DISCUSSION NURS 6053

Discussion: Review of Current Healthcare Issues

If you were to ask 10 people what they believe to be the most significant issue facing healthcare today, you might get 10 different answers. Escalating costs? Regulation? Technology disruption?

These and many other topics are worthy of discussion. Not surprisingly, much has been said in the research, within the profession, and in the news about these topics. Whether they are issues of finance, quality, workload, or outcomes, there is no shortage of changes to be addressed.

In this Discussion, you examine a national healthcare issue and consider how that issue may impact your work setting. You also analyze how your organization has responded to this issue.

**To Prepare:**

- Review the Resources and select one current national healthcare issue/stressor to focus on.

- Reflect on the current national healthcare issue/stressor you selected and think about how this issue/stressor may be addressed in your work setting.

By Day 3 of Week 1

**Post** a description of the national healthcare issue/stressor you selected for analysis, and explain how the healthcare issue/stressor may impact your work setting. Then, describe how your health system work setting has responded to the healthcare issue/stressor, including a description of what changes may have been implemented. Be specific and provide examples.

By Day 6 of Week 1

**Respond** to at least **two** of your colleagues **on two different days** who chose a different national healthcare issue/stressor than you selected. Explain how their chosen national healthcare issue/stressor may also impact your work setting and what (if anything) is being done to address the national healthcare issue/stressor.

By Tina Gerardi, MS, RN, CAE,
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# Moving Closer to the 2020 BSN-Prepared Workforce Goal

**ABSTRACT**

One of the recommendations of the landmark *Future of Nursing: Leading Change, Advancing Health* report was to increase the proportion of nurses with a bachelor of science in nursing or higher degree to 80% by 2020. In 2012, the American Organization of Nurse Executives was selected by the Robert Wood Johnson Foundation as the National Program Office for a new initiative—the Academic Progression in Nursing (APIN) program—with the goal of identifying and developing the most promising strategies for creating a more highly educated nursing workforce. This article discusses the findings of APIN's four-year project.

**Keywords:** bachelor of science in nursing, nursing students, nursing workforce

In 2010, the Institute of Medicine (IOM) released its groundbreaking report *The Future of Nursing: Leading Change, Advancing Health*. One of the report's recommendations was to increase the proportion of the nursing workforce with a bachelor of science in nursing (BSN) or higher degree to 80% by 2020.[1] When the report was released, approximately 50% of nurses in the United States had a BSN or higher.[2]

Better use of the nursing workforce is one goal of the Campaign for Action, a joint initiative of the Robert Wood Johnson Foundation (RWJF) and AARP, created to transform health care nationally.[3] Through work conducted by the Center to Champion Nursing in America, possible models for addressing the need for more nurses to obtain a BSN were identified,[4] and the RWJF built on that structure in developing and evaluating opportunities to accelerate change within the nursing education system.

In 2012, the American Organization of Nurse Executives (AONE)—one of the four members of the Tri-Council for Nursing—was selected by the RWJF as the National Program Office (NPO) for a new initiative, the Academic Progression in Nursing (APIN) program, which was created to study the topic of higher degrees and employment for nurses and develop solutions. (Along with AONE, the Tri-Council member organizations are the American Association of Colleges of Nursing, the American Nurses Association, and the National League for Nursing.)

Now, APIN has concluded a four-year project designed to identify and develop the most promising strategies for creating a more highly educated nursing workforce.

## APIN GRANTEES

The National Advisory Committee for the APIN NPO selected nine states—California, Hawaii, Massachusetts, Montana, New Mexico, New York, North Carolina, Texas, and Washington—to design and test potential models of academic progression. All nine states were already engaged in some aspect of academic progression, and each received a two-year, $300,000 grant with the possibility of a second. The RWJF and the NPO considered this a laboratory in which results could be obtained, evaluated, and shared within that four-year time frame; all grants concluded by the end of 2016.

APIN funded efforts on two fronts: initiatives that remove obstacles that keep nursing students from getting their BSN—such as support for partnerships between universities and community colleges to allow seamless progression from the associate's degree (AD) to the baccalaureate—and employment-focused partnerships between schools and health care facilities that provide students with practice experience, promote greater use of the BSN, and create employment opportunities.

## APIN OUTCOME HIGHLIGHTS

All of the states involved in the program developed strategies for removing obstacles that keep nursing students from getting their BSN. Massachusetts, Montana, Texas, and Washington, for instance, developed

group and asked the students what a realistic part-time work schedule that allowed them to complete their studies might be. Through the focus group, it was determined that 16 hours per week would give these new RNs the time they needed to meet the academic requirements of the DDPN program.

The CNO worked to change hospital policy to allow any employee enrolled in the final year of the DDPN program to receive part-time benefits while working a minimum of 16 hours per week. This proved to be a win–win for the students and the employer.

The NPO and the APIN learning collaborative (among the grant states and other academic-progression leaders) determined that the community college–university partnership model showed great potential. New Mexico provided visionary leadership through its New Mexico Nursing Education Consortium model, pilot testing a statewide curriculum to increase the number of BSN-educated nurses in New Mexico and mentoring many other programs as they implemented the model. All participants recognized that close collaboration and support from practice partners are critical to success, and many worked to develop mechanisms to foster these relationships.

Updated information on the increase in the percentage of nurses with a baccalaureate or higher degree is available from the Campaign for Action, at https://campaignforaction.org/issue/transforming-nursing-education. Here are highlights of the positive changes that have taken place as a result of these efforts:

- The percentage of the RN workforce with at least a BSN increased from 49% in 2010 to 53.2% in 2015.
- The percentage of first-time NCLEX takers with a BSN or higher increased from 39.3% in 2010 to 47.2% in 2015.
- The proportion of RN–BSN graduates, in relation to all BSN graduates, increased from 30.6% in 2010 to 47.4% in 2016.

More information on APIN and the outcomes of the grant can be found at www.academicprogression.org.

## COMMUNITY DEVELOPMENT

The creation of a national community of nursing educators dedicated to smoothing the path from community colleges to universities is having a profound impact. The collegial spirit of this community has created a climate that invites frank discussion of model strengths, weaknesses, and challenges. Promising practices from all areas have been shared and consolidated. Working toward a common goal has resulted in a fellowship and camaraderie that generate a commitment not only to the work but to one another. This represents transformative change in the nursing-education community. The addition of local employers into the development, implementation, and evaluation of these models has added to the strength of the partnerships, while providing incentives for the incumbent workforce to achieve their BSNs.

## NEXT STEPS

With the closing of the NPO on June 30, 2017, the work toward national academic progression continues through a new initiative called the National Education Progression in Nursing Collaborative (NEPIN). The collaborative evolved from a series of meetings with Tri-Council members and other interested parties, including the Organization for Associate Degree Nursing (OADN), HealthImpact, the Washington Center for Nursing, Western Governors University College of Health Professions, the University of Phoenix, the University of Kansas School of Nursing, the Center to Champion Nursing in America, and the Philip R. Lee Institute for Health Policy Studies. The OADN Foundation will serve as the fiduciary and convener for the collaborative in partnership with the National Forum of State Nursing Workforce Centers.

For additional information on NEPIN, contact Tina Lear, NEPIN national program director, at tina.lear@nepincollaborative.org. ▼

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By Thomas C. Ricketts and Erin P. Fraher

# Reconfiguring Health Workforce Policy So That Education, Training, And Actual Delivery Of Care Are Closely Connected

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**ABSTRACT** There is growing consensus that the health care workforce in the United States needs to be reconfigured to meet the needs of a health care system that is being rapidly and permanently redesigned. Accountable care organizations and patient-centered medical homes, for instance, will greatly alter the mix of caregivers needed and create new roles for existing health care workers. The focus of health system innovation, however, has largely been on reorganizing care delivery processes, reengineering workflows, and adopting electronic technology to improve outcomes. Little attention has been paid to training workers to adapt to these systems and deliver patient care in ever more coordinated systems, such as integrated health care networks that harmonize primary care with acute inpatient and postacute long-term care. This article highlights how neither regulatory policies nor market forces are keeping up with a rapidly changing delivery system and argues that training and education should be connected more closely to the actual delivery of care.

Health care professionals are being challenged to find new ways to organize care and develop systems that hold providers accountable for the quality, cost, and patient experience of care.[1] The once incremental pace of change is accelerating, and there is evidence that long-standing paradigms are dramatically shifting.[2] For example, the relatively slow acceptance of prepaid and managed care systems is being replaced by the rapid adoption of bundled and risk-based payment models.[3,4] Early adopters of accountable care organizations (ACOs) are finding that their workforce is shifting from acute care to community- and home-based settings with increasing roles for physicians, nurses, social workers, patient navigators and outreach coordinators, and other clinicians in providing enhanced care coordination, better medication management, and improved care transitions.[5]

The training of health professionals, however, lags behind these reforms because it remains largely insulated from change behind the walls of schools of medicine, dentistry, pharmacy, and nursing. Medical training is done primarily in hospitals, while the greatest challenges are found in coordinating care in multiple outpatient settings. This article describes how health workforce policy was done in the past. It illustrates some of the specific changes under way and how they are changing the health care workforce. Further, it suggests that closer links should be built between the day-to-day caring for patients and the training of the people who deliver that care.

## Workforce Policy Center Stage Again

Health workforce policy took center stage in an earlier *Health Affairs* thematic issue in 2002.[6] Articles in that issue described future efforts to

effective health care delivery system. For example, although the use of electronic health records (EHRs) has burgeoned with the implementation of the federal program to certify and reward the meaningful use of health information technology, there is limited understanding of how health professionals can work with EHRs to change the flow of work or how work should be reconfigured and reallocated among team members. EHRs are shaping the work of clinicians as much as they are being adopted for and adapted to current practices. To be optimally effective, EHRs require broad and rapid adoption, practitioners must pay constant attention to data entry, and care patterns have to be reengineered to accommodate EHRs' use.[14,15]

## Projecting Supply, Demand, Need, And Requirements

That workforce projections are controversial should come as no surprise; any projection will inevitably be ambushed by unknown or unexpected factors and events that affect future workforce supply and demand. The surprising thing is that projections, whether based on empirical models or "expert" opinion, are criticized for not correctly predicting the future when their purpose is almost always to change policies and practices. Projections, when accepted as roughly correct, are often followed by policy shifts that, in turn, change the future supply or pipeline of workforce production.

Projections turn out to be wrong either because it is not known how many physicians there are[16] or because there is a lack of understanding of the true relationship between physician supply and health outcomes.[17] They are, in one sense, "projectiles" shot across the bows of policy makers to stimulate action; they paint a picture of what is likely to happen if some desirable policy is not implemented. If a policy is changed, then the projection is likely to turn out wrong because it helped cause changes in the factors that drove the model.

For example, the Graduate Medical Education National Advisory Committee's 1980 projection of a physician surplus was used to justify cutbacks in federal support to medical education, thus changing medical school growth trends. That policy shift reduced production and eventually led to a perceived shortage.[18] The more recent Association of American Medical Colleges forecasts of shortages of physicians have similarly prompted the expansion of existing and the opening of new medical schools and have put strong pressure on the debate over how to support graduate medical education to provide the additional training necessary to produce practicing physicians.[19]

Recent work has focused on developing dynamic projection models that are amenable to changes in the assumptions on which they are based and that allow policy makers to simulate the effects of potential policy scenarios[20] on workforce supply and demand. This type of work is supported by the National Center for Health Workforce Analysis in the Department of Health and Human Services, but the center struggles with a lack of both up-to-date inventories of existing health professionals and a common data set to measure practitioner capacity or simply identify the location of practice.[21,22]

The modeling field in the United States and other countries[23] is moving toward using projections not as a method for generating one "right" answer but as a way to educate health professionals and their associations, policy makers, and other workforce stakeholders about the complexity of projecting future workforce needs and the effects of the policy options they have at hand. Engaging stakeholders—particularly clinicians—in the modeling process can generate numerous desirable results, including a better understanding of how rapid health system change affects workforce deployment and improved communication between the professions and policy makers. Having clinicians involved in modeling can also serve as a check on the "face validity" of model outputs and can generate clinical input in areas where data inputs are weak. Stakeholders engaged in modeling can also help identify ways to redesign care processes to address workforce shortfalls or surpluses.

Models and projection thus cannot provide a single "right" answer in a system that is rapidly changing. The important thing is to have a model that can be used to simulate the effect of policy change and educate stakeholders about the effects of policy options. For example, a model might show that increasing graduate medical education slots will likely have a relatively small effect on the overall match of supply to need compared to increasing productivity and delaying retirement.

Efforts to model the nursing workforce have been complicated by nursing's persistent sine-wave pattern of shortages prompting policy actions that, in turn, stimulate rapid growth leading to surpluses.[24] Analyses of nurse supply and demand remain doggedly unconnected to physician workforce projections. There are no examples of national models that simultaneously project the supply of both professions despite their substantial overlap in providing care. Combining the two in projections is now an imperative given nurses' complementary and supplementary roles in delivering or supporting

point out, there are real costs associated with coordination.[35] Those costs have not been calculated or even anticipated in most of the calls for reorganization using teams.

The rise of additional specialists and professions within the health care "team" in new models of care have made Irving Zola and Stephen Miller's description of long-term care commonplace: "In the course of...long term disorders, the doctor recedes further and further into the background, eventually assuming the role of occasional medical consultant. With this, the physiotherapist, visiting nurse, dietician, prosthetist becomes essentially 'the doctor' not only in terms of primary day-to-day management, but in terms of the transference relationship as well."[36]

The career paths for physicians, nurses, and even dentists are multiplying. They involve serial training in fellowships to acquire new techniques and skills; adapt to shifts in practice focus; and, more often, prepare them for a return or to introduce them to a type of practice that is more flexible—essentially a return to a generalist role.[37] At the simplest level of care, the nature of labor for direct care workers who feed, move, and clean patients has become dominated by part-time jobs with fewer and fewer benefits.[38] To achieve true integration, teams must accommodate the multiple needs of the people working around the patient, including highly trained physicians who seek professional satisfaction and high rewards as well as unlicensed personnel whose formal connection to the system is tenuous but whose practical training and skills are often crucial in generating quality care and patient satisfaction.

The pressure to coordinate, or perhaps simply serve as a traffic cop controlling, the flow of practitioners around the patient, has emerged as a true challenge. Atul Gawande's description of his mother's care during her knee replacement gives a sense of what a contemporary hospital-based team is like: It is large, potentially irrational, and likely to grow.[39] We know far less about what makes for an effective team of ambulatory caregivers when it comes to managing transitions for patients with complex chronic illnesses from community to acute care settings and back. If the workforce needs of the future are to be adequately assessed, it is necessary to first get a better handle on who will make up the workforce in each setting in the future.

## Training And Education As Field Of Reform

Training professionals for the future of team-based care has been recognized as a real chal-

# Training professionals for the future of team-based care has been recognized as a real challenge.

The Institute of Medicine is currently supporting a committee, the Global Forum on Innovation in Health Professional Education, to explore how best to promote "transdisciplinary professionalism." The group recognizes the challenges of integrating the diverse cultures and skill sets of the various professions, the problem of teaching "followership" and leadership, and the practical problem of measuring how well a team works.

The National Center for Interprofessional Practice and Education has been funded by the Health Resources and Services Administration to do similar work. These efforts follow on a series of precursor programs in interdisciplinary training that never quite found traction in formal policy or in health professions training.[40] The central task for reformed health care delivery may indeed be to create and sustain teams of different professional pedigrees. The question is whether teams can be constructed around a template or whether it must happen in practice with ad hoc teams forming around the patient and their needs.

## Innovations In Training And Education

The ways in which health care professionals are taught are changing rapidly. Additionally, there is pressure to streamline pathways into professions.[41] Online courses, clinical simulators, and learning teams have made education more flexible. Still, little is known about what constitutes efficient and effective clinical training.[42] The true costs of preparing health professions are being revealed by the rapid growth in the number of private, including for-profit, health professions institutions that have sprung up to meet demand from prospective students.[43] These include osteopathic medical schools and physician assistant programs and umbrella "Health Science" schools that provide training for nurses, therapists, and technicians. Public community colleges in some states fill this niche, but the market

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# Medical Education and Health Care Delivery: A Call to Better Align Goals and Purposes

David P. Sklar, MD, Paul A. Hemmer, MD, MPH, and Steven J. Durning, MD, PhD

## Abstract

The transformation of the U.S. health care system is under way, driven by the needs of an aging population, rising health care spending, and the availability of health information. However, the speed and effectiveness of the transformation of health care delivery will depend, in large part, upon engagement of the health professions community and changes in clinicians' practice behaviors. Current efforts to influence practice behaviors emphasize changes in the health payment system with incentives to move from fee-for-service to alternative payment models.

The authors describe the potential of medical education to augment payment incentives to make changes in clinical practice and the importance of aligning the purpose and goals of medical education with those of the health care delivery system. The authors discuss how curricular and assessment changes and faculty development can align medical education with the transformative trends in the health care delivery system. They also explain how the theory of situated cognition offers a shared conceptual framework that could help address the misalignment of education and

clinical care. They provide examples of how quality improvement, health care innovation, population care management, and payment alignment could create bridges for joining health care delivery and medical education to meet the health care reform goals of a high-performing health care delivery system while controlling health care spending. Finally, the authors illustrate how current payment incentives such as bundled payments, value-based purchasing, and population-based payments can work synergistically with medical education to provide high-value care.

**T**he current U.S. health care system is more expensive than that of other developed nations, yet it does not provide the highest quality of care and has well-described gaps in access to care.[1] As our population ages, future health care expenses are anticipated to increase, leading to a health care financing crisis.[2,3] At the same time, transformative changes in the health care delivery system—facilitated by new technologies

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and changes in the relationships between physicians, insurance companies, and hospitals—have disrupted traditional physician professional practices and the business models they use. With all of the changes in health care delivery and the growing costs of care, physicians, who many say account for 80% of health care spending, have been the major focal point for governmental efforts to control health care spending through programs that provide penalties and incentives related to costs and quality of care.[4–7]

Physicians' behavior is complex and can be affected by a variety of social, economic, psychological, and cultural factors as well as through education.[8] We believe that medical education has largely been ignored as one potential contributor in addressing the impending health care financial crisis and the new challenges and opportunities for transforming care delivery because education and training have been viewed as separate from, rather than integral to, patient care and health care systems.[9] Medical education provides the foundation for physician practice and has the capacity to change physicians' decisions and actions that have an impact not only on health care spending but also on quality of care.[10,11] We believe that medical education could work synergistically with payment and regulatory reforms to lower increases in

health care spending, produce higher-quality health care, and better prepare medical students and residents for a health care system undergoing rapid transformation. However, for this to occur, the goals and purposes of medical education and the health care delivery system need to be better aligned. In this essay we will describe how changes in medical education not only could be used to change physicians' behaviors in clinical practice but also could facilitate delivery system transformation in a reinforcing cycle. We hope that our article (1) will help medical schools to understand the important role that delivery sciences play in the overall educational program and how to balance its content with that of other important topics, and (2) will influence those who assess medical students and medical schools.

## Goals of Medical Education

Medical education prepares future physicians by instilling the knowledge, skills, and attitudes to deliver high-quality care to the population. Typically, medical students in undergraduate medical education progress through programs designed to give them a unique and sophisticated understanding of complex basic and clinical sciences as the necessary foundation for transitioning to carrying out actions for the benefit of individual

or system itself. McGinnis et al[25] have described the impacts of various factors on preventable mortality and suggested that determinants such as environmental exposures, behavioral patterns, and social circumstances had far greater influence than did improvements in the quality of medical care. We would argue that medical education needs to pay sufficient attention to the living environment, the social and behavioral influences on patients, and their effects on the care delivery system. We believe that creating an awareness of a population health perspective while maintaining a focus on the individual patient would provide students and residents with the needed mix of competencies for a transformed health system.

Payment regulations in the clinical care system are also misaligned with the medical education system, creating confusion and waste. Although the Centers for Medicare and Medicaid Services pays for both GME and health care services for Medicare and Medicaid beneficiaries, it attempts to separate the activities physicians provide for education from those that are provided for patient care in the same setting. Current regulations also inhibit the gradual progression of independence of students because of requirements related to billing. Most medical students' activities and documentation cannot be used for billable activity regardless of faculty presence or supervision,[26,27] despite the foreseeable marginalizing effects this has on the education and patient care activities of students. This leads to unnecessary duplication of documentation that forces trainees and faculty to spend more time documenting in the medical record than in seeing the patients.[28,29] The result is that medical students are ill prepared to assume resident responsibilities at the completion of medical school. Dividing a patient care encounter into education and clinical care is both arbitrary and artificial and does not recognize concepts such as entrustment[30] that form the foundation of faculty–learner relationships or the continuing professional development that is stimulated when learners work with health professionals.

## Aligning Education and Care Delivery—The Way Forward

If education and care delivery had the same goals and a shared conceptual framework (i.e., mental model or frame of reference) for achieving the goals of better health, better health care, and lower cost, we could address the areas of misalignment and find new areas of synergy. Current transformational forces in the health care delivery system would then be a stimulus for educational innovation. We believe we could achieve this alignment by recognizing the similarities in the theories that help us understand how to improve education and clinical care. In education, several theories emphasize the critical role of experience, social environment, reflection on experience, and integration of knowledge with experience in a cycle that repeats itself and grows.[31,32] A cycle is also the model commonly used for quality improvement in clinical care in which a problem is identified and planning occurs to identify an intervention that might address the problem. Quality improvement activities can use some of the same types of theories that education does.[33] The improvement cycle is in line with social cognitive theories such as situated cognition, situated learning, and distributed cognition.[31,32] The main difference is that in the quality improvement cycle, the goal is process improvement, while in social cognitive learning theories, the goal typically is individual or group learning. However, this separation is not inherent, since process improvement is a form of learning. If the goals of reforming medical education and clinical care delivery were the same, it would be easy to recognize the dual purpose—in quality improvement and in learning—being accomplished through process improvement activity.

Situated cognition[31,32] is an educational theory that attempts to integrate knowledge with activity and practice. This theory provides the shared conceptual framework that could help address the misalignment of education and clinical care. Situated cognition sees outcomes (e.g., patient care, societal care) as the result of emergent interactions between participants and the environment (or system); this contrasts with the long-held view that the provision of health care is predominantly by an individual practitioner. Principles of both education and clinical health delivery can be explicitly incorporated into the theory's design by (1) choosing system and interaction "factors" from the perspective of clinical delivery system expertise to help inform physicians, and (2) choosing interaction factors from the perspective of medical education expertise to help inform both physicians and medical educators. Figure 1 illustrates how the approach of situated cognition can be used to align education and care delivery and, ultimately, patient care outcomes. As an example of how one aspect of care delivery (payment priorities) can be aligned with educational approaches, see Chart 1.

*Physician factors* include acquisition of new knowledge (including exposure to new content that could occur in a variety of ways depending on learner preferences and institutional resources). The contribution of the health care team, the information system, and new technology can be easily incorporated into this model as *system factors*; the empowered patient who has access to information and shares in decision making can be accommodated in the model as a *patient factor*. The *outcomes* (shown in the center of the figure; e.g., patient care) emerge from the dynamic interactions among the physician, patient, and system factors that are considered relevant. Such a model allows for quantitative, qualitative, or mixed methodologic approaches to explore the outcome of interest with appropriate labeling and measurement of the variables of interest.

With shared goals and mental models, educational programs across the continuum would be able to better prioritize the numerous areas of new knowledge and new technology that endlessly seem to creep into already-overcrowded curricula. For example, medical students could learn about systems design, health economics, patient safety, philosophy, ethics, and anthropology as well as current basic sciences throughout medical school. Many medical schools have begun to explore health systems sciences, and the American Medical Association has funded 32 medical schools to address curricular change to integrate medical education and health care systems.[14] Some examples of these efforts include creating more flexible, competency-based pathways during medical school, defining meaningful medical student contributions in the clinical environment from early in medical school, and using

## Chart 1

**Examples of How Care Delivery and Payment Priorities Can Be Aligned With Educational Approaches[a]**

| Problem | Care delivery priority | Payment priority | Educational approach | Examples | Main findings |
|---|---|---|---|---|---|
| Central line infections, mortality, morbidity costs | Quality improvement | Payment penalties for hospital-acquired conditions | Central line insertions and management education | Mastery learning[38,39] Education and quality improvement[37] | Standardization of processes and training reduced infection rates[37] as well as morbidity and mortality.[38,39] |
| Reduction of costs for orthopedics procedures | Diffusion of innovation | Bundled payment | Adoption of peripheral nerve blocks to replace general anesthesia to reduce hospitalization time | Ambulatory orthopedic surgery[44] | Education led to the introduction of a different anesthetic approach that diffused throughout the system. |
| High costs for patients with complex chronic disease | Population management | Capitated payment, bundled payment | Education of primary care providers for complex care management | Telemedicine (Project ECHO[46]) | Expertise to manage complex care can be shared.[46] |
| — | — | Chronic care fee for service payment | Team training and case management | Chronic care model[47] | Teams can learn to identify and manage chronically ill patients and avoid hospitalization.[47] |

[a]The chart demonstrates that there are current payment incentives that could provide the financial support to integrate education and health care delivery.

On a more day-to-day level, the use of effective feedback can improve individual provider knowledge and clinical care as part of system-wide quality improvement initiatives. There are methods of delivering feedback in medical education that could be similarly applied in the clinical care environment to improve quality and provider knowledge[40]; these should result in learning and better care.[41] For example, feedback that is accompanied by data (e.g., the number of tests ordered compared with goals and peer comparisons) has been used effectively to reduce unnecessary laboratory test ordering[42] and improve antibiotic stewardship.[43] Such feedback can take advantage of big data systems and be provided to teams to allow them to compare their performances against standards and/or performances of others and make appropriate changes to improve the patient experience and quality of care.

Another bridge between education and health care delivery involves the development and diffusion of innovations. A recent innovation is the replacement of general anesthesia with peripheral nerve blocks for orthopedic surgery.[44] This approach could reduce the need for postoperative hospitalization and reduce postoperative pain and

other complications, thus improving quality and reducing costs. Even after the technique had been known for some time, there was resistance to adoption. Leggott et al[44] describe how, through the education of providers, communication between specialties, and supportive changes in the clinical environment, the innovation diffused through the health care system following a pattern described by Rogers.[45] Understanding diffusion of innovation should be a part of the education of medical students and residents who will be faced with decisions about when and how to adopt innovations during their careers. Bundled payment programs that combine hospital and provider payments for a procedure encourage the development and diffusion of innovations, such as the use of peripheral nerve blocks, that improve efficiency (see Chart 1).

Population health management is another bridge between education and health care delivery systems through its emphasis on identification of various groups within a population and changing incentives so that hospitalization can be avoided through better case management. Project ECHO[46] is an educational telemedicine program used to connect experts in the care of complex patients, such as those with hepatitis C, with primary care

providers. The project allows patients to remain in their home communities and receive care equal in quality to what they would receive at a specialized center. In this way, transportation and hospitalization costs can be reduced without reducing the quality of care.

For patients with multiple chronic illnesses, Bodenheimer et al[47] have described how a chronic care model using teams and data can help to reduce hospitalization, improve quality, and reduce health care spending. Educational programs that prepare students to work in teams with nurse case managers and social workers and the use of big data systems to identify patients who can benefit from management can provide a workforce that will be prepared to improve health systems. Payment incentives that align with population management include a chronic care management fee in the fee-for-service system or alternative payment incentives in the alternative payment model for population management (see Chart 1). Accountable care organizations that are included as part of the Affordable Care Act also provide incentives for population management.

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