it is thought of more as a medical diagnosis—a situation that results in the availability of occupational resources and access to paid work leave for those who have high degrees of burnout (Schaufeli et al., 2009). Philosophically, since the drivers of burnout originate in the work environment, the committee favors the occupational framework that views and addresses burnout as a system issue rather than as a personal mental health diagnosis. While individually targeted interventions may help individual clinicians, they will not address the systemic issues that drive the burnout problem in the first place.

The evidence indicates that burnout is best thought of as a continuous variable, rather than as a dichotomous one; that is, there are "degrees" of burnout with severity in the various dimensions—emotional exhaustion, depersonalization, and loss of personal accomplishment—manifesting differently in different individuals (Maslach et al., 1997). Greater severity across these dimensions has been shown to relate to multiple negative professional and personal outcomes among clinicians (see Chapter 3). Although it may be more accurate to consider burnout as a continuous variable, research studies often treat it as a dichotomous variable; approaches to dichotomizing burnout, as well as commonly used measurement tools for burnout, are discussed in Chapter 3. The dichotomous-versus-continuous-variable issue for burnout is analogous to the situation with hypertension (Palamara et al., 2018). Blood pressure is a continuous variable for which higher numbers are associated with a greater risk of adverse consequences. Nonetheless, thresholds are set to dichotomize individuals as having or not having "hypertension," even though it is recognized that not all individuals thus characterized as hypertensive have an equally severe condition. All of these features of blood pressure characteristics (i.e., continuous variable, higher scores associated with greater risk, and thresholds identified as associated with an increased risk of adverse outcomes) are consistent with the construct and data on burnout. As with hypertension, any thresholds set to dichotomize burnout should be based on objective data indicating a relationship between the threshold and adverse or undesirable outcomes.

Professional Well-Being

Professional well-being is related to the broader concept of psychological well-being, or subjective well-being, which stems from various life and non-work sources of satisfaction enjoyed by individuals (Diener, 2000). Worker well-being (which in this report applies to clinicians) is defined "as an integrative concept that characterizes quality of life with respect to an individual's health and work-related environmental, organizational, and psychosocial factors. Well-being is the experience of positive perceptions and the presence of constructive conditions at work and beyond that enables workers to thrive and achieve their full potential" (Chari et al., 2018, p. 590). Professional well-being is further conceptualized as job-related and is a function of being satisfied with one's job, finding meaning in one's work, feeling engaged while at work, having a high-quality working life, and finding professional fulfillment in one's work (Danna and Griffin, 1999; Doble and Santha, 2008). Although professional well-being can be measured by a variety indicators (Chari et al., 2018), work engagement, linked to the motivational aspects of work, has been a common proxy for professional well-being. Work engagement is a positive, fulfilling state of mind characterized by "vigor, dedication, and absorption" with work (Schaufeli and Bakker, 2010, p. 2).

Although research suggests that professional well-being can be influenced by both the physical and the psychological aspects of work (Chari et al., 2018), little is known about how to best measure professional well-being, what contributes to professional well-being, and which benefits are derived from the professional well-being of clinicians (Brady et al., 2018; Diener et al., 2015).

Resilience

While there is no generally agreed-upon definition of resilience (Aburn et al., 2016), the term generally reflects the ability of a person, community, or system to withstand, adapt, recover, rebound, or even grow from adversity, stress, or trauma (IOM, 2012b; Luthar et al., 2000; Szanton and Gill, 2010). Resilience is something that emerges (or not) as a sum of an individual's or system's traits, states, external stimuli, mediators, and prior responses. Resilience can be viewed as a kind of "dynamic adaptive capacity" to support the ability to rebound and to ultimately improve the function of an individual, community, or system (Szanton and Gill, 2010). All entities, including health care systems and the clinicians who work in these systems, have limits to the magnitude of changes, disturbances, or stressors they can absorb before their structures, processes, and relationships begin to degrade. When stress overpowers resilience, performance and, in the case of individuals, health can degrade. In this report the term "resilience" is used to refer both to individual clinicians and to the clinical systems in which they work. The former usage, individual resilience, is discussed in Chapter 4, under individual mediating factors.

A SYSTEMS VIEW OF CLINICIAN BURNOUT AND WELL-BEING

The committee's framework for a systems approach to clinician burnout and professional well-being is based on theories and principles from the fields of human factors and systems engineering and job and organizational design (see Box 2-2) and draws on the literature and programs from the field of occupational safety and health (Lamontagne et al., 2007; NIOSH, 2019). The committee's systems framework emphasizes identifying interventions aimed at the critical factors contributing to burnout in order to foster an improved state of professional well-being (defined above) while improving patient care. The evidence-based interventions that the committee highlights in the report (see Chapter 5) focus on organizational strategies addressing the primary drivers of burnout (see Chapter 4). The committee believes that burnout prevention efforts should involve both risk reduction and wellness promotion and that every stakeholder at every level of the system must embrace the responsibility to build a healthy and safe work environment and to foster a culture of wellness while also supporting individuals' efforts to improve their own well-being. The committee's framework for a systems approach to clinician burnout and professional well-being is in line with recommendations in multiple Institute of Medicine (IOM) and National Academies reports targeting quality of care (IOM, 2001), patient safety (IOM, 2000), diagnostic errors (NASEM, 2015), global quality of care (NASEM, 2018), and learning health care (IOM, 2007). The literature offered many opportunities to better understand work organization, job stress, and professional well-being and provided the committee with a number of health work design approaches to consider. Chapter 5 further discusses these approaches and their integration in well-being systems.

A SYSTEMS MODEL OF CLINICIAN BURNOUT AND PROFESSIONAL WELL-BEING

The committee concluded that the processes associated with clinician burnout and professional well-being are complex and occur over time within the context of a multi-level system that influences those processes. The committee's systems model of clinician burnout and professional well-being is an adaptation of various models of multi-level systems in health care and workplace safety that describe hierarchical levels that interact with each other to influence the health care process (Berwick, 2002; Carayon et al., 2015; NASEM, 2018; Rasmussen, 2000; Shanafelt and Noseworthy, 2017; Skeff, 2018).

BOX 2-2
The Science of Systems Reflected in the Framework

There are many systems approaches in various scientific disciplines. The committee's framework for a systems approach to clinician burnout and professional well-being is based on the following theories and principles.

Sociotechnical Systems and Complex Adaptive Systems

Sociotechnical system design is an approach to work design that focuses on the broad system in which people work and the interaction between humans and technology (Carayon, 2006; Clegg, 2000; Pasmore, 1988). The goal is to design technologies (which constitute the "technical sub-system") that better fit and support the rest of the system (the "social sub-system") (Kleiner, 2007). The organizational concept of sociotechnical systems recognizes interdependencies between people and technology; therefore, technologies should not be designed without consideration of the people and the work they perform. The concept has been applied to improving the design and implementation of health information technology through systematic consideration of people and organizational issues (Harrison et al., 2007; Sittig and Singh, 2010; Waterson, 2014).

In the organizational context, complex adaptive systems are a type of sociotechnical systems that adapt to changes (e.g., changes in the external environment or technologies, disruptions, or unexpected events) (Braithwaite et al., 2018; Plsek and Greenhalgh, 2001). Plsek and Greenhalgh describe a complex adaptive system as "a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents" (Plsek and Greenhalgh, 2001, p. 625). Therefore, whenever an organizational change is implemented (e.g., work re-organization to address clinician burnout), adaptations will occur, sometimes in unanticipated ways. The concept of complex adaptive systems emphasizes the need for organizations to establish learning mechanisms as part of change management.

Human Factors and Systems Engineering

Human factors engineering (HFE) is a scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the HFE profession applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance (Dul et al., 2012). Thus, the fundamental characteristics of HFE are the following: (1) it takes a systems approach; (2) it is design driven; and (3) it focuses on three related outcomes: performance, safety, and well-being. An important principle of systems engineering is to go beyond improving single system elements, such as technology or physical environment, and instead to analyze and improve the entire system, including both the system elements and their interactions (Carayon et al., 2018). Systems engineering applies multiple methods and principles to model, improve, optimize, and integrate complex sociotechnical systems (and systems of systems); these systems often have multiple (sometimes conflicting) goals and various stakeholders (Cassel and Saunders, 2014; NAE and IOM, 2005; PCAST, 2014). The 2005 report by the National Academy of Engineering and the Institute of Medicine, *Building a Better Delivery System*, described systems engineering in health care in the following categories: systems design tools (e.g., human factors), systems analysis tools (e.g., modeling and simulation), and systems control tools (e.g., quality engineering) (NAE and IOM, 2005). A systems approach in the context of systems engineering and HFE commonly addresses three questions: What is the system? What are the system goals? And, how can we design, redesign, or improve the system to achieve these goals?

System Properties

There are many system properties that are relevant to the committee's understanding of health care systems (Waterson, 2009; Wilson, 2014). The committee discussed key characteristics of systems thinking and systems design in its deliberations about the identification and implementation of system changes. Some of these relevant systems characteristics are as follows: Systems have multiple levels; for example, each hospital and the individual units within the hospital represent levels in a health care system. Successful interventions pay attention to the interactions and interdependencies between levels. A solution in the local context may be optimal for the local context but may create negative consequences at higher levels, such as at the health system level or the regulation level. For instance, one could optimize workload for one group (e.g., physicians), but create additional workload, stress, and burnout for another group (e.g., nurses). In a similar manner, a solution enacted at a higher level (e.g., the health care organization or the regulation level) may not have the desired effects or may even lead to negative consequences when implemented in local contexts. Complex systems, such as health care systems, have emergent properties: this means that when a change is implemented, behaviors and outcomes occur that were not predicted and that emerge from system interactions and the adaptation of individuals to the system and vice versa. Therefore, mechanisms need to be in place to monitor the impact of changes (e.g., a change may be a job redesign to address clinician burnout) and the potential (positive or negative) consequences of these changes; such monitoring makes it possible to learn from the effects of the changes and to better predict and allow for such effects in the future.

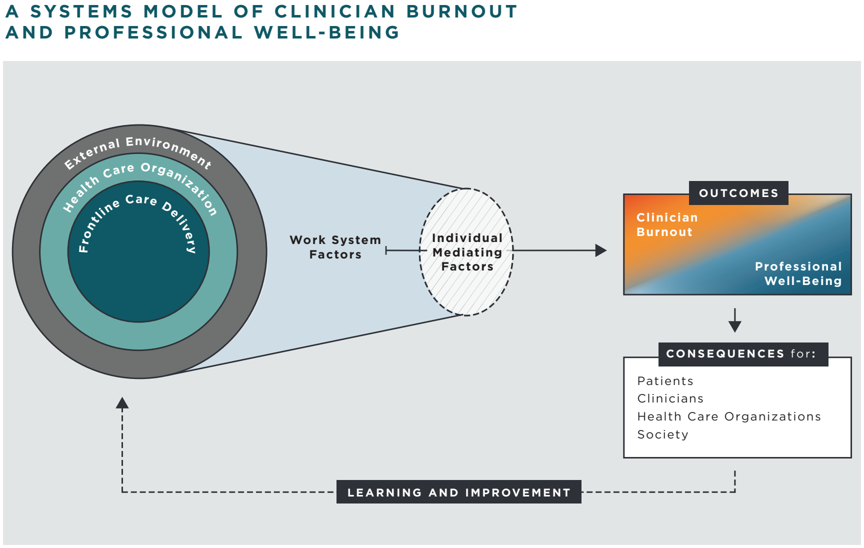

FIGURE 2-1 The systems model of clinician burnout and professional well-being.

Figure 2-1 is the committee's conceptual model of the clinical work system and its relationship to burnout and professional well-being and the consequences.[2] In this model, there are three interacting system levels—frontline care delivery, health care organization, and external environment—whose characteristics influence the factors contributing to burnout and professional well-being. Decisions made at the three levels of the system have an impact on the work factors—job demands and resources—that clinicians experience.

The collection of job demands and resources can be balanced or optimal and thus enhance professional well-being, or it can be unbalanced or less than optimal and thus predispose clinicians to burnout (Carayon, 2009; Demerouti et al., 2001; Siegrist, 1996; Smith and Sainfort, 1989). Individual factors, such as personality traits and personal experiences, play a role in the effects of job demands and resources, although that role is less important than that of the job demands and resources themselves. See Chapter 4 for a further description of the various factors that contribute to burnout. See Chapter 3 for a description of the consequences that burnout and professional well-being have for patients, clinicians, health care organizations, and society.

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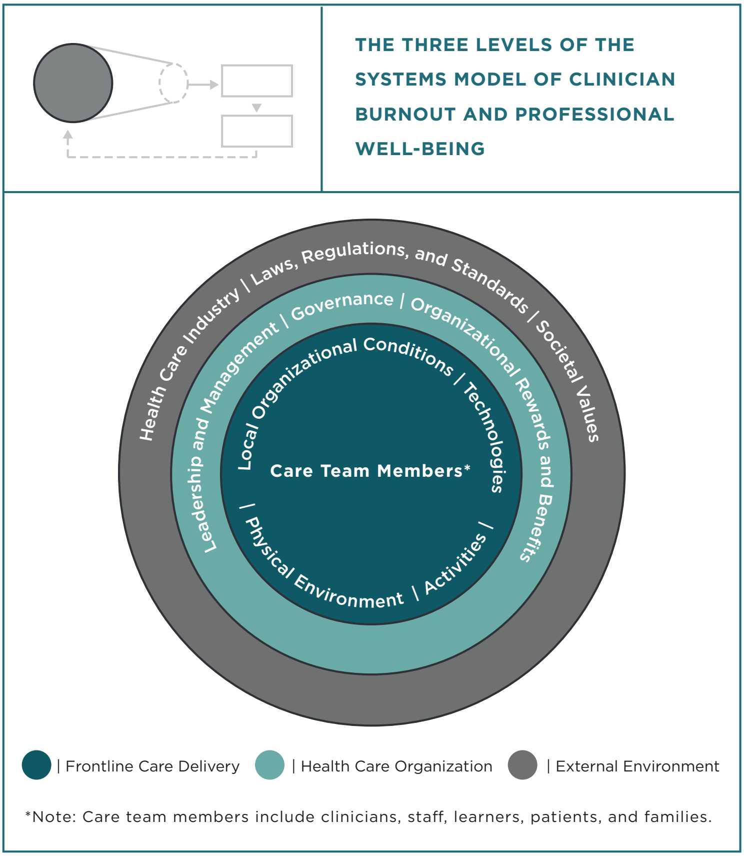
[2] The concepts articulated in the framework are intended to address burnout and professional well-being in health care clinicians and learners.

Ideally a system will continuously learn and improve using measurements of burnout and professional well-being and findings about the consequences. Learning and improvement activity can be integrated into the system via feedback loops, which lead to changes in various elements at various levels of the system; these changes in turn affect job demands and resources and ultimately improve the outcomes that clinicians experience.

SYSTEM LEVELS AND INTERACTIONS

Figure 2-2 shows the three interacting levels of the committee's systems model of clinician burnout and professional well-being. At each level, decisions are made that influence the balance between job demands and resources (i.e., psychosocial work factors).



*Note: Care team members include clinicians, staff, learners, patients, and families.

FIGURE 2-2 The three levels of the systems model of clinician burnout and professional well-being.

Frontline Care Delivery

Frontline care delivery is where interactions between clinicians and patients occur in the local context. In sociotechnical systems terms, frontline care delivery is the "work system" (Carayon, 2009; Kleiner, 2008). Frontline care delivery takes place in the context of a care team, including clinicians, learners (including trainees and students), patients and families, and support staff (Skeff, 2018), who engage in activities using various tools and technologies according to established policies and procedures within the available resources and infrastructure. Clinical care team members have individual characteristics (e.g., age and gender, educational background, clinical experience). The parallel and often interacting activities of the care team members occur in a physical environment and under local organizational conditions (e.g., the role definitions of team members, team cohesion, communication and coordination among the team, unit leadership). Organizational conditions include how members of the care team perceive the organizational culture. This perception informs the organizational climate. This description of frontline care delivery is based on an established work system model (Smith and Carayon, 2001) and is consistent with the description of microsystems[3] in health care quality improvement (Mohr and Batalden, 2002; Nelson et al., 2002).

The Health Care Organization

The health care organization, the second level of the systems model, is composed of multiple interconnected work systems that share common structures and processes. Many of their decisions and activities are interdependent; for instance, the transfer of a patient from the emergency department to an inpatient unit requires extensive unit-to-unit communication, coordination, and collaboration, with the different units needing to have common expectations and norms. Thus, the health care organization is characterized by a wide variety of elements (Trist, 1981), including organizational culture, payment and reward systems, the management of human capital/human resources, leadership and management style, and organizational policies (e.g., regarding scheduling, vacation, part-time/full-time, and the use of electronic health records [EHRs] and other technologies). See Chapter 5 for further description of the influence and role of health care organizations in clinician burnout.

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[3] Microsystems are the small clinical care teams that provide care during most health care encounters.

The External Environment

The third and final level of the systems model is the external environment, which includes political, market, professional, and societal factors. This level contains opportunities and constraints that influence decisions and actions at the health care organization level and the work done by clinicians at the frontline care delivery level. Many elements of the external environment play a role in clinician burnout and well-being (Trist, 1981), including structural changes in the U.S. health care industry and the landscape of laws, regulations, and standards for the oversight of U.S. clinicians (e.g., those relating to payment policies, clinical documentation, quality measurement and reporting, prescription drug monitoring, privacy rules and procedures, pre-authorization forms, professional and legal requirements for licensure, board certification, and professional liability). Societal factors, such as changing attitudes, expectations, and values about health care, are also part of the external environment influencing the work system. See Chapter 6 for a discussion of these elements of the external environment.

Frontline care delivery, the health care organization, and the external environment all influence each other. For instance, documentation requirements by regulators and insurance entities represent an element of the external environment that influences what health care organizations do with regard to EHR implementation and configuration, which in turn influences the actual work of the care team and, in particular, of clinicians who directly interface with the EHR (Erickson et al., 2017). Influences between system levels go both ways. What happens at a lower level can influence what happens at a higher level. An example of this upward influence from the health care organization to the external environment was provided in the 2018 National Academy of Medicine report on interoperability (Pronovost et al., 2018), which supports the belief that if health care organizations demanded more usable, safer, and interoperable health information technology (IT) as part of their purchasing decisions, it would spur vendors to make developing this improved health IT a priority.

IMPORTANT CONSIDERATIONS RELATED TO THE SYSTEMS MODEL

Learning Health Care Systems

As shown in the committee's systems model of clinician burnout and professional well-being (see Figure 2-1), learning and improvement feeds back into the three levels of the system in a process of continuous improvement. The model is consistent with the work of the landmark report produced by the IOM Committee on the Learning Health Care System in America, which laid out the foundation for building more effective learning processes and systems across health care (IOM, 2012a). The report called for improving organizational learning throughout the health care industry and highlighted the emerging capabilities offered by information technologies. The report also described "progress in human and organizational capabilities and management science" (IOM, 2012a, p. xii) that could be used to better design health care work systems and improve outcomes for both patients and clinicians. Box 2-3 displays key characteristics of learning health care systems.

The foundation for a learning health care system is "continuous knowledge development, improvement and application" (IOM, 2012a, p. x). This approach is relevant not only to improving care processes and outcomes for patients, but also to improving health care work systems and the work experiences of clinicians. Expanding the focus of health system improvement beyond the triple aim (Berwick et al., 2008) to the quadruple aim (Bodenheimer and Sinsky, 2014; Sikka et al., 2015) is in line with this committee's proposed approach to expand the concept of learning health care systems to include improving clinician professional well-being.

The 2012 IOM report on learning health care highlights the need to improve health care work systems so as to better support clinicians' work as well as the need to allow clinicians to continually learn and improve in their work (IOM, 2012a). In addition to the roles played by data collection, measurement, and the greater use of IT (Budrionis and Bellika, 2016), it is important to consider the "human capital" of the learning health care system. For example, consistent with the management and organizational design literature (Argyris and Schön, 1978; Hundt, 2012), clinicians' workload and work environment must support continual learning and participation in improvement activities. This is based on (and fosters) an organizational culture aimed at continually improving care work systems and processes (Grossman and Salas, 2011).

Human-Centered Design

The learning and improvement feedback loops of the committee's systems model are in line with human-centered design (HCD), an approach anchored in human factors engineering and aimed at designing work systems that match the needs of the users (clinicians) and, therefore, producing usable, healthy, and safe work systems. The International Organization for Standardization (ISO), an international standard-setting body composed of representatives from various national standards organizations, has defined HCD as an "approach to systems design and development that aims to make interactive systems more usable by focusing on the use of the system

BOX 2-3

Characteristics of a Continuously Learning Health Care System

A learning health care system is designed to generate and apply the best evidence for the collaborative health care choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care.

A learning health care system has the following elements:

Science and Informatics

- Real-time access to knowledge—continuously and reliably captures, curates, and delivers the best available evidence to guide, support, and improve clinical decision making, care safety, and quality.
- Digital capture of the care experience—documents the clinical encounter on digital platforms (e.g., in an electronic health record) for the real-time generation and application of knowledge for care improvement.

Patient–Clinician Relationships

- Engaged, empowered patients—is anchored on patient needs and perspectives and promotes the inclusion of patients, families, and other caregivers as vital members of the continuously learning care team.

Incentives

- Incentives aligned for value—actively aligns incentives to encourage continuous improvement, identify and reduce waste, and reward high-value care.
- Full transparency—systematically monitors the safety, quality, processes, prices, costs, and outcomes of care and makes information available for care improvement and informed choices and decision making by clinicians, patients, and their families.

Culture

- Leadership-instilled culture of learning—is stewarded by leadership committed to a culture of teamwork, collaboration, and adaptability in support of continuous learning as a core aim.
- Supportive system competencies—constantly refines complex care operations and processes through ongoing team training and skill building, systems analysis and information development, and the creation of the feedback loops for continuous learning and system improvement.

SOURCE: IOM, 2012a.

and applying human factors/ergonomics and usability knowledge and techniques" (ISO, 2010, p. 2). A key aspect of HCD is the participation and involvement of users through design and implementation whereby inputs from users and stakeholders are incorporated in a systematic approach to work system redesign.

HCD allows iterative design, prototyping, and evaluation of a solution at all system levels, anticipating its effects on the entire work system, that is, individuals, tasks, technology, and the physical and organizational work environment. If appropriate, these design–evaluation–redesign cycles may be performed in simulations (computer-based modeling or clinical simulations of increasing fidelity) under both routine and non-routine conditions. Once a solution has been refined, it can be tested in small pilot trials in a particular care unit. Evaluations need to consider the contextual factors related to success or failure and to seek generalizability across different units, conditions of use, and user populations. Formal assessment and continuous improvement should continue into the post-implementation phase.

The HCD approach can be scaled according to the magnitude and type of problem as well as to the time and resources available. Experience shows that although such techniques may impose additional up-front effort, that effort will be more than made up for by *decreased* (1) difficulties and expense of initial implementation, (2) time to full adoption, (3) number of workarounds required, (4) rework or other mitigations for design failures, and (5) harm from unintended errors and other negative consequences (Erwin and Krishnan, 2016; Harte et al., 2017; Sanders and Stappers, 2013). HCD should be implemented at multiple system levels, in particular by health care organizations in their effort of reducing clinician burnout and implementing well-being systems (see Chapter 5) and by stakeholders of the external environment who design new policies and need to anticipate potential negative consequences such as clinician burnout (see Chapter 6).

Professionalism

Health professions share an idealistic set of values, codified in historical documents such as oaths (Hippocrates, Maimonides), pledges (Nightingale pledge, Robb's nursing ethics statement), and more contemporary codes of ethics that describe the aspirational expectations of members of professional organizations (ACP, 2019a; ADEA, 2005; AMA, 2001; ANA, 2015; APA, 2013). These all share a focus on the primacy of clinicians' dedication to the well-being of the patient.

Professionalism has been defined to include such attributes as integrity, altruism, fairness, compassion, and respect for the dignity of all persons, and it has informed the development of competencies that have been applied across the health care professions (ACP, 2019b; ANA, 2015).

Contemporary codes of ethics have expanded the concept of professionalism to include obligations of clinicians to address transparency and honesty, the appropriate management of conflicts of interest, confidentiality, stewardship of resources, social justice, evidence-informed decision making and treatment, and preserving the integrity of the profession. Increasingly, these codes acknowledge the interplay between the well-being of clinicians and the quality of care they can deliver to those they serve. The ANA code (ANA, 2015), for example, obliges nurses to preserve their own integrity and well-being in order to continue to uphold their ethical commitments to the people they serve. The World Medical Association (2017) revised the Declaration of Geneva (the contemporary Hippocratic oath) by adopting a requirement that obligates physicians to "attend to their own health, well-being, and abilities in order to provide care of the highest standards" (Parsa-Parsi, 2017, p. 1971).

Threats to professionalism mirror work-related stressors thought to contribute to clinician burnout, such as interpersonal conflict, technology, market forces, health care systems strain, and broader sociological shifts in the role of physicians in society (ABIM Foundation, 2005; ANA, 2015) (see Chapter 4). As discussed below, the sources of these threats to professionalism originate from all levels of the system: frontline care delivery, the health care organization, and the external environment (see Figure 2-2).

Threats to Professionalism and Frontline Care Delivery

Unprofessional behaviors, including threats of retaliation, disrespectful and disruptive behaviors (Dang et al., 2016; Hickson et al., 2007; Reddy et al., 2012), harassment, and other issues, occur at the frontlines of care. For decades, nurses have identified ineffective or conflictual professional relationships as a source of moral distress (Burston and Tuckett, 2013; Hiler et al., 2018), which in turn is a factor that contributes to burnout (Moss et al., 2016). Physicians in training have reported longstanding patterns of intimidation, retaliation, and disrespect (Karim and Duchcherer, 2014; Martinez et al., 2017) that can undermine their ability to speak up about clinical concerns (Martinez et al., 2017). Other disciplines, including dentistry (Rowland et al., 2010), have reported similar patterns. If organizations have a culture that tolerates lapses of ethical behavior, that discourages team members to speak up, or that erodes personal integrity, dignity, and sense of fairness—all of which contribute to moral distress (Atabay et al., 2015; Epstein et al., 2019; Hiler et al., 2018; Rathert et al., 2016)—there is an increased risk of clinician burnout, poor professional well-being, and the consequences described in Chapter 3.

Over the past three decades there has also been a discernable shift from medical paternalism to models of shared decision making that emphasize the role of patients in health care decisions (IOM, 2001; Oshima Lee and Emanuel, 2013). This shift has created a tension between clinicians' desire to respect patient autonomy and the pressure they feel from being held to quality measures. These two goals may be in conflict with each other, and more research is needed to better understand the relationship between shared decision making, patient outcomes, and how clinicians can effectively include patients in clinical decisions (Hargraves et al., 2016; Montori et al., 2017). The increased emphasis on shared decision making (i.e., including patients to a greater extent in the process and planning of their health care), when done properly, actually leads to more trust between clinicians and patients and gives clinicians more professional fulfilment. This shift could also create more clinician autonomy since shared decision making requires both parties to work together to personalize the patient's care and maximizes the likelihood that the highest value care (for that patient) will be delivered.

Threats to Professionalism and Health Care Organizations

Clinicians' primary obligations to patients may conflict with organizational priorities driven by economic and business interests (Rushton and Broome, 2015). Clinicians are buffeted by conflicting pressures that depend on the local context. These pressures include cost reduction, personal or organizational revenue enhancement, and population health interventions, which sometimes conflict with individual patient preferences or needs. Volume-driven throughput incentives, pressures to "do more with less," and complex regulations (see Chapters 5 and 6 for additional details) confront clinicians with ethical tensions among their obligations to serve individual patients, to be responsible stewards of health care resources, and to contribute to the solvency of their health care organizations. This constant dissonance can be cumulative, culminate in high levels of work stress, and erode even the most resilient clinician's professional well-being.

Threats to Professionalism and the External Environment

Clinicians' first duty is to provide care for individuals who need health care services. The ability to do so, however, is influenced by multiple factors outside the sphere of direct influence for most clinicians and even of the health care organizations in which they work. These factors, which contribute to individuals' health and their access to and the quality of care, include local and national public health issues (e.g., access to clean water and air, affordable housing and nutrition, health education), health care financing (e.g., treatment coverage decisions), and the economic pressures on the health care industrial complex (e.g., the rising cost of medical technology) (Adler et al., 2016). Clinicians have high levels of altruism and generally want to address patients' needs. Doing so, however, can be difficult, if not impossible, given multitude of socioeconomic determinants of health and societal constraints.

Health care organizations committed to upholding the "quadruple aim" (Bodenheimer and Sinsky, 2014) are taking intentional and strategic steps to create the culture and conditions for clinicians to practice in accordance with their ethical mandates and to fulfill their social covenant with society. Leveraging the Charter on Professionalism for Health Care Organizations, and its recommendations relating to patient partnerships, organizational culture, community partnerships, and operations and business practices, may be a promising avenue for achieving needed culture change (Egener et al., 2017). The charter espouses developing organizational accountability for creating the conditions for individual professionalism to thrive by focused and sustained attention to systemic barriers and enablers of *organizational* professionalism. Others have called for shifting organizational cultures to embrace humanism as a means for enabling professional and ethical practice (Rider et al., 2018). Engaging humanistic practices throughout the organization are necessary to align professional and organizational values, norms, and practice and to foster professional well-being.

KEY FINDINGS

Burnout is a work-related phenomenon. WHO defines burnout as a problem associated with employment, not as an individual mental health diagnosis, and sees it as distinct from mood disorders. Maslach's definition of burnout—a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment—and the accompanying measurement tool, the MBI, are the most widely used definition and measurement tool in studies of clinician burnout. Definitions of professional well-being reflect a clinician's experience of positive perceptions and the presence of constructive conditions at work and beyond, enabling the achievement of one's full potential. Professional well-being is further conceptualized as job-related and generally a function of job satisfaction, finding meaning in work, feeling engaged and fulfilled with work, having a high-quality working life, and professional fulfillment. However, little is known about how to best measure professional well-being, what contributes to professional well-being, and which benefits are derived from the professional well-being of clinicians. Resilience generally reflects the ability of a person, community, or system to withstand, adapt, recover, rebound, or even grow from adversity, stress, or trauma. The identification of interventions aimed at tackling the critical factors contributing to burnout is a way of fostering an improved state of professional well-being while improving patient care. Personal resilience and other individual and contextual factors influence each individual's capacity and approaches to dealing with work-related stress.

Theories and principles from the fields of human factors and systems engineering, job and organizational design, and occupational safety and health—which underlie the committee's model for a systems approach to clinician burnout and professional well-being—reveal many opportunities to better understand work organization, job stress, and professional well-being as well as healthy work design approaches. In the committee's model, there are three system levels—frontline care delivery, health care organization, and external environment—that together influence the factors contributing to burnout and professional well-being. Decisions made at the three levels of the system have an impact on the work factors—job demands and resources—that clinicians experience.

Other aspects of the committee's model of clinician burnout and professional well-being include the importance of learning and continuous improvement processes, human-centered design approaches that focus on the use of the system and applying human factors and ergonomics and usability knowledge, and the recognition of the professional oaths and values that motivate clinicians.

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3

Extent and Consequences of Clinician Burnout

> "The moment I found myself envious of the man lying down on the operating room table was a startling and dark admission of the effects of my fatigue. I think of that time when I realize I have again ignored my own well-being...."
>
> (Night in OR #5, Rishi Doshi)[1]

In this chapter, the committee describes various instruments used to measure the extent of burnout among clinicians and discusses the literature on the prevalence of burnout and its consequences for clinicians, health organizations (e.g., job retention and turnover), and the quality of care. Chapter 8 describes the extent and consequences of burnout among learners and summarizes the evidence about the system factors that contribute to learner burnout and well-being.

MEASURING BURNOUT

As discussed in Chapter 2, burnout is a multi-dimensional construct that has been studied for nearly 50 years across various occupations (Maslach et al., 2001; Schaufeli et al., 2009). Thorough reviews of the

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[1] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Rishi Doshi, visit https://nam.edu/expressclinicianwellbeing/#/artwork/199 (accessed January 30, 2019).

psychometric properties of various instruments used to measure burnout and of the factors to consider in selecting the optimal instrument for local use have recently been published and are publicly available on the National Academy of Medicine's website.[2]

Briefly, Maslach's theoretical framework considers burnout to be a syndrome consisting of emotional exhaustion, depersonalization (also referred to as cynicism or disengagement), and a low sense of personal accomplishment from work that is driven largely by factors within the work environment. The Maslach Burnout Inventories (MBIs) (Maslach et al., 1996) are the most widely used measures of burnout (Schaufeli et al., 2009). Most of the studies included in this report used the MBI–Human Services Survey, Medical Professionals (MBI–HSS [MP]), which is widely considered the criterion standard, although some studies used the MBI–General Survey (MBI–GS), developed for use in other workers, or the MBI–Student Survey (MBI–SS), developed for use in learners. Other studies have used Oldenburg Burnout Inventory, the Copenhagen Burnout Inventory, or the Stanford Professional Fulfillment Index (Demerouti and Bakker, 2008; Dyrbye et al., 2018; Kristensen et al., 2005; Trockel et al., 2018). The Oldenburg Burnout Inventory evaluates physical, cognitive, and affective exhaustion and disengagement from work (Demerouti and Bakker, 2008). The Copenhagen Burnout Inventory evaluates personal work-related and client-related burnout (Kristensen et al., 2005). The Stanford Professional Fulfillment Index evaluates emotional exhaustion, interpersonal disengagement, and professional fulfillment (NAM, 2018; Trockel et al., 2018). Although single-item measures of burnout are frequently used, the ability of such items to measure the holistic construct of burnout are unclear, their validity data are less robust, and their use cannot be recommended at the present time.

The preferred analytical approach is to treat each dimension (e.g., emotional exhaustion, depersonalization), or sub-scale within the scale, separately as a continuous variable. However, low, average, and high cut-off scores for each sub-scale have been established for the MBI, and these are commonly used instead of continuous variables. Investigators often dichotomize into burnout/no burnout, but there is no accepted standard definition of where burnout begins (Dyrbye et al., 2009). A common approach is to consider individuals as having at least one symptom of burnout if they have high scores in either the emotional exhaustion (≥27) or the depersonalization (≥10) sub-scale of the MBI–HSS. Evidence indicates that high scores on these sub-scales can distinguish the clinically burned out from the non-burned out (Schaufeli et al., 2001), and this approach

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[2] See https://nam.edu/valid-reliable-survey-instruments-measure-burnout-well-work-related-dimensions (accessed March 15, 2019) and https://nam.edu/a-pragmatic-approach-for-organizations-to-measure-health-care-professional-well-being (accessed March 15, 2019).

identifies individuals whose degree of burnout places them at an increased risk of potentially serious personal and professional consequences (Dyrbye et al., 2008, 2010; Shanafelt et al., 2002, 2011, 2016b; West et al., 2006, 2009b). Because there is evidence that higher scores in either the emotional exhaustion or depersonalization domain decrease the quality of care provided by clinicians, high degrees of burnout in either of these domains is cause for concern. An alternative option is to consider individuals to have burnout if they have a high emotional exhaustion score along with either a high depersonalization score *or* a low personal accomplishment score (Dyrbye et al., 2009) or else high scores in all three domains. There is no established approach to dichotomizing results from the Oldenburg Burnout Inventory or the Copenhagen Burnout Inventory, but threshold scores for dichotomizing results from the Stanford Professional Fulfillment Index have been published (Demerouti and Bakker, 2008; Dyrbye et al., 2018; Kristensen et al., 2005; Trockel et al., 2018).

As mentioned above, the data concerning the validity of various burnout measures have recently been summarized (Dyrbye et al., 2018; NAM, 2018). Briefly, the strongest construct validity data for the 22-item MBI–HSS (MP) are for U.S. physicians and other clinicians. An abbreviated two-item version of the MBI is available and has been shown to correlate strongly with the emotional exhaustion and depersonalization sub-domains of the full-length instrument (West et al., 2009a, 2012a), and there is strong evidence for its validity from large samples of U.S. physicians. There are less robust validity data available for the remaining measures, especially for use in U.S. physicians, nurses, and dentists.

The MBI, the Oldenburg Burnout Inventory, the Copenhagen Burnout Inventory, and the Stanford Professional Fulfillment Index instruments can be used across the health care professions broadly, including with physicians, nurses, advanced practice providers, social workers, and pharmacists. The MBI is proprietary, and individuals or organizations must pay a fee to use it for operational or research purposes. Both the Oldenburg Burnout Inventory and the Copenhagen Burnout Inventory are also proprietary, but they are free to use. The Stanford Professional Fulfillment Index is also available at no cost for use by not-for-profit organizations for research or operational assessment. These instruments are often embedded within anonymous surveys and can be part of a large survey assessing multiple dimensions of professional well-being.

It should be noted that, depending on the time interval being assessed, the various burnout instruments may not be equally sensitive to change. Items on the MBI are rated on a frequency scale with the low end of the continuum anchored by "never" and "a few times per year" and the more frequent end of the continuum anchored by "every day." Although the MBI is largely designed to detect changes over intervals of at least 12 months, studies have effectively used it to evaluate changes over 6-month intervals (Panagioti et al., 2018; West et al., 2016). In contrast, the items in the Oldenburg Burnout Inventory are assessed on a four-point agreement scale with options ranging from "totally disagree" to "totally agree," and items in the Copenhagen Burnout Inventory are rated on a frequency scale with options ranging from "never" to "always." Accordingly, the time interval over which the Oldenburg and Copenhagen Burnout Inventories can be used to measure change may be imprecise, and less is known about their ability to detect meaningful effect size from an intervention. The Stanford Professional Fulfillment Index assesses symptoms over the past 2 weeks, and preliminary data suggest that it may be sensitive to change over short time intervals (Trockel et al., 2018).

There is substantial heterogeneity in the research methods employed by investigators studying burnout, including variability in the measures used to evaluate burnout symptoms and the approaches to dichotomizing burnout. Studies have also varied widely in sample size, the types of clinicians included (e.g., single occupation versus multiple health care disciplines), practice settings, participation rates, and adjustment for potential confounders (Rotenstein et al., 2018). Similar issues exist for other instruments used to subjectively measure aspects of well-being or mental and emotional health, including depression (Mata et al., 2015). These factors have created variability in the reported burnout prevalence. Nonetheless, the definition of burnout, its conceptual framework, and its links to personal and professional consequences are well established (Schaufeli et al., 2009).

PREVALENCE OF CLINICIAN BURNOUT

Numerous studies have evaluated the prevalence of clinician burnout by occupation, specialty, practice setting, career stage, and demographic characteristics. Among clinicians the most extensive data on prevalence comes from studies of physicians and nurses. Rates of burnout among U.S. nurses have typically ranged between 35 and 45 percent (Aiken et al., 2002, 2012; McHugh et al., 2011; Moss et al., 2016), although many studies have employed only the emotional exhaustion sub-scale of the MBI, resulting in an incomplete picture. In national studies of U.S. physicians using the MBI, rates of burnout have ranged from 40 to 54 percent over the past decade (Shanafelt et al., 2009a, 2012a, 2015, 2019). Limited national data are available on rates of burnout among U.S. nurse practitioners, physician assistants, and pharmacists, and many of these studies have not used standardized or validated instruments (Bell et al., 2002; Benson et al., 2016; Coplan et al., 2018; Hoff et al., 2019; Jones et al., 2017; Lahoz and Mason, 1990; Tetzlaff et al., 2018). Contemporary studies of the prevalence of burnout among U.S. dentists are limited; however, data from other countries suggest a substantial burden of burnout among dentists (e.g., Choy, 2015). Given that burnout is due to work-related stressors, the prevalence of burnout among clinicians would be expected to vary substantially among countries and health care delivery systems; thus, we have not included prevalence data from clinicians outside the United States.

Limited data are available on long-term trends in the prevalence of burnout among health care clinicians in the United States. National studies of U.S. physicians in 2011, 2014, and 2017 found a substantial increase in burnout between 2011 and 2014, with a subsequent improvement between 2014 and 2017 (Shanafelt et al., 2012a, 2015, 2019). When assessed using the MBI, 43.9 percent (2,147 of 4,893) of the physicians reported at least one symptom of burnout in 2017, compared with 54.4 percent (3,680 of 6,767) in 2014 and 45.5 percent (3,310 of 7,227) in 2011.

Extensive evidence also shows variation by practice setting and specialty within a given profession (Balch et al., 2011; Shanafelt et al., 2009a, 2012a, 2015, 2019). Among nurses, those practicing in hospitals or nursing homes appear to have higher rates of burnout than those in other practice settings (McHugh et al., 2011). Among physicians, individuals in private practice models appear to be at a roughly 30 percent higher risk for burnout than those in academic practice settings (Shanafelt et al., 2015, 2019). Wide variation in burnout exists by physician specialty, and many of the specialties at highest risk are those with substantial direct patient care responsibilities at the frontline of access to the health care delivery system, such as emergency medicine, family medicine, general internal medicine, and neurology (Balch et al., 2011; Busis et al., 2017; Shanafelt et al., 2009a, 2012a, 2015, 2019). The relationship between specialty area and burnout among nurses is less clear (Hooper et al., 2010).

A number of demographic factors also appear to relate to burnout. Studies both inside and outside of health care have found a greater risk of burnout among younger workers (Dyrbye et al., 2011; El-Ibiary et al., 2017; Kuerer et al., 2007; Lahoz and Mason, 1990; Poncet et al., 2007; Shanafelt et al., 2009a,b, 2012a, 2014a, 2015, 2016a). This is not due to a generational effect as it has been consistently observed from studies both inside and outside of health care workers over the past 20 to 30 years. Younger workers face a number of distinct challenges as they establish themselves in their career and deal with the complex interplay between personal and professional life as they begin relationships and care for children.

Studies also demonstrate that women are at increased risk for burnout relative to their male colleagues after adjusting for other personal and professional factors (El-Ibiary et al., 2017; Lahoz and Mason, 1990; Shanafelt et al., 2012a,b, 2014a, 2015, 2016a; Templeton et al., 2019). There also appear to be subtle differences in the way that burnout is manifest by gender, with burnout in women more likely to manifest as emotional exhaustion than in men and men more likely than women to experience depersonalization. Although these patterns have been observed at the population level, they are not absolute and must be considered to be a group-level generalization. Having children has also been shown to reduce the risk of burnout both inside and outside of the health professions, although the impact likely varies based on the age of the child (Dyrbye et al., 2011; El-Ibiary et al., 2017; Shanafelt et al., 2009a, 2014a). Life events such as a personal illness, an illness in a loved one, the birth of a child, or the death of a close loved one also are related to burnout risk (Dyrbye et al., 2006).

PERSONAL CONSEQUENCES OF BURNOUT

Burnout has a number of personal and professional repercussions. Studies from outside health care have demonstrated that individual workers experiencing burnout are at an increased risk for cardiovascular disease (Appels and Schouten, 1991; Toker et al., 2012; Toppinen-Tanner et al., 2009), as well as a host of other health consequences, including hypercholesterolemia, type 2 diabetes, coronary heart disease, hospitalization due to cardiovascular disorder, musculoskeletal pain, changes in pain experiences, prolonged fatigue, headaches, gastrointestinal issues, respiratory problems, and severe injuries (Salvagioni et al., 2017). Burnout was also found to be associated with shorter overall survival among individuals less than age 45 in a prospective cohort study of more than 7,000 individuals (Ahola et al., 2010) and with an increased risk of severe occupational injuries in a prospective cohort study of more than 10,000 workers who were followed for 8 years (Ahola et al., 2013). Other studies suggest that the increased risk of occupational injury extends to health care workers. For example, resident physicians with burnout are at increased risk for needle sticks, bodily fluid exposures, and motor vehicle accidents (West et al., 2012b).

Multiple studies have found a correlation between burnout and rates of depression (Maslach and Leiter, 2016). Although these two conditions frequently co-exist, not all individuals with symptoms of burnout experience depression, and not all individuals with depression are burned out (Maslach and Leiter, 2016). Prospective longitudinal studies suggest that burnout may predispose one to depression rather than the converse (Hakanen and Schaufeli, 2012).

Burnout may also contribute to the increased risk of suicide that exists among health care workers (Davidson et al., 2018; Feskanich et al., 2002; Hawton et al., 2011; Hem et al., 2005; Katz, 1983; Petersen and Burnett, 2008; Roberts et al., 2013; Schernhammer and Colditz, 2004; Stack, 2001).

Cross-sectional studies of physicians have found burnout to be associated with a nearly 200 percent greater chance of suicidal ideation (Shanafelt et al., 2011). A dose–response relationship between burnout and suicidal ideation, independent of depression, has also been found in multiple studies (Dyrbye et al., 2008; Shanafelt et al., 2011; van der Heijden et al., 2008). Longitudinal studies also suggest that suicidal thoughts attenuate when burnout improves, providing some evidence of causality between burnout and suicidal thoughts (Dyrbye et al., 2008). Accordingly, occupational burnout may be one of the reasons for the increased rates of suicide observed in some health care occupations (Center et al., 2003). Other studies have found higher rates of problematic alcohol use among health care clinicians experiencing burnout (Balayssac et al., 2017; Jackson et al., 2016; Oreskovich et al., 2012, 2015; Pedersen et al., 2016; Sargent et al., 2004). Although the direction of effect is unknown, this association may be related to self-medicating as a means of coping with occupational distress.

Connections Heal Patients and Clinicians[a]

One cannot endure in palliative medicine without the willingness to deeply know one's patients—to know their diseases and symptoms, trials and tribulations, fears and hopes, and, if one is very lucky, their spirits and hearts.

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[a] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Erin FitzGerald, visit https://nam.edu/expressclinicianwellbeing/#/artwork/359 (accessed January 30, 2019).
SOURCE: Medicine Woman (poetry), Erin FitzGerald, Albuquerque, NM.

EFFECTS OF BURNOUT ON TURNOVER AND CLINICAL WORK EFFORT

Those with burnout are more likely to be dissatisfied with their current job and to consider leaving. Multiple studies of physicians and nurses have demonstrated that burnout is associated with an increased likelihood of considering a change in position (Aiken et al., 2002; Fida et al., 2018; Pantenburg et al., 2016; Shanafelt et al., 2011, 2014b). Similarly, one study of nurse anesthetists in Europe reported a relationship between burnout and intent to leave the current job (Meeusen et al., 2011). Studies from the Cleveland Clinic, Stanford University, and the University of California, San Francisco, have found that physicians experiencing burnout are approximately twice as likely to actually depart the organization as non-burned-out colleagues (Hamidi et al., 2018; Willard-Grace et al., 2019; Windover et al., 2018). Turnover has a potentially large economic cost to organizations due both to the cost to recruit and replace individuals once they depart and also the lost revenue from caring for patients during the transition (Shanafelt et al., 2017). Health care clinicians with burnout may also be more likely to leave their profession altogether and pursue a non–health care–related career (Sinsky et al., 2017).

Even when clinicians with burnout stay in their current job, there are often adverse individual and organizational job consequences. Prospective longitudinal studies have demonstrated that individuals experiencing burnout are more likely to cut their professional work effort over the next 12 to 24 months (Shanafelt et al., 2016c). Burnout has also been associated with increased absenteeism (sick days) among nurses (Parker and Kulik, 1995). In other studies, individuals with burnout may show up for work but demonstrate sub-optimal performance even though present (so-called presenteeism) (Salvagioni et al., 2017). Collectively, the combination of all these factors has a major impact on the ability of health care organizations to maintain an adequate professional workforce. Burnout may also be decreasing the adequacy of the health care professional workforce precisely at a time when the nation is facing large shortages of some types of health care clinicians, particularly physicians (AAMC, 2017) and nurses (AACN, 2017). The effects of burnout on turnover and productivity also have a tremendous economic cost at the organization and societal levels. A recent estimate of the societal cost of turnover and reduced productivity due to burnout among the physicians in the United States was greater than $4 billion annually (Han et al., 2019). Although the societal cost of burnout in other health care clinicians has not, to the committee's knowledge, been modeled (due to the required underlying data being insufficient to do so accurately), it is no doubt substantial.

EFFECTS OF BURNOUT ON JOB PERFORMANCE AND QUALITY OF CARE

Extensive research across diverse occupations has demonstrated a link between burnout and job performance (Wright and Bonett, 1997). Studies of nurses have demonstrated a correlation between nurse burnout and supervisor ratings of nurse performance (Parker and Kulik, 1995). Other studies involving 198,500 employees across nearly 8,000 work units have demonstrated a relationship between engagement (the positive antithesis of burnout) at the work unit level and customer satisfaction, safety, and productivity (Harter et al., 2002).

Burnout among health care clinicians has also been shown to have potentially profound effects on quality of care. The data from health care are consistent with the broad body of organizational science across disciplines (Salvagioni et al., 2017; Schaufeli et al., 2009; Wright and Bonett, 1997). Studies of nurses have demonstrated a relationship between nurse burnout and nurse rating of the hospital's safety culture (Halbesleben et al., 2008) and quality of care (Poghosyan et al., 2010). The aggregate nurse burnout score at the hospital level has been shown to correlate with publicly reported hospital quality measures, such as surgical site and urinary-catheter-associated infection rates (Cimiotti et al., 2012). Similarly, emotional exhaustion among nurses has been found to increase the likelihood that patients will rate the hospital poorly, will not recommend the hospital for care, and will perceive their communication with nurses unfavorably (Aiken et al., 2012).

Multiple studies of physicians and nurses have demonstrated a relationship between burnout and perceived medical errors (Garrouste-Orgeas et al., 2015; Holden et al., 2011; Leiter and Spence Laschinger, 2006; Lu et al., 2015; Oskrochi et al., 2016; Shanafelt et al., 2002, 2010; Tawfik et al., 2018; West et al., 2006, 2009b; Williams et al., 2007). Except in egregious situations, it can be difficult to establish a link between individual provider actions (or inactions) and ultimate patient outcomes (Garrouste-Orgeas et al., 2015; Linzer et al., 2009; Panagioti et al., 2018). Nonetheless, multiple systematic reviews and meta-analyses have concluded that burnout affects quality of care in a variety of ways (Dewa et al., 2017; Panagioti et al., 2018; Salyers et al., 2017). For example, one meta-analysis of 47 studies (2002–2017) involving 42,473 physicians concluded that

> physician burnout was associated with an increased risk of patient safety incidents (OR [odds ratio] 1.96; 95% CI [confidence interval] 1.59–2.40), poorer quality of care due to low professionalism (OR 2.31; 95% CI 1.87–2.40), and reduced patient satisfaction (OR 2.28; 95% CI 1.42–3.68). (Panagioti et al., 2018, p. E1)

A study in nursing homes found that nurses who were experiencing burnout (as measured by the emotional exhaustion sub-scale of the MBI) were five times more likely to omit necessary care (OR = 4.97; 95% CI = 2.56–9.66) (White et al., 2019).

Other studies have found strong links between burnout and unprofessional behavior leading to undesirable patient experiences (Windover et al., 2018). Burnout appears to erode communication between patients and clinicians. Burnout has also been associated with malpractice claims, which is another potential source of economic risk to the organization (Balch et al., 2011; McAbee et al., 2015; Oskrochi et al., 2016). It is possible that this increased risk may be related to sub-optimal communication and lower empathy among individuals with burnout. A dose–response relationship has been observed between burnout and validated scores that predict a physician's risk of future malpractice litigation, suggesting that individuals who are burned out are at increased risk for future litigation (Hamidi et al., 2018). Physicians with burnout are also less likely to espouse a commitment to direct patient care and clinical practice (Tak et al., 2017). Historical studies of satisfaction and distress broadly (as opposed to burnout specifically) have found a correlation with physicians' prescribing practices (Grol et al., 1985; Melville, 1980), which indicates a potential insidious effect of burnout on quality of care. Unfortunately, there are not yet any empirical studies examining the relationship between work-related stress or burnout and dentists' and pharmacists' clinical performance (Plessas et al., 2018).

One study looking at the aggregate level of burnout in all members of the health care team working on a given unit have found a correlation with the adjusted mortality rates of the patients cared for by that team of health care clinicians (Welp et al., 2015). Like many studies of burnout, the explanation for this association could be directional in either (or both) directions and may well be influenced by other unknown factors that may in fact be the driver of the association. For example, it is possible that a poorly resourced unit is bad both for the patients cared for on that unit and the clinicians for them.

Collectively, these effects on quality, patient satisfaction, and litigation risk can also have potential broad effects on health care organizations by affecting referrals, reputation in the community, reimbursement, and contracting. The associated economic costs from these dimensions compound the costs associated with turnover, productivity, quality, and patient satisfaction and further strengthen the business case for health care organizations to address this issue (Shanafelt et al., 2017).

KEY FINDINGS

Burnout is highly prevalent among health care clinicians and has important personal and professional consequences as well as negative effects on the organizations in which they work and on society as a whole. Personal consequences include occupational injury, detrimental alcohol use, and a risk of suicide. Professional consequences include effects on the quality of care, the patient experience, and patient outcomes. Burnout has clear and profound impacts on staffing, including absenteeism, presenteeism, reduced productivity, turnover, and clinicians leaving the profession. These aspects have not only a substantial impact on health care organizations but also profound consequences for the adequacy of the U.S. health care workforce. In addition to the potentially tragic consequences for patients and clinicians, there are substantial economic costs to society and health care organizations. In aggregate, the facts make a compelling case for action to address health care professional burnout at the organization and societal levels.

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4

Factors Contributing to Clinician Burnout and Professional Well-Being

> "It seems like the never-ending paperwork, the hours, the stress, the expected perfectionism, and superhero-like outlook people have of [clinicians] is not changing for the better."
>
> (Bridging the Gap, Zohal Ghulam-Jelani)[1]

This chapter describes the potentially modifiable contributory factors for which there is evidence supporting either a direct association or a strong indirect relationship with clinician burnout. The chapter first elaborates on the relationships between the factors that contribute to burnout and the committee's systems model for burnout and professional well-being (see Chapter 2). The second section discusses the evidence for contributory factors, starting with work system factors related to the demands and resources of a clinician's job, followed by the individual (clinician) factors that mediate burnout. Many of these contributory factors are under the control of the health care organization, which largely decides how work will be performed. In addition to the direct negative impact of high job demands and low job resources on burnout, the job demands–resources model suggests that job resources can offset the adverse effects of increased

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[1] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Zohal Ghulam-Jelani, visit https://nam.edu/expressclinicianwellbeing/#/artwork/347 (accessed January 30, 2019).

job demands (Bakker and Demerouti, 2007, 2017; Demerouti et al., 2001). Systems approaches and interventions that address the contributory factors described in this chapter are discussed in detail in Chapter 5.

RELATIONSHIP TO THE COMMITTEE'S SYSTEMS MODEL OF BURNOUT AND PROFESSIONAL WELL-BEING

Worker capacities and needs, job content, the work environment, organizational conditions and culture, and personal considerations—and the ways these components interact with each other—make up the *work system* (Carayon, 2009; ILO, 1986; Smith and Sainfort, 1989). In the committee's model, decisions made at all levels—frontline care delivery, the health care organization, and the external environment—can affect clinicians' experiences at the frontline care delivery level (i.e., "the work system") (see Figure 4-1). This chapter focuses on the work system factors—framed as the job demands and job resources perceived by individual workers—that are under the control of health care organizations and how they affect clinicians at the frontline care delivery level. The chapter also discusses how individual factors related to the clinician may mediate the impact of the work system factors leading to burnout. Chapter 5 will build on the conclusions of this chapter to propose guidelines to address clinician burnout. Chapter 6 will examine factors related to the external environment, such as payment policies, regulatory oversight, and professional and societal expectations. And Chapter 7 will expand on some of the factors related to technology that are discussed in this chapter.

Figure 4-2 shows the work system factors, which are conceptualized as job demands and job resources that appear to contribute to clinician burnout and professional well-being. Information on clinicians' experience of job demands and job resources may be used as feedback to change (or redesign) the system elements at each of the three levels of the system. Job demands include workload and time pressure, various intrinsic aspects of clinical work (e.g., moral distress), and work inefficiencies (e.g., administrative burden, inadequate technology usability). Job resources include tangible and intangible resources within the work environment, such as meaning in work, job control, and the availability of social support from peers and supervisors (Bakker and Demerouti, 2017; Bakker et al., 2010; Demerouti et al., 2001). The work system is influenced by the organization and includes job structure, local culture, values and expectations, leadership, and the amount of individual job control (e.g., flexibility or autonomy). Other factors, which are unique to each individual, mediate the effects of these work system factors on clinician burnout and professional well-being. Each of the work system factors and individual mediating factors are discussed in detail in the sections that follow.

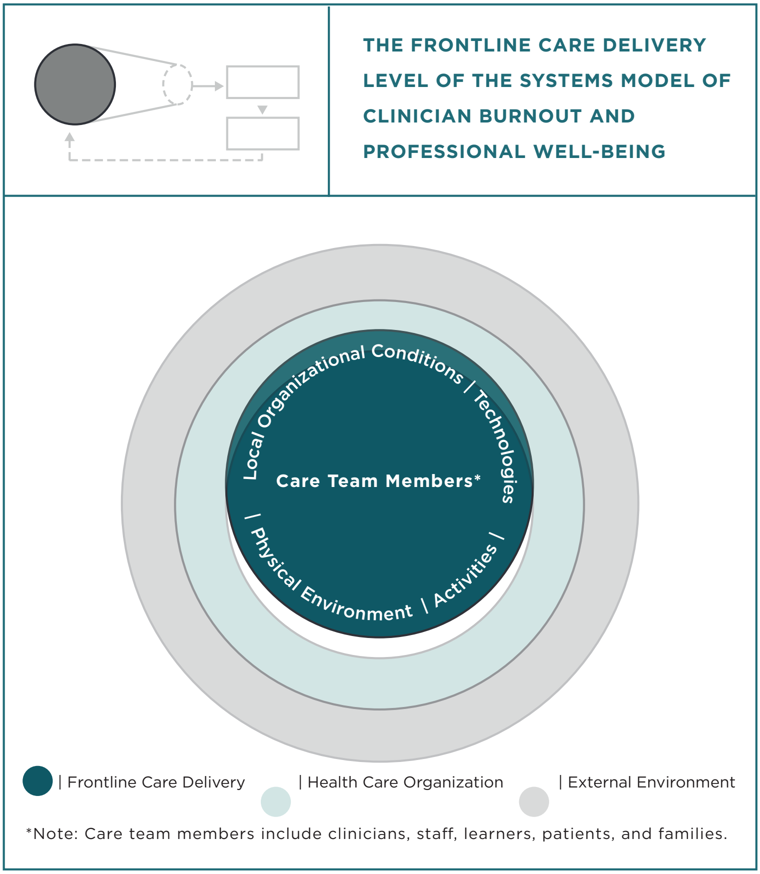
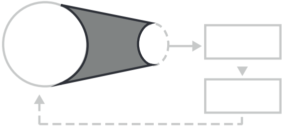


FIGURE 4-1 The frontline care delivery level of the systems model of clinician burnout and professional well-being.

JOB DEMANDS

When job demands require sustained physical or psychological effort or skills, individuals experience physiological or psychological costs, including burnout. Job demands can exceed an individual's available capacity or skills when the work is inefficient (and especially when it requires numerous tasks that are considered by the clinician to be lower priority than or a distraction from direct patient care). Poorly designed work systems and chronically excessive job demands can exhaust employees and lead to burnout. Similarly, when psychological or psychosocial capacities are exceeded in response to repeated exposure to suffering, death, or social inequities without sufficient structural mechanisms to address them, emotional exhaustion can



WORK SYSTEM FACTORS OF THE SYSTEMS MODEL OF CLINICIAN BURNOUT AND PROFESSIONAL WELL-BEING

Work System Factors include:

Job Demands

- Excessive workload, unmanageable work schedules, and inadequate staffing
- Administrative burden
- Workflow, interruptions, and distractions
- Inadequate technology usability
- Time pressure and encroachment on personal time
- Moral distress
- Patient factors

Job Resources

- Meaning and purpose in work
- Organizational culture
- Alignment of values and expectations
- Job control, flexibility, and autonomy
- Rewards
- Professional relationships and social support
- Work–life integration

FIGURE 4-2 Work system factors of the systems model of clinician burnout and professional well-being.

significantly contribute to burnout. When job resources are lacking because of the structure of the job (e.g., a low level of autonomy or flexibility) and when the associated organizational culture and leadership do not support individual work goals, goal failure occurs, and burnout may develop. An imbalance between job demands and resources can also occur when there is inadequate job control or insufficient professional support, particularly during challenging and demanding work. When the overall job resources available (supply) do not fit with what is required (demand) to achieve the goal, resulting in goal failure, individuals become stressed and frustrated (Caplan, 1987; Caplan et al., 1975). In this section, the committee discusses the relationship between job demands and clinician burnout.

Job demands may contribute to work overload (Demerouti et al., 2001). Job demands are a function of work frequency and duration, work intensity, and the nature of the work itself, including the context in which the work is performed. Job demands can often be measured by objective organizational metrics such as shift duration, rotation, and frequency and patient load (e.g., panel size, patient encounters, staffing ratios) as well as with measures of patient complexity or acuity. Different clinicians' work schedules and activities (including after-hours work) can be organized quite differently. Emergency physicians, nurses, and pharmacists are shift workers, whereas surgeons and many specialist internists have more irregular schedules that include intermittent "call" shifts or other after-hours work. Thus, measures of job demands will vary depending on the clinician's job. For inpatient nurses, a common metric of job demand is the number and length of shifts, while for work intensity it is nurse-to-patient ratio, adjusted for some measure of patient acuity. As a multi-dimensional concept, job demand is assessed in many different ways, with the results operationalized into different descriptive variables such as workload, time pressure, and inadequate staffing.

Excessive Workload, Unmanageable Work Schedules, and Inadequate Staffing

Workload can be conceptualized in two different ways—either as the work performed or capable of being performed within a specified time, or, more commonly in human factors engineering, as the effects of the work on the worker. In the latter case, rigorous studies use validated worker self-report tools (the most common being the National Aeronautics and Space Administration's Task-Load Index; see Hart and Staveland, 1988), physiological measures (e.g., heart rate and heart rate variability; see Weinger et al., 2004), or quantitative metrics related to the tasks being performed or neglected (Cao et al., 2008). The concept of mental workload has been well elaborated (e.g., Rasmussen [1979], Gopher and Donchin [1986]) and there is extensive literature on workload assessment (Eggemeier, 1988; Hancock et al., 1985; Meshkati, 1988; Moray, 1979; Wilson and O'Donnell, 1988).

Across many industries there is ample evidence that excessive workload is associated with increased worker stress as well as with decreased job performance, including an increase in errors and accidents (Karasek and Theorell, 1990; Vidulich and Tsang, 2012; Young et al., 2015). In a direct-observation study of 124 intensive care unit (ICU) nurses, an increase in the number of medication-related events was associated with an increase in task demands and in nurses' subjective workload (Xu et al., 2017). In a survey of pediatric nurses, both mental workload (related to interruptions, divided attention, being rushed) and the perception of staffing adequacy were predictors of burnout (Holden et al., 2011).

For more than a century, the norm for health care professionals has been to work long intense hours and to selflessly put patients' needs ahead of one's own. Yet, despite compelling positive associations between job demands and burnout, as discussed in the remainder of this chapter, the "demand side" of the equation is not the entire story; the nature of modern clinical work is as important as, if not more important than, the actual work hours. For example, a number of studies across professions show that other factors, such as job control (Pisanti et al., 2016a; Portoghese et al.,

2014) and degree of professional commitment (Nesje, 2017), may mediate the observed associations between job demands and burnout.

The scientific literature does not provide enough evidence to determine the precise relationships between job demands and clinicians' resulting perceptions of their workload and associated stress. However, a number of factors that have been shown to be associated with less burnout likely act, at least in part, on these relationships; such as for a given level of job demands, the workload will be perceived as lower when a clinician finds greater meaning in work; experiences greater job control, rewards, or sense of community; or works in a supportive organizational culture. Globally considered, the evidence for an association between job demands and clinician burnout is arguably the strongest for any independent variable.

Physicians

In a 2002 study of 1,740 U.S. oncologists, the most common self-reported contributors to burnout were excessive workload and insufficient time away from the office (Allegra et al., 2005). With regard to hours at work, a review of 47 multinational studies of physicians published between 2008 and 2013 (Amoafo et al., 2015) found that longer work hours was a strong predictor of burnout. A subsequent systematic review of studies published between 2010 and 2016 (Azam et al., 2017) reported that 21 of 31 studies found at least one measure of job demands to be significantly associated with burnout. In a systematic review of 71 studies of burnout in surgeons (Oskrochi et al., 2016), total work hours, frequency of call, and patient load were all associated with high emotional exhaustion. When Embriaco and colleagues (2007a) surveyed 978 critical care physicians from 189 French ICUs, they found that almost 50 percent of respondents met their criteria for burnout. Workload (number of night shifts per month and time since most recent non-working week) was a strong independent predictor of burnout. With regard to workload, "perception of the work as stressful" was strongly associated with increased emotional exhaustion in orthopedic surgeons (Arora et al., 2013).

According to a multi-variate analysis of the results of a survey of 7,288 U.S. physicians, for every extra hour worked (above 51.8 hours) per week, the odds of burnout symptoms increase by about 2 percent (Dyrbye et al., 2013). Night call is extremely taxing, and several large studies found that for each additional night on call per week, the odds of burnout increased by from 3 to 9 percent (varying in part because of differences in the baseline incidence of night call among study populations) (Dyrbye et al., 2011a, 2013; Shanafelt et al., 2009a, 2012b). In a study of 1,490 U.S. oncologists, for each extra hour spent at home working (e.g., on electronic documentation), there was a 2 percent increase in the odds of burnout (Shanafelt et al., 2014). These three measures of job demands are probably at least additive so that a physician who is working 60 hours per week, taking more than two calls per week, and taking appreciable work home could be 30 percent or more likely to be at risk of burnout than one in the same specialty who works 50 hours per week, takes one call per week, and does little work once at home.

One of the arguments for extended work schedules is care continuity—if the same clinician cares for the same patient for extended periods of time, there will be fewer care transitions (i.e., handovers) and thus a lower likelihood of errors and care gaps (Arora and Farnan, 2008; Riesenberg et al., 2009). However, even in the absence of sleep deprivation or circadian cycle disturbances, extended day shifts (longer than 12 hours) or repeated continuous work shifts for many days in a row without days off could have adverse effects on clinician performance and degrade clinician well-being. Furthermore, when shift schedules are actively managed, including using structured handovers, there do not appear to be differences in quality of care between extended schedules and those with reasonable work breaks. For example, in a study of 45 intensivists in 5 ICUs taking care of 1,900 patients, the clinicians were cluster-randomized in half-month rotations to either a continuous schedule (14 consecutive all-day shifts) or weekday coverage with weekend cross-coverage by colleagues (interrupted schedule) (Ali et al., 2011). The patient length of stay (LOS) and mortality were non-significantly higher in the continuous schedule condition (ICU LOS 0.36 day, $P = 0.20$; hospital LOS 0.34 day, $P = 0.71$; ICU mortality, odds ratio [OR] = 1.43, $P = 0.12$; hospital mortality, OR = 1.17, $P = 0.41$). On the other hand, according to survey measures derived from the National Study of the Changing Workforce (Fenwick and Tausig, 2001), the intensivists working under the continuous schedule experienced significantly greater burnout, work–home life imbalance, and job distress.

Nurses

There are numerous studies that relate measures of (especially inpatient) nurses' job demands to burnout. Led by pioneering work by Linda Aiken and her colleagues, there is an extensive literature relating higher nurse-to-patient ratios to nurse burnout as well as to other clinician, patient, and organizational outcomes. In a study of more than 10,000 hospital nurses showed that nurses are 23 percent more likely to experience emotional exhaustion for each additional patient they cover after exceeding a 4:1 patient-to-nurse ratio (Aiken et al., 2002). In a 2012 study, increasing the overall workload of the nurses in a hospital by just one patient per nurse was associated with significant increases in both urinary tract and surgical site infections in the patients, and this was mediated by job-related burnout

(Cimiotti et al., 2012). Similarly, Liu et al. (2018) in a study of 1,523 nurses in 23 hospitals in China, found that lower day shift patient–nurse ratios and better work environments correlated with fewer nursing care tasks left undone, less nurse burnout (using the emotional exhaustion sub-scale of the Maslach Burnout Inventory [MBI]), and with better nurse perceptions of patient safety. A meta-analysis by Shin and colleagues (Shin et al., 2018) showed that a greater patient-to-nurse ratio was consistently associated with slightly higher degree of burnout among nurses (OR = 1.07; 95% confidence interval [CI] = 1.04–1.11), increased job dissatisfaction (OR = 1.08; 95% CI = 1.04–1.11), and higher intent to leave (OR = 1.05; 95% CI = 1.02–1.07). The relationship between staffing ratios and burnout persists even after adjusting for wages and other covariates (McHugh and Ma, 2014).

Increased nurse burnout has been associated with "inadequate," "inappropriate," or "short" staffing—primarily as measured by nurses' self-report (Edwards et al., 2018; Garrett, 2008; Simpson et al., 2016)—as well as with perceptions of more "unfinished tasks" (Sochalski, 2001) and missed care (Simpson et al., 2016). In a time-lagged study of 406 Canadian new graduate nurses, short-staffing at the first sample time resulted in more nurse burnout, lower job satisfaction, and lower patient care quality 1 year later (Boamah and Laschinger, 2016). A cross-sectional survey of 821 nurses in 20 urban U.S. hospitals found that perceptions of adequate staffing were associated with lower burnout (Vahey et al., 2004). Consistent with this, a review of seven studies suggested a positive bidirectional relationship between a shortage of oncology nurses' and their job dissatisfaction, stress, and burnout (Gi et al., 2011).

Independent of total work hours, longer shift length is associated with greater burnout. In a cross-sectional study of 31,627 nurses in 488 hospitals in 12 European countries, nurses who worked shifts greater than 12 hours were much more likely than those who worked shifts of 8 hours or less to experience burnout, be dissatisfied with their job, and report an intention to leave their jobs (Dall'Ora et al., 2015). This study reinforced similar findings in two studies of U.S. nurses by Stimpfel and colleagues (Stimpfel et al., 2012, 2013)—that nurses working shifts of 10 hours or longer were more than twice as likely to experience burnout than nurses working shorter shifts. It is important to note that nurses commonly work longer than their specified shift length (27 percent of the nurses in the Dall'Ora study reported working overtime on their most recent shift). Feeling pressured or expected to work overtime could be an important mediator of the relationship between shift length and burnout (Patrick and Lavery, 2007).

Other measures of job demands that have been associated with nurse burnout include overall job demands, physical demands, and time pressure (Gelsema et al., 2006). In a series of studies involving hospital-based European nurses, higher job demands (Pisanti, 2012; Pisanti et al., 2011) and increased workload (Portoghese et al., 2014) were associated with higher emotional exhaustion and depersonalization. In a sample of 263 Polish nurses, the strongest correlation with emotional exhaustion was "excessive demands" (Basińska and Wilczek-Ruzyczka, 2013).

Other Clinicians

The data are more limited for other clinical professionals. Work hours, workload, or time pressure were associated with measures of job stress or burnout in community pharmacists in studies in France (Balayssac et al., 2017), Turkey (Calgan et al., 2011), and the United Kingdom (Lea et al., 2012). There are fewer data for inpatient pharmacists. Among pharmacy practice faculty, greater emotional exhaustion scores were associated with longer working hours (El-Ibiary et al., 2017), but another study of inpatient pharmacists failed to find a significant relationship between work hours and burnout (Jones et al., 2017). Greater external demands experienced during medication dispensing (interruptions, divided attention, and rushing) were positively associated with a risk of burnout among inpatient pharmacists (Holden et al., 2010). In a study among critical care pharmacists, no single factor predicted burnout, but 73 percent of the reporting pharmacists were found to work more than 50 hours per week (Ball et al., 2018).

Among practicing dentists, time pressure and long working hours may be associated with burnout (Singh et al., 2016). In a national survey of 700 New Zealand dentists, 48 percent reported "constant time pressure" as a major stressor (Ayers et al., 2008). In a study of 300 dentists practicing in Northern Ireland, time pressure was associated with the risk of burnout (Gorter and Freeman, 2011). Studies of both Pakistani (Jugale et al., 2016) and Lithuanian (Puriene et al., 2008) dentists found associations between longer working hours and measures of burnout.

Administrative Burden

Perhaps the most prominent current complaint by clinicians about their workplaces is the excessive amount of time they must spend on administrative tasks. These tasks can be divided into patient care–related (i.e., such clinical administrative tasks as looking up laboratory values or documenting a history and physical examination) and non–patient care–related (e.g., billing activities). Because clinicians view administrative tasks as less meaningful work and finding meaning in one's work is an important mediator of burnout (see section below), the addition of administrative tasks can be predicted to increase the risk of burnout. In fact, in a study of 1,774 physicians a higher percentage of time spent on administrative duties was associated with decreased career satisfaction and more burnout after adjusting for gender, race, specialty, and years of experience (Rao et al., 2017). The respondents felt that administrative tasks adversely affected their ability to deliver high-quality care and to focus during patient encounters. Note, however, that while shifting clerical tasks from physicians to nurses may reduce physician burnout, it runs the risk of increasing the burnout of the nurses on whom they are relying (Edwards et al., 2018).

Nurses spend appreciable time doing indirect patient care tasks including clinical documentation, care coordination, patient flow management, reporting of quality indicators, ordering of supplies, and communication tasks. The degree to which such administrative tasks impede direct patient care and engender frustration varies by the nurse's role and by the administrative resources provided by the organization (Michel et al., 2017). Survey responses from nearly 11,000 nurses in a large Southeastern state suggested that many nurses had inadequate resources or lacked the administrative support necessary to provide quality care (Neff et al., 2011). Similarly, in 974 inpatient clinical pharmacists, administrative burden ("too many non-clinical duties" and "inadequate administrative time") independently increased the odds of burnout (Jones et al., 2017).

Workflow, Interruptions, and Distractions

Workflow issues are related to work inefficiency and greater difficulty achieving everyday tasks and goals. Workflow that is poorly designed to meet clinicians' needs leads to frustration and creates time pressure. In a study of 422 family practitioners and general internists, adverse workflow, defined in terms of time pressure and chaotic environments, was associated with symptoms of emotional exhaustion (Linzer et al., 2009). Interruptions and distractions are known to disrupt clinicians' workflow and are associated with lower-quality and less safe care (Chrouser et al., 2018; Flynn et al., 1999; Morrison and Rudolph, 2011). Interruptions are known to add to cognitive burden, delay task completion, and increase the risk of forgetting tasks (Grundgeiger et al., 2010). Pharmacists have also reported that phone-call interruptions are one of the most stressful parts of their jobs (Munger et al., 2013).

While many interruptions in daily clinical work are clinically relevant and likely inevitable, the introduction of the modern electronic health record (EHR) has created many additional and often unnecessary interruptions. As but one example, excessive and often irrelevant or poorly timed electronically generated alerts or "decision support" prompts lead to interruptions and alert fatigue and are likely associated with burnout (Gregory et al., 2017). This topic is discussed further in Chapter 7.

Inadequate Technology Usability

Technology is a tool that is intended to meet users' needs. Technology can be designed to be a job resource that will enhance job performance; however, the use of technology can also create new job demands, particularly if that technology is not well designed. Human-centered design evaluates the outcomes of health care technology use in terms of effectiveness, efficiency, safety, and clinician and patient satisfaction (Weinger et al., 2004). An incomplete or ineffective human-centered design or implementation of a technology can lead to products that do not attain optimal outcomes. For example, the poor usability of many types of medical technology, such as infusion pumps, can lead to clinician inefficiency, frustration, and error (Weinger et al., 2011).

The technology that plays the biggest role in creating work frustration and contributing to clinician burnout is the EHR (see Chapter 7 for an expanded discussion of this topic). Greater use of the EHR and other information technology during clinical care is associated with more clinician burnout (Babbott et al., 2014; Shanafelt et al., 2016a).

In an observational study of 57 physicians in four specialties, 47.2 percent of clinic time was spent on the EHR and desk work, nearly double the amount of time spent doing direct patient care tasks (Sinsky et al., 2016). Clinicians also spent 1–2 hours of work, primarily with the EHR, each night after work. A different study using different methods found similar results. In a retrospective cohort audit log and direct observational study of EHR use by 142 family medicine physicians in Wisconsin, full-time physicians spent an average of 4.5 hours during and 1.4 hours after clinic hours per weekday working on the EHR (61 percent of an 11.4-hour workday) (Arndt et al., 2017). The predominant tasks were chart review and documentation (47.9 percent of total use). Nearly 1.5 hours each day were spent managing the inbox. Almost 1 hour of EHR time was spent each weekend day. Shanafelt and colleagues (Shanafelt et al., 2016a) found that physicians who used EHRs or computerized physician order entry (CPOE) were significantly less likely to be satisfied with the amount of time they spent on clerical tasks after adjusting for work hours, specialty, practice setting, and demographic variables. Furthermore, the use of CPOE was associated with a higher risk of burnout (OR = 1.29) after similar statistical adjustments.

Eighty-five percent of 585 physician residents and faculty in 19 primary care programs indicated that the use of the EHR affected their work–life balance. Respondents who spent more than 6 hours per week after hours using the EHR were almost three times (OR = 1.9–4.4) more likely to report burnout and almost four times (OR = 1.9–8.2) more likely to attribute burnout to the EHR (Robertson et al., 2017).

Many nurses and nursing leaders are frustrated with the current EHR (Staggers et al., 2018). In a 2016 online survey, 469 participants from 45 countries expressed low levels of satisfaction (4.5 mean out of 10) with the current state of nursing functionality in EHRs. Two-thirds of the participants provided disconcerting comments associated with their low rankings. More than half of the comments identified technology design issues (e.g., poor usability and interoperability, lack of integration or standards, and limited functionality), while 28 percent noted user–task issues (e.g., failure to meet nurses' clinical needs) (Topaz et al., 2016). In a single state survey, among 333 advanced practice nurse participants with an EHR, half agreed or strongly agreed that the EHR added to their daily frustration, and one-third reported an insufficient amount of time for documentation. Both insufficient time for documentation (adjusted odds ratio [AOR] = 3.2 [1.8–7.8]) and EHR use adding to daily frustration were predictors of burnout (Harris et al., 2018).

EHR use cannot be disentangled from increasingly granular billing, compliance, and documentation requirements (Downing et al., 2018). And greater clinician involvement in EHR deployment decisions clearly improves the success of deployments (Boonstra et al., 2014). However, human factors evaluations have demonstrated that the poor usability of many EHRs increases task times and contributes to work frustration (Ratwani et al., 2018a,b). Only in the past few years has a groundswell of clinician complaints, supported by increasing evidence of poor usability (Sittig et al., 2018), led to improved efforts by stakeholders in the health information technology (IT) system, including The Office of the National Coordinator for Health Information Technology (ONC) to address the poor usability of EHR products.

In summary, to ensure that the technology used by clinicians and patients enhances rather than degrades well-being, all stakeholders must appreciate that clinicians' and patients' experience with the technology will depend on the details of its design, configuration, implementation, and ultimate context of use. Furthermore, the successful use of any technology, including its effects on clinician burnout, is a shared responsibility and requires the productive collaboration of all stakeholders as well as the use of a human-centered design approach to design and implementation (Sinsky and Privitera, 2018). The topic of technology, and specifically health information technology, as both a potential source and solution of the problem of burnout is covered in some detail in Chapter 7.

Time Pressure and Encroachment on Personal Time

Although it has always been the case that many health care professionals work long hours, a number of changes to the practice environment have increased job demands in many disciplines. Organizational budget structures drive nurse assignment and nurse-to-patient staffing ratios. For physicians and advanced practice providers, increasing expectations concerning productivity and the number of patients seen each day have resulted in shorter office visits, and there is often not enough time for clinicians to complete clinical documentation or other tasks (e.g., order entry) during the workday (Arndt et al., 2017). The introduction of electronic patient portals has led to increased electronic messages and patient queries (see Chapter 7 for an expanded discussion on patient portals). The evidence is mixed on whether patient portals are linked to improved patient outcomes (Goldzweig et al., 2013), but there is evidence that the use of these patient portals may increase patient phone calls and overall workload (Dexter et al., 2016) and create additional work for health care professionals (Palen et al., 2012). This often results in professionals having to perform many professional tasks outside of regular work hours by remotely accessing the EHR to complete professional work on personal time. Although such work is compensated for hourly employees, it is typically not compensated for physicians, advance practice providers (APPs), and other clinicians. This can often lead administrators to erroneously conclude that they have “increased productivity” without increasing costs when, in reality, they have simply extended the work week of health care professionals and stolen time from their families and personal activities. Based on EHR time-stamp data, the average family physician now spends approximately 28 hours per month completing clinical documentation on nights and weekends when he or she is not on duty (Arndt et al., 2017; Sinsky et al., 2016).

Clinical documentation and online patient messages are not the only professional tasks clinicians must perform on personal time. Continuing medical education (CME) and the maintenance of certification (see Chapter 6) are frequently performed on nights, weekends, and even vacation time since most organizations do not provide dedicated time for their completion. Clinicians also must complete a number of required training modules each year, typically mandated by regulators, covering topics such as patient safety, infection control, the Health Insurance Portability and Accountability Act (HIPAA), and human subjects protections. Once again, although the time to complete these tasks may be provided to hourly employees, physicians, APPs, and other salaried or non-hourly health care professionals must typically complete them on personal time. Independent of CME and maintenance of certification, health care professionals must keep abreast of advancing knowledge in their field by reading the literature. Because the pace at which medical knowledge is expanding has accelerated significantly, the time required to stay current has also increased, which is another demand on personal time.

While these time pressures affect health care professionals in all practice settings, several additional dimensions specific to academic practice settings merit attention. For example, academic physicians historically have had a portion of their time dedicated to clinical work and a portion of their time dedicated to scholarly pursuits, including providing education for health care professionals in training and carrying out clinical or translational research (which are core components of their professional duties and necessary to sustain and improve the nation's health care delivery system). Indeed, the performance of these health care professionals is typically measured using an academic yardstick that requires them to engage in substantial educational activities (lectures and presentations) and produce a specified number of manuscripts and grants in defined timeframes as a requirement for retaining their positions. To increase revenue generation, nearly all academic centers have steadily reduced the proportion of time allocated to scholarly pursuits and increased the time devoted to clinical care without adjusting any of the academic performance expectations. Most academic centers still have a similar set of criteria for the publications, presentations, grants, and educational responsibilities that are required to retain a position. Accordingly, the requirements for scholarly activity necessary to preserve job security have been increasingly shifted to personal time on nights and weekends.

Collectively, all of these variables have led to the encroachment of professional tasks into personal time for health care professionals to a much greater degree than for most other fields (Shanafelt et al., 2012a, 2015, 2019a,b). In most settings, this work is not clearly compensated. These professional activities steal time from family, relationships, self-care, and personal pursuits, creating problems with work–life integration (see section below) as well as with getting adequate sleep, all of which fuel burnout.

An honest accounting of the collective amount of work being done by health care professionals both on and off the clock, along with a recalibration of a sustainable cumulative work week, is long overdue. For academic institutions, this must also include a reassessment of the criteria and timelines required of their faculty for academic promotion and for retaining a position, in light of the reduced scholarly time institutions are now providing.

Moral Distress

Moral distress is a factor that contributes to burnout, particularly among critical care clinicians (Johnson-Coyle et al., 2016a; Moss et al., 2016b). It occurs when a clinicians' professional ethical values or commitments are incongruent with those of their patients and families, colleagues, supervisors, or the health care organization (HCO) in which they work. In clinicians, moral distress is commonly described as the anguish experienced when clinicians perceive that they have participated in a morally undesirable situation or been unable to act in accord with their professional ethical values under conditions of constraint or duress (Campbell et al., 2016; Thomas and McCullough, 2015). Pressure to act contrary to ethical standards can arise from patients or their surrogates, the clinical team, the HCO, or the external environment (Burston and Tuckett, 2013; Dodek et al., 2016). For example, providing potentially harmful or futile treatment, providing care that prolongs dying, or witnessing clinicians who give false hope to patients or family members can create moral distress (Campbell et al., 2016; Epstein et al., 2019; Johnson-Coyle et al., 2016b; Thomas and McCullough, 2015). Among nurses poor communication, insufficient input to clinical decisions, clinical disagreements with physicians, unsafe staffing, and unnecessary tests and procedures also contribute to moral distress (Burston and Tuckett, 2013; Pauly et al., 2009; Piers et al., 2012; Sauerland et al., 2015). Witnessing patient care suffer as a result of a lack of provider continuity was identified by a sample of interprofessional clinicians as a key driver of moral distress (Whitehead et al., 2015). Data from a revised instrument to measure moral distress among health care professionals indicated that the most common sources of moral distress among physicians were related to excessive documentation, a lack of resources that compromised patient care, and lack of administrative action (Epstein et al., 2019). Negative perceptions of staffing, support by managers, and resources are influential factors associated with moral distress among nurses (Browning, 2013; Burston and Tuckett, 2013).

These experiences are associated with an organization's overall ethical climate (Atabay et al., 2015; Epstein et al., 2019; Lamiani et al., 2017; Pauly et al., 2009), perceived practice environment (Hiler et al., 2018), and quality of care (Browning, 2013), which in turn appears associated with nurse outcomes (e.g., retention, job satisfaction) (Hart, 2005; Hiler et al., 2018; Hwang and Park, 2014; Piers et al., 2011). Studies of moral distress among interprofessional clinicians showed that nearly 20 percent of respondents were considering leaving their jobs because of moral distress (Dodek et al., 2016; Epstein et al., 2019; Whitehead et al., 2015), which has implications for workforce sustainability. Ethical climate and practice setting are postulated to be predictors of moral distress along with the frequency of exposure to morally distressing situations, particularly for nurses (Rathert et al., 2016).

Although moral distress appears to be common among nurses in various settings (Rushton et al., 2016), the prevalence of moral distress among other clinicians is less well understood (Dzeng and Curtis, 2018). Several studies have documented moral distress among physicians and other clinicians (Houston et al., 2013; Ulrich et al., 2007; Whitehead et al., 2015), particularly in high-intensity settings such as critical care (Dodek et al., 2016; Epstein et al., 2019; Moss et al., 2016a). The data suggest that moral distress may be less prevalent in physicians than in nurses (Johnson-Coyle et al., 2016a; Moss et al., 2016a), although this gap may be closing (Epstein et al., 2019). Whether these trends can be generalized requires further investigation.

Repeated episodes of moral distress can have a cumulative effect over time, causing feelings of depletion, disillusionment, despair, and moral residue[2] (Carse and Rushton, 2018; Epstein and Hamric, 2009). Practice settings in which the frequency of morally distressing events is higher are priorities for intervention, especially when they are associated with poor ethical climate (Epstein et al., 2019). Several studies have described a relationship between moral distress and burnout among nurses (Delfrate et al., 2018; Johnson-Coyle et al., 2016a; Meltzer and Huckabay, 2004; Piers et al., 2012), as well as among critical care clinicians, with those having higher moral distress scores being more likely to experience burnout (Fumis et al., 2017). Additional research is needed to more fully understand the relationship between moral distress and burnout among nurses and other clinicians and to determine the direction of the relationship (Moss et al., 2016b), as well as whether the development of protective psychological factors or the cultivation of moral resilience, along with interventions that address team and systemic factors that contribute to moral distress and the development of burnout, may mitigate the negative impact of moral distress on burnout (Epstein et al., 2019; Lamiani et al., 2017; Rushton, 2018).

Degraded Patient–Provider Relationships

The opportunity to attend to and ease individual suffering is the reason why many clinicians enter the healing professions. As noted earlier in this chapter, the job demands that erode the time spent with patients or spent on direct clinical care can be contributing factors to burnout. Caring for the sick is not without consequences. When patients die or experience serious preventable adverse events, this can be a major stressor for clinicians. In particular, studies in nurses have reported that dealing with patient death and dying played a role in their distress and burnout (Borteyrou et al., 2014; Payne, 2001; Tawfik et al., 2017). Similarly, in a study of 1,156 physicians from various specialties, caring for dying patients was found to be associated with an increased likelihood of symptoms of burnout (Yoon et al., 2017). Several studies in primary care physicians suggest that interactions with patients who ignore medical advice, insist on unnecessary tests or treatments, or exhibit disrespectful behavior is associated with greater

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[2] Moral residue is the lingering feeling of moral distress that, over time, can accumulate and can be detrimental to personal well-being and professional effectiveness (Webster and Baylis, 2000).

job dissatisfaction and emotional exhaustion (as measured by a single item) (An et al., 2009, 2013).

In dentistry, working in a practice with more anxious patients may predispose a dentist to burnout. In a survey of more than 1,800 Swiss dentists of whom 638 responded, the more anxious that patients in the practice were perceived to be, the higher the risk of burnout (Goetz et al., 2018). A study of 300 dental practices in Northern Ireland found that dealing with difficult patients was associated with higher emotional exhaustion and depersonalization (Gorter and Freeman, 2011). Similarly, pharmacists have reported that managing difficult patients is one of the attributes that is the most stressful in their job (Munger et al., 2013).

Threats of psychological and physical harm from the work environment can negatively affect how clinicians can find joy and meaning in their work (Sikka et al., 2015). Nurses commonly experience incivility from patients and their families (Ulrich et al., 2019), and interpersonal challenges or conflicts with patients also correlate with clinician burnout (Borteyrou et al., 2014; Campana and Hammoud, 2015).

Patient and family physical violence against clinicians is the extreme side of interpersonal conflict (Ulrich et al., 2019), and several studies have found an association between patient/family violence and clinician burnout. In one study, 53 percent of 2,397 nurses and midwives working in Queensland reported having experienced occupational violence (Rees et al., 2018). Those who experienced such violence had higher rates of burnout than those who had not experienced violence. In a study of patient-initiated violence in 1,656 physicians from 123 public hospitals in 3 Chinese provinces, reports of verbal abuse (92.8 percent), physical threats (88.1 percent), and physical assault (81.0 percent) by patients were common (Shi et al., 2015). Exposure to violence was also significantly associated with increased emotional exhaustion and decreased job satisfaction. While physical violence against clinicians in the United States is commonplace, particularly in hospital settings (Phillips, 2016), the committee is not aware of any U.S.-based research that links violence to clinician burnout.

JOB RESOURCES

Meaning and Purpose in Work

Purpose, in life and work, gives direction, guides decisions, influences behavior, and propels individuals toward goals or specific outcomes (Steger, 2009). Meaning and purpose are synergistic and can be the fuel for sustained engagement and creativity, particularly under adversity (Rushton, 2018). Both meaning and purpose are critical to clinicians' professional identity (Tak et al., 2017). In a sample of 1,289 U.S. physicians, "sense of calling" was strongly associated with elevated levels of meaning in life. In this study, physicians with burnout were less likely to report life satisfaction, commitment to direct patient care, and high life meaning (Tak et al., 2017). In a national study of more than 2,200 U.S. physicians, physicians with burnout were less likely to identify medicine as a calling (Jager et al., 2017). For nurses, the concept of "calling to nursing" is associated with improved meaningfulness in work, career commitment, personal well-being and satisfaction, and work engagement (Ziedelis, 2018).

Finding meaning in work can protect clinicians from burnout (Ben-Itzhak et al., 2015; Rasmussen et al., 2016). For example, in a sample of nurses working in high-intensity settings, meaning in patient care and hope were independent predictors of a lower risk of burnout (Rushton et al., 2015). A study of 300 Israeli physicians found that the existential meaning derived from work served as a significant protective factor against burnout (Ben-Itzhak et al., 2015). In contrast, when dissonance arises between what clinicians find meaningful and the reality of their daily work tasks, they may experience increased work stress and burnout. Physicians who report spending less than 20 percent of their time (approximately 1 day per week) on the professional activity they find most meaningful have higher rates of burnout (Shanafelt, 2009; Shanafelt et al., 2009b). In a related study, the amount of personally rewarding hours spent each day was found to be positively associated with more career and life satisfaction and commitment to clinical practice (Tak et al., 2017).

Alignment between work activities and what an individual finds meaningful has also been shown to be related to burnout in samples of nurses. For example, a better person–job match in six areas of work–life (manageable workload, control, reward, community, fairness, and values) had a direct negative effect on burnout (emotional exhaustion and cynicism in a cross-sectional survey of 215 registered nurses) (Boamah and Laschinger, 2016). Similarly, personal goal facilitation (career fit) was associated with lower burnout in another study of nurses (Pisanti et al., 2016a).

Connections Heal Patients and Clinicians[a]

> [T]he patient is what is keeping the doctor from falling further into burnout. The physician–patient relationship and the desire for doctors to help their patients is the core of why physicians entered medicine. Yet, a gap is pushing them apart.

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[a] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Zohal Ghulam-Jelani, visit https://nam.edu/expressclinicianwellbeing/#/artwork/347 (accessed January 30, 2019).

SOURCE: Bridging the Gap (painting), Zohal Ghulam-Jelani, Albany, NY.

Organizational Culture

Organizational culture is defined by the fundamental artifacts, values, beliefs, and assumptions held by employees of an organization (Schein, 1992). An organization's culture is manifested in its actions (e.g., decisions, resource allocation) and relayed through organizational structure, focus, mission and value alignment, and leadership behaviors (see also Chapter 5). Perceptions of low organizational support, organizational politics, or insufficient resources offered for professional development may increase the risk of burnout among clinicians (Lorenz and Guirardello Ede, 2014; McAbee et al., 2015). For example, having inadequate time for professional development was an independent predictor of burnout in a multi-variate analysis performed on a national sample of 783 neurosurgeons (McAbee et al., 2015). Similarly, inadequate time allocated for teaching independently increased the odds of burnout in a sample of 974 inpatient clinical pharmacists (Jones et al., 2017). Management and policy decisions and change-management processes influence the daily work lives of health care professionals and set the tone for decision latitude and interprofessional collaboration (Van Bogaert et al., 2013). Another important component of an organization's culture is the ethical climate, which influences the way clinicians appraise their relationships, leadership, and workplace (see previous section on Moral Distress and Chapter 5).

Overall organizational culture can be reflected in a clinician's satisfaction with the overall work environment. Physicians and nurses who are less satisfied with their work environment are more likely to experience burnout (Aiken et al., 2012; Casalicchio et al., 2017; Hanrahan et al., 2010; Hayes et al., 2015; Kutney-Lee et al., 2013; McHugh and Ma, 2014; Meeusen et al., 2011; O'Mahony, 2011; Pantenburg et al., 2016; Patrician et al., 2010; Poghosyan et al., 2010). Similar findings have been reported in mental health providers (Green et al., 2014).

In contrast, healthy work environments have been positively associated in nuses with job satisfaction, retention, and better patient outcomes and negatively correlated with emotional strain (emotional exhaustion, burnout, compassion fatigue, and stress) (Aiken et al., 2011, 2012; Cho et al., 2015; Lake et al., 2019; McHugh and Ma, 2014; Olds et al., 2017; Pantenburg et al., 2016; Ulrich et al., 2019; Van Bogaert et al., 2013; Wei et al., 2018). For example, in a sample of more than 2,300 physicians in Germany, higher satisfaction with the work environment was associated with lower emotional exhaustion and depersonalization (Pantenburg et al., 2016). Similarly, in a study of more than 26,000 nurses, better work environment quality was associated with less burnout and job dissatisfaction after controlling for wages and other covariates (McHugh and Ma, 2014). In a retrospective, two-stage study of nurses employed in hospitals between 1999 and 2006, improvements in perceptions of the work environment were associated with lower adjusted rates of emotional exhaustion, job dissatisfaction, and intent to leave (Kutney-Lee et al., 2013). One potential approach to improving the work environment would be to implement the American Association of Critical-Care Nurses' Healthy Work Environment standards (AACN, 2016) (see Chapter 5). The 2018 National Survey of Critical Care Nurse Work Environments, which involved more than 8,000 acute and critical care nurses (Ulrich et al., 2019), found that nurses working in clinical units actively addressing work environment issues rated the work environment more positively than nurses who were not working in such units.

Alignment of Values and Expectations

Studies indicate that when individual clinicians perceive that their values are aligned with the values of the organization, engagement and job satisfaction increase (Linzer et al., 2017; Rothenberger, 2017). Conversely, when values or expectations are not congruent, the resulting dissonance intensifies stress, and burnout can result (Leiter et al., 2009). For example, a longitudinal survey in a sample of practicing primary care physicians working in a large integrated delivery system found that values dissonance along with workload and job control were the largest drivers of burnout (Gregory and Menser, 2015). In a study of 88,605 U.S. Department of Veterans Affairs employees, alignment between stated values and the organization's behaviors and decisions was associated with more favorable perceptions of organizational culture, which in turn was related to employee satisfaction and worker engagement (Foglia et al., 2013). The issue of what constitutes important aspects of an ethical climate with respect to creating a positive work environment is discussed in Chapter 5.

Job Control, Flexibility, and Autonomy

Job control (also referred to as job decision latitude), flexibility, and autonomy are associated with clinician burnout. For this discussion, autonomy can be defined as the amount of freedom an individual has to control and plan his or her work activities and the input that an individual has in decisions that affects the work (Maslach and Leiter, 2008).

Physicians

Several cross-sectional studies of physicians have reported a low sense of control over the practice environment, little autonomy, and lack of involvement in decision making correlate with burnout (Campbell et al., 2001; Gabbe et al., 2002; Gregory and Menser, 2015; Linzer et al., 2009; Oskrochi et al., 2016). For example, in a study of chairs of obstetrics and gynecology, low perceived control over professional life was independently associated with burnout after controlling for work–life integration, partner support, and current work-related stressors (Gabbe et al., 2002). A small longitudinal study of primary care physicians indicated that job control played a central role in physicians' experience of burnout and emphasized the need for physicians to be involved in practice-related decisions as a key strategy for reducing burnout (Gregory and Menser, 2015).

Nurses

Similarly, a lack of input in decision making, particularly in the context of the reorganization of work, is a source of stress for nurses (Billeter-Koponen and Freden, 2005). In a study of more than 20,000 nurses working in 425 hospitals, higher perceived engagement in shared governance (i.e., frontline workers being active and empowered to influence institutional decision making) was associated with lower emotional exhaustion, better job satisfaction, less turnover intention, higher nurse-reported quality of care, and better patient-reported care experience scores (Kutney-Lee et al., 2016). Several cross-sectional studies of nurses working outside the United States have reported associations between limited autonomy, input in decision making, and job control and burnout (Lorenz and Guirardello Ede, 2014; Mudallal et al., 2017; Pisanti et al., 2016b). For example, in a national sample of more than 2,400 ICU nurses in France, the inability to schedule days off according to personal wishes was associated with symptoms of burnout (Poncet et al., 2007), and in a study of more than 1,300 Italian hospital-based nurses, lower job control was independently associated with higher emotional exhaustion and depersonalization (Pisanti, 2012). Longitudinal studies exploring the relationship between job control and burnout are limited. In one small longitudinal study of 217 nurses working in Italy, decreases in perceived job control predicted increased emotional exhaustion scores 14 months later, after controlling for baseline job characteristics (Pisanti et al., 2016b). In contrast, a longitudinal study of 170 nurses working in 15 emergency rooms in Belgium found that changes in perceived job control did not predict changes in emotional exhaustion scores 18 months later after controlling for other factors (Adriaenssens et al., 2015a). These differences may be due to differences in workload, as one study of 352 hospital workers (nurses and others) from 5 Italian public hospitals reported that job control mediated the relationship between workload and emotional exhaustion (measured by the MBI–General Survey [MBI–GS]) (Portoghese et al., 2014).

Rewards

Research by Leiter and Maslach suggests that personal resources are expended to meet job demands and that when this effort does not result in reward, work stress occurs and burnout ensues (Leiter and Maslach, 2004). Individuals experience intrinsic rewards when they perceive work as meaningful, have job control, feel mastery over their work (especially when challenged), are respected, and connect with others at work (Deci and Ryan, 1985). In a study of more than 800 physicians in the United Kingdom, deriving intellectual stimulation from work was found to contribute to job satisfaction, which in turn had a protective effect against job stress on emotional exhaustion and depersonalization (Ramirez, 1996). On the other hand, threats to mastery—such as feeling inadequately trained—may increase the risk of burnout (Ramirez, 1996). Intrinsic rewards derived from meaning in work are discussed further in the earlier Meaning and Purpose in Work section. Extrinsic rewards include money, prestige, and praise. The last factor, explicit feedback on a "job well done" from supervisors, peers, and patients, is an important reward for clinicians.

For external rewards, one typically thinks of financial compensation, but in a national sample of more than 900 general and subspecialty physicians, no relationship was found between gross income and burnout (Keeton et al., 2007). Similarly, a small longitudinal study of primary care physicians found that workload and job control—but not rewards—predicted burnout (Gregory and Menser, 2015). However, relationships have been found between physician burnout and compensation models. A 2008 study of 7,900 surgeons reported that incentive pay based entirely on an individual's billings was associated with a 37 percent increased odds of burnout, after controlling for demographics, years in practice, subspecialty, hours worked per week, number of nights on call, practice setting, and other professional factors (Shanafelt et al., 2009a). Another study, in 1,490 U.S. oncologists, similarly found that the risk of burnout increased with greater reliance on productivity-based compensation (Shanafelt et al., 2014). On the other hand, some (Porter et al., 2018; Sargent et al., 2004) but not all (Bertges Yost et al., 2005) studies using a univariate analysis have found financial stress or concerns to be related to domains of burnout, although in a study involving more than 700 neurosurgeons, a multi-variate analysis found that concerns about future earnings was an independent predictor of burnout (McAbee et al., 2015).

Differences in nurses' overall compensation may not be a contributory factor in burnout. In a study of more than 26,000 registered inpatient nurses working in non-federal acute hospitals in four states, wages did not explain differences in nurses' emotional exhaustion after adjusting for nurse-to-patient ratio (McHugh et al., 2013). However, in a study of 602 Canadian nurses, a perceived imbalance between effort expended and the rewards provided was associated with burnout (Pratt et al., 2009). Similarly, in a cohort of 974 inpatient clinical pharmacists, while payment structure (salaried versus hourly with overtime pay) was not an independent predictor of burnout, feeling that one's contributions were underappreciated by others doubled the odds of burnout (Jones et al., 2017).

Professional Relationships and Social Support

It could be said of every clinician "that strong relationships with patients also benefit the health of physicians" (Dugdale, 2017, p. 1075). In line with this, interpersonal relationships between colleagues can be a source of support that buffers against detrimental stress or, alternatively, can be a source of tension and conflict and contribute to work-related stress (Borteyrou et al., 2014; Leiter and Maslach, 1988).

Several studies have suggested that poor professional relationships increase the risk of burnout (Embriaco et al., 2007a; Leiter and Maslach, 1988; Oskrochi et al., 2016; Pereira et al., 2016; Petitta et al., 2017). For example, in a study of more than 900 critical care physicians working in France, impaired relationships with physician colleagues were independently associated with higher burnout (Embriaco et al., 2007a).

Poor relationships with colleagues has also been demonstrated to correlate with burnout among nurses in both cross-sectional (Adriaenssens et al., 2015b; Embriaco et al., 2007a; Li et al., 2013; Oyeleye et al., 2013; Payne, 2001; Read and Laschinger, 2013) and longitudinal studies (Nicholson et al., 2014). Supervisor incivility and co-worker bullying were associated with emotional exhaustion among a group of 342 new graduate nurses in Ontario (Read and Laschinger, 2013). Co-worker incivility at baseline predicted depersonalization 1 year later in 300 nurses in Canada (Nicholson et al., 2014).

Comparable findings have been reported in pharmacists (Gaither and Nadkarni, 2012; Jones et al., 2017). For example, in a study of 974 inpatient clinical pharmacists, a multi-variate analysis found that difficult relationships with pharmacist colleagues doubled the odds of burnout (Jones et al., 2017).

Poor interpersonal relationships *across disciplines* have been shown to be associated with burnout (Embriaco et al., 2007b; Gunnarsdóttir et al., 2009; Hanrahan et al., 2010; Li et al., 2013; Sargent et al., 2004) in some but not all studies (Lorenz and Guirardello Ede, 2014). In one study of more than 900 physicians working in ICUs in France, conflicts with nurses were independently associated with a higher risk of burnout, while better relationships with nurses and with the head nurse were independently associated with a lower risk of burnout (Embriaco et al., 2007a). In a sample of orthopedic surgeons, perceived stress with other faculty and with nursing staff correlated with burnout (Sargent et al., 2004).

According to an analysis of survey data from 23,446 nurses in 352 hospitals in 11 countries, nurse-perceived doctor–nurse collegial relations affected all burnout dimensions at the unit level (Li et al., 2013). Similar findings were reported in a study of 353 psychiatric nurses in 67 hospitals (Hanrahan et al., 2010) and in 695 Icelandic nurses (Gunnarsdóttir et al., 2009). Another study in five acute care community hospitals measured perceptions of relational coordination (i.e., communicating and relating for the purpose of completing tasks) between 382 direct care nurses and other on-unit and out-of-unit nurses, physicians, and support staff (Havens et al., 2018). Higher perceived relational coordination—and particularly mutual respect—correlated with lower emotional exhaustion. Interestingly, in a longitudinal study of 2,100 critical care nurses and physicians, measures of teamwork did not predict subsequent emotional exhaustion, although emotional exhaustion predicted subsequent deterioration in the clinicians' perception of interpersonal teamwork between nurses and physicians (Welp et al., 2016).

Petitta and colleagues (2017) studied "emotional contagion," defined as perception of how one's own emotions are influenced by the emotions of colleagues. In this study, "feeling better after interacting with happy individuals" was associated with a lower risk of emotional exhaustion and depersonalization in physicians and a lower risk of depersonalization in nurses. Conversely, feeling irritated after interacting with angry individuals was associated with the opposite effects on burnout measures.

Interpersonal relationships may serve a buffering role against stress by providing social support. Multiple studies have found that positive support from colleagues lowers the risk of burnout among clinicians (Adriaenssens et al., 2015b; Hyman et al., 2017; Pisanti, 2012; Pisanti et al., 2016b; Proost et al., 2004). In a study of 2,075 nurses in Belgium (Proost et al., 2004) and of 1,383 hospital-based nurses in Italy (Pisanti, 2012), higher perceived social support was associated with lower burnout. In two longitudinal studies of nurses in Western Europe, emotional exhaustion was negatively correlated with improvements in social support over more than 1 year (Adriaenssens et al., 2015a; Pisanti et al., 2016b). Unfortunately, maintaining patient confidentiality may be a considerable obstacle for clinicians seeking social support in some cultures (Løvseth et al., 2010, 2013).

Work–Life Integration

Work–life integration is the combination of personal and professional responsibilities and activities; in contrast, work–life balance refers to the segmentation of one's life, an approach that may be more cognitively draining (Burkus, 2016; Smit et al., 2016). In comparison to other U.S. workers, physicians are less likely to be satisfied with their work–life integration. This finding persists even after controlling for work hours and other factors (Shanafelt et al., 2015, 2019b). Within the house of medicine, satisfaction with work–life integration among physicians varies substantially by specialty, age, sex, work hours, and practice setting (Shanafelt et al., 2015, 2019b). The burden of personal responsibilities is also influenced by home dynamics, such as the age of one's children and having a partner who is employed (Dyrbye et al., 2010). Lower satisfaction with work–life integration is associated with a higher risk of burnout (Anandarajah et al., 2018; McAbee et al., 2015; Oskrochi et al., 2016).

When struggles with work–life integration occur, work–home conflicts can occur, and such events also increase the risk of burnout (Dyrbye et al., 2011b, 2012; Oskrochi et al., 2016; Sargent et al., 2004). Work–home conflicts are commonly experienced by physicians, especially among women, those in dual-physician relationships, and early career physicians (Dyrbye et al., 2010, 2011a,b). Both having a recent work–home conflict and solving a work–home conflict in favor of work (rather than being able to solve in a manner that enables one to meet both work and home responsibilities) have been shown to be independent predictors of burnout for both sexes in a national sample of more than 7,800 U.S. surgeons and a smaller sample of 465 academic general and subspecialist internists (Dyrbye et al., 2011b, 2012). A longitudinal study of physicians working in Norway found that a failure to experience a reduction in work–home interference over a 5-year time span after medical school graduation was an independent predictor of emotional exhaustion 15 years after medical school graduation (Hertzberg et al., 2016).

Several nursing studies also have reported a relationship between lower satisfaction with work–life integration and burnout (Boamah et al., 2017; Flynn and Ironside, 2018; Naruse et al., 2012; Proost et al., 2004). For example, in a large longitudinal study of recently graduated Canadian nurses, reported work–life imbalance predicted burnout (MBI–GS), lower job satisfaction, and lower perceived patient care quality 1 year later (Boamah et al., 2017). In a cross-sectional study of more than 2,000 nurses in Belgium, work–home conflicts increased the risk of burnout when controlling for dimensions of Karasek's (Karasek and Theorell, 1990) job demand–control–support model (Proost et al., 2004). Work–home conflicts may be reduced when there is better alignment between work schedules and personal life needs. For example, in a longitudinal study of 247 nurses in the Netherlands, when the nurses' work schedules fit better with their personal lives, they had less emotional exhaustion and were less likely to report declines in work engagement 1 year later (Peters et al., 2016).

INDIVIDUAL FACTORS MEDIATING BURNOUT AND PROFESSIONAL WELL-BEING

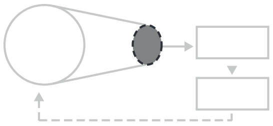
Available personal resources are strongly influenced by individual traits (e.g., personality), current individual states (e.g., sleep deprivation, mood), the complex intersection of one's personal and professional responsibilities (e.g., relationships, health issues, age of children, status of personal relationships, and other demands), and the prior history of goal achievement across all aspects of life.

Individuals vary in their capacity, their approaches, and their response to work-related stressors. These differences may be related to traits intrinsic to the individual (e.g., demographic variables such as gender, cultural background, and age as well as personality and general disposition), individual states (e.g., degree of sleep deprivation, mood, mindfulness), and other contextual factors (e.g., the varying nature of personal relationships).

While many individual traits are not modifiable, states and context can vary over time and have stronger or weaker effects depending on the work context. Individual factors, such as personality traits, cognitive abilities, and decision styles play a crucial role in workers' performance and in their subjective responses to perceived task difficulty and workload (Borg, 1978; Borg et al., 1971; Damos, 1988; Meshkati and Loewenthal, 1988; Moray, 1982). The role of demographic variables in the predisposition to burnout is discussed in Chapter 3; this section discusses other individual mediators. Figure 4-3 highlights the indvidual factors that mediate burnout in the committee's systems model of burnout and professional well-being.

Personality and Temperament

Although personality is multifaceted, the "big 5" personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) are widely considered to be the basic dimensions of personality (DeYoung et al., 2016). Perfectionism is another commonly explored dimension that correlates with conscientiousness and neuroticism. There are some data on the mediating role of personality on burnout in clinicians. Several studies have reported small associations between high neuroticism and burnout among physicians and nurses (McManus et al., 2004; Shimizutani et al., 2008; van der Wal et al., 2016; Yao et al., 2018; Zellars et al., 2004). For example, a prospective study of more than 2,000 physicians in the United Kingdom reported a weak, but statistically significant association between higher levels of neuroticism and subsequent symptoms of burnout among physicians. In this study of UK physicians, as well as in another study of



INDIVIDUAL MEDIATING FACTORS OF THE SYSTEMS MODEL OF CLINICIAN BURNOUT AND PROFESSIONAL WELL-BEING

Individual Mediating Factors include:

- Personality and temperament
- Coping strategies
- Resilience
- Personal relationships and social support

FIGURE 4-3 Individual mediating factors of the systems model of clinician burnout and professional well-being.

680 nurses in China, being an introvert was also associated with a higher likelihood of burnout (McManus et al., 2004; Yao et al., 2018). Other aspects of personality, such as having an easygoing and receptive personality (Meeusen et al., 2011) and having an internal locus of control, have also been reported to have some small mediating impact on the relationship between work stress and burnout (Partlak Günüşen et al., 2014).

Self-efficacy, an individual's belief in his or her own ability, and comfort with decision making may also relate to how individuals deal with stressors (Fida et al., 2018; Moreno-Jiménez et al., 2008; Spence Laschinger and Fida, 2014). For example, in a 1-year longitudinal study of 596 Canadian nurses, a higher level of self-efficacy in an individual's ability to cope with interpersonal conflict in the workplace was correlated with lower levels of burnout 1 year later (Fida et al., 2018). In a small study of 130 physicians working in Madrid, physicians' anxiety about decision-making processes was associated with burnout after controlling for age, gender, and patient characteristics. Attitudes about death (acceptance versus avoidance) moderated the relationship between decision making and burnout. When physicians took more responsibility for decision making, greater acceptance of death was correlated with the physician experiencing less emotional exhaustion (Moreno-Jiménez et al., 2008).

Coping Strategies

Personality, in particular locus of control, may influence the selection and use of coping behaviors (Haybatollahi and Gyekye, 2014), which in turn appears to mediate the impact of stress on well-being. Active or task-focused coping is associated with lower levels of psychological distress. Emotion-focused coping, such as wishful thinking, can moderate stress, but extensive reliance on it can lead to problems. The data regarding coping strategies and the risk of burnout among clinicians are conflicting. Some studies have reported that escape avoidance coping increased the risk of burnout (Pejuskovic et al., 2011; Pisanti, 2012) and task-focused coping reduced the risk for burnout (Bertges Yost et al., 2005), while other studies have reported no independent relationships among avoidance coping, task-focused coping, and burnout (Howlett et al., 2015). Still other studies have reported a significant but small relationship between emotion-oriented coping and burnout (Buttigieg et al., 2015; Howlett et al., 2015; Pisanti, 2012). In a study of 616 emergency room personnel, emotion-oriented coping was found to have a small to moderate ($r = 0.18$ to 0.22) relationship with a higher risk of burnout (Howlett et al., 2015). Similarly, in a study of 1,383 hospital-based nurses in Italy, a multi-variate analysis found emotion-oriented coping to be associated with a higher risk of burnout (Pisanti, 2012). On the other hand, planful problem solving (coping though analysis and planning to resolve the situation) was correlated with a decreased risk of depersonalization in a small study of hospice nurses (Payne, 2001). In aggregate, these studies suggest that coping strategies likely explain approximately 10 percent of variance in burnout (Payne, 2001; Pejuskovic et al., 2011).

Other active coping strategies, such as getting regular sleep, exercise, spending time with family and friends and engaging in recreation or hobbies, have been associated with a lower risk of burnout (Balayssac et al., 2017; Bertges Yost et al., 2005; Oskrochi et al., 2016; Sargent et al., 2004; Shanafelt et al., 2005, 2012b). For example, a systemic review of burnout among surgeons concluded that surgeons who exercised were at lower risk for burnout (Oskrochi et al., 2016). Protecting time away from work to be with spouses or partners, family, and friends and talking about feeling with them as a way to manage stress is another active coping strategy associated with a lower risk of burnout in physicians (Shanafelt et al., 2012b).

Resilience

As indicated in Chapter 2, resilience has a variety of definitions, including the ability to persevere and remain positive and a mindset and skill set that enables individuals to maintain their performance and well-being under adversity (Szanton and Gill, 2010). Resilience is considered a continuous, dynamic state that can be nurtured into a stronger and more effective attribute, at least up to a point (Howe et al., 2012). Resilience includes self-regulation and mindfulness and also the capacity for self-monitoring, limit setting, and attitudes that promote engagement with difficult issues at work (Epstein and Krasner, 2013; Luthar et al., 2000).

Studies suggest that higher levels of resilience may decrease the risk of burnout among nurses (Guo et al., 2018; Mealer et al., 2012; Rushton et al., 2015). In a survey by Rushton et al. (2015), greater resilience was associated with lower emotional exhaustion and a higher sense of personal accomplishment in a sample of nurses practicing in high-intensity settings. Mealer and colleagues (2012), in a national survey of 744 critical care nurses, found that high resilience was also associated with a lower likelihood of burnout as well as a lower likelihood of posttraumatic stress disorder, anxiety, and depression. Higher levels of resilience in nurses have also been associated with improved work relationships (McDonald et al., 2013), increased job satisfaction (Matos et al., 2010), improved professional quality of life (Hegney et al., 2015), and increased overall well-being (Ablett and Jones, 2007). It is worthwhile to note, however, that no published study to date has reported lower levels of resilience among physicians, nurses, or other health care professionals than among the general population.

Personal Relationships and Support Systems

Relationships can be a source of support as well as of stress. In a 2010 study, having a spouse or partner who worked outside the home was independently associated in physicians with high emotional exhaustion after controlling for a variety of personal and professional factors (Dyrbye et al., 2010). Other studies have reported that low spousal support and spousal occupation was associated with high emotional exhaustion (Gabbe et al., 2002; Golub et al., 2008; Johns and Ossoff, 2005; Oskrochi et al., 2016). Of course, being a partner of a clinician creates challenges since work-related stressors can affect home life and relationships with partners and children (Shanafelt et al., 2013, 2016b).

KEY FINDINGS

The literature on the work system and individual factors associated with clinician burnout and professional well-being is vast. Much of the evidence has been derived from physician studies and, to a lesser degree, nursing studies. More investigations are needed to confirm the relevance of particular contributing factors in other professions. One conclusion that may be drawn is that systemic contributory factors that can cause burnout or adversely affect professional well-being are numerous and varied but are quite context-dependent—factors in one setting may not be present in another. These contributory factors are further mediated by individual traits, many of which are intrinsic and not modifiable. Nevertheless, system factors are impacted by the way work is organized and managed and are influenced by multiple system levels. These system factors need to be addressed to decrease, prevent, and mitigate burnout.

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5

Healthy and Safe Health Care Organizations

> "Health care is physically, emotionally, and mentally draining, and while great strides have been instituted to protect patients, more needs to be done to protect clinicians. Adequate staffing is a must, as is a less punitive work environment."
>
> (Isolation Mask, Julie Shinn)[1]

As described in Chapter 2, the committee's conceptual model shows that system factors that contribute to burnout and professional well-being are influenced by multiple system levels. These system factors need to be addressed to decrease, prevent, and mitigate burnout. This chapter addresses the linkages between two levels of the health care system, frontline care delivery and the health care organizations (HCOs) (Berwick, 2002). It focuses on the actions and decisions HCOs make that affect the clinical work system and the care team. Research about complex systems shows that resources, constraints, incentives, and demands produced by organizational leadership shape the work and the behavior of people in the organization (Cook et al., 1998; Reason, 1997). Thus, it is important to understand the interactions between the care team and HCO leadership.

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[1] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Julie Shinn, visit https://nam.edu/expressclinicianwellbeing/#/artwork/197 (accessed January 30, 2019).

Figure 5-1 highlights the HCO system level in the context of the committee's systems model for clinician burnout and professional well-being. (See Figure 2-1 for the full systems model.)

As discussed in Chapter 4, the committee found that the factors contributing to burnout are numerous, varied, and are context-dependent, which underscores the need for HCOs to adopt multi-pronged strategies to shift their current structure and practices. The committee is aware that, to combat the factors driving burnout, many HCO leaders are seeking actionable solutions that have proven effectiveness against burnout and detailed specifications rendering them ready for implementation. Unfortunately, the committee found few interventions that meet these expectations. The first part of this chapter presents the committee's findings about the limited evidence for organization-focused interventions that address burnout

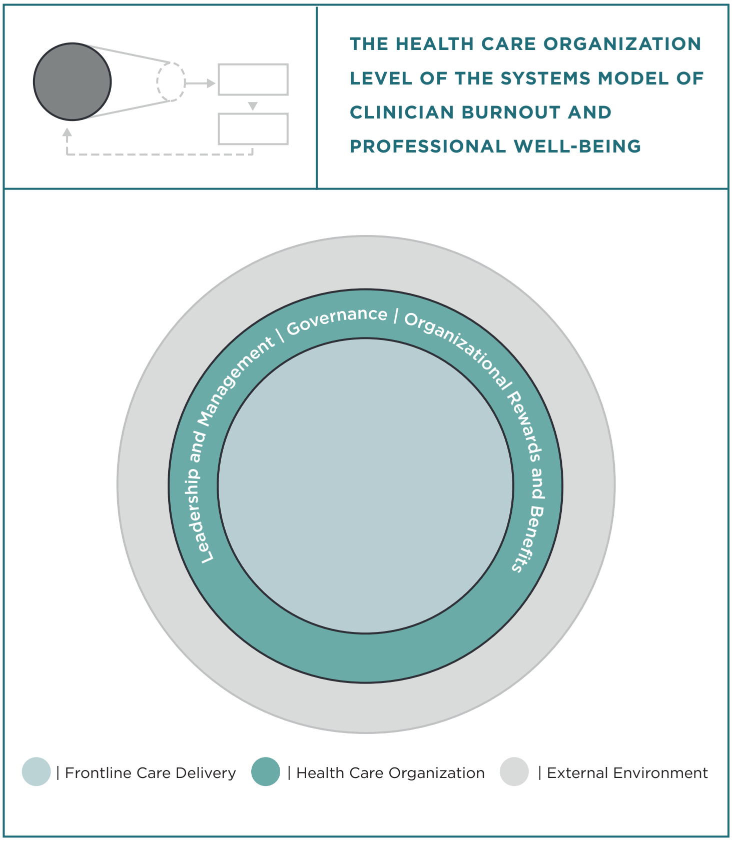

FIGURE 5-1 The health care organization level of the systems model of clinician burnout and professional well-being.

and professional well-being. Nonetheless, there are many opportunities for HCOs to bring about positive change that can reduce burnout and improve professional well-being. The second part of the chapter focuses on guidelines for creating systems that promote professional well-being. These guidelines reflect the characteristics of work systems that produce professional well-being (based on work design theories and models), as well as approaches for improving work systems and worker well-being (e.g., based on human-centered design). The committee developed these guidelines for well-being systems to support HCOs' efforts to design, implement, and sustain positive work environments and thereby continually improve both professional well-being and patient care.

EVIDENCE ON HEALTH CARE ORGANIZATION INTERVENTIONS

This section discusses the limited literature on the effectiveness of HCO-based interventions designed to address clinician burnout. The majority of published studies have focused on individual versus organizational interventions, with variable results. Of the few systematic reviews and meta-analyses conducted to date (discussed below), the evidence suggests that organization-focused interventions are more effective at reducing overall burnout than individual-focused interventions. Gregory and colleagues (2018) reported that "interventions to reduce burnout have sought to improve the resilience of an individual to withstand this [job demand–job resource] imbalance rather than identify and ameliorate the cause" (Gregory et al., p. 339). (See Chapter 4 for a definition of job demands and job resources.) The committee's charge to examine *systems* approaches to the problem of burnout is consistent with the evidence. On the basis of the available literature, the committee concludes that while individual-focused interventions can help to reduce burnout, they should be combined with effective organizational or system-level interventions.

Organizational and Individual Interventions

A systematic review and meta-analysis by West and colleagues (2016) examined research published on individual and organizational (or structural) interventions designed to prevent or reduce physician burnout. In the studies reviewed, organizational interventions primarily consisted of changes in duty hour requirements and practice-based delivery changes. Mindfulness, stress management, and small-group discussion interventions were the individual-focused approaches that demonstrated the most promise at reducing burnout symptoms. For both individual and organizational interventions, most of the studies reviewed by the authors suggested reductions in specific dimensions of burnout (i.e., emotional exhaustion or depersonalization), whereas fewer found improvements in overall burnout. Of the studies that measured overall burnout, organizational interventions were more effective than individual-focused ones. However, the authors suggested that "both strategies are probably necessary" (West et al., p. 2278). Another systematic review and meta-analysis of interventions targeting burnout among physicians published 1 year later had similar findings—organizational interventions, such as schedule and staffing changes and reductions in workload intensity, resulted in significant reductions in burnout (Panagioti et al., 2017). While individual-focused interventions also significantly reduced burnout, the effects of the organizational interventions reviewed were significantly greater.

Individual interventions target clinicians' behaviors and coping strategies, stress and burnout reactions, and resiliency. For instance, there is some evidence that interventions promoting physical exercise can reduce workplace burnout (Bretland and Thorsteinsson, 2015; Weight et al., 2013). Resiliency training, another individual intervention, may also be an effective way to help clinicians manage the unavoidable stress inherent to their jobs (Card, 2018; Epstein and Krasner, 2013).

The evidence is unclear on how best to strengthen an individual's resilience or how to measure the impact of one individual's resilience on other team members. These topics warrant further study (Epstein and Krasner, 2013). Despite its popularity, resiliency training does not address the problem of avoidable occupational suffering caused by systemic issues that can be prevented through organizational changes (Card, 2018). Mandatory or required training in this setting, such as mindfulness training, can fuel resentment and disengagement and thus should be avoided. However, having mindfulness and other individual-focused interventions as optional offerings among a menu of choices is a reasonable strategy (Card, 2018; Ripp et al., 2017).

Some individual interventions are embedded into organizational efforts aimed at supporting clinicians. Schwartz Center Rounds are an example of this type of intervention and are in place in more than 400 HCOs in the United States as well as in Australia and New Zealand and in nearly 200 sites in Ireland and the United Kingdom (Schwartz Center, 2019). "The rounds" offer clinicians regular opportunities to discuss the social and emotional stressors they face while caring for patients and families. In a group setting, clinicians share their thoughts and feelings on various topics inspired by real-life cases. A panel presents a case to the interdisciplinary group, which includes physicians, nurses, social workers, and other clinicians, and this is followed by a group discussion about the case and its broader implications. While the committee is not aware of any evidence linking Schwartz Center Rounds with reductions in burnout, there is some evidence they may foster better communication, teamwork, and provider support (Lown and Manning, 2010) and improve psychological well-being (Maben et al., 2018). Individual interventions such as Schwartz Center Rounds have the potential to be effective if they received adequate HCO support and if clinicians have the resources (e.g., time) to participate in them.

Organization-Focused Strategies

The available literature does not fully elucidate what types of organizational interventions hold the most promise to reduce burnout or its sub-components (e.g., emotional exhaustion, depersonalization, sense of reduced personal accomplishment). One study, however, did attempt to compare organizational interventions that target different work conditions to see which had the greatest effect on clinician stress and symptoms of emotional exhaustion (Linzer et al., 2015). In a cluster-randomized controlled trial in 34 primary care clinics, the interventions were classified into three categories: communications among clinicians and staff, changes in workflow, and quality improvement. While the specific improvement efforts varied, workflow interventions (e.g., reassigning clinic staff work, changing call schedules) and targeted quality improvement projects (e.g., automating prescription phone lines, establishing mechanisms to improve quality metrics for routine screening) were more likely to decrease symptoms of emotional exhaustion (Linzer et al., 2015). These interventions address multiple work system factors that contribute to clinician burnout (see Chapter 4), such as workload, staffing, and professional relationships.

In addition to the interventions assessed in the two systematic reviews discussed above (Panagioti et al., 2017; West et al., 2016), the committee identified studies of organizational interventions that targeted the following work system factors: (1) professional relationships and social support, (2) organization of teamwork, and (3) technology-related factors. These are discussed in the sections below, followed by a discussion of two initiatives designed to foster positive clinical work environments.

Professional Relationships and Social Support

Poor professional relationships and social isolation at work contribute to clinician burnout. Maslach and Leiter (2017) present burnout as a symptom of broken relationships between people and their work and suggest improving workgroup civility as an intervention approach that has shown promise in controlled intervention studies. One example of this type of intervention is CREW (Civility, Respect, and Engagement at Work), developed by the Veterans Health Administration to improve the social climate of workgroups (Osatuke et al., 2009). Workgroup participants meet weekly or bi-weekly with a trained facilitator to set goals and improve ways in which they work together as a unit. The sessions emphasize respectful interpersonal interactions and building trusting relationships between unit staff and management. In a pre–post comparison, the CREW intervention was found to achieve significantly greater employee civility ratings than the control sites, which showed no improvement. The efficacy of a similar process was demonstrated in a controlled study of Canadian hospitals (Leiter et al., 2011, 2012).

Two studies in 2011 and 2012 (Laschinger et al., 2012; Leiter et al., 2011) examined the impact of CREW on nurses' empowerment, experiences of coworker and supervisor incivility, and trust in nursing management. Compared with controls, the intervention group reported greater improvements in access to support, resources, total empowerment, trust in management, and supervisor incivility as well as improved job satisfaction and significant reductions in the depersonalization/cynicism dimension of burnout. The changes in emotional exhaustion were not significant. It is notable that while the CREW intervention was not explicitly designed to address burnout, the authors suggest that improving work relationships may, in turn, reduce burnout, and they cite other findings (Bakker et al., 2000; Leiter and Maslach, 1988) that show strong relationships between social support and reduced burnout. Leiter and colleagues subsequently developed a more focused civility intervention, SCORE (Leiter, 2016), that is currently undergoing testing in HCOs in Australia (Leiter, 2018).

A randomized controlled trial of 74 practicing physicians at the Mayo Clinic assessed the impact of an organizational intervention to build professional relationships and social support (West et al., 2014). The intervention consisted of a series of facilitated physician discussion groups that met for an hour about once every other week for 9 months. The 35 participants of the intervention group attended an average of 12 of 19 sessions. Topics discussed during the group sessions included meaning in work, personal and professional balance, and caring for patients. The institution provided the participants with protected, paid time to attend each session. Compared with controls and a non-study cohort, participants in the facilitated small-group intervention reported improvement in meaning, empowerment, engagement in work, and depersonalization (one of three dimensions of burnout). Based on the studies the committee reviewed, initiatives that promote system strategies to foster interprofessional teamwork and civility, reduce disruptive behavior, and build trust among team members can contribute to reducing clinician stress and promote healthier workplaces.

Organization of Teamwork

Reorganizing work to better distribute tasks can be accomplished through various forms of teamwork organization. Organizational strategies that establish well-functioning care teams are likely to target multiple work factors, such as workload, social relationships, job control, and autonomy. Using a pre–post quasi-experimental design, Gregory and colleagues (2018) examined the impact of an organization-level workload intervention at a primary care practice within a large, urban, integrated health care delivery system. The intervention consisted of a distinct work process and model change within the primary care clinics. This involved shifting from a dyad practice structure composed of a clinician (physician, advanced practice nurse, or mental health provider) and a certified medical assistant to a team-based structure of two clinicians and three certified medical assistants who worked together to manage a patient panel. In this team-oriented work model, physicians' assessments of their workload, the emotional exhaustion dimension of burnout, and depersonalization were lower after 3 months; at 6 months post-intervention, emotional exhaustion and depersonalization improvements were sustained, but the improvement in the workload was not. There could be many reasons for this, which highlight the challenges of sustaining the benefits of interventions. Similarly, a study of clinician and staff perceptions of their work teams showed that positive perceptions of team culture were associated with less emotional exhaustion among clinicians. Clinicians who had positive perceptions of their team culture and also who routinely worked with the same team members, had lower emotional exhaustion scores (Willard-Grace et al., 2014).

Other studies have looked at new models of care based on the patient-centered medical home (PCMH) concept of team-based care. In PCMH, teams work together with the goal of improving clinical continuity, coordination, and patient centeredness. Some studies suggest a potential for team-based care models to reduce stress, anxiety, and burnout among clinicians. For example, Group Health of Puget Sound implemented a medical home prototype that included reductions in panel sizes, expanded staffing model, lengthening of office visits, chronic care management, virtual medicine, visit preparation, patient outreach, and other practice management changes (Reid et al., 2010). In a pre–post study design, implementing the prototype was associated with improvements in patient experience and costs of care delivery as well as with decreases in clinician burnout scores.

In contrast, in a study of the Veterans Health Administration's team-based model, the Patient Aligned Care Team (PACT), Helfrich and colleagues (2014) found that being assigned to a PACT was an independent predictor of *higher risk* of emotional exhaustion, as was spending 25 to 50 percent of one's time on work that could be done by someone with less training and working in a chaotic work environment with overwhelming work demands. On the other hand, participants on an adequately staffed PACT and those who reported that their teams used employed participatory decision making had significantly lower odds of symptoms of emotional exhaustion. Teams included a primary care provider (physician, nurse practitioner, or physician assistant), a nurse care manager, a clinical associate (licensed practice nurse or medical assistant), and an administrative clerk. Clinicians with 2 or more years of tenure had higher odds of burnout than those with less than 6 months on the job (odds ratio [OR] = 2.13–2.68). The authors theorize that this may be a common feature of working on a job for a long time—the longer an individual works in the same job, the more emotionally exhausted by it that person may be. Alternatively, the authors suggest, these longer-tenure workers may be more resistant to organizational change, and thus they may feel the stress of the PACT transformation more acutely, and their pre-existing habits and expectations may be more ingrained. These results point to the need for organizational interventions that are deployed over the long run and involve multiple changes that target various work system factors, such as appropriate staffing, participatory decision making, and meaning of work (e.g., increased time spent working at the top competency level or providing care that is aligned with professional values).

Using in-depth interviews, LaVela and Hill (2014) further explored the challenges associated with PACT implementation. One unanticipated negative consequence was that, although PACT was designed to break down silos and de-fragment patient care, there was a perception that the individual PACTs became silos themselves. Understaffing of PACTs, which often meant nurses splitting time between two or more PACTs, often made it difficult for these individuals to fulfill their assigned roles. In another qualitative assessment (Ladebue et al., 2016), many respondents reported that patients had a positive view of PACT and felt more involved in their care under the model. However, many also reported that the model put a strain on staff. Namely, respondents reported insufficient staffing levels, a lack of sufficient training, scheduling complications, new duties without promised resources, less time with patients, and team dysfunction when there was a weak team member.

Another team-based care delivery intervention, which was assessed in a mixed-methods study, involved assigning advanced practice nurses (APNs) to support, coach, and encourage junior doctors during overtime shifts in an urban hospital in Australia (Johnson et al., 2017). The APNs facilitated collaboration between the junior doctors and ward nurses in order to assist with patient management and delegation of tasks. The junior doctors who worked with APNs reported less stress and anxiety during their shifts, reported receiving assistance to develop technical skills, and had more opportunities and support to develop cognitive skills. Both the APNs and junior doctors reported that the staffing structure fostered teamwork and eased many of the difficulties seen on overtime shifts. The improvements included improved delegation of tasks, greater awareness across the team of the patients on the ward, and improved interdisciplinary collaboration compared to shifts without the collaborative staffing model. Overall, the intervention had a greater effect on less experienced doctors. The authors hypothesized that early experiences of collaboration among clinicians may play a role in establishing habits that extend through the clinicians' careers and foster interprofessional practice. Interventions that reorganize the work among team members have the potential to reduce clinician burnout, but team members must have sufficient resources to balance the demands and expectations put on the team.

With any team-based intervention or redesign, it is important to proactively and regularly monitor and, if needed, adjust changes to avoid shifting the work burden from one discipline to another.

Connections Heal Patients and Clinicians[a]

I think the key to decreasing [clinician] burnout and creating better health care is more time for patients to be heard, physicians to understand their stories, and for both to build a relationship that heals.

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[a] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Diana Farid, visit https://nam.edu/expressclinicianwellbeing/#/artwork/132 (accessed January 30, 2019).
SOURCE: Dear Medicine (poetry), Diana Farid.

Technology-Related Factors

A few studies point to specific strategies that HCOs can undertake to address clinician burnout and frustrations related to technology use. For example, in a small study, Lapointe and colleagues (2018) report on an assessment of a Health Insurance Portability and Accountability Act–compliant text-paging system that was integrated within the existing electronic health record (EHR) at a university-affiliated residency program in an urban hospital. The EHR-based text system was intended to reduce interruptions during patient care or educational activities and reduced time spent responding to traditional telephone pages. Unit clerks, nursing staff, case managers, and physicians could either use a traditional telephone number page with a request for call back or initiate a text page directly from the EHR system. The latter supported consult requests or sending communications about admissions, patient or family requests, diet orders, or medication reconciliation. The system allowed recipients to respond immediately in the EHR (e.g., place an order) without calling the sender. In surveys of a small sample (n = 25) of resident physicians, the vast majority preferred the text system to traditional paging. Respondents reported decreases in interruptions, stress, frustration, and workload and increased communication and satisfaction with the EHR-based text system. While the survey did not measure burnout or stress with validated instruments, the results seem promising and support the view that technology that improves clinical work efficacy and efficiency can have beneficial effects on clinician burnout and well-being.

In an effort to reduce technology-related workload and administrative burden, another HCO asked all of its employees "to nominate anything in the EHR that they thought was poorly designed, unnecessary, or just plain stupid" (Ashton, 2018, p. 1789). This program led to multiple changes in the EHR (e.g., removing 10 of 12 most frequent alerts for physicians), additional staff training (e.g., regarding documentation tools), and other organizational changes (e.g., reducing the frequency of required evaluation and documentation). While the impact of the program on clinician burnout was not evaluated, such an organizational intervention seems promising since it removes activities and work that should not be performed, therefore reducing clinician workload (a major contributor to clinician burnout). Chapter 7 discusses further how technology can both prevent and reduce clinician burnout, especially if it is designed to support the real-world needs of clinicians and other members of the care team, is usable, and is properly integrated into clinical workflow.

Medical scribes have been proposed as a way of addressing clinician burnout since they can help reduce the EHR-related demands experienced by clinicians and, in particular, by physicians (e.g., the administrative burden of documentation, time spent on the EHRs outside of regular hours, the EHRs interfering with patient–clinician relationships during encounters). Scribes are trained to assist physicians in documenting patient encounters in real time. Physicians review and approve the notes drafted by scribes. Scribes can be in-house personnel (e.g., medical assistants in a primary care clinic) or outsourced personnel hired through a scribe company (Pozdnyakova et al., 2018). Scribes have been mostly used in emergency departments and primary care settings (Heaton et al., 2016). For instance, in primary care the use of medical scribes has produced improvements in physician satisfaction, including satisfaction with EHR use and clinic workflow (Pozdnyakova et al., 2018) and perceptions concerning the amount and quality of time spent with patients (Gidwani et al., 2017). In a crossover study of 18 primary care physicians in 2 primary care facilities, primary care physicians reported spending less after-hours time in EHR documentation and more time interacting with patients (Mishra et al., 2018). Scribes can help improve the timeliness of encounter documentation (Gidwani et al., 2017; Mishra et al., 2018). In general, patients report neutral or positive experiences with medical scribes (Heaton et al., 2016). Whereas the use of medical scribes seems to improve work system factors known to increase physician burnout (e.g., reducing administrative burden), there is no clear evidence for its impact on physician burnout. In a small prospective pre–post study of six physicians in a single primary care clinic, physician burnout measured by a single questionnaire item was low at baseline and did not change after the implementation of scribes.

While adding scribes to a clinical team requires a financial investment, there is some evidence that the overall increase in efficiency that they bring leads to a net-revenue gain (Nambudiri et al., 2018). Scribes can be a meaningful addition to a team-based model and improve how a practice functions. That said, more fundamental solutions are needed to address issues of EHR design and workflow integration. Thus, it is important that the increased use of scribes does not distract health care actors from exploring and developing other solutions, such as improvements in the usability of EHR documentation (including the use of templates and macros) and the development of assistive technologies (e.g., speech recognition, artificial intelligence tools) (Bates and Landman, 2018). Chapter 7 describes technologies that have the potential to reduce clinician burnout.

Programs for Positive Clinical Work Environments

The Institute of Medicine (IOM) reports *To Err Is Human: Building a Safer Health System* (IOM, 2000) and *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001) concluded that the biggest potential for gains in patient safety comes from the ability of organizations to create the work conditions essential for high-quality care. In the context of professional well-being, the committee reviewed the evidence for two national programs designed to improve the clinical work environment, the Magnet Recognition Program®[2] and the recently launched American Medical Association (AMA) Joy in Medicine Recognition Program.

Magnet Recognition Program® The American Nurses Credentialing Center's (ANCC's) Magnet Recognition Program® is an organizational model designed to improve the work environment for nurses in a hospital setting. The Magnet program emerged from a study by the American Academy of Nursing in 1981 to "examine characteristics of systems impeding and/or facilitating professional nursing practice in hospitals" (McClure et al., 1983, p. 2). This study suggested that the key organizational characteristics needed to support nurses were empirical outcomes, transformational

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[2] Registered trademark of the American Nurses Credentialing Center.

leadership,[3] structural empowerment, exemplary professional practice, and new knowledge, innovations, and improvements. These components form the Magnet model and serve as a framework for improving nurses' work environment. The model encourages organizations to improve the modifiable features of the nurses' work environment, such as staffing adequacy, leadership, clinical autonomy, interdisciplinary effort, and professional governance; this parallels many of the work system factors that contribute to clinician burnout (see Chapter 4). As of 2019, about 10 percent of U.S. hospitals have achieved Magnet Recognition Program® designation (ANCC, 2019b).

There is some evidence that nurses in Magnet hospitals are less burned out and more satisfied with their jobs. In a comparison of nurses in non-Magnet hospitals, Kelly and colleagues (2011) found that nurses in Magnet hospitals rated their work environment better and were 18 percent less likely to be dissatisfied and 13 percent less likely to have high levels of burnout (Kelly et al., 2011; Lake, 2002; Lake et al., 2019). In a longitudinal study assessing improvements to the work environment in Magnet Recognition Program®–recognized hospitals compared with other hospitals, Kutney-Lee and colleagues (2015) found significant perceived improvements over time in the quality of the work environment (e.g., more collegial nurse–physician relations and participation in hospital affairs). By the end of the study, nurses in Magnet hospitals had significantly lower adjusted rates of high emotional exhaustion (29.7 versus 38.4 percent, $p < 0.001$), lower job dissatisfaction (21.2 versus 30.9 percent, $p < 0.001$), and lower intention to leave their employer (8.9 versus 13.4 percent, $p < 0.01$) than nurses in hospitals that were non-Magnet throughout the study period. The authors concluded that better work environments in Magnet hospitals was an explanation for improved nurse outcomes, including burnout (Kutney-Lee et al., 2015). In addition to reduced burnout, job dissatisfaction, and intention to leave, there is some evidence that Magnet-recognition is associated with lower odds of patient mortality (McHugh et al., 2013). Similarly, improvements to the work environment correlate with improved patient safety (Aiken et al., 2018). A recent study also showed an association between Magnet Recognition Program® recognition and improved physician engagement (Dempsey and Lee, 2019). These studies suggest that the Magnet model is one way that HCOs can improve their work environments.

However, two systematic reviews have shown mixed results regarding the association of Magnet Recognition Program® recognition and nurse outcomes. In a 2014 systematic review, while two studies reviewed reported

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[3] Transformational leadership includes four components: individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence.

higher levels of job satisfaction among nurses in Magnet versus non-Magnet hospitals, a third study failed to find a difference in satisfaction ratings between Magnet and non-Magnet hospitals (Hastings et al., 2014). Another systematic review found mixed results in terms of nurse and patient outcomes in Magnet versus non-Magnet hospitals. Among the four studies included that assessed nurse outcomes, three showed improvements in job satisfaction, burnout, or intention to turnover. The authors of this review noted the lower quality of the research of the included studies (which were largely retrospective or cross-sectional) and concluded that it is difficult to isolate the impact of accreditation programs like the Magnet Recognition Program® from other factors (Petit Dit Dariel and Regnaux, 2015) such as potential differences in resources, culture, and leadership between hospitals that choose to seek Magnet designation and those that do not. It is worth noting that the review did not include the longitudinal study of Kutney-Lee and colleagues (2015) discussed above. Despite these mixed findings, seeking Magnet designation appears to be one way HCOs can improve the clinical work environment, at least for nurses (Lasater et al., 2019).

Pathway to Excellence®[4] Program The ANCC Pathway to Excellence (Pathway) Program recognizes an HCO's commitment to creating a positive work environment that empowers and engages its staff (ANCC, 2019a). To receive Pathway to Excellence recognition, an HCO must meet 12 standards for workplace excellence that demonstrate a positive work environment. While Pathway has not been the subject of substantial research, limited data from HCOs suggested that compliance with the Pathway to Excellence standards may be associated with better patient care and improved workforce outcomes, including reduced emotional exhaustion and higher job satisfaction among nurses (Jarrin et al., 2017).

The Joy in Medicine Recognition Program In 2019 the AMA launched the Joy in Medicine Recognition Program to recognize organizations that have demonstrated efforts to improve physician satisfaction and reduce burnout. The program grants the AMA Joy Award at three levels (bronze, silver, gold) across six competencies—commitment, assessment, leadership, efficiency of the practice environment, teamwork, and peer support. Organizations must meet the criteria for five of six competencies at either the bronze, silver, or gold level to receive the award (AMA, 2019). The Joy in Medicine Recognition Program encourages organizations to address physician burnout and satisfaction by dedicating resources and implementing workplace changes to combat it.

Case studies available on the AMA website describe approaches and specific interventions implemented by HCOs to reduce physician burnout

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[4] Registered trademark of the American Nurses Credentialing Center.

and improve satisfaction. The interventions include technology-related changes (e.g., collaborative and streamlined documentation, in-basket management), and teamwork changes (e.g., small group discussion) (AMA, 2017a,b,c). Because the Joy in Medicine Recognition Program just started, it is too early to know if taking the required steps to achieve recognition is associated with improvements in burnout and satisfaction among clinicians.

The Leadership Alliance The Leadership Alliance, convened by the Institute for Healthcare Improvement (IHI), consists of 40 participating North American hospitals, associations, and other care systems that have developed a set of "radical redesign" principles intended to guide transformational changes in health care (Berwick et al., 2017). One of these principles is dedicated to eliminating administrative barriers that add little or no value to clinical care, interrupt clinician workflow, frustrate patients and clinicians, or are otherwise wasteful of time and resources. To accomplish this, the participating organizations asked their clinicians and patients "If you could break or change any rule in service of a better care experience for patients or staff, what would it be?" Only 22 percent of the rules identified were actual statutory and regulatory requirements. The rest were either organization-specific requirements (62 percent) or organization behaviors with little or no legal or regulatory basis (16 percent). In most cases, local organizations could change or eliminate many of the rules identified in this process without violating any legal, regulatory, or statutory requirement (Berwick et al., 2017). While the impact of this initiative on the work environment has not been evaluated, it does illustrate a relatively simple process by which local organizations can identify and eliminate wasteful and unnecessary rules that are diverting time and resources and may be contributing to clinician burden.

DESIGNING WELL-BEING SYSTEMS IN HEALTH CARE ORGANIZATIONS

As described above, the committee found a dearth of evidence-based interventions that mitigate the multitude of factors contributing to burnout. Thus, the committee concluded that there is a need to provide HCOs with guidance about which actions they can take to reduce burnout in the short term with the ultimate long-term goal of eliminating burnout. In the remainder of this chapter, the committee describes a set of principles for designing, implementing, and sustaining professional well-being systems in HCOs, drawing on a systems perspective and the literature on human factors and systems engineering. In particular, this literature (Clegg, 2000) emphasizes a methodical approach to work system redesign. These guidelines for designing well-being systems, shown in Box 5-1 and described in the remainder of this chapter, are anchored in the committee's conceptual

BOX 5-1
Guidelines for Designing Well-Being Systems

Values, Systems Approach, and Leadership

- Align organizational structures and processes with organizational and workforce values (respect, justice, compassion, diversity of views).
- Use a systems approach to proactively improve professional well-being while supporting patient care.
- Engage and commit leadership at all organizational levels to address clinician burnout and improve professional well-being.

Work System Redesign

- Enhance the meaning and purpose of work and deliver value to patients.
- Provide adequate resources and environment (e.g., staffing, scheduling, workload, opportunities to learn, greater job control, usable technologies, adequate physical environment) to support clinicians' work.
- Design work systems that encourage and facilitate relational care (teamwork), collaboration, communication, and professionalism.

Implementation

- Build infrastructure for a well-being system that has adequate organizational resources, processes, and structures; continually learns and improves; and is accountable.
- Design reward systems that align with organizational and professional values to support professional well-being.
- Nurture (establish and sustain) organizational culture that supports change management, psychological safety, vulnerability, and peer support.
- Use human-centered design processes (see Chapter 2) to co-design, implement, and continually improve solutions and interventions that address clinician burnout.

framework and its systems approach. These guidelines can serve as the foundation for long-term organizational commitment to eliminating clinician burnout, improving professional well-being, and supporting the high-quality patient care.

Values, Systems Approach, and Leadership in Professional Well-Being Systems

The first set of principles in Box 5-1 outlines three areas that are foundational to successful HCOs' professional well-being initiatives: the alignment of values, the use of a systems approach, and the engagement and commitment of leadership.

Alignment of Values

Values are the foundation of organizational culture, and they ultimately drive business success and productivity. HCOs often declare their commitment to core values such as respect, equity and inclusion, diversity, transparency, integrity, and compassion in their mission statements, on plaques on their walls, and in their marketing messages (Brinkley, 2013; Graber and Kilpatrick, 2008). Clinicians aspire to uphold similar core values as evidence of their commitment to the basic tenets of their professions. When clinician and organizational values align, clinicians are more engaged. But when values are not aligned, or become dissonant or confused, conflict, discontent, and disengagement emerge, potentially leading to burnout (see Chapters 3 and 4).

U.S. Department of Veterans Affairs employees (n = 88,605) were surveyed to examine their perceptions of the ethical practices and ethical leadership in their HCO (Foglia et al., 2013). The survey questions that were most highly associated with the ethics quality in the organization were related to the fair distribution of resources, whether leaders were perceived as giving mixed messages that caused ethical conflict or uncertainty, and leadership follow-up when ethical concerns are raised. The authors suggest that when there is good alignment of stated values, behaviors, and decisions, health care workers view their organization's culture more positively, which ultimately affects the organization's performance, employee satisfaction, and worker engagement (Foglia et al., 2013). This could potentially have a positive effect on clinician burnout and professional well-being.

Clinicians and health care leaders may be unaware of the conditions and pressures that gradually erode the organization's ethical climate. One of the symptoms of this erosion is the dissonance that clinicians experience in how core organizational values are reflected in decisions, policies, mandates, and the reality of the work environment. For example, HCOs may espouse a patient-centered mission but then limit the number of Medicare or Medicaid patients who can be scheduled for non-urgent outpatient visits. Similarly, organizations may claim that they value diversity of the workforce while hiring or promotion practices indicate otherwise.

Aligning organizational structures and processes with organizational and workforce values requires a sustained intentional focus on collective values. The patterns that created the conditions for values dissonance did not occur overnight, and ethical dimensions of individuals within a system are critical to successful system redesign. As Donabedian, founder of the health care quality movement, said, "Systems awareness and systems design are important for health professionals but are not enough. They are enabling mechanisms only. It is the ethical dimension of individuals that is essential to a system's success" (Mullan, 2001, p. 140).

Use of Systems Approach

As emphasized in the committee's conceptual model, multiple work system factors can produce imbalances in job demands and job resources, which can in turn lead to burnout and negative consequences for patients, clinicians, HCOs, and society at large (see Figure 2-1). Effectively and sustainably improving professional well-being in HCOs requires a systems approach. Clinician burnout is not inevitable; it can be reduced and even prevented. The National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience has advocated for a systems approach to dealing with clinician burnout and professional well-being (Coffey et al., 2017; Dzau et al., 2018). This systems approach is in line with similar systems approaches recommended by multiple IOM and National Academies reports to address quality of care, patient safety, and learning health care (IOM, 2000, 2001, 2007; NASEM, 2015, 2018).

Role of Governance, Leadership, and Management

The many work system factors interact with each other and are influenced by decisions and actions throughout the HCO. Therefore, a systems approach to clinician burnout should address all of the critical aspects under the control of the HCO but especially the organization's governance and leadership. Successfully addressing the challenge of clinician burnout requires the engagement of leaders across the organization, including hospital boards, executive officers and senior leaders, department chairs, and administrative and operational leaders. As stated by Shanafelt and Noseworthy (2017, p. 129), "Leadership and sustained attention from the highest level of the organization are the keys to making progress" in addressing burnout. This statement was about physician burnout, but it applies equally to all groups of clinicians. A systems approach to addressing clinician well-being requires a commitment from leadership at all levels of the organization and should be a shared responsibility across all HCOs and their affiliated associations (e.g., the American Hospital Association, the Association of American Medical Colleges).

The current state of each HCO must be assessed and a comprehensive and coordinated organizational strategy developed to reduce burnout and cultivate professional well-being. Data and progress with respect to clinician well-being should be regularly reviewed by the HCO's board and its executive leaders. These leaders must build organizational will to make clinician well-being a priority, remove barriers, advocate for needed regulatory reforms, and create the enabling conditions that equip clinicians and non-clinician staff with the time, resources, and skills needed to devote to this effort. Leaders and managers at the frontline care delivery level (e.g., unit level) are also instrumental in creating the conditions for positive work environments (Adriaenssens et al., 2015; Gunnarsdóttir et al., 2009; Li et al., 2013; Shanafelt et al., 2015).

Governance of health care organizations Attention to the well-being of clinicians is necessary at the highest levels of the organization, including the board of trustees. Shanafelt and colleagues summarized seven things governing boards should know about burnout and professional fulfillment in clinicians (Shanafelt et al., 2018):

1. Burnout is prevalent among health care professionals.
2. The well-being of health care professionals affects quality of care.
3. Health care professionals' distress costs organizations a lot of money.
4. Greater personal resilience is not the solution.
5. Different occupations and disciplines have unique needs.
6. Evidence and tactics are available to address the problem.
7. Interventions work.

The authors argue that HCO boards play an important role in addressing the problem by insisting that executive leaders provide regular updates on organization-specific data on clinician burnout and well-being and asking the senior leadership team to develop specific plans for improvement. Boards should also encourage and support the allocation of resources by the executive team in ways that address the issue.

Leadership One meta-analysis of leadership across industries (beyond health care) found a link between leadership constructs (e.g., transformational leadership, leadership focused on relationship with employees and abusive supervision) and burnout (Harms et al., 2017). In its review of the literature on leadership in health care, the committee encountered similar findings—HCOs with effective leaders who have good relationships with clinicians are more likely to have better clinician professional well-being, retention, and other workplace outcomes.

Much of the leadership research that the committee reviewed focused on nurses. Two recent systematic reviews reported that effective nurse leaders were essential to creating and sustaining a healthy work environment that could positively affect nursing and patient outcomes (Cummings et al., 2010a; Wei et al., 2018). Nurses working under leaders who are focused on people and relationships report higher job satisfaction than nurses working with nurse leaders focused on tasks. Studies have found associations between resonate and authentic leadership styles and positive nursing and patient outcomes.

In one study, resonant hospital-level nursing leadership styles (e.g., empathic, achievement- and relationship-focused, power and influence sharing, empowering, visionary) had significant positive relationships with patient mortality. Nurses who work with resonant nursing leaders reported that the disruption of hospital restructuring was mitigated by the leader's style (Cummings et al., 2010b).

Another study reported that nurses who work for managers demonstrating higher levels of authentic leadership (e.g., who are perceived as hopeful and optimistic and who practice with high ethical standards and transparent values) report greater work engagement (Bamford et al., 2013). Expanding these findings, a longitudinal study found that authentic leadership was associated with a lower risk of burnout and improved nurse well-being (Spence Laschinger and Fida, 2014). Data further suggest that developing nurse managers' "authentic leadership" behaviors to create and sustain empowering work environments may help reduce nurse burnout and increase nurse job satisfaction and retention (Boamah et al., 2017; Spence Laschinger et al., 2012). Shanafelt and colleagues (2015) described the importance of frontline leadership on the well-being and professional satisfaction of physicians who practiced in a large, integrated HCO. In a cross-sectional study, 2,813 physicians rated their immediate supervisor across a range of leadership behaviors. The composite supervisor leadership score was an independent predictor of burnout and job satisfaction of the physicians directly reporting to the physician leader; as leadership scores improved, the likelihood of frontline physicians' burnout decreased (Shanafelt et al., 2015). Leaders who informed, engaged, inspired, developed, and recognized those working for them were considered effective leaders in this study (Shanafelt et al., 2015).

The research underscores the importance of leaders and managers in creating supportive work environments by, for example, being accessible and fostering collegial relationships (Epp, 2012). These findings can serve as a framework for leadership development programming in HCOs as part of designing, implementing, and sustaining organizational well-being systems.

Work System Redesign in Health Care Organizations' Professional Well-Being Systems

Box 5-1 outlines three principles for work system redesign that support successful HCOs' professional well-being initiatives. As described in Chapter 4, multiple work system factors need to be considered in order to systematically address clinician burnout and improve professional well-being. The committee's review of HCO interventions found only limited published evidence for what an organization can do to address clinician burnout. Therefore, the committee relied on the literature on work design to develop three broad principles for work system redesign. Models, theories, and approaches of work design highlight key principles of job meaning and content (e.g., variety), adequate balance of job demands and resources, and support for team work and good professional relationships (Carayon et al., 2007; Parker et al., 2001, 2017a).

First, the committee's review of contributing factors to clinician burnout points to the role of repetitive, meaningless, low-value work that does not fit with the abilities and motivations of clinicians (see Chapter 4). Systematic efforts at work system redesign should, therefore, aim to eliminate low-value work and enhance the meaning and purpose of work. This may be accomplished by reorganizing work and care processes or by a judicious use of technology. Second, in line with the job demands–job resources model (Bakker and Demerouti, 2007, 2017) described in Chapter 4, clinicians need to have adequate organizational, informational, environmental, and technological resources to do their job in a safe, efficient, and effective manner. Finally, team-based care has been emphasized by multiple experts, health care leaders, and IOM reports (ANA, 2016; IOM, 2001; Mitchell et al., 2012; Schottenfeld et al., 2016). Developing care processes and organizational structures aimed at supporting team-based care can not only produce benefits for patients (e.g., increased care coordination, improved patient safety), but also can help reduce and mitigate clinician burnout (see examples in the section on organizational interventions earlier in this chapter). Work system factors such as social support are important facilitators for clinician well-being and can be enhanced via team-based care.

Below, the committee describes the literature on work design and on healthy work environments that provides the background for the three work system redesign principles summarized in Box 5-1.

Models and Theories of Work Design

Recent approaches to work system redesign and professional well-being use holistic systems approaches and examine the range of work factors that may create imbalances in the work system (Carayon, 2009; Smith and Carayon, 2001; Smith and Sainfort, 1989), such as (lack of) balance between effort and reward (Siegrist, 1996) or between job demands and job resources (Bakker and Demerouti, 2007; Demerouti et al., 2001). This is in line with the conceptual approach used by the committee to describe the work system factors that contribute to clinician burnout (see Chapter 4).

In light of the committee's systems approach (see Figures 2-1 and 2-2), the level of frontline care delivery is a work system with multiple elements that interact with each other: the care team members, their activities and technologies, and the physical environment and organizational conditions under which they perform their activities (Carayon, 2009; Smith and

Carayon, 2001; Smith and Sainfort, 1989). Work design should therefore ensure that all work system elements and their interactions support the work of clinicians and clinical teams. For instance, using knowledge from the literature on human factors and ergonomics (Salvendy, 2006), principles for the physical design of environments (Alvarado, 2012; Carayon et al., 2011; Lyson et al., 2019) and workstations (Carayon et al., 2007) can be used to design health care facilities that promote positive interactions and support teamwork, which can in turn help reduce clinician burnout and improve well-being. The usability of technologies is another important work design principle (see Chapter 7 for additional discussion of this topic) and there are ways to quantify its impact on clinicians and clinical workflow (Zheng et al., 2010). There is a large body of knowledge on job design that provides information on design principles for positive work environments (Carayon et al., 2003, 2006; Parker, 2014, 2017a,b; Smith and Sainfort, 1989). Models of job stress also provide useful guidance on how to reduce burnout and improve professional well-being as they identify various job stressors (Cooper and Marshall, 1976; Hurrell and McLaney, 1988). See Box 5-2 for selected models of job design and job stress.

BOX 5-2
Selected Models of Job Design and Job Stress

The job characteristics theory identifies five job characteristics that lead to enhanced satisfaction and performance: variety of tasks and skills, job control or autonomy, significance or meaning of job, feedback on performance, and task completeness (Hackman and Oldham, 1975; Hackman et al., 1975).

The job enrichment theory of Frederick Herzberg (Herzberg, 1974, 2003) defines "eight ingredients of a good job": direct feedback on one's performance, building relationships with clients or consumers, opportunity to learn, opportunity to participate in scheduling one's work, control over resources, development of unique expertise, direct communications authority, and personal engagement in one's work.

The job strain model of Karasek (Karasek, 1979) initially identified two dimensions (job demands and job decision latitude [also referred to as autonomy]) and was later extended to include social support (Johnson and Hall, 1988; Karasek and Theorell, 1990). According to the job strain model, work system redesign should focus on reducing job demands (if this is possible) as well as enhancing job decision latitude and social support in order to mitigate the potential stressful impact of job demands.

Healthy Work Environments

The nature of the overall work environment (i.e., the professional milieu in which the clinicians, staff, patients, and families experience daily health care delivery) is critical for enhancing professional well-being and improving patient care. In the nursing literature, a "healthy work environment" describes a workplace that is safe, empowering, and satisfying and that includes effective cross-disciplinary communication, collaboration, and decision making; appropriate staffing; recognition; and authentic leadership (AACN, 2019; ANA, 2019). The retention of nurses, nurse satisfaction, and patient outcomes are significantly affected by the health of the work environment. Aiken and colleagues (2008, 2011) found that nurses who worked in healthier work environments reported significantly lower rates of burnout and job dissatisfaction and better quality-of-care outcomes. For nursing, a healthy work environment is often measured on five dimensions using the National Quality Forum–endorsed Practice Environment Scale of the Nursing Work Index (Warshawsky and Havens, 2011): (1) nurse participation in hospital affairs; (2) nursing foundations for quality of care; (3) nurse manager ability, leadership, and support of nurses; (4) staffing and resource adequacy; and (5) collegial nurse–physician relations (Lake, 2002; Lake et al., 2019). Unfortunately, structured descriptors of the characteristics of a healthy work environment for other clinicians have not been as clearly articulated, although they could be expected to include many, if not all, of these dimensions.

A driver for redesigning work and improving clinician outcomes can be the adoption of work design principles, such as the American Association of Critical-Care Nurses (AACN) standards for establishing and sustaining a healthy work environment: "skilled communication, true collaboration, effective decision making, appropriate staffing, meaningful recognition, and authentic leadership" (AACN, 2016, p. 10). AACN has also developed the Healthy Work Environment Assessment tool to assist organizations in monitoring their progress as they implement these standards[5] (Connor et al., 2018). Although the tool was established for critical care nurses, the standards embed concepts that align with principles of good work system design and positive work environments. The effectiveness of these standards—and others like them—to improve clinician professional well-being warrants study.

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[5] See details at http://www.aacn.org/hwe (accessed April 10, 2019).

Implementation of Professional Well-Being Systems

Implementing well-being systems requires a major organizational change, which can create new or additional sources of stress. Box 5-1 provides principles for implementing well-being systems in HCOs in a thoughtful, systematic manner. In a review of the literature on individual and organizational interventions designed to reduce or prevent pharmacists' stress (including burnout), Jacobs and team (2018) documented effective characteristics of organizational interventions across industries that could be adapted to the pharmacy industry in the United Kingdom. Based on their review, the authors identified key criteria that are necessary for a workplace stress-reduction intervention to succeed. These criteria include top-management support to provide the resources necessary to develop and implement the intervention, active participation from employees throughout the development and implementation process, action planning and project management with clear tasks and responsibilities assigned across the organization, and changes brought on by the interventions reflected in the organizational culture to be sustainable. These criteria are in alignment with the extensive literature on change management and system redesign (Barrow and Toney-Butler, 2019; Karsh, 2004).

Infrastructure and Resources for Well-Being Systems

Given the growing importance of clinician burnout, HCOs need to build adequate infrastructure for enhancing professional well-being. This infrastructure should have sufficient resources and rely on effective organizational design principles, such as accountability, continuous measurement and improvement, and organizational learning. It is important to identify an executive leader who has the primary responsibility for facilitating and managing the efforts to address clinician burnout.

Executive leader for professional well-being As with other major organizational endeavors, an executive leader is needed to oversee and coordinate the activities aimed at enhancing professional well-being. Similar to the situation in past decades when the positions of chief medical officer, chief nursing officer, and chief quality and safety officer were created in response to the recognition of a critical unmet need for leadership within HCOs, there is now a clear need for organizations to create a senior leadership position to oversee the new suite of responsibilities to address clinician well-being. Much like the chief quality officer, this new leader must be able to transcend individual silos in order to catalyze progress across all divisions, departments, and work units. The committee believes it will be essential that this leader's focus be exclusively on the professional fulfillment and well-being of the individuals in the organization and be independent of other activities, such as efforts to improve quality or patient experience. Simply adding responsibility for clinician well-being to the duties of the chief quality officer or chief experience officer is unlikely to be successful, given that these groups already have a broad and expansive charge that will necessarily be the primary focus of their activities.

The committee agrees with a number of organizations and societies that have argued that it is important this person be a positioned at the executive officer level to have appropriate impact (Jha et al., 2019; Kishore et al., 2018). The title of this position may vary across organizations, with the "chief wellness officer" being a common choice. Other organizations designate this person as a senior or associate dean or vice president. The key responsibilities of the executive leader in charge of professional well-being include evaluating the current scope of the problem and reporting the results throughout the organization, benchmarking, designing and implementing an interprofessional organization-wide strategy, overseeing broad system-level efforts to drive improvement in the dimensions most relevant to the local organization, and communicating with outside entities. The qualifications required to fulfill this role are not defined by disciplinary expertise but rather reflect a relevant knowledge base and skills necessary to lead large-scale change initiatives and produce meaningful and sustainable results. Designating an executive leader dedicated to well-being in an organization will be insufficient unless a diverse team and sufficient resources are provided to allow collaborative solutions to produce effective interprofessional results (Shanafelt et al., 2019).

Professional well-being, patient safety, and employee safety Organizational efforts for tackling clinician burnout should be coordinated with activities related to patient safety and employee safety and health because many of the same work system factors influence clinician burnout as well as worker and patient safety (McCaughey et al., 2016; Weinger and Englund, 1990). For example, extended work hours and fatigue have been associated with both medical errors and needlestick injuries (Dember et al., 2009; Olds and Clarke, 2010). High workload, a major contributor to clinician burnout, also adversely affects patient safety (Aiken et al., 2002; Gurses et al., 2009; Hoonakker et al., 2011). For nurses there is good evidence that a "healthy work environment" is concurrently associated with improved patient safety, a reduction in occupational injuries, and improved nurse well-being (Wei et al., 2018). Patient safety, employee safety (e.g., occupational injuries), and clinician burnout are inter-related; they share contributory factors and may influence or affect each other.

On the other hand, improperly designed patient safety or quality improvement initiatives can have adverse effects on employee safety and clinician well-being as well as on other aspects of patient care. Patient safety interventions that increase frontline clinician workload, time pressure, or clerical burden can unintentionally result in decreased attention to other aspects of care quality, contribute to staff burnout and job dissatisfaction, and even impair clinician health (e.g., work-related stressors that contribute to chronic illness) (Koppel et al., 2008).

The committee agrees with Yassi and Hancock (2005, p. 32) that "a comprehensive systems approach to promoting a climate of safety, which includes taking into account workplace organizational factors and physical and psychological hazards to workers, is the best way to improve the health care workplace and thereby patient safety." Others have strongly advocated for the coordination and integration of the various goals (patient safety, occupational safety, professional well-being) into a single comprehensive safety program. Stevenson and colleagues (2013, p. 25) at Island Health in British Columbia argue for system-wide commitments to "quality and safety for all," stating that "we must challenge the paradigms that juxtapose employee and patient safety and move beyond alignment and coordination into integration." Despite the parallels among patient safety, occupational safety, and clinician burnout, these organizational functions within HCOs tend to be separate, reflecting the largely independent external (e.g., state and federal) infrastructures, regulations, standards, and reporting requirements of these equally laudable goals. There can be tension between the various groups and their goals as well as potential constraints with regard to organizational resources.

While there are likely benefits and disadvantages to either an integrative or collaborative approach to patient safety, occupational safety, and clinician well-being at the organizational level, the goals and organizational mechanisms need to be closely aligned and coordinated. This should include having a strong safety culture (broadly defined), educated and engaged leadership, common organizational processes or infrastructure when possible, clear frontline expectations and engagement, and effective measurement and feedback systems. At a minimum, with organizationally separate entities there must be effective communication, mutual consideration of requirements, constraints and unanticipated consequences, effective coordination, and a substantial alignment of organizational goals and resources at the most senior leadership level. Additionally, a shared focus on improving patient care can align efforts, reduce competition, and contribute to a healthier work environment.

Organizational learning Improvement at scale requires careful attention not only to which changes are theorized to result in improvement but also to how those changes will be tested, evaluated, and implemented and the experiences of the individuals experiencing the change. Organizations should ensure that a robust learning and improvement system is in place. Such a system should enable those directly involved or affected by the changes to clearly visualize the alignment between professional and organizational values and to understand the ultimate aim of the effort, how progress toward the aim will be measured, expectations around their contribution, and the process by which their feedback and ideas will be surfaced and addressed. See the discussion of learning health system in Chapter 2.

Rewards Management in Well-Being Systems

Reward systems should compensate and recognize clinicians equitably while ensuring that they do not create additional sources of stress and burnout. As discussed in Chapter 4, extrinsic rewards can be a contributor to clinician burnout. HCOs should design and implement organizational systems and processes aimed at compensating and rewarding their workers, in particular clinicians, in a manner that cultivates meaning and fulfillment. There are not "right" or "wrong" models of compensation; however, each compensation model will have both positive and negative consequences. Among physicians, salary-based models run the risk that some people will underperform and take advantage of hard-working colleagues. Productivity-based compensation models can encourage clinicians, many of whom who already work long hours, to work even more in a manner that is unsustainable. Such models can also de-incentivize taking breaks during the work day (e.g., to see an extra patient and generate more relative value units) or vacation. Thus, like the problems with 12-hour shifts for nurses discussed in Chapter 4, the use of heavily incentive-oriented clinician compensation models will have undesirable long-term effects, including an increased risk of burnout (Shanafelt et al., 2009). There has been movement away from volume-based salary structures toward a more hybrid model of physician base salary, production and quality incentives, and other stipends (Kritzer and Mayse, 2018). Ultimately, such models are extrinsic motivators that appeal to a fiscal motive rather than to the altruistic, intrinsic motivations that drew most clinicians into health care professions originally (Pink, 2009; Steers et al., 2004).

HCOs using productivity-based compensation models should recognize that they are using a transactional model that has a high risk of eroding the human–human interaction and altruistic motivation that clinicians bring to their work. At a minimum, they should consider how to counter this risk by creating other safeguards to insure that the intrinsic motivation of clinicians is simultaneously recognized, nurtured, and supported. It will be important to more fully understand the drivers of meaningful and fulfilling work for all clinicians beyond extrinsic rewards. The recent AACN Critical Care Nurse Work Environment study shed some light on the issues facing nurses and their workplace frustrations. Of the 54 percent of responding nurses who indicated that they planned to leave their current position within the next 12 months, the top three issues they noted as being able to influence them to reconsider leaving were better staffing (50 percent), higher salary or improved benefits (46 percent), and more meaningful recognition (39 percent), suggesting that compensation is only one of many factors that contribute to job satisfaction (Ulrich et al., 2019).

Designing organizational reward systems that are meaningful to clinicians is vital to creating a healthy work environment. Meaningful recognition refers to the mutual responsibility between clinicians and the organization in which the clinicians practice to recognize the value of their own and others' contributions to patient care (Barnes and Lefton, 2013). For critical care nurses, the most meaningful recognition of their contribution to care comes from their patients and families (Ulrich et al., 2019). Similarly, in a national survey, U.S. physicians reported greater life satisfaction when they had long-term relationships with at least some of their patients, and more time doing personally meaningful work was strongly correlated with life and career satisfaction (Tak et al., 2017). To be meaningful, recognition cannot be an isolated event nor automatically conferred, but rather must be integrated into the fabric of the HCO through formal processes and structures.

Psychological Safety for Individuals and Organizations

HCOs need to support clinicians' ability to discuss, report, and address burnout, its sources, and its consequences without fear of shame, retaliation, marginalization, or disrespect (Edmondson, 2018). Therefore, organizational culture should support an environment in which clinicians feel safe (i.e., psychological safety) to report and to receive individual support when experiencing burnout or other forms of distress.

For HCOs to improve, it will be necessary to first assess the current state in order to establish a baseline level of burnout and professional well-being within the organization. This is typically accomplished through organization-level surveys, but can also include other methodologies (Sharma, 2017). To achieve honest and accurate data, it is important to attend to psychological safety in the data collection and reporting processes for both individual clinicians and the organization.

Attending to psychological safety at the individual level means that surveys or other data collection should either be anonymous or confidential with appropriate firewalls and safeguards in place to ensure that the responses of an individual cannot be identified by other members of the organization and to alleviate any concerns that an individual's responses may affect future status (e.g., credentialing or privileging decisions, employment) in the organization. At the organization level, psychological safety means that the institution's willingness to ask for honest and unvarnished feedback as a means for improving work environments will not be used to damage or tarnish the reputation of the organization and its leaders (Yuan, 2019). Both practices are necessary to create a trustworthy practice environment.

It is important that the results of such surveys be shared transparently with all members of an organization (e.g., those who participated in the survey). This should include both a high-level summary of the results for the organization at large and results that are specific to occupation (e.g., nurses, physicians, pharmacists, advanced practice providers) and specialty or unit. Individuals should receive reports designed to be relevant to them. For example, a nurse should receive the results of the aggregate organization-level results, results summarizing the experience of nurses in the organization, and the nurse's work-unit-level results. When results are shared, attention should be given to creating an atmosphere of learning. It is critical that organizational leaders avoid any perception of blaming frontline staff for the results or exerting pressure for them to remediate the results (see above discussion on organizational learning). Additionally, when solutions can be co-created rather than imposed, the likelihood of meaningful and sustainable progress is possible (see below discussion about clinician participation).

Although the committee is in favor of transparent sharing of data across and within the organization, there are downsides to the public reporting of the survey data, especially for the purposes of ranking or comparing HCOs. Such public-ranking systems often have negative consequences and create perverse incentives. For example, the public rating systems of the "best hospitals" in the United States has led organizations to try to game the system and the metrics by which they are ranked, rather than to engage in authentic efforts to improve the underlying factors (e.g., quality) that the ranking system is intending to capture. Given the highly subjective nature of questions about burnout and well-being, organizations would have ample opportunity to engage in subtle or overt coercion and manipulation of results. Individual employees could also lose with the public reporting of results since their livelihood is tied to how their organization performs (Yuan, 2019). Public reporting could also influence contracting and the ability to recruit clinicians. Thus, one could easily envision an administrator telling clinicians, "Be sure you remember what a great place this is to work when you fill out your survey so we can recruit people to the open positions and get back to full staffing." Hence there are tremendous pressures that may prompt euphemistic rather than honest reporting when psychological safety is not created for both individuals and organizations.

Clinician Participation in Enhancing Professional Well-Being

The transformation of HCOs to address clinician burnout needs to be driven by leadership commitment (see Box 5-1), but also requires significant input and involvement from clinicians, who will co-design the solutions and implement the organizational decisions. Such a human-centered design approach with *genuine* clinician participation (Østergaard et al., 2018), which has been recommended and is being adopted in other health care improvement domains including health information technology design and patient safety, needs to be extended to address clinician burnout (see Chapter 2 for more information on human-centered design). In this human-centered design approach, clinicians are intimately involved in co-designing interventions to improve their work environment and reduce burnout. The co-design approach with genuine clinician participation may actually foster the development of innovative approaches to reduce clinician burnout (Wolstenholme et al., 2017). The most meaningful and sustainable improvements often involve the active participation of those closest to the work (Cotton et al., 1988; Pasmore and Fagans, 1992). Not only should clinicians be asked about their degree of burnout, but they should have an active role in translating their insights, experiences, and expertise into identifying, testing, evaluating, implementing, and continually enhancing proposed improvements that foster well-being and a healthy work culture. The principle of "Nothing about me, without me" applied to patient empowerment and engagement should also be applied to clinicians as HCOs work to create the necessary conditions that foster their well-being.

Clinician participation in developing and implementing solutions for addressing burnout can also be a solution to reducing burnout (Jackson, 1983) as it provides a path for engaging clinicians, giving them opportunities to work with others (social support) and to learn from others (meaning in work), and allowing them to exert greater control over their work environment (autonomy) (Spector, 1986). In addition, since organizational changes can be stressful because of the uncertainty in what the future work environment will look like and of the extra demands to participate in improvement activities, the participation of clinicians in the change process can provide the channels for them to support each other and bring up ideas on how to better manage the change.

KEY FINDINGS

HCOs are a powerful determinant of clinician burnout and have a critical role to play in reducing clinician burnout. There is evidence that interventions focused on work organization can improve burnout. The evidence also indicates that individual-focused strategies may be beneficial but not sufficient to address clinician burnout and that they need to be embedded in organizational efforts. Furthermore, organizational interventions should be deployed over the long run and should involve multiple changes that target various work system factors, such as appropriate staffing, participatory decision making, and the meaning of work (e.g., increased time spent working to top of one's competency level). The committee, however, concluded that there is no quick fix to eliminating burnout; there is no single solution at the HCO level.

To identify opportunities to design interventions that address the myriad factors that contribute to burnout, the committee reviewed systematic approaches based on human factors and systems engineering methods and principles and on knowledge from organizational design and change management. The committee concluded that much is known about the characteristics of good work systems that produce professional well-being (e.g., work design theories and models) as well as about approaches for improving work systems and well-being (e.g., human-centered design). HCOs can use this knowledge to foster organizational learning and improvement in addressing clinician burnout and enhancing well-being. This is the essence of the committee's proposed guidelines for designing the well-being systems described in this chapter. Well-being systems require sustained commitment, leadership, infrastructure, resources, accountability, and a culture that supports clinician well-being. HCOs should support the participation of clinicians in co-designing solutions to address burnout and foster well-being. A key approach to the sustainability of organizational interventions to address clinician burnout is a continuous improvement model that includes feedback and organizational learning (see the feedback loop of improvement and learning in the committee's systems model in Figure 2-1).

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6

The Influence of the External Environment on Clinician Burnout and Professional Well-Being

> "[Clinicians] are often forced to make tough decisions that involve their patients, insurance companies, pharmacies, pharmaceutical companies, the hospital, or clinic administrators, among others. Oftentimes, there is no one clear answer as to what the best decision is. The decision-making process can be challenging and anxiety-provoking, especially when a patient's well-being is at stake. They are often faced with a moral dilemma and have to balance the possible benefits and risks that may result from their decisions."
>
> (Tough Decision, Edi Matsumoto)[1]

Dramatic changes in the U.S. health care system over the past several decades have affected clinicians' professional responsibilities and workplace experiences in profound ways. In this chapter the committee examines economic (or market), regulatory, and social factors in the external environment that affect health care organizations (HCOs) and contribute to workplace stress and greatly diminish clinicians' professional well-being. The external environment is the third level of the committee's systems framework for clinician burnout and professional well-being (see Figure 6-1). As

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[1] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Edi Matsumoto, visit https://nam.edu/expressclinicianwellbeing/#/artwork/220 (accessed January 30, 2019).

described in Chapter 2, the external environment influences the structure and performance of HCOs directly and, through them, the frontline care delivery level. Clinicians' experiences of external environmental demands is influenced by HCOs' interpretations of regulatory and administrative requirements and decisions about work processes. (See Chapter 4 for the work system factors under the control of HCOs that influence clinician burnout and well-being and Chapter 5 for more about HCO actions and decisions affecting the clinical work system and the care team.)

This chapter focuses on the available evidence related to the ways that three external environment factors contribute to clinicians' workplace stress: (1) structural changes in the U.S. health care industry, including the growth of large, health care corporations; (2) the laws, regulations, and standards for the oversight of U.S. clinicians; and (3) changing societal

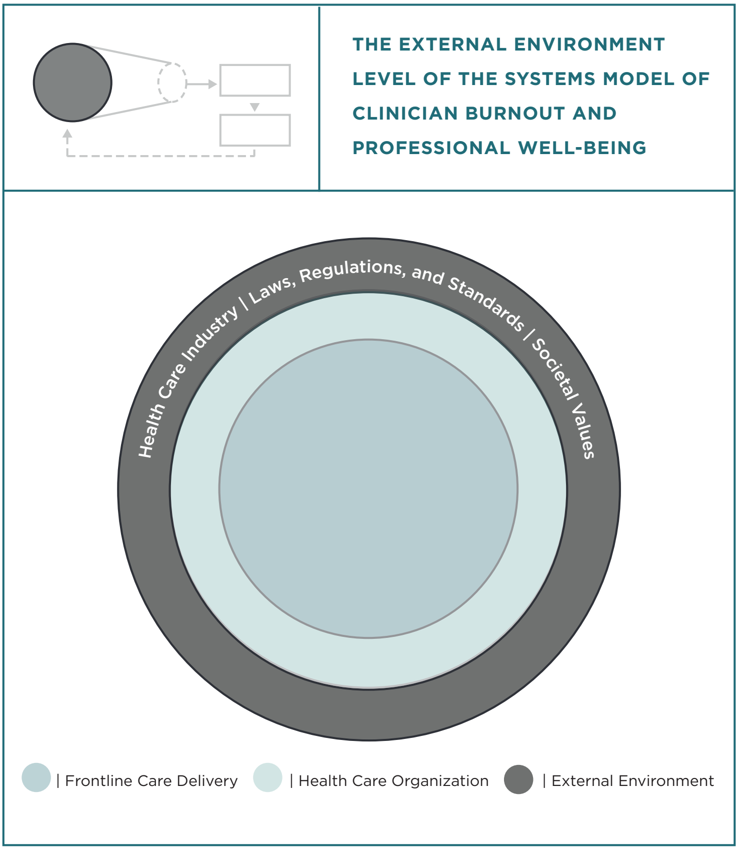

FIGURE 6-1 The external environment level of the systems model of clinician burnout and professional well-being.

values and the clinician–patient relationship. The chapter discusses health information technology (IT) in the context of some of the policies associated with clinical documentation, prescription drug monitoring, prior authorizations, and information privacy and security. Chapter 7 takes a broader view of the role of health IT in clinical practice, its effects on clinicians, and the innovations under development.

HEALTH CARE INDUSTRY

Efforts to improve the quality of health care and reduce its cost have led to the unprecedented changes that are ongoing in today's health care system. These changes, however, are occurring within a highly fragmented health care system that is characterized by a vast array of complex interrelationships among those who receive, provide, finance, and regulate care. The many different stakeholders often have divergent interests and expectations, which complicates efforts to improve the system (Altman and Frist, 2015; Moses et al., 2013). Clinicians and the work environment are affected by the shifts toward the industrialization of health care delivery, toward greater accountability and transparency through measurement, and toward new care delivery and payment models.

The practice of medicine, once considered a cottage industry practiced by individuals or small partnership groups, started transitioning toward multi-specialty groups and corporations in the 1990s (Maloney, 1998). Ongoing structural changes in the health care industry, including the horizontal and vertical integration of insurers, hospitals, pharmacies, and physician and dental practices, are leading to an increasing number of clinicians being employed by large corporations. These changes are also bringing about the wider application of industrial-type operational strategies by HCOs designed to deliver care more efficiently, such as greater divisions of labor and reliance on unskilled labor, standardization of roles and tasks, and the creation of corporate managerial structures (Casalino, 2017; Moses et al., 2013; Rastegar, 2004). One analysis estimated that the number of health care administrators increased 3,200 percent between 1975 and 2000, thus, underscoring the nature of the structural changes occurring in the industry (Cantlupe, 2017).

Corporate employment can provide various advantages to physicians, such as freedom from the business demands of operating a practice, negotiating leverage with health insurers over payment rates, and, potentially, more control over their work schedules (Casalino, 2017). At the same time, the managerial hierarchy in health care corporations can have control over many domains that affect clinicians, including the

> application of clinical algorithms, practice guidelines, standardization of procedures, cost-control measures that affect care directly (such as choice of orthopedic prostheses and implantable cardiac devices), quality improvement programs, and supply of clinical information required by insurers. (Moses et al., 2013, p. 1957)

Care delivery strategies such as standardization, cost controls, and productivity targets can create schisms between individual clinicians' values and expectations and those of the organization as well as declines in the clinicians' sense of control, flexibility, and autonomy and a potential erosion of professional values (Casalino, 2017; Moses et al., 2013; Rastegar, 2004). These tensions between HCOs and clinicians can contribute to work stress, job dissatisfaction, and burnout (Gregory and Menser, 2015; Linzer et al., 2017; Rothenberger, 2017). See Chapter 3 for the consequences of burnout and Chapter 4 for details on the work-related sources of clinician burnout.

LAWS, REGULATIONS, AND STANDARDS

Mirroring the complex organization of the U.S. health systems and the major changes in care delivery and financing, the U.S. regulatory landscape for the oversight of the health professions includes a multitude of ever-changing regulatory and oversight bodies that define and influence many aspects of a clinician's responsibilities and actions. Health care laws and regulations are promulgated by federal, state, and local governments and affect institutional providers as well as individual clinicians. Additionally, private organizations supplement the work of governmental regulators by issuing standards, such as those that are used to accredit health professions schools, administer licensing examinations, and certify specialists (Field, 2008). Also, health professional organizations and societies have had a longstanding role in self-regulation (authority over certain legal, economic, and institutional aspects of the profession) (Havighurst, 1983), although the authority of each organization varies greatly (Madara and Burkhart, 2015).

The myriad laws and regulations as well as the many accreditation and other professional standards are intended to support the health care system, for example, by engendering public confidence in the competence of physicians through licensure requirements (Field, 2008). However, despite areas of overlap, oversight bodies at times operate without coordination (Field, 2008), which is contributing to growing concerns about the burden of administrative requirements on clinicians (a contributory factor to burnout; see Chapter 4). Policy makers often fail to assess the impact of new regulations or requirements before they are implemented (Lee et al., 2019a).

A 2017 survey of members of a multi-specialty academic faculty in New England found that the average time spent by a physician on administrative duties was nearly 28 percent of the physician's work week, and this appears to have increased since 2014. Prior authorizations, specialty recertifications, and compliance regulations related to opioid prescribing were the duties for which required faculty engagement had increased the most over the 3-year study period (Del Carmen et al., 2019).

Growing administrative requirements, many of them discussed in this chapter and in Chapters 4 and 7, can interfere with the care experience of patients and "drain time and morale" from clinicians (Berwick et al., 2017, p. E1). In response to the negative effects of administrative burden on patient care and on clinicians, clinician-led efforts have begun to focus attention on the problem. In 2018 six medical professional organizations representing 560,000 physician and medical student members called upon U.S. Congress, the administration, payers, vendors, and other stakeholders to expand and accelerate efforts to reduce administrative burden. The six organizations issued joint principles calling for the simplification of clinical documentation requirements, improved performance measures, and the streamlining or elimination of prior authorization forms. These organizations also encouraged better leveraging of health IT to improve usability and clinical workflows and called for continuous evaluations of regulations and administrative tasks on clinicians and patients (AAFP, 2018). In addition to this call to action, the American College of Physicians' Patients Before Paperwork initiative is identifying and prioritizing the most burdensome administrative tasks faced by clinicians, developing policy recommendations to address these administrative tasks, and engaging in ongoing outreach and stakeholder engagement efforts with external sources of administrative and regulatory burden (ACP, 2018a). Chapter 5 discusses an approach some HCOs are taking to modify or eliminate administrative rules that contribute little or no value to patient care (Berwick et al., 2017).

In the sections that follow, the committee discusses various laws and regulations that define payment schemes for clinician services and that shape the requirements, policies, and procedures for medical records documentation and coding, quality measurements and reporting, prescription drug monitoring, privacy rules, and prior authorization forms. (Laws and regulations related to electronic health records and other technologies are discussed in Chapter 7.) In the latter part of this section, the committee addresses professional licensure, board certification, and professional liability.

Health Care Reform and Payment Policies

The Patient Protection and Affordable Care Act of 2010[2] initiated a significant federal interest in value-based health care. The more recent Medicare Access and CHIP (Children's Health Insurance Program) Reauthorization Act of 2015[3] (MACRA) (in particular, the new payment options under the MACRA Quality Payment Program [CMS, 2019b]), along with initiatives in the private sector (Health Care Transformational Task Force, 2017) are accelerating the value movement. These initiatives include linking payment to value by using alternative payment models, increasing care integration and coordination to improve population health (i.e., the medical home model), and using information technology to improve patient care. A goal is to substantially change incentives to promote the delivery of higher value care by clinicians and HCOs.

Figure 6-2 shows eight federal value-based programs that have been implemented over the past decade. Most recently, under MACRA, the U.S. Department of Health and Human Services (HHS) set a goal of having 90 percent of Medicare fee-for-service payments linked to quality or value by 2018 (HHS, 2015). In 2019 MACRA introduced a two-track Quality Payment Program for participating Medicare clinicians. Under the Merit-Based Incentive Payment System, participating clinicians receive performance-based payment adjustments, and under alternative payment models such as accountable care organizations, clinicians have additional incentives to provide high-quality and cost-efficient care (CMS, 2019b).

In addition to the payments they receive from participating in federal value-payment programs, HCOs and clinicians are, of course, reimbursed for their services and procedures by multiple commercial insurers and consumers. Payment structures can vary from fee-for-service to newer value-based models. Each payer has its own set of rules and regulations with different levels of complexity (Gottlieb et al., 2018). For example, there is variation in practice requirements (e.g., credentialing); variation in the conditions, tests, and treatments that are covered and the associated coding rules (i.e., Current Procedural Terminology [CPT] and the *International Classification of Diseases, Tenth Revision* [ICD-10]); variation in the payment-related incentives and penalties employed; and variation in the quality measures required to be reported (see the section on quality reporting below).

There are many reports in the literature concerning how the existing federal and commercial payment schemes have created a confusing and onerous environment for clinicians. Managing multiple payment systems with complex rules, processes, metrics, and incentives that may frequently change is a

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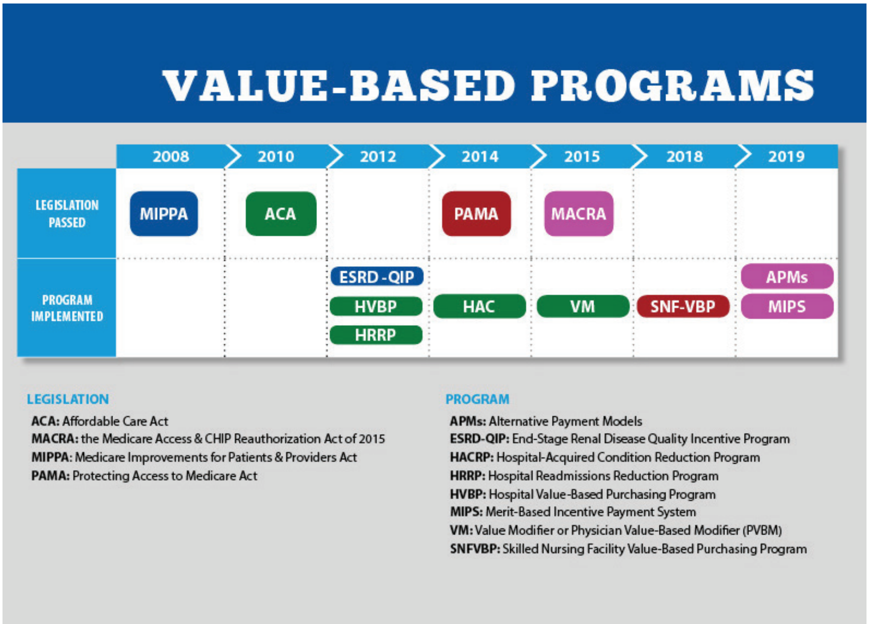
[2] Public Law 111-148, 124 *Stat.* 119.

[3] H.R. 2, Public Law 114-10.



LEGISLATION

ACA: Affordable Care Act
MACRA: the Medicare Access & CHIP Reauthorization Act of 2015
MIPPA: Medicare Improvements for Patients & Providers Act
PAMA: Protecting Access to Medicare Act

PROGRAM

APMs: Alternative Payment Models
ESRD-QIP: End-Stage Renal Disease Quality Incentive Program
HACRP: Hospital-Acquired Condition Reduction Program
HRRP: Hospital Readmissions Reduction Program
HVBP: Hospital Value-Based Purchasing Program
MIPS: Merit-Based Incentive Payment System
VM: Value Modifier or Physician Value-Based Modifier (PVBM)
SNFVBP: Skilled Nursing Facility Value-Based Purchasing Program

FIGURE 6-2 Federal value-based care programs, 2008–2019.
SOURCE: CMS, 2019c.

source of considerable burden for clinicians (Casalino et al., 2016; Cohen et al., 2018; Wynne, 2016). As private insurance plans continue to follow the Centers for Medicare & Medicaid Services' (CMS's) lead and expand the use of risk-sharing contracts (Health Care Transformational Task Force, 2017; Hsu et al., 2017), one result could be greater clinician burden because of the variations across payers in terms of programmatic goals, documentation and performance measurement requirements, and uncertainty about the evolution of payment models (Hsu et al., 2017). One study of clinical hospital pharmacists found that uncertainty regarding health care reform is a risk factor for burnout (Jones et al., 2017).

To the extent that payment policies and requirements are causing substantial administrative burden, financial pressures, or other negative effects on clinicians to the point that they are leaving their practices, the very success of health care reform may be threatened (Dyrbye and Shanafelt, 2011) and create barriers to patient care. For example, third-party reimbursement policies under Medicare Part D have been reported to contribute to community pharmacists' financial stress (Gabay, 2017) and the closing of community pharmacies, which may reduce access to care, particularly in rural communities where there may be only one community pharmacy and the pharmacist may be the only local health care provider (Ullrich et al., 2017).

Medical Records Documentation and Coding Requirements

Medical records documentation facilitates several functions, including the recording of pertinent information regarding a patient's health history, the planning and evaluation of a patient's treatment, the monitoring of a patient's health over time, communication among providers involved in the patient's care, billing, carrying out reviews of usage and quality of care, liability protection, and data collection for research. Myriad federal and state laws and regulations impose specific documentation requirements on health care providers.[4] For example, the Medicare conditions of participation state that "[t]he medical record must contain information to justify admission and continued hospitalization, support the diagnosis, and describe the patient's progress and response to medications and services" and provides further detailed requirements to meet this standard.[5] Additionally, the federal Meaningful Use program has expanded medical records documentation requirements to include specific information pertaining to payer quality measures[6] and to serve as a vehicle for sharing health information with patients, families, and caregivers.[7] Appendix B provides examples of the clinical documentation and coding requirements of the Medicare Program, for accreditation by The Joint Commission, and of the ICD-10.

State medical boards also may require certain clinical documentation requirements, for example, with respect to a telehealth encounter.[8] Other stakeholders have placed additional requirements on the clinical documentation process for quality reporting, physician report cards, reimbursement,

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[4] See, e.g., Illinois Administrative Code, Title 77 Public Health, Chapter 1: Department of Public Health, Subchapter b: Hospitals and Ambulatory Care Facilities, Part 250 Hospital Licensing Requirements, Subpart L: Records and Reports, Section 250.1510(b)(2) Medical Records; Commonwealth of Massachusetts, Division of Health Care Facility Licensure and Certification, Hospital licensure, 105 CMR 130.

[5] See 42 CFR § 482.24 (C).

[6] See, e.g., 42 CFR § 495.20—Meaningful use objectives and measures for eligible professionals, eligible hospitals, and critical access hospitals before 2015.

[7] See 42 CFR § 495.24—Stage 3 meaningful use objectives and measures for eligible professionals, eligible hospitals, and critical access hospitals for 2019 and subsequent years.

[8] See, e.g., Section 13: Medical Records, Telemedicine Standards of Practice, Board of Licensure in Medicine and Board of Osteopathic Licensure, Maine Department of Professional and Financial Regulation. ("A licensee who uses telemedicine in providing health care shall ensure that complete, accurate and timely medical records are maintained for the patient when appropriate, including all patient-related electronic communications, records of past care, physician-patient communications, laboratory and test results, evaluations and consultations, prescriptions, and instructions obtained or produced in connection with the use of telemedicine technologies. The licensee shall note in the patient's record when telemedicine is used to provide diagnosis and treatment.")

public health data, and disease tracking and trending. Moreover, hospital bylaws and rules and regulations typically address the content of medical records[9] and impose their own sets of requirements, based on organizational goals, values, and the interpretation of external expectations. These multiple sources of clinical documentation requirements lead to duplicative and inconsistent requirements (AHA, 2017) that are burdensome and time consuming. The American Hospital Association reports that hospitals are required to comply with 341 mandatory regulatory requirements, at an estimated annual cost of $7.6 million per community hospital, on average. Larger hospitals can spend up to an estimated $19 million annually. Fulfilling these demands requires 59 full-time staff per hospital, more than one-fourth of which are doctors or nurses who could otherwise be providing direct patient care (AHA, 2017). To fulfill the requirements, short cuts, such as use of copy-and-paste functions and check boxes, are commonly employed, but they may result in an increased risk of poor-quality notes, contradictions in the history, and inadequate documentation (Dimick, 2008). Another increasingly popular strategy to help clinicians complete documentation is the use of medical scribes. (Chapters 5 and 7 discuss the evidence associated with the use of scribes.) Excessive paperwork and documentation is also a stressor for other professions. For example, Schommer and colleagues (2018) identified higher levels of reported time stress among community pharmacists than among hospital pharmacists; doing excessive paperwork or documentation (i.e., third-party work) was found to be one of seven items that may contribute to time stress (Schommer et al., 2018).

Clinical Documentation Redesign

As a result of the many reports that have examined the burden associated with clinical documentation and other clerical tasks (Arndt et al., 2017; Baumann et al., 2018; Shanafelt et al., 2016; Sinsky et al., 2016; Tai-Seale et al., 2017) (see Chapter 4 for details), there have been multiple calls for a significant redesign of clinical documentation (ACP, 2018b; Haas et al., 2019; Ommaya et al., 2018).

Federal actions to reduce the effort and time required to record health information include the development of a draft *Strategy on Reducing Regulatory and Administrative Burden Relating to the Use of Health IT and EHR* (ONC, 2018) released by the HHS Office of the National Coordinator for Health Information Technology (ONC) in 2018, as directed by

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[9] The Joint Commission Standard, Medical Staff (MS); MS.01.01.01, EP 16 mandates that requirements for completing and documenting medical histories and physical exams in accordance with state law and hospital policy must be included in the medical staff bylaws.

U.S. Congress under the 21st Century Cures Act.[10] In response to ONC's proposed strategy, the American Medical Informatics Association (AMIA) called for HHS to adopt a long-term electronic health record (EHR) strategy that uses informatics tools and methodologies to gather information from care documentation and apply it to clinical decision support and improving performance (Fridsma, 2019). In AMIA's view, efforts to improve clinical documentation and reduce clinician burden should focus on clinically purposeful documentation and not just on reduced documentation (Fridsma, 2019).

In addition, CMS's Patients over Paperwork initiative, launched in 2017, has made a number of changes in an attempt to simplify Medicare documentation requirements in order to reduce the amount of time clinicians spend on claims documentation (CMS, 2019a). In June 2019, CMS announced that it is actively soliciting public feedback to shape Patients over Paperwork's next steps and future progress in tackling unnecessary clinician burden (CMS, 2019a).

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[10] Public Law 114-255.

Connections Heal Patients and Clinicians[a]

As many clinicians battle with endlessly long hours, administrative burden, low sense of accomplishment, and difficult work–life balance, it is important for clinicians to take a step back and have a time for reflection. With continued stress and exhaustion, clinicians may lose sight of rewarding and inspiring moments in their patient care....

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[a] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Sung Min Ma, visit https://nam.edu/expressclinicianwellbeing/#/artwork/127 (accessed January 30, 2019).
SOURCE: Reflection, Sung Min Ma.

Quality Measurement and Reporting

Documenting and reporting quality measures is of paramount importance to improving health care. Two Institute of Medicine reports, *To Err Is Human: Building a Safer Health System* (IOM, 2000) and *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001), powerfully brought the public's attention to significant gaps in health care quality and safety and to the importance of measuring system performance. Since then a growing number of employers, payers, and regulators have required the reporting of quality and safety information (e.g., Healthcare Effectiveness Data and Information Set®[11] clinical measures, Consumer

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[11] Healthcare Effectiveness Data and Information Set (HEDIS®) is a registered trademark of the National Committee for Quality Assurance.

Assessment of Healthcare Providers and Systems®[12] patient experience measures, and Leapfrog hospital survey data) from health plans, hospitals, and health systems. At the same time, published comparative score cards and rankings (e.g., Hospital Compare [CMS, 2000], Quality Compass®[13]) based on these performance data have emerged as key drivers for improved accountability, transparency, and increased value in health care.

Value-based payment models require measures of quality, patient experience, and efficiency, which is contributing to a proliferation of performance measures and reporting requirements, with a commensurate increase in the burden on clinicians who are recording and collecting the data (NQF, 2019). Although many of the performance measures provide useful information, there are many that do not (because they are duplicative, not clinically relevant, have poor methodological design, etc.) and are thus not effective in improving the performance of the health system (Berwick, 2016; IOM, 2015; MacLean et al., 2018). The current mandatory measurement requirements, which include measures that are not important to patient health (Berwick, 2016; Dunlap et al., 2016; IOM, 2015; Panzer et al., 2013; Safran and Higgins, 2019), contribute to the perception that current quality measures detract from meaningful clinical activity and deprofessionalize the clinician (Khullar et al., 2018; Pronovost et al., 2018), as well as adding a substantial burden to the workload of clinicians (Casalino et al., 2016; Sinsky et al., 2016) (see Chapter 4), even with the use of current health information technology (Cohen et al., 2018).

Multi-stakeholder efforts to decrease the burden associated with quality measurement are ongoing. For example, the Measure Applications Partnership (MAP), convened by the National Quality Forum (NQF), guides HHS on the selection of performance measures for federal health programs. In its 2017 guidance (NQF, 2017), MAP called for a reduction in the number of measures in federal programs as well as better feedback from frontline clinicians to ensure that measures are driving improvement and not causing negative consequences (e.g., burnout) on clinicians. In addition, the Core Quality Measure Collaborative (CQMC), involving America's Health Insurance Plans, CMS, and NQF, as well as national physician organizations, employers, and consumers, promotes the coordination of measure use and collection across public- and private-sector payers. In developing core sets of performance measures, CQMC aims to "reduce the burden of measurement by eliminating low-value metrics, redundancies, and inconsistencies in measure specifications and quality measure reporting requirements across

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[12] Consumer Assessment of Healthcare Providers and Systems (CAHPS®) is a registered trademark of the Agency for Healthcare Research and Quality.

[13] Quality Compass® is a registered trademark of the National Committee for Quality Assurance.

payers" (NQF, 2019). CQMC indicates it is monitoring the use of these measures and will use lessons learned to modify them and minimize their negative consequences (CMS, 2017).

Prescription Drug Monitoring Program Requirements

Currently, 49 states, the District of Columbia, and one U.S. territory (Guam) have authorized a prescription drug-monitoring program (PDMP). PDMPs are state-operated data repositories that collect, monitor, and analyze electronically transmitted patient-specific prescribing and dispensing data submitted by pharmacies and dispensing practitioners with the goal of reducing prescription drug abuse and diversion. When prescribers or pharmacists query the database for a patient's prescription history, they can see prescription information regarding the dose, supply, and prescriber of scheduled drugs the patient has filled. Clinicians can use this information to inform their prescribing decisions, avoid polypharmacy, and refrain from supplying opioids to patients exhibiting drug-seeking behavior. The circumstances under which a clinician is required to access the database, however, vary from state to state.

As of January 2019, at least 43 of the 49 states with PDMPs (plus Guam) now legally mandate prescribers—and 20 mandate pharmacists—to query the system prior to writing or dispensing a prescription for controlled substances with recognized potential for abuse or dependence (PDMP TTAC, 2019). While this policy is well intended and serves the need to curb prescription drug abuse, requiring clinicians across care settings to query PDMPs can be burdensome (Haffajee et al., 2015). In querying PDMPs, prescribers have experienced difficulty in obtaining logins, encountered system downtime, and noted that information is not integrated into clinical workflow with often incomplete data (Haffajee et al., 2015). According to a 2018 *JAMA Surgery* study, clinicians without PDMP databases built directly into their EHR systems (i.e., one-click access) spend an average of 13 minutes per patient to complete PDMP queries, opioid risk calculator processes, and required institutional informed consent processes (Stucke et al., 2018).

To increase the use of PDMPs, the Substance Abuse and Mental Health Services Administration funded projects in nine states from fiscal years 2012 to 2016 through its PDMP Electronic Health Records Integration and Interoperability Expansion (PEHRIIE) program (CDC, 2017). Ensuring that prescribers have one-click access to state PDMP data is one strategy to reduce administrative burden on clinicians by eliminating the need for prescribers to manually log into PDMP's website separately. EHR integration of PMDP data is becoming increasingly common across the country (Monica, 2018a,b) and will likely accelerate with the emergence of new private-sector initiatives facilitating clinician access to prescription drug information at the point of care (DrFirst, 2019).

CMS has also taken action to reduce the burden associated with PDMPs. In 2018 CMS called on state Medicaid programs to improve EHR integration of PDMP data to enhance appropriate and safe prescribing, reduce provider burden, and allow HCOs to more easily track patient information related to opioid use (Hill, 2018). In its guidance to states, CMS stated,

> This integration removes the requirement for providers to log in to a separate system, manage a separate login and disrupt their workflow to query the PDMP. Single sign-on interoperability between EHR and PDMP, such that PDMP results are displayed when the EHR indicates a controlled substance is prescribed, could be supported, as an example. (Hill, 2018, p. 2)

In addition, under Medicare Part D, CMS has implemented a voluntary prescription drug benefit that makes e-prescribing optional for physicians and pharmacies but requires drug plans that participate in the prescription benefit to support electronic prescribing (CMS, 2014).

Maintaining Privacy and Security Compliance

Federal and state laws and regulations impose obligations on HCOs and clinicians to maintain the privacy and security of health information. For example, the goal of the Health Insurance Portability and Accountability Act (HIPAA) privacy standards is to protect the integrity, confidentiality, and availability of health data. Similarly, the purpose of the HIPAA Security Rule is to establish national standards for the protection of electronic protected health information (PHI). The steps required by clinicians to comply with federal and state privacy and security laws and regulations concerning health information along with related organizational policies and procedures add to the administrative burden on clinicians. For example, the HIPAA Privacy Rule requires that an authorization contain either an expiration date or an expiration event that relates to the patient or the purpose of the use or disclosure.[14] Some HCOs require patients to execute written authorization for the use and disclosure of PHI on an annual basis. Such a requirement results in clinicians searching the EHR to find the most recent authorization, making sure that it has been signed within the past year and, if not, obtaining a new form from the patient. Additionally, two commentators have noted that misapplications of the HIPAA requirements have unnecessarily resulted in restricting the exchange of clinical information

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[14] 45 CFR § 164.508(c)(1)(v).

between treating clinicians and have led to rules against posting patients' names in clinical areas to facilitate finding or identifying the patient and also rules against family members or loved ones reviewing medical records and clinical information even with the patient's permission (Berwick and Gaines, 2018).

Another example of HCOs' influence on the implementation of privacy and security laws and regulations and the effects on clinician burden relates to patient communications, including e-mail, text messaging, or Web-based messaging platforms, all of which are subject to the HIPAA privacy and security standards (HHS, 2019; Liederman et al., 2005). In order to comply with the HIPAA security standards, access to a clinician's e-mail and the HCO's EHR or other Web-based messaging platforms must be password protected. The HIPAA security standards require covered entities to have procedures for creating, changing, and safeguarding passwords.[15] In implementing such procedures, HCOs typically use stringent password management requirements (e.g., number of characters, symbols, capitalization, and frequency of change) that clinicians must meet. Dealing with user logon and authentication procedures can be time consuming. For example, in one study of family medicine physicians (n = 142), clinicians were found to have spent nearly as much time on system security as on reading or editing the problem list each day (Arndt et al., 2017). Challenges are amplified for clinicians who use more than one EHR and communication platform, as each requires its own password and software (Gellert et al., 2017; Liu et al., 2019; Luxton et al., 2012).

Prior Authorization Process

Payers often require clinicians to obtain prior authorization for medications, other forms of treatment, diagnostic procedures, and referrals. The intent of prior authorization is to deter patients from getting unnecessary medical care and to direct prescribers to less costly treatment options where appropriate (and thus reduce the cost of care); however, these requirements can also create hassles for patients and add to clinicians' burden (Jacobson and Neuman, 2018). Different prior authorization rules by different payers require inconsistent workflow processes and the submission of additional information through manual processes (eHealth Initiative, 2019). Pre-authorization processes, which have to be completed annually even for medications for chronic conditions, are resource-intensive and pose barriers to providing optimal patient care (Brown and Brown, 2018; Del Carmen et al., 2019). In a recent study of physicians at an academic medical center, pre-authorization was the most onerous administrative task

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[15] 45 CFR § 164.308 (a)(5)(ii)(D).

(Rao et al., 2017). Similarly, a national study of community pharmacists found that prior authorization was a top concern among pharmacists with Medicare Part D, with pharmacists reporting that they spent the most time on prior authorization, followed by reimbursement and formulary issues (Spooner et al., 2017).

Among the advocacy initiatives to reform prior authorization and reduce the burden on clinicians and patients is a consensus statement from the American Medical Association (AMA), America's Health Insurance Plans, and other stakeholder organizations (AHA et al., 2018). These stakeholders identified five areas for improving the prior authorization process: the use of criteria for the selective application of prior authorization requirements; regular review of the list of medical services and prescription drugs that are subject to prior authorization; enhanced communications among health plans, health care providers, and patients; continuity of patient care; and widespread industry use of standard electronic prior authorization processes.

At the federal level, more than 100 members of U.S. Congress sent a letter to the CMS administrator in 2018 expressing concern about Medicare Advantage plans' use of prior authorization and the associated administrative burden placed on clinicians (Roe et al., 2018). They asked CMS to collect data on the scope of prior authorization practices, prepare a report describing CMS oversight of pre-authorization policies, and engage stakeholders to improve the prior authorization process for patients and clinicians.

Professional Licensure

Health care professionals in the various disciplines are required to be licensed and must meet certain standards to maintain their licenses. Licensing occurs at the state level, and the requirements vary from state to state. Clinicians practicing in multiple states and those using telehealth technologies have additional requirements (FSMB, 2019a). For example, telehealth and telepharmacy require appropriate licensure in all of the jurisdictions where a clinician's patients receive care, resulting in clinicians needing to meet yearly or every-other-year licensure requirements in multiple states. Although licensure requirements vary, common requirements include completing medical licensure applications and engaging in continuing medical education, including mandated programs in drug prescribing, child abuse, pain management, and other topics specified by state laws, and maintaining an active physician drug monitoring program profile (to detect overprescribing of controlled drugs). Recent efforts to streamline licensing have attempted to expedite medical licensure applications for multistate practice (FSMB, 2014; Interstate Medical Licensure Compact, 2019) and simplify physician licensure applications across multiple states with the use of a

Web-based uniform application (FSMB, 2019b). There are similar efforts in place to streamline the nursing licensure process (NCSBN, 2019). The National Association of Boards of Pharmacy adopted an online state license transfer process in 2018 (NABP, 2019). The requirements of each individual state must also be met.

State Licensing Board Questions on Mental Health Status

Applicants for state licensure in a variety of health professions typically are required to answer questions relating to their physical and mental health status, including any substance use disorders, in both initial and renewal applications. Such questions reflect a responsibility among state medical boards to ensure clinicians are not impaired and that they can meet their statutory duty to promote patient safety. Unfortunately, many medical and nursing license application questionnaires include overly intrusive personal health questions that can be a barrier to clinicians seeking treatment for treatable illnesses (Dyrbye et al., 2017; Halter et al., 2019).

While this issue affects a number of licensed health care professionals, state medical licensing board questions relating to the mental health status of physicians have received the most attention in the literature. In a 2016 review of initial and renewal medical license application forms from 48 medical licensure boards, 50 percent were found to have included overly broad questions about physicians' mental health that were inconsistent with the AMA, the American Psychiatric Association (APA), and the Federation of State Medical Boards (FSMB) policies and recommendations (Dyrbye et al., 2017). A 2017 analysis of state medical board applications for physicians seeking first-time licensure found that 84 percent asked about mental health conditions and 92 percent asked about substance use. Of the states that did ask about mental health, only 53 percent limited those questions to conditions that cause functional impairment, and 86 percent included questions about *past* mental health conditions (Gold et al., 2017). In nursing, Halter and colleagues (2019) report that 30 nurse licensing boards ask questions about mental illness on their applications, 22 of which ask questions that focus on specific diagnoses, examine historical data in the absence of current impairment, or require the applicant to predict future impairment (Halter et al., 2019).

There is also some evidence that these requirements discourage honest disclosure and also inhibit treatment seeking among physicians who are struggling with mental health issues. In a survey of 5,829 U.S. physicians, physicians who worked in a state that had overly broad questions on mental health were found to be 20 percent more likely to be reluctant to seek formal care for a mental health condition because of concerns about repercussions to their medical licensure (Dyrbye et al., 2017). A survey of female physicians (n = 2,106) found that only 6 percent of physicians with a mental health diagnosis or who had sought mental health treatment reported it to their state licensing board (Gold et al., 2016).

Some analyses have concluded that many state medical and nursing licensing board questions about past, rather than current, histories of mental illness and substance abuse are likely in violation of the Americans with Disabilities Act (ADA) of 1990 (Halter et al., 2019; Polfliet, 2008; Schroeder et al., 2009). Protection of the public from impaired professionals is a critical function of state licensing boards for medicine, dentistry, pharmacists, nursing, lawyers, and other regulated professions. This public safety function, however, is in tension with another important public policy objective of avoiding discrimination against persons with disabilities. These competing societal goals have come into conflict with respect to the content of application questions for certain professional licensing boards, and this has led to litigation in both the medical and the legal professions under Title II of the ADA. Title II provides that "no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity."[16] Title II of the ADA further requires state and local government agencies to operate programs so that they are "readily accessible to and usable by individuals with disabilities."[17]

Certain judicial rulings have held that licensing boards are subject to Title II of the ADA because they are empowered by state governments to provide benefits, services, and programs.[18] For example, in *Medical Society of New Jersey v. Jacobs et al.*,[19] the New Jersey State Board of Medical Examiners sought information about an applicant's status as a person with a disability instead of focusing on any behavioral manifestations of disabilities that might impair the individual's ability to practice medicine. The U.S. District Court for the District of New Jersey examined the licensing board's inquiry, "Have you ever suffered or been treated for any mental illness or psychiatric problem?" and concluded that questions regarding applicants' diagnosis of and treatment for psychiatric illness or condition are unnecessary, where the medical examiners could "formulate a set of effective questions that screen out applicants based only on their behavior and capabilities."[20] Since the *Jacobs* case, several federal district courts

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[16] 42 U.S.C. § 12132 (Title II) (1994).

[17] 42 U.S.C. § 12148(a)(1) (1994).

[18] See, e.g., *Theriault v. Flynn*, 162 F.3d 46 (1st Cir., 1998); *Burke v. State Bar of Cal.*, No. C 06-06950 WHA, 2007 WL 39397 (N.D. Cal., Jan. 4, 2007).

[19] See *Medical Society of New Jersey v. Jacobs et al.*, 1993 WL 413016 (D.N.J., 1993).

[20] Id. (section 7).

have ruled on mental health inquiries by state licensing boards.[21] Although many of these cases involved questions relating to state bar applications,[22] the common issue with medical licensure is the balance of an applicant's right to privacy with the protection of the public.

The FSMB and the APA have noted that a history of mental illness or substance use does not reliably predict a future risk to the public (APA, 1984, 2018; FSMB, 2018). In 2018, the FSMB issued 10 recommendations related to the state medical board licensing process that were intended to reduce the stigma associated with mental health issues and encourage treatment seeking (FSMB, 2018). Several recommendations address the necessity of including questions about the mental health of physicians on applications for medical licensure or renewal as well as addressing the appropriate phrasing of such questions, including focusing only on *current* impairment

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[21] See *Hason v. Medical Board of California et al.*, 279 F.3d 1167, 1168 (9th Cir. 2002) (Following denial of an application for medical license on the basis of mental illness, rather than on actual functional impairment, the physician filed a *pro se* complaint in federal district court alleging discrimination based on his disability in violation of his rights under the U.S. Constitution and Title II of the ADA, which was dismissed. The Ninth Circuit Court of Appeals ruled that the lower court erred in its interpretation of Title II of the ADA, noting that "[t]he act of licensing involves the Medical Board (*i.e.*, a 'public agency') providing a license (*i.e.*, 'providing a service') to an applicant for a medical license" and thus falls within the purview of the Act.).

[22] See, e.g., *Bartlett v. New York State Board of Bar Examiners*, 226 F.3d 69 (2d Cir. 2000) (The Board denied an applicant's request for testing accommodations, such as extended time and alternative ways to answer questions. The U.S. Court of Appeals for the Second Circuit concluded that if the applicant had a disability, then she was entitled to the requested accommodations because the Board was subject to Title II of the ADA. On remand, the U.S. District Court for the Southern District of New York found the Board's failure to accommodate the plaintiff's reading impairment was a substantial factor contributing to her failure to pass the bar and that she was entitled to reasonable accommodations when taking the bar exam.); *Clark v. Virginia Bd. of Bar Examiners*, 880 F. Supp. 430, 436-440 (E.D. Va. 1995) (the U.S. District Court for the Eastern District of Virginia found a question reading, "Have you, within the past five years, been treated or counseled for any mental, emotional or nervous disorders?" to be overly broad, unproven in its necessity, and potentially discriminatory; the *Clark* court determined that only questions concerning an applicant's conduct are permissible in assessing the applicant's current level of competence. Additionally, the *Clark* court held that even if open-ended questions are limited in time, there was no evidence of a correlation between past psychiatric treatment and current functional impairment. Although it invalidated the bar examiners' question, the *Clark* court indicated that the ADA would permit some form of mental health inquiry); *Ellen S. v. Florida Board of Bar Examiners*, 859 F. Supp. 1489, 1493-94 (S.D. Fla. 1994) (Applicant for admission to the bar sued the Florida Board of Bar Examiners claiming that application questions pertaining to an emotional disorder violated the Title II of the ADA, and the U.S. District Court for the Southern District of Florida held that a defendant need not have knowledge of the plaintiff's disability in order to violate Title II of the ADA and that questioning the applicant as to whether she had ever sought treatment for a nervous, mental, or emotional disorder or had been diagnosed as having such a condition violated the Act.).

when state medical boards decide to include these types of questions. The FSMB also encouraged state medical boards "to advance a positive cultural change that reduces the stigma among and about physicians seeking treatment for mental, behavioral, physical or other medical needs of their own" (FSMB, 2018, p. 2).

Similarly, in 2018, the AMA confirmed its stance that physicians should be able to seek the care they need for burnout, anxiety, depression, and substance-related disorders without fear of punitive treatment, discoverability in malpractice litigation, or licensure and career restrictions (AMA, 2018). Several states recently have adopted, or are actively considering, the recommendations of the FSMB and the AMA, including the state medical boards of Florida (Freeman, 2019), North Carolina (Ellis, 2016), Ohio (Ohio Academy of Family Physicians, 2016), and Washington (Fordham, 2018).

Board Certification

Certification boards have the goal of ensuring the competence of physicians and other clinicians completing postgraduate specialty training and throughout their careers (Baron, 2015). In medicine, board certification is a process whereby professional peers set standards for designation as "board-certified specialists" by 1 of the 24 boards of the American Board of Medical Specialties. Board certification requirements include completion of an accredited residency or fellowship program, maintaining a current and unqualified license to practice, and successfully passing a secure examination of knowledge specific to that specialty. Certification has evolved from an initial, one-time event to a program of ongoing education and assessment (recertification) to help physicians stay current with medical knowledge and skills. The Board of Pharmacy Specialties addresses similar issues in pharmacy.

Recertification programs, known as "maintenance of certification" (MOC) or, more recently, as "continuing certification" programs (Vision for the Future Commission, 2019), have been a source of dissatisfaction among physicians. Physicians have strong concerns over the burden, cost, and relevance of MOC programs (Cook et al., 2016; Del Carmen et al., 2019; Teirstein and Topol, 2015; Vision for the Future Commission, 2019). Meeting MOC requirements adds a substantial burden that is typically handled after work, contributing to stress and difficulties with work–life balance. A survey involving national cross-specialty random sample of licensed U.S. physicians found no association between attitudes toward MOC and burnout (Cook et al., 2016). In 2018 an independent commission (Vision for the Future Commission) was formed to address key issues related to continuing certification programs, and it recently issued its final report with conclusions and recommendations to enhance these programs (Vision for the Future Commission, 2019).

Professional Liability

Similar to medical licensure, obtaining professional liability insurance often requires completing forms that include questions inquiring about past and current mental health concerns, presenting yet another barrier to appropriate treatment seeking. Professional liability policies are a response to a litigious society. A 2004 study found widespread discontent among physicians practicing in high-liability environments (Mello et al., 2004). As discussed in Chapter 3, malpractice lawsuits are common (Mello et al., 2004) and are associated with increased stress (Jones et al., 1988) and risk of burnout as well as personal consequences for physicians (Balch and Shanafelt, 2011). The stressors involved in being named in a medical malpractice action may be heightened if the use of emerging technology is involved, particularly given the uncertainty of how current theories of legal liability will apply to claims involving new technology, such as an artificial intelligence (AI) diagnostic tool. Traditionally, medical malpractice is based on negligence, which is defined as any act or omission by a clinician during the treatment of a patient that deviates from the accepted norms of practice and causes injury to the patient. The standard of care in medical malpractice actions, usually a national or community-based standard relating to what is customary practice among physicians in the same specialty in similar settings, generally is established through expert witness testimony.[23] In contrast, if a medical device or piece of equipment is responsible for the patient's injury, then the principles of product liability apply, with its strict liability standard for manufacturing defects, design defects, and failure to warn of such defects.

As discussed in Chapter 7, the use of AI tools that are reliable and embedded smoothly in the workflow may help reduce the stress of practice, but they may also place new demands on clinicians. As the use of emerging

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[23] Jurisdictions differ as to the expected standard of care in a medical malpractice action. The national standard of care requires a doctor to use the degree of skill and care of a reasonably competent practitioner in his field under same or similar circumstances. The community-based or locality standard requires a physician to have the reasonable caliber of skill and knowledge that is generally possessed by surgeons and physicians in the locality where he or she practices. The respectable minority rule provides that where the physician did not follow the same course of therapy that other doctors would have followed, he can show that his course is accepted by a respectable minority of practitioners. Given the implementation of national standards for medical education and the universal availability of online guidance and evidence, there has been increasing support for a shift to a national standard of care. See Lewis et al. (2007).

technologies becomes more common, the standard of care in medical malpractice actions likely will change because certain technologies, such as an AI-based diagnostic tool, may supplant rather than support a clinician's professional judgment or function. In determining legal liability, it is presently unclear whether the use of new technologies in patient care that results in injury to a patient will be evaluated under the traditional negligence standard applied in medical malpractice claims or by the product liability doctrine (Bennett and Habte, 2018).

As the regulation of digital health technologies continues to evolve, the evolution may affect whether a negligence standard or product liability will apply in a medical malpractice claim. Moreover, establishing whether the clinician who employed the AI diagnostic tool or the health IT vendor or the developer is at fault in the event of harm to a patient and then determining the degrees of comparative negligence among the three will be complicated, given the myriad functionalities and the blurring of boundaries between the tasks that are performed by the clinician and the extent to which the AI diagnostic tool is substituting for a clinician's professional judgment or function. As AI algorithms improve and clinicians increasingly use this technology for diagnosis and decision making, the traditional malpractice standard of negligence may become more difficult to apply.

Not only do lawsuits add economic burden for organizations and clinicians, but the fear of malpractice can led to lower quality care (Forster et al., 2002). Medical malpractice reform is back on the federal policy agenda, but there is little available evidence that currently proposed medical liability reforms will be effective, with the possible exception of safe harbors and administrative compensation (Mello et al., 2017).

Societal Values and the Clinician–Patient Relationship

Over the past several decades, societal values and norms have been shifting away from the traditional paternalistic model of health care ("Doctor knows best") (Bhopal, 2015; Kilbride and Joffe, 2018) toward a more patient-centered model (Gusmano et al., 2019; Weil, 2019). Currently, this shift places value on a more therapeutic and balanced relationship between clinicians and patients, shared decision making (Montori, 2019; Montori et al., 2019), and a more collaborative care experience. Technology and the Internet are allowing wider access to information about health conditions, treatments, quality, safety, and costs, which benefits patients wanting greater participation in the health care they receive (Gusmano et al., 2019).

At the same time, some of these same societal changes seem to be contributing to the erosion of patients' trust in clinicians and the health care system (Blendon et al., 2014; Lee et al., 2019b; Levey, 2015; Lynch, 2018). Factors reported to be undermining public trust in clinicians and the health care system include the growth in the variety of information sources, perceptions that health care is a business like any other, health care advances and changes to patient care recommendations, quality problems and medical errors, and cost-containment strategies (Lynch, 2018). The 2018 American Board of Internal Medicine Foundation Forum on [Re]Building Trust elaborates the role of trust among and between various stakeholders, including patients, clinicians, health care delivery organizations, payers, and regulators (Lynch, 2018).

While several strategies exist to improve the trust between clinicians and patients (Lee et al., 2019b), the committee's review of the literature suggests that more needs to be known about the various system factors influencing the clinician–patient relationship, such as federal policies, market forces, new technologies, health information on the Internet, and organizational policies and practices. A systems approach to supporting and strengthening the clinician–patient relationship would focus on the design and implementation of policies, rules, and management actions that demonstrate a commitment to patient values and preferences and at the same time support and sustain the professional well-being of clinicians. As articulated in the committee's conceptual framework, this process relies on using feedback, learning, and improvement principles (see Figure 2-1).

The clinician information available on health care rating websites is but one example of an opportunity to balance what consumers value (accurate information to inform health care choices) and what clinicians value (an accurate assessment of the care they provide). As discussed in the beginning of the chapter, the structural organization of the health care industry is shifting, giving HCO administrators greater control over the practices, policies, and procedures governing many aspects of frontline care delivery, while relying on clinicians' professional ethics to go above and beyond requirements if patient well-being demands it (Ofri, 2019). There is concern that health care rating websites targeting patients are not accurately reflecting these structural changes in care delivery. That is, health care rating websites report information on aspects of care that are out of the direct control of clinicians (Burn et al., 2018; Lester et al., 2019), such as office staff friendliness, wait times, and ease of parking. In a study of community pharmacy ratings, for example, wait time was most frequently associated with a low rating, and friendliness and helpfulness of staff was most frequently associated with a high rating (Lester et al., 2019). If clinician assessments include factors attributable to the HCO and not to the individual clinician or direct patient encounter, patients may not be getting an accurate view of the patient experiences with the individual clinicians, in which case the information is not useful. Because these assessments can have adverse effects on a clinician's professional reputation, patient recruitment, and revenue, they are an important source of clinician stress. These implications for patients and clinicians suggest that taking a systems look at how clinician assessment approaches may be influencing the clinician–patient interactions in various ways is warranted.

KEY FINDINGS

An array of factors within the external health care environment perpetuate the complex landscape of legal, regulatory, standards requirements, and expectations that influence the everyday work of clinicians. While there is little published research that examines how compliance with these requirements directly affects clinicians, it is reasonable to conclude that the combination of the additional clinical workload, the disruptions to workflow, and the time and stress associated with fulfilling the requirements described in this chapter diverts clinician attention away from providing patient care and may contribute to clinician burnout. A better balance between important HCO and societal goals and maintaining clinician well-being is needed.

A number of stakeholders have called for reforming these evolving regulations and (at times) redundant and conflicting requirements and expectations. While some efforts to simplify federal regulations have been initiated, it is too early to know if these changes will reduce the burden on clinicians in a meaningful way. What is clear is that further coordinated efforts from a variety of stakeholders are needed to address the issue and to help optimize clinician professional well-being and prevent and mitigate burnout.

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7

Health Information Technology

> “[T]he sharp lines that appointment times, insurance, and electronic record keeping requirements drew around the experiences I had with patients became a clear source of frustration, burnout, and missed opportunities for deeper connections with patients that would support healing and wellness.”
>
> (Dear Medicine, Diana Farid)[1]

Broadly defined, technology is the application of scientific knowledge for a practical purpose. From the germ theory to gene therapy, science continues to transform health care, and the technological revolution in computing and engineering over the past quarter century has only accelerated this change. Increasingly rapid improvements in data storage and computing, genetic sequencing, smartphone performance, and Internet backbone bandwidth over the past 15 years are evidence of the rapid pace of change. Although the deployment of technology in medicine has brought notable improvements in quality of care and efficiency, the rapid change can also be associated with risks and negative consequences for clinicians and patients. As the committee described in Chapter 4, poorly designed and deployed

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[1] Excerpted from the National Academy of Medicine’s Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Diana Farid, visit https://nam.edu/expressclinicianwellbeing/#/artwork/132 (accessed January 30, 2019).

technology is a contributory factor in its systems model of clinician burnout and professional well-being. In this chapter the committee examines in more detail how health information technology (IT) in clinical practice may affect clinician burnout. It further describes how the actors across the three levels of the committee's systems model of clinician burnout and professional well-being (see Figure 2-1 in Chapter 2)—frontline care delivery, health care organizations (HCOs), and the external environment—share responsibility in finding and implementing solutions. Finally, the chapter briefly discusses future health IT opportunities and emerging innovations.

Technology used in the clinical environment can be classified into three broad categories based on its primary physical embodiment: pharmacologic (drugs and fluids), mechanical (e.g., medical devices, new surgical tools, robotics), and digital (e.g., health IT). Although all types of technologies affect the clinical work environment and the experiences of clinicians and patients, much of the current literature on technology in the context of clinician burnout—and thus this chapter as well—focuses on health IT and, more specifically, the electronic health record (EHR).

Health IT is ubiquitous in modern U.S. health care and is part of every level of the committee's systems model of clinician burnout and professional well-being (see Figure 2-1 in Chapter 2):

- The frontline care delivery team uses health IT throughout the care delivery process—for diagnostic coding and billing purposes and to communicate with patients and caregivers outside of the clinical setting—and it sends patients home with technology for their own use (e.g., test strips, devices, software applications);
- HCOs must make decisions about what health IT to adopt, implement, and manage within their organization; and
- The external environment designs, develops, regulates, and at times mandates the use of health IT throughout the health care system.

Well-designed health IT will support the delivery and management of care. By supporting the individuals involved in the care delivery process—both the care delivery team and patients and caregivers—technological innovations can make the process of providing and receiving care more efficient and reliable. But poorly designed health IT, while well intentioned, may introduce frustrating processes into the care delivery experience and make the experience more difficult and error prone. For example, compared to handwritten paper health records, a well-designed EHR allows clinicians to review a patient's medical history, make orders, and document treatment plans and diagnoses more quickly and accurately. However, a poorly designed EHR may necessitate unnecessary work or require clinicians to enter redundant information. This will frustrate clinicians (who must spend extra time with the EHR) and patients (whose providers are preoccupied managing the EHR during their encounters). In addition, over-burdensome documentation requirements may make an otherwise well-designed EHR frustrating to use simply because the time needed to complete what is required is overbearing (Ommaya et al., 2018). Physicians have reported that well-functioning EHRs can improve professional satisfaction by fostering better communication between clinicians and patients (via patient portals), by facilitating better access to patient data, and by facilitating the delivery of quality care (Friedberg, 2013).

Well-designed health IT should be easy to use and help a clinician do his or her job more effectively, efficiently, and safely. Patient-centered technology, such as patient portals that allow patients to communicate with their clinicians via secure messaging, can improve both patients' and clinicians' experiences by facilitating efficient communication outside of the office setting and giving patients easier access to their medical information (Friedberg, 2013; Hoonakker et al., 2017). While the 2012 Institute of Medicine (IOM) report *Health IT and Patient Safety: Building Safer Systems for Better Care* described key attributes of *safe* health IT, these attributes also more broadly apply to effective, efficient, and usable health IT:

- Easy retrieval of accurate, timely, and reliable native and imported data;
- Simple and intuitive data presentation;
- Easy navigation;
- Provides evidence at the point of care to aid decision making;
- Enhances workflow, automates mundane tasks, and streamlines work, without increasing physical or cognitive workload;
- Easy transfer of information to and from other organizations and clinicians; and
- No unanticipated downtime.

Health IT lacking these attributes will frustrate users, lead to workarounds, and may contribute to medical errors (NASEM, 2015) and clinician burnout (see Chapter 4). In contrast, a well-designed system that includes these attributes will be one that clinicians want to use.

ELECTRONIC HEALTH RECORDS

Health IT—including, but not limited to, EHRs—that is well-designed to meet clinicians' and patients' needs and that is integrated seamlessly into care processes will improve both clinicians' and patients' experiences with health care delivery and the quality of that care (IOM, 2012). Health IT enhances the ability of clinicians and patients to collect and retrieve patients' health-related information. It can also facilitate access to the world's medical knowledge base at the point of care. Additionally, via the EHR, it has the potential to improve decision making, increase patient safety, and reduce medical errors through computerized provider order entry, electronic prescribing, and decision support systems (including alerts and reminders). Ideally, the EHRs would share a common electronic vocabulary that would facilitate the continuity and coordination of care by providing access to different providers in different locations and contributing to a single version of a patient's medical record (Blumenthal, 2011).

In a complex health care delivery system, the EHR has many different users and stakeholders. The EHR is not only the primary tool for documenting clinical information, it also serves as the documentation source for regulatory compliance, revenue cycle management and billing, and materials management. Even within the clinical team, documentation tasks in the digital environment change with each software installation, with physicians, nurses, pharmacists, dentists, therapists, unit secretaries, and others shifting documentation tasks among themselves with system updates. In many complex medical systems, the clinical team is just one stakeholder with limited authority when decisions concerning the deployment of technology are made. In most health systems the ultimate responsibility for capital spending—including health IT—rests with the financial and administrative team. When systems are used by all, those leaders most often make the judgment call if trade-offs among user interests are required.

While overall satisfaction with the EHRs remains low (Shanafelt et al., 2016), most clinicians see their value and potential and do not want to go back to paper documentation (Blumenthal, 2018). However, for a variety of reasons, the EHRs are not as usable or well aligned with clinical workflow as most clinicians would desire and are associated with clinician burnout and decreased professional satisfaction (Ehrenfeld and Wanderer, 2018; Gardner et al., 2018). In addition to the EHR's usability issues, over-burdensome administrative and clerical requirements may make an otherwise well-designed EHR frustrating to use simply because of the time required to fulfill the requirements (Jamoom et al., 2013).

While this section delves into the usability, interoperability, and clinical burden of the EHRs, it is important to emphasize that, despite its problems, clinicians recognize the current and future benefits of health IT and the EHRs. Physicians have reported that well-functioning EHRs can improve professional satisfaction by fostering better communication between clinicians and patients (via patient portals, as discussed below), by facilitating better access to patient data, and by facilitating the delivery of quality care (Friedberg, 2013). Physicians also are hopeful that technology can solve many of the problems they currently face (Friedberg, 2013; Tcheng et al., 2017) (see the section on future opportunities later in this chapter).

However, understanding how EHR-associated activities contribute to burnout is a prerequisite for developing solutions.

EHR Adoption

Rapid EHR adoption in the United States was spurred by the Health Information Technology for Economic and Clinical Health (HITECH) Act, part of the American Recovery and Reinvestment Act of 2009[2] (Adler-Milstein and Jha, 2017). As of 2017, almost all hospitals and nearly 80 percent of private practices were using certified EHRs (Washington et al., 2017). The speed at which U.S. Congress allocated HITECH Act funds led some organizations to quickly expand existing proprietary EHRs, while others purchased and deployed commercially available systems with less than customary deliberation and preparation. Commercial vendors focused on meeting the rapid new demand with associated requirements, implementing functionality without due regard for usability (Washington et al., 2017). In addition, the speed of action required in this political environment did not allow for fostering the framework needed to achieve interoperability (Sittig et al., 2018).

Though there were many improvements expected with EHR adoption—including better quality, less errors, lower costs—clear challenges exist, and the full promise has not been achieved (Ommaya et al., 2018). Installation of new systems is often difficult, and there has often been a steep learning curve associated with the introduction of digital health records. Lin and colleagues (2018) examined associations between the adoption of health IT and Medicare patient mortality using Medicare data from 3,249 U.S. hospitals linked to the American Hospital Association's annual hospital survey data on health IT capabilities. Overall, they found that in the first year after a hospital's implementation of basic EHR functionality (operationalized as the number of discrete features such as patient demographics, clinical notes, and test results), mortality actually increased. However, over time and with the adoption of increased EHR functionality (i.e., the addition of more features), mortality then progressively decreased, suggesting that a maturation period is needed before the benefits to mortality are realized. The greatest adverse effects on patient outcomes in the initial implementation appeared to occur in smaller and less-resourced (e.g., critical access) hospitals; however, these same hospitals saw greater improvements over time thereafter. Prior studies on patient outcomes after initial EHR implementation have had variable results (Brenner et al., 2016; Han et al., 2005; Longhurst et al., 2010). Nevertheless, this and other literature supports the claim that deliberate national and organizational investments in iterative improvements in health

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[2] Public Law 111-5.

IT using a human-centered systems approach can reasonably be expected to pay off in terms of both better patient and clinician outcomes.

Regardless of the causes, the EHRs have become a major source of dissatisfaction (Friedberg, 2013; Harris et al., 2018) as well as of burnout among physicians (Ehrenfeld and Wanderer, 2018; Gardner et al., 2018), advance practice nurses (Harris et al., 2018), nurse informaticians (Topaz et al., 2017), and residents (Robertson et al., 2017). Although there is limited evidence that older physicians are less satisfied with the EHRs than their younger counterparts, satisfaction with the EHRs is low across all age groups (Shanafelt et al., 2016). As was mentioned in Chapter 4, numerous studies have reported that greater use of the EHR is associated with more clinician burnout (Babbott et al., 2014; Robertson et al., 2017; Shanafelt et al., 2016). The EHR factors most commonly identified as being associated with clinical burnout relate to problems with usability (computerized provider order entry) (Shanafelt et al., 2016) and message basket alerts (Gregory et al., 2017), interoperability, and the increased administrative and clerical burdens on clinicians to meet the documentation, regulatory, and quality reporting requirements (Ehrenfeld and Wanderer, 2018). Training in EHR functionality may lead to some gains in sense of usability/control and satisfaction with EHR use (DiAngi et al., 2019; Longhurst et al., 2019), but training alone may not yield improved work efficiency as documented by time spent on the EHR after work hours (DiAngi et al., 2019). This may be, in part, due to usability issues of the user interfaces (Weinger et al., 2011), as discussed in the next section.

Clinical Usability of Current EHRs

The EHRs with well-designed features that are deployed with an attention to clinical workflow can improve care effectiveness and safety. Physicians report that the EHRs can facilitate better communication with their patients and improve some aspects of care quality (Friedberg, 2013), and there is evidence that EHR use is associated with improvements to clinical note quality (compared with paper records) (Burke et al., 2015). But the picture is complex. For example, well-designed and implemented computerized provider order entry (CPOE) can reduce medication errors (Kim et al., 2006; Radley et al., 2013). However, patient outcomes may not improve significantly (Del Beccaro et al., 2006) or may even get worse (Han et al., 2005) immediately after CPOE implementation, perhaps because CPOE implementation is associated with numerous changes in workflow, clinician communication, and unanticipated consequences (Ash et al., 2009). Clinicians, informaticians, and human factors experts have blamed vendors for poor usability and unmitigated safety risks (Ratwani et al., 2016, 2018c,d).

Many studies describe EHR usability problems, particularly during a clinical encounter (Ellsworth et al., 2017; Khairat et al., 2018; Ratwani et al., 2018c,d; Roman et al., 2017), and EHR usability problems may be contributing to patient harm (Howe et al., 2018). Cluttered visual displays, for example, or settings with incorrect defaults may make it easier to order the wrong medication or a medication at an incorrect dose (Moacdieh and Sarter, 2015; Ratwani et al., 2018a). Some studies suggest there may be a higher incidence of inaccurate clinical findings documented in the EHR than in paper records (Chan et al., 2013; Yadav et al., 2017), likely due to the inherent challenges of electronic structured data entry or user interface design issues. While the EHR's underlying structural design and user interface design decisions play an important role because most commercial EHRs are highly configurable, many usability problems are the result of configuration decisions made at the HCO level (Zhang et al., 2014). There is some evidence that usability improvements to the EHR are associated with better cognitive workload and performance among physicians (Mazur et al., 2019) as well as with prescriber satisfaction and efficiency (Russ et al., 2014). However, there are still too few published, scientifically valid, and reproducible usability evaluations at various stages of EHR system development (Ellsworth et al., 2017).

The standardized menus for billing, reporting, and regulatory purposes may also adversely affect usability. Those menus may not accurately reflect the uniqueness of a particular clinical situation. This in turn forces clinicians to make unnecessary clicks and use a "best fit" approach to move through the EHR and complete their clinical work, which is one factor contributing to clinician dissatisfaction (Friedberg, 2013). Workflow changes in an EHR implementation may also result in a shift in clinical documentation duties, such as additional requirements for physicians to order medications or nurses to request durable medical equipment. In the past, others closer to the clinical operation, such as pharmacy or materials management staff, may have handled these tasks.

In part because of EHR workflow and usability deficits, many physicians spend as much time working in the EHR fulfilling routine clerical, reimbursement, and regulatory documentation requirements as they do with their patients (Sinsky et al., 2016; Tai-Seale et al., 2017). Similarly, a systematic review of studies on nurses' experiences with EHR adoption found that nurses commonly resorted to workarounds to adapt to changing workflows to meet documentation needs. Nurses also reported difficulty accessing the information they needed to make patient care decisions (Gephart et al., 2015). A more recent study found that usability among nurses continues to be a significant challenge that has implications for patient care. The authors suggest that nurses are essential collaborators as the EHRs and other health IT continues to evolve (Staggers et al., 2018).

Asynchronous alerts, or inbox notifications within the EHR, communicate time-sensitive information to a clinician regarding patient test results, medication refill requests, or messages from other clinicians. Generally these alerts (or messages) do not interrupt the work of a clinician but rather appear in an inbox that the clinician must check (although local configuration determines the exact way the alerts behave in the EHR). The alerts, however, often go unchecked (Cutrona et al., 2017; Gregory et al., 2017). In fact, one study showed that the more alerts there were in a primary care physician's inbox, the less likely the physician was to open a newly received alert, suggesting that the burden of the alerts has a compounding effect (Cutrona et al., 2017).

While there is some evidence that EHR use is associated with improvements in clinical note quality (compared with paper records) (Burke et al., 2015), time demands, navigation, and the quality of the information in the EHR are still sources of frustration among many clinicians (Roman et al., 2017). Copying and pasting information is a common practice when using an EHR and may lead to the erroneous migration of excessive information without the appropriate context and create bloated notes that include redundant or clinically irrelevant information. This makes it difficult and time consuming to locate the clinically important information, contributes to navigation problems, and can contribute to patient safety issues (Tsou et al., 2017).

There are many changes in the team dynamic that result from the introduction of the EHRs. One that must be taken into account is a decrease in face-to-face interaction between doctors and nurses resulting from the placement and retrieval of digital orders. When this face-to-face interaction is no longer part of the performance of clinical tasks, it becomes necessary to foster team relationships in other ways. In team care settings, EHR use is associated with improved access to information within a well-functioning team (Graetz et al., 2014), but there can be usability issues associated with the EHRs specific to team-based care (Ommaya et al., 2018). For example, in some cases the entire team (including nurses and non-clinicians) lacks full access to the EHR when such access would help them perform simple tasks involved in clinical care maintenance or the management of care (Smith et al., 2018). It is difficult for clinicians to navigate through notes from many team members (nurses and other non-physician providers), and many of the EHRs do not have integrated messaging, which further impedes efficient teamwork (Gross et al., 2016). Furthermore, as implemented, EHR systems may allow only one team member at a time to enter information in a patient's chart, which can result in frustrating delays and workflow interruptions.

Interoperability

Delivery system reform, as defined by the Patient Protection and Affordable Care Act of 2010, requires three actions: changing the way that providers are paid, changing how care is delivered, and providing a technical infrastructure to guide decision making (Burwell, 2015). A learning health system requires the free flow of information among providers, researchers, and citizens (AHRQ, 2019). The promise of health IT and the HITECH Act in part depend on free information flow, which does not occur in the current health care ecosystem. Providers are increasingly frustrated that the digital transition in health care has not translated into having the information necessary for patient care when and where patients need.

The 21st Century Cures Act of 2016 (Cures Act) defines an interoperable health IT system as one that

> (a) enables the secure exchange of electronic health information with, and use of electronic health information from, other health information technology without special effort on the part of the user; (b) allows for complete access, exchange, and use of all electronically accessible health information for authorized use under applicable State or Federal law; and (c) does not constitute information blocking.[3]

While the Cures Act encourages interoperability and prohibits any sort of blocking of information that may interfere with the exchange of health information (Lye et al., 2018), most current EHRs and other IT systems do not meet this interoperability standard (Pronovost et al., 2018).

There are many reasons for inadequate interoperability despite the federal legislative intent (Blumenthal, 2009), and they include the proprietary policies of EHR vendors and HCOs and ineffective incentives (Ratwani et al., 2018a). Data blocking and the lack of interoperability negatively affect patient care. Even within a single health system, information is often siloed in different health IT systems. For example, one specialty within a system may use an EHR that is different from and not interoperable with the EHR that the rest of the system is using (Friedberg, 2013). This can increase administrative and clerical efforts to ensure that all test results, scheduling updates, orders, and clinical notes are accurate and consistent across the different systems (Friedberg, 2013). Similarly, different health systems' EHRs, even when from the same vendor, are often incompatible due to the lack of nationally standardized data and metadata and to independent health care organizational choice. For patients who receive care from several systems or who move from one system to another, transferring medical information

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[3] Public Law 114-255.

may require manual input, a time-consuming process that is prone to human error (Smith et al., 2018). Thus, the lack of interoperability compounds the administrative burden placed on clinical staff (Alyousef et al., 2017; Carayon et al., 2019), which erodes efficiency and contributes to fatigue (Cantwell and McDermott, 2016) and dissatisfaction (Friedberg, 2013).

The Office of the National Coordinator for Health Information Technology (ONC) continues to work with stakeholders and federal agencies to improve interoperability by implementing Section 4003 of the Cures Act. For example, ONC released Draft 2 of the Trusted Exchange Framework and Common Agreement (TEFCA) on April 19, 2019, which outlines a common set of principles, terms, and conditions to facilitate interoperability and information exchange across disparate health information exchange platforms and help enable the nationwide exchange of electronic health information (ONC, 2019b). When fully implemented, TEFCA should help different health systems using different health IT platforms access patient information seamlessly across systems (Rucker, 2018). ONC and the Centers for Medicare & Medicaid Services (CMS) have also proposed new interoperability rules that, combined with TEFCA, would bring the Cures Act definition of interoperability closer to reality (Blumenthal et al., 2019) (see an expanded definition of the proposed rules in the section below on shared responsibility for improving health IT).

Administrative Burden and the Clinician–Patient Experience

The provider relationship with health IT remains complicated. For example, providers have reported that finding data and e-prescribing were more efficient with EHRs, while information sharing and the documentation process have remained as significant problems with the EHRs over the intervening decade. In particular, the prolonged time spent working in the EHR during patient visits can adversely affect the clinician–patient relationship and patient satisfaction (Crampton et al., 2016; Ratanawongsa et al., 2016). Physicians perceive EHR use as negatively altering patient interactions (Pelland et al., 2017), and it can interfere with the gathering of psychosocial and emotional information, thereby impeding the development of therapeutic relationships with patients (Rathert et al., 2017). Patient interaction is a critical aspect of clinicians' work; therefore, these perceptions may adversely affect clinician satisfaction.

The usability and interoperability problems with the EHR, combined with the demands of documentation and reporting requirements, create an administrative and clerical burden for clinicians that allows less time for patient care or non-work-related activities (Kroth et al., 2018; Rao et al., 2017). According to one study, primary care physicians spend more than half of their work hours interacting with the EHRs (Arndt et al., 2017).

This study also found that during clinical visits, primary care physicians spent 44 percent of their time "computer facing" and only 24 percent on direct patient communication (Arndt et al., 2017). Another observational study (Sinsky et al., 2016) found that ambulatory physicians (n = 57) in four specialties spent 37 percent of their time in the exam room on EHR and desk work versus 53 percent on direct patient interaction. In the inpatient setting, several time studies have found that medical interns spend at least 40 percent of all inpatient work time interacting with the EHR and that these increased documentation demands are associated with erosions (12 to 13 percent) in the amount of time spent directly interacting with patients (Chaiyachati et al., 2019; Fletcher et al., 2012). For every hour spent with a patient, physicians spend an additional 1 to 2 hours on the EHR at work, with additional time spent on the EHR at home after work hours (Sinsky et al., 2016; Tai-Seale et al., 2017). Similarly, nurses also may spend up to 50 percent of their time documenting in the EHR (Kelley et al., 2011). Especially in the first year post-implementation, clinicians spend more time interacting with current EHR systems than they had spent documenting in paper health records (Baumann et al., 2018; Carayon et al., 2015; Joukes et al., 2018), although this is likely dependent on many factors, including EHR design and local configuration.

The increased documentation time associated with EHR use has been linked with clinician burnout (Gardner et al., 2018; Robertson et al., 2017). The time spent on EHRs in isolation can lead to burnout (Domaney et al., 2018). Furthermore, having insufficient time to complete documentation is also a predictor of burnout (Harris et al., 2018). In the 2019 survey study by Gardner and colleagues (2018), reports by physicians of having insufficient time for documentation were associated with an almost three-fold increased odds of reporting burnout, while reports of spending an excessive amount of time documenting at home were associated with almost double the odds of burnout.

These requirements on top of poor interaction design have increased the likelihood of lengthy and often less usable clinical notes. In a recent brief report concerning the use of a particular commercial EHR system, Downing and colleagues (2018) offered data showing that physicians' clinical notes in the United States were, on average, nearly four times longer than those of clinicians in other developed countries—even though they were using the same EHR system. The authors suggest that the reason for the difference is that physicians in other countries are not required to fulfill many of the reimbursement and other documentation regulations that are applicable in the United States.

Another burden that clinicians and practices face is the time spent on the reporting of quality metrics for HCOs, payors, and regulators. Although providers embrace the role of measurement in improvement, legislators, regulators, and payors often do not agree on how or what to measure. Even within the same institution, there are many needs for quality data and measurement that are duplicative and too often burdensome. According to one study, practices spend more than 15 hours per week *per physician* on quality reporting (Casalino et al., 2016). Despite this, many EHRs do not include the functionality needed to fully report mandated quality measures (Cohen et al., 2018). Generating tailored electronic reports of clinical quality measures is challenging—measure specifications are often not customizable, and making the needed changes to provide useful quality reports would be too costly and time consuming for individual practices. There is also a lack of integration of other mandated administrative tasks into the EHR, such as for a prescription drug monitoring program (PDMP) and pre-authorization, which requires duplicative data entry and slows workflow (for an expanded discussion of PDMPs, see Chapter 6). These programs grew out of an urgent societal need to address the opioid epidemic and a clinical need for gathering all available Schedule 2 drug data at the time of prescribing. However, the way that the data from these initiatives are presented to the prescriber in his or her workflow is obtrusive and has led to unanticipated burdens (AHA et al., 2018).

Similarly, legitimate concerns for organizational cybersecurity and patient privacy (Fernandez-Aleman et al., 2013) have led to policies and procedures that have had unanticipated and undesirable consequences for clinicians. Federal legislation such as HIPAA sets national policies for patient security. The Office for Civil Rights and ONC have sought to clarify the policy in this space because organizations commonly over-interpret the risk of operating in this environment (HHS, 2019). However, each care delivery institution makes an interpretation of the risk of information and develops a customized internal policy. In isolation, federal policies may be manageable in terms of their impacts on workflow. However, combined with policies required by cybersecurity insurers and intuitional policies driven by local risk management, well-meaning efforts can become a heavy weight borne by clinicians at the point of care. For example, the need to log out after each use, even in clinical areas not accessible to the public, can add appreciable computer time to a busy clinicians' day (Berg, 2018). This burden is compounded by multiple logins and other screens, especially when multiple non-communicating systems must be accessed concurrently during patient care delivery. Although other solutions for managing the threat of an unauthorized login such as by using a radio frequency identification (RFID) device carried by the provider or biometric login capabilities are available, these are not widely deployed.

Early design decisions by major EHR vendors may have contributed to sub-optimal user experience and increased clinician documentation burden. For example, for many current EHR systems, a very early design conceptualization was that the electronic systems should simply be a paper record replacement rather than a re-envisioning of care delivery, which could have taken greater advantage of the full benefits of electronic data management (see the section below on future opportunities). Additionally, there remains a general unwillingness to standardize clinical and operational practices, not just at a national level, but within organizations and even single clinics.

THE ROLE OF HEALTH INFORMATION TECHNOLOGY IN FOSTERING PATIENT-CENTERED CARE

There is an increasing emphasis on delivering more patient-centered care, which includes a better incorporation of patients' diverse beliefs and goals, more effective clinician–patient communication, shared decision making, greater patient engagement, and health promotion (Constand et al., 2014). In addition to improving patient satisfaction with their care experiences, there is growing evidence that patient-centered care also improves outcomes (McMillan et al., 2013). Health IT appears to be a useful tool for fostering more patient-centered care by enhancing patients' access to their own health care information, democratizing medical knowledge, and facilitating clinician–patient communication (Finkelstein et al., 2012). In this section, the committee discusses health IT used to foster patient center care and its impact on clinician workload and well-being.

A key development in facilitating more patient-centered care has been the development of patient portals, which are encouraged by the Medicare EHR Incentive Program (referred to as Meaningful Use—now a part of the Medicare Access and CHIP [Children's Health Insurance Program] Reauthorization Act of 2015 or MACRA). Patient portals allow patients easier access to their health information, including laboratory results, clinical summaries, and health histories as well as to clinical appointments and billing information. They also provide a more secure platform than email over which send and receive messages with health care providers. ONC data from 2017 show that more than half of patients now have access to patient portals and more than half of these have accessed their records, marking an upward trend in their use (Patel and Johnson, 2018). Of those who accessed a patient portal, almost half also used it to message their provider. While patient portals and electronic clinician–patient communication have become a regular part of many health care delivery services, and current trends suggest increasing use, it is unclear exactly how this relatively new technology is related to the professional well-being and burnout of clinicians. A 2013 review found inadequate evidence linking patient portals to improved patient outcomes, although there were some examples of improved outcomes for patients with chronic diseases (Goldzweig et al., 2013).

In theory, electronic clinician–patient communication facilitates more efficient and potentially lower-cost communication that otherwise would have to occur on the phone or face to face (Antoun, 2016). Physicians who used secure e-mail communication regularly in their practice reported that it improved the quality of care that they provided and increased patient satisfaction; however, they also expressed concerns about volume and having adequate time to respond to messages in a timely manner (Johnson et al., 2014). Generally, patients are more willing to communicate via e-mail or secure messaging than physicians. A 2010 review found that while many physicians were satisfied with e-mail communication, others cited excessive workload and a lack of reimbursement as reasons why they are reluctant to use Web-based communication with their patients (Ye et al., 2010). Paradoxically, one study found that the use of electronic communication can increase the number of patient phone calls and overall workload (Dexter et al., 2016). This and other work (Antoun, 2016) suggest that some physicians view e-mail communication as an additional, unpaid responsibility. A 2017 article examining secure patient messaging in five primary care clinics found that, depending on volume and implementation (e.g., team-based approach for managing messages), secure messaging can either improve workflow and efficiency in a practice or be a hindrance if the workload is too much to manage and the work process for dealing with secure messages is not well organized. Furthermore, if the communication platform has poor usability, it can negatively affect workflow (Hoonakker et al., 2017).

Given the accelerating consumer and non-medical business adoption of instant messaging and social media, the use of these platforms is likely to spread in health care. Increasingly, disease management and health improvement interventions are using mobile text messaging and app-based reminders to facilitate patient engagement and treatment adherence (Castensoe-Seidenfaden et al., 2018; Zhang and Jemmott, 2019). Thus, more research is needed to determine whether the benefits of these new technologies outweigh their potential negative effects on clinician workload and burnout.

SHARED RESPONSIBILITY FOR IMPROVING HEALTH INFORMATION TECHNOLOGY

To advance health IT and improve its usability and interoperability and to reduce its administrative burden, it will be critical that participants at all three levels of the systems model—actors in the external environment (including health IT vendors, payors, regulators, and national societies), HCOs, and frontline care delivery—work together to find solutions.

As a federal regulator of health IT, ONC is responsible for setting the national certification standards of EHRs. Existing ONC standards focus on objective metrics—operational capabilities, digital quality metrics, privacy and security (Jha et al., 2019)—and to this point usability and the ease of information sharing have not been criteria for certification. In 2019 ONC issued for public comment a draft on reducing the regulatory and administrative burden related to the EHR and health IT (ONC, 2018). The goal in part is to provide an environment that allows for increased attention to usability and innovation. The draft acknowledges many of the problems associated with health IT use as delineated in this chapter and includes three goals to reduce clinician burden:

1. Reduce the time and effort clinicians spend recording record health information;
2. Reduce the time and effort clinicians and HCOs spend to meet regulatory reporting requirements; and
3. Improve the functionality and usability of the EHRs.

Others have encouraged innovation aimed at improving the health IT user experience. In a letter to the National Coordinator (Hale, 2018), the American College of Physicians suggested that ONC develop criteria for vendors to report on the functionality of the EHRs in fully deployed, real-world settings. In a related development, human factors and ergonomics professionals and other stakeholders have advocated that ONC include human-centered design criteria as part of its certification process (similar to what is expected by the U.S. Food and Drug Administration [FDA] of medical devices) and to establish a transparent, federal rating system for EHR usability (DiAngi et al., 2016; Hale, 2018; Ratwani et al., 2017). Ratwani and colleagues (2017, 2018a,b,d, 2019) have put forth a general blueprint, which is supported by many informed human factors and ergonomics professionals, informaticians, and clinicians, for addressing EHR usability and safety:

1. Enhance ONC's certification process by invigorating user-centered design requirements that include process evidence, the conducting of usability tests using representative deployed systems, the use of usability test participants who represent clinical end users, the use of rigorous test cases that assess usability and safety, and making the results fully publicly available;
2. Eliminate obstacles to research on and the free flow of information about EHR usability and safety, including the reporting of vendor-specific events and problems by end users, researchers, and organizations;
3. Create a national database of usability and safety issues;
4. Establish basic interface design standards for all of the EHRs, with a particular emphasis on designs that mitigate unintended patient harm;

5. Simplify mandated documentation requirements that affect usability; and
6. Develop standard measures of the usability and safety of deployed systems.

Information sharing remains a key component of achieving the promise of health IT deployment in the clinical environment. As one example, Horvath and colleagues (2018) recommend that ONC, vendors, HCOs, and clinicians collaborate to set and implement interoperability standards for the EHRs. The bipartisan Cures Act calls for an end to information blocking and for collaboration among vendors, health care providers, and others in the health ecosystem in the sharing of information. For the first time, the act calls for definitive action against bad actors in the system, with significant fines to be levied by the Office of Inspector General against those that block information flow. In addition, ONC is taking steps to develop TEFCA to facilitate data sharing across different information-exchange platforms. The effort, called for in the Cures Act, will establish principles, terms, and conditions to facilitate interoperability and information exchange across platforms. When fully implemented, this framework should allow different health systems using different health IT platforms to access patient information seamlessly across systems (Rucker, 2018). As discussed earlier in the chapter, ONC released Draft 2 of TEFCA on April 19, 2019 (ONC, 2019b). The draft outlines a common set of principles, terms, and conditions for facilitating interoperability and information exchange across disparate health information exchange platforms to help enable the nationwide exchange of electronic health information. Related to this, in 2019 CMS and ONC proposed rules to improve interoperability and increase innovation and competition by giving patients and providers secure access to electronic health information at no cost (CMS, 2019; ONC, 2019a). The rules also call on industry to adopt standardized application programming interfaces (APIs), which would allow patients and providers to access information via smartphone applications. According to CMS, the proposed rules should reduce the burdens and duplicative testing associated with data blocking. In June 2019, ONC's six former national coordinators for health IT endorsed the proposed rules (Blumenthal et al., 2019).

To simplify guidance on federal regulations and reduce variability in the interpretation and burden associated with fulfillment, the U.S. Department of Health and Human Services (HHS) has begun the process of simplifying documentation requirements (CMS, 2018) and has updated evaluation and management documentation guidelines (HHS, 2018). This is a promising development, although how clinicians and HCOs receive it will depend significantly on whether clinicians will continue to receive the same reimbursement for the same actual work (for more discussion on this topic, see Chapter 6).

Reducing the documentation burden for payments, quality measurements, and compliance could directly address some of the antecedent factors in EHR use that are linked to clinician burnout. A 2015 position paper from the EHR-2020 Task Force of the American Medical Informatics Association suggests that federal agencies should more fully quantify the burden of requirements before they implement them. They recommended federal support of research into the unit-time cost of documentation requirements and how they differ across different collection mechanisms, such as typing, dropdown selections, voice recognition, natural language processing, and handwriting recognition (Payne et al., 2015). Currently, federal regulations are reviewed for their financial impact, per the Office of Management and Budget rules (Carey, 2016) and the Paperwork Reduction Act of 1995,[4] and a consideration of the administrative burden is required during the rulemaking process; however, an opportunity exists to more fully limit the impact of regulation.

The 2012 IOM report *Health IT and Patient Safety: Building Safer Systems for Better Care* (IOM, 2012) highlighted the need for shared responsibility among all of the stakeholders involved in health IT; however, many of the problems identified by that report still exist today. A more recent report by the National Academies, *Improving Diagnosis in Health Care*, reiterated the importance of shared responsibility and recommended that vendors work with users and with ONC to ensure that new health IT is usable and fits well within the clinical workflow (NASEM, 2015). The report also recommended that ONC require new health IT to meet interoperability standards and that HHS require vendors to routinely submit their products for evaluation and report any potentially adverse findings. While that committee focused on health IT used specifically in the diagnostic process, this committee believes that its recommendations are applicable to health IT more broadly.

Because health care providers and health IT vendors and developers play complementary roles in ensuring safe and effective technology that is usable, interoperable, and secure, there should be a balancing of responsibility among the involved stakeholders so that clinicians do not bear the burden of being solely responsible for any adverse outcomes or other unanticipated negative consequences associated with the use of technology. Commentators have noted that assigning complete responsibility for performance to either the vendor's technology or to the health care provider organization's implementation or use of the technology is inappropriate, because overall performance is based on a combination of these

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[4] Public Law 104-13.

things (Belmont et al., 2016; Sittig et al., 2018). Many factors affect the safe and secure use of technology, including (1) the design, development, and configuration of hardware and software components; (2) the manner in which these components are implemented and used; and (3) the extent to which effective processes are in place to monitor and improve the use of the technology and associated outcomes (Belmont et al., 2016). Moreover, from a contractual perspective, the party who has the most control over the factors that lead to a health IT patient safety risk is in the best position to prevent and mitigate such a risk (Belmont, 2017; Belmont et al., 2016).

HCOs are responsible for purchasing technologies that will meet the needs of their patients, clinicians, and reporting obligations. To help facilitate this, ONC shares best practices and provides resources to the practice community (Washington et al., 2017) in order to address the unanticipated negative consequences of the rapid adoption of health IT. This policy was also in response to complaints that ONC had received about unethical business practices and overall poor experiences with the purchase and implementation of some certified EHR technology, particularly in the provider office setting. In addition, while many institutions were well suited for configuring and deploying the EHRs, others did not have the internal tools or the capital to invest in consulting efforts to derive value from the digital journey. Thus, ONC provides resources for health IT consulting[5] and workforce development[6] as well as guidelines for EHR safety and improvement[7] and a health IT playbook,[8] a reference guide to help organizations navigate the health IT implementation process. The playbook focuses in part on selecting the right technology for a practice environment, including clinicians in the design process, reengineering workflow in the digital space, quality reporting, alternate payment program participation, and information sharing. HHS identified these areas as problem areas for EHR usage, and many of the same areas appear in existing literature on factors that lead to frustration and burnout.

To provide greater transparency in the certification process, in 2016 ONC launched the enhanced Certified Health IT Product List, which allows end users to compare product functionality, performance, and certification status (ONC, 2016). Previous versions did not allow purchasers of certified technology to have insight into how well the vendors performed in the certification test; they only knew whether the vendor passed or failed. Providers also noted difficulty in comparing the EHRs head to head during the selection process. Expansion of this tool with the additional data described

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[5] See https://www.healthit.gov/topic/regional-extension-centers-recs (accessed February 26, 2019).

[6] See https://www.healthit.gov/topic/onc-programs/workforce-development-programs (accessed February 26, 2019).

[7] See https://www.healthit.gov/topic/safety/safer-guides (accessed February 26, 2019).

[8] See https://www.healthit.gov/playbook/introduction (accessed February 26, 2019).

above will make ONC's certification process more transparent and provide more useful comparison data for end users.

Purchasing and deployment decisions at HCOs also have an impact on interoperability, another component of the health IT landscape that affects the user experience and the efficiency of the health IT care environment. The publication *Procuring Interoperability: Achieving High-Quality, Connected, and Person-Centered Care* identified five priorities for HCOs that wish to ensure that purchased technologies meet interoperability and usability standards (Pronovost et al., 2018). These included

1. *Commit*. Declare interoperability a primary priority and form an organization-wide interoperability steering group or related capacity to champion the IT acquisition strategy.
2. *Identify*. Charge this group with identifying the set of interoperability goals, requirements, and model use cases for the procurement process to support organizational priorities and patient outcome goals.
3. *Collaborate*. Create a sector-wide strategy and partner with other stakeholders to align on common contracting requirements and specifications in order to move toward the next generation of interoperable health IT.
4. *Specify*. Use the collaboratively developed specifications to state clear functional interoperability requirements in existing and future proposals, purchases, and contracts.
5. *Assess*. Establish and monitor short- and long-term metrics for the progress of interoperability and its contributions to system-wide learning and the improvement of health outcomes.

The publication notes that HCOs must make thoughtful acquisitions of truly interoperable technology in order to deliver safe, efficient, and high-quality care. Doing so will also help organizations reduce the clinician burnout that is a result of frustration and the excessive time that clinicians spend using technology that does not meet usability or interoperability standards (see Chapter 4). It is important to note that organizations are responsible for interpreting the federal, state, local, and payer regulatory and documentation requirements. If organizations are unnecessarily conservative in their interpretation of the requirements, the extra work to fulfill them will needlessly add to the administrative burden that clinicians face in their daily work. HIPAA, for example, is often cited as one federal law that is interpreted with great variability across institutions (IOM, 2009). If implemented conservatively by local lawyers and administrators, it can add to the daily burden for clinicians (e.g., through unnecessary extra logins and pop-ups, extra clicks to see necessary clinical information).

Workflow design and the process of documentation are two areas that offer significant opportunities for improvement at the HCO level. Improvements in these areas, many of which can be achieved at relatively low cost, can, in the short term, mitigate some of the stress caused by EHR use during clinical encounters. For example, the use of non-clinician scribes instead of the clinician to populate the EHR has been shown to be associated with increased provider satisfaction, improved provider workflow (Gidwani et al., 2017; Mishra et al., 2018; Pozdnyakova et al., 2018), and increased patient satisfaction (Gidwani et al., 2017). Similarly, an intervention that provided clerical support to a small sample of physicians for the entry of physician orders into the EHR was associated with significant improvements in overall quality of life, personal balance, burnout (using an abbreviated two-question version of the Maslach Burnout Inventory), and productivity (Contratto et al., 2017). Organizations are also changing the roles of providers in the delivery of care. Non-physicians are taking greater, more proactive roles in patient care, which potentially could make all clinicians' work more meaningful. Clinicians will need to adapt to these changing roles and to changes in the environment of practice, the flow of information, the structure of teams, and consumer expectations. HCOs must closely monitor how changes like these affect (positively or negatively) quality of care and stress and burnout among clinicians. The curriculum of the professional health schools will similarly need to change to allow the next generation of clinicians to continue to adapt to future changes in their work environment.

Relatively small—and often inexpensive—technical solutions can support privacy and security standards while improving efficiency and workflow by reducing the time that clinicians spend working in the EHR. For example, many systems have streamlined the login process in their systems with a badge scan or biometrics, rather than requiring the manual entry of usernames and passwords. At the Yale School of Medicine, badge-scan login has saved up to 20 minutes per day per physician and is a relatively simple way to reduce keystrokes and save time (Berg, 2018). The Yale School of Medicine and other institutions across the country have also deployed voice recognition software that allows physicians to speak to the EHR, rather than type. By using this interface, they have reduced the time it takes for clinicians to complete and close encounters by half (Berg, 2018). Other systems have made similar, pragmatic modifications to their EHRs' deployment to reduce computer screen time and improve workflow (Guo et al., 2017).

EHR optimization—a process of using clinical, financial, and operational assessments to refine an EHR—is yet another way that HCOs can improve the provider experience with health IT (Pandhi et al., 2014). Physicians who report working with an optimized EHR are more likely to report that their practice functions more efficiently, that the EHR meets their clinical needs, and that the EHR allows for better patient care compared with those who report that their EHR has not been optimized (Jamoom et al., 2016). In one study EHR improvements, including the introduction of a mobile documentation application, auto-populating abnormal test results, and a system of alerts to flag inappropriate test orders and safety issues, were found to decrease the documentation burden of providers in a major urban hospital (Guo et al., 2017).

Frontline care delivery clinicians too must be part of the solution, given that HCOs include clinicians in their processes. HCOs can seek timely feedback from clinicians during the purchase and implementation decision processes and invite clinicians to be participants in vendor and organizational usability tests. Additionally, clinicians can attend relevant health IT training sessions to foster the successful implementation of health IT, put forth the effort needed to learn newly deployed health IT, work with organizational IT personnel to configure the applications to meet their work needs and patterns, and help others in the organization to learn and use the systems. The clinical teams engaged in development and configuration should be multidisciplinary, because the stakeholders of different groups can unintentionally worsen the user experience of other members of the care team if the planning is not collaborative. Staggers and colleagues (2018) emphasized the essential role of nurses as collaborators as the EHRs and other health IT continues to evolve. Clinicians also need to be willing reporters of usability and safety problems, to participate in health IT–related event analyses, and to serve on multidisciplinary teams assembled to create solutions to problems that have been identified. Finally, knowledgeable clinicians need to participate in relevant national societies and organizations that are working, for example, on health IT usability and risk standards (e.g., the Association for the Advancement of Medical Instrumentation) or standard EHR terminology.

FUTURE OPPORTUNITIES: NEW AND EVOLVING TECHNOLOGIES

The pace of technological innovation in health care is accelerating. Many developments, such as artificial intelligence (AI), predictive analytics, genomic medicine, and robotics, have real potential to both enhance care quality and reduce clinicians' workload. Other developments, such as social media and patient-facing health IT, could connect providers and patients and provide new ways for them to enhance their relationships. Over time, technology has shown an ability to enhance people's lives, but the risk of negative, unanticipated consequences always exists. Technologies on the horizon carry both the promise of positive change and the risk of further increasing clinicians' work stresses and burnout. Furthermore, over the past two decades, the increased technological sophistication of care in the United States has come with exponential increases in health care costs. If this latter trend continues, health care may be increasingly out of the reach of many. In addition, the resulting systemic pressures for cost containment and greater clinical efficiency could adversely affect clinician well-being. History has shown that technological advances are not sole determinant of the future; the method of deployment, people, and surrounding processes will drive the ultimate outcome. This next section describes some of the most important technological trends and examines their potential to address the clinician burnout epidemic.

Artificial Intelligence and Machine Learning

Advances in emerging technologies are occurring at an accelerating rate in the health care sector and are transforming the clinical practice of medicine. Physicians report that they hope for future innovations, such as the use of AI and natural language processing, that could address many of the frustrations they currently experience in using the EHRs (Friedberg, 2013; Tcheng et al., 2017). AI is the ability of software-based systems to perform tasks typically associated with human intelligence. For example, current health IT applications are increasingly able to recognize clinician's speech, identify tumors on radiological or pathological images, and propose differential diagnoses based on structured data about patients' signs and symptoms. Importantly, there are many different AI methods that have different goals and that take different approaches to achieving a task or solving problems and consequently have different applications and outcomes. For example, data mining (i.e., the examination of large datasets to draw inferences about relationships), often uses AI techniques.

Machine learning (ML), a type of AI, can be used to direct scarce resources—such as population health teams—based on the risk of hospitalization or worsening disease. ML could be used to remove the burden from providers of payer prior authorization or fraud waste and abuse audits. The most important attribute of this AI method is that the system uses its outputs and new data to refine or improve its ongoing performance without explicit human intervention. The result is an adaptive, dynamic, or learning system. Deep learning is an ML approach that typically uses multilayered neural networks to achieve better performance accuracy (but that requires more hardware and more training). Deep learning is particularly good for elucidating "hidden" but potentially important patterns within very large unstructured datasets. In medicine, deep learning algorithms are already performing some diagnostic tasks more accurately than physicians (Ehteshami Bejnordi et al., 2017; Gulshan et al., 2016; Rajkomar et al., 2018). The technology also has the potential to assist clinicians by suggesting appropriate, evidence-based clinical actions that align with the latest evidence. This could relieve some of the pressure that clinicians face in managing emerging medical information—something that many struggle to keep up with (Masys, 2002; Middleton et al., 2016) and that likely contributes to the overall work burden and stress (Klerings et al., 2015).

Additionally, it is becoming increasingly common for robotic surgery enabled with AI to assist in microsurgical procedures to help reduce surgeon variations that could affect patient recovery. Precision medicine allows physicians to select medicines and therapies to treat diseases based on an individual's genetic profile in order to provide the most effective treatment for a given patient and thus improve care quality while reducing unnecessary diagnostic testing and therapies (Dzau, 2016).

While emerging technologies hold promise in helping to reduce clinician burden and are not currently part of the immediate pressures relating to clinician burnout, it is possible that they will become a factor within the next several years as the technologies mature and their adoption becomes more widespread.

In addition to the pace of change, which may be a source of stress for clinicians, the adoption of new technologies into mainstream medicine will require the integration of such technologies into existing clinical workflows, practice guidelines, and support systems. The implementation of emerging technologies also will require additional education and training of practitioners to ensure that they are properly using the technologies in the evaluation, diagnosis, and treatment of patients. Additionally, patient expectations that clinicians should maintain pace with state-of-the-art medicine in order to deliver the best available quality of care also may serve as a stressor. Similarly, HCOs and clinicians may struggle with questions about liability and malpractice associated with technology use, the performance and accuracy of newly adopted technology, the evaluation of technological choices, and staying current with technological advances (for more on this topic, see Chapter 6).

A recent survey of HCOs found that 73 percent of organizations either used or planned to use AI or ML in their delivery of care (HIMSS Media, 2018). AI applications designed to manage intake and triage patients based on their reported symptoms and complaints are already in the marketplace (Coye, 2018) and are being increasingly adopted by leading HCOs. While the real-world application of this technology is just beginning to emerge and few AI technologies have received FDA approval (He et al., 2019), the use of AI methods to reduce clinical burden is one promising application of the technology in medicine. For example, AI-based applications have the potential to auto-populate structured EHR fields by extracting pertinent information from open-ended physician notes, using voice recognition during the patient encounter, identifying relevant data from older medical records, and interpreting laboratory results (Horvath et al., 2018). Health systems could also potentially use this same technology to automate quality reporting (Nundy and Hodgkins, 2018), automate coding and billing (Topol, 2019), assist in error detection, and improve diagnostic accuracy (Ommaya et al., 2018).

While much of the technology needed to accomplish this already exists in other settings (Horvath et al., 2018), adapting the technology to do this in a health care setting is still under development (Wachter and Goldsmith, 2018). For example, using ML, Microsoft has launched EmpowerMD to develop virtual scribes that "listen" to clinical encounters and auto-populate EHRs, allowing the clinician to devote his or her full attention to the patient. At the end of the encounter, the clinician reviews (and accepts or modifies) the pre-populated EHR (Microsoft, 2018). Other innovations, such as the ability to search patient records by voice command (rather than clicking and scrolling or typing), automatically integrating laboratory results into the patient record, intelligent alert prioritization, and auto-populating billing and documentation requirements based on doctors notes, remain aspirational at this point, but would also help alleviate some of the burden clinicians currently face in using EHRs (Wachter and Goldsmith, 2018).

Fundamental changes will be required before some of the technological innovations described above can become commonplace. Most current EHRs were built to facilitate transactions and information essential for billing and were not intended to be fully interactive digital platforms for supporting patient care. Thus, EHR vendor platforms as well as the national health IT infrastructure will need to be restructured. Ubiquitous health IT interoperability and data standards will be required. Government regulatory and compliance policies and rules will need to be modified to accommodate automated, albeit more verifiable, documentation. To encourage vendors to develop the technological solutions, federal processes and policies permitting their use will be essential. There are both human capital and financial implications to developing and implementing such complex technological solutions. Finally, buy-in from both patients and clinicians will be essential for this to succeed (Horvath et al., 2018). Further research into acceptability and adoption, particularly at the care team level, is warranted to ensure that the innovations are effectively integrated into the care delivery process.

Telehealth

Telehealth is the use of electronic information and communication technologies to provide health care (IOM, 1996). Commonly, telehealth is delivered via Internet-based video conferencing connecting patients to clinicians in different locations in either real time or asynchronously; however, delivering care via other modalities, such as by telephone or mobile application, is also considered telehealth. Two 2016 reviews, one in primary care and one in mental health care, found that telehealth is both feasible and acceptable to patients across different populations. It can improve efficiency and reduce cost and is as effective as in-person care for appropriate clinical conditions (Bashshur et al., 2016a,b). Newer developments in this space include the remote delivery of medical procedures (e.g., "telesurgery") and tele-assistive specialty care, where either human experts or AI systems provide remote guidance during in-person clinician–patient encounters.

Little published research has examined the relationship between the use of telehealth by clinicians and clinician burnout. In a study of the use of telehealth for child psychiatry patients in an emergency room, the length of stay was reduced, as was the time that on-call psychiatrists spent traveling (Reliford and Adebanjo, 2018). The authors noted that the improved efficiency associated with reducing the psychiatrists' travel burden by more than 2 hours per day freed up time for activities outside of work. In theory, this could reduce stress and reduce burnout. A small pre–post comparison study of the effects of an overnight telehealth service in a critical care system found that nurses in the intervention group reported small but significant improvements in communication, in their psychological working conditions, and on a burnout sub-scale (although it was unclear how burnout was measured) (Romig et al., 2012). There were no improvements in the parallel control group. The effects of telehealth on clinician well-being warrant more study; to the extent that telehealth reduces the factors known to contribute to burnout (e.g., workload, time pressure, work frustrations, clerical/administrative tasks), it could be beneficial. However, poorly designed telehealth user interfaces or unrealistic patient lists, for example, will likely have the opposite effect. Thus, like any other technology or work process innovation, the design and implementation are critical factors in its success.

KEY FINDINGS

Despite the many positive benefits, the negative impact of ubiquitous health IT, including the EHRs, on care delivery, workflow, workload, and burnout is well documented. The myriad factors that have led to this situation are not solely the fault of the vendors who develop and sell the technology or the government that regulates it. Rather, as with some of the other complex factors contributing to burnout, all of the stakeholders, including HCOs, payers, accreditors, national societies, and clinicians themselves share responsibility for the current situation and, more importantly for designing and implementing effective solutions, many of which are already under development.

The impact of newer technological advances on clinician burnout and professional well-being is unclear. There is the potential that new technologies could greatly affect clinicians' roles in the health care delivery process. What is clear is that health care technology—as well as associated processes and policies—is always evolving and that these developments are likely to be disruptive to the care delivery system as we know it today. This puts the onus on all stakeholders to work together to thoughtfully design, regulate, acquire, configure, and deploy technology that not only meets regulatory, payer, and organizational needs but also the needs of clinicians, patients, and society at large.

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8

Student and Trainee Burnout and Professional Well-Being

> "With each year of training however, I became more and more about making sure things get done. Instead of being about the patient, at some point, it became about checking off the list."
>
> (Checklist Manifest, Somalee Banerjee)[1]

In the health professions, students and trainees ("learners") learn and work within various and diverse settings, including classrooms, laboratories, and clinical settings. Organizations that sponsor health care professional training programs (e.g., professional schools, undergraduate and graduate programs, sponsoring health care organizations) provide structure, guidance, and support for learning, informed by accreditation rules and organizational culture, practices, and policies. Within these learning environments is a complex array of social interactions, organizational cultures and structures, and physical and virtual spaces that surround and shape participants' experiences, perceptions, and professional development (Gruppen et al., 2019; Josiah Macy Jr. Foundation, 2018). From these spring learning environment factors that may inadvertently cause high degrees of stress and burnout.

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[1] Excerpted from the National Academy of Medicine's Expressions of Clinician Well-Being: An Art Exhibition. To see the complete work by Somalee Banerjee, visit https://nam.edu/expressclinicianwellbeing/#/artwork/344 (accessed January 30, 2019).

This chapter describes the extent of burnout among learners and the consequences of learner burnout. Consistent with the committee's framework for clinician burnout and professional well-being described in Chapter 2, the chapter summarizes the evidence about the system factors that contributed to learner burnout and well-being as well as the individual factors that can mediate learner burnout. The factors contributing to learner burnout and well-being overlap with the factors leading to burnout and well-being in practicing health care clinicians, but they also have unique attributes related to the learning experience. This chapter will not include a review of anxiety, depression, or posttraumatic stress disorder among learners. Recent meta-analyses have reported that depression is more common among medical students and residents than in the general U.S. population (Mata et al., 2015; Rotenstein et al., 2016). Concerning depression, the contributing factors and consequence are likely to overlap with those associated with burnout but also to have unique and important differences.

EXTENT OF BURNOUT

Medical Students

Numerous studies have found a high prevalence of burnout among students in medical schools. Estimates from a comprehensive narrative review of articles about medical student burnout (1990–2015) were that 35 to 45 percent of medical students had high emotional exhaustion, 26 to 38 percent had high depersonalization, and 45 to 56 percent had at least one symptom of burnout (Dyrbye and Shanafelt, 2016). It is difficult to ascertain whether the prevalence of burnout increased over this time period given the lack of large, multi-institutional or national studies using similar methodologies and the existence of only one publication on burnout among medical students prior to 2005 (Guthrie et al., 1998). A review of existing data from large cross-sectional studies conducted over the past decade using similar methodologies found that the prevalence of burnout has had an upward trajectory overall (Dyrbye and Shanafelt, 2016). This review included results from a large study of more than 4,000 U.S. allopathic medical students, which reported that 56 percent of medical students had at least one symptom of burnout. In addition, high emotional exhaustion, high depersonalization, and overall burnout were more prevalent among medical students than in a national sample of age-similar college graduates not studying medicine (Dyrbye et al., 2014). Similarly, a study of nearly 1,300 osteopathic medical students found that more than 40 percent had symptoms of burnout (Lapinski et al., 2016).

Little is known about the course of burnout over time. Limited cross-sectional data suggest that the prevalence of burnout increases as students move into the more advanced years of medical school training (Dyrbye and Shanafelt, 2016). In a 1-year longitudinal study of medical students, 36 percent did not have burnout at either baseline or follow-up, 16 percent did not have burnout at baseline but did at follow-up (new burnout), 34 percent had burnout at both time points (chronic burnout), and 12 percent had burnout at baseline but not at follow-up (recovered) (Dyrbye et al., 2008). In a longitudinal study of medical students in Sweden, emotional exhaustion at the end of medical school, as measured by the Oldenburg Burnout Inventory, independently predicted the students' level of emotional exhaustion during their internships (Dahlin et al., 2007).

Resident Physicians

During postgraduate specialty training, also called residency, the "resident physician" works and learns under the supervision of a senior physician licensed in that specialty. There is evidence showing a high prevalence of burnout among resident physicians; this is present at the beginning of residency training and continues into subsequent years of residency (Willcock et al., 2004).

In a national study of second-year residents (n = 3,588), 45 percent were reported to have burnout symptoms, with a large variation in prevalence by specialty that was similar to the variation found in studies of practicing physicians (post-training) (Dyrbye et al., 2018). A multi-variate analysis found that training in urology, neurology, emergency medicine, ophthalmology, and general surgery was independently associated with higher relative risks (RRs) of burnout symptoms relative to training in internal medicine (the RRs ranged from 1.23 to 1.48), after controlling for other factors.

Several prevalence studies assessing burnout in other years of training or within a single discipline also indicate that residents commonly experience burnout. The percentage of residents reporting burnout symptoms across these studies is high: 32 to 38 percent have high depersonalization, 44 to 50 percent have high emotional exhaustion, and more than 60 percent have at least one symptom of burnout (Attenello et al., 2018; Dyrbye and Shanafelt, 2016; Moradi et al., 2015; Prins et al., 2007a; Ripp et al., 2011; West et al., 2011). Similar to the case with medical students, findings from a national sample of 1,701 residents conducted in 2012 reported that the prevalence of high emotional exhaustion, high depersonalization, and overall burnout was higher among residents than among age-similar college graduates not studying medicine (Dyrbye et al., 2014).

Nursing, Dental, and Pharmacy Learners

Compared to the research on physician trainees, there are fewer studies measuring the symptoms of burnout in students and trainees in nursing, dentistry, and pharmacy. Nonetheless, there is evidence to show that training in these fields is stressful and causes distress (Del Prato et al., 2011; Dutta et al., 2005; Edwards et al., 2010; Labrague et al., 2018). For example, Zinurova and DeHart found higher levels of stress among pharmacy residents than among other individuals in the U.S. population (Zinurova and DeHart, 2018).

In general, existing studies of burnout among nursing, dentistry, and pharmacy learners are small, single-institutional, or conducted outside the United States, limiting the generalizability of the findings. Nonetheless, the data suggest that burnout among non-physician learners is a serious problem. For example, a 2010 study of 436 nursing students at a single institution found emotional exhaustion, depersonalization, and personal accomplishment scores (Maslach Burnout Inventory–Human Services Survey for Medical Personnel [MBI–HSS MP]) of 18.2–22.3, 5.2–6.7, and 32.8–36.2, respectively, with mean scores lowest in the first-year nursing students (Michalec et al., 2013). A longitudinal study of nursing students in Sweden reported that the exhaustion and disengagement (as measured by the Oldenburg Burnout Inventory) increased over 3 years of training (Rudman and Gustavsson, 2012). A small, single-institutional study of 151 dental and dental hygiene students found that 40 percent had burnout symptoms (Deeb et al., 2018). A single-institution study of 629 pharmacy students showed significant associations between older age, year in school (higher in second than first year), and being at the main campus (versus a branch campus) and higher emotional exhaustion scores (using MBI–Student Survey [MBI–SS]) (Ried et al., 2006).

Demographic Characteristics

Studies of learners have reported differences in the prevalence of burnout by individual demographic variables, but the findings are not consistent. Some studies suggest that women learners are at higher risk for burnout than their male colleagues (Dyrbye et al., 2009b, 2018; Elmore et al., 2016). For example, in a national study of 3,588 second-year residents, female residents had a 19 percent increased odds of burnout (versus males) after controlling for specialty and other characteristics (Dyrbye et al., 2018). Longitudinal research, however, has produced conflicting findings. One study in medical students and another in internal medicine residents found no relationship between gender and the risk of developing burnout (Dyrbye et al., 2010b; Ripp et al., 2011). In a 3-year longitudinal study of

86 internal medicine residents, a logistic regression model indicated that male residents had a three-fold increased risk of persistent burnout, defined as having burnout at each time point across 3 years, after controlling for other factors (Campbell et al., 2010). There may also be subtle sex differences in the way that burnout is manifested among learners, with burnout more likely to manifest as emotional exhaustion in women than in men and men more likely than women to experience depersonalization (Golub et al., 2007; Liébana-Presa et al., 2018; Prins et al., 2007c; Ried et al., 2006).

With respect to race, several multi-institutional studies involving more than 5,700 medical students have found that self-identifying as white was an independent predictor of burnout, after controlling for age, gender, and parenting and marital status (Dyrbye et al., 2007, 2009b, 2010b). Likewise, in a longitudinal multi-institutional study of 1,701 medical students, being non-white was an independent predictor of higher likelihood of recovering from burnout within 1 year (Dyrbye et al., 2010b). Although two cross-sectional studies involving family medicine residents and hematology–oncology fellows also reported a relationship between race and burnout (Michels et al., 2003; Mougalian et al., 2013), a longitudinal study involving more than 3,500 second-year residents found no independent relationship between burnout and race, ethnicity, or country of birth (United States or not) (Dyrbye et al., 2018).

Less is known about the experience of learners who belong to other minority groups. In a study of 1,294 osteopathic medical students, a univariate analysis showed that those who self-identified as lesbian/gay/bisexual/asexual were more than twice as likely to report symptoms of burnout than heterosexual students. There were no differences in the mean scores for emotional exhaustion or depersonalization between the groups and no adjusted analysis (Lapinski et al., 2016). In a large national study of allopathic medical students, sexual minority students (lesbian, gay, transgender, bisexual, questioning [LGTBQ]) had a greater risk of depressive symptoms, anxiety symptoms, and low self-rated health, after adjusting for relevant covariates (Przedworski et al., 2015).

The prevalence of burnout among U.S. medical residents may vary according to where the individual trained prior to residency. A large study involving nearly three-fourths of all U.S. internal medicine residents reported that international medical graduates were less likely to have burnout, a finding that persisted on multi-variate analysis that controlled for debt and other factors (West et al., 2011). Similarly, a small study of 150 medical residents from 13 specialties training in two hospitals reported residents who had completed medical school outside of the United States had significantly lower emotional exhaustion and depersonalization on univariate analysis (Eckleberry-Hunt et al., 2009).

CONSEQUENCES OF LEARNER BURNOUT

Care Quality and Patient Safety

The evidence shows that burnout affects the quality of patient care delivered by medical trainees. Several studies have found that residents with burnout are more likely to report delivering sub-optimal care or having committed a medical error (Shanafelt et al., 2002; Wallace and Lemaire, 2009; West et al., 2006, 2009). In the seminal 2002 study on burnout (Shanafelt et al., 2002), burnout among a sample of internal medicine residents (n = 115) significantly predicted self-reported sub-optimal patient care practices, such as dismissing patients from the inpatient service to make the service more manageable, not fully discussing treatment options with patients, and paying little or no attention to the social or personal impact of illness on patients. Longitudinal studies of internal medicine residents have similarly found burnout to be an independent predictor of residents perceiving that they committed a medical error over the subsequent 3 months (West et al., 2006, 2009).

Negative emotions can impede learning, recall, and the application of knowledge and skills (McConnell and Eva, 2012). Consistent with this, medical residents with burnout are also more likely to report greater struggles with concentrating at work (Fahrenkopf et al., 2008). In one qualitative study, residents described how fluctuations in their overall well-being affected their motivation at work (Ratanawongsa et al., 2007). Burnout's adverse effects on learning and performance are further supported by a study of more than 16,000 U.S. internal medicine residents that reported a step-wise reduction in Internal Medicine In-Training Examination (IM-ITE) scores as burnout symptoms worsened (West et al., 2011). In addition, in a study of 58 emergency medicine residents from six institutions, residents with burnout showed lower cumulative performance scores on high-fidelity simulation scenarios used for assessing performance (Lu et al., 2017).

Other findings about the well-being and the experiences of medical trainees include focus group results from 26 medical residents in internal medicine, psychiatry, surgery, emergency medicine, anesthesia, obstetrics and gynecology, and pediatrics. Affirming the claim that well-being influences decisions and social interactions, the study reported that participants perceive having better decision-making capacity and higher-quality patient discussions when their well-being is high and more sub-optimal exchanges with patients when their well-being is low (Ratanawongsa et al., 2007). However, a small, single-institution study of 202 internal medicine residents found that those with burnout had higher supervisor ratings of their communication skills with patients, families, and team members (Beckman et al., 2012).

Few studies have examined the relationship of learner burnout in nursing, pharmacy, and dentistry with patient outcomes. A longitudinal study of more than 1,700 nursing students in Sweden, using the Oldenburg Burnout Inventory found that baseline levels of burnout and the subsequent experience of burnout during nursing school predicted lower levels of self-reported, in-class learner engagement as well as a lower perception of occupational preparedness in the final year of nursing school. Earlier development of burnout during nursing school also predicted lower self-reported mastery of occupational tasks and less use of research in every day clinical practice 1 year after graduation (Rudman and Gustavsson, 2012).

The evidence strongly indicates that burnout can impede the acquisition of professional knowledge and skills and thus diminish the systems' capacity to provide the best patient care, placing patients at risk in both the short term and the long term for sub-optimal care and medical errors.

Professionalism

Chapter 2 contains a discussion that places the tenets of professionalism in the context of this report. Here, studies examining the attributes of professionalism and burnout among learners document the negative consequences for patient care. In a multi-institutional study of 2,682 medical students, burnout was independently associated with self-reported unprofessional conduct, with the potential to undermine both student competency (by cheating and plagiarism) and good patient care (by lying about aspects of the physical exam done and tests ordered, etc.) (Dyrbye et al., 2010a). The evidence suggests that medical students with burnout have lower altruism and integrity, are less likely to endorse correct attitudes about managing conflicts of interests with industry, are less likely to have correct attitudes about appropriate prescribing behaviors, and are less likely to believe that they have a personal responsibility to report impaired colleagues (Dyrbye et al., 2010a, 2015b).

Similarly, several studies have found that medical students with burnout have lower empathy, including a multi-institutional study of 545 medical students (Thomas et al., 2007), a single-institution study of 127 fourth-year medical students (Brazeau et al., 2010), and a national study of 1,350 Brazilian medical students (Paro et al., 2014). These findings are important because empathy during medical school predicts subsequent risk of burnout during residency (Dyrbye et al., 2018). In a longitudinal study of internal medicine residents, reduced empathy was an independent predictor of higher odds of self-perceived error in the following 3 months (West et al., 2006). A study of 254 hematology–oncology fellows suggests that lower levels of burnout may promote more compassionate patient care (Mougalian et al., 2013).

Societal Consequences

Attrition in health professions education has the potential to contribute to shortages in some professions and specialties. When learners do not finish their training, the adequacy of the workforce is threatened, and institutions and individual learners bear the cost (Jones and Korn, 1997). There can be many reasons students choose to discontinue training, and studies suggest that half of those who choose to discontinue medical school do so for nonacademic reasons (Garrison et al., 2007).

Burnout may influence learner attrition and turnover. A multi-institutional study of medical students (n = 858) found that burnout independently predicted students having serious thoughts of dropping out of medical school over the course of 1 year. The frequency of serious thoughts of dropping out returned to baseline level with recovery from burnout, suggesting a causal association (Dyrbye et al., 2010c). In addition, an earlier development of burnout during school was reported to be associated with higher turnover intentions during the first year post training in a longitudinal study of burnout in nursing students (n = 1,702) in Sweden that used the Oldenburg Burnout Inventory (Rudman and Gustavsson, 2012).

Burnout is associated with an increased likelihood of career choice regret among residents (Becker et al., 2006; Campbell et al., 2010; Dyrbye et al., 2018; Shanafelt et al., 2002). In a cross-sectional study of second-year residents (n = 3,588), career regret was reported by 14 percent and was significantly associated with burnout (Dyrbye et al., 2018). These findings parallel those in studies of practicing physicians, which report that burnout is associated with turnover intention (Sinsky et al., 2017).

In addition, some studies suggest that burnout may influence medical students' specialty choices, raising the possibility of societal consequences since an inadequate specialty distribution among physicians in the workforce can negatively affect patients' access to care. For example, one study reported that medical students with high emotional exhaustion were more likely to choose a specialty with a more controllable lifestyle (e.g., dermatology versus internal medicine) and that those with low personal accomplishment were more likely to choose a higher-income specialty (e.g., anesthesiology versus pediatrics) (Enoch et al., 2013). Other studies found that burnout among medical residents increased the likelihood of seriously considering changing specialty and abandoning medicine altogether (Blanchard et al., 2010) and that medical residents who developed burnout over the course of intern year were less likely to plan to pursue subspecialty training (Campbell et al., 2010).

Personal Health

Cross-sectional studies in medical students and residents show a relationship between burnout and suicidal thoughts (Dyrbye et al., 2008; van der Heijden et al., 2008). A multi-institutional longitudinal study of U.S. medical students (n = 1,321) found that burnout was an independent predictor of medical students developing thoughts of suicide over the course of 1 year (Dyrbye et al., 2008). Even medical students without depression were at substantially higher risk of developing thoughts of suicide if they had burnout. In a cross-sectional study of residents training in the Netherlands (van der Heijden et al., 2008) and the United States (Lebares et al., 2018), suicidal thoughts were also more prevalent among residents with burnout.

Similar to findings concerning alcohol use among U.S. physicians (Oreskovich et al., 2012), cross-sectional studies of learners report that burnout is associated with higher alcohol intake. For example, burnout was found to be an independent predictor of alcohol abuse and dependence in a multi-institutional study of 4,402 medical students (Jackson et al., 2016), and higher emotional exhaustion and depersonalization scores were associated with greater alcohol intake in a study of 168 family medicine residents (Lebensohn et al., 2013).

There are some data to suggest burnout in learners may increase the likelihood of them subsequently developing poor mental health, but, notably, poor mental health may not increase the likelihood of burnout. In a study of 218 nursing students, emotional exhaustion scores (measured by the MBI–HSS) at baseline predicted psychological well-being (measured by the General Health Questionnaire [GHQ]-12) 18 months later; however, baseline psychological well-being did not predict subsequent emotional exhaustion, suggesting that the relationship is not bidirectional (Ríos-Risquez et al., 2018). Concordant with those findings, a multi-institutional longitudinal study of 185 first-year internal medicine residents found no relation between past psychiatric history and the incidence rate of burnout over the course of 1 year (Ripp et al., 2011).

Burnout also appears to adversely affect learners' physical health. A longitudinal study of internal medicine residents (n = 340) provides evidence of a dose–response relationship between burnout and adverse risk to personal health; each 1-point decrease in a personal accomplishment score was associated with an 8 percent increase in the odds of a self-reported blood and body fluid exposure in the subsequent 3 months (West et al., 2012). Moreover, after controlling for fatigue, each 1-point increase in an emotional exhaustion score or a depersonalization score was associated with a 3 percent increase or 4 percent increase, respectively, in the odds of reporting any motor vehicle incident in the subsequent 3 months. This magnitude of effect was large enough to meaningfully affect resident safety and potentially public safety as well, if others were involved in the motor vehicle incidents.

SYSTEM FACTORS CONTRIBUTING TO BURNOUT AND WELL-BEING IN THE LEARNING ENVIRONMENT

As discussed in Chapter 4, job demands and job resources can contribute to clinician burnout and professional well-being. Similarly, learners have demands and resources related to their professional development that can contribute to burnout or well-being. The demands include the learners' non-clinical and clinical workload and intrinsic aspects of their clinical work (e.g., curriculum and training experiences). The resources include teaching by faculty and social support from peers and supervisors. The learning environment, as explained above, is influenced by organizational culture and structure. Other factors, unique to each individual learner, mediate the effects of the demands and thus influence the link between those demands and burnout and professional well-being.

The evidence suggests that learning and workplace conditions, rather than individual attributes, are the major drivers of burnout among learners (Dyrbye and Shanafelt, 2016) and practicing clinicians (Williams et al., 2002). Studies show that there is a relationship between learners' perceptions of the overall learning environment and their risk for burnout. In a 2009 study (Dyrbye et al., 2009b), a multi-variate analysis found that learning climate factors were independently associated with burnout among U.S. medical students (n = 1,701). Similarly, another study (van Vendeloo et al., 2018) found that among residents from 29 specialties training in Belgium (n = 252), perceptions of the learning environment were associated with burnout, a finding that persisted after adjusting for work hours and satisfaction with work life. In addition to these studies, longitudinal data reported in 2010 (Dyrbye et al., 2010b) showed that higher satisfaction with the learning environment was an independent predictor of not having burnout at baseline or 1 year later among medical students.

Work Hours, Overnight Call, and Workload

Among practicing physicians, studies show that work hours and workload are major drivers of burnout; their role in the experience of burnout among learners is less clear, however. Among medical students, two studies suggest no relationship between work hours and workload and burnout. A study of first- and second-year (pre-clinical) medical students reported no significant association between hours spent in lectures and small groups, hours of clinical experiences, hours and number of exams, or weeks of vacation and any measure of student well-being, including burnout, quality of life, or depressive symptoms (Reed et al., 2011). In a study of third- and fourth-year medical students, workload characteristics (e.g., number of patients cared for in the past week, call schedule, inpatient/outpatient rotation) and the current specialty of the clinical rotation were not independent predictors of burnout (Dyrbye et al., 2009b).

In a study of first-year pharmacy residents, a relationship was found between higher work hours and greater levels of stress (Zinurova and DeHart, 2018). Among medical residents, work hours, excessive workload, and overnight call frequency have been shown to increase the risk of burnout (Sargent et al., 2004; van Vendeloo et al., 2018), but the studies are inconsistent (Dyrbye and Shanafelt, 2016). Several studies examined the Accreditation Council for Graduate Medical Education's (ACGME's) common duty-hour standards for resident training in the United States. In 2003, ACGME set resident duty-hour and institutional oversight standards, which it revised in 2011 and again in 2017 (Nasca, 2017).

Only three of seven studies using historical cohort controls found that the 2003 ACGME mandated work-hour reforms led to significant reduction in burnout among residents (Dyrbye and Shanafelt, 2016; Fletcher et al., 2011). A 2005 study of 684 residents in otolaryngology–head and neck surgery reported a strong positive linear relationship between emotional exhaustion and hours worked which persisted after adjusting for potential confounders (Golub et al., 2007). However, in a 2008 national study of nearly three-quarters of all U.S. internal medicine residents (>16,000 residents), the prevalence of burnout was similar to rates prior to 2003 ACGME work-hour reforms (West et al., 2011). Additionally, no relationship was found between self-reported workload, work hours, call frequency, and burnout in two longitudinal studies of residents conducted in 2003–2008 (Campbell et al., 2010; Ripp et al., 2011, 2015).

Studies also reported mixed findings related to resident well-being and the 2011 ACGME-mandated changes to shift length, night float rotations, and protected sleep time (Reed et al., 2010). For example, a study of first-year internal medicine residents found similar year-end prevalence of burnout in cohorts that trained before and after the 2011 ACGME changes (Ripp et al., 2015). Similarly, there were no differences in burnout among 47 residents in Canada who were randomly assigned in 2-month blocks to an intensive care unit rotation with overnight in-house calls in schedule blocks of 24, 16, or 12 hours (Parshuram et al., 2015). In a 2012 single-institution study (Krug et al., 2017), internal medicine residents reported a lower prevalence of burnout (61 percent) than had been reported in 2001 (76 percent), but there was no statistically significant difference in prevalence when compared with the 2004 (64 percent) historical cohort. Only 23 percent of the residents in 2012 thought that the 2011 duty-hour policy had a positive impact on their well-being, and most thought the policy had a neutral (42 percent) or negative (41 percent) impact on patient care (Krug et al., 2017).

In light of the difficulty in proving benefit across several dimensions and concern among program directors about the rigidity of the policy, ACGME reviewed the 2011 duty-hour standards and revised the policy in 2017 (ACGME, 2017). However, one recent study (Desai et al., 2018) showed no significant differences in mean emotional exhaustion or depersonalization scores between cohorts of residents in 63 internal medicine programs who trained under a flexible policy that resembles the 2017 ACGME requirements and those who trained under the 2011 ACGME standard duty-hour policies. The potential impact of a flexible policy for surgical trainees is less clear since studies to date have not included a validated measure of well-being (Bilimoria et al., 2016). However, a qualitative study to explore some of these findings in greater depth found that residents perceived a flexible duty-hours policy to have several advantages, including giving them the ability to schedule time off for personal needs (Kreutzer et al., 2017).

The literature offers several possible reasons for the lack of consistently documented benefit from mandated work-hour restrictions on resident well-being. There is the possibility that the potential benefits are obscured as a result of work-compression, that is, that educational requirements and patient care duties remain the same despite a reduction in work hours. Or, alternatively, learners may feel a sense of increased stress due to the perception of being less well prepared for clinical tasks (owing to less repetition and exposure to clinical encounters or impressions given by supervisors) (Ludmerer, 2010). Eckleberg-Hunt (2009) reported that not having enough time in the day to complete the workload and perceptions of having excessive paperwork were associated with burnout among 150 residents in two hospitals. Similarly, Domaney and colleagues (2018) found that self-reported hours spent on EHRs (outside of work, total time, and reviewing notes) correlated with emotional exhaustion in a cross-sectional study of 40 psychiatric residents.

Curriculum and Training Experiences

Little is known about the relationship between school or clinical training program characteristics (e.g., size, competitiveness, research intensiveness, curriculum design [subject-centered or problem-based centered], faculty-to-student ratio, longitudinal clerkships) and burnout among learners, although recent longitudinal studies have explored how these factors relate to depression among learners (Dyrbye et al., 2019b; Pereira-Lima et al., 2019).

Pass–Fail Grading

Studies examining structural factors within the learning environment show a relationship between pass–fail curricula and well-being. In a multi-institutional study, medical students in pass–fail curricula were less likely to have burnout than students not in pass–fail curricula, even when controlling for multiple other factors related to the allocation of curricular time (i.e., time spent in didactics and clinical experiences, number of exams, and length of vacation) (Reed et al., 2011). In addition, two single-institutional studies provide further evidence that moving to a pass–fail curriculum in years 1 and 2 can improve learners' well-being, satisfaction with medical education, and group cohesion without adversely affecting first- and second-year courses, grades in clerkships, scores on the United States Medical Licensing Examination (USMLE) Step 1 and Step 2CK, success in residency placement, and attendance at academic activities (Bloodgood et al., 2009; Rohe et al., 2006).

In addition to changing to a pass–fail curriculum during the pre-clinical years, studies support a multi-faceted approach to improving curricula and training experiences. Slavin and team (2014) reported that a multi-faceted program, which included pass–fail, changes to course content and scheduling, a reduction in contact hours, the addition of electives, learning communities, and required resilience/mindfulness experiences, was associated with significantly lower levels of depression symptoms, anxiety symptoms, and stress and with significantly higher levels of community cohesion in the pre-clinical years when compared with historical cohorts at a single medical school. However, these improvements were not sustained through the clerkship years (Slavin, 2018).

Given the importance of clerkship grades to the residency selection process, it will likely be necessary to explore strategies other than pass–fail grading (National Resident Matching Program, 2018). The relationships between how clerkship grades are determined (e.g., norm-based grading versus criterion-based grading, weight of clinical clerkship shelf examination versus more subjective evaluations) and student well-being warrants exploration.

Clinical Training Experiences

Few studies have examined the association between factors stemming from the clinical training environment and learner burnout. One study of third- and fourth-year medical students reported that lower satisfaction with the organization of clerkship rotations and the variety of medical problems encountered during clinical training were independent predictors of burnout (Dyrbye et al., 2009b). Difficult rotations are among the major stressors for learners (Jenkins et al., 2018). For example, among neurosurgical residents (n = 395), self-reported inadequate operating room experience was an independent predictor of burnout (Attenello et al., 2018). On the other hand, having clinical experiences that provide opportunities for learning and growth may protect against burnout (Verweij et al., 2017). Other sources of stress within the clinical training environment are related to interactions with patients. One important result from a longitudinal study of internal medicine residents was that perceptions of having committed a medical error was an independent predictor of subsequent worsening in all domains of burnout (West et al., 2006).

Within nursing, studies suggest that completing a 6- to 12-month postgraduate nursing residency program increases confidence in one's skills; the ability to organize and prioritize work; comfort communicating with team members, patients, and families; and leadership skills (Goode et al., 2009), which may reduce stress and mediate risk for burnout, although this has not been directly studied. A barrier to implementing nursing residency programs is the current reliance on hospital funding. How well residencies for dentists, pharmacists, nurse practitioners, and physician assistants aid the transition to practice and reduce stress and burnout also warrants exploration.

Licensure and Hospital/Clinic Credentialing and Privileging

Multiple organizational, accreditation, and licensing boards have a role in influencing the types, frequency, and stakes of assessments, which results in substantial variability across health profession training programs. Licensure requires passing national standardized examinations, and exam stress is a widely acknowledged stressor for learners (Jenkins et al., 2018; Jevtic et al., 2012). How well learners perform on these exams may have a large impact on their future careers (National Resident Matching Program, 2018). For example, a medical student's USMLE Step 1 score has a strong impact on that student's chances of getting a residency within his or her desired specialty. The competition within select residency training specialty programs is steep, particularly in more desirable training locations (Mullan et al., 2015). Although well accepted as an enormous stressor for medical students, the way in which the USMLE Step 1 exam affects self-care behaviors and mental health has not yet been formally studied. For residents, licensure typically requires a specified period of training. Those residents who take a medical leave due to illness or maternity may experience escalations of their stress as rigid training requirements constrain the time available for self-care and personal life events (Magudia et al., 2018; Varda et al., 2018).

In addition, state medical license boards and hospital credentialing and privileging processes commonly inquire about previous emotional problems, including help-seeking behaviors (Dyrbye et al., 2017c). Although those types of questions are well-established barriers to help-seeking for practicing physicians experiencing emotional difficulties (Dyrbye et al., 2017c). Less is known about their role in learners' reluctance to seek help for emotional problems. However, factors such as a lack of time, a lack of confidentiality, the stigma associated with using mental health services, cost, a fear of documentation on academic record, and a fear of unwanted intervention all appear to be major barriers to help-seeking among medical students (Chew-Graham et al., 2003; Dyrbye et al., 2015a; Givens and Tjia, 2002; Schwenk et al., 2010).

Data show that medical students are more reluctant to seek help for a serious emotional problem than the general population (and age-matched individuals) (Dyrbye et al., 2015a). A 2015 study found that perceived stigma likely explains why medical students with burnout do not actively seek help and, in addition, reported that faculty and peer behaviors may also influence a learner's help-seeking (Dyrbye et al., 2015a). Although burnout is not a mental health problem, it can lead to one (Hakanen and Schaufeli, 2012; Ríos-Risquez et al., 2018), which underscores the urgency to eliminate barriers to help-seeking for all students, trainees, and practicing clinicians.

Rapidly Changing Health Care Delivery

For students, trainees, and practicing clinicians, the unprecedented rate of change in health care is one source of feelings of uncertainty about their professional future, and feelings of uncertainty appear to be more common among residents meeting burnout criteria (Shanafelt et al., 2002). Health care systems changes have led to additional required competencies for the 21st-century physician (Crosson et al., 2011; Lucey, 2013), resulting in an increase in the amount of content one must master during medical school. This expanding content adds to workload. A study conducted at a single institution a decade ago found that medical students would need to devote 5 to 7 days of 6 hours each week to complete the assigned basic science reading only once (Klatt and Klatt, 2011). Adding content to an already dense educational program is occurring in an era when some medical schools are reducing their 4-year curriculum to 3 years, at least for some learners.

Patient Factors

Interactions with patients are a critical component of competency development for health care professional students and trainees. Surprisingly little is known about patient-related factors, interpersonal relationships between patients and their families, and learners' experiences. The interplay between the level of complexity of a patient's medical problem, the learner's level of preparedness to handle the situation, available support and resources, and the learner's professional development and well-being is largely unexplored.

A cross-sectional study of 150 residents from 13 specialties in two U.S. hospitals found an association between self-reported difficult and complicated patients and a higher risk of burnout (Eckleberry-Hunt et al., 2009). On the other hand, patients can also be a source of renewed energy for learners (Mata et al., 2016).

Organizational Culture

Many factors arising from an organization's culture are positive and supportive, but there are many other factors that can contribute to the risk of burnout, particularly among certain groups of learners. For example, organizational culture influences how many same-gender, same-race, same-ethnicity, or same–sexual orientation advocates and role models are available to provide personal and professional support to learners. Learners may struggle even more without same-gender role models. In one qualitative study, for example, 35 female and 63 male surgical residents generally agreed that women residents had to try harder and received less respect from hospital staff and patients (Dahlke et al., 2018).

Another cultural factors that may affect learner well-being is the racial and ethnic inclusiveness of the organization. Although non-white medical students are overall at lower risk for burnout, a multi-institutional study found that this changes when non-white medical students perceive that their race has adversely affected their medical school experience; that is, they were more likely than non-white students who reported no such experience to have burnout as well as a lower quality of life and depressive symptoms (Dyrbye et al., 2007). Similarly, a longitudinal study of medical students found that greater exposure to a negative medical school diversity climate was associated with an increase in depressive symptoms among students of all races and ethnicities groups (Hardeman et al., 2016).

Flexibility and Empowerment

Studies show that the degree of control that learners have over their education and daily lives also affects stress level. Medical students who perceive having little control over their daily schedule or life are more likely to have burnout (Mazurkiewicz et al., 2012; Santen et al., 2010), and among a sample of residents from 13 specialties in two hospitals, perceptions of a lack of control over office processes and schedule increased the likelihood of burnout (Eckleberry-Hunt et al., 2009). A qualitative study of 26 residents from seven specialty training programs (Ratanawongsa et al.,

2007) found that schedule flexibility was more important to some residents' sense of well-being than an overall limitation of work hours. Overly rigid schedules amplify the challenges of completing personal tasks, sending the message that personal needs are inconsequential, which has been found to be a major stressor more often for residents with burnout than for those without (Shanafelt et al., 2002).

Educator Behaviors

Learners in the health professions have a variety of teachers and clinical supervisors (educators), including other learners who are more advanced in their training and faculty within and outside their intended professions. Faculty members are at various stages of their own careers and have disparate abilities and interests in educating learners as well as different levels of investment and connection to the training program.

Learning interactions occur in a variety of settings, including classrooms, laboratories, simulation centers, and clinical settings—each with its own unique attributes, challenges, and constraints. For example, in most clinical settings the faculty are expected to teach and assess multiple learners at various stages of professional development while also having patient care responsibilities. A faculty member's ability to shape clinical interactions and provide an optimal levels of professional challenge and support to a learner's professional growth depends on many factors within and outside the scope of faculty's influence, such as the learner's previous experiences and formal curriculum, the types of patients available, and the faculty member's skills and own job demands (Sanford, 1962).

Many learning environment elements that can adversely affect learners can also have negative effects on educators. A national study of U.S. second-year residents found that the clinical specialty areas with the highest prevalence of resident burnout were similar to the clinical specialty areas with the highest rates of burnout among practicing physicians (Dyrbye et al., 2018). The authors say further study is needed to determine whether this finding is due to unique work environment factors intrinsic to certain specialties or to the behaviors of burned-out supervising physicians that model burnout behavior to residents or otherwise negatively affect the learning environment. On that latter point, a national study found that clerkship directors with burnout were more likely to report an attitude of not caring what happens to some of their students, suggesting that faculty well-being may influence teaching behaviors and the experience of learners (Dyrbye et al., 2009a). In a qualitative study, medical students identified negative role models as a major stressor in the learning environment and reported that positive role models helped them reframe stressors, making the challenges inherent to professional development seem more worthwhile (Jenkins et al., 2018).

Substantial evidence suggests that various aspects of the learner–educator relationship, such as faculty support, relate to a learner's risk of experiencing burnout symptoms. In a study of more than 1,100 medical students attending five different medical schools, Dyrbye and colleagues (2009b) found that dissatisfaction with the level of faculty support was an independent predictor of burnout among first- and second-year students, while perceptions of residents being cynical and the students' dissatisfaction with the level of resident supervision were independent predictors of burnout among third- and fourth-year students (Dyrbye et al., 2009b). In contrast, students reporting that education was a priority for faculty members was an independent predictor of "never" having burnout (i.e., not having burnout at baseline or 1 year later) and of "recovering" from burnout (i.e., having burnout at baseline but not 1 year later) in a multi-institutional study of medical students (Dyrbye et al., 2010b). In a study of residents training in the Netherlands, dissatisfaction with the emotional support received from supervisors was a strong predictor of emotional exhaustion and depersonalization, and this finding persisted upon multi-variate analysis controlling for other factors (Prins et al., 2007c). Among otolaryngology–head and neck surgery residents (n = 684), greater perceptions of demands from attending physicians and lack of independence correlated with higher emotional exhaustion scores (Golub et al., 2007). Similarly, several studies have demonstrated a relationship between a perception of insufficient autonomy and burnout, including a study of 193 emergency medicine residents in eight residency programs (Kimo Takayesu et al., 2014) and a smaller sample of residents in the Netherlands (Ringrose et al., 2009). Residents with burnout are also more likely to describe their relationships with supervisors as stressful (Prins et al., 2007b; Sargent et al., 2004).

Reports of harassment and belittlement are common among all learners, particularly among minorities. Not surprisingly, perceptions of recurrent mistreatment by faculty or residents are associated with an increased risk of burnout among medical students (Cook et al., 2014). Within dentistry, Rowland and colleagues (2010) found that intimidation by instructors was significantly associated with perceived stress, a finding that persisted after controlling for school, age, and gender. Similarly, in a study of 395 neurosurgical residents, perceptions of working with hostile faculty was an independent predictor of burnout that persisted on multivariable analysis (Attenello et al., 2018).

Other studies suggest a relationship between faculty teaching behaviors and learner burnout. For example, more favorable ratings of teachers, reported explicit teaching about certain topics, and direct observation of goals-of-care discussions was associated with lower emotional exhaustion scores and better overall teaching quality, while more frequent observation of the residents' skills was associated with lower depersonalization scores in a sample of hematology–oncology residents (Mougalian et al., 2013). Although the direction of the relationship cannot be determined from these cross-sectional studies, one longitudinal study involving 186 final-year medical students in Sweden found that positive perceptions of the first year of residency training environment, driven by supervisors who incorporated residents' needs for education, feedback, and support, was negatively associated with the development of emotional exhaustion (measured using Oldenburg Burnout Inventory) during residency (Dahlin et al., 2010). Similarly, when residents perceived their relationships with supervisors to be one of mutual support and benefit—that is, the resident benefited from a supervisor's teaching and support, and the supervisor benefited from the work done by the resident—residents had lower emotional exhaustion and depersonalization scores (Prins et al., 2008).

Advising and Mentorship

Faculty play a critical role in advising and mentoring learners; however, some learners struggle to find advocates, role models, and mentors (Mazurkiewicz et al., 2012). As discussed in Chapter 3, faculty members face numerous challenges, including increased clinical duties, a reduction in time allocated for scholarly pursuits, and inadequate time allocated for fulfilling teaching obligations (Jones et al., 2017).

Studies show that residents with burnout were more likely to be dissatisfied with mentoring relationships (Oladeji et al., 2018), while residents in a structured mentoring program had lower burnout scores (Elmore et al., 2016). Furthermore, among a sample of European surgical oncology residents and fellows (n = 404), choosing a specialty because of a relationship with a faculty member in that specialty (versus for some other reason) was an independent predictor of not having burnout, providing additional evidence of the relationship between mentorship and burnout (Mordant et al., 2014).

Peer Behaviors

Peers can be a tremendous source of support for learners, but in some cases poor peer interactions (e.g., competitiveness) can affect a learner's well-being. For example, perceptions of poor peer collaboration and poor relationships with colleagues have been associated with an increased risk of burnout among orthopedic residents training in the Netherlands (van Vendeloo et al., 2014) and among U.S. residents training in 13 specialties in 2 hospitals (Eckleberry-Hunt et al., 2009). A qualitative study involving 26 residents from multiple specialties also found that residents attributed conflict with colleagues to lower states of well-being (Ratanawongsa et al., 2007).

Less is known about the frequency of harassment or belittlement among peer learners and how these relate to the risk of burnout, but a study of first-year dental students found that perceptions of bullying by fellow students was significantly associated with higher perceived stress (Rowland et al., 2010).

Work–Home Conflict

Work–home conflicts are a well-established contributor to burnout among practicing physicians (Dyrbye et al., 2011a,b, 2012). Few studies have explored learners' satisfaction with their work–life integration or experiences of work–home conflict. Small qualitative studies have examined the dual-role responsibilities experienced by residents and how work hours contribute to work–life imbalance (Dahlke et al., 2018; Rich et al., 2016). A study of 252 residents training in Belgium reported that satisfaction with work–life balance was an independent predictor of burnout (van Vendeloo et al., 2018). Similarly, in a study of 2,115 residents training in the Netherlands, conflicts between work and home were found to be important contributors to burnout (Verweij et al., 2017). Conflict between personal and professional obligations was also associated with burnout in a study of pediatric residents (Sagalowsky et al., 2018). Other smaller studies have also reported an association between work–home conflict and higher emotional exhaustion scores, higher depersonalization scores, and overall burnout among residents (Ringrose et al., 2009; Sargent et al., 2004).

By contrast, a qualitative study of 26 residents from multiple specialties indicated that they "viewed residency as a time for temporary imbalance, during which they invested in professional development at the expense of other domains" (Ratanawongsa et al., 2007, p. 273). Although some rebalancing of personal priorities for the sake of professional development may be warranted, the authors noted that excessive self-sacrifice can be detrimental. This point is underscored by findings by Shanafelt and colleagues (2002), which found that among internal medicine residents, those who reported adopting a survival attitude as a significant or essential approach for managing stress were more likely to have burnout.

INDIVIDUAL MEDIATING FACTORS

Personal attributes, beliefs, and experiences likely mediate the relationship between stress and burnout (Dyrbye and Shanafelt, 2016). However, a study of 582 entering medical students attending 6 U.S. medical schools found that the students matriculated with better preserved mental health (less burnout, less depression, and better quality of life in multiple dimensions) than similarly aged college graduates, a finding that persisted after adjusting for age, gender, relationship status, race, and ethnicity (Brazeau et al., 2014). These findings suggest that individuals who choose to become physicians are not inherently more susceptible to becoming burned out.

Personality and Personal Disposition

In a prospective study of learners in the United Kingdom, a weak but statistically significant association was found between higher levels of neuroticism (measured by an abbreviated questionnaire assessing the "big five" personality dimensions), measured both at the time of the study and 5 or more years prior, and emotional exhaustion and depersonalization (measured using a modified MBI) as well as lower career satisfaction once in practice. Individuals who were extroverts also reported lower levels of emotional exhaustion subsequently (McManus et al., 2004). A more recent study of 185 internal medicine residents, which included a 10-item personality instrument assessing extroversion, agreeableness, conscientiousness, emotional stability, and openness to experience, reported that a disorganized personality style was associated with increased odds of developing burnout over the course of the first year of residency (Ripp et al., 2011).

In a longitudinal study involving more than 3,588 individuals followed from the first year of medical school through residency, higher reported levels of anxiety during the fourth year of medical school were associated with higher odds of burnout as a second-year resident (Dyrbye et al., 2018). In a longitudinal study that followed medical students as they transitioned from the Karolinska Institute Medical School into residency, a high degree of worry about the future during the final year of medical school predicted emotional exhaustion (Oldenburg Burnout Inventory) 6 to 10 months after graduation. The authors suggest that students who are anxious about workload, long hours, the volume of information to learn, and their ability to meet future responsibilities may be more vulnerable to burnout as they start residency (Dahlin et al., 2010). In a study of 342 Swedish medical students, a small to moderate relationship was found between performance-based self-esteem and exhaustion and disengagement (as measured by the Oldenburg Burnout Inventory) (Dahlin et al., 2007). Similarly, a correlation between confidence in having the knowledge and skills needed to become an intern was found to be related to burnout (as measured by MBI–General Survey [MBI–GS]) in a small study of 89 third-year medical students (Mazurkiewicz et al., 2012). Other studies suggest that medical students who feel like an "imposter" (Villwock et al., 2016) and residents who report a intolerance of uncertainty may be more likely to experience higher degrees of burnout (Kimo Takayesu et al., 2014; Simpkin et al., 2018).

Few studies have explored the relationship between the underlying reason for entering the medical profession and the risk of developing burnout. One study of 277 medical students in Brazil found that those who had applied for medical school motivated by illness/death experiences were at a great risk for burnout (MBI–SS) according to a multiple regression analysis that controlled for life events, age, and gender; no relationship was found between altruism, economic motivator, or professional esteem as primary career choice motivator and burnout (Pagnin et al., 2013).

Coping and Self-Care Strategies

Learners use a variety of coping and self-care strategies (e.g., exercise, hobbies) to manage stress (Labrague et al., 2018; Ratanawongsa et al., 2007). Greater use of approach-oriented coping strategies (as opposed to avoidant-oriented strategies) was shown to significantly decrease the risk of burnout in a cohort of 161 medical students (Thompson et al., 2016) and among 280 nursing students (Gibbons, 2010). In a study of 244 clinical dental students in Chile, the prevalence and severity of burnout was directly related to the use of "social withdrawal" as a coping strategy (Pérez et al., 2016). Residents who report lacking skills to cope with stress are also more likely to report burnout (Eckleberry-Hunt et al., 2009). Interventions that teach coping skills to reduce the intensity or number of stressors have shown promising results in samples of nursing students (Galbraith and Brown, 2011). How best to teach approach-oriented coping strategies and if coping skills learned early on are transferrable to later practice both warrant additional study.

Similarly, self-care strategies are important. For example, a study of 4,402 medical students found that being compliant with exercise guidelines from the Centers for Disease Control and Prevention was an independent predictor of a lower risk of burnout (Dyrbye et al., 2017a). These students also reported a higher quality of life. Smaller studies of residents have found associations between greater physical activity and both an improved quality of life and a lower risk of burnout (Lebensohn et al., 2013; Weight et al., 2013).

Social Support and Isolation

Social support is a well-established buffer against emotional distress. Relationships with others are an important source of strength for medical students (Jenkins et al., 2018) and residents (Ratanawongsa et al., 2007). Needing to move for training disrupts personal lives and often separates learners from their family and friends, leading to lack of social support outside of training (Rich et al., 2016). Studies have found associations between perceptions of lower social support and the risk of burnout (Santen et al., 2010; Thompson et al., 2016). A large survey involving 2,115 residents in the Netherlands found that social support from family, partner, or colleagues seemed protective against burnout (Verweij et al., 2017). Among U.S. medical residents from 13 specialties in two hospitals, perceived social support was also significantly associated with levels of emotional exhaustion, depersonalization, and personal accomplishment (Eckleberry-Hunt et al., 2009). Sources of social support, however, likely vary for individuals. One small study of 86 third-year medical students found no relationship between having family in the local area and burnout (MBI–GS) (Mazurkiewicz et al., 2012), and a study of 1,294 osteopathic medical students reported that being involved in extramural club activities was associated with a lower risk of burnout (Lapinski et al., 2016).

Personal Life Stressors

Life stressors unrelated to educational or training processes also affect learners' well-being. For example, the number of negative personal life events (e.g., serious illness in a family member) in the previous 12 months was found to be correlated with the risk of burnout in a multi-institutional study of 545 medical students. A multi-variate analysis indicated that personal life events had a stronger relationship with burnout than did year of training (Dyrbye et al., 2006). Similarly, a larger study of osteopathic medical students reported that personal and family stressors were strongly linked to overall burnout (Lapinski et al., 2016). On the flip side, in a subsequent cross-sectional study of 897 first- and second-year medical students, not having a positive life events (e.g., getting married) within the previous 12 months was an independent predictor of burnout (Dyrbye et al., 2009b). Finally, social stressors outside of work were an independent predictor of burnout in a national study of 395 neurosurgical residents (Attenello et al., 2018).

Learners often have a high educational debt with the accompanying financial stress. Although, in a large study of medical students, educational debt has not found to be an independent predictor of burnout (Dyrbye et al., 2010b), a multi-institutional longitudinal study of 1,701 medical students found that those students who worked for income were significantly less likely to recover from burnout over the course of 1 year than students who were not employed (Dyrbye et al., 2010b). In contrast to medical students, educational debt may feel "more real" to residents, as they are in a situation of having to pay back their educational loans. In a study of more than 16,000 internal medicine residents, educational debt was an independent predictor of burnout (West et al., 2011). Although smaller studies support a relationship among education debt, financial stress, and burnout

(Sargent et al., 2004), education debt was not an independent predictor of burnout in a large multi-specialty sample of second-year residents (Dyrbye et al., 2018) or in a 1-year longitudinal study of internal medicine residents (Ripp et al., 2011).

ORGANIZATIONAL AND PROGRAM STRATEGY

There is overwhelming evidence that the characteristics within a particular learning environment are the primary drivers of burnout, leading most health care professional degree accreditation programs to require that learning institutions devote some attention to learner well-being. Yet, the evidence is scant regarding effective organizational and programmatic strategies to reduce the risk of burnout or help learners recover (Wasson et al., 2016; West et al., 2016; Williams et al., 2015). Existing data suggest that organizations, schools, and programs responsible for learners need a multi-pronged strategy that addresses primary, secondary, and tertiary prevention in order to mitigate the risk of trainees developing burnout and to help those individuals with burnout to recover.

Structural Changes to the Learning Environment

Several recent publications have highlighted various approaches to improving the learning environment (Josiah Macy Jr. Foundation, 2018; Wasson et al., 2016) aimed at building a culture of respect (Morrissette and Doty-Sweetnam, 2010) and promoting well-being (Dyrbye and Shanafelt, 2016; Shiralkar et al., 2013). However, a 2016 systematic review found limited evidence showing that specific changes to the learning environment were associated with improved emotional well-being among medical students (Wasson et al., 2016). To improve the learning environment, the authors concluded that medical schools should consider a multi-faceted approach that includes pre-clinical pass–fail curricula and formal faculty advisor–mentor programs. Published studies suggest that pass–fail grading in the pre-clinical years is associated with enhanced student well-being without adverse impact on academic performance (Bloodgood et al., 2009; Reed et al., 2011; Rohe et al., 2006; Spring et al., 2011). Nonetheless, research assessing the relationship between how grades are assigned (e.g., norm-based grading versus criterion-based grading) and learner burnout or the relationship between grading schema and burnout among other health care professional learners does not seem to exist. Similarly there is no definitive evidence concerning whether new curricular models, such as longitudinal clerkships, or accelerated medical school training (e.g., 3-year tracks) lead to a lower risk of burnout.

There is an increasing body of evidence showing that faculty behaviors relate to the well-being of learners. Although some studies suggest that well-prepared preceptors may be able to facilitate new nurses transitioning into the work environment (Thomas et al., 2012), little remains known about how best to design and implement faculty development programming and organizational infrastructure in order to better equip and enable faculty to support and teach learners. The benefits of continuity of supervision (i.e., longitudinal relationships between faculty and learners) have been delineated (Hauer et al., 2012a,b; Hirsh et al., 2007; O'Brien et al., 2012), but the relationship between length of supervision by a faculty member and learner well-being has not been studied.

Lacking are studies focused on changes in the clinical work environment and learner well-being. Because learners and clinicians share the same environments, for at least a part of their experiences, there is a need to learn about the impact of clinician-focused system changes on learner burnout. In the most optimistic view, improvements in the clinician environment should benefit learners as well, but one could imagine that some changes aimed at improving clinician life could have an adverse effect on learners, or vice versa. Studies are also needed to determine how best to support learners involved in medical errors or emotionally laden events, such as unexpected deaths and illnesses in colleagues (Ripp et al., 2017). Some studies suggest some structural changes may effectively mitigate learner burnout. For example, providing medical residents with support from advanced practice providers and scribes (Holmes et al., 2017) and enhancing interprofessional collaboration between advanced practice nurses and junior doctors during overnight shifts (Johnson et al., 2017) have demonstrated some effectiveness.

As part of their overall well-being strategy, some medical schools and residency programs assess learner well-being (Hill and Smith, 2009; Oladeji et al., 2018) via internally or externally administered surveys or by reviewing data from Web-based self-assessment instruments completed by learners or collected nationally by external organizations, such as the Association of American Medical Colleges and ACGME. Doing so can be helpful as data suggest that program directors of residency programs underestimate the prevalence of burnout among their residents (Holmes et al., 2017) and accurately self-assessing one's level of distress is challenging (Shanafelt et al., 2014). Aggregated data from self-assessment instruments can provide organizations and programs with just-in-time information about the well-being of their learners and can allow for the identification of target groups or areas requiring focused attention and resources (Shanafelt and Noseworthy, 2017); self-assessment can also help learners more accurately self-calibrate their own well-being, which may promote health behavior change and help-seeking behavior before distress is severe. Effective strategies for measuring learner well-being use validated measurement tools (NAM, 2018) and ensure the protection of confidentiality, the consent of learners, transparency and honesty in reporting, and the regular evaluation and improvement of learner well-being as part of broader learning environment assessments.

Well-Being Curriculum

Medical schools and residency programs have introduced a breath of curricula to raise awareness, promote self-care, and teach positive coping skills and mindfulness-based stress reduction in an effort to help learners promote their well-being. In a national study of 27 U.S. medical schools, more than half had a well-being curriculum, and most offered a variety of emotional/spiritual, physical, financial, and social well-being activities intended to promote self-care, reduce stress, and build social support for medical students (Dyrbye et al., 2019a). Evaluation strategies consisted mostly of participation rates and student satisfaction. Resources and infrastructure varied substantially across the schools. In a 2012 survey of 212 family medicine residency directors, nearly all reported that they offered stress management lectures or workshops in addition to residency retreats and residency support groups or Balint groups (Gardiner et al., 2015). Similarly, in a study of 107 otolaryngology program directors, nearly all had had a wellness lecture within the past year, provided no-cost mental health resources with extended hours, and financially supported social events for their residents. Less than one-third held seminars in mindfulness or meditation, supported athletic or mental wellness activities, or provided healthy food options (Oladeji et al., 2018). Others have published models for curricula (Williamson et al., 2018) or described how to use a health behavior framework to help learners translate new self-care knowledge into action (Kushner et al., 2011).

Studies on the efficacy of curricula have primarily focused on mindfulness-based stress reduction and have used volunteer learners, with the majority reporting a reduction in burnout and stress and improvements in mood and empathy (de Vibe et al., 2013; Finkelstein et al., 2007; Hassed et al., 2009; Jain et al., 2007; Shapiro et al., 2000; Shiralkar et al., 2013; Warnecke et al., 2011). However, most studies did not include an appropriate control group and were vulnerable to volunteer bias. Several other studies have not found measurable improvements in learners' stress and emotional health as a result of wellness and stress management courses (Dyrbye et al., 2017b; Slavin and Chibnall, 2016) or facilitated small group discussion (Ripp et al., 2016).

A systematic review of the stress reduction and stress management literature targeting student nurses concluded that many work-site programs facilitated problem solving, self-management skills including relaxation and interpersonal skills, affective well-being, and work performance, although a number of design and evaluation inadequacies were identified (Edwards and Burnard, 2003). Additional strategies to reduce anxiety among nurses in the clinical environment have also been suggested. Studies testing the impact of curricular interventions on the rates of burnout among other health professional students are lacking (Moscaritolo, 2009).

Stronger evidence is needed to support the efficacy of wellness curricula aimed at improving learner well-being (Thomas et al., 2016). Learning organizations wishing to integrate wellness curricula should carefully consider the use of existing educational sessions so as to not further overburden learners. In most situations, a menu of offerings, rather than required experiences, is likely to be of greater benefit (Ratanawongsa et al., 2007; Ripp et al., 2017).

KEY FINDINGS

Burnout is highly prevalent among medical students and residents and has important personal and professional consequences, including alcohol abuse or dependence, suicidal ideation, career regret, sub-optimal professional development (professionalism, competency), sub-optimal patient care, and medical error; less is known about its prevalence and consequences in other health care professional learners. The main drivers for burnout among learners have their roots in the learning environment and include grading schema, sub-optimal clinical experiences, inadequate preparation and support, supervisor behaviors, peer behaviors, and a lack of autonomy. In aggregate, existing data make a strong case for strengthening efforts to improve the learning environment, to offer resources to promote well-being, and to support those suffering with symptoms of burnout and other mental health problems. Research to study the extent, contributing factors, and consequences of burnout among learners outside of medicine is needed. Furthermore, additional research is needed to better define the extent of the problem, to understand the long-term effects of learner burnout and whether experiencing burnout early during professional development has personal or professional ramifications later in a career, and to delineate contributing factors in order to inform system-level interventions that can meaningfully reduce burnout during training (short-term) and improve well-being over the long term into practice.

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9

A Research Agenda to Advance Clinician Professional Well-Being

As the committee reviewed the research and evidence relevant to its charge, it found multiple gaps. This chapter discusses these gaps and charts a course forward for the research community and other stakeholders.

LIMITATIONS OF THE EXISTING LITERATURE

In its discussions about the approach to the study charge, the committee deliberated over various manifestations of workplace stress, such as burnout, compassion fatigue, and posttraumatic stress disorder, and concluded that the report should focus on burnout as a barrier to professional well-being. The scope of the literature review and the committee's approach are discussed in Chapters 1 and 2.

Nearly all of the research that the committee found in its extensive review of the literature focused on physicians, residents, medical students, and, to a lesser degree, nursing populations. The committee identified few publications related to burnout and professional well-being in the dentistry and pharmacy professions, suggesting the evidence base in those fields is largely non-existent. Similarly, few studies were identified on burnout and professional well-being among advance practice providers (e.g., advanced practice nurses, nurse anesthetists), other members of the health care team (e.g., physician assistants, physical therapists), fellows in graduate medical education, and learners in nursing, pharmacy, and dentistry. Even the foundational information in these fields, such as the national prevalence of burnout among dentists and pharmacists in practice as well as in training, is not available. There is a strong sense, however, that these clinicians and learners are not immune to the workplace stressors outlined in this report and that they likely have a substantial prevalence of burnout. It also became apparent to the committee that little is known about the contributing factors and the consequences of burnout among these clinician types and that a deeper understanding of the drivers and consequences of burnout across career and life stages for all clinicians is needed.

Overall, the committee found limited evidence for causal relationships between clinician or learner burnout and many of the possible contributing and outcome variables. Most studies reviewed by the committee were cross-sectional correlational and explored a limited number of personal and system factors. The few published longitudinal studies that the committee identified generally had smaller sample sizes and were still correlational in nature. The committee found few randomized trials evaluating the causes of, or solutions to, clinician burnout.

Many studies that the committee reviewed had small sample sizes. In the larger studies it did review, the response rates were typically low and usually the authors did not include a non-response analysis. In many studies the key independent variables, such as clinical workload, were subjectively reported by the same individuals who also provided the key dependent variables, such as burnout or job satisfaction, thereby introducing inherent biases. Most of the available intervention studies focused on individual strategies and often lacked rigorous study design, data collection with validated instruments, appropriate control groups, and long-term follow-up (Panagioti et al., 2017; West et al., 2016). Overall, the evidence for systems solutions for combating burnout is scant across all clinician types.

Questions about generalizability also apply to much of the published research. For many of the contributing factors discussed in the report, there are multiple studies in different settings confirming that the factors do indeed contribute to clinician burnout. Many of the studies examining interventions, however, are limited to a single site. Study sites may have unique features that are difficult to quantify (or even identify or describe) and that may affect the outcome of the intervention. While there is much to learn from the evidence established from single-site studies, their scalability and generalizability are, in many cases, untested. This is important because interventions with positive outcomes in one location may not work in the same way elsewhere without local adjustments.

NEEDED RESEARCH

Moving forward, the research on clinician burnout and professional well-being should employ robust quantitative or qualitative methodologies and study design principles, should include objectively obtained measures of key independent variables, and should use measures of burnout and professional well-being with strong psychometric properties. Validated instruments to measure burnout should be used, as discussed in Chapter 3. A review on this topic has recently been published (NAM, 2018). Similar to the case with the assessment of mental health issues, such as depression, more than one measure can be used to measure the same construct. Although it is not necessary for every study to use the same instrument, each study should use a validated instrument with defined performance characteristics. Although the Maslach Burnout Inventory (MBI)–Human Services Survey is the most widely used instrument and has the most evidence for its validity, other validated tools are available. Other available instruments to measure burnout include the Oldenburg Burnout Inventory, the Copenhagen Burnout Inventory, and the Stanford Professional Fulfillment Index. Instruments to measure dimensions of professional well-being, such as professional fulfillment and engagement, also exist but would benefit from additional validity work, particularly with respect to predictive validity (i.e., whether the scores correlate with outcomes of interest for health care). Instruments are available to measure other professional well-being outcomes of interest, such as compassion fatigue, posttraumatic stress disorder, and engagement. In developing instruments to measure new constructs of professional well-being, it will be essential to use established rigorous scientific processes of instrument development and validation, paying particular attention to concurrent and predictive validity.

Another high-priority research need identified by the committee is the carrying out of longitudinal study designs that enable the exploration of causation as well as the trajectory of burnout over time. Additionally, intervention studies should have randomized controlled or cohort study designs with crossover or appropriate comparison groups and include follow-up at least 6 to 12 months after the end of the intervention. Consideration should also be given to exploring the impact of an intervention in one clinician group on the work-lives and professional well-being of other team members. Select intervention studies should be designed at the interprofessional team level. Interventions should report on cost and be scalable. Pragmatic research that identifies best practices for the implementation of intervention strategies shown to have a positive effect on professional well-being is also needed.

Several investigators have proposed research agendas (Dyrbye et al., 2017a,b; Linzer, 2018). To move the field forward, the committee believes methodologically rigorous research should be conducted within the following five major areas:

1. **Foundational epidemiologic research is needed to better define the prevalence of burnout among select groups of clinicians and learners within select health profession education programs.**

Studies that include large samples of clinicians other than nurses and physicians (e.g., dentists, pharmacists, advance practice providers, and other clinicians) and learners other than medical students and residents (e.g., those in nursing, pharmacy, dentistry, and other clinical health profession education programs and fellows in graduate medical education training programs), preferably from the United States and across practice settings, institutions, and demographic groups, are needed to better define the extent of the problem of burnout in these professional groups. Special attention should be given to understanding how burnout affects underrepresented groups, such as women and racial and ethnic minorities. Studies exploring the prevalence of professional well-being at the interdisciplinary team level are also needed. These studies should employ validated instruments to measure burnout and other dimensions of professional well-being. If studied in combination with samples of other workers from the general population, a more in-depth understanding of the problem could be acquired. There also continues to be a need for well-conducted, longitudinal studies of burnout among physicians, nurses, and other clinicians across practice settings (e.g., private practices, hospitals, nursing care facilities, and community-based organizations in both urban and rural areas) and across modalities of care delivery, including in-person and virtual interactions. Such longitudinal studies in health care profession learners than span the educational continuum would provide useful information about the course of burnout among learners and about whether the experience of burnout as a learner affects the risk of experiencing burnout subsequently once in practice.

2. **Hypothesis-generating research is needed to define optimal professional fulfillment and well-being.**

More than the absence of burnout is required for clinicians and learners to thrive professionally and personally. A number of frameworks of professional fulfillment, engagement, and professional well-being have been developed in an effort to define this concept, and both qualitative and quantitative studies are needed to advance this work. How these constructs relate to enhanced personal, professional, and societal outcomes is also needed, as are intervention studies evaluating how system design can best cultivate and support these qualities for clinicians and learners.

3. **Research is needed to identify work system factors, learning environment factors, and individual mediating factors that increase the risk for burnout or that promote professional well-being among clinicians and health profession learners.**

Research is needed that identifies additional job demands and job resources and individual mediating factors that relate to clinician professional well-being and risk for burnout, recognizing that these issues may need to be examined separately for different types of clinicians (role-specific factors) and different practice settings (e.g., physician versus nurse versus pharmacist, etc.; inpatient versus outpatient; large practice versus solo or small group practice; metropolitan versus rural practice). Research should also be carried out to identify the elements of the learner environment, including online education settings, that contribute to learners developing burnout and the elements that are critical to promoting learner professional well-being. Specifically, longitudinal studies are needed to better identify external environment, health care organization (HCO), learning environment (as applicable), frontline care delivery, and individual factors that contribute to burnout and enhance professional well-being among clinicians and health profession learners. A better understanding of the effects of health information technology on nurses and other non-physician clinicians is also needed, as is a better understanding of the relationship between work and learning environments and the impact that changes in one have on the other and on learners. Efforts should incorporate measures of workload, work complexity, teamwork, professionalism, the learning environment, and other relevant factors (DiAngi et al., 2017; Josiah Macy Jr. Foundation, 2018). Select research priorities within this domain are listed in Box 9-1. Investigators should approach their work with the understanding that identified factors and their relative contributions may vary across different types of clinicians, demographics, career stages, and learners.

4. **Research is needed to gain further understanding of the implications of clinician and learner burnout and professional well-being on patients, clinicians, learners, health care organizations, and society.**

Prospective study designs that measure a variety of independent outcomes (rather than self-report), such as quality, safety, and costs of care, are needed. Studies are needed to advance our understanding of the personal and professional consequences of professional burnout (and its levels of severity), high engagement, and professional well-being. Economic models that estimate the costs of clinician burnout across disciplines, including medicine, nursing, pharmacy, dentistry, and other clinical disciplines, are also needed. Research priorities within this domain are listed in Box 9-2.

BOX 9-1
Research Priorities to Identify Work System Factors and Individual Mediating Factors That Affect Burnout and Professional Well-Being Among Clinicians and Health Professional Learners

External Environment

- What models of health care delivery system (forms of economic integration and employment models) optimize clinician performance and professional well-being?
- What is the effect of specific regulatory policies related to health care delivery and payment on clinician burnout and professional well-being?
- How do non-financial performance incentives, such as price transparency, public performance reporting for consumers, and performance feedback reports to clinicians, affect clinicians' degree of burnout and professional well-being?
- What are the regulatory and compliance factors that contribute to clinicians' administrative burden and clerical tasks? How can such tasks best be measured, leveraging audit log data from electronic health records (EHRs) and other technologies?
- What components of health information technology systems contribute to cognitive load and affect clinician burnout and professional well-being?
- What effect would totally interoperable EHRs have on clinician burnout?
- What is the effect of malpractice liability and tort reform on clinician burnout and professional well-being?
- What are the effects of accreditation rules and licensure requirements, including high-stakes assessment, on clinician and health profession learner burnout and professional well-being?

Health Care Organizations and Frontline Care

- What structural, functional (including clinical), financial, and operational features of a health care organization and health education institution are associated with the risk of burnout among clinicians and learners, and which

5. **Research is needed to evaluate systems-based interventions to prevent and mitigate the risk of burnout and optimize professional well-being across the career span as well as help clinicians and learners with burnout recovery.**

Methodologically robust intervention studies are needed to identify effective systems approaches to preventing and mitigating the risk of clinician and learner burnout and to identifying evidence-based practices to help individuals recover from burnout. This research should identify system approaches to optimizing clinician and learners' professional well-being, including strategies that assist individuals in optimizing the personal factors that mediate stress response. How best to engage clinicians, learners,

features are associated with higher levels of professional well-being? Which features are modifiable?
- What is the relationship between practice-level factors (e.g., delivery model, team composition, hours of operation, panel characteristics [e.g., panel size, complexity of patients seen], hours of operation, appointment length), and workload, job control, flexibility, autonomy, meaning in work, clinician burnout, and professional well-being?
- What are the optimal workloads for clinicians for promoting the quality of care, preventing burnout, and achieving patient safety? How can workload be objectively measured?
- What effect does case complexity have on workload, meaning in work, clinician burnout, and professional well-being?
- What system-level factors affect patient–clinician relationships, and to what extent does lack of continuity of care (i.e., longitudinal patient relationships) threaten meaning in work and contribute to clinician burnout?
- How do different compensation and incentive models influence clinician well-being?
- How does the organizational customization of EHRs affect workload, work efficiency, and clinician burnout and professional well-being?
- Which care team designs facilitate high-quality care, meaning in work, work efficiency, job satisfaction, and professional well-being among all care team members?
- Do system factors affect clinicians differently based on demographic factors such as race, ethnicity, age, and gender?
- What system-level factors affect the learning environment and learner professional well-being?

Individual Mediating Factors

- What modifiable individual characteristics relate to perceptions of social support, resilience, and risk of burnout, and to what degree do they mitigate the negative impact of workplace stress on professional well-being?

and patients in the design of interventions (and system redesign) needs to be explored, as does how best to facilitate these individuals' engagement in research studies. Potential targets for intervention research are listed in Box 9-3 and will be further informed by the research proposed in Boxes 9-1 and 9-2. Interventions that include diverse groups of clinicians and learners as well as studies that target the unique needs of each type of clinician and learner (e.g., physicians, nurses, nurse practitioners, physician assistants, pharmacists, and other clinical disciplines) are both needed. Studies should explore if improving the work environment also improves the learning environment and examine the similarities and differences between effective interventions. Strategies that are effective under research design settings should subsequently be tested further using principles of implementation science to

BOX 9-2
Research Priorities to Further Understand the Effects of Clinician Burnout and Professional Well-Being on Patients, Clinicians, Health Care Organizations, and Society

- What is the relationship between clinician burnout and professional well-being and the quality of care, patient safety, the cost of care, and patient health outcomes? How does this relationship vary by type of clinician?
- What is the relationship between clinician burnout and professional well-being and patient experience, patient engagement, and patient adherence to treatment?

BOX 9-3
Intervention Research Priorities to Prevent and Mitigate the Risk of Burnout, Optimize Professional Well-Being Across the Career Span, and Help Clinicians with Burnout Recovery

External Environment

- What changes in the external environment would prevent or mitigate clinician or learner burnout and promote professional well-being? What types of improvements in health information technology improve workflows, decrease clerical work, and mitigate the risk of burnout and optimize professional well-being?
- What changes in the external environment reduce barriers to help seeking among clinicians and learners?
- What interventions to improve clinician professional well-being also improve patient outcomes and reduce cost of care?

Health Care Organizations and Frontline Care Delivery

- What are the optimal approaches to designing and implementing individual and organizational interventions to reduce clinician or learner burnout and promote professional well-being?
- What are effective ways to engage clinicians and learners in system redesign oriented to reducing burnout and improving professional well-being, including reconfiguration of the electronic health record?
- What organizational interventions in the practice environment reduce burnout and cultivate professional well-being among clinicians and learners?
- What is an optimal workload that maximizes patient outcomes while preserving clinician professional well-being?

- What are the short- and long-term economic costs of clinician burnout and professional well-being?
- How do clinician burnout and professional well-being affect actual turnover, productivity, disability claims, liability, and access to care?
- How does burnout in a clinician affect other members of an interdisciplinary team?
- How does clinician burnout affect learners' professional development, risk of burnout, and professional well-being?
- What is the relationship between burnout among learners and their professional development, career decisions, and future experiences and behaviors once in practice?

- What approaches to workflow optimize team-based care and enhance professional fulfillment for all team members?
- What types and approaches to patient education about navigating interactions with the health system and frontline care team members, including Web-based portals, achieve the dual goal of optimizing the patient experience and streamlining work?
- What practice environment factors optimize the implementation of interventions aimed at increasing efficiency and controlling and improving affordability without increasing clinician burnout?
- How do interventions for one group of clinicians affect the workplace stress and professional well-being of other groups of clinicians? How do interventions in the work environment affect the learning environment and vice versa?
- How do health care organizations optimally incorporate regular assessment of clinician and learner professional well-being and act on results?
- How should organizations evaluate and improve the work and learning environment, help individual clinicians and learners promote their professional well-being, and support those who experience distress?

Individual Mediating Factors

- What personal strategies are essential to accessing resources/services and facilitating recovery from burnout and other types of distress among clinicians and learners?
- What systems-based approaches most effectively provide resources and reduce barriers for individual clinicians and learners to engage in strategies that strengthen their abilities to deal with the stressors inherent to the practices of medicine, pharmacy, and dentistry?

determine the best way to scale and spread such advances. Studies should also explore the unintended consequences of interventions (e.g., impact on other members of the health care team, impact on the work or learning environment). Finally, intervention research that assesses not only the impact on clinician burnout and professional well-being but also the downstream impact on quality, safety, cost of care, and access to care is critically needed. Research priorities within this domain are listed in Box 9-3.

KEY FINDINGS

As documented throughout this report, much is known about the prevalence, causes, and consequences of clinician burnout in physicians and nurses. Less is known about the issue in other clinicians and learners. There is also little known about systems-based approaches to mitigating burnout and promoting professional well-being in all clinicians, including physicians and nurses. The proposed research agenda is robust and has the potential to be transformative. Success in moving the research agenda forward and, ultimately, reducing suffering and improving patient care outcomes will require methodologically strong studies, substantial funding, and collaboration.

A multi-pronged approach involving all stakeholders to addressing research barriers is critical to realizing viable and sustainable solutions. Such effort must be coupled with HCOs making clinician professional well-being a priority, surfacing and testing new ideas, and sharing them with one another and the field to accelerate improvements within their individual organizations and the field at large.

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Conclusions and Recommendations

The magnitude of the burnout problem and the growing consequences for clinicians, patients, and the performance of the U.S. health care system should compel health care leaders to make an immediate and widespread commitment to major systemic changes to improve the clinical work and learning environments. Although enthusiasm for systems approaches to address the problem of clinician burnout is growing, greater progress is warranted, especially in the fundamental ways the system is organized to meet the needs of patients and to support clinicians. Based on its collective assessment of the available evidence, the committee concluded that taking action to mitigate burnout requires a bold vision for redesigning clinical systems—one that focuses on the activities that patients find important to their care and which enables and empowers clinicians to provide high-quality care. Central to the committee's vision for the way forward is an emphasis on the human aspects of care—putting patients, families, caregivers, clinicians, and staff at the center of focus; demonstrating compassion for patients, clinicians, and other care team members; and deriving professional goals and actions from the needs of patients (Thibault, 2019).

The evidence shows that clinician burnout is a complex and multifaceted problem and consequently there is no single solution to achieve the changes that are needed. The committee's conceptual framework, developed to articulate the systems aspects of clinician burnout and professional well-being, communicates that clinician burnout and professional well-being occur within the context of a broader system. Collective, coordinated action is needed across all levels of the health care system—frontline care delivery, the health care organization (HCO), and the external environment—to prevent, reduce, and ultimately eliminate clinician burnout. The committee found that there are many health care stakeholder initiatives intended to address burnout and well-being, such as efforts to raise awareness, collect information about the problems and potential solutions, and pilot new strategies to reduce burnout. Some of the initiatives are in the early phases of development, testing, or implementation, however, the committee found little research demonstrating how effective such efforts are at reducing burnout. Thus, in its recommendations, the committee took both a pragmatic and aspirational approach to considering changes that would prevent and reduce burnout and promote improved professional well-being.

On the basis of established methods and principles in human-centered design, human factors and systems engineering, organizational design, and change management, the committee concluded that there are opportunities to redesign work and learning environments in order to reduce clinicians' and learners' risks of burnout and promote their professional well-being. The principles and guidance for redesign offered in the recommendations target the factors that are known to contribute to clinician burnout and foster professional well-being.

To lay the foundation for progress toward the elimination of clinician burnout and the enhancement of professional well-being, the committee recommends that health system stakeholders pursue the following six goals (listed in Box 10-1) and the associated actions under each goal as described below.

BOX 10-1
Goals for Eliminating Clinician Burnout and Enhancing Professional Well-Being

1. Create Positive Work Environments: Transform health care work systems by creating positive work environments that prevent and reduce burnout, foster professional well-being, and support quality care.
2. Create Positive Learning Environments: Transform health professions education and training to optimize learning environments that prevent and reduce burnout and foster professional well-being.
3. Reduce Administrative Burden: Prevent and reduce the negative consequences on clinicians' professional well-being that result from laws, regulations, policies, and standards promulgated by health care policy, regulatory, and standards-setting entities, including government agencies (federal, state, and local), professional organizations, and accreditors.
4. Enable Technology Solutions: Optimize the use of health information technologies to support clinicians in providing high-quality patient care.
5. Provide Support to Clinicians and Learners: Reduce the stigma and eliminate the barriers associated with obtaining the support and services needed to prevent and alleviate burnout symptoms, facilitate recovery from burnout, and foster professional well-being among learners and practicing clinicians.
6. Invest in Research: Provide dedicated funding for research on clinician professional well-being.

Goal 1. Create Positive Work Environments: Transform health care work systems by creating positive work environments that prevent and reduce burnout, foster professional well-being, and support quality care.

HCOs have a vitally important role in creating and maintaining positive work environments that clinicians find to be safe, healthy, and supportive and that foster ethical and meaningful practice. HCOs can enable the delivery of high-value health care by addressing burnout and its impact on the safety, health, and job satisfaction of the clinical workforce. As presented in Chapter 5 of the report and reflected in the Goal 1 recommendations, HCOs should focus on adopting fundamental principles for redesigning work systems to prevent and reduce clinician burnout and foster professional well-being. The active engagement of clinicians and patients is essential to the efforts of HCOs to create positive work environments, including efforts to prioritize actions, procedures, and policies that will deliver the greatest value to direct patient care.

Recommendation 1A Health care organizations should develop, pilot, implement, and evaluate organization-wide initiatives to reduce the risk of burnout, foster professional well-being, and enhance patient care by improving the work environment. To accomplish this, they should:

- Commit their executive and board leadership to monitor and continuously improve the clinical work environment. Specifically, governing boards should hold organizational leaders accountable for creating and maintaining a positive and healthy work environment.
- Create and maintain, at the health care organization executive level, a leadership role and function responsible for improving and sustaining professional well-being across the organization. This leader and his or her team should strengthen coordination across all organizational programs, especially those that deal with patient care quality and safety and with occupational safety.
- Align the design of interventions to prevent and reduce burnout and promote professional well-being with desired organizational values such as respect, justice, ethical practice, compassion, and diversity.
- Assess the foreseeable impact of business and management decisions on the work environment. Specifically, health care organization leaders should evaluate how decisions may affect clinicians' job demands (e.g., additional clerical and administrative burden on clinicians, competing demands on clinicians, unnecessary stress) and job resources (e.g., supportive managers and leaders, useful and usable technologies, effective teamwork), patient care quality

and safety, and levels of burnout within the organization. Decisions and their implementation should be adjusted accordingly.

- Hold leaders at all levels of the organization accountable for improving the work environment within their scope of responsibility.

Recommendation 1B To guide new systems that have been designed to promote professional well-being and patient care quality, health care organizations should adopt and apply the following principles that improve the work environment and balance job demands and job resources.

- Enhance meaning and purpose in work, and optimize workload and task distribution.
- Facilitate and incentivize interprofessional teamwork, collaboration, communication, and professionalism.
- Establish and sustain an organization-wide and unit-level culture that supports psychological safety and facilitates participatory decision making and peer support.
- Align incentives, compensation, and reward systems for clinicians and work units with organizational and professional values.
- Provide access to resources, such as coaching and adequate time for professional and personal development, to support clinicians in managing stress and adapting to change.

Recommendation 1C Health care organizations should routinely measure and monitor clinician burnout and ameliorate the work system factors that erode professional well-being. To accomplish this, they should:

- Use validated measurement tools to assess the extent of burnout in their organization and the potential contributory factors relevant to their system. It is essential to identify data capture strategies that minimize burden and protect clinicians' privacy and address any stigma or pressure that clinicians may perceive related to measurement or reporting.
- Accurately assess total workload and the complexity of the work expected of clinicians (including continuing professional education, maintenance of certification, required institutional learning modules, and work performed outside of scheduled hours). For clinicians in academic institutions, this assessment of work should include clinical work, research and scholarship, teaching, and service activities required to meet criteria for academic promotion. Clinical work involves cognitive processes, decision making, teams, and social interactions that need to be considered to optimize clinician workload so that it is sustainable.

- Obtain clinician and patient input to identify and eliminate documentation and other administrative burdens in the organization that are not mandatory and contribute little or no value to patient care. Assess opportunities to utilize clinical assistants or nonclinical staff to perform the work.
- Conduct reporting, at a minimum annually, overseen by the governing board, on the professional well-being of the organization's clinicians, including the outcomes of interventions. These reports should be targeted internally, including to leadership, managers, and clinicians.
- Use the data to guide system-oriented efforts to prevent and reduce clinician burnout and improve professional well-being as part of a continuous learning and improvement process in which data are shared transparently within the organization.

Goal 2. Create Positive Learning Environments: Transform health professions education and training to optimize learning environments that prevent and reduce burnout and foster professional well-being.

Health professions educational institutions, affiliated clinical training sites, accreditors, and related external organizations have a responsibility to create and maintain positive learning environments that support the professional development and well-being of students and trainees (learners). Evidence indicates that there is a need to promote professional well-being and address burnout early in professional development. Health professions educational institutions should work together with HCOs to ensure that efforts to prevent and reduce burnout are coordinated across the work and learning environments.

Recommendation 2A Health professions educational institutions and affiliated clinical training sites should develop, pilot, implement, and evaluate initiatives to improve the learning environment and support learner professional well-being. To accomplish this, they should:

- Commit their executive and board leadership to the improvement of the learning environment. Specifically, governing boards should provide the resources necessary to create and maintain a positive learning environment and then hold educational leadership accountable. At the executive level, educators should designate a leadership role and function responsible for improving and sustaining learner professional well-being across the organization and across the continuum of learners. These efforts should be coordinated with individuals charged with improving the clinical environment where learners interact with clinical teachers.

- Ensure that workload, rewards and incentives, and the professional development of faculty and other educators of health professional learners promote positive role model behaviors and the professional development and professional well-being of learners.
- Enhance the ability of learners to contribute meaningfully to patient care while learning, and implement strategies that build relationships among and between learners, faculty, and other health professionals with the intent to build social support and interprofessional practice.
- Create systems of learner evaluation that fairly evaluate competencies while mitigating undue stress and promoting a collaborative learning environment, including criterion-based grading and a consideration of pass–fail grading.
- Provide resources for learners to promote and support their own personal and professional well-being. Establish and sustain a system-wide culture that promotes help-seeking behaviors and supports psychological safety.

Recommendation 2B Health professions educational institutions and affiliated clinical training sites should routinely assess the learning environment and factors that erode professional well-being and contribute to learner burnout. The data should guide systems-oriented efforts to optimize the learning environment, prevent and reduce learner burnout, and improve professional well-being. Health professions educational institutions should:

- Use validated measurement tools to assess the extent of the burnout problem and the potential contributory factors relevant to their system. It is essential to identify data capture strategies that minimize response burden, protect individual privacy, and address any stigma or pressure that learners may perceive related to measurement or reporting.
- Accurately assess the total clinical and academic workload expected of learners (including preparation for licensure examinations and required institutional and professional learning activities) with the goal of achieving a reasonable workload that is sustainable.
- Conduct at least annual reporting, overseen by the leadership of the health professions education institution and affiliated clinical training sites, on the professional well-being of its learners, including the outcomes of interventions taken to improve learner professional well-being. These reports should be targeted internally, including to leadership, learners, and faculty.

- Ensure that barriers to participation in professional well-being assessments are effectively addressed. It is essential for health professions educational institutions to protect learners' privacy and address any stigma or pressure that learners may perceive related to assessment or reporting.
- Use the data to guide systems-oriented efforts to prevent and reduce learner burnout and improve professional well-being as part of a continuous learning and improvement process in which data are shared transparently across learners' health professions educational institutions and affiliated clinical training sites.

Recommendation 2C Accreditors, regulators, national educational organizations, health professions educational institutions, and other related external entities should partner to support the professional well-being and development of learners. To accomplish this, they should:

- Commit, at the highest level, to identifying, implementing, and continuously evaluating strategies that optimize learner professional well-being and development.
- Support the discovery and implementation of evidence-based approaches to reduce the risk of learner burnout and optimize learner professional well-being while simultaneously ensuring the appropriate development of competencies, skills, professionalism, and ethical standards.
- Engage and commit leadership at all levels to curbing learner educational debt, with such strategies as improving access to scholarships and affordable loans and building new loan repayment systems.
- Assess the foreseeable impact of decisions on learner professional well-being. Specifically, accreditors and administrators of licensure and certifying examinations should evaluate how their policies may affect learner professional well-being and willingness to seek emotional support.

Goal 3. Reduce Administrative Burden: Prevent and reduce the negative consequences on clinicians' professional well-being that result from laws, regulations, policies, and standards promulgated by health care policy, regulatory, and standards-setting entities, including government agencies (federal, state, and local), professional organizations, and accreditors.

Health care laws, regulations, policies, and standards in the United States are numerous and, as a whole, immensely complex, and imposed by many entities that are considered part of the external environment. The associated burden of the myriad requirements on clinicians is well documented and includes regulations and standards for the oversight of U.S. clinicians, specifically those addressing payment policies, clinical documentation, quality measurement and reporting, prescription drug monitoring, privacy rules and procedures, pre-authorization forms, and professional and legal requirements for licensure, board certification, professional liability, and health information technology (IT).

Administrative burden is a barrier to quality care that diminishes patient care experiences and contributes to the risk of clinician burnout. Health care policy makers, regulators, and standards-setting bodies have a responsibility to identify and eliminate policies, rules, and processes that impede a clinician's ability to perform productive work necessary for quality patient care and that negatively affect the clinician–patient relationship. These entities should engage clinicians and patients in the process to identify and eliminate health care laws, regulations, policies, standards, and administrative processes that contribute little or no value to patient care.

Recommendation 3A Health care policy, regulatory, and standards-setting entities at the federal and state levels, such as the U.S. Department of Health and Human Services' Centers for Medicare & Medicaid Services and The Office of the National Coordinator for Health Information Technology, the National Quality Forum, state legislatures, professional boards, and departments of health, should systematically assess laws, regulations, policies, and standards to determine their effects on clinician job demands and resources as well as the effects on patient care quality, safety, and cost. To accomplish this, these entities should:

- Allocate the necessary resources to support assessment of the effects of regulations, policies, and standards on clinicians in various care settings. Formal assessment should be conducted both prior to and following implementation in order to evaluate how the requirements affect clinician workload and whether they are redundant or conflict with other requirements. Regulations, policies, and standards should then be modified accordingly based on these findings.
- Apply human-centered design and human factors and systems engineering approaches in developing regulations, policies, and standards, including those related to payment and performance to minimize the potential risk for adverse effects on clinicians and patients.
- Periodically review laws, regulations, policies, and standards related to the clinical work environment for alignment and usability with new technology.

- Align licensure standards and enable broad license reciprocity for all clinicians regulated by states.

Recommendation 3B Health care policy, regulatory, and standards-setting entities, in conjunction with health care organizations, should appreciably reduce documentation requirements and adopt approaches to documentation and reporting that incorporate human-centered design and human factors and systems engineering approaches and that also are technology-enabled. To facilitate this:

- Payers and health care organizations should promote the development and use of technology to streamline documentation for billing and quality reporting, with the goal of decreasing to the greatest extent possible clinicians' workload and non–patient care–related work.
- Professional certification and health care accrediting entities should coordinate efforts to align documentation requirements, streamline reporting, and eliminate redundant processes and requirements that contribute to unnecessary burden.

Goal 4. Enable Technology Solutions: Through collaboration and engagement of vendors, clinicians, and expert health information technology system developers, optimize the use of health information technologies to support clinicians in providing high-quality patient care.

Many challenges of health IT are reported to affect clinician professional well-being, including problems with the usefulness and usability of health IT tools, their poor integration into clinical workflow, difficulty sharing information among clinical team members and settings, and limitations in supporting clinical decision making. Despite nascent industry and regulatory efforts to improve health IT design and evaluation, many clinicians find these technologies excessively challenging and time consuming to use. Strategies are needed in which vendors, clinicians, HCOs, regulators, and policy makers in the broader external environment can work together to address the current challenges and support the integration of new technologies and approaches with the overarching goal of improving patients', caregivers', and clinicians' care experiences and outcomes.

Recommendation 4A Stakeholders should engage clinicians in the design and deployment of health information technology (IT), including electronic health records, using human-centered design and human factors and systems engineering approaches to ensure the effectiveness, efficiency, usability, and safety of the technology. For example:

- Regulators should use rigorous human factors usability and safety criteria to evaluate and certify health IT.
- Health IT vendors and health care organizations should design and configure systems to improve the clinical work environment, including attention to cognitive load and workflows that reduce the demand of clinical documentation and automate non-essential tasks.
- Health IT vendors, health care organizations, and regulators should closely monitor implemented technology for negative consequences and should have an existing mitigation plan to address them as they arise.
- Policy makers and organizational leaders should create incentives for, and lower barriers to, the development and implementation of new ideas, approaches, and technologies that have the promise of enhancing professional well-being as well as improving the quality of care.

Recommendation 4B Federal and state policy makers should facilitate the optimal flow of useful information among all members of the health care community through regulation and rule making. Health information sources should be shared efficiently, safely, and securely, including but not limited to electronic health records, electronic pharmacy records, digital health applications, medical devices, and quality data repositories.

Recommendation 4C Federal policy makers, in collaboration with private-sector health IT companies and innovators and other relevant stakeholders, should develop the infrastructure and processes that will lead to a truly patient-centered and clinically useful health information system. This would be an electronic interface that gives the entire care team, including the patient, the ability to collect and use timely and accurate data to achieve high-quality care. A major goal of this new health information system should be to allow clinicians to focus on optimizing patient and population health, while adjuvant processes and technologies derive, to the extent possible, the essential business, administrative, and research data necessary to deliver high-value care efficiently and effectively.

Goal 5. Provide Support to Clinicians and Learners: Reduce the stigma and eliminate the barriers associated with obtaining support needed to prevent and alleviate burnout symptoms, facilitate recovery from burnout, and foster professional well-being among learners and practicing clinicians.

Research shows that stigma (negative perceptions, attitudes, and discrimination) associated with seeking emotional and mental health help is pervasive in American society. Such stigma thrives in the health professions because of the culture and training, the perceptions of health professionals, and the expectations and responses of HCOs, licensure boards, and other external organizations. Reducing stigma and eliminating barriers to help-seeking are critical to improving the professional well-being of clinicians and learners.

Recommendation 5A State licensing boards, health system credentialing bodies, disability insurance carriers, and malpractice insurance carriers should either not ask about clinicians' personal health information or else inquire only about clinicians' current impairments due to any health condition rather than including past or current diagnosis or treatment for a mental health condition. They should be transparent about how they use clinicians' health data and supportive of clinicians in seeking help.

Recommendation 5B State legislative bodies should create legal protections that allow clinicians to seek and receive help for mental health conditions as well as to deal with the unique emotional and professional demands of their work through employee assistance programs, peer support programs, and mental health providers without the information being admissible in malpractice litigation.

Recommendation 5C Health professions educational institutions, health care organizations, and affiliated training sites should identify and address those aspects of the learning environment, institutional culture, infrastructure and resources, and policies that prevent or discourage access to professional and personal support programs for individual learners and clinicians.

Goal 6. Invest in Research: Provide dedicated funding for research on clinician professional well-being.

The compelling evidence of the alarmingly high rates of burnout and its negative effects on the health care system and patient care requires the expansion and support of research and innovation in this area. Such support can be achieved through the collaborative efforts of government bodies and organizations charged with improving care quality and patient safety, improving the patient experience, reducing health care costs, and supporting the professional development of learners and clinicians in the health professions.

Recommendation 6A By the end of 2020 federal agencies, including the Agency for Healthcare Research and Quality, the National Institute for Occupational Safety and Health, the Health Resources and Services Administration, and the U.S. Department of Veterans Affairs, should develop a coordinated research agenda to examine:

- Organizational, learning environment, and health care system factors that contribute to occupational distress and threaten or promote the professional well-being of health care learners and practicing professionals;
- The implications of clinician and learner distress and degraded professional well-being on health care and workforce outcomes as well as personal outcomes; and
- Potential system-level interventions to improve clinician and learner professional well-being and help those with burnout to recover.

These federal agencies should commit funding to implement this research agenda. The amount of this funding should be commensurate with the magnitude of the problem and its impact on the health care delivery system. A particular area of focus should be the support of rigorous prospective empirical studies, including multi-center randomized controlled trials, of system-level interventions.

Recommendation 6B Federal agencies, including the Agency for Healthcare Research and Quality, the National Institute for Occupational Safety and Health, the Health Resources and Services Administration, and the U.S. Department of Veterans Affairs, should pursue and encourage opportunities for public–private partnerships among a broad range of stakeholders, such as health professional associations, foundations, payers, health care industry, health care organizations, health professions educational institutions, and professional liability insurers, to support research on clinician and learner professional well-being and burnout. Organizations need to be willing to test, learn, and share in order to accelerate the pace of change. A public–private partnership should support the creation and ongoing management of a national registry of evidence-based interventions to facilitate research and innovation beneficial to every stakeholder with responsibility for eliminating clinician and learner burnout and improving professional well-being.

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Appendix A

Committee and Staff Biographies

COMMITTEE

Pascale Carayon, Ph.D. (*Co-Chair*), is Leon and Elizabeth Janssen Professor in the College of Engineering, the Director of the Wisconsin Institute for Healthcare Systems Engineering (WIHSE), and she leads the Systems Engineering Initiative for Patient Safety (SEIPS) at the University of Wisconsin–Madison. Dr. Carayon has three decades of research experience analyzing, designing, and improving complex work systems such as those found in health care. In the past 20 years, her research has focused on patient safety and other health care quality issues such as design and implementation of health information technologies. As an industrial and systems engineer, she is renowned for her groundbreaking contributions in modeling complex system interactions in health care processes that can lead to medical errors and other adverse outcomes for patients and health care professionals. Dr. Carayon is the editor of the *Handbook of Human Factors and Ergonomics in Health Care and Patient Safety*. Dr. Carayon is a Fellow of the Human Factors and Ergonomics Society, Fellow of the International Ergonomics Association, member of the editorial boards of *Behavior and Information Technology*, *Work & Stress* and the *Journal of Patient Safety*. Dr. Carayon is currently Chair of the Board on Human-Systems Integration in the Division of Behavioral and Social Sciences and Education of the National Academies of Sciences, Engineering, and Medicine.

Christine K. Cassel, M.D. (*Co-Chair*), is Senior Advisor on Strategy and Policy, Professor of Medicine at the University of California, San Francisco.

Recently, Dr. Cassel served as Planning Dean of the new Kaiser Permanente School of Medicine. An internist and geriatrician, Dr. Cassel was President and Chief Executive Officer (CEO) of the National Quality Forum, and served as President and CEO of the American Board of Internal Medicine (ABIM) and the ABIM Foundation, and as the former President of the American College of Physicians. She served on the President's Council of Advisors on Science and Technology (PCAST) under President Barack Obama and was the Co-Chair and Physician Leader of PCAST reports, working group on issues relating to health information technology; advances in technology for hearing, technology, and aging; and ensuring the safety of the nation's drinking water A national leader in efforts to inspire quality care, she was a founding member of the Commonwealth Fund's Commission on a High Performance Health System, and served on the Institute of Medicine (IOM) committees that wrote the influential reports *To Err Is Human* and *Crossing the Quality Chasm*. In addition to having chaired IOM reports on end-of-life care and public health, she served on the IOM's Comparative Effective Research (CER) Committee mandated by U.S. Congress to set priorities for the national CER effort. She is an active scholar and lecturer on geriatric medicine, aging, bioethics, and health policy.

Elisabeth Belmont, Esq., serves as Corporate Counsel for MaineHealth, which is ranked among the nation's top 100 integrated health care delivery networks and has combined annual revenues of nearly $2 billion. She is responsible for a myriad of complex issues faced by an integrated delivery system on a daily basis and has a specialty concentration in health information and technology. Ms. Belmont has participated in a number of national initiatives in which quality improvement, patient safety, and information technologies intersect including events sponsored by the U.S. Department of Health and Human Services (HHS) Office of the National Coordinator for Health Information Technology (ONC), HHS Office of Inspector General, American Health Lawyers Association, American Society of Healthcare Risk Management, and American Association for the Advancement of Science. She serves as a member of the Division Committee of the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. She is a former member of the National Academies' Board on Health Care Services of the Health and Medicine Division, and participated as a member of the National Academies' consensus study Committee on Diagnostic Error in Health Care. Additionally, Ms. Belmont is a past President of the American Health Lawyers Association, former Chair of the Association's Health Information & Technology Practice Group, and former Chair of the Association's Quality in Action Task Force. She also was appointed Co-Chair of the National Quality Forum's Health IT Patient

Safety Measures Standing Committee. Ms. Belmont previously served on the Advisory Boards of Bloomberg's *Health Law Reporter* and *Health Law & Business News*. Ms. Belmont co-authored agency guidance, *EHR Contracts Untangled: Selecting Wisely, Negotiating Terms and Understanding the Fine Print*, for the HHS ONC. She is the recipient of numerous honors, including being named by Modern Healthcare as one of the 2007 Top 25 Most Powerful Women in Healthcare, being selected to receive the American Health Lawyers Association 2014 David J. Greenburg Service Award, and being named by the National Academies as a 2016 National Associate for outstanding contributions to the work of the National Academies.

Neil A. Busis, M.D., FAAN, is Director of Community Neurology and Director of the General Teleneurology Program of the University of Pittsburgh Medical Center (UPMC) Department of Neurology. He is Clinical Professor of Neurology at the University of Pittsburgh School of Medicine and Chief of Neurology and Director of the Neurodiagnostic Laboratory at UPMC Shadyside. He serves on the UPMC Physician Wellness Committee. Prior to joining UPMC in 2012, Dr. Busis was in the private practice of neurology for 27 years. Dr. Busis has expertise in practice issues—especially coding, billing, reimbursement, and regulatory agency advocacy—and in health information technology, including electronic health records and the use of telemedicine, and Web-based resources and mobile devices to enhance medical practice. Dr. Busis was Co-Chair of the American Academy of Neurology's (AAN's) Neurologist Wellness Task Force Study Group and principal investigator of its neurologist burnout study. He serves as Vice Chair of the AAN Health Policy Subcommittee and is a member of its Joint Coordinating Council on Wellness and Neurology Outcome Quality Measure Development Work Group. He is the AAN's Alternate Advisor on the American Medical Association's (AMA's) CPT Advisory Committee. Dr. Busis is a member of the Steering Committee and co-leads the Action on Consensus Report Recommendations Working Group of the National Academy of Medicine's (NAM's) Action Collaborative on Clinician Well-Being and Resilience. He was formerly co-lead of the Messaging and Communications Working Group and a member of the Publications and Art Show Working Group of the NAM Action Collaborative.

M. Lynn Crismon, Pharm.D., FCPP, BCPP, is Dean, James T. Doluisio Regents Chair and Behrens Centennial Professor, College of Pharmacy, and Professor of Psychiatry, Dell Medical School, at The University of Texas at Austin. He is board certified in psychiatric pharmacy by the Board of Pharmacy Specialties, and he is a Diplomate of the American Board of Clinical Pharmacology. Prior to becoming Dean, he developed a nationally recognized training program in psychiatric pharmacotherapy and mental health outcomes research and supervised post-Pharm.D., psychiatric pharmacy residents, research fellows, and graduate students. His research, scholarship, and practice have focused on the development and evaluation of strategies to improve the pharmacotherapy and health outcomes of adults and children with severe mental disorders. Dr. Crismon is a past Chair of the American Association of Colleges of Pharmacy (AACP) Council of Deans, past member of the AACP Board of Directors, a past member of the American College of Clinical Pharmacy (ACCP) Board of Regents, ACCP Research Institute Board of Trustees, and a current member of the National Institute for Pharmaceutical Technology and Education (NIPTE) Board of Directors.

Liselotte Dyrbye, M.D., MHPE, is Professor of Medicine & Medical Education and Co-Director, Program on Physician Well-Being at the Mayo Clinic. Dr. Dyrbye is a general internist in Community Internal Medicine, Mayo Clinic, Minnesota, and holds many key positions, including Department of Medicine Associate Chair for Faculty Development, Staff Satisfaction, and Diversity, Director of Faculty Development for the Mayo Clinic School of Graduate Medical Education, and Executive Director of the Mayo Clinic Academy of Educational Excellence. Her research addresses the prevalence, drivers, and consequences of burnout and mitigating strategies. She collaborates with numerous national organizations in an ongoing effort to translate the body of knowledge generated by herself and others into meaningful and substantive changes for the medical profession. Dr. Dyrbye is a member of the National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience, the National Board of Medical Examiners Effort on Wellness Task Force, and the Physician Well-Being Task Force of the Accreditation Council for Graduate Medical Education.

Pooja Kinkhabwala, D.O., is an Endocrinology Fellow at Larkin Community Hospital. She completed her Internal Medicine Residency as resident physician at the Hackensack Meridian Health Palisades Medical Center. In addition to her experience as a practicing physician in internal medicine, Dr. Kinkhabwala has been engaged in activities to address physician and resident wellness. She is a member of the American Osteopathic Association Task Force on Physician Wellness and is a co-author of the paper "Addressing Burnout, Depression, and Suicidal Ideation in the Osteopathic Profession: An Approach That Spans the Physician Life Cycle," published by the National Academy of Medicine in 2017. Dr. Kinkhabwala is a past President of the American Association of Physicians of Indian Origin–Medical Student/Resident/Fellow Section.

Wanda Lipscomb, Ph.D., is the Senior Associate Dean for Diversity and Inclusion and the Associate Dean for Student Affairs at the Michigan State University College of Human Medicine. Dr. Lipscomb is a tenured Associate Professor of Psychiatry. Trained as a psychologist, Dr. Lipscomb has an active interest in the areas of medical student development and engagement, medical student health and wellness, mental health, improving diversity in the health professions workforce, and improving health care services. In her role as Associate Dean for Student Affairs, Dr. Lipscomb oversees health and wellness, career development, professional development, community engagement, records, enrollment, financial aid, and services for medical students. Dr. Lipscomb is the National Chair of the Group on Student Affairs of the Association of American Medical Colleges. The Group on Student Affairs coordinates constituency activities in medical student affairs including health and wellness, careers in medicine, admissions, financial advising, student records, and student diversity. Dr. Lipscomb also currently serves on the GSA National Committee on Student Affairs and is the President of the National Council on Diversity in the Health Professions.

Saranya Loehrer, M.D., M.P.H., serves as the Head of Innovation at the Institute for Healthcare Improvement (IHI). In this capacity, she leads a team of curious and creative researchers responsible for exploring seemingly intractable impediments to health and health care improvement and developing actionable theories and tools that can be tested in collaboration with partners worldwide. In addition, Dr. Loehrer supports selected efforts of the IHI Leadership Alliance, a group of more than 40 leading U.S. health care executives working courageously and collaboratively to deliver on the full promise of the Triple Aim. Prior to joining IHI, Dr. Loehrer worked for Physicians for Human Rights, leading global and domestic grassroots advocacy efforts to create more just and scientifically sound HIV/AIDS policies. She received her M.D. from the Loyola University Chicago Stritch School of Medicine, where she was an Albert Schweitzer Fellow, and her M.P.H. from the Harvard School of Public Health, where she was a Zuckerman Fellow.

M. A. J. Lex MacNeil, D.D.S., retired (June 2019) as Professor and Founding Dean, College of Dental Medicine–Illinois (CDMI) at Midwestern University. Prior to his appointment at CDMI in 2009, Dr. MacNeil was a full-time general dental practitioner and then spent 15 years as the Associate Dean for Clinical Affairs and tenured Associate Professor in the Department of Oral Health Sciences at the University of British Columbia. Dr. MacNeil has extensive expertise in organizational planning and clinical operations for dental education programs, including the development and implementation of a hybrid Problem-Based Learning (PBL) curriculum and the development of person-centered care and group practice models to support clinical education. Dr. MacNeil is a graduate of the Midwestern University Costin Institute for Medical Educators, a program for medical personnel involved in teaching and academic management. Additionally, he is a past President of the Association of Canadian Faculties of Dentistry (ACFD), the national association for dental education in Canada. For more than 20 years, Dr. MacNeil has worked collaboratively with private-sector software corporations on the development of electronic health records and patient management software systems, and is currently focused on improving design and interoperability aimed at enhancing health care and learning in dental education, dental practice and interprofessional settings. As well, Dr. MacNeil continues to serve as a consultant in the wider realm of pre-doctoral dental education, particularly in the clinical domain.

José A. Pagán, Ph.D., is Professor and Chair of the Department of Public Health Policy and Management in the College of Global Public Health at New York University. He is also Adjunct Senior Fellow of the Leonard Davis Institute of Health Economics at the University of Pennsylvania and Chair of the Board of Directors of New York City Health + Hospitals. Dr. Pagán is a health economist who has led research, implementation, and evaluation projects on the redesign of delivery and payment systems. His research interests include population health science, health care payment and delivery system reform, and the social determinants of health. He was a member of the Committee on Accessible and Affordable Hearing Health Care for Adults at the National Academies of Sciences, Engineering, and Medicine. Dr. Pagán was Director of the Center for Health Innovation at The New York Academy of Medicine and Professor in the Department of Population Health Science and Policy at the Icahn School of Medicine at Mount Sinai. He was a member of the Board of Directors of the Interdisciplinary Association for Population Health Science and the American Society of Health Economists. He also chaired the National Advisory Committee of the Robert Wood Johnson Foundation's Health Policy Research Scholars.

Sharon H. Pappas, R.N., Ph.D., NEA-BC, FAAN, is the Chief Nurse Executive for Emory Healthcare. She is a member of Emory Healthcare and the Woodruff Health Science Center's senior leadership teams and is responsible for nursing practice across Emory's hospitals, ambulatory care, and post-acute agencies. Dr. Pappas served on the Colorado Board of Nursing and served on the Governor's Task Force for Nurse Staffing. Throughout her career, Dr. Pappas has focused on the role nurses and the nursing environment play in patient safety and hospital costs. She serves as professor for the Nell Hodgson Woodruff School of Nursing. Dr. Pappas is a member of the American Nurses Association, the Council on Graduate Education for Administration in Nursing, and the American

Organization of Nurse Executives (AONE), for which she served as a Board member and currently represents AONE on the Commission on Magnet® for the American Nurses Credentialing Center. Dr. Pappas is a Fellow in the American Academy of Nursing, for which she co-chairs the Expert Panel on Building Health Care System Excellence.

Cynda Hylton Rushton, Ph.D., R.N., FAAN, is the Anne and George L. Bunting Professor of Clinical Ethics in the Johns Hopkins Berman Institute of Bioethics and the School of Nursing, with a joint appointment in the School of Medicine's Department of Pediatrics. A founding member of the Berman Institute of Bioethics, Dr. Rushton co-chairs the Johns Hopkins Hospital's Ethics Committee and Consultation Service. An international leader in nursing ethics, Dr. Rushton in 2014 co-led the first National Nursing Ethics Summit, convened by the Johns Hopkins Berman Institute of Bioethics and School of Nursing. In 2016 she co-led a national symposium focusing on transforming moral distress by cultivating moral resilience and ethical practice. Her current scholarship in clinical ethics focuses on moral suffering of clinicians, the development of moral resilience, palliative care, and designing a culture of ethical practice in health care. She is a Fellow of the American Academy of Nursing and the Hastings Center. She has served on the Institute of Medicine's committee on increasing rates of organ donation and was a consultant to its project When Children Die. She also was appointed the first Chair of the Maryland State Council on Quality Care at the End-of-Life. She is editor and author of the recently released book *Moral Resilience: Transforming Moral Suffering in Healthcare*.

Tait Shanafelt, M.D., is the Jeanie and Stew Ritchie Professor of Medicine, Associate Dean and Chief Wellness Officer at Stanford Medicine. A hematologist–oncologist by training, Dr. Shanafelt is a leading researcher on clinician burnout and its impact on quality of care, access to care, and the health care workforce. Prior to his position at Stanford, Dr. Shanafelt was a Professor of Medicine and Hematology at the Mayo Clinic and served a 3-year term as President of the Mayo Clinic voting staff from 2013 to 2016. He was the founding Director of the Mayo Clinic Department of Medicine Program on Physician Well-Being and led a number of initiatives at Mayo to mitigate burnout and improve physicians' sense of fulfillment and well-being. He has published more than 325 peer-reviewed manuscripts and research studies, including more than 125 on the topic of health care professional well-being. His research in this area has involved physicians at all stages of their career, from medical school to practice, and has included many multi-center and national studies. In 2018, he was named by *Time Magazine* as one of the 50 most influential people in health care.

George Thibault, M.D., is former President for the Josiah Macy Jr. Foundation and the Daniel D. Federman Professor of Medicine and Medical Education Emeritus at Harvard Medical School (HMS). Prior to that position, he served as Vice President of clinical affairs at Partners Healthcare System in Boston and Director of the Academy at HMS. Dr. Thibault previously served as Chief Medical Officer at Brigham and Women's Hospital and as Chief of Medicine at the Harvard-affiliated Brockton/West Roxbury Veterans Affairs Hospital. He was Associate Chief of Medicine and Director of the Internal Medical Residency Program at the Massachusetts General Hospital (MGH), where he also served as director of the medical intensive care unit and the founding director of the Medical Practice Evaluation Unit. For nearly four decades at HMS, Dr. Thibault played leadership roles in many aspects of undergraduate and graduate medical education. He has been Chairman of the Board of the MGH Institute of Health Professions and The New York Academy of Medicine. He currently serves on the boards of The New York Academy of Medicine and the Arnold P. Gold Foundation. In 2017 he was the recipient of the Abraham Flexner Award for Distinguished Service to Medical Education from the Association of American Medical Colleges, and he is a member of the National Academy of Medicine.

Vindell Washington, M.D., is Chief Medical Officer at Blue Cross and Blue Shield of Louisiana, where he leads statewide efforts to focus the health care system on delivering patient-centered, high-value care for its members. Dr. Washington, who has extensive experience in leading clinical teams and in health information technology (IT), most recently served as the national coordinator for health care information technology in the U.S. Department of Health and Human Services. In that role he led the nation's efforts to promote the use of health IT, data interoperability, and delivery system reform. Prior to that, Dr. Washington was at the Franciscan Missionaries of Our Lady Health System in Baton Rouge for more than 7 years serving in senior clinical and administrative roles, including Medical Group President and Chief Medical Information Officer. A board-certified emergency medicine physician, Dr. Washington is the former Chief Executive Officer of Piedmont Emergency Medicine Associates, a large private medical group in Charlotte, North Carolina.

Matthew B. Weinger, M.D., is a Fellow of the Human Factors and Ergonomics Society, holds the Norman Ty Smith Chair in Patient Safety and Medical Simulation, and is a Professor of anesthesiology, biomedical informatics, and medical education at the Vanderbilt University School of Medicine. He is the Director of Center for Research and Innovation in Systems Safety at Vanderbilt University Medical Center, and is a Professor of civil and environmental engineering in the Vanderbilt University School of Engineering. Dr. Weinger has been teaching and conducting research in human factors in health care, patient safety, and clinical decision making for three decades. He has done research on burnout, distraction, fatigue, and the effects of information technology on clinician performance. He served as Vice Chair for research on the Board of Directors of the Association for the Advancement of Medical Instrumentation (AAMI) and as the Co-Chair of its Human Factors Engineering standards committee for 13 years. He continues to be a member of that committee as well as on the AAMI committee developing national standards for health information technology. He is currently a member of a committee of the American Board of Anesthesiology developing a new simulation-based assessment exam for primary certification of anesthesiologists. He is a member of the Board on Human-Systems Integration in the Division of Behavioral and Social Sciences and Education at the National Academies of Sciences, Engineering, and Medicine.

STAFF

Laura Aiuppa Denning, M.S., is a Senior Program Officer at the National Academies of Sciences, Engineering, and Medicine. Since 2010, Ms. Aiuppa has directed various National Academies policy research studies and program evaluations in support of high-quality health care in the United States. She recently served as rapporteur for *Long-Term Survivorship Care After Cancer Treatment: Proceedings of a Workshop* (2018). Other past studies led by Ms. Aiuppa address mental health care for military service members, veterans, and families, including *Evaluation of the Department of Veteran Affairs Mental Health Services* (2018), *Preventing Psychological Disorders in Service Members and Their Families: An Assessment of Programs* (2014), and *Returning Home from Iraq and Afghanistan: Readjustment Needs of Veterans, Service Members, and Their Families* (2013). Prior to her employment at the National Academies, Ms. Aiuppa was a Program Director at the National Committee for Quality Assurance, where she led health care quality measurement and reporting projects. Ms. Aiuppa began her career working as a research associate at a health care consulting firm serving federal clients. Ms. Aiuppa received a bachelor's degree in health and society from the University of Rochester and earned a master's of science degree in health policy and program evaluation from Cornell University.

Marc Meisnere, M.S.P.H., is an Associate Program Officer on the National Academies of Sciences, Engineering, and Medicine's Board on Health Care Services. Since 2010, Mr. Meisnere has worked on a variety of National Academies' consensus studies and other activities that focused on mental health services for service members and veterans, suicide prevention, primary care, and clinician well-being. Before joining the National Academies, Mr. Meisnere worked on a family planning media project in northern Nigeria with the Johns Hopkins Center for Communication Programs and on a variety of international health policy issues at the Population Reference Bureau. He is a graduate of Colorado College and the Johns Hopkins Bloomberg School of Public Health.

Heather Kreidler, M.S., was Associate Program Officer for the National Academies' Board on Environmental Change and Society and the Board on Human-Systems Integration until 2019. She joined the National Academies in 2008 and worked on wide-ranging topics including public health, nutrition, dietary guidance, and issues facing children, youth, and families. Her projects examined and advanced the social and behavioral sciences at the intersection of human activity and global environmental change and issues concerning the relationship of individuals and organizations to technology and the environment. Ms. Kreidler received a B.S. in business management from Kutztown University in Pennsylvania and an M.S. in environmental science and policy from George Mason University.

Rajbir Kaur was Senior Program Assistant in the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. She supported various convening activities at the National Academies, including the Roundtable on Quality Care for People with Serious Illness and the Forum on Mental Health and Substance Use Disorders. Prior to joining the National Academies, she was a Clinical Quality Coordinator at Erickson Living and an intern for the Office of Minority Health at the Centers for Medicare & Medicaid Services. Ms. Rajbir graduated from the University of Maryland, Baltimore County, with a degree in health administration and public policy.

Sharyl J. Nass, Ph.D., serves as Director of the Board on Health Care Services and Director of the National Cancer Policy Forum at the National Academies of Sciences, Engineering, and Medicine. The National Academies provide independent, objective analysis and advice to the nation to solve complex problems and inform public policy decisions related to science, technology, and medicine. To enable the best possible care for all patients, the board undertakes scholarly analysis of the organization, financing, effectiveness, workforce, and delivery of health care, with emphasis on quality, cost, and accessibility. The forum examines policy issues pertaining to the entire continuum of cancer research and care. For two decades, Dr. Nass has worked on a broad range of health and science policy topics that includes the quality and safety of health care and clinical trials, developing technologies for precision medicine, and strategies for large-scale biomedical science. She has a Ph.D. from Georgetown University and undertook postdoctoral training at the Johns Hopkins University School of Medicine, as well as a research fellowship at the Max Planck Institute in Germany. She also holds a B.S. and an M.S. from the University of Wisconsin–Madison. She has been the recipient of the Cecil Medal for Excellence in Health Policy Research, a Distinguished Service Award from the National Academies, and the Institute of Medicine staff team achievement award (as team leader).

Toby Warden, Ph.D., is the director for the Board on Human-Systems Integration (BOHSI) and the Board on Environmental Change and Society at the National Academies of Sciences, Engineering, and Medicine. Dr. Warden is returning to the National Academies after a 2-year period as the director of Scientific Administration for the Department of Neurological Sciences and as an assistant Professor at the University of Nebraska Medical Center, spearheading strategic planning efforts to foster research collaboration. Previously at the National Academies, she began in 2009 as a Study Director on climate change and weather-related activities with the Board on Atmospheric Sciences and Climate. She joined BOHSI in 2011 as a Study Director, and later Associate Board Director, working on a number of activities related to worker safety, safety culture, systems design, and organizational performance. She holds a Ph.D. in social ecology with an emphasis on environmental analysis and design from the University of California, Irvine. A member of the Human Factors and Ergonomics Society, she also holds a certificate in Business Fundamentals from HBX/Harvard Business School.

Appendix B

Medicare Program, The Joint Commission, and *International Classification of Diseases, Tenth Revision*, Clinical Documentation and Coding Requirements

Clinical Documentation and Coding Requirements	Regulatory, Accreditation, and Coding Citations	Brief Description
Medical Record Services-Documentation	42 CFR § 482.24(c), Condition of participation: Medical record services	• Content of record.
Medical Record Services-Orders	42 CFR § 482.24(c)(3)(i), Condition of participation: Medical record services 42 CFR § 482.24(c)(3)(ii), Condition of participation: Medical record services 42 CFR § 482.24(c)(3)(iii), Condition of participation: Medical record services	• Orders reviewed and approved by medical staff and nursing and pharmacy leadership. • Orders are consistent with nationally recognized and evidence-based guidelines. • Orders are dated, timed, and authenticated promptly.

Clinical Documentation and Coding Requirements	Regulatory, Accreditation, and Coding Citations	Brief Description
Medical Record Services-History and Physical	42 CFR § 482.24(c)(4)(i)(A), Condition of participation: Medical record services 42 CFR § 482.24(c)(4)(i)(B), Condition of participation: Medical record services	• Medical history and physical examination. • Updated changes to history and physical within 30 days. • Admitting diagnosis. • Consultative evaluations and clinical findings. • Documentation of complications, unfavorable reactions to drugs and anesthesia, and hospital-acquired infections. • Documentation of properly executed consent forms. • Documentation necessary to monitor patient's condition, including orders, nursing notes, treatment reports, medication records, radiology and laboratory reports, and vital signs.
Medical Record Services-Discharge Summary	42 CFR § 482.24(c)(4)(vii) and (viii), Condition of participation: Medical record services	• Documentation of discharge summary, hospitalization outcome, case disposition, and provisions for follow-up care. • Documentation of a final diagnosis with completion of the medical record within 30 days.
Medical Record Services-Discharge Planning	42 CFR § 482.43(c)(6)(iii) Condition of participation: Discharge planning	• Documentation of a list of home health aides or skilled nursing facilities that are available, participating in Medicare Program and serves the geographic area in which patient resides or requests, and that the list was presented to the patient or authorized individual.

Clinical Documentation and Coding Requirements	Regulatory, Accreditation, and Coding Citations	Brief Description
Surgical Services	42 CFR § 482.51(1)(i) Condition of participation: Surgical services 42 CFR § 482.51(1)(ii) Condition of participation: Surgical services 42 CFR § 482.51(2) Condition of participation: Surgical services 42 CFR § 482.51(6) Condition of participation: Surgical services	• Medical history and physical exam must be completed and documented no more than 30 days before or 24 hours after admission. • Updated physical exam and changes to medical history must be completed and documented within 24 hours. • A properly executed informed consent form must be placed in the patient's chart except in emergencies. • Operative report describing techniques, findings, and tissues removed or altered must be completed immediately following surgery and signed by surgeon.
Medical Necessity Criteria	Medicare Claims Processing Manual-Chapter 12-Physicians/Non-physician Practitioners-Section 30.6.1.A Selection of Level of Evaluation and Management Service	• Medical necessity is the overarching criterion for payment along with the individual requirement of a CPT code.
Evaluation and Management Services	Centers for Medicare & Medicaid Services, Medicare Learning Network, Evaluation and Management Services	• Medical record documentation requirements and coding considerations.
Medical Record Documentation Requirements	Centers for Medicare & Medicaid Services, Medicare Learning Network, Fact Sheet, "Complying with Medical Record Documentation Requirements"	• Provides examples of Insufficient Documentation Errors.
Medicare Physician Practitioners	Medicare Claims Processing Manual-Chapter 12-Physicians/Non-physician Practitioners	• Medicare physicians fee schedule, correct coding policy, evaluation and management codes, prolonged services, surgeons, and global surgery charges.

Clinical Documentation and Coding Requirements	Regulatory, Accreditation, and Coding Citations	Brief Description
The Joint Commission History and Physical	The Joint Commission Standard, Record of Care, Treatment, and Services (RC); RC.01.02.01 The Joint Commission Standard, Medical Staff (MS); MS.01.01.01, EP 16	• Requirements for completing and documenting medical histories and physical exams in accordance with state law and hospital policy must be included in the medical staff bylaws.
The Joint Commission Operative Report	The Joint Commission Standard, Information Management (IM); IM.6.30	• Addresses record content requirements for operative or other procedures and moderate or deep sedation or anesthesia.
ICD-10-CM Official Guidelines for Coding and Reporting	*International Classification of Diseases, Tenth Revision* (ICD-10) https://www.cdc.gov/nchs/icd/data/10cmguidelines-FY2019-final.pdf	• Contains codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.