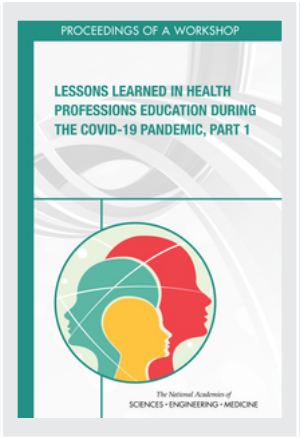

Lessons Learned in Health Professions Education During the COVID-19 Pandemic, Part 1: Proceedings of a Workshop (2021)

DETAILS

84 pages | 6 x 9 | PAPERBACK
ISBN 978-0-309-68254-1 | DOI 10.17226/26210

CONTRIBUTORS

Patricia A. Cuff and Erin Hammers Forstag, Rapporteurs; Global Forum on Innovation in Health Professional Education; Board on Global Health; Health and Medicine Division; National Academies of Sciences, Engineering, and Medicine

SUGGESTED CITATION

National Academies of Sciences, Engineering, and Medicine 2021. *Lessons Learned in Health Professions Education During the COVID-19 Pandemic, Part 1: Proceedings of a Workshop*. Washington, DC: The National Academies Press. https://doi.org/10.17226/26210.

Lessons Learned in Health Professions Education During the COVID-19 Pandemic, Part 1

PROCEEDINGS OF A WORKSHOP

Patricia A. Cuff and Erin Hammers Forstag, *Rapporteurs*

Global Forum on Innovation in Health Professional Education

Board on Global Health

Health and Medicine Division

The National Academies of
SCIENCES • ENGINEERING • 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 Academic Collaborative for Integrative Health, Academy of Nutrition and Dietetics, Accreditation Council for Graduate Medical Education, Aetna Foundation, American Academy of Nursing, American Association of Colleges of Osteopathic Medicine, American Board of Family Medicine, American College of Obstetricians and Gynecologists, American Council of Academic Physical Therapy, American Dental Education Association, American Medical Association, American Nurses Credentialing Center, American Occupational Therapy Association, American Osteopathic Association, American Physical Therapy Association, American Psychological Association, American Speech-Language-Hearing Association, Association of American Medical Colleges, Association of American Veterinary Medical Colleges, Association of Schools and Colleges of Optometry, Association of Schools Advancing Health Professions, Athletic Training Strategic Alliance, Council on Social Work Education, The George Washington University, Heron Therapeutics, Josiah Macy Jr. Foundation, National Academies of Practice, National Association of Social Workers, National Board for Certified Counselors, Inc. and Affiliates, National Board of Medical Examiners, National Council of State Boards of Nursing Inc., National League for Nursing, Physician Assistant Education Association, Society for Simulation in Healthcare, University of Michigan Center for Interprofessional Education, University of Toronto, U.S. Department of Veterans Affairs, and Weill Cornell Medicine–Qatar. 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-XXXXX-X
International Standard Book Number-10: 0-309-XXXXX-X
Digital Object Identifier: https://doi.org/10.17226/26210

Additional copies of this publication are available for sale 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. 2021. *Lessons learned in health professions education during the COVID-19 pandemic, part 1: Proceedings of a workshop*. Washington, DC: The National Academies Press. https://doi.org/10.17226/26210.

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PLANNING COMMITTEE ON LESSONS LEARNED IN HEALTH PROFESSIONS EDUCATION FROM THE COVID-19 PANDEMIC[1]

MARY JO BONDY (*Co-Chair*), Physician Assistant Education Association
DARRIN D'AGOSTINO (*Co-Chair*), Kansas City University
JAMES BUEHLER, Dornsife School of Public Health, Drexel University
SUSAN CHOI, Health Care Improvement Foundation
DAVID B. DANIEL, James Madison University
EMILIA IWU, Rutgers School of Nursing
PINAR KESKINOCAK, Georgia Institute of Technology
KIMBERLY D. LOMIS, American Medical Association
VALERIE WILLIAMS, University of Oklahoma Health Sciences Center

Consultants

DARLA SPENCE COFFEY, Council on Social Work Education
JODY FROST, National Academies of Practice

[1] The National Academies of Sciences, Engineering, and Medicine's planning committees are solely responsible for organizing the workshop, identifying topics, and choosing speakers. The responsibility for the published Proceedings of a Workshop rests with the rapporteurs and the institution.

Reviewers

This Proceedings of a Workshop 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 proceedings as sound as possible and to ensure that it meets the institutional standards for quality, objectivity, evidence, and responsiveness to the charge. The review comments and draft manuscript remain confidential to protect the integrity of the process.

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

ANTHONY BREITBACH, Saint Louis University
CHERYL L. HOYING, Values Coach Inc.

Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the content of the proceedings nor did they see the final draft before its release. The review of this proceedings was overseen by **DAVID A. ASCH,** University of Pennsylvania. He was responsible for making certain that an independent examination of this proceedings was carried out in accordance with standards of the National Academies and that all review comments were carefully considered. Responsibility for the final content rests entirely with the rapporteurs and the National Academies.

Contents

1

Introduction[1]

The effect of the COVID-19 pandemic has been wide ranging and far reaching, affecting nearly every person on the globe, said Darrin D'Agostino, executive dean of the College of Osteopathic Medicine and vice president of health affairs at the Kansas City University of Medicine and Biosciences. COVID-19 has created a "syndemic" in which synergistic interactions between socioecological factors and biological factors result in adverse health outcomes. Existing issues such as poor nutrition, loneliness, and racial inequalities have been exacerbated, and they are leading to poorer health outcomes, said D'Agostino. The COVID-19 pandemic has contributed to escalating rates of depression, suicide, substance abuse, domestic violence, and psychiatric illness, and even worse, said D'Agostino, these outcomes are not equally distributed across all communities.

Health professions education (HPE) was not spared from the effect of the COVID-19 pandemic. Educators were forced to shift their entire curricula online within a matter of weeks and to create ways to maintain clinical activities and research; at the same time, many were also coping with increased family responsibilities at home. The pandemic laid bare the vulnerabilities of health care and health care education, D'Agostino said. However, the COVID-19 crisis may be the "scratch on the beaker wall"

[1] The planning committee's role was limited to planning the workshop, and the Proceedings of a Workshop was prepared by the rapporteurs as a factual account of what occurred at the workshop. Statements, recommendations, and opinions expressed are those of individual presenters and participants and are not necessarily endorsed or verified by the National Academies of Sciences, Engineering, and Medicine. They should not be construed as reflecting any group consensus.

(i.e., the driving force) that pushes HPE into a new way of thinking and a new way of working together. Compared to the rapid pace of scientific discovery, HPE has grown very little since the first educational model was proposed in 1765 by Benjamin Franklin. The education of health professionals is now at a "tipping point," and the challenges and opportunities presented by COVID-19 may lead to a transformation of the HPE system, D'Agostino said.

To examine and learn from the experiences of health professions educators, students, administrators, and health professionals during the COVID-19 pandemic, the National Academies of Sciences, Engineering, and Medicine convened a series of workshops, the first of which was a 1-day virtual workshop on December 3, 2020. The workshop, hosted by the Global Forum on Innovation in Health Professional Education, was organized by a planning committee in accordance with the Statement of Task in Box 1-1. More than 800 virtual attendees joined the workshop from at least the 17 different health professions represented as members of the forum. Despite challenges to actively engage workshop attendees during

BOX 1-1
Statement of Task

A planning committee of the National Academies of Sciences, Engineering, and Medicine will organize and conduct a 1-day public workshop to explore lessons learned in the grand challenges facing health professions education (HPE) stemming from the COVID-19 pandemic and how those positive and negative experiences might inform development of sustainable improvements in the value, effectiveness, and impact of HPE. The planning committee will bring together educators, students, administrators, and health professionals to share ideas, stories, and data in an effort to discuss the future of HPE by learning from past experiences. Invited presentations and discussions will involve global audiences in topics such as:

- Examples and evaluation of online education;
- Innovations in interprofessional education and learning opportunities within the social determinants of health and mental health;
- Effects on preclinical and clinical education;
- Regulatory and accreditation changes affecting HPE; and
- Stress and workload on students and faculty.

The planning committee will select and invite speakers and discussants to moderate the discussions at the workshop. Following the workshop, a proceedings of the presentations and discussions will be prepared by designated rapporteurs in accordance with institutional guidelines.

a large, online event, efforts were made by the planning committee to use the chat function and polling so participants felt included in the workshop discussions.

During the pandemic, health professionals adapted, innovated, and accelerated in order to meet the needs of students, patients, and the community, said Mary Jo Bondy, chief executive officer at the Physician Assistant Education Association. Educators adapted educational methods and materials, clinicians adopted technologies to deliver care remotely, and researchers across the globe collaborated to produce vaccines in record time. However, these efforts, and the strain of the pandemic in general, led to immense pressure, stress, burnout, hardship, and loss among health professionals, said Bondy. Health professionals have acted with "incredible courage, bravery, and resilience," she said, and it is important to recognize their service and sacrifice.

This workshop, Bondy said, was planned in the summer of 2020, when many hoped the peak of the pandemic had already passed. It began with the idea of reflecting on the history of HPE in order to illuminate the path forward. However, as the planning committee reached out to stakeholders—including students, educators, clinicians, and administrators—it became clear that there were lessons to be learned from the pandemic. Bondy said stakeholders reported certain system characteristics facilitated a smoother transition during the early days of COVID. Systems with emergency planning, institutional support, and infrastructure in place could more easily pivot to online learning and telehealth, said Bondy, while those possessing strong, longstanding relationships with health systems and state and local governments were better able to continue offering clinical educational opportunities for students. These characteristics allowed systems to quickly adapt to the realities of COVID-19 education and practice, to adopt new curricular models, and to create a supportive environment for learning. Bondy offered context on the workshop by saying it was designed for participants to reflect on these types of experiences and to apply lessons learned during the COVID-19 pandemic so participants might begin imagining how to collectively build a sustainable learning health system for the future.

Her hope was that over the course of the workshop, participants would flesh out a framework to help educators, students, and administrators manage the challenges posed by the pandemic and to improve education for tomorrow's health workforce. This will require intentional change with a collective focus on the pathway into the health professions as well as diversity, inclusion, and equity for our students, our faculty, and our patients said Bondy.

Bondy's and D'Agostino's remarks kicked off the event, which was followed by three moderated presentations as described in Chapter 2 of this report. The presentations take a systems perspective in describing how

solving one challenge can intentionally and unintentionally influence other parts of the system. Embedded in those presentations are lessons learned in HPE during the pandemic. These and other lessons are further explored by subsequent speakers whose remarks are captured in Chapter 3. The experiences or lessons described in Chapter 3 emphasize the value of preexisting relationships for being able to pivot quickly in responding to public health needs brought on by the pandemic. Chapter 4, the final chapter, lays out the experiences of two health professionals as they each describe different interprofessional frameworks for actively engaging learners in responding to the COVID-19 pandemic.

2

Looking Back and Moving Forward

Key Points Made by Individual Presenters

- The pandemic has increased stress and cognitive load on everyone, including clinicians, faculty, and students. Flexibility, empathy, and grace for oneself and others can help lessen this load. (Stewart-Clark)
- A systems approach begins with understanding the characteristics of complex systems, which often involve multiple stakeholders, multiple perspectives, and multiple objectives and incentives. Balancing conflicts in complex systems like HPE requires consideration of different perspectives and making trade-offs. (Keskinocak)
- Now is the time—in the midst of the pandemic—to think about whether the educational adaptations created new problems or exacerbated old ones. Now is the time to plan ahead for the future by learning from the present. (Daniel)

Health professions education (HPE) has evolved over time and has moved through various models over the years, said Valerie Williams, vice provost for academic affairs and faculty development at the University of Oklahoma Health Sciences Center. The process of change has generally been gradual, as the status quo shifted in response to challenges and new circumstances. However, said Williams, COVID-19 has been a "remarkably

different challenge" for HPE, and the pandemic rapidly affected every aspect of HPE and introduced disruption and chaos into the environment. Faculty and staff have risen to the challenge, said Williams, and demonstrated "an awesome level of resolve and commitment" to ensuring that the education of future health professionals could pivot and stay on track. Williams emphasized that acknowledging the compassion and dedication of health professions educators is critical for building the strength and resilience necessary to get through this challenge together.

The COVID-19 pandemic has forced an extraordinary amount of change, said Williams, and it can be difficult to see the end goal in the midst of disruption and chaos. Williams said there are two types of people who like change: those who have designed the change, and a "wet baby." People who design change are willing to think through the steps for innovation and adaptation. The need for change is evident to them and the necessary next steps may be quite clear. Others, who do not see the need for change, may expect to be convinced, remain skeptical, or oppose any change from the status quo. In the situation with a "wet baby," said Williams, the baby wants change—being a "wet baby" is uncomfortable. The "change" results in a much happier, more comfortable baby. Of course this metaphor can only be pushed so far, Williams noted with humor; however, she used it to make this point—the lessons participants are learning will include awareness and interest in HPE change along a continuum from *not ready* to *very ready* for HPE change, particularly given what we are learning in the era of COVID-19.

Williams shared one example of how things have changed during the pandemic. Early in the process, she said, health professionals and educators talked about "social distancing" as important to mitigating transmission risk. However, as time went on, the messaging shifted toward "physical distancing," as understanding of the term "social distancing" grew. With the realization that social distancing could be contributing to loneliness, isolation, and loss of the human "social" contact, the importance of shifting the language to support mental health and a general sense of well-being, became apparent.

Williams asked workshop participants questions about their top concerns within HPE at different points in the pandemic. Williams reported several of the respondents' concerns at the beginning of the pandemic were within learner assessment, competence, and feedback. As time passed, additional concerns surfaced to include learner isolation, distress, disparities, and safety issues. These critical areas will be addressed by our next three presenters, said Williams, and they are noted in the following three sections of this report. The first speaker focused on her experiences during the pandemic as an educator, a health professional, and a mother; the second speaker framed how to use a systems approach to learn from the disruption

of the COVID-19 pandemic; and the third speaker discussed how to understand and assess the experiences and lessons learned from the pandemic so we can begin plotting a way forward.

THE IMPACT OF COVID-19 ON FACULTY

Skylar Stewart-Clark, Charleston Southern University

The COVID-19 pandemic, said Skylar Stewart-Clark, assistant professor and diversity and inclusion liaison at the Charleston Southern University physician assistant program, presented on the "significant seismic shift in everyone's cognitive load." Whether a parent, spouse, practicing clinician, or a health professions educator, the pandemic required immediate and dramatic shifts in roles and responsibilities. Stewart-Clark is a mother to four children, one with significant needs, and she noted the significant challenges around the shift to working and teaching from home while managing all of her children and their school schedules. As a faculty member, Stewart-Clark teaches patient assessment and diagnostic methods. She shared her initial response of it being "jarring" to think about how to teach these hands-on skills online. As a clinician, Stewart-Clark practices hospital medicine, and she was routinely called in for extra shifts to assist with surge capacity or to fill in for colleagues diagnosed with COVID-19. Simultaneously balancing all of these roles left Stewart-Clark feeling "isolated at times, quite uncomfortable, and pretty unsure" as to how to manage the chaos (see Figure 2-1). She shared her reflections on these experiences in four different areas with workshop participants: balancing work and life, leadership, empathy, and felt needs.

Balancing Work and Life

Managing both work and home life simultaneously added a new load of stress and the potential for burnout, said Stewart-Clark. Stewart-Clark relied on her value system to help her decide how to respond to competing demands. For example, her son, who is on the autism spectrum, required significantly greater attention as he shifted to a virtual learning environment because of the COVID-19 educational disruption. One evening, Stewart-Clark was working "feverishly" on a presentation and her son asked her to watch him play with his LEGOs.

Stewart-Clark drew on a framework called 10-10-10, developed by Suzy Welch (2009), in order to decide what to do. The 10-10-10 framework considers what the consequences of a decision will be in 10 minutes, 10 months, and 10 years. Stewart-Clark decided that the near-term and mid-term consequences were minimal, but that in 10 years, her son would

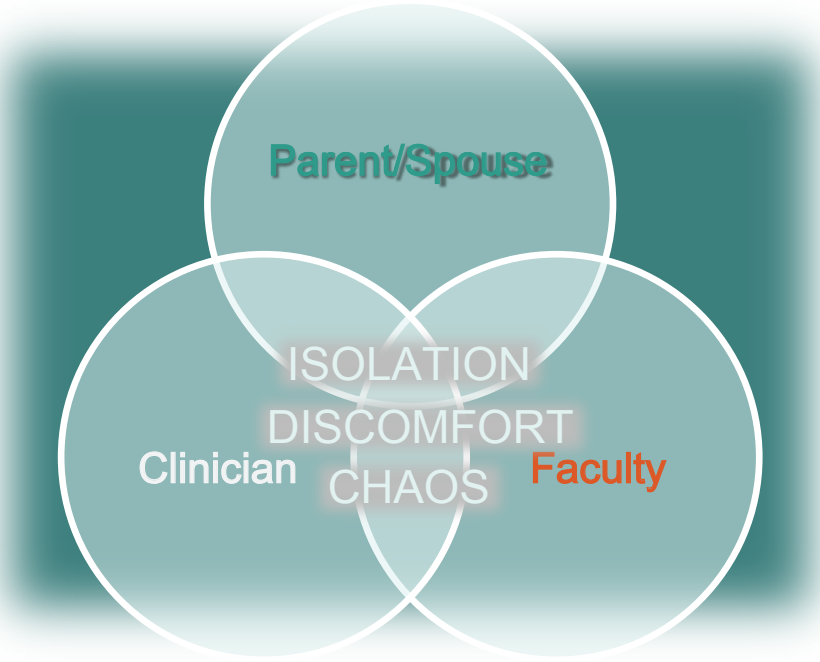

FIGURE 2-1 A seismic shift in cognitive load during the COVID-19 pandemic.
SOURCE: Stewart-Clark presentation, December 3, 2020.

remember that she pulled away from her work to spend quality time with him. Being "your own personal change manager" and making decisions based on your values can help manage the stress of prioritizing competing demands. When confronted with stressful, overwhelming circumstances, she said, it is critical to take a step back, reflect on one's values, and then make choices that are in line with those values and one's desired vision of the future.

Leadership

The pandemic had a disproportionate effect on female faculty, said Stewart-Clark. Nearly everyone's responsibilities increased during the pandemic, she said, but for female faculty this was often in the context of less support in one or more areas of responsibility. In response to this change, Stewart-Clark used her leadership position to push for greater flexibility for faculty. For example, when her physician assistant (PA) program was set to return to the classroom in a hybrid format, bringing in small cohorts of students at designated times, Stewart-Clark made sure that the hybrid experience was available to faculty as well. Faculty members—particularly those with caregiving responsibilities—needed flexibility to arrange their schedules and responsibilities according to their needs.

While there was some pushback initially, she said, in the end the idea was well supported and proved to be equitable. Stewart-Clark continued to push for other policy changes that could benefit women and caregivers, noting that COVID-19 has presented an opportunity to move issues from the backburner to the forefront and make meaningful changes. She urged participants to "lead from a position of authenticity" when creating space for innovation and change.

Empathy

COVID-19 has been incredibly disruptive to the health care learning environment, said Stewart-Clark, and it threatens student well-being. Stewart-Clark reflected on her own experiences as a clinician in an effort to empathize with her students. At the peak of the pandemic, she was being called in to work additional shifts, and from one shift to the next, "something would change." For example, there were changes to the setup of the hospital, the COVID-19 treatment protocols, or the way that practice administrators communicated the changing expectations. Eventually, Stewart-Clark "started to accept the fact that something was going to change," and this helped her mentally prepare herself.

Likewise, students were dealing with significant and continual changes to the learning environment. Her response, said Stewart-Clark, was to be as transparent and empathetic as possible and to allow as much flexibility as possible. She conducted social and emotional check-ins during each class, and engaged her students in a multitude of ways in order to give them a sense of community and belonging. For example, one day she invited the students to bring their pets with them to virtual class. Stewart-Clark hoped that her approach of transparency, empathy, flexibility, and inclusivity would convey to students the importance of cultivating grace for themselves and others, something that in a broad context seems absent in the daily practice of providers who are charged with caring for and maintaining the health of patients with diverse lived experiences.

Perceived Needs

Stewart-Clark noted that one of the most powerful lessons she has learned during the pandemic has been the importance of observing the needs of a group while using one's own experiences to inform a response. For example, she said that being "thrust into practicing telemedicine" in her clinical practice was a great source of insight into how her students were coping with the transition to virtual learning. She also observed that many students had a "heart of service" but nowhere to serve, and at the same time, there were many patients with chronic

diseases who because of socioeconomic barriers, lost access to care and ran out of medications.

Out of these observations, "Project Learn to Serve" was born in conjunction with a local safety net clinic. The socially distanced service-learning project, which began in August 2020, served more than 200 patients with a diagnosis of hypertension or diabetes who had been lost to follow-up. PA students connected with the patients via telephone or video, and they used a decision tree to triage patients into emergent, urgent, routine, or telemedicine disposition. This program, said Stewart-Clark, increased clinic operational capacity, increased primary care telemedicine visits, and strengthened the chart review process for high-risk patients, ultimately improving care delivery. Moreover, the students who were involved had "profound outcomes" in learning as well as the opportunity to experience health care from a public health perspective. Stewart-Clark relayed the experience of one of her students who said:

> The most valuable learning from this project was witnessing the importance of an interprofessional team in optimizing patient care, and being exposed to the need for facilities like the Dream Center in underserved areas and how we can contribute to this now as students and in the future as medical providers. Having the opportunity to speak with each patient directly and learning the obstacles they face to access care in America was eye-opening. I will take this experience with me for the rest of my life.

In her concluding remarks, Stewart-Clark described the pandemic as highlighting "what we already know to be true about meaningful growth during challenging times." She challenged workshop participants "to prioritize with a values-based strategic approach, to lead with authenticity and question the system, to communicate with empathy and transparency, and to respond appropriately to your felt needs."

A SYSTEMS APPROACH TO INFORMING THE FUTURE

Pinar Keskinocak, Georgia Institute of Technology

Pinar Keskinocak, chair and professor in the School of Industrial and Systems Engineering at the Georgia Institute of Technology, gave workshop participants an overview of a systems approach to health care and HPE, and how it might help inform a post-COVID-19 world. There are multiple complex and interacting systems that affect our health, said Keskinocak, including our physical bodies, behaviors, workplaces, schools, faith institutions, environment, regulations, policies, socioeconomic conditions, and culture. To design and run an effective health system, it is critical to

understand the features and characteristics of each system as well as how they interact and fit together. HPE, said Keskinocak, is a "keystone in the system of systems," and has a significant effect on the health and well-being of individuals and the population.

HPE and health care delivery have traditionally been focused on treating the sick. However, Keskinocak said, it is well established that medical care is not sufficient for ensuring better health. Medical care is responsible for roughly 10–20 percent of health outcomes, with the other 80–90 percent attributable to health-related behaviors and environmental factors (NAM, 2017). COVID-19 has underscored this fact, as preexisting conditions have been associated with significantly higher risk of complications. This highlights the importance of promoting healthy lifestyles, prevention, and nonpharmaceutical interventions, she said.

Keskinocak said that using a systems approach to examine the experiences with COVID-19 provides an opportunity to be intentional in rethinking and redesigning HPE, both to respond better to future crises and also to provide better care during normal times. Challenges that could be addressed using this approach include

- How do we better enable team-based work and better integrate HPE with practice?
- How do we build multisector partnerships?
- How do we shift the conversation from the leading causes of death to the leading causes of life?
- How do we better integrate physical and mental health?
- How do we adopt a competence approach to HPE? Which core competencies should be included in our curriculum, considering both the current and future needs across the system?

A systems approach begins with understanding the characteristics of complex systems like HPE, said Keskinocak. Complex systems often involve multiple stakeholders, multiple perspectives, and multiple—and sometimes conflicting—objectives and incentives. Balancing these conflicts requires considering the different perspectives and making trade-offs; for example, the decision to provide in-person learning or virtual learning requires consideration of the health and safety of learners and educators, the opportunities for learning, and the needs of various stakeholders. There is variability within complex systems, as well as limitations in available information, inaccuracy, and asymmetry. Uncertainty and disruptions are common, said Keskinocak.

In a complex system, a course of action may be optimal from an individual or subgroup perspective but may have unintended negative consequences in other areas of the system. For example, she said, the educational

goals of an educator in a clinical setting may have unintended effects on the efficient care and discharge of patients, resulting in crowding and delays in admission of more patients. Keskinocak emphasized there is a need for better visibility, communication, and proper incentives to ensure the choices of individuals or subgroups align with the overall system's objectives. Particularly during a crisis like COVID-19, operating within a silo is inefficient and ineffective. Instead, there is a need for systems that are adaptive, responsive, agile, flexible, evidence based, and integrated with other systems, Keskinocak said.

Next, Keskinocak described the systems engineering approach. Systems engineering, she said, follows a structured, unified approach to improve or redesign systems considering multiple decisions, stakeholders, objectives, and constraints. The first step is analysis of the current state, which involves identifying problem areas, measuring the magnitude of the problem, and detecting potential root causes of the problem or bottlenecks. The second step is building a road map toward an improved state. This requires designing interventions to make improvements to the system, or redesigning the system entirely, along with evaluating the potential effects of these proposed changes. Finally, the effects of the proposed changes must be assessed after implementation. Analytic methods such as statistics, machine learning, and simulation can allow researchers to predict the effects of interventions even before they are implemented.

Keskinocak illustrated the systems engineering approach using an example of childhood asthma. If there are a large number of children presenting to the emergency department with asthma attacks, and they are experiencing long wait times, a siloed approach would view the long wait times as the symptom and would work on optimizing care for the children and making it more efficient. A systems engineering approach, on the other hand, would identify the root causes of the asthma attacks, such as air quality, access to medication, and health management education. Focusing interventions in these areas could reduce the number of children who end up in the emergency department in the first place, said Keskinocak. Williams added that in the midst of a crisis such as the COVID-19 pandemic, it is easy to slip back into siloed thinking and siloed approaches; keeping the systems engineering framework in mind can help prevent this return to a "comfortable place."

The systems engineering approach has been widely used in other industries to improve efficiency, reliability, quality, and safety, and HPE is poised to achieve similar benefits, she said. This approach can be used to address challenges including health disparities, access to care, and the needs of an aging population, which are complex issues beyond the traditional patient–provider relationship. A systems approach to HPE has the potential to change the education of the future generation of health professionals and

ultimately to improve the health and well-being of individuals and populations, Keskinocak concluded.

FROM SURVIVE MODE TO THRIVE MODE: DEVELOPING ACTIONABLE EVIDENCE

David Daniel, James Madison University

At the beginning of the pandemic, said David Daniel, professor of psychology at James Madison University, health professions educators were in survival mode, with little time to prepare for rapid changes and new demands. Although participants were throwing suggestions for tools and technologies at educators, Daniel said it was a challenge to triage the suggestions, to decide which ones to pursue, and to assess whether they were useful. To assess these ideas for change, it is critical to first identify and understand the end goals, he said.

Daniel used the war on hunger as an illustration of how the goals of an intervention must be carefully identified and targeted. When the war on hunger began in the 1950s, said Daniel, the goals were to make food that was accessible, affordable, convenient, and engaging. Adequate food was being grown in the United States but it was challenging to get the healthy foods to people who needed it most. Those who were tasked with fighting the war on hunger leveraged tools such as the new interstate highway system and food engineering in order to create and disseminate food that was easy to transport, affordable, and convenient. Unfortunately, said Daniel, although we won the war on hunger by producing cheap and tasty food, the unintended consequences of this approach were high rates of obesity, diabetes, hypertension, and heart disease. The four goals of making food accessible, affordable, convenient, and engaging were important, but what was missing was the critical goal of ensuring the food was nutritious. The lesson, said Daniel, is to "Pick your goals wisely!"

When choosing goals and assessing approaches for reaching these goals, Daniel said there are three main considerations: efficiency, effect, and practical usefulness. Efficiency is often discussed in terms of economics; however, money should not be the "sole arbiter of what works and what does not work." The time and effort of those involved is also a critical consideration. For example, is an HPE intervention worth the time and effort from both the educators and the students? Answering this question also requires looking at the effect: Did an intervention result in the kind of learning that was desired? Did it affect the correct target? Were there unintended consequences?

Teaching and learning are messy, complex, and dynamic systems, and even the best-intentioned approaches can potentially create more problems

than they solve, Daniel said. For example, the use of an online learning platform could be beneficial for supplementing coursework; however, it could potentially interfere with the learning process if students are too busy interacting with the platform rather than with the material itself. Daniel emphasized the goal of HPE is developing "usable knowledge." Finally, assessing practical usefulness requires answering three questions:

1. Is the approach solving a problem we actually have?
2. How much improvement will we get?
3. Will it work in this context?

Taking lessons from the COVID-19 pandemic to build a better HPE system moving forward will require consideration of a number of issues, said Daniel. The first step is to identify the specific goal of an intervention or approach. Daniel noted that our goals often shift over time, so our approaches must also be able to shift. The second step is to examine whether the system was working before it was adapted, and for whom it was working or not working. For example, was the system of in-person HPE education and training working well for all stakeholders before it was forced to move online because of COVID-19? Therefore, the third step is to determine how well the new system (e.g., virtual education) works, and for whom is it working and not working? Once the crisis subsides, will the new system still be useful or beneficial? The fourth and final step, said Daniel, is to ask how can we take these lessons and prepare for future challenges in HPE?

Daniel added that in addition to assessing systems and setting goals, it is critical for educators to create a safe place where students can come together during times of anxiety and crisis. While educators are also affected by the pandemic, "We do not want our stress to be contagious and compound the issue."

Daniel underscored that now—in the midst of the pandemic—is the time to begin assessing and planning ahead. "Now is the time to think about whether the adaptations created new problems or exacerbated old ones. Now is the time to plan ahead for the future by learning from the present." This is the time, he said, to identify the ways in which educators adapted, both formally and informally, and to assess whether the adaptations worked.

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3

Innovation Brought by COVID-19

Key Points Made by Individual Presenters

- The preexisting relationships between schools of public health and state health departments were instrumental in the two being able to come together and quickly adapt the program in response to the pandemic crisis. (Maniar)
- To continue the education of students during a crisis, accreditors need to be flexible with requirements, educators need to identify ways students can be useful to partnering organizations, and everyone needs to think outside the box to create nontraditional placement opportunities. (Kolker)
- Partnerships between academic and practice settings can not only provide clinical experiences for students but also potentially help to close the education–practice gap. (Spector)
- When traditional education paths are disrupted, systems thinking and a competency-based approach can help identify alternative routes to achieving the same outcomes. (Lomis)
- Students are eager to serve during times of crisis, and they can be creative in identifying ways to help. (Robinson)
- Students need support from faculty during crisis times, both in terms of academics as well as personally. (Wilbon)
- Times of crisis can give students opportunities to create strong bonds, experience individual growth, and learn coping strategies. (Hoque)

In this session, workshop participants heard from stakeholders who shared their experiences innovating and adapting during the COVID-19 pandemic. Stakeholders included leaders from schools of public health, clinical educators, and students.

PUBLIC HEALTH

James Buehler, Drexel University

When the planning committee held listening sessions in preparation for this workshop, it heard from health professional educators, representing a wide array of perspectives, who spoke of the need to more substantially address social determinants of health and principles of health equity in their training programs. These are foundational concepts in the curricula of schools of public health, said James Buehler, clinical professor and interim chair of the Department of Health Management and Policy at Drexel University. As with other health professions, schools of public health seek interprofessional training opportunities for students and applied experiences outside of the classroom. However, said Buehler, rather than concentrating on the care of individual patients, public health students often work in communities with a variety of agencies and organizations, focus on promoting and protecting the health of populations, and work with people from a broad mix of health and nonhealth professions. To the extent that public health students are placed in health care organizations, they are positioned within administrative settings dealing with issues such as population health management, quality improvement, or performance management.

Like all other HPE programs, schools of public health suffered disruptions resulting from the COVID-19 pandemic, although the pandemic also presented new opportunities for engaging students. In this session, representatives of two programs of public health shared with workshop participants how they responded to those challenges and opportunities.

Academic Public Health Volunteer Corps

Neil Maniar, Northeastern University

In March 2020, Massachusetts Governor Charlie Baker convened the leadership of eight public health programs to find a way of engaging the programs in support of local health departments during the pandemic, said Neil Maniar, professor of practice and director of the M.P.H. program in the Bouve College of Health Sciences at Northeastern University. The group proposed an idea that would deploy volunteers into local health departments, which were stretched beyond their capacity because of the

BOX 3-1
Academic Public Health Volunteer Corps Partners

Academic Programs
- Boston University
- Harvard T.H. Chan School of Public Health
- Holyoke Community College
- Massachusetts College of Pharmacy and Health Sciences University
- Northeastern University
- Northern Essex Community College
- Regis College
- Simmons College
- Tufts University
- University of Massachusetts Amherst
- University of Massachusetts Medical School
- University of Massachusetts Lowell

Public Health Organizations
- Massachusetts Department of Public Health
- Massachusetts Health Officers Association
- Massachusetts Public Health Association

SOURCE: Presented by Neil Maniar, December 4, 2020.

pandemic. Out of these conversations, the Academic Public Health Volunteer Corps (APHVC) was born.[1] The initial group of eight programs was expanded to additional schools and programs, including community health worker programs based in community colleges, as well as the Massachusetts Department of Public Health, the Massachusetts Public Health Association, and the Massachusetts Health Officers Association (see Box 3-1).

The eight original programs of public health had begun collaborating with the Massachusetts Department of Public Health in 2019, forming the Academic Health Department Consortium. Maniar noted how this preexisting relationship was instrumental in being able to bring these entities together and quickly develop the program. Although the participating organizations in the APHVC varied by size, reputation, and resources, Maniar said they all were committed to being equal partners in terms of their work, the weight of their voice, and the level of engagement for students. The Massachusetts Health Officers Association acted as the key point of contact with the 351 local boards of health across the state.

[1] For more information, see https://academicpublichealthvolunteercorps.org (accessed March 31, 2021) and https://www.mass.gov/info-details/academic-health-department-academic-public-health-volunteer-corps (accessed March 31, 2021).

The mission of APHVC is "to support state and local public health agencies and to advance health equity in Massachusetts by engaging public health students, alumni, and expert volunteers through interdisciplinary collaboration." The operational structure of the program took some time to develop, said Maniar, but eventually leaders of different parts of the program emerged, as well as working groups and subject-matter experts (see Figure 3-1).

APHVC began with a focus on contact tracing. Within 1 week of launching the program more than 2,000 volunteers had signed up, and 1,200 of these were deployed into about 80 communities across Massachusetts. The volunteers made more than 2,000 contact tracing calls in the first month and assisted communities with developing policy proposals. In addition, volunteers created dozens of infographics and geographic information system

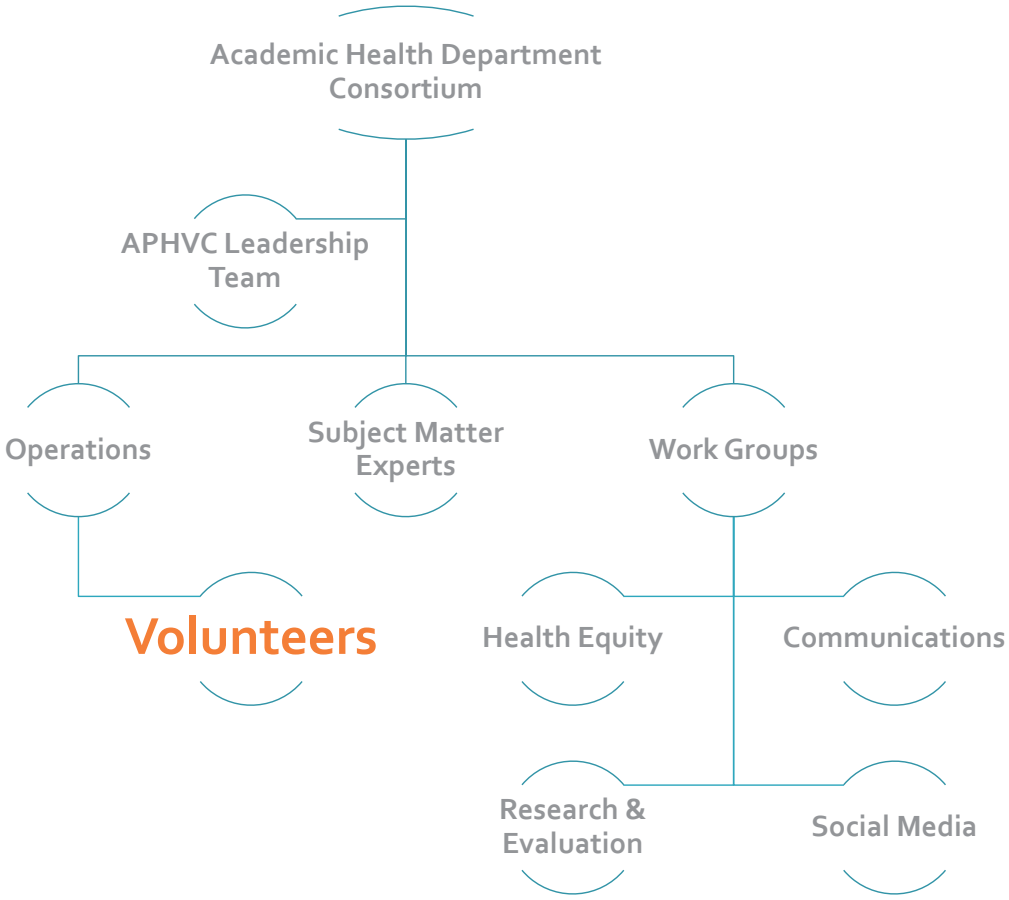

FIGURE 3-1 Structure of the Academic Public Health Volunteer Corps (APHVC). SOURCES: Maniar presentation, December 3, 2020. King S, Maniar N, Gilbert Loinaz A, Levy C, Blinn A, Sibor D. June 2020. Copyright 2020. National Council of State Boards of Nursing. Used with permission from the National Council of State Boards of Nursing.

(GIS) maps to support local public health education and surveillance needs, and they helped translate materials and messaging into different languages.

Health equity is a critical component of the APHVC mission, said Maniar, as he shared an example of the group's work in this area. The towns of Randolph and Brockton have large Haitian and Cabo Verdean populations, and the local health departments identified challenges in these communities around the issues of testing, social distancing, mask wearing, and stigma. APHVC worked with the community to create a team that included community members and heritage speakers;[2] key informant interviews were also conducted. The team translated materials, collaborated with local radio stations, and used social media to educate the community in a culturally sensitive and linguistically appropriate manner while responding to its needs. As the pandemic continues, said Maniar, APHVC will be focusing its efforts in a number of areas, including

- Increasing focus on health equity;
- Assisting with policy development related to reopening;
- Engaging additional local partners including community health centers, nonprofit partners, and local cultural organizations and coalitions; and
- Focusing on data analysis, epidemiology, and data translation needs at the local level.

The academic programs involved in APHVC, said Maniar, see it as a viable and sustainable collaborative that can help engage students and support public health efforts. To ensure the program remains relevant and effective beyond the current pandemic, APHVC is undertaking three actions: (1) establishing a development committee to secure long-term funding, (2) conducting interviews and surveys about local board of health perceptions of the APHVC experience, and (3) evaluating the work accomplished thus far. In this way, Maniar said, APHVC hopes to create a long-lasting, valuable collaboration among public health learners and experts across multiple sectors.

Dornsife School of Public Health

Jennifer Kolker, Drexel University

The M.P.H. program at the Drexel University Dornsife School of Public Health is accredited by the Council on Education for Public Health (CEPH),

[2] Heritage speakers are "individuals raised in homes where a language other than English is spoken and who are to some degree bilingual in English and the heritage language" (Valdés, 2000).

said Jennifer Kolker, clinical professor of health management and policy. As part of the accreditation, all M.P.H. students are required to complete an applied practical experience (APE), which is a supervised, hands-on project or internship within a public health practice setting. Through the APE, students are expected to develop competencies commensurate with their area of focus (e.g., epidemiology), as well as three competencies that all students must meet:

- Communicate audience-appropriate public health content, both in writing and oral presentation;
- Perform effectively on interprofessional teams; and
- Apply systems thinking tools to a public health issue.

The accreditation guidelines, said Kolker, emphasize that the APE should generally take place outside the school of public health; in a governmental, nonprofit, or for-profit setting; and involve community engagement with external partners. M.P.H. students at Dornsife have completed the APE in a wide variety of settings, including public health departments and other governmental organizations, large nonprofit health and social service organizations, small community-based organizations, clinical settings, and regional planning associations. In these settings, students have worked on projects such as needs assessments, strategic planning, program evaluation, policy, and research, noted Kolker.

When the COVID-19 pandemic began in early 2020, she said, it was the "peak time" for coordination of sites and student placement decisions. Realizing the approach to APE would have to change dramatically, educators at Dornsife asked themselves two questions:

- How do we make the student APE experience as rich and rewarding as possible?
- How do we best serve our public health community?

To pivot the APE program in a way that served both students and the public health community, said Kolker, Dornsife focused its efforts on four areas: reassure students, strategize with partners, ask accreditors for flexibility, and develop nontraditional placements.

Reassure Students

Students had a number of worries, said Kolker. They were dealing with their own issues related to COVID-19, such as isolation and worrying about family members with health challenges. Students were anxious about missing out on a critical component of their MPH training. The APE

experience, she noted, is considered a key way that students get the training they need to get a job after school. Students were also concerned about the COVID-19 pandemic in general and wanted specific opportunities to feel part of the response to the pandemic. The school worked to ensure that students felt safe and supported, while assuring them there would be opportunities to get involved.

Strategize with Partners

Many of the projects that had been planned for students were cancelled owing to logistical challenges or changing priorities of the partner organizations. Partners were struggling to manage the shift to remote work for their own staff, and many were burdened with new responsibilities and circumstances. The idea of adding the task of supervising and mentoring students was overwhelming, said Kolker. Dornsife worked with its partner organizations to redefine opportunities and rethink how students could be a valuable addition during the pandemic.

Ask Accreditors for Flexibility

The accrediting guidelines for APEs are fairly specific in terms of setting, competencies, and deliverables, Kolker said. In the midst of the pandemic, Dornsife and other schools of public health determined that some of these guidelines would need to be relaxed. Kolker and others wrote a letter to CEPH asking for greater flexibility on a number of issues, including content, types of deliverables, preceptor requirements, and competency matching. The letter to CEPH expressed confidence that individual MPH schools and programs "can assure and manage the learning that will come from these APE experiences in ways that both meet our students' learning needs and achieves the intent of the APE." CEPH obliged and granted the necessary flexibility.

Develop Nontraditional Placements

Finally, said Kolker, Dornsife developed new options for students beyond the traditional 1:1 placements. Although some organizations were able to accommodate and host students, the demand for placements was greater than the supply. To fill this gap, the school created a consulting course where students worked in teams to develop products supporting the needs of six organizations, with some of the projects focused on the pandemic.

The experience of rethinking and restructuring the APE, said Kolker, was largely positive for both students and organizations. All students were

able to fulfill the APE requirement, either through a remote traditional placement or through one of the other options. The organizations reported that students made valuable contributions, particularly those who worked on COVID-related projects. Students who felt cut off from the world during the pandemic found the team-based projects, such as the consulting course, helped mitigate their sense of isolation. Of course, said Kolker, there were drawbacks as well. Students missed the experience of physically being in an organization, and they missed out on developing soft skills and the nuanced learning that stems from working with other people. In addition, mentoring and supervision were challenging in a remote setting. However, overall, the experience demonstrated the ability of the school and its partners to quickly adjust during a challenging and changing situation, she said.

Kolker offered two thoughts on using lessons from COVID-19 to inform the future of HPE. First, COVID-19 has driven home the idea that interprofessional education goes far beyond the clinical and health care setting. For example, if public health professionals are tasked with deciding whether schools or businesses should be open, public health students and trainees need to learn how these sectors are organized, staffed, and financed. Second, Kolker said, health professions educators need to consider how to "truly be responsive" to public health partners, particularly during a crisis. Specifically, do the competencies taught in school accurately reflect public health practice, are there ways that accreditors can be flexible in order to better meet the needs of the community, and how can educators be flexible and nimble both during an emergency as well as in normal times?

CLINICAL EDUCATION

Kimberly Lomis, American Medical Association

Experiences in the clinical learning environment are a critical element across all health professions education, said Kimberly Lomis, vice president for undergraduate medical education innovations at the American Medical Association (AMA). These experiences support the development of competencies as well as professional identity formation. During the pandemic, learners across the health professions were abruptly displaced from care settings because of concerns about both safety and education. Regarding safety, she said, there were concerns about student and patient safety, given the limited bandwidth of faculty to appropriately supervise clinical students. Regarding education, there were concerns that because of disruption of the case mix and disruption in how clinical settings were functioning, placements would not be meeting the traditional goals of clinical education. In this session of the workshop, speakers discussed innovations to ensure that learners had adequate clinical experiences during the pandemic.

Practice/Academic Partnership Model

Nancy Spector, National Council of State Boards of Nursing

COVID-19 put a significant demand on the nursing workforce, said Nancy Spector, director of regulatory innovations at the National Council of State Boards of Nursing (NCSBN). Because of the pandemic, it was more critical than ever for nursing students to be ready for practice upon graduation. However, at the same time, health care facilities were shutting doors to nursing students, and students were graduating without clinical experience. Spector recalled one board of nursing's concern that "some students would graduate without even having touched a patient." Although schools used simulations and virtual experiences, Spector said, "Nothing can replace those clinical experiences with patients."

In March 2020, NCSBN convened a group of nursing leaders from practice, academia, and regulation to find a solution to this challenge, and together they developed the practice/academic partnership. The key to the program, said Spector, is for students to be considered "essential workers," which is a designation from the college of nursing and the health care setting that, in her experience, is almost always agreed to by government officials. The partnership incorporates all levels of prelicensure nursing students as either facility employees or trainees obtaining clinical hours. Faculty provide oversight of the students, and in some cases, the practice setting also provides preceptors. Academic credit is awarded toward clinical experiences (see Figure 3-2).

This program, said Spector, is a win-win for practice and academic organizations, and it presents an unparalleled opportunity for students to work and learn in a time of crisis and to gain firsthand exposure to the principles of population health and emergency management. Clinical assignments for students in the program varied. Most cared for non-COVID-19 patients to free up nurses, although some cared for COVID-19 patients directly. Students gained experience in areas including testing, vaccine administration,[3] screening, and telehealth. The program was endorsed by numerous nursing organizations (see Box 3-2).

A number of lessons were learned during the process of developing and implementing this program, said Spector. First, communication between all stakeholders was key, particularly to clarify the expectations and responsibilities of all involved (e.g., oversight of students). Spector remarked that while it was critical to rely on already-established channels of communication, it was also important to establish new mechanisms for clear communication. Second, preexisting relationships between practice settings

[3] At the time of the workshop, the vaccine was not being administered.

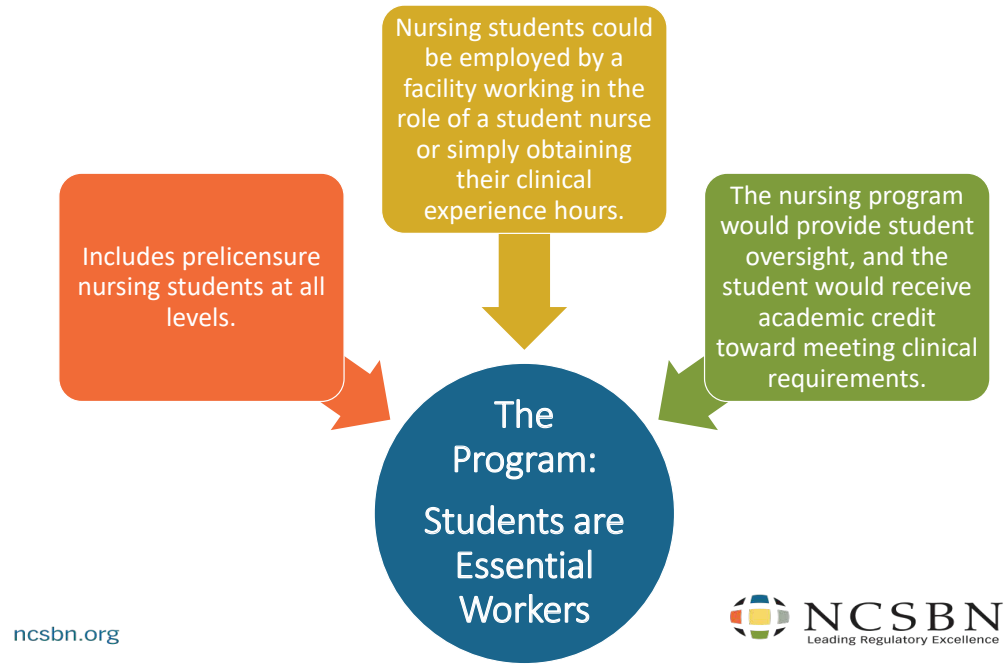

FIGURE 3-2 Practice/academic partnership.
SOURCES: Spector presentation, December 3, 2020. From NCSBN, 2020.

BOX 3-2
Endorsements of the Practice/Academic Partnership Model

Accreditation Commission for Education in Nursing, Inc.
American Association of Colleges of Nursing
American Nurses Association
American Organization for Nursing Leadership
Commission on Collegiate Nursing Education
National Council of State Boards of Nursing
National League for Nursing (NLN)
National Student Nurses' Association
NLN Commission for Nursing Education Accreditation
Organization for Associate Degree Nursing

SOURCE: Spector Presentation, December 3, 2020.

and academic programs can be used in support of the new model, and new relationships can be formed, but it may require writing up new contracts, providing orientation specific to COVID-19 policies, and determining who will provide personal protective equipment (PPE) for the students. Spector

expressed a note of surprise that rural critical access hospitals were eager to join the partnership because she and her colleagues had up to this point just assumed most of the practice partners would be medical centers. Third, faculty ought to collaborate closely with the practice setting in order to identify and meet the objectives of students and organizations, and to ensure the planned experience fulfills clinical requirements. Fourth, students need to be prepared for what will be expected of them in the practice setting. For example, trainees must be familiar with the COVID-19 policies, know the risks and responsibilities of working in a health care environment during the pandemic, and be proficient at safely donning and doffing PPE.

As of December 2020, said Spector, the program had been implemented in Idaho, Iowa, and Georgia, with more than 700 participating students and an overwhelmingly positive response from students, faculty, and practice partners. One student's comment described a "pretty challenging but very rewarding experience," while a faculty member said that students "embraced this opportunity to help meet the needs of the community during this unprecedented time." A practice partner reported hiring 92 percent of the participating spring graduates, and 100 percent of the graduates passed the National Council Licensure Examination exam. Spector closed saying while the main goal of the program was to provide clinical placements for students during COVID-19, this type of partnership between academia and practice could help close the education-practice gap that has been discussed by members of the forum and others in previous workshops held by the National Academies (NASEM, 2018).

Lessons Learned from the American Medical Association's Accelerating Change in Medical Education Consortium

Kimberly Lomis, American Medical Association

In 2013, AMA launched the Accelerating Change in Medical Education Consortium, said Lomis. This baseline investment in innovation prepared AMA to better respond in a time of crisis, such as the COVID-19 pandemic. The consortium consists of 37 medical schools and programs that work together, with a major emphasis on the training of health professionals in health systems science. Medical education tends to have a rigid structure, she noted, so this emphasis on systems thinking is useful for contemplating alternative paths to the same outcomes when the traditional paths are disrupted.

In the early days of the pandemic, the consortium virtually convened on a regular basis to discuss struggles, share ideas, and strategize. Lomis described three major phases of response to the COVID-19-related disruptions to clinical experiences. First, as students were pulled out of the clinical

environment, medical programs were offering alternatives through coursework in pandemic-specific areas, general clinical topics, and discipline-specific topics. These alternatives, said Lomis, were partially a way to "buy some time" to create alternative pathways for clinical learning.

The second phase involved engaging students in physically distanced patient care roles. This involved tasks such as working on COVID-19 hotlines, preparing educational materials, and conducting contact tracing. In addition, students could engage in general clinical training that could be conducted remotely. As others have mentioned, noted Lomis, the consortium also found medical students eager to add value and do their part in the fight against COVID-19. The third phase was getting students back to direct interaction with patients. This was accomplished in some areas in the summer of 2020, but it continues to be difficult.

One way of rethinking how to conduct clinical education in the midst of the pandemic, Lomis said, is to use competency-based approaches. A competency-based framework starts by identifying the desired learning outcomes, which is followed by a process of deconstruction to ensure the learning activities and assessments will lead to those predefined desired outcomes. Lomis noted how educators can be "a little bit entrenched" in traditional learning activities and can lose sight of the fact that outcomes—not the activities—are the ultimate goal. A competency-based framework views time as a variable, rather than as a fixed proxy for learning. For example, she said, medical school courses are traditionally defined by length (e.g., one semester), whereas a competency-based approach looks at when the learning outcomes are achieved.

Lomis gave an example of how a medical clerkship could be deconstructed in order to find alternate ways of giving students similar experiences and opportunities to develop the same competencies. There are layers of competency development, starting with the "big Cs" such as patient care, medical knowledge, professionalism, and interpersonal and communication skills. Next, there are overarching clinical skills that students develop through a clerkship, such as diagnostic skills, clinical reasoning, and ethics, followed by discipline-specific knowledge and skills. Developing most of the skills in these areas does not require direct physical contact with a patient. For instance, said Lomis, interpersonal skills can be gained through helping an elderly patient prepare for a telehealth visit, and clinical reasoning can be performed remotely. Identifying alternative approaches for developing some of these skills can allow educators to take full advantage of the "precious time" when students *do* have direct contact with patients by concentrating only on skills that must be developed in person.

Using a competency-based framework can be enormously helpful during a challenging time such as the COVID-19 pandemic, Lomis said. A rapid response was required to ensure students' medical education continued,

but students and faculty felt strained as changes to education and practice occurred quickly and frequently. This framework can help show the reflection and thought that went into developing alternative educational pathways. The framework can also provide a stronger rationale for the choices made during the pandemic, she said. Showing learners the value in focusing on the most critical components can support the students' understanding of why certain decisions that disrupted their education was in their best interest. However, said Lomis, "There's no getting around" the fact that these students will have some gaps in their experiences, and the gaps will vary among learners. As these students move forward in their education and practice, a competency-based framework will be a tool for identifying and filling the gaps with additional experience and training.

STUDENTS

Emilia Iwu, Rutgers University

Emilia Iwu, clinical faculty at Rutgers School of Nursing Newark, introduced three health professions students—from medicine, social work, and nursing—to speak about their experiences during the COVID-19 pandemic. Iwu asked the students to focus particularly on adaptations to education that should be continued post-COVID, and those that should be left behind.

MEDICINE

Londyn Robinson, University of Minnesota Medical School

Londyn Robinson, a fourth-year medical student at the University of Minnesota Medical School, began by noting that she and her fellow students had only 2–3 months of in-person clinical rotations during their final year of medical school. Because of this, she said, some students have doubts about whether they are prepared for residency. She added that the entire national cohort of 25,000 medical students missed out on this training, and said "You can't replace the in-person clinical environment, full stop." Robinson wondered how medical residency programs and other health professions programs will adapt to the lack of knowledge and experience these students are bringing to the workplace, and how they will ensure competent patient care.

On the positive side, Robinson said the transition to online coursework was fairly seamless. She and her fellow students appreciated the online resources that were made available for free, and how the online format of learning increased student participation and engagement. However, many

schools "continue to sweat the small stuff," she noted, and students are being asked to do equal if not more work than before the pandemic. Robinson further remarked that while state public health officials urged people to stay home, students were still required to take the Medical College Admissions Test (MCAT) and medical licensing exams in person. Several students tested positive for COVID-19 after taking the MCAT, she said, and many students had to reschedule exams multiple times in multiple states. Robinson herself rescheduled her exam five times, and ended up taking it on the day of her grandmother's funeral.

Robinson then shifted the presentation to share her personal response to the pandemic as a medical student in cofounding a nonprofit organization called Minnesota CovidSitters. She and other medical students recognized that childcare was one of the "major bottlenecks" preventing health care workers from working since the onset of the pandemic. With schools and day care centers closed, health care workers were "caught between choosing going to work to help care for people's families, or staying at home to care for their own." The students worked with a local technology company to develop an application that uses GPS coordinates to match health care workers' needs with free babysitting services. The service quickly expanded beyond Minnesota to operate in 32 states and 5 different countries, serving more than 1,000 families. Robinson said the project was completely student led and interprofessional, and she emphasized that students did this work in their free time outside of courses and other responsibilities.

SOCIAL WORK

Angela Wilbon, Howard University School of Social Work

Angela Wilbon has a dual role at the Howard University School of Social Work. She is a doctoral student in the dissertation proposal writing phase and also works with M.S.W. students who are training to become behavioral health providers. During the pandemic, Wilbon admitted that she and other students experienced isolation, and they formed virtual writing or study groups in order to be able to connect. The M.S.W. students she trains have grappled with how to build rapport and connect with clients when meeting virtually or when meeting in person but physically distanced. To cope with the pandemic, she said, it has been critical to transparently acknowledge the victories and challenges, and to practice self-care and continue connecting with others through virtual social activities. Above all, she said, both students and service providers need to grant grace and compassion to themselves and others.

There have been some positive educational experiences during the pandemic, said Wilbon. Students have felt well supported by faculty members,

in terms of both academics as well as personal challenges. Faculty and leaders have supported and encouraged students through Zoom, email, and telephone calls at all hours of the day, she said. Another positive experience was the opportunity for students to participate in interactive, experiential, and problem-based learning, where "students can be engaged and pulled into the lectures and the conversations so they own the experience and that education." Students also worked with standardized patient case telesimulation, which "they love" because they could hone their craft in a safe environment. In addition, some students were exposed to telehealth services, and were able to learn best practices and the ethical responsibilities of remote care.

Of course, said Wilbon, students also missed out on some opportunities and faced challenges during the pandemic. There were fewer field placement opportunities, and there is a continued need for students to learn how to build rapport with clients virtually. Some online educational methods—such as lectures and PowerPoint slides—were devoid of student engagement or interaction. Students missed out on in-person connection to fellow students, faculty, and clients. Finally, said Wilbon, there is a need for students and faculty to find strategies to reach and serve medically underserved communities who lack access to technology.

NURSING

Gusna Hoque, Rutgers University Nursing Program

The junior year of nursing school is generally the hardest year, said Gusna Hoque, a student in the nursing program at Rutgers University. This is the year when students take their foundational classes that shape them as nurses. The year started off normally, said Hoque, but in mid-March, all in-person classes and clinicals were suddenly cancelled because of the pandemic. Adjusting to this new reality was difficult, said Hoque, and students were concerned about their own health, their family's health, and the stress of continuing their studies during a global pandemic. Many students lived with multiple family members and found it difficult to find a quiet space and time to study. Rutgers was able to restart clinicals for students in the fall semester, and students worried about bringing the virus home to their families. Some students, including Hoque, had family members who suffered or died from COVID-19. During all of this, Hoque said, students were still expected to meet the high expectations of nursing school, rather than being given a pass/fail option like students in many other majors.

However, there were also positives: studying from home saved students time and money, the extraordinary circumstances created strong bonds between peers, and students experienced individual growth as they

learned their own strengths and weaknesses. Students learned to cope with the stress through various strategies including peer-to-peer support and acknowledging their own struggles and emotions. Iwu added that as future frontline workers, it is critical that students learn these types of strategies during school. Hoque closed with the hope that as she and her fellow students move into the workplace with less experience under their belt, they will be helped and guided by experienced health care staff who acknowledge the challenges of education during a pandemic.

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4

An Interprofessional Framework for the Future

Key Points Made by Individual Presenters

- There is enormous potential for health professions students to make a difference during a crisis; however, to capitalize on this potential, there is a need for a coordinated and structured mechanism for educational institutions to get involved. (Cain)
- A major key to innovation is listening to the ideas of students and other learners; these learners are often "zero gravity thinkers" who are open to new and creative ways of doing things. (Arora)

D'Agostino introduced two speakers to present examples of interprofessional efforts that are under way during the COVID-19 pandemic. He underscored how these examples demonstrate the use of rapid cycle learning and a system-based thinking approach to respond to the demands of the pandemic and the needs of both students and health care organizations.

STUDENTS ASSIST AMERICA

Robert Cain, American Association of Colleges of Osteopathic Medicine

In mid-March 2020, said Robert Cain, president and chief executive officer of the American Association of Colleges of Osteopathic Medicine

(AACOM), colleges of osteopathic medicine were faced with the challenge of continuing education for their students in the face of the unfolding pandemic. In particular, there was concern about the ability to continue clinical education in the absence of adequate personal protective equipment (PPE) and a disrupted learning environment. At the same time, there were unmet public health, community, and mental health needs arising out of the crisis, and there was an opportunity for students to help address these needs. AACOM, recognizing there was no organized response to the pandemic that included the medical student workforce, spearheaded the development of the Students Assist America initiative.

The original concept of the initiative, said Cain, was twofold. The first was to enable students to move forward on their clinical education path while traditional methods of learning were disrupted. The second concept was to create meaningful opportunities for students with valuable skills and knowledge to help during the pandemic. The COVID-19 pandemic is not just a medical challenge; instead, it arises out of a complex system of interconnected parts. Recognizing this, AACOM invited other health professions organizations to participate in creating a shared vision for an interprofessional initiative to combat the pandemic. Ten other organizations across the spectrum of health professions joined the effort (see Box 4-1). This initiative reflects the osteopathic philosophy of attention to the body, soul, and mind, by seeking to address not just physical health, but public health, community health, and mental health.

The group's early conversations focused on sharing best practices across professions, developing shared content for educating students about

BOX 4-1
Organizations Involved in Students Assist America

American Association of Colleges of Nursing
American Association of Colleges of Osteopathic Medicine
American Association of Colleges of Pharmacy
American Dental Education Association
American Psychological Association
Association of American Medical Colleges
Association of American Veterinary Medical Colleges
Association of Schools and Colleges of Optometry
Association of Schools and Programs of Public Health
Council on Social Work Education
Physician Assistant Education Association

SOURCE: Robert Cain presentation, December 3, 2020.

COVID-19, and developing a common curriculum that could be used in clinical settings. Cain said one major motivation for the initiative were concerns over the effect the pandemic was having or would have on students. "Faced with uncertainty, we knew it was important to provide students with a sense of purpose, helping them to have some sense of control when things seemed otherwise out of control," he said. To this end, the initiative was developed with student safety, success, and security as key components. With 11 health professions organizations on board, the question they asked themselves was "What can we do with 1 million extra sets of hands?"

The organizations spent a significant amount of time identifying potential tasks that would fit the knowledge base and skill set of students across the professions, he said. Because of the lack of PPE, the group looked for tasks that were no-contact or low-risk roles, such as contact tracing, education via telephone, conducting well-elderly checks, and mental health screenings. Ultimately, the group decided their greatest contribution could be made by using students to expand the vaccination workforce. With the country about to undertake the largest mass-vaccination effort ever, he said, "Extra hands are going to be needed." Cain quoted Ron Klain, chief of staff to President Joe Biden, who said in November 2020, "It's great to have a vaccine, but vaccines don't save lives. Vaccinations save lives. And that means you've got to get that vaccine into people's arms all over this country."

The group identified three necessary steps for expanding the vaccination workforce with health professions students. First, working with the governor of each state to address liability concerns and to facilitate creation of necessary institutional agreements. Second, prioritizing access to the COVID-19 vaccine for health professions students in clinical settings. Third, addressing issues at the federal level to simplify medical reserve corps recruitment, expand the CDC definition of "provider" to include students, and coordinate with the Biden administration's COVID-19 task force.

There were a number of lessons learned through this experience, said Cain. First, access to PPE and concerns about liability were major issues at the beginning of the pandemic and remain so today. Second, the lack of a national response to the pandemic slowed the ability to implement and scale up the initiative. Third, the potential mental health effects associated with the pandemic are real and warrant greater attention in the future. Fourth, the lessons from student experiences during the H1N1 pandemic could be applied today. Fifth, there is bias toward certain health professions, and this bias prevents the full potential of the student workforce from being realized. Sixth, there is a need for training in public health across all health professions education. However, despite these challenges, said Cain, another lesson learned was the commitment to interprofessional education is real. The 11 involved organizations have met weekly since March, and

this type of collaboration between health professions "must continue after the pandemic is resolved."

Students across the health professions, said Cain, can contribute in meaningful ways to the U.S. health care system in times of both crisis and stability. To make this kind of contribution possible, "We just need to open the pathways." There is a need to develop a more structured way for institutions of higher learning to respond to public health needs to fully capitalize on the potential. Health professions programs are spread across the country, even in some of the most remote parts, Cain said. If one imagines a circle of influence around each of these programs, there is enormous potential to make an impact. However, there is a need for a coordinated, structured way for institutions and students to be engaged.

Another needed shift, he said, is improved and expanded interprofessional education and practice. Cain added that students in all health professions should learn about and work with other professions, particularly public health. For example, he said, a team of students from medicine, nursing, public health, social work, pharmacy, and other professions could conduct wellness checks for elderly patients with chronic disease, with each bringing their own area of expertise to the table. There are challenges associated with this approach, such as supervision and accreditation, but it is an idea worth exploring.

In conclusion, said Cain, the COVID-19 pandemic has brought uncertainty and challenges to health professions education, but it has also given students an opportunity to contribute. Students have demonstrated their passion by choosing to get involved in the response, and this willingness shows that we will be in good hands when these students move into the workforce.

INTERPROFESSIONAL LEARNING AT THE POINT OF CARE: SALVAGE, SUSTAIN, AND REPACKAGE POST-COVID

Vineet Arora, University of Chicago School of Medicine
Mary Jo Bondy, Physician Assistant Education Association

In this workshop session, Bondy interviewed Vineet Arora, associate chief medical officer and assistant dean for scholarship and discovery at the University of Chicago School of Medicine (UChicago Medicine). Arora shared examples of the innovations that have happened at her institution throughout the COVID-19 pandemic. The interview was divided into three topics: bridge leadership, interprofessional collaboration, and a case study.

Bridge Leadership

Bondy asked Arora to describe the concept of "bridge leadership" and to explain why connecting practice to education is critical during the COVID-19 pandemic as well as for the future of health care. Arora explained that a bridge leader is one who not only thinks about the health system but also about the entire health professions education and training system, and sees the benefits of aligning education with clinical priorities, goals, and opportunities. Arora said "where you train matters," and she noted that other speakers at this workshop shared powerful stories about the value students and residents can add in health care organizations. Bridging education and practice requires changes to health professions education curricula, changes to systems in health care, and the bridging leadership to align these efforts (see Figure 4-1). Arora said one of the keys to bridging leadership is to be open to the ideas of students, residents, and health professions trainees; she noted that learners often have innovative ideas about changes that could be implemented. Arora said these "zero gravity thinkers"—nonexperts who are open to new ideas and new ways of doing things—are the key to innovation (Rabe, 2006).

To illuminate the concept of bridging leadership, Arora described innovations that occurred during the COVID-19 pandemic at her institution. At the beginning of the pandemic, it became clear that educating students, residents, and clinicians around the proper use of PPE was going to be a challenge, she said. There were multiple signs around the hospital, each with slightly different information. The Hospital Incident Command

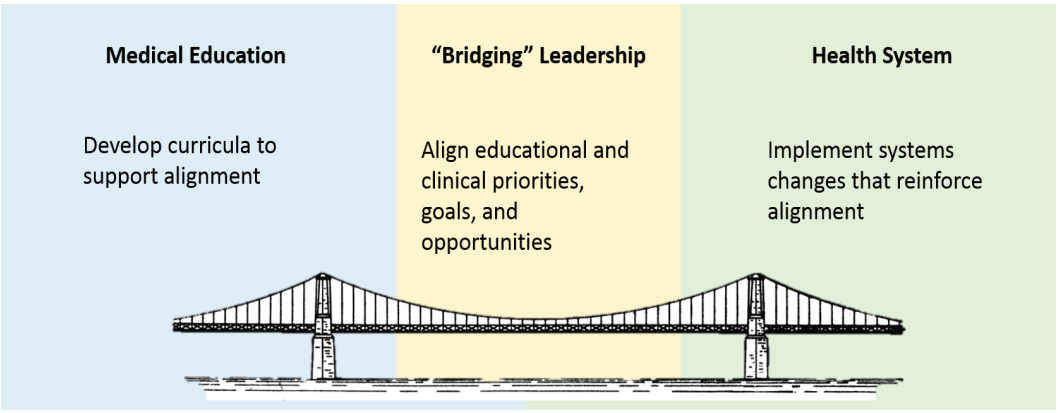

FIGURE 4-1 Bridging leadership.
SOURCES: Arora presentation, December 3, 2020. Reprinted from Healthcare, Vol 6/4, Christopher Moriates and Vineet M. Arora, "Achieving alignment in graduate medical education to train the next generation of healthcare professionals to improve healthcare delivery," 242-244. Copyright 2018, with permission from Elsevier.

System (HICS) distributed multiple messages per day via email and hospital intranet; among these messages were policies and procedures about PPE. Clinicians found it difficult to learn using these methods, and expressed anxiety about not knowing how to *don and doff* PPE correctly. To address this challenge, medical students were deployed as "PPE observers" to help with the process and to ask people how signage could be improved.

One approach that was suggested, she said, was to use a checklist with pictures to make the procedures clearer. In addition, they partnered with a design think tank to test which signs were more effective, and with which groups. For example, they found that nurses preferred one sign while physicians preferred another, and residents were more comfortable donning and doffing than faculty. This demonstrates, said Arora, the importance of educating for the entire health system.

Arora described another approach they used for improving PPE education involving an application that delivered information about PPE at the point of care. People were overwhelmed by the multiple emails per day sent out by HICS, said Arora, and asked for something they could use on their phones. The information technology team was unavailable to help because they were overwhelmed themselves with updating the electronic health record with COVID-19-related changes. A "zero gravity thinker," who was both a cardiology fellow and a health informatics student, had already developed and deployed an app to improve communication on the frontlines. The app was modified to include continuously updated PPE protocols and instructions; this allowed people to access the information at home before work, while donning and doffing, or whenever necessary. This highlights the role that bridging leaders can play at a very high level at an organization, by thinking about education not just for students but also for clinicians who need new information, said Arora.

Interprofessional Collaboration

UChicago Medicine, said Bondy, has a history of investing in interprofessional education such as the IGNITE (Improving GME-Nursing Interprofessional Team Experiences) initiative, and integrating medical librarians into interprofessional teams. Bondy asked Arora to explain how they sought to salvage, sustain, and repackage these efforts during COVID-19. Arora began by describing the benefits of interprofessional collaboration: reduced medication errors, improved patient satisfaction, decreased inpatient mortality, and shorter length of stay. However, she said, it has been challenging to achieve these benefits owing to some of the characteristics of UChicago Medicine. It is located in a health care desert and runs at 98 percent capacity on a regular day; in addition, there is no nursing school associated with the institution.

These circumstances led to the creation of the IGNITE initiative. The idea, said Arora, was to marry residency programs with nursing units so people would take ownership of the patients and the service line and would feel a shared responsibility to each other. Nurses nominate residents for the program, and they work as a team to identify areas that need improvement. This work has resulted in many innovations and improvements in patient care, she said. For example, one challenge at the institution was bringing nurses and physicians together for rounds. An OB nurse suggested having physicians press a button on an existing console in the unit in order to inform nurses of their arrival. Out of this idea came the "MD in the room communication workflow" that allows nurses and providers to touch base at the bedside or in the hallway. A postimplementation survey of the program found improved resident satisfaction, greater interprofessional collaboration, decreased length of stay, and decreased paging volume. When COVID-19 hit, this whole process needed to be reimagined, said Arora. While teamwork is even more critical during COVID-19, there were challenges caused by social distancing, PPE, and the use of alternatives such as web rounding. The program fell by the wayside early in the pandemic but was relaunched in July 2020, with nurses meeting physicians at a safe distance in the hallway or at the bedside.

Another interprofessional initiative at UChicago Medicine is the use of clinical librarians rounding with the teams, said Arora. In this program, a librarian joins the team once a week for patient rounds to offer research support to faculty, residents, and medical students. An evaluation of the program found that it improved learning and did not increase rounding length. At the beginning of the pandemic, librarians stopped attending rounds but were eventually redeployed to serve as an educational support team to keep clinicians educated and updated on COVID-19 related issues. During the redeployment, the librarians collaborated with medical students to synthesize information and answer questions. Arora reported that 22 clinicians were assisted, 80 questions answered, and 325 articles summarized. One clinician said the services were "incredibly helpful in facilitating data-driven clinical practice."

Case Study: Family-Centered Rounds in Pediatrics

Arora concluded with a brief description of an innovation that allowed family-centered rounds to continue in pediatrics during COVID-19. The pediatric team used a rapid cycle plan-do-study-act approach to develop the plan for rounding. They used an iPad clipped onto an IV pole, and learners used the iPad to join the rounds virtually. This rounding approach, said Arora, is called the "leapfrog" model because learners switch off and on between joining in-person and joining virtually (see Figure 4-2). For example,

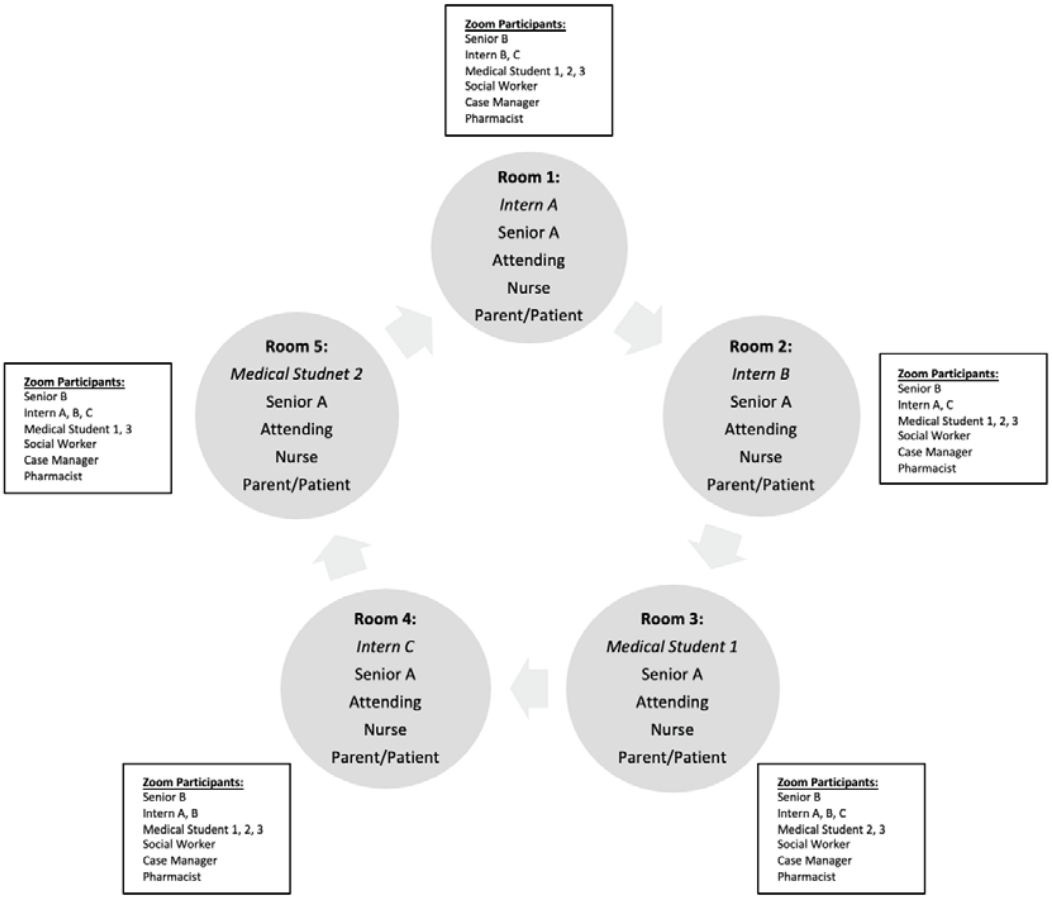

FIGURE 4-2 Leapfrog model for clinical rounds.
SOURCE: Arora presentation, December 3, 2020.

one intern will attend in-person for the first patient, then join Zoom for the next patient while another intern attends in-person. Before this innovation, traditional virtual rounds were not working well, said Arora. Using this hybrid model improved education during rounds as well as communication between clinicians, residents, and patients.

MOVING FORWARD

Darrin D'Agostino, Kansas City University

At the conclusion of the workshop, D'Agostino offered his thoughts and polled participants on the main lessons from the sessions. D'Agostino said that speakers had emphasized the need for leadership to support innovation, the need for collaboration between academia and practice settings, and the need to use a systems-based approach to designing interprofessional

HPE. Participants were asked to answer two poll questions. Bondy reported that many participants indicated their intent to "definitely" get involved with implementing similar programs at their institutions. Several participants also endorsed continuing the dialogue and expressed a desire to move forward with a focus on interdisciplinary teams, promoting wellness, telehealth, evidence-based practice, and systems thinking. D'Agostino closed by expressing his hope that COVID-19 and this workshop would serve as the "scratch on the beaker wall" to crystallize and scale up these innovations.

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Appendix A

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Jeffrey Stewart, D.D.S., M.S.
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Appendix B

Workshop Agenda

December 3, 2020

Online

LESSONS LEARNED IN HEALTH PROFESSIONS EDUCATION (HPE) FROM THE COVID-19 PANDEIMC

DESIRED OUTCOME: To explore the desirability of continued discussion on creating a new framework for health professional education.

11:00 a.m. Opening Session

Welcome and Setting the Stage

- Workshop Co-Chairs: Mary Jo Bondy (Assistant Education Association) and Darrin D'Agostino (Kansas City University)

LOOKING BACK AND MOVING FORWARD

11:15 a.m. **Using the Past to Inform the Future**
Facilitator: Valerie N. Williams, University of Oklahoma Health Sciences Center

Poll Questions:

- What were your top three concerns before the pandemic disrupted HPE?
- What are your top three concerns now, during the pandemic?
- What are your top three concerns for the future of HPE?

Speaker: Skylar Stewart-Clark, Charleston Southern University

A Systems Approach to Informing the Future
Pinar Keskinocak, Georgia Institute of Technology

From Survive Mode to Thrive Mode: Developing Actionable Evidence
David B. Daniel, James Madison University

12:20 p.m. **[10 min intermission—do not exit the webinar]**

INNOVATION BROUGHT BY COVID-19

12:30 p.m. **Showcasing Innovation**

Public Health

- Jim Buehler, Drexel University, and Susan Choi, Healthcare Improvement Foundation
  - **Academic Public Health Volunteer Corps**
    Neil Maniar, Northeastern University
  - **Dornsife School of Public Health**
    Jennifer Kolker, Drexel University

Discussion

Clinical Education

- Kimberly Lomis, American Medical Education (AMA)
  - **Lessons Learned from the AMA Accelerating Change in Medical Education Consortium**
    Kimberly Lomis, AMA

- **Practice/Academic Partnership**
  Nancy Spector, National Council of State Boards of Nursing

Discussion

Students

- Emilia Iwu, Rutgers School of Nursing
  - Londyn Robinson, medical student, University of Minnesota Medical School
  - Angela Wilbon, social work Ph.D. student, Howard University
  - Gusna Hoque, nursing student, Rutgers University

EXPLORING A DYNAMIC FRAMEWORK

1:45 p.m. **An Interprofessional Framework for the Future**
Facilitators: Mary Jo Bondy and Darrin D'Agostino, Co-Chairs

Students Assist America

- Robert Cain, American Association of Colleges of Osteopathic Medicine

Interprofessional Learning at the Point of Care: Salvage, Sustain, and Repackage Post-COVID-19

- Interview with Vineet Arora, University of Chicago Medicine

2:30 p.m. **ADJOURN**

Appendix C

Speaker Biographical Sketches

Vineet Arora, M.D., MAPP, is an academic hospitalist who specializes in improving the learning environment for medical trainees and the quality, safety, and experience of care delivered to hospitalized adults. She is an internationally recognized expert on patient handoffs in health care and also has extensive expertise using technology such as social media to improve workplace learning in teaching hospitals on a variety of topics. Her educational videos on handoffs, supervision, professionalism, and costs of care have been used by numerous educators around the country and have been featured on NPR and in *The New York Times*. Through her leadership roles, Dr. Arora enables incoming medical students to participate in longitudinal mentored scholarly projects. She is also working to ensure residents from all specialties are integrated into hospital quality initiatives.

An accomplished researcher, Dr. Arora has served as the principal investigator of numerous federal and foundation research grants. Most notably, Dr. Arora has developed tools to evaluate handoff quality among hospitalists and residents. She is also investigating the effect of sleep loss on hospitalized patients and working to create novel interventions to optimize patient experience in hospitals through workplace learning and systems change. Through R-01 funding, Dr. Arora is studying the effect of a novel social media intervention to boost interest of minority youth into medical research careers. Dr. Arora's work has been funded by the Agency for Healthcare Research and Quality, the National Institute on Aging, and the American Sleep Medicine Foundation.

Dr. Arora's academic work has resulted in dozens of peer-reviewed publications and has been recognized with awards from the Society of Hospital

Medicine, the Society of General Internal Medicine, the Association of Program Directors in Internal Medicine, and the Association of American Medical Colleges. She has also testified to Congress on the primary care crisis as well as to the Institute of Medicine on residency duty hours and handoffs. For her work, she was been recognized as *ACP Hospitalist Magazine*'s Top Hospitalist in 2009, one of "20 People Who Make Healthcare Better" by *HealthLeaders Magazine* in 2011, and as a master to the Academy of Distinguished Medical Educators at The University of Chicago.

Mary Jo Bondy, D.H.Ed., M.H.S., PA-C (*Workshop Co-Chair*), is the chief executive officer (CEO) at the Physician Assistant Education Association (PAEA). A distinguished clinician, educational leader, and innovator, in February 2020 she became the first physician assistant (PA) to serve as CEO of PAEA, where she leads a staff of 40 in serving the more than 250 member programs and meeting the needs of more than 3,000 individual faculty. Following her graduation from the Duke University PA Program in 1993, she worked in many clinical settings and specialties, including in family medicine, emergency medicine, internal medicine, and orthopedics. She also served as a clinical preceptor for PA students for many years and was awarded the Duke University PA Program Preceptor Award in 2001. She began her career as an educator as a regional clinical coordinator for the Duke University PA Program. In this role she helped recruit and develop potential students and preceptors for the South East Area Health Education Center in Wilmington, North Carolina. In 2003 she moved to Maryland to become the academic coordinator of the Anne Arundel Community College PA Program and in 2007 she became the program director. Dr. Bondy earned a D.H.Ed. from AT Still University in May 2011.

James W. Buehler, M.D., is a clinical professor and the interim chair of the Department of Health Management and Policy and an affiliate of the Drexel Urban Health Collaborative at Drexel University. Prior to joining the Drexel faculty in 2013, Dr. Buehler had more than two decades of government public health service at the Centers for Disease Control and Prevention (CDC) in Atlanta and the Georgia Department of Public Health, where his work spanned general field epidemiology, maternal and child health, infectious diseases (particularly HIV/AIDS, sexually transmitted diseases, and tuberculosis), population health surveillance, public health ethics, informatics, and emergency preparedness and response. During the final 18 months of Mayor Michael Nutter's administration, Drexel granted Dr. Buehler a leave of absence to serve as Philadelphia's health commissioner, where he directed the Philadelphia Department of Public Health. In that capacity, he was responsible for a broad spectrum of public health and safety-net clinical services and for leading the health department's

response to the threat of Ebola virus in 2014–2015 and its preparations for the Pope's visit to Philadelphia in 2015. In addition to his position at Drexel, Dr. Buehler was formerly a research professor in the Department of Epidemiology at the Emory University Rollins School of Public Health. His research interests focus on advancing public health systems, including the interface between public health and health care services. He is a graduate of the University of California, Berkeley; the University of California, San Francisco, School of Medicine; CDC's Epidemic Intelligence Service program, and is board certified in pediatrics and general preventive medicine.

Robert A. Cain, D.O., FACOI, FAODME, joined the American Association of Colleges of Osteopathic Medicine (AACOM) as the president and the chief executive officer in July 2019. Prior to assuming this position, he served as the associate dean for clinical education at the Ohio University Heritage College of Osteopathic Medicine (OU-HCOM) where he oversaw business development and relationship management for clinical experiences associated with undergraduate and graduate medical education (GME). As part of his GME-related duties, Dr. Cain functioned as the chief academic officer for the Ohio Centers for Osteopathic Research and Education, a statewide medical education consortium. Prior to this university appointment he served as the director of medical education at Grandview Hospital in Dayton, Ohio (2006–2014), and as the director of the internal medicine residency program at the same facility (1999–2007).

Over the past two decades, Dr. Cain has served on a number of local, state, and national committees, task forces, and boards in a variety of roles, including the American Osteopathic Association (AOA) Council on Postdoctoral Training Institutions, the AOA Council on Postdoctoral Training, the American College of Osteopathic Internists (ACOI) Board of Directors, the ACOI Board of Trustees and Executive Committee, the AOA and AACOM Blue Ribbon Commission on Osteopathic Medical Education, and the first chair of the Accreditation Council for Graduate Medical Education Osteopathic Principles Committee. He also served as the president of the Association of Osteopathic Directors and Medical Educators (AODME, now known as AOGME).

Dr. Cain was inducted into the AOGME Collegium of Fellows in 2018 and has received many other awards for his contributions to osteopathic medical education, including the Association of Osteopathic Directors and Medical Educators Leadership Award in 2014, OU-HCOM Master Clinical Faculty in 2011, OU-HCOM Standard of Excellence Award in 2009, and the ACOI Teacher of the Year in 2004.

As a specialist in pulmonary medicine, Dr. Cain graduated from OU-HCOM in 1988 and operated a private practice in Ohio from 1994 to 2008. Originally board certified in both internal medicine and pulmonary

medicine, he was recertified by the American Osteopathic Board of Internal Medicine in pulmonary medicine in 2018.

Susan Choi, Ph.D., is the senior director of population health at the Health Care Improvement Foundation (HCIF). Since joining HCIF in 2012, Dr. Choi has directed learning collaboratives addressing a variety of topics, including health literacy, palliative care, and early identification management of hypertension and diabetes. She is currently responsible for the facilitation of two community health improvement collaboratives—Montgomery County Hospital Partnership and Collaborative Opportunities to Advance Community Health—that engage health systems in southeastern Pennsylvania to address pressing community health needs. Dr. Choi previously worked as a consultant and a research associate for the Institute for Community Health and the Cambridge Health Alliance in Cambridge, Massachusetts. In these roles, she conducted evaluations of a variety of health promotion programs and led several quality initiatives focused on improving health equity, language services, and HIV care. She earned her B.A. in psychology and Ph.D. in social psychology from Harvard University.

Darrin D'Agostino, D.O., M.P.H., M.B.A. (*Workshop Co-Chair*), is currently the executive dean of the College of Osteopathic Medicine and the vice president of health affairs at the Kansas City University (KCU) of Medicine and Biosciences. Dr. D'Agostino does research related to health care issues and population health as well as the influence of it on disease progression. Dr. D'Agostino comes to KCU from the University of North Texas (UNT) Health Science Center in Fort Worth, where he served as the associate dean of community health and innovation and a professor of medicine. He was also the chair of the Department of Medicine at UNT for 8 years. Prior to that, Dr. D'Agostino held positions as the program director for the Osteopathic Internal Medicine Residency and the director of osteopathic medical education for both the University of Connecticut School of Medicine in Farmington, Connecticut, and Hartford Hospital in Hartford, Connecticut.

David B. Daniel, Ph.D., is currently a professor of psychology at James Madison University and an award-winning teacher with more than 25 years of classroom experience. A fellow of the Association for Psychological Science, Dr. Daniel has been honored numerous times for his teaching and translational efforts. In additional to earning many university- and college-level teaching awards, his national honors include the Society for the Teaching of Psychology's Teaching Excellence Award, the Transforming Education through Neuroscience Award, and being recognized as one of the top 1 percent of educational researchers influencing public debate

in the United States. He was recently appointed to a select panel of the National Academies of Sciences, Engineering, and Medicine to update and extend the influential National Research Council report *How People Learn: Brain, Mind, Experience, and School*, and he was featured in the *Princeton Review*'s 300 Best Professors.

Dr. Daniel's dedication to facilitating student learning extends from higher education contexts to the K–12 classroom and across a wide variety of disciplines. He regularly consults with schools, districts, teaching and learning centers, publishers, education-oriented companies, policy makers, and nonprofit foundations on the development of high-impact pedagogy, including the targeted use of appropriate technologies.

Dr. Daniel's scholarship and related activities focus on translating findings from the science of learning and the scholarship of teaching and learning to useable knowledge, particularly for educational practice, policy, and student learning. He works to infuse the design of pedagogy and systems, including digital tools, with learning science and stakeholder usability to maximize learning and engagement.

Gusna Hoque, Nursing Student, Rutgers School of Nursing

Emilia Iwu, Ph.D., R.N., APNC, FWACN, completed her basic nursing and midwifery education in Nigeria. She obtained a B.A. in school health services from Rowan University of New Jersey, and she earned her B.S., M.S., and Ph.D. in nursing from Rutgers University. Before joining the University of Maryland Institute of Human Virology and School of Nursing in 2006 as a technical advisor for the Presidential Emergency Program for AIDS Relief (PEPFAR) grant in Nigeria, she worked as a family nurse practitioner in the Infectious Diseases Clinic at the Cooper Hospital University Medical Center and the Healthcare for the Homeless Program, both in Camden, New Jersey. Her key interests have been capacity development of nurses and community health workers through education and practice. As an assistant professor at the University of Maryland School of Nursing, Dr. Iwu helped design a postmaster's global health certificate program that involves clinical and research rotations for U.S.-based nursing students in Nigeria and other resource-constrained countries. She is an alumna of the Robert Wood Johnson Foundation and Jonas Foundation Faculty/Leadership programs. As clinical faculty at the Rutgers University School of Nursing Newark since 2014, she continued her global HIV work in Nigeria. Her research interests include HIV nursing, patient access and retention, and nursing roles in changing health care delivery systems especially in resource limited settings.

Pinar Keskinocak, Ph.D., is the William W. George Chair and a professor in the School of Industrial and Systems Engineering and the co-founder

and the director of the Center for Health and Humanitarian Systems at the Georgia Institute of Technology. She is the lead faculty advisor for the MS Health Systems at Georgia Tech and also leads the Health and Humanitarian Supply Chain Management Professional Education certificate program. Previously, she has served as the College of Engineering ADVANCE Professor and the interim associate dean for faculty development and scholarship.

Dr. Keskinocak's research focuses on the applications of quantitative methods and analytics to have a positive impact in society, particularly in health care and humanitarian systems. Her recent work has addressed a broad range of topics such as infectious disease modeling (including pandemic flu, COVID-19, malaria, Guinea worm, polio), evaluating intervention strategies and resource allocation, catch-up scheduling for vaccinations, decision support for organ transplants, hospital operations management, and disaster preparedness and response. She has worked on projects with a variety of governmental and nongovernmental organizations and health care providers, including the American Red Cross, CARE, the Carter Center, the Centers for Disease Control and Prevention, Children's Healthcare of Atlanta, Emory Healthcare, the Georgia Department of Public Health, Grady Hospital, and the Task Force for Global Health.

Dr. Keskinocak is the president-elect of INFORMS (Institute for Operations Research and Management Sciences) and has served in various other roles within the society over the years, including INFORMS secretary, INFORMS vice president for membership and professional recognition, president of the women on OR/MS Forum, president of the public sector OR Section, and the department editor for *Operations Research*. She is an INFORMS fellow.

Jennifer Kolker, M.P.H., holds an M.P.H. in public health policy and administration from the University of Michigan School of Public Health. Professor Kolker is a clinical professor of health management and policy, the director of the Center for Public Health Practice, and the co-director of the Pennsylvania Public Health Training Center, a federally funded training center for the public health workforce, operated in collaboration with the University of Pittsburgh. Prior to joining Drexel University in 2004, she held various positions in the nonprofit world and then in the Philadelphia Department of Public Health, working first in HIV/AIDS policy and planning and later in the Office of the Health Commissioner, also in a health planning and policy role. Professor Kolker was also a senior policy associate with Public Works, a consulting firm that provides public policy research and analysis to government agencies and officials, nonprofits, and think tanks across the country. Professor Kolker teaches several courses on public policy and public health practice and advises and mentors graduate students. Her work is focused on building bridges between academic public

health and public health practice within the school's mission of pursuing public health, human rights, and social justice.

Kimberly D. Lomis, M.D., is the vice president for undergraduate medical education innovations at the American Medical Association. In that capacity, she guides the Accelerating Change in Medical Education consortium of 37 medical schools, affecting approximately 25,000 medical students across the United States. Dr. Lomis is invested in competency-based medical education. She previously served as the associate dean for undergraduate medical education at the Vanderbilt University School of Medicine, where she guided a major revision of the medical school curriculum that included implementation of a comprehensive competency-based assessment program. Dr. Lomis also served as the director of the national pilot of the Association of American Medical Colleges Core Entrustable Professional Activities for Entering Residency. Dr. Lomis trained in general surgery at the Vanderbilt University Medical Center from 1992 to 1997 and practiced until 2012. She retains appointment at Vanderbilt as an adjunct professor of surgery and of medical education and administration.

Neil Manair, Ph.D., M.P.H., is a professor of practice and the director of the M.P.H. in urban health program in the Department of Health Sciences in the Bouve College of Health Sciences at Northeastern University. Prior to this, he was the vice president of health systems at the American Cancer Society's (ACS's) New England Division, overseeing cancer control efforts in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. As the Division's health systems leader, he led a team of 40 staff working within health care systems to increase use of cancer prevention strategies and cancer screening tests, reduce barriers to care for cancer patients, help patients navigate the cancer journey, and engage health care organizations in fighting cancer through the society's advocacy and community initiatives. He also served on the Division's Senior Leadership Team.

Prior to joining ACS, he was the director of health equity programs in the Brigham and Women's Hospital Center for Community Health and Health Equity. Dr. Maniar was also the founding director of the Massachusetts Youth Violence Prevention Program at the Massachusetts Department of Public Health. He created this program through a $200,000 Centers for Disease Control and Prevention grant in 2004 and directed its growth into a program with $3.5 million in state funding by 2008. He also founded and co-chaired the Massachusetts Coalition for Youth Violence Prevention and currently serves on the Board of Directors of the Massachusetts Public Health Association.

He received his Ph.D. from the Johns Hopkins Bloomberg School of Public Health in 2005 and his M.P.H. with distinction from the Yale

University School of Public Health in 1998. He also has a bachelor's degree from Connecticut College with a double major in English and zoology.

Londyn Robinson is a medical student at the University of Minnesota Medical School. She obtained a B.S. in genetics and human development at the University of Minnesota and started medical school in the fall of 2016. Currently, she is pursuing a passion for medicine and scientific research while working at the Division of Rheumatic and Autoimmune Diseases at the University of Minnesota Medical School.

Nancy Spector, Ph.D., R.N., FAAN, is the director of regulatory innovations at the National Council of State Boards of Nursing (NCSBN). Before coming to NCSBN, Dr. Spector was a faculty member at the Loyola University School of Nursing in Chicago, where she taught at the undergraduate and graduate levels. She has worked on a number of initiatives while at NCSBN, including the regulatory implications of social media, innovations and trends in nursing education, the future of nursing program approval, regulatory issues in distance learning programs, outcomes and metrics of nursing education programs, and she was instrumental in developing the innovative Regulatory Scholars Program and the Safe Student Reports study of nursing student errors and near misses. Dr. Spector was the principal investigator on an NCSBN multisite transition to practice study, and she was a consultant on the National Simulation Study. Dr. Spector presents and publishes nationally and internationally on regulatory issues in nursing education.

Skylar Stewart-Clark, Ph.D., PA-C, joined the faculty at the Charleston Southern University (CSU) physician assistant (PA) program after 3 years of practice in adult urology and urologic oncology at the Medical University of South Carolina (MUSC) and serving as adjunct faculty in the MUSC PA program. Dr. Stewart-Clark holds a B.S. and a Ph.D. in biomedical engineering from Louisiana Tech University and an M.S. in physician assistant studies from MUSC. As part of her doctoral training, she completed a 4-year teaching fellowship sponsored by the National Science Foundation. After completion of her Ph.D., she spent several years as a postdoctoral research fellow in tissue engineering and regenerative medicine at MUSC, where she worked on various projects with clinician scientists to find solutions for orthopedic, dental, and cardiac clinical applications. In 2009 she served at the Dream Center Clinic of Seacoast Church as a volunteer translator and assistant, and eventually this led her on the path to participating in international medical and surgical missions in Central America. Those experiences and following the prompting of a never-ending call to practice medicine led her to pursue training as a physician assistant in 2013.

Dr. Stewart-Clark is an active member of the South Carolina Academy of Physician Assistants, where she served as the chair of the ASPIRE (pre-PA) committee for 2 years. She is passionate about unconscious bias and diversity in medicine and has guest lectured on these topics. She continues to volunteer with the Seacoast Dream Center Clinic and organizes and chairs the annual community health fair every October. She is thrilled to be part of the CSU PA program, where she can not only share her knowledge but also her faith with fellow faculty and PA students.

Angela Wilbon, M.S.W., is a licensed clinical social worker. She received her B.S.W. and M.S.W. from The University of Iowa. She currently is a doctoral student at the Howard University School of Social Work. Her research areas of interests are HIV, health equity, and integrative health. Ms. Wilbon has provided clinical services for children, adolescents, and families for more than 20 years. Ms. Wilbon is a psychotherapist in a private practice serving the DC metropolitan area. Since 2007, she has served as a medical social worker at Children's National Hospital (CNH) providing mental health and supportive services to pediatric patients and their families. Prior to CNH, she was an in-school psychotherapist for middle school students in Alexandria, Virginia, for nearly 5 years. At the Center for Child Protection and Family Support, Ms. Wilbon designed and implemented a successful Office of Juvenile Justice and Delinquency Prevention (OJJDP) at-risk youth mentoring program in Southeast Washington, DC, for approximately 3 years. She has worked for various nonprofit organizations over her career including Second Story (formerly Alternative House), the Women's Research and Education Institute, Community Horizons, and Foundations for Families.

Ms. Wilbon has served as a volunteer with several local and national agencies. She volunteered as a parent education facilitator for SCAN (Stop Child Abuse Now) in Alexandria, Virginia. She volunteered as a mentor to City of Alexandria youth. Lastly, she was a U.S. Peace Corps volunteer in Namibia as a regional youth development officer.

Ms. Wilbon has facilitated workshops and trainings for a plethora of agencies including child care facilities in Virginia; Washington, DC; and Maryland. She has conducted parenting classes with the Arlington County Department of Social Services for several years. She has trained social workers, educators, health professionals, and numerous other disciplines in a range of topic areas.

Valerie N. Williams, Ph.D., M.P.A., is the vice provost for academic affairs and faculty development at the University of Oklahoma Health Sciences Center (OUHSC). In this role she has responsibility for campus-wide academic affairs, academic integrity, and faculty development issues. The

Office of Vice Provost Academic Affairs and Faculty Development includes academic affairs, admissions and records, academic technology, faculty development and interdisciplinary programs, and the Robert M. Bird Health Sciences Library.

A year after joining the OUHSC College of Medicine faculty in 1989, Dr. Williams created the Health Sciences Center Faculty Leadership Program, an interprofessional faculty development and mentoring program. Following nomination, faculty participants representing the six health professions colleges and interdisciplinary graduate college participate in an 11-month program focused on the teaching and research mission and leadership knowledge and skill development. The program is sponsored by the OUHSC deans and provost. As the program director, Dr. Williams has served as a mentor or coach for more than 350 OUHSC faculty and more than 500 faculty participating in summer institutes or nationally sponsored faculty development programs.

The Office of Academic Affairs at the OUHSC includes academic program and academic policy oversight. The office hosts the faculty-led Academic Program Council, provides admissions data, and manages an on campus online application. Student data and reporting is handled through the Office of Institutional Research, and student records are overseen by the HSC Registrar. In addition, Dr. Williams serves as an adviser to the Student Government Association Academic Integrity Council.

Appendix D

Workshop Resources and Presenter Handouts

STUDENTS ASSIST AMERICA (SAA) BACKGROUND

SAA is spearheaded by the American Association of Colleges of Osteopathic Medicine and is an interprofessional collaborative of 11 associations representing academic health institutions across the country. Collectively, SAA has access to nearly 1 million students in the United States in medicine (DO and MD), nursing, public health, pharmacy, physician assistant, social work, optometry, dentistry/dental hygiene, veterinary medicine, and psychology. SAA has been engaging with the U.S. Department of Health and Human Services, national and state Medical Reserve Corps leaders, the Centers for Disease Control and Prevention (CDC), and with governors' offices to get students in the vaccination workforce.

Now that potential Pfizer and Moderna vaccines exist, interest in this approach is rising, but we need your help to make the promise of SAA a reality.

POLICY BRIEF: U.S. NURSING LEADERSHIP SUPPORTS PRACTICE/ACADEMIC PARTNERSHIPS TO ASSIST THE NURSING WORKFORCE DURING THE COVID-19 CRISIS

Purpose

This policy brief is the collaborative effort of nursing leaders who propose and support academic–practice partnerships between health care facilities and prelicensure registered nursing (RN) and practical/vocational

nursing (PN/VN) programs across the country during the COVID-19 crisis. This is one potential model to consider. It is not mandated; rather, it is an innovative approach to meeting academic and workforce needs.

The proposed model requires cautious evaluation at the local level with a clear understanding that:

- The participation of student nurses and faculty is voluntary and must comply with any additional requirements mandated in state emergency response provisions or through existing Occupational Safety and Health Administration (OSHA) requirements.
- The safety for all frontline providers of services across multiple points of care must be safeguarded through appropriate and prevailing infection control practices.

Context

- COVID-19 is a virus affecting the entire world. To date, thousands of people in the United States have tested positive for the disease, and it is anticipated that many more will be affected in the near future. After observing the pattern of the virus, CDC anticipates an overabundance of patients inundating hospitals and possibly overwhelming the entire U.S. health care system.
- A significant demand is being placed on the entire nursing workforce, and this is anticipated to increase at an alarming rate.
- Simultaneously, the pandemic has affected prelicensure RN and PN/VN nursing students across the country. Clinical experiences with patients are an essential part of every nursing program curriculum and are mandated by the state boards of nursing for licensure. Many hospitals and health care facilities have determined that prelicensure RN and PN/VN nursing students should not be in contact with patients and have discontinued student clinical experiences in their facility. Without this valuable experience, all nursing students will have a deficit in their education, will be unable to meet their program requirements, and will not be eligible for graduation at a time when RNs and PN/VNs are needed in the health care system.

Proposal

- Health care facilities and nursing education programs are encouraged to partner during the COVID-19 crisis.
- Prelicensure RN students from diploma, associate degree, and baccalaureate degree nursing programs and PN/VN students from a

nursing program could augment and support nursing services in health care facilities.
- Nursing students would be employed by the facility on a full- or part-time basis and would work in the role of a student nurse for compensation and, in conjunction with the student's nursing education program, would receive academic credit toward meeting clinical requirements.
- Nursing students would be required to be enrolled in an RN or PN/VN prelicensure program approved by the state board of nursing (or its equivalent).

Benefits

This opportunity will not only provide much needed clinical education to assist in meeting program requirements, it is an unparalleled opportunity for nursing students to assist the nation in a time of crisis and learn the principles of population health and emergency management. This academic–practice model demonstrates that in the midst of a periling disruption in the environment, such as COVID-19, continuous innovation can occur.

Recommendations

1. Health care facilities and nursing programs are encouraged to promulgate plans to take advantage of this opportunity and make every effort to reach out to eligible nursing students and inform them of the opportunity.
2. Health care facilities and nursing programs are encouraged to collaborate to identify ways to accomplish appropriate faculty supervision of the nursing student–employee to achieve the final learning outcomes of the nursing program. For example, the health care facility could hire the nursing program faculty to oversee the nursing student-employee, the nursing program faculty could hold joint appointment by the college/university/school and the health care facility, or the health care facility-employed preceptors could oversee the nursing student–employee with nursing program faculty oversight.
3. Nursing program leaders and faculty are encouraged to work with health care facility representatives to align clinical skills and competencies with the nursing student-employee work role and responsibilities.
4. Nursing student–employees must have planned clinical practice experiences that enable the students to attain new knowledge and

demonstrate achievement of the final learning outcomes of the nursing program.

5. Nursing programs should consult with their state board of nursing to ensure clinical requirement regulations would be met with this opportunity and experience.
6. Nursing programs are responsible for informing nursing students of the risks and responsibilities associated with working in a health care facility at this time. Additionally, nursing programs are responsible for communicating with students about their rights to be protected from infection and their options for completing the clinical practice requirements of the nursing program.

ACCELERATING CHANGE IN MEDICAL EDUCATION: LINKS TO OPEN-ACCESS RESOURCES FROM AMA

AMA Practical Guide to Restoring Clinical Rotations for Medical Students
https://www.ama-assn.org/system/files/2020-05/recommendations-restoring-clinical-rotations.pdf

Webinar series (must register to create a free account)
https://innovationmatch.ama-assn.org/groups/ace-community/pages/resources

Most relevant sessions:

- *Deploying Students in Alternative Roles During COVID-19: Preserving Clinical Educational Objectives and Supporting Competency Development*, April 1
- *Clinical Education and Return to Clerkships in the World of COVID-19: Principles, Alternative Models, and Assessing Competence*, April 29
- *Engaging Learners in Telemedicine Visits: Workflows to Support Teaching, Feedback, and Billing*, June 29
- *Applying Systems Thinking to Address Structural Racism in Health Professions Education: Curriculum, Structural Competency, and Institutional Change*, July 20
- *Fostering Agility in Learning: Competency-Based Medical Education and Coaching to Support Master Adaptive Learners*, August 3

Diversity Vigilance Statement
Guidelines for Protecting Students and Residents Underrepresented in Medicine During COVID-19 Educational Disruptions

Framework for Combatting Structural Racism in Medical Education Programs
AMA Curricular Diversity and Inclusion: Outline for Self-Study and Action Plans

Health Systems Science Learning Series
Most relevant modules "Systems Thinking" and "What Is Health Systems Science?"
https://edhub.ama-assn.org/health-systems-science

Coaching in Medical Education—Handbooks for Faculty and Learners
https://www.ama-assn.org/system/files/2019-09/coaching-medical-education-faculty-handbook.pdf
https://www.ama-assn.org/system/files/2019-09/coaching-medical-education-learner-handbook.pdf

AMA STEPS*forward* Caring for Caregivers
https://www.ama-assn.org/delivering-care/public-health/caring-our-caregivers-during-covid-19

Mind–Body Resources

Substance Abuse and Mental Health Services Administration's Disaster Distress Helpline

1-800-985-5990

Provides 24/7, 365-day-a-year crisis counseling and support to people experiencing emotional distress related to natural or human-caused disasters

5-part curriculum infusion package (CIP) on compassion fatigue and the behavioral health workforce

http://uclaisap.org/html2/compassion-fatigue-behavioral-workforce-cip.html

CIP was created to help college and university faculty infuse brief, science-based content into existing substance use disorder-related course syllabi (e.g., foundation of addiction courses, ethics, counseling courses). Each slide contains notes for the instructor to provide guidance as necessary. References are included for each slide and handouts when possible.

Mental health and psychosocial messages during the COVID-19

https://www.who.int/publications-detail/mental-health-and-psychosocial-considerations-during-the-covid-19-outbreak

World Health Organization aims messages at different target groups (including health care workers and their facility managers)

Remote psychological first aid Guidance during the COVID-19

https://reliefweb.int/sites/reliefweb.int/files/resources/IFRC-PS-Centre-Remote-Psychological-First-Aid-during-a-COVID-19-outbreak-Interim-guidance.pdf

International Federation of Red Cross and Red Crescent Societies

Relaxation videos (free)

https://blog.calm.com/take-a-deep-breath

Neck/back pain exercises

https://www.youtube.com/watch?v=6C-wfV27bzI

3 easy exercises (10-minute video)

A practical toolkit for health systems responding to COVID-19

https://www.rush.edu/sites/default/files/2020-07/creating-wellness-pandemic-toolkit.pdf

Rush wellness toolkit

Appendix E

Forum-Sponsored Products

GLOBAL FORUM ON INNOVATION IN HEALTH PROFESSIONAL EDUCATION SUMMARIES AND PROCEEDINGS

nationalacademies.org/ihpeglobalforum

Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models Across the Continuum of Education to Practice: Workshop Summary (2013)

Establishing Transdisciplinary Professionalism for Improving Health Outcomes: Workshop Summary (2013)

Assessing Health Professional Education: Workshop Summary (2013)

Building Health Workforce Capacity Through Community-Based Health Professional Education: Workshop Summary (2014)

Empowering Women and Strengthening Health Systems and Services Through Investing in Nursing and Midwifery Enterprise: Lessons from Lower-Income Countries: Workshop Summary (2015)

Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes (2015)

Envisioning the Future of Health Professional Education: Workshop Summary (2015)

A Framework for Educating Health Professionals to Address the Social Determinants of Health (2016)

Exploring the Role of Accreditation in Enhancing Quality and Innovation in Health Professions Education: Proceedings of a Workshop (2016)

Future Financial Economics of Health Professional Education: Proceedings of a Workshop (2017)

Exploring a Business Case for High-Value Continuing Professional Development: Proceedings of a Workshop (2018)

Improving Health Professional Education and Practice Through Technology: Proceedings of a Workshop (2018)

A Design Thinking, Systems Approach to Well-Being Within Education and Practice: Proceedings of a Workshop (2019)

Strengthening the Connection Between Health Professions Education and Practice: Proceedings of a Joint Workshop (2019)

The Role of Nonpharmacological Approaches to Pain Management: Proceedings of a Workshop (2019)

Educating Health Professionals to Address the Social Determinants of Mental Health (2020)

Health Professions Faculty for the Future: Proceedings of a Workshop (2021)

NATIONAL ACADEMY OF MEDICINE PERSPECTIVE PAPERS

Breaking the Culture of Silence on Physician Suicide (2016)

I Felt Alone But I Wasn't: Depression Is Rampant Among Doctors in Training (2016)

Defining Community-Engaged Health Professional Education: A Step Toward Building the Evidence (2017)

100 Days of Rain: A Reflection on the Limits of Physician Resilience (2017)

A Multifaceted Systems Approach to Addressing Stress Within Health Professions Education and Beyond (2017)

Addressing Burnout, Depression, and Suicidal Ideation in the Osteopathic Profession: An Approach That Spans the Physician Life Cycle (2017)

Burnout, Stress, and Compassion Fatigue in Occupational Therapy Practice and Education: A Call for Mindful, Self-Care Protocols (2017)

Promoting Well-Being in Psychology Graduate Students at the Individual and Systems Levels (2017)

Stress-Induced Eating Behaviors of Health Professionals: A Registered Dietitian Nutritionist Perspective (2017)

Breaking Silence, Breaking Stigma (2017)

Breaking the Culture of Silence: The Role of State Medical Boards (2017)

The Role of Accreditation in Achieving the Quadruple Aim (2017)

Nursing, Trauma, and Reflective Writing (2018)

The Role of Health Care Profession Accreditors in Promoting Health and Well-Being Across the Learning Continuum (2018)

Utilizing a Systems and Design Thinking Approach for Improving Well-Being Within Health Professions' Education and Health Care (2019)

Compassionate, Patient-Centered Care in the Digital Age (2019)

What Is the Value of Social Determinants of Health in Dental Education? (2020)

Health Professional Education Student Volunteerism amid COVID-19: How a Diverse, Interprofessional Team of Health Students Created a Volunteer Model to Support Essential Workers (2020)

Educating Health Professions Educators to Address the "isms" (2020)

Learning from the Global Response to the COVID-19 Pandemic: An Interprofessional Perspective on Health Professions Education (2020)