

Clinical Education in Transition: Recommendations and Strategies from the Clinical Education Task Force of the Association of Schools of Allied Health Professions

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The ASAHP Clinical Education Task Force conducts ongoing literature review and research for ASAHP, on behalf of deans and other stakeholders, to improve and strengthen the value of health science clinical education programs to ensure safe, quality, cost effective care.

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Executive Summary

The theory, intersecting competencies, settings, practice models, interdisciplinary team functions, and economies of allied health clinical education are all in flux in contemporary healthcare, creating both a threat and opportunity for truly disruptive innovations to change the educational landscape. It is toward these possibilities that this paper turns its focus. Change is inevitable, and the Association of Schools of Allied Health Professions (ASAHP) and Allied Health (AH) deans, collectively and individually, must determine what priorities and strategies to embrace in advancing the future of AH education and client/patient care.

This paper offers five overarching recommendations and proposes action strategies for educating students in the clinical environment over the next decade. The recommendations for the association, ASAHP deans and their institutions and the association are:

1. Develop meaningful strategic partnerships with healthcare organizations to prioritize evolving needs for current and future healthcare
2. Adapt pre-clinical curriculum and clinical education assessments to meet contemporary needs for efficient and effective interprofessional practice (IPP)
3. Incorporate effective use of healthcare technology into allied health education and practice

4. Advocate with healthcare systems, higher education leadership, accreditors, professional organizations, and governmental agencies, to foster IPP and to encourage informed referrals across disciplines to improve patient/client care
5. Drive excellence in clinical education through promotion of research and scholarly activity.

We offer myriad of strategies and identify likely agents of change for each, in recognition of priorities and resources according to institutional needs. In four chapters, we highlight contexts and approaches to educational and healthcare partnerships that optimize student preparedness to become productive members of the healthcare workforce. Chapter 1 summarizes ongoing changes in the healthcare environment. Chapter 2 explores challenges occurring in higher education with a particular eye toward clinical education for allied health practitioners. Chapter 3 contains a review of existing models for clinical education. Chapter 4 expands on the five recommendations above with specific strategies aligned to each, and concludes with our vision of shared stakeholder commitment to sustainable clinical education that produces safe and effective clinical competencies among the healthcare providers of the future.

Multiple converging issues cause allied health deans, educators and practitioners to reconsider clinical education priorities and strategies to strengthen how we approach clinical education. We encourage reliance on testing, studying and reporting on various models of clinical education, including simulation training and technological approaches to student acquisition of clinical competencies, to optimize opportunities to graduate

competent practitioners. These methods afford guidance toward less stressful and more efficient learning systems than the traditional models while providing value to all stakeholders in educational and healthcare arenas.

Introduction

The theory, intersecting competencies, settings, practice models, interdisciplinary team functions, and economies of allied health clinical education are all in flux in contemporary healthcare, creating both a threat and opportunity for truly disruptive innovations to change the educational landscape. It is toward these possibilities that this paper turns its focus. Change is inevitable, and the Association of Schools of Allied Health Professions (ASAHP) and Allied Health (AH) dean leadership, collectively and individually, must determine what priorities and strategies to embrace in advancing the future of AH education and client/patient care.

This paper on clinical education highlights issues and changes in the healthcare environment, in higher education, and in allied health clinical education that cause allied health deans, educators and practitioners to reconsider priorities and strategies to strengthen their approaches to clinical education.

Chapter 1

United States Healthcare Environment

Infrastructure and Spending

Widespread closings of community hospitals and increasing projections of physician shortages have raised national alarm. The American Hospital Association reports that 4840 of the 5534 registered hospitals in the U.S., about 85%, are considered community hospitals.¹ Nearly one-third of community hospitals are rural hospitals (1,829), and a third of those across 42 states (673) are at risk of closing.² In fact, 80 rural hospitals closed in the six years prior to December 2016.³ Total inpatient hospital beds dropped from 32.8 per 1,000 people in 1990 to 17.3 in 2014, a decrease of 47%, according to Center for Medicare and Medicaid Services (CMS).⁴ The Association of American Medical Colleges estimated the U.S. physician shortage will reach 61,700 to 94,700 physicians by 2025.² Furthermore, physicians spend, on average, 50% of their work day entering data into electronic health records and completing clerical work, only 27% of work hours interacting with patients, and an average of 785 hours (\$15.4 billion) per year dealing with quality measure reporting.⁵ In response to these gaps, not surprisingly, 13 of the top 20 fastest growing professions between 2014-2024 are in medical/healthcare professions.⁶ These trends show no sign of slowing.

Meanwhile, healthcare costs continue their steady rise. Becker's Hospital Reviews cited CMS Office of the Actuary data showing that annual healthcare spending in the U.S.

increased 5.8% from 2014 to 2015, growing to \$3.2 trillion, which accounted for 17.8% of the gross national product up from 17.4.⁷ According to Moody's Investors Services, the average operating margin for a non-profit hospital in 2012 was 2.5%.⁸ While many hospitals and health systems maintain profits in the current economic healthcare environment, others are looking for solutions through workforce reductions. In early 2017, The University of Texas MD Anderson Cancer Center cut its workforce by 5%, and Baptist Health cut 288 positions across its eight markets in Kentucky and southern Indiana. Hospitals attribute layoffs to electronic healthcare expenses, lower volumes and reimbursement than expected under the Affordable Care Act and a host of other issues.⁹ In concert with the advent of the Affordable Healthcare Act, CMS and the Center for Health and Human Services continue aggressive pursuit of value-based care initiatives that provide further strains to the system and the challenge to maintain profits. CMS is pushing to achieve 50% of Medicare payments in value-based payment models by the end of 2018.¹⁰ By March 2016, CMS was nine months ahead of schedule when it attained its goal of tying 30% of Medicare payments to quality services.² The financial picture for healthcare systems, clinicians, and patients remains volatile and uncertain.

Health of the Nation & Models of Care

Social determinants of health dictate that policy makers and educators recognize the preventable nature of most chronic illness and many acute health problems. While approximately 20% of an individual's healthcare is based on heredity and access to quality care, the remaining 80% is determined by physical environment, health

behaviors and socioeconomic factors.¹¹ Nearly 40% of all Americans are obese, 24% have a diet-related condition and 20 million live in so-called “food deserts” that lack access to nutritious food.² The Health Research Institute arm of PricewaterhouseCoopers reports that 68% of primary physicians are ill equipped to manage patients’ social needs, and fewer than 50% believe they coordinate with the proper social service agencies. Sixty-eight percent of primary care physicians want mental health professionals on their primary care teams.¹²

A 2015 survey of 1,500 American primary care physicians, specialists, nurse practitioners, physician assistants and pharmacists, and 1,750 consumers found that:

- Most primary care teams are not designed to optimize care or meet consumer demands for convenience and value,
- Clinicians and consumers are ready to embrace broader care teams,
- Healthcare primary care dream teams should be based on the interplay of consumers’ medical, social and behavioral health needs and preferences, and
- Healthcare organizations should assess the impact of a primary care dream team on their business models and understand how knowing their consumers, market dynamics and capabilities can help them achieve targeted return on investments¹³

“Most physicians choose their career because they want to help patients,” said Marc Boom, M.D., president and Chief Executive Officer of Houston Methodist. “All too often, however, we are asked to solve issues unrelated to actual patient care, taking away

valuable time we could spend improving our patients' health. Practicing at the top of the license is something we all say, but we have way too many physicians practicing at the bottom."¹³

Evolving Healthcare, Technologies, Influences, and Visioning

The 2017 Healthcare Industry Brief identified contemporary priorities for healthcare systems, intended to inform strategies for health professions clinical education and workforce development.¹⁴ For that Brief, 100 healthcare executives and financial leaders from hospitals around the U.S. identified the following priorities for 2017 (percentage endorsement in parentheses).

- Measuring and managing patient outcomes and quality care (86%)
- Measuring and managing cost, spending and utilization (84%)
- Measure and managing patient satisfaction (74%)
- Managing the organizations' transition from fee-for-service to value-based care (46%)
- Measuring and managing revenue growth (43%).¹⁴

For healthcare organizations to shift successfully from volume-based to value-based care, as these priorities compel, they will need to adapt, innovate and build new programs and approaches to their work; these processes may strengthen the position of allied health professions. An opinion in the Harvard Business Review suggests,

Rather than ask complex, high-cost institutions and expensive, specialized professionals to move down-market, we need to look at the problem in a

very different way. Managers and technologies need to focus instead on enabling less expensive professionals to do progressively more sophisticated things in less expensive settings.

Optimization of workforce practices, and efficient delegation of services across a skilled team of diverse professionals, will be required to maintain quality of care and reduce cost.¹⁵

As an example, an Australian group examined the roles of advanced practitioners and expanded scopes of practice for allied health professionals. This group asserted that advanced practitioners, especially those authorized to prescribe, can improve access to care and reduce cost of delivering care by freeing up medical care time.¹⁶ Another Australian team studied opinions on strategies to maximize clinical value provided by allied health professionals.¹⁷ Their perspective was that allied health professionals could “assist in maximizing value and sustainability of healthcare” (p.194) through engaging individuals in decision-making and self-care and advocating for integrated healthcare systems that keep individuals living independently. They also suggested that students can be trained to look for and suggest improvements to practice in the workplace, enhancing their value to worksites that conduct clinical education.¹⁷

A significant requirement of the integrated “dream team” concept is ensuring that team members know the roles and responsibilities of each contributing discipline and that all are supported to practice at the top of their respective licenses, necessitating advocacy

for modifying scopes of practice of various health professions to ensure meaningful efficiencies for healthcare systems. The ability to create and sustain such a dynamic is encompassed in the notion of a “Learning Health System” based on an Institute of Medicine framework. In this perspective, the shared vision across healthcare systems creates a synergy among the various missions that continually improves “health and healthcare through advancing, applying, and disseminating knowledge” (p.1109) with constant system improvement.¹⁸

PricewaterhouseCoopers Health Research Institute also invoked the concept of a dream team, stating that a “dream team designed around the needs of complex, chronic consumers, for example, could potentially result in \$1.2 million in savings for every 10,000 patients served.”¹³ The team would provide healthcare and wellness, based on the needs of the community, and achieve a return on investment. When primary care physicians were asked who would be on their dream team if cost were not an issue, their responses included dietitians, mental health providers, home health and community health workers, social workers, physical and occupational therapists, and more, with responses varying based on the type of consumers, such as children or elderly, and the types of presenting health issues in these clinical sites.¹³

On March 5, 2017, *The New York Times* repeated an H.G. Wells quote from its 1939 World of Tomorrow special edition:

It is so close a Tomorrow that it is almost Today when it will be possible for a dozen men or a score of men to sit in conference seeing and hearing each other, by radio, television, telephone, when bodily they are hundreds of miles apart. (p. A2)¹⁹

Within healthcare, advances in technology are occurring rapidly but the care experience and technology have not fully kept pace. One in three people have used telehealth²⁰ and it may soon be standard practice that retail clinics and urgent centers will exploit technology to screen patients via computers, phones, visual images, or videos to determine whether a diagnosis requires an in-person visit. Visualize that large screen monitors at home, in hospitals or elsewhere, will allow patients to visit with families and friends, as well as to be examined virtually. Still, even while healthcare has advanced greatly in monitoring patients from a distance, data transfer to and among health providers with due consideration to privacy and confidentiality is in its infancy. Investment in technology directly supports the goals for improved health outcomes at a lower cost as suggested by the Triple Aim²¹, or more recently, the Quadruple Aim but the needed resources to achieve this level of sophistication are lacking.

Reports of the PricewaterhouseCoopers 2017 Global CEO Survey stressed the need for efficiencies in use of artificial intelligence (AI) and Big Data, and for strengthened innovation. They project that patient/doctor balance in accountability for care will shift further to the patient as email, phone and health communication portals grow to exceed in-person consultation.²⁰ The use of AI and virtual reality in care and education will

increase. In the Harvard Business Review, June 2017, Anderson, Martin and Mate advocate to develop systems where patients are supported to administer their own care for routine specific procedures, such as administering IV antibiotics or setting-up, plugging-in, and cleaning-up during dialysis. In some circumstances, such mechanisms have been shown to yield improved outcomes and reduced cost.²²

Chapter 2

Higher Education for Health Professions

Evolving Pedagogy

In 2010, The Lancet commissioned an international collaboration of educators and policy leaders who observed that health professions education had failed to address rapid demographic and epidemiological transitions that threaten healthcare worldwide. Transformative change in healthcare education was proposed to establish a mindset to prepare health professionals to function in a globally interdependent world.²³ A “third generation” of healthcare education was proposed, to follow the historical approach to teach the science of physiology and disease processes and the more contemporary pedagogy of problem-based education focused on critical reasoning skills. The new global vision was that health professionals be educated to access scientific knowledge, as well as to engage critical reasoning in the context of strong ethical foundations, in order to ensure individual competencies to perform in systems that prioritize both patient-centered care and population-centered health. This call engaged leaders in academic and professional communities, backed by broad political and social investment in health professions education, and encouraged effective stewardship of resources. The realization of this vision will require development of metrics, evaluation and research that promotes effective innovations tailored to current and evolving circumstances.

The trend toward competency-based education illustrates that leaders in allied health education are centrally positioned to embrace The Lancet report's vision, and to determine practical strategies to transform today's learners into tomorrow's clinical professionals, who are prepared for an uncertain healthcare environment.²³ Educational leaders recognize that graduated clinical exposure and experience are pivotal to the aim of professional transformation of the individual learner, and are mindful of the need for thoughtful attunement to this aim amidst complex systems that educational institutions do not control. Education leaders embrace the opportunity to fulfill this aim through collaboration among all invested stakeholders as a means to develop effective models of clinical education that work in today's environment.

As healthcare is poised to shift from acute care hospitals to community settings such as outpatient clinics and geographically disbursed urgent and emergency care centers, educators are faced with the challenge to prepare students for emerging delivery models. Clinical education still primarily occurs in hospitals, so education programs need to develop new ways to prepare students to anticipate and cope with transformations in healthcare delivery.²⁴ Contemporary healthcare models not only demand innovative approaches to pre-professional education, but also need to anticipate the need to retrain the existing workforce, opening the door for timely collaborations between educators and healthcare systems.

Analyzing Clinical Education Costs

It is broadly assumed that clinical education in the health professions is expensive, but methodologies to analyze costs are based on inconsistent assumptions and practices. Concern has emerged over several decades about the cost-benefit analysis approach in which representatives of clinical placements simply opine about a range of monetary and non-monetary costs associated with hosting student clinicians²⁵⁻²⁹ By self-report, staff members cite increased time working and decreased productivity as costs of supervisory responsibility.²⁷ Occupational therapists and dietetics educators have reported additional stress due to supervisory responsibility, a complaint echoed by other disciplines along with the frustration of working with challenging students.^{30,31,28} Increased costs for materials and supplies used by student clinicians have also been reported.²⁹

Some more sophisticated cost-benefit and cost-effectiveness analyses designed to identify the economics of clinical education have met with limited success.^{25,32} Findings of cost analyses that attempt to operationalize the value of supervisors' time, number of patients seen by learners, staff time devoted to student education, and student use of equipment and supplies, have been inconclusive. Dizon, Grimmer-Somers and Kumar (2012) conducted a systematic review of allied health clinical education, using the Briggs format, and found improvements in learning outcomes, but the research was so limited in number and rigor that they could not conclude what components of training contributed to beneficial outcomes.³³ A British effort to cost out expenses for clinical

training detailed a complex methodology that considered myriad cost components, including pre-placement costs, direct teaching, staff training and time spent in courses and while delivering patient care, overhead costs for facilities, administration, central education, and library access, cost of reviewing trainee's work products, expenses for sources and exams, trainee time in coursework, and outside educational activities.³⁴

While rigorous, the methodology has been questioned with regard to its philosophy and assumptions. Among the assumptions are that all undergraduate students' time on site is spent in training and not in delivering service, that degree of faculty oversight distinguishes whether the activity counts as learning or service, and that a standard percentage of additional time is required for training whenever a student is present for a clinical service.³⁵

Numerous methodologies and analytics have been used, making comparisons across studies difficult.³⁶ Nevertheless, anecdotal evidence continues to perpetuate the notion that clinical education is costly.³⁷

Clinical Competencies, Technology, and Accreditation

Accrediting organizations are in a position to champion advances in health professions education to advance the development and dissemination of competency-based curricula that better meet patient needs, and to encourage curricula based on effective partnerships between educators, patients, families, and communities.³⁸ Competency-based assessments and education have been incorporated into the standards of

several professions including physicians³⁹ and physician assistants.⁴⁰ A recent National Academies Workshop that explored how accreditation agencies might approach core competencies, particularly with regard to competencies that span health professions, proposed that professions reach agreement on common core competencies to align in education and practice; at present, insufficient collaboration and consistency were seen across accrediting and certifying bodies for this to occur.²⁴ Nearly ubiquitous among competencies recommended or required in allied health education are the core competencies generally adopted for interprofessional education (IPE) and practice.⁴¹ The National Center for Interprofessional Practice and Education is collaborating with the Health Professions Accreditors Collaborative to encourage the Commission on Accreditation of Allied Health Education Programs⁴² to include IPE as an outcome of professional education programs.⁴³ Accreditation agencies have been encouraged to promote the Quadruple Aim of healthcare, as well.⁴⁴

The Josiah Macy Jr. Foundation conducted a 2015 conference on Enhancing Health Professions Education through Technology: Building a Continuously Learning Health System.⁴⁵ Participants observed that the course of study for health professions tends to be lengthening to accommodate added coursework to ensure competencies for an increasingly complex healthcare system, even as increasing workforce demands suggest the need to accelerate introduction of new graduates into the workforce. This tension supports their recommendations that healthcare education become more efficient and flexible, educational pathways leading to service be streamlined, on-the-job

experience be expected to shorten the time to degree, and informal programs be implemented that support mid-career job changes to include advanced specialized training as an individual's career develops. A further implication is that collaboration between workplaces and educational programs will ensure graduate preparation for lifelong and continuous learning, with the expectation that they will need to demonstrate competencies for the duration of their careers.⁴⁶

Technology is expected to improve opportunities for efficient assessment of knowledge and skills gaps for both students and practicing professionals, enabling educators to anticipate and provide the information clinicians need in real-time to support flexible learning and optimal care. Learners should acquire the skills to tackle increasingly complex problems in a safe simulation environment through deliberate interprofessional practice.^{47,48} An example has been offered in which, “virtual patients are used widely in clinical education to fill gaps in clinical exposure, and to provide learners the important experience of evaluating undiagnosed patients”.⁴⁶

Wide support exists for simulation education, which applies to specific skills training as well as to integration of complex team-based communications and workflow efficiencies. Simulation learning has been tied to improved quality of care.⁴⁹ Educational technologies include the use of high fidelity full-body, torso, and focal anatomical simulators across health professions education; virtual patients; and environmental simulations including simulated operating and emergency rooms located in hospitals for

practice in team-related communication and clinical workflow exercises; as well as virtual reality simulators that invoke sensory experiences to emulate real-life critical patient incidents.⁴⁶

Further, randomized controlled trials have found that replacement of one week of a four-week clinical experience in musculoskeletal practice for physiotherapy students yielded blind assessments of student competencies equivalent to those of students with traditional full clinical experiences, suggesting that simulation may be substituted for clinical experience at least with regard to some elements of clinical education.⁵⁰ Low and moderate fidelity simulation and critical event training can help with communication, minimize errors, and optimize patient safety in complex care, with the use of existing models to conduct and debrief critical learning exercises to address appropriate assertion, use of clear and critical language, and situational awareness.⁵¹ Because simulation is an effective vehicle for (IPE), and can be substituted for some elements of clinical experience, programs are advised to build capacity through simulation-based IPE/IPP.⁵²

Technology is changing the look and feel of education on campuses and through learning management systems, allowing computer-based education on and off campus. The consolidation of programs, mergers of schools, and creation of international partnerships are anticipated to continue Nancarrow, Moran and Graham suggest that didactic education could occur through massive open online course or other

technologies, especially for paraprofessionals wanting a bump up the career ladder⁵³. Further, they assert that “poorly constructed models of clinical placements actually detract from service capacity and productivity”. The authors and the Macy Foundation highlight the efficacy of competency-based or milestone-based over time-based or hour-based models.

Many allied health and nursing education programs are already striving for competency-based education. Brooks (2016) states in an article on new roles for nursing that simulation education may increase from 25% to 50% of clinical preparation and anticipates that nursing will be conceptualized to include specific competencies in health counseling, community health and population health⁵⁴. This evolution of competencies resonates in allied health education, as well. A Macy Foundation monograph cites evidence regarding use of educational technologies (p 79-81). It also includes recommendations for programs to maximize effective use of technology (p 84-88).⁴⁶

Tension exists with regard to the role of accreditation relative to educational innovation; educational leaders have historically experienced accreditation as more to protect the public than to dictate pedagogies and educational philosophies, and more to hinder than to encourage innovation. Furthermore, in the current environment, it is questionable whether accreditation can adapt as rapidly as transformations in the healthcare system occur.²⁴ The Council for Higher Education Accreditation has taken a position to encourage a decreased federal presence in accreditation in order to reduce undue

regulatory burden and to encourage accreditors to value innovation and acquire greater flexibility to design innovative accreditation practices themselves.⁵⁵ On the other hand, changes in the educational landscape, such as the proliferation of for-profit schools that now offer health professions education, underscore the value of regulation as manifest in the accreditation review process. Accreditation has an increasing role in establishing a national and international system to ensure globally responsibility in which graduates of health professions programs meet standards for qualified professional practice.⁵⁶

Growing Education Programs and Student Access

Graduate programs in the health professions account for a significant portion of U.S. higher education graduates and have experienced enormous growth in recent years. Among the 20 largest fields of study analyzed by the National Center for Educational Statistics, from 2006 through 2015 the greatest number of doctoral degrees granted each year was in health professions and related fields.⁵⁷ Further, 61% more doctoral degrees in health professions were conferred in 2015 than 2005: from 44,200 to 71,000. Master's degrees in health professions experienced similar growth. The largest percentage increase in number of master's degrees conferred per year in these ten years was a 120% increase in health professions and related programs: from 46,700 to 103,000. Health professions were among the top three fields for associate's degrees across these years, as well.⁵⁷

Despite increasing numbers of graduates, financial constraints restrict the potential to develop a diverse healthcare workforce. The rapid growth in education programs is coincident with increases in tuition and fees and with decreases in sources of grant aid, which both threaten the capacity of educational institutions to enroll and retain underrepresented minority students and to develop a diverse workforce that reflects regional and national demographics. Annual appropriations battles create distractions and barriers to the ability of educational programs to focus resources on diversity recruitment and retention along with multiple growing demands, such as technological and pedagogical changes needed to prepare students to participate effectively in the future of healthcare. To achieve diversity aims in the healthcare workforce, the Department of Education and the Council for Higher Education have been encouraged to promote diversity criteria in health professions education through accreditation bodies, with recommendations to increase focus on innovations in student support such as scholarship and stipends in exchange for post-graduation service⁵⁸ and sustained support for health professions and nursing workforce development programs.⁵⁹ Increased loan forgiveness programs for allied health professions could reduce the economic burden of graduate allied health programs and promote diversity.

Rapid growth and spiraling costs affect the format and level of health professions education. A 2013 University of California report noted several trends in the development of health professions programs, including the rapid growth of programs and student enrollment, new business models and pedagogical formats, increased

costs to students, and higher student debt upon graduation.⁶⁰ One striking trend across higher education in general is the dramatic increase in for-profit school enrollment, which increased 236% from 1999 to 2009, compared public and private nonprofit institutions increases of 21% and 17%, respectively. In subsequent years, higher education has seen a “leveling off” of enrollment numbers, with minor decreases in all areas. For-profit enrollment in the academic year 2014-2015 saw a 10% decrease in enrollment, while non-profit schools saw a minor increase.⁶¹ Through this period, for-profit institutions were seen to move from their initial focus on associate’s degrees and certificate programs that educate “support occupations” (e.g., assistants within health disciplines) to more “advanced degree” health professions. The Ginder et al. report noted that the educational quality of the proliferating non-profit programs is not regulated by any single accreditation body across the U.S. or globally, and asserted the need to assess the quality and contributions of these new schools and programs. The report cited that the increased burden in accessing clinical training sites will negatively impact the quality and preparation of future graduates, if not corrected. A further trend is increased faculty shortages attributed to swelling numbers and sizes of programs, retirement of a generation of educators, and increased competition. Across all kinds of institutions, professional doctorates have increased markedly, and an increased proportion of schools have been seen to offer accelerated programs and online formats, at least for a portion of their curriculum. These changes are happening in the context of increased institutional pressures to minimize the expense of academic programs, while

states roll back financial support for higher education, and federal financial aid resources appear threatened.⁶¹

Schools of health professions are incorporating increased technology for curriculum delivery that includes distance learning (synchronous and asynchronous online learning) and increased reliance upon simulation training for clinical procedures. Yale University provides a case study in the prospects for on-line high-level health professions education; Yale achieved “accreditation-continued” ARC-PA status with ARC-PA for an online master's degree program in physician assistant studies, in which clinical education requirements may be met in part through program assignment of students to clinical rotations located in their home communities.⁶²

Not surprisingly, mounting strain within health education and healthcare systems has increased stress in students, faculty, and professionals, taking a toll on “productivity, efficiency, quality, and the human capital of the workforce”.⁶³ Stresses include excessive workloads for students and educators. In academic and clinical sites, alike, increased demands for productivity by generating positive financial margins co-occurs with increased documentation requirements and limited administrative support, fueling perceptions that leadership and the institutional culture lack compassion. Effects of such stresses on faculty, administrators, and clinicians include exhaustion and poor health, decreased productivity and timeliness, increased errors and bad judgment, and

emotional burnout including frustration, depression, and diminished commitment and enthusiasm for the work.⁶³

Chapter 3

Clinical Education Past, Present, Future

Clinical education that confronts students with clinical, moral and ethical decision-making experiences is critical in determining the quality of allied health professional education.⁶⁴ Romig and colleagues provide a functional description of AH clinical education settings and purposes:

Clinical education takes place in a variety of settings including, but not limited to, the classroom, simulation and standardized patient activities, and clinical/community/patient care settings. It provides students with the education and experiences necessary to develop and refine clinical skills, knowledge, attitudes, and values required to provide quality patient and client care (p.249)⁶⁵.

While ASAHP deans likely concur on these conditions for clinical education, a review of the healthcare literature for well-defined clinical education models describes traditional theoretical and workplace assessments as well as nontraditional and evolving models, but no formally established, universally recognized, or standardized tools for measurement.

The literature on clinical education models highlights the importance of developing students into confident and competent healthcare practitioners.⁶⁶⁻⁶⁸ Many educators aim to develop standardized models that ensure clinical competencies are reliably achieved. Wetherbee and colleagues determined five standards in clinical practica: format and

length of experience, breadth of experience, expected outcomes and assessment of student performance, standards for clinical instructors, and standards for clinical education sites.⁶⁹ Mandy advocated providing current and relevant didactic courses to support student knowledge and skills required for the achievement of optimal clinical competence⁷⁰ which DeClute & Ladyshevsky described to include patient evaluation, care planning and implementation, professional behavior, appropriate record documentation, communication, and management skills.⁷¹ In their review of relevant research and ASAHP dean consensus, Romig's group extracted four common clinical education goals:

Goal 1. Applying theory and didactic learning, coupled with practicing clinical skills and professionalism, into evidence-based, applied safe clinical practice.

Goal 2. Orienting students to professional behaviors and attitudes within the clinical workplace.

Goal 3. Developing professional, interpersonal communication skills and functioning within a team to provide patient/client care.

Goal 4. Developing critical thinking, problem-solving and time management skills in the clinical setting. (p. 250)⁶⁵

Theoretical Clinical Educational Models

Table 1, page 48, summarizes theoretical and clinical models found in the allied health literature. Several of these clinical education theoretical models emphasize the importance of engaged and supportive clinical supervisors who are responsible to direct

the clinical education process and facilitate student learning.⁶⁶⁻⁶⁸ Anderson's model of "dynamic supervision" described three stages in the clinical education continuum: evaluation-feedback, transitional period, and self-supervision.⁶⁶ Theoretical models support the necessity to provide consistent and reliable student assessment⁷² using goal setting and reflection on clinical experiences coupled with debriefing.⁷³ Clinical instruction should be individualized according to the student's readiness or maturity for a particular task.^{74,75} In rehabilitation counseling, *the Hagler and McFarlane Coaching Model* (1992) demonstrated that student independence, creativity and self-supervision were positively impacted when clinical supervisors adopted a coaching versus supervisory role.⁷⁶

Traditional Clinical Education Models

In nursing practicum experiences, pairing one student with one clinical instructor produced positive student outcomes in regard to increased sense of belonging, reduced anxiety, and enhanced learning.^{77,78} Nevertheless, the capacity of this traditional *One-on-One Clinical Education Model* to develop student competencies and clinical course outcomes can be restrictive when clinical preceptor time is inadequate, clinical resources are limited, and clinical placements are in short supply.^{72,73,79} LeFlore, Anderson, Michael, Engle, and Anderson (2007) referred to the traditional clinical education model as "education by random opportunity" when it cannot ensure that students will reliably receive a planned experience with a suitable variety of patients and learning experiences.⁸⁰

The *Two-to-One Collaborative Clinical Education Model* (two students to one clinical preceptor) has been shown to increase placement capacity, as well as improve student learning and skill development and enhance faculty clinical knowledge and management skills.^{27,71,81-84} A systematic review of collaborative clinical education models in speech-language pathology revealed several advantages of student peer learning: higher clinical competence scores, increased student reflection, and increased student satisfaction.⁸¹ While the collaborative clinical model provided valuable learning experiences, it increased the clinical educators' administrative workload in placement site organization and student evaluations. A review of physical therapy clinical education models showed more consistent productivity outcomes for the one-to-one-model than the two-to-one model.²⁷

The *Multiple Mentoring Model* expanded the *Collaborative Model* and involved multiple clinicians supervising multiple students. Nolinske reported that occupational therapy students experienced both more positive professional relationships and emotional connections with more exposure to a variety of clinical faculty and staff.⁸⁵ Warne et al. (2010) used a composite and comparative research method to assess the clinical learning environment of nursing students in nine European countries. This research showed positive student feedback when multiple clinicians supervised nursing students using the *Multiple Mentoring Model*.⁸⁶ While the literature documents benefits of

collaborative and mentorship relationships from clinical faculty and student perspectives, roles and responsibilities in the mentorship process deserve further study.

Among the parameters differing among clinical education practices is the length of time in the clinic.⁸⁷ Longer clinical experiences limited to a single setting may improve the depth of clinical training for that site but reduce exposure to complex and variable medical conditions more likely to be found in across multiple or specialty practice environments.⁸⁸ To integrate clinical learning experiences, Harvard Medical School-Cambridge instituted the *Cambridge Integrated Clerkship Model (CIC)*, a one-year principal clinical training opportunity that fostered student learning in close and continuous contact with cohorts of patients from multiple venues of care.⁸⁹ A team of experienced educators who facilitated didactic and clinical learning experiences for each student collaborated to supervise the student's development and benchmark achievements, and provided collaborative and supportive relationships. The popularity of the program ultimately necessitated random assignment to place students into CIC, as student demand exceeded capacity. The longitudinal integrated clerkship demonstrated higher student satisfaction with the learning environment, equal or better content knowledge and clinical skills than traditionally trained peers, more confidence in dealing with numerous domains of patient care, and a stronger attitude of patient-centeredness.⁹⁰

In some settings, traditional models have evolved to adopt a blended learning approach, capitalizing on technological advances such as web-based learning, a coaching approach, and student peer learning to support clinical training and provide accessible and convenient learner-centered educational methods.⁹¹ Although blended learning has been shown to bridge the gap between theory and practice, while improving clinical competencies in therapeutic technique and clinical laboratory skills, few studies in the clinical education arena exist that explore blended learning methods.⁹²

Ladyshevsky (2006) found that academic programs that used the high-quality cooperative learning system of the *Peer Coaching and Supervision Model* prepared student learners to carry these cooperative behaviors and team skills into the clinical environment and professional workplace upon graduation.⁹³ The *Peer Coaching and Supervision Model* was comprised of an eight-stage structured and formal allied health student pairing model to supplement clinical instructor efforts.⁹⁴ The model structured the student learning experience around several components of clinical competency: recognition of needed support in applying techniques, training with the demonstration of the new practice behaviors, opportunity for practice, non-evaluative feedback and questioning, and self-assessment. This approach enhanced learning for novice AH students in multiple domains including: clinical competence, communication skills, ability to give and receive constructive feedback, problem solving skills, critical thinking, professionalism, and stress management.⁹⁴

The *Clinical Teaching Nursing Model* that used staff nurses to assist faculty members in the direct clinical supervision of students showed that students and faculty benefited from increased contact time between students and preceptors, better use of faculty time, and instruction of students by clinical experts.⁹⁵ Students scored high in integration of theory into practice, realistic perception of work environment, and use of evidence-based practice.^{96,97} The model's limitation was that fewer nursing students received individual or one-to-one preceptor support due to the emphasis on faculty training students in teams.

A systematic review of the clinical education literature found no consensus for a “gold standard” or superior model of clinical education and substantial variability of models among professions.⁹⁸ To address best practice in clinical education practica, some disciplines have called for a national dialogue to determine standards that facilitate education to produce the most competent clinicians.⁹⁹

Emerging Clinical Education Models

Clinical education has evolved from a traditional clinical or hospital setting using available patient populations to diverse educational models that include blended learning⁹¹, coaching²⁷, interdisciplinary structures.^{100,101}, or clinical education technologies.¹⁰² Over time, the benefits of traditional methods of clinical education have been well accepted, without rigorous attention to which elements accounted for learning, whereas alternative or nontraditional methods in clinical education now require

empirical evidence to facilitate adoption for which educational researchers are beginning to develop effective methodologies to document success. Health professions schools are advised to collect and analyze student and graduate feedback on educational preparedness and clinical experiences¹⁰³; student evaluations are important contributions to continuous quality improvement. Wilkinson, Smallidge, Boyd, and Giblin (2015) examined student perceptions of the effectiveness of methods used to close the gap between classroom learning and the clinical experience.¹⁰⁴ Junior students predicted that hands-on experiences, critical thinking exercises, and visual aids would be the most supportive methods to facilitate transfer of knowledge to practice. Senior students proficient in the clinical setting identified critical thinking exercises and visual aids as most beneficial in connecting classroom learning to patient care.¹⁰⁴ Cole and Wessel (2008) reported that students achieved positive learning when theory was linked to clinical practice and supervisor assessment was provided on skills and patient interaction.¹⁰⁵ Student access to adequate educational resources has also been associated with optimized clinical learning.¹⁰⁶ Continued innovation and creative methodologies that incorporate learner views are needed to document enhancements in clinical education effectiveness and efficiency and to assure that students acquire the competencies to enter the healthcare marketplace.

Learner self-efficacy suggests another important indicator of readiness to practice, regardless of the practice setting. OT students demonstrated similar professional and personal skills in traditional hospital-based and nontraditional community-based clinical

settings. Interestingly however, the students at community-based sites where their OT supervisor was not present reported higher perceptions of personal responsibility, cultural competence, and overall personal skills when compared to students whose placements had an active OT supervisor present.¹⁰⁷

Innovative clinical sites beyond traditional hospitals placements have been shown to provide suitable clinical education experiences, including student-run free clinics¹⁰⁸ and rural, underserved community clinics¹⁰⁹⁻¹¹². Additional clinical placement sites include: private practice offices; patient homes^{113,114}, and nursing homes.¹¹⁵ Interprofessional, specialist, and project placements have also been reported as viable alternatives.¹¹⁶ For example, occupational therapy students developed positive perceptions of their knowledge, skills, and confidence in their abilities to provide community-based services when they provided healthcare services to adult patients with neurological conditions.¹¹⁷ International pro-bono clinical experiences may also promote understanding of global healthcare, increase exposure to patient diversity, and develop critical thinking skills.¹¹⁸

Interprofessional Education Models (IPE)

The value of using an *Interprofessional Education Collaborative Model* over the limited traditional single-discipline model has been clearly communicated by researchers, health organizations, government bodies.^{101,119-122} and healthcare leaders in various allied health professions, medicine, nursing, and pharmacy.¹²³⁻¹²⁵ The benefits of an interdisciplinary model include appreciation and understanding of other professions'

clinical roles¹²⁶ and knowledge and access to other clinical practices.¹¹⁹ IPE in didactic-based teaching, simulation-based learning, and clinical experiences, has demonstrated a positive impact on the healthcare team's shared learning, interaction, and collaboration in the determination of patient healthcare goals.^{100,127}

Clinical education with additive interdisciplinary approaches has been used successfully in the rehabilitation clinical setting with physical therapy, occupational therapy, and speech-language pathology students and clinicians to help learners attain discipline-specific learning objectives as well as interdisciplinary skills.¹²⁷ In dietetic education, IPE has been used to provide greater depth and range of learning through employing several supervisors from different professional backgrounds.⁸³ Interdisciplinary simulation experiences can also be implemented to advance team building skills.^{100,128-132} In a simulation-based workshop designed to teach healthcare students about various health professions, allied health and medical students coordinated patient care using shared learning, interaction and collaboration.¹⁰⁰ Positive student feedback supported the use of a IPE workshop model in didactic-based teachings, simulation-based learning and clinical experiences. Simulation training can be used effectively in an interprofessional format, allowing students to gain knowledge of other professions and engage in realistic collaborative patient treatment.^{133,134}

Students appreciate IPE experiences as means to improve patient care, advance their careers, and satisfy curiosity about related disciplines and their healthcare reform

initiatives.¹³⁵ With the shift of healthcare toward collaborative, team-based care models to support patient safety and quality healthcare, student demonstration of IPE standards and IPP practices promotes student recruitment and hiring.¹²⁰ Student awareness of the professional contributions and value of all healthcare team members improves when interprofessional teamwork is included in clinical education^{124,135} which may encourage them to be more collaborative in the healthcare workplace.^{101,101,120}

It is critical to prioritize the support and sustainability of IPE initiatives among key stakeholders in the clinical education arena including health services, regulatory authorities, and education leaders.¹³⁶ Allied health deans value the impact of IPE clinical education initiatives at their respective institutions.¹³⁷ The deans supported curriculum competencies in team building, management and leadership skills, and patient-centered care, to enhance student preparation to be IPE “ready” in the clinical education environment; deans recognized that prioritizing IPE education and training may positively impact student recruitment at their institutions.¹³⁷

Educational Technology in Clinical Education

When integrated with the clinical model, educational technologies can augment faculty and student learning, validate clinical competencies with real world experience, and reduce clinical education costs and time. Instruction using simulation-based technology can develop skills and clinical competencies, shape clinical practice strategies, and build student self-confidence.^{133,138-141} Students often request that clinical training

incorporate additional simulation and educational technology experiences.¹⁴² Further, students view simulation as a useful tool for evaluating their professional and clinical behaviors.¹⁴⁰

Manikins, simulated patients, and anatomic simulators were the most common technologies used in the healthcare arena based upon a 2011 literature search.¹⁴³ “Role-playing, task trainers (e.g., plastic arm on which to practice inserting intravenous catheters), standardized patients using actors, human patient simulators (e.g., SimMan[®]), and virtual simulation (e.g., Second Life[®]) are commonly reported nursing simulation learning tools” (p. 227) that can be incorporated in health professions curricula to teach a range of skills.¹⁴⁴ The use of virtual patients with realistic scenarios who are responsive to user interaction and provide assessment feedback is relevant to clinical reasoning skill development.¹⁴⁵ High-fidelity patient simulators create real-life clinical situations that students may substitute for equally valuable clinical learning experiences.¹⁴⁴

The benefits of simulation in student clinical education are well documented, but it can be time consuming and expensive.¹³⁴ Due to the expense, careful attention is required to select the appropriate simulation technology for the intended learning environment and to determine whether low- or high-fidelity simulation equipment is more suitable for the learning objectives desired.¹⁴⁶ In general, novice students can obtain meaningful learning with less sophisticated educational technology, such as computer-aided

instruction or virtual patients, while higher fidelity is required for learning more technically advanced skills. To provide quality, cost effective learning, improved efficiency and productivity, health professions schools should strive to limit cost escalation by incorporating modern instructional methods and technological advances such as online learning and simulation.¹⁴⁷

Chapter 4

Priorities for Clinical Education Leaders

Educational priorities to improve clinical education include establishing a positive learning climate, and structured modeling and learning experiences, as well as utilization of student feedback.¹⁴⁸ The literature documents the benefits of collaborative clinical models, including increased placement capacity, improved student learning and skill development, and improved departmental productivity.^{82,83,119,126} Collaborative partnerships must be prioritized that pool clinical and financial resources, assure excellence in patient care and clinical outcomes, and offer incentives for clinical education.^{71,81-84}

In light of these priorities, we draw from the preceding chapters our five overarching recommendations and several action steps aligned to each, that can be implemented by various stakeholders in the clinical education enterprise. Table 3 (p. 53) replicates this list. We encourage readers to create alliances among stakeholder groups, discover synergies, and share resources, to make some of these suggestions realities. We further encourage researchers and clinicians to develop collaborative methodologies to assess learning and healthcare outcomes related to clearly articulated models of clinical education; these collaborations are necessary to establish the empirical base

educational leaders and healthcare professionals need to justify the resources required to produce health professions experts for the workplace.

Table 2 expands on opportunities to determine research questions and scholarly activities regarding clinical education. The chart uses the classical PICO model ¹⁴⁹ (population/problem, intervention, comparison and intervention) to identify researchable components of training that contribute to good student, preceptor, client or program outcomes. The table also suggests variables that can be operationalized to quantify components of research metrics and methods.

Recommendations and Action Strategies

Following are five major recommendations and action strategies aligned to each.

Recommendation 1: Develop meaningful strategic partnerships with healthcare organizations to prioritize evolving needs for current and future healthcare

Action strategies:

1. Establish recurrent forum for exchange of information with each affiliated healthcare system in order to anticipate changing needs for clinical education access or curriculum
2. Align program objectives, health system objectives, and student learning objectives to ensure that all are consistent with current clinical practice

3. Engage allied health clinicians to collaborate on curriculum development applicable to pre-clinical students and to practicing clinicians in communications skills to promote patient self-care education, autonomy, and empowerment
4. Identify care team competencies specific to serve targeted populations defined by common diseases or conditions, demographics, or cultures, to inform curriculum development for students and practicing clinicians across disciplines
5. Expand experiential education into outpatient and community settings, and prepare students with competencies matched to the unique needs of treatment teams in each setting
6. Proactively and systematically set shared expectations among learners, faculty, preceptors, and health systems administrators before students begin clinical rotations
7. Conduct professional development opportunities for existing workforce, especially preceptors, that are co-designed with clinicians to assure currency and relevance to clinicians' career pathways
8. Apply metrics that measure value (clinical outcomes, patient satisfaction, cost of care) to examine the effects of students' clinical education processes in the clinical setting
9. Validate tools to assess student outcomes in the clinical setting aligned to the needs of the healthcare system

Recommendation 2: Adapt pre-clinical curriculum and clinical education assessments to meet contemporary needs for efficient and effective interprofessional practice (IPP)

Action strategies:

1. Integrate population health, cultural competency and IPP into core allied health curriculum
2. Teach principles of teamwork based on informed awareness of their application in clinical education settings
3. Implement clinical curricula for students and clinicians that empower professionals to work at the top of their scopes of practice, to negotiate roles with transparency and respect, and to delegate responsibilities consistently with workplace values
4. Develop and teach best practices for intra-and interprofessional delegation of duties that optimizes scopes of practice, maintains quality, and reduces cost
5. Improve fidelity of preceptors' use of objective competency assessments, to include assessment of IPP competencies

Recommendation 3: Incorporate effective use of healthcare technology into allied health education and practice

Action strategies:

1. Invest in and use educational technologies, including simulation, to teach and assess foundational knowledge

2. Adopt hybrid learning methods including on-line learning to increase student access to educational resources and methods and prepare them as conscientious lifelong consumers of electronic educational resources
3. Implement pre-clinical training on electronic communications and electronic health records to develop student competencies in documentation; consult affiliated health systems administrators to inform and teach this curriculum
4. Teach data management and analysis techniques and artificial intelligence to meet current and future practice needs
5. Incorporate telehealth education (skills and legal, ethical, and regulatory standards) into curriculum and, where applicable, provide experiential opportunities in practice settings

Recommendation 4: Advocate with healthcare systems, higher education leaders, accreditors, professional organizations, and governmental agencies, to foster and support Interprofessional practice and referrals across disciplines to improve client/patient care

Action strategies:

1. Convene local, regional, and national meetings with stakeholder groups to influence educational and quality care models that produce competent clinicians

2. Identify and minimize obstacles to effective IPP in concert with certification and licensure regulations in order to optimize practice with each profession's full scope of practice
3. Work with accreditors to foster educational innovations and meaningful IPE activities
4. Reach across levels of higher education (two-year colleges through doctoral programs) to develop and align curricula that teach about allied health disciplines and to teach intra- and interprofessional negotiation and delegation skills
5. Investigate and design models for international partnerships to promote global health and create opportunities for student learning in global environments
6. Develop collaborative funding proposals to support a "Learning Health Systems Approach" to care that promotes learning among students, clinicians, and patients/clients

Recommendation 5: Drive excellence in clinical education through promotion of research and scholarly activity

Action strategies:

1. Evaluate and contrast traditional and innovative clinical models for efficiency and efficacy of student involvement in healthcare settings, from perspectives of patient/clients, preceptors and students (see Table 1 for models)

2. Evaluate the contributions of didactic, simulation, and clinical experiences to educational outcomes
3. Develop and validate reliable tools and methods to assess student competencies and clinical reasoning skills in relation to time-based and competency-based variable clinical education
4. Develop and validate tools and methodologies to measure how integration of clinical learning impacts value indicators such as healthcare outcomes, patient satisfaction, and cost of care
5. Design, implement and evaluate curricula to enhance preceptor skills in clinical teaching and assessment
6. Incorporate student and graduate judgements of clinical experiences and educational preparedness for continuous quality improvement
7. Disseminate research, scholarship, and best practices across ASAHP community

Conclusion

This paper offers broad considerations and practical recommendations aligned to vitalize clinical education and spark dialogue. The sustainability of a healthcare system that can propel the nation into the future depends on the recruitment and effective preparation of the next generation of learners, who will create the science and provide the clinical service. Educational leaders need strategies and resources to assure that diverse individuals see a future in the healthcare professions and that these learners succeed in learning to access and capitalize on the mounting body of evidence-based

science about health management, disease, and clinical treatment. The joint investment of all stakeholders is required to accomplish these aims, especially at a time when the economics, content, and methods of curriculum delivery in higher education, health professions education in particular, are all in flux. Academic and healthcare systems must create dynamic collaborations, locally and nationally, to leverage our mutual knowledge and to determine the future of healthcare practice; the economies of these systems will flourish only in a spirit of integrated needs and resources. A shared vision of seamless interprofessional client-centered practice that optimizes the skills of each profession requires accessible and affordable structures that funnel learners into healthcare careers; theories, models, and educational experiences that assure that they acquire safe and effective clinical competencies; and a viable healthcare system that welcomes them and enhances their skills throughout their career trajectories. The recommendations contained in this paper are offered in this spirit and toward these ends.

Tables

Table 1. Clinical Education Models

Table 2. Potential Research Variables for Clinical Education and Scholarship

Table 3. Potential Agents of Action Strategies

Table 1. Clinical Education Models

Model	Description	Page
<i>Theoretical</i>		
Dynamic Supervision	Three-phase model, consisting of: 1) Evaluation-feedback phase 2) Transitional phase 3) Self-supervision phase. ⁶⁶	29
Coaching	Students receive feedback and instruction based upon readiness and maturity. Emphases of the model include student independence, creativity, and self-supervision. ⁷⁶	29
<i>Current</i>		
One-to-One	One student is paired with one clinical instructor for the duration of the clinical education. Documented student benefits include enhanced sense of belonging, reduced anxiety, and enhanced learning. ^{78,78} Documented challenges include restricted clinical experience (i.e., “education by random opportunity”), strains on clinical resources, and reduced placements. ^{72,73,79,80}	30
Collaborative Clinical Education: Two-to-One	Two students are paired with one clinical instructor for the duration of their clinical education. Documented benefits include improved student learning and skill development, increases in faculty clinical knowledge and management skills, and increased placement capacity. ^{27,71,81-84} A documented challenge is increased administrative workload for clinical instructors. ⁸¹	30
Multiple Mentoring	One student is supervised by multiple clinicians for the duration of the clinical education. ⁸⁵ Documented benefits include students’ building positive professional relationships and emotional connections with clinical faculty and staff. ^{86,86} A documented challenge is the lack of data on the formation of roles and responsibilities within the mentorship process.	30
Cambridge Integrated Clerkship	A one-year clinical training involving close and continuous contact with cohorts of patients from multiple venues of care. Each student learns from a team of experienced clinical	31

	<p>instructors.⁸⁹ Documented benefits include higher student satisfaction with learning environment, equal or better content knowledge than traditionally trained peers, more confidence in multiple patient domains, and a stronger sense of patient-centeredness.^{90,90}</p>	
Blended Learning	<p>Combines multiple educational methods including trending technology, web-based, coaching, peer-to-peer.⁹¹ Documented benefits include effective translation from theory to practice, improved therapeutic techniques, and laboratory skills. A documented challenge is the lack of data regarding efficacy.⁹¹</p>	32
Peer Coaching and Supervision	<p>Structured and formalized learning experience designed to build competence and practice through: 1) Recognition of needed support in applying techniques 2) Training with the demonstration of the new practice behaviors 3) Opportunity for practice 4) Non-evaluative feedback and questioning 5) Self-assessment Documented benefits include enhanced learning in clinical competence, communication skills, giving and receiving feedback, problem-solving, professionalism, and stress management.⁹⁴</p>	32
Clinical Teaching Nursing Model	<p>Utilizes professional nurses as a complement to formal clinical instructor-student relationship. Documented benefits include increased contact between students and instructors, efficient use of faculty time, high translation of theory to practice, realistic perceptions of work environment, and application of evidence-based practice.⁹⁵⁻⁹⁷ A documented challenge is that students potentially receive less one-to-one instructor time due to emphasis on student team training.</p>	33
<i>Alternative</i>		
Student-Run Free Clinics	<p>Seen particularly in occupational therapy, such clinical education occurs most often in largely underserved rural community clinics.¹⁰⁸⁻¹¹²</p>	35

	<p>Documented student benefits include development of a positive perception of their knowledge, skills, and self-efficacy providing community-patient services.</p>	
<p><i>Interprofessional Education</i></p>		
<p>Inter-disciplinary Teamwork</p>	<p>Clinical instructors supervise discipline-specific learning activities, as well as clinical experiences that overlap into related healthcare disciplines (commonly seen in Occupational Therapy, Physical Therapy, and Speech and Language Pathology clinical education).^{83,127} Documented benefits include increased healthcare team communication and teambuilding, enhanced understanding of clinical roles, greater knowledge and access to other clinical practices.^{119,124,126,135,137}</p>	<p>35</p>

Table 2. Potential Research Variables for Clinical Education and Scholarship

Population →		Intervention →		Comparison →		
1) Student 2) Preceptor 3) Client/patient 4) Academic Faculty/School		Various educational models, refer to Table 1 Alternatives that supplement or substitute for part of clinical education <ul style="list-style-type: none"> • Simulations • Virtual patients rather than clinical patients • Telehealth care • Alternate sites, such as student run clinics 		Your current clinical model(s)		
Outcomes						
Students <ul style="list-style-type: none"> ○ Self-reported competence and confidence ○ Self-reported satisfaction with CE model ○ Knowledge for practice and use of evidence ○ Learning in real time ○ Competency for practice ○ Entrustable professional activities ○ Interprofessional skills: understanding of values/ethics, roles/responsibilities, interprofessional communication, teams/teamwork ○ Cultural competency ○ Global experience ○ Cost of education 		Preceptors <ul style="list-style-type: none"> ○ Satisfaction with CE model and responsibilities ○ Stress and workload levels ○ Assessment skills ○ Professional skills in clinical educational practice ○ Professional skills in clinical practice 		Clients/patients <ul style="list-style-type: none"> ○ Satisfaction with provided healthcare ○ Perceptions of value related to student presence in healthcare activities ○ Facility-reported length of stay, length of treatment ○ Client outcomes in terms of safety and knowledge and skills to foster health ○ Willingness to try health changes ○ Cost of care 		Faculty/schools <ul style="list-style-type: none"> ○ Student satisfaction with program/CE ○ Student competency and readiness for entry level practice ○ Control of costs ○ Faculty workload in clinical education
Measurements						
Self report on outcomes <ul style="list-style-type: none"> ○ Surveys ○ Reflection ○ Debriefing ○ Self-efficacy 		Feedback from preceptors, academic faculty and /or clients <ul style="list-style-type: none"> ○ Observation ○ Presentations ○ Projects, QI, research, Evidence analysis reviews ○ Interprofessional interactions 		Measured outcomes <ul style="list-style-type: none"> ○ Blinded assessment of competencies ○ Reliable and validated tools ○ Pre-clinical skills evaluation as compared to workplace competency ○ Workload variability ○ Ability to conduct quality improvement ○ Time to competency ○ Retraining workforce 		

Example of research question using Table 2:

Does the One-to-One Model or Blended Learning Model promote higher entry-level competency in allied health students, as reported by preceptors?

Table 3. Potential Agents of Action Strategies

RECOMMENDATION #1 Develop meaningful strategic partnerships with healthcare organizations to prioritize evolving needs for current and future healthcare	Agents								
	Accreditors	Deans	Government	Healthcare Orgs	Patients	Preceptors	Professional Orgs	Program/Faculty	Students
Action Steps									
1. Establish recurrent forum for exchange of information with each affiliated healthcare system in order to anticipate changing needs for clinical education access or curriculum									
2. Align program objectives, health system objectives, and student learning objectives to ensure that all are consistent with current clinical practice									
3. Engage allied health clinicians to collaborate on curriculum development applicable to pre-clinical students and to practicing clinicians in communications skills to promote patient self-care education, autonomy, and empowerment									
4. Identify care team competencies specific to serve targeted populations defined by common diseases or conditions, demographics, or cultures, to inform curriculum development for students and practicing clinicians across disciplines									
5. Expand experiential education into outpatient and community settings, and prepare students with competencies matched to the unique needs of treatment teams in each setting									
6. Proactively and systematically set shared expectations among learners, faculty, preceptors, and health systems administrators before students begin clinical rotations									
7. Conduct professional development opportunities for existing workforce, especially preceptors, that are co-designed with clinicians to assure currency and relevance to clinicians' career pathways									

8. Apply metrics that measure value (clinical outcomes, patient satisfaction, cost of care) to examine the effects of students' clinical education processes in the clinical setting									
9. Validate tools to assess student outcomes in the clinical setting aligned to the needs of the healthcare system									

<p style="text-align: center;"><u>RECOMMENDATION #2</u></p> <p style="text-align: center;"><i>Adapt pre-clinical curriculum and clinical education assessments to meet contemporary needs for efficient and effective interprofessional practice (IPP)</i></p>	<p style="text-align: center;"><i>Agents</i></p>								
	Accreditors	Deans	Government	Healthcare Orgs	Patients	Preceptors	Professional Orgs	Program/Faculty	Students
<p style="text-align: center;"><i>Action Strategies</i></p>									
1. Integrate population health, cultural competency and IPP into core allied health curriculum									
2. Teach principles of teamwork based on informed awareness of their application in clinical education settings									
3. Implement clinical curricula for students and clinicians that empower professionals to work at the top of their scopes of practice, negotiate roles with transparency and respect, and delegate responsibilities consistently with workplace values									
4. Develop and teach best practices for intra-and interprofessional delegation of duties that optimizes scopes of practice, maintains quality, and reduces cost									
5. Improve fidelity of preceptors' use of objective competency assessments, to include assessment of IPP competencies									

<p>RECOMMENDATION #3</p> <p><i>Incorporate effective use of healthcare technology into allied health education and practice</i></p>	<p><i>Agents</i></p>								
	<p><i>Action Strategies</i></p>	Accreditors	Deans	Government	Healthcare Orgs	Patients	Preceptors	Professional Orgs	Program/Faculty
<p>1. Invest in and use educational technologies, including simulation, to teach and assess foundational knowledge</p>									
<p>2. Adopt hybrid learning methods including on-line learning to increase student access to educational resources and methods and prepare them as conscientious lifelong consumers of electronic educational resources</p>									
<p>3. Implement electronic communications and electronic health records pre-clinical training to develop student competencies in documentation of care; consult affiliated health systems administrators to inform and perhaps teach this curriculum</p>									
<p>4. Teach data management and analysis techniques and artificial intelligence to meet current and future practice needs</p>									
<p>5. Incorporate telehealth education (skills and legal, ethical, and regulatory standards) into curriculum and, where applicable, provide experiential opportunities in practice settings</p>									

<p style="text-align: center;">RECOMMENDATION #4</p> <p style="text-align: center;"><i>Advocate with healthcare systems, higher education leadership, accreditors, professional organizations, and governmental agencies, to foster IPP and to encourage informed referrals across disciplines to improve patient/client care</i></p>	<p style="text-align: center;"><i>Agents</i></p>							
	Accreditors	Deans	Government	Healthcare Orgs	Patients	Preceptors	Professional Orgs	Program/Faculty
<i>Action Strategies</i>								
1. Convene periodic national meetings with stakeholders to influence educational and quality care models to produce competent clinicians								
2. Identify and minimize obstacles to effective IPP in concert with certification and licensure regulations in order to optimize practice with each profession's full scope of practice								
3. Work with accreditors to foster educational innovations and meaningful IPE activities								
4. Reach across levels of higher education (two-year colleges through doctoral programs) to develop and align curricula that teach about allied health disciplines and to teach intra- and interprofessional negotiation and delegation skills								
5. Investigate and design models for international partnerships to promote global health and create opportunities for student learning in global environments								
6. Develop collaborative funding proposals to support a "Learning Health Systems Approach" to care that promotes learning among students, clinicians, and patients/clients								

<p style="text-align: center;">RECOMMENDATION #5</p> <p style="text-align: center;">Drive excellence in clinical Drive excellence in clinical education through promotion of research and scholarly activity.</p>	<p style="text-align: center;"><i>Agents</i></p>								
	Accreditors	Deans	Government	Healthcare Orgs	Patients	Preceptors	Professional Orgs	Program/Faculty	Students
<p style="text-align: center;"><i>Action Strategies</i></p>									
1. Evaluate and contrast traditional and innovative clinical models for efficiency and efficacy of student involvement in healthcare settings, from perspectives of patient/clients, preceptors and students (see Table 1 for models)									
2. Evaluate the contributions of didactic, simulation, and clinical experiences to educational outcomes									
3. Develop and validate reliable tools and methods to assess student competencies and clinical reasoning skills in relation to time-based and competency-based variable clinical education									
4. Develop and validate tools and methodologies to measure how integration of clinical learning impacts value indicators such as healthcare outcomes, patient satisfaction, and cost of care									
5. Design, implement and evaluate curricula to enhance preceptor skills in clinical teaching and assessment									
6. Incorporate student and graduate judgments of clinical experiences and educational preparedness for continuous quality improvement									
7. Disseminate research, scholarship and best practices across the ASAHP community									

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