



TURN
MED ED
ON ITS
HEVD

AMERICAN MEDICAL ASSOCIATION

MEDICAL EDUCATION INNOVATION CHALLENGE

2016 TEAM PROPOSALS

What does the medical school of the future look like to you?

Launched as an extension of the American Medical Association's "Accelerating Change in Medical Education" initiative, our first-ever **AMA Medical Education Innovation Challenge** asked medical students and students of other health professions across the country to answer this very question.

The response was enthusiastic and enlightening.

We received nearly 150 submissions from student teams (comprised of two to four students each) and were impressed with the ingenuity and originality with which each team tackled this question. The challenge dared students to "turn MedEd on its head" and think differently about their education. Creative, forward-thinking and bold, the innovations submitted not only reinforced our confidence in tomorrow's physicians, but they also made for a difficult decision-making process when it came to determining winners.

The AMA is very pleased to award one first-place prize (\$5,000), one second-place prize (\$3,000) and two third-place prizes (\$1,000). In addition, we recognized 26 proposals with an honorable mention (noted throughout this book). Following the challenge, we asked each team to synthesize the highlights of its innovation in an abstract, 113 of which you will find captured in the following pages.

As you read through these abstracts, we hope you will recognize, as we did, the passion and unique perspective each student team brought to answering our question. And just as we did, we hope you will appreciate the enthusiasm and see the promise in our next generation of physicians who are giving their voices to help transform the future of medical education in this country.



Susan E. Skochelak, MD, MPH
Group vice president, Medical Education, AMA



Richard Hawkins, MD
Vice president, Medical Education
Outcomes, AMA

Grand prize winners

FIRST PLACE

In search of a “Muse”: An open national exchange for the advancement of medical education

Utrankar A 2018, Shenson JA 2016
Vanderbilt University School of Medicine

Identified need

In the instant, open, participatory ecosystem of the Digital Age, medical education remains slow to change, siloed within institutions and over-reliant on passive learning. The forces of academic publishing, institutional isolation, and resource constraints on curriculum development restrict the diffusion of innovations in content and pedagogy as medicine evolves exponentially. For a generation that must know and do more than ever before, medical education must be collaborative, evenly distributed and adaptive.

Innovation

We envision “Muse,” an online national exchange—equal parts information repository, social network and learning management system—where medical schools will publish their curricular materials as free, open-access content for use by educators and learners. Creative Commons licensure will facilitate attribution, content adaptation and iteration. Systems for search, post-publication peer review, learner feedback and social metrics will surface and scale the strongest content, accelerating diffusion of innovations and reducing redundancy.

Implications

Muse empowers medical schools to continually discuss, share and strengthen content in a “living curriculum” that evolves with changing medical science and practice. It enables faculty to redirect efforts from developing redundant content to selecting the strongest content, then supplementing it with active learning approaches that promote comprehension and retention. It allows emerging schools to launch at lower cost and ensures learners are well-prepared to navigate medicine’s changing landscape.

Contact

amol.utrankar@vanderbilt.edu

Keywords

medical education, education technology, open access, information management, social networking

SECOND PLACE

Design-thinking, making and innovating: Fresh tools for the physician’s toolbox

Bober T 2018, Albala L 2018, Koeneke-Hernandez L 2018, Mallozzi M 2018
Sidney Kimmel Medical College at Thomas Jefferson University

Identified need

We want to foster creativity in medical education by enabling medical students to become “makers” who prototype and design medical devices. Health care professionals and students experience pain points on a daily basis but are not given the tools, training or opportunity to help solve them. The physician of the future, bolstered by in-situ problem-solving and making skills, will be able to make a difference in the changing health care landscape.

Innovation

We want to enable medical students to become tinkerers who prototype and create solutions to problems in health care through collaborative workshops. The pre-clinical curriculum would incorporate skills centered around (1) computer science and small electronics (CSSE), (2) textiles and medical materials (TMM), and (3) rapid prototyping technologies (RPT). Complemented by an on-campus makerspace, students will be able to prototype and iterate on their ideas in a fun and accessible space.

Implications

Designing and making with patients and health care professionals would change the current dynamic of medical education, making students feel empowered to solve problems in health care even at an early stage in their careers. In doing so, they will gain empathy, problem-solving abilities and communication skills that will extend into clinical practice. Our proposed curriculum will equip medical students with the skills, passion and curiosity to impact the future of health care.

Contact

lxao22@jefferson.edu

Keywords

making, makerspace, innovation, design, prototyping

THIRD PLACE

Happy healers, healthy humans: A wellness curricular model as a means of effecting cultural change, reducing burnout and improving patient outcomes

Deshmukh A 2018, Neal M 2018, Ruberg M 2018, Yared K 2018
University of Louisville School of Medicine

Identified need

Traditional medical education emphasizes the efficient transfer of ever-expanding bodies of scientific and clinical information to students. Although aspects of professionalism are addressed to

varying degrees, the important skills of self-awareness, communication and empathy are neglected. Physicians who lack these skills are more susceptible to burnout. Given the negative impact of burnout on patient care, this is a problem that needs to be addressed.

Innovation

Student goal-setting groups, reflection groups, cognitive behavioral therapy training, and “The Healer’s Art” course will develop self-awareness, self-care and coping skills. Communication skills and compassion will be cultivated through frequent pre-clinical patient interactions. Facility design will make healthy choices easy for students and faculty. To address the hidden curriculum and propagate a positive learning culture, wellness activities will be incentivized, and faculty will be trained in mentoring and wellness.

Implications

Participant health and wellness data will be collected at regular time points to gauge the efficacy of the program. The data also helps students and faculty track personal progress and address health problems empirically. These innovations will reduce the incidence of physician burnout while increasing physician self-awareness, communication skills and empathy. These qualities will ultimately improve patient satisfaction and outcomes and will contribute to a culture of compassionate care.

Contact

msneal02@louisville.edu

Keywords

burnout, compassion, wellness, curriculum, education

THIRD PLACE

Community and classroom approaches to cultural competency and health equity

Platt C 2019, Paprocki N 2019
Midwestern University/Chicago College of Osteopathic Medicine

Identified need

Health disparities by race, ethnicity and socioeconomic status have remained intractable despite many targeted public health initiatives. Though entering medical students identify health disparities as a barrier to positive health outcomes, the standard medical school curriculum does not address health disparities in a comprehensive manner. As such, graduating medical students are ill prepared to preempt, identify and address factors contributing to poor health among at-risk populations.

Innovation

We propose that medical schools institute intentional, four-year, community-based service learning experiences, beginning in the first year of medical school. A service learning curriculum, designed in collaboration with community partners, will expose medical students to local underserved communities, provide opportunities for longitudinal relationship building, and help students reflect upon structural and individual determinants of

health, including the built environment, access to care and provider biases.

Implications

A service learning medical curriculum will provide medical students with a deeper understanding of the social determinants of health and equip them with the tools to apply this perspective to their medical practice. This will benefit communities that suffer from health disparities by motivating a new generation of culturally competent patient advocates who seek to understand and treat each individual within the context of their life and community.

Contact

cplatt61@midwestern.edu

Keywords

health disparities, service learning, cultural competency, education, community health

Other submissions

The community and homelessness integrated medical experience (CHIME)

Adamo M 2018, Smith M 2016, Lu A 2018, Shah M 2018
The Warren Alpert Medical School of Brown University

Identified need

Without changes to how future professionals are taught to conceptualize issues of homelessness and to interact with individuals experiencing it, our health care system will continue to underserve this community. Medical education can do more to shape practitioners who are able to both provide competent, individual-level care and engage effectively on a systems level around issues related to the social determinants of health.

Innovation

CHIME is comprised of the following components: (1) weekly interdisciplinary classes with social work students and members of the homeless community to discuss policy and practice impacting homeless individuals with a focus on medicine within a social justice framework; (2) monthly street outreach with community partners, social workers and medical providers; (3) engagement in a longitudinal community project; (4) completion of an independent project.

Implications

CHIME will expose students to a unique fount of knowledge and perspective not yet adopted by many experienced providers. This creates a meaningful opportunity for students to educate and inform their seniors and, thereby, impact the quality of care for homeless and underserved patients. Students armed with early exposure to community medicine and social determinants impacting health can champion efforts to promote systemic change and advocacy during their clinical experiences.

Contact

meredith_adamo@brown.edu

Keywords

homelessness, advocacy, social determinants of health, outreach, interdisciplinary education

HONORABLE MENTION

Physician citizens: The future of medicine

Agrawal S 2018, Geiger C 2018, Vagasi A 2018
Medical College of Georgia – AU/UGA Medical Partnership

Identified need

We are the beneficiaries of our medical school's problem-based learning curriculum, but one aspect of promoting health still needs attention: physician citizenship. A physician citizen advocates for and participates in improving the social determinants of health in our communities. While medical school curricula include projects to address advocacy and public health, much more can be done to integrate this important aspect of health care into our education as physicians.

Innovation

We have created a longitudinal curriculum lasting all four years. The pre-clinical years are spent learning the foundation of physician advocacy while the clinical years are spent applying and honing those skills. We want to create medical graduates with advocacy skills that are as second nature to every physician as taking a history and physical.

Implications

Our ultimate goal is to reach the point where advocacy becomes the new status quo, and physicians translate the findings of research into ways to improve community health outcomes and take collective action to address social problems. Our proposed curriculum integrates these goals into all four years of medical school. It is crucial for us to foster the relationship between scientific evidence, medicine, politics and community.

Contact

cgeiger@gru.edu

Keywords

physician citizen, advocacy, innovation, medical education

Medical education enhanced by augmented reality

Allan K 2022, Ghodasara S 2018, Rieth G 2018, Russell E 2018
Case Western Reserve University School of Medicine

Identified need

Based on a survey of students at Case Western Reserve University School of Medicine, we found a disconnect between students' enthusiasm for learning about medicine and their

views on medical education. Currently, students find medical education to be tedious and scattered, and it fails to accurately reflect the practice of medicine.

Innovation

We propose using Microsoft's augmented reality device, the HoloLens, to make learning medicine more interactive and realistic. We can generate an infinite number of patient scenarios in an enhanced problem-based learning format to help medical students gain realistic experience in the pre-clinical years of medical school. These scenarios can simulate patients' emotional states, normal and abnormal physical exam findings, conversations with patients and much more.

Implications

With the use of patient scenarios and the aid of the HoloLens, medical students will have more practical patient interaction experiences in the pre-clinical years, ultimately making them much better prepared for practicing medicine in the real world. Additionally, the HoloLens can revitalize medical education, better aligning it with medical students' inherent enthusiasm for learning.

Contact

sdg46@case.edu

Keywords

augmented reality, simulation, evaluation

HONORABLE MENTION

Community adoption in medical education: Living with and learning from those we will one day serve

Andrie J 2016, Cooper C 2017
Penn State College of Medicine

Identified need

Medical education must adapt to produce physicians capable of meeting the needs of our evolving health care system. Yet, as care shifts towards the ambulatory setting, medical education remains rooted in large academic institutions. Social determinants of health are absent in many curricula but greatly impact health and disease. Medical school tuition has skyrocketed, just one of many factors driving students to choose sub-specialty careers over much-needed primary care specialties.

Innovation

The community adoption model is designed to provide contextual learning for students through the collaborative exchange of ideas and resources between a medical school and a community. A medical school would sponsor several community campuses, each with a distinct concentration on a particular population. Population health would be taught through the lens of each community. Curricular innovations include a community advisor for each student, a community professorship initiative and longitudinal community-based experience.

Implications

Community adoption allows medicine to be learned in the context in which it will be applied and allows students to appreciate how community resources positively and negatively impact health. Implementation of technology decreases the cost of education through utilization of online and pre-recorded resources. Creating multiple campuses in diverse communities allows medical education to be individualized according to the career trajectory and personal interests of each student.

Contact

jandrie@hmc.psu.edu

Keywords

community adoption, population health, primary care, individualized education, contextual learning

Longitudinal experience in interprofessionalism: Education, clinical simulation and rotation

Argo C 2018, Bayne D 2016, Hageman S 2018, Schenk S 2016
University of Nebraska Medical Center College of Medicine

Identified need

Multiple suboptimal and poor patient outcomes have been linked to poor teamwork and communication, which has prompted a renewed national interest in interprofessional education. Despite this knowledge, the traditional medical school curriculum is typically a silo-structured, monodisciplinary education wherein interprofessional collaboration is not directly taught or practiced. Physicians should come out of training with the knowledge and skills necessary to become competent clinicians as well as effective members of multidisciplinary teams.

Innovation

We propose a longitudinal program for interprofessional engagement in three phases—education, clinical simulation and clinical rotation. Pre-clinical students learn about the roles of health care team members via shadowing, panel discussions or e-modules, then work through patient cases with an interdisciplinary student group, progressing from cases on paper to electronic health records and simulation. Finally, students in their final training months apply experiences to real-life patient care in a strongly interprofessional setting.

Implications

Student confidence and competency in a team environment within existing systems would be improved through these experiences. High-quality interprofessional practice delivers more cost-effective care and has been shown to enhance patient safety, decrease errors, and improve both patient and health professional satisfaction.

Contact

sara.schenk@unmc.edu

Keywords

interprofessionalism, longitudinal, education, simulation, safety

HONORABLE MENTION

CaseMed Minute—on-demand videos to reincorporate faculty into 21st century medical education

Augustin, R 2018, Seth D 2018
Case Western Reserve University School of Medicine

Identified need

The class of 2019 is immersed in social media, spends more time with mobile devices than any other informational medium and is required to trek through an increasingly immense volume of material throughout the standard four years of medical school. One can conclude from these observations that today's medical student requires incredible efficiency, has a naturally evolved shorter attention span and receives a majority of information via online resources.

Innovation

"CaseMed Minute" has been established to (a) re-incorporate faculty into today's medical school and (b) establish a format that is not only conducive but also adaptable to the learning process of current students. Through surveys, CaseMed Minute identifies topics that are difficult for students and, then, identifies a faculty member who can address those topics. A CaseMed Minute member meets with the professor to create an interactive video using drawings and slides via the iPad app "Explain Everything".

Implications

The videos are made to be efficient and clinically relevant and are posted on YouTube and Facebook for easy online access. CaseMed Minute is reducing barriers between faculty and students, creating an efficient space of learning amidst the volume overload of medical school and passing on resources for many students to come. We are creating a resource that is truly personalized—made according to student demand, available on-demand. This is medical education of the future.

Contact

rca44@case.edu

Keywords

student-driven, high-yield, videos, on-demand, social media

Collapsing the curriculum: Clinical integration, critical theory and multidisciplinary perspectives

Baker R 2018, Garcia-Sampson L 2018, Richardson E 2018, Tsai J 2018
The Warren Alpert Medical School of Brown University

Identified need

This proposal aims to address intersecting health care issues including poor care coordination, health disparities, over-treatment and inadequate preventive approaches to health. Biomedical content memorization is often emphasized above clinical skills and interdisciplinary approaches, hindering medicine's ability to respond to the dynamic needs of its communities. Medical education should better integrate scientific content with clinical application and emphasize context in order to increase clinical skills and critical perspectives.

Innovation

Our innovation utilizes the clinical experience as the main vehicle for training. Clinical blocks combine basic science curriculum, clinical rotations, and interdisciplinary problem-solving sessions that examine medicine through humanities perspectives including policy, public health and sociology. Additionally, students are placed both with longitudinal primary care physicians, and a second mentor specific to the clerkship the student is currently studying. Thus, students develop both clinical skills and critical perspectives.

Implications

The boundary between pre-clinical and clinical years is dissolved, and training is tailored to clinical practice. Earlier clinical exposure, alongside longitudinal patient experiences and continued examination of determinants of health beyond biomedical perspectives allow students to begin cultivating holistic and ethically responsible doctor-patient relationships. Student doctors enter the workforce more equipped to be responsive to patient needs and to create and adapt to constantly shifting models of medical knowledge, policy and delivery.

Contact

Jennifer_tsai@brown.edu

Keywords

clinical integration, interdisciplinary, critical perspectives, longitudinal

Reimagining medical education: The flipped classroom model

Jill Bange 2019, Ayad Ali 2019, Mónica Saccucci 2019, Esther Zusstone 2019
University of Cincinnati College of Medicine

Identified need

In the first two years of most medical schools, instructional time is used to deliver information, and self-study time is used to commit information to memory. The focus of this format is on retaining information rather than analyzing and processing the importance of the content. Any lecture time devoted to discussing clinical application of basic science facts may be minimal because time must be devoted to first explaining core concepts.

Innovation

The solution to the problems created by the traditional lecture format is the flipped classroom model. This model consists of two components. First, students learn the information that would have been covered in lecture in a standard model during self-study time. Second, students engage in activities during classroom time that reinforce concepts introduced during self-study. This is essentially the opposite of traditional lecture, hence the model's name.

Implications

The focus of classroom time is to foster critical thinking and help students integrate information, rather than merely exposing students to information. Students taught under this model spend less time in lecture and more time in active learning environments, such as small groups, panel discussions and case presentation activities. This could help foster a generation of young physicians who are more prepared to tackle challenging clinical scenarios and solve problems effectively within a team.

Contact

bangejl@mail.uc.edu

Keywords

flipped classroom, online, module, active learning, medical education

Patient-inspired education: Improving time efficiency of students by enhancing teaching presentation

Berthet B 2019¹, McFadden R 2018², Eck E 2019¹
A.T. Still University, School of Osteopathic Medicine in Arizona¹
A.T. Still University, Arizona School of Health Sciences²

Identified need

Medical students must be able to assimilate information in an efficient manner throughout their education. Constantly evolving information requires an adaptive information delivery system that matches the supply of information to the information absorption ability of students. Students can master information in a shorter timeframe by combining learning and teaching themselves the skills that will benefit their roles as practitioners of health.

Innovation

Patient-inspired education (PIE) is a teaching model that better matches teaching styles to student learning styles. PIE looks to improve information retention on a weekly timeframe. Primary learning early in the week is flexible by topic to match the individual student. Afterwards, secondary learning begins to solidify primary level knowledge with cases and faculty mentorship. Lastly, tertiary learning summarizes the week's material in the context of exams and interprofessionalism.

Implications

By optimizing student learning, more time is available for applying knowledge learned and solidifying memory retention. PIE encourages students with different learning styles to assimilate medical knowledge more quickly. Learning clinical relevance and interprofessional skills that are seamlessly interwoven into the curriculum also reduces the learning curve after entering the professional world. As a result, young professionals are more productive earlier in their careers within health care institutions.

Contact

bberthet@atsu.edu

Keywords

efficiency, education, learning, adaptive, time

A proposal for the integration of interdisciplinary care in medical education

Bradberry MM 2021¹, Amarnani A 2021², Pitta DM 2016¹, Wieser D 2016³

University of Wisconsin School of Medicine and Public Health¹

SUNY Downstate College of Medicine²

The Ohio State University College of Medicine³

Identified need

While medical practice today relies on interdisciplinary teams, students often have little contact with other care providers during their training. This represents a missed opportunity to learn concrete skills in overcoming the navigational challenges of interdisciplinary care. Improved interdisciplinary training for physicians leads to care that is safer and more effective. Undergraduate medical training represents an opportunity to address these factors before medical students bear the responsibilities of resident physicians.

Innovation

We propose an interdisciplinary curriculum that is integrated into each step of undergraduate medical education. In pre-clinical classwork, problem-based learning sessions with students of medicine, nursing, pharmacy, social work and other disciplines help students become familiar with the integration of all aspects of patient care. In the clinical years, medical students perform a short rotation with various non-physician providers to gain practical insight into their respective roles and challenges.

Implications

Our proposed curriculum would prepare medical students to become physicians who more effectively enhance the function of interdisciplinary teams in patient care. Improved communication and coordination would improve the quality and safety of care, as well as the patient's subjective experience. Widespread adoption of this curriculum would prepare a

generation of team-focused students for the leadership roles they will take on as they become practicing physicians.

Contact

bradberry@wisc.edu

Keywords

interdisciplinary, team-based, safety, communication, leadership

Changing testing and blending curricula to improve retention of clinical and didactic information

Braunthal S 2017, Farrell C 2017, Kodela J 2017

University of New England College of Osteopathic Medicine

Identified need

One of the greatest challenges in medical school is not only learning vast amounts of new information, but also remembering it all. Students often learn material for an exam and forget it by the next one. As a medical student, the problem manifests itself most when studying for cumulative board exams, as well as when on the wards, trying to compile a differential diagnosis or recall treatments and tests.

Innovation

Our innovation to encourage knowledge retention is two-fold. We first suggest supplementing multiple choice tests with oral and written exams. Secondly, we suggest combining the curricula of the second and third year of medical school, such that didactics and rotations alternate over the course of two years.

Implications

We hope that changing the testing methods and rearranging the second- and third-year schedules will create a more academically satisfying environment for medical students. If students are more confident leaving their pre-doctoral education, they will ultimately be more confident as they enter residency and will become objectively better physicians.

Contact

sbraunthal@une.edu

Keywords

medical education, learning, memory, curriculum

The free clinic medical school: A novel model for 21st century medical education

Burns L 2018, Kronenberg D 2018

University California, San Diego, School of Medicine

Identified need

Evidence suggests that early clinical exposure in medical education, particularly to underserved patients, produces graduates who are both technically capable physicians and humanistic doctors. However, most U.S. medical schools rely on a model that divides medical education into distinct clinical and pre-clinical stages with little longitudinal training in doctoring or the physician/patient relationship. Patient exposure is often limited to standardized patients, and students are far removed from indigent populations in their communities.

Innovation

We propose a free clinic medical school (FCMS) built around a student-run free clinic (SRFC) with a learning community (LC) model of medical education that's intimately linked to the longitudinal care of free clinic patients. The curriculum would provide lecture-based didactics in the mornings. Students would then spend several afternoons each week at the campus SRFC learning practical skills from LC mentors and interacting directly with patients under faculty supervision.

Implications

Within this framework, students will be able to practice their knowledge in a way that serves their communities. Faculty will assess students' abilities and challenges through the lens of real-time patient care and provide feedback that encourages an evolving sense of humanism and reflections on improving access to health care. Patients at the FCMS could expect to receive the highest quality care while students train to become America's next generation of physicians.

Contact

lburns@ucsd.edu

Keywords

service-learning, free clinic, humanism, education, pre-clinical

HONORABLE MENTION

The health care innovation and entrepreneurship track

Cantrell WA 2020, Hu J 2019, Luo S 2020, Niforatos J 2019
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University

Identified need

While academic institutions often provide the first moment of inertia for innovation and discovery, resource scarcity is problematic for future physician-investigators. The private sector (PS), however, has fewer limitations. Current preparation of medical students for success through collaboration with the PS is inadequate. To address this concern, we propose a curricular track aimed to equip future physicians with both business fundamentals and familiarity in PS research.

Innovation

Our curricular track has two components. The first is a four-year longitudinal research experience where students collaborate with peers and companies to contribute to private sector research and development projects. As they advance through

medical school, students gain more responsibility and take on leadership roles. The second arm involves weekly classes on health care business topics like accounting, marketing and finance, in addition to traditional research-oriented coursework like epidemiology and statistics.

Implications

Deeper integration between physicians and leaders in the private sector is needed to face increasingly complex health care responsibilities that extend beyond patient care. Physicians must be more than just competent clinical decision-makers. The private sector has deep and valuable expertise that medical students can leverage, allowing student-led innovations to become realities. Private sector research and development firms, in turn, can benefit from investing in relationships with future physician leaders.

Contact

cantrew@ccf.org

Keywords

entrepreneurship, curriculum, research, collaboration, business

Team-based care: Inter-professionalism as a core curriculum

Chen D 2018, Pondicherry A 2018
Rutgers Robert Wood Johnson Medical School

Identified need

Poor communication among health care professionals and complicated patient cases lead to increased health care expenses and unnecessary errors in patient care. The current norm is to educate various professionals separately but expect them to work as a team in practice. This leads to stigma and inefficiency; instead of encouraging a true patient care team, it fosters a multi-professional environment the patient must navigate to receive optimal care.

Innovation

We discarded the idea of separate professional schools and built a three-year curriculum with weekly interprofessional team-based learning. Together, students of medical fields and non-traditional affiliates (e.g., public health, social work, chaplains and biomedical engineering) learn to conduct team patient visits, develop and implement a project to address health care needs and attend shared classes where material overlaps (e.g., basic sciences, health policy). Specialized material is taught in curricular elective units.

Implications

Currently, medical education focuses on material learned. Our curriculum refocuses on integrating fields to maximize cognitive resources across disciplines in the name of patient care. Schools would be more efficient as redundant lectures are reduced, and educators are freed for patient hours or research. Long-term interprofessional projects encourage innovative solutions for health care problems with a multi-field approach. Shared

training can minimize prejudice between professionals and create a culture of teamwork.

Contact

dchen1491@gmail.com

Keywords

Curriculum, interprofessional team, school stigma

The chiasmatic model: A tool for organizing and contextualizing content throughout medical education

Clark L 2018, Lawson A 2018, Primbas A 2018
University of Washington School of Medicine

Identified need

Medical education requires medical students to synthesize a large amount of information. This process would be more efficient and effective by changing how material is presented in order to maximize students' ability to integrate basic sciences with clinical medicine. Adapting techniques that are already utilized by outstanding instructors, we propose the chiasmatic model as a broadly applicable organizational tool for fostering mastery of the vast spectrum of medical knowledge.

Innovation

In a chiasmatic pattern, ideas are presented in palindromic sequence (e.g., ABCBA.) We propose applying the chiasm to teach diseases. The instructor might begin with clinical presentation (A), progress to pathophysiology (B) and pharmacology or biochemistry (C), and then reverse the order, at the end revisiting the presenting signs and symptoms in light of what has been learned. Each conceptual "level" deepens understanding of those preceding and following.

Implications

The chiasmatic model is an organizational tool for teachers and students that actively encourages integration of interdisciplinary information. The chiasm is flexible and easy to use, requires no changes in infrastructure, and can be applied during pre-clinical years, continuing education and bedside teaching. It anchors classroom learning to patient experience while deepening understanding of disease. Training in this model will foster critical thinking and speed clinical mastery.

Contact

lclark5@uw.edu

Keywords

medical education, teaching, pre-clinical, active learning, chiasmatic model

The Medical College of Primary Care: Innovation and solution

Cline A 2017, Ye S 2017
Medical College of Georgia

Identified need

The primary care physician (PCP) shortage is worsening. Currently, there is a shortage of 16,643 PCPs, with future projections of a shortfall of as much as 52,000 PCPs. Only 18 percent of medical students are expected to practice primary care. Medical education has 84 percent of students in debt, with 79 percent averaging a debt of \$100,000 or more. Primary care has a lower financial return than other medical specialties. Thus, the PCP shortage may be due to medical students being unable to afford to practice primary care.

Innovation

We propose an innovative school that is not only more affordable, but also directed at training PCPs. The Medical College of Primary Care (MCPC) prepares students specifically for primary care careers in internal medicine, family medicine, pediatrics and geriatrics. Medical schools could even offer an inexpensive primary care program alongside their traditional curriculum.

Implications

The MCPC would better train students for primary care careers. Decreasing tuition allows students who never thought they could afford medical school to attend. The lower debt burden allows students to pursue primary care careers without worrying about paying off their loans. More students would be placed in residencies that lead to primary care careers, helping to alleviate the looming shortage.

Contact

abcline@gru.edu

Keywords

primary care, student debt

HONORABLE MENTION

Synthesis block: Integration of basic medical sciences in the context of population health

Cloonan D 2018, Jesse N 2018, Arkfeld D 2019, Wagoner J 2018
University of Nebraska Medical Center College of Medicine

Identified need

The needs addressed by our synthesis block are five-fold: the absence of a transitional experience before clinical education, a need for integration after systems-based education, the necessity to enhance the rural care experience in the first phase of medical education, a deficit in interactive exposure to the electronic medical record (EMR), and a lack of the patient perspective in the context of a population in health care education.

Innovation

Our innovation is a gamified block that synthesizes pre-clinical knowledge in a population-based setting while utilizing teamwork, patient simulation, EMRs and clinical practice to prepare students to enter the clerkship years. Students are divided into cohorts that compete in the care of a simulated population using multiple learning modalities. Our model introduces patient care techniques and strategies alongside the synthesis of material from the pre-clinical years.

Implications

Early clinical engagement will improve student experience by shifting focus from the volume of medical knowledge to application of each concept. Gamification will make students more receptive to the active learning taking place in a simulated clinical environment. Emphasis on EMR proficiency and clinical skills improves educational yield during the clinical phase. Technological learning primes students to engage new medical practice and technology in the future, ultimately improving patient care.

Contact

daniel.cloonan@unmc.edu

Keywords

competition-based learning, simulation, gamification, population medicine, team learning

HONORABLE MENTION

3s short courses: Health care training in the third science

Coburn BW 2018^{1,2}, Riggle J 2016¹, Dahlquist L 2018³, Jones RL 2017¹.

University of Nebraska Medical Center College of Medicine¹
University of Nebraska Medical Center Graduate Studies²
University of Nebraska Medical Center College of Nursing³

Identified need

Clinical and basic science courses do not fully prepare health professional students to address complex health care delivery issues in real-world practice. Over the past two decades, many seminal publications from the Institute of Medicine, including *To Err is Human*, and other organizations have pointed to the need for a more robust health care delivery science called the third science. Most students, however, do not currently receive adequate third-science training.

Innovation

The 3s short courses platform is an open, online learning environment where students from various professions work together on real-world problem-solving. Course instructors are front-line experts in health care delivery science. Coursework is developed around current real-world projects that engage students in actual third-science processes. The online nature of the platform expands learner access beyond traditional health care professions to also include engineers, architects, data scientists and others.

Implications

The 3s short courses innovation breaks ground in the third science by making a powerful domain of knowledge broadly accessible. The design simultaneously provides engaging content for learners while benefiting course instructors with crowd-sourced input from those with diverse educational backgrounds. The online nature improves scalability and lowers cost while expanding access. By expanding access to the third science, 3s will empower a diverse generation of new learners to improve patient outcomes.

Contact

brian.coburn@unmc.edu

Keywords

health care delivery science, interprofessional education, third science, online learning, massive open online courses

Incorporating health insurance and policy education into medical curricula: A longitudinal approach

Congiusta D 2019, Di Vitantonio T 2019
Rutgers, New Jersey Medical School

Identified need

Many recent studies highlight the logistical problems physicians face under new health care laws and insurance regulations. Student doctors are largely unexposed to these challenges until we are already in practice—a point when our patients expect us to know how to manage them. Despite this well-known fact, there is a paucity of education on health policy and health care issues found at the level of medical school training.

Innovation

The goal of our program is to educate students on the basic principles of health policy throughout the four years of medical school; this longitudinal approach distinguishes our innovation. Medical students will be made aware of the extra-medicinal realities of practice within an institution's pre-existing doctoring courses. With minimal expense of resources, our program applies team-based learning and practical simulations within the limits of an already demanding medical curriculum.

Implications

Through our program, student doctors will have a better understanding of why hospitals and private practices function the way they do. They will also be better prepared to handle the social and economic determinants of health that affect patient lifestyle choices. Our course will prime new doctors to become more socially, economically and practically aware of the forces that influence the health care system—a necessity in contemporary America.

Contact

dvc33@njms.rutgers.edu

Keywords

insurance, policy, longitudinal, innovation, curriculum

Flipping the classroom: A world-class education for every student

Convissar D 2016, Ghadiali J 2016
Rutgers, New Jersey Medical School

Identified need

This innovation addresses a number of major issues within medical education. First, the current paradigm requires students to align to the school's schedule for teaching. Second, the existence of the "professor vs. teacher" dilemma commonly results in experts in the field providing education, not necessarily experts in teaching. Third, the costs and resources required for medical education have gone up significantly in recent times.

Innovation

The foundation of this innovation involves learning at home from compact, digital lectures. A group of decentralized, world-class educators would be responsible for creating and maintaining the digital curriculum. Feedback systems would be put into place to allow students to make suggestions and comments for improving education. Clinician time would be more effectively used in small groups. The goal is to create a student-centered, evidence-based educational model.

Implications

This innovation can be scaled to multiple disciplines and schools. It would help ensure the availability of a world-class medical education across the country. Education would become more standardized, and patients would benefit from increased competency among health care providers. Medical education would become more efficient and cost-effective as educators would no longer be required to give the same lectures repeatedly.

Contact

convisdl@njms.rutgers.edu

Keywords

flipping the classroom, evidence based education, technology, standardization, cost effective education

Healthonomics: A novel curriculum empowering future physicians to maximize patient outcomes

Coombs D 2017, Salehi P 2017, Colon N 2017, Kim D 2017
Drexel University College of Medicine

Identified need

Today's health care system is in flux. As health care policy continues to evolve, the knowledge gap amongst physicians/medical students regarding the system continues to grow. At its crux, the problem is two-fold. First, many professionals in the medical field lack a fundamental knowledge of the U.S. health care system, business and policy. Second, the

medical community lacks the understanding of how to address and inspire policy change in its own field.

Innovation

Our solution is "Healthonomics," a novel, holistic approach to delivering crucial information that remains unique to our program and designed for a new generation of medical students. The interactive website represents an online curriculum with courses discussing the economic aspects of health care. The result is a profound educational experience for individuals with a desire to broaden their understanding, or medical schools wishing to implement a self-directed health care/economics curriculum.

Implications

By developing an understanding of our own health care system (through our medical school curriculum), we position future physicians to legitimize the idea that they ought to have a stronger voice in shaping their careers and patient care. Creating the resource outlined in our proposal equips physicians with not only the understanding, but also the tools needed to inspire change that benefits patients, physicians and our nation as a whole.

Contact

Demetrius.Michael.Coombs@drexel.edu

Keywords

business, health care, curriculum, policy, education

Restructuring the undergraduate curricula to re-innovate general practitioners in primary care

Dalal S 2018, Elegino J 2017, Sahay T 2018, Kaur K 2018
Lake Erie College of Osteopathic Medicine - Seton Hill

Identified need

The need that is addressed includes medical students becoming advocates for patients by working in an interdisciplinary environment. A restructured educational system also addresses the current problems of a diminishing general practitioner workforce and burned out physicians upon completion of residency. With evolving methodologies in the delivery, technologies and personalization of care, medical students must be educated in a system that continually adapts to the ever-changing facets of health care.

Innovation

The innovation is a five-year Bachelor of Medicine degree that creates general practitioners who will provide health care to underserved and rural populations without a formal residency program. A restructured system provides students with early exposure to medical education and clinical training, focused repetition on relevant medical subjects, early opportunities to pursue research, and an option to pursue a residency program in their specialty of choice after their Bachelor of Medicine degree.

Implications

Our model provides a focused curriculum that promotes an increase in a competent primary care workforce as well as an attraction to the field of primary care. With a restructured undergraduate program, students will have decreased financial burden due to the decrease in length of training. Students interested in clinical research will have increased time allocated to their research field, which promotes continuous innovation in health care.

Contact

Sarthi.Dalal@med.lecom.edu

Keywords

general practitioner, medical innovation, undergraduate medical education, primary care, medical curriculum

HONORABLE MENTION

Project “Engage”

Davis MG 2016¹, Asnaashari P 2016², Dhamija A 2017³
*University of California, San Diego, School of Medicine*¹
*Western University of Health Sciences College of Osteopathic Medicine of the Pacific-Northwest*²
*University of California, Riverside, School of Medicine*³

Identified need

Obesity and obesity-related chronic diseases, such as diabetes and hypertension, constitute some of the most challenging and costly public health dilemmas facing America today. To address these challenges, physicians must be better equipped to counsel on areas of diet and physical activity with their patients. Research has strongly suggested the power of healthy lifestyle behaviors to prevent the development of disease.

Innovation

We want to improve our current medical education system by incorporating more teaching and training on the topics of diet and exercise. These topics have traditionally received little attention in formal medical school curricula and training programs, but they are increasingly essential as part of a comprehensive, patient-focused approach to treating some of the most common health problems affecting the American population today and to “engage” patients fully in their health.

Implications

The creation and implementation of this curriculum would require a collaborative effort. A lifestyle medicine committee would be established, headed by a chair and filled by a committee of nutrition educators, exercise physiologists, motivational interviewing experts, curriculum coordinators and OSCE coordinators. The committee would provide guidance on the development of various curriculum components: lectures, problem-based learning, kitchen lab, OSCE and ambulatory care apprenticeships in order to create a cohesive introduction to lifestyle medicine.

Contact

gail.marsha@gmail.com

Keywords

lifestyle medicine, nutrition, exercise, medical education, medical education innovation.

Cognovi: A collaborative learning system integrating retrieval practice and spaced repetition

Deng F 2016, Wesevich A 2017, Gluckstein J 2016, Mishra S 2017

Washington University in St. Louis School of Medicine

Identified need

Clinical problem-solving depends critically on medical knowledge. Unfortunately, most of the factual and conceptual knowledge learned in medical school is forgotten after only several years. Breaking the cycle of “cram, pass and forget” to promote long-term retention represents an unmet need in medical education. Schools should place greater priority on producing graduates with durable foundational medical knowledge as well as the skills for lifelong learning.

Innovation

We propose Cognovi, an evidence-based learning management system grounded in spaced retrieval practice, wherein learners repeatedly extract information from memory over time. Students annotate course texts and videos in situ with short-answer, multimedia flashcard questions. Students and faculty collaboratively rate and curate flashcard collections integrated across the curriculum. Students answer flashcards on personal devices daily, and repeated reviews are individually scheduled based on difficulty. Data analytics provide feedback and monitoring.

Implications

Randomized trials in medical education have demonstrated the benefits of spaced retrieval practice on long-term retention as well as clinical process and outcome measures. Cognovi provides the technological infrastructure for schools to implement this educational strategy in an efficient, scalable, collaborative and personalized manner. Further, curricular integration encourages faculty buy-in. Armed with active learning habits and more durable mastery of important medical knowledge, graduates will provide higher quality patient care.

Contact

francisdeng@wustl.edu

Keywords

retrieval practice, spaced repetition, active learning, instructional technology, e-learning

Reducing physician burnout and promoting health equity through community organizing education

DeSure A 2018, Nirkhe S 2018, Nuttall E 2018, Johnson A 2018
University of Washington School of Medicine

Identified need

Physician burnout is a problem that often begins in medical school. Many medical students feel they lack the skills to care for patients in the context of social barriers to good health. While health inequality is discussed in medical schools, students are not taught skills to take action. This can reinforce burnout by making physicians feel helpless to tackle systemic forces that are making their patients sick.

Innovation

We propose integrating a foundation in practical skills that medical students can use to address social determinants of health throughout their careers into all four years of the medical school curriculum. This education will help students learn to recognize patterns in the barriers to health that their patients face and encourage them to engage with the community as a whole rather than focusing only on individual patients.

Implications

Physicians treat the maladies of patients, but they are also uniquely poised to play a role in treating the societal maladies that underlie them. This innovation will empower physicians to be community leaders and reduce the hopelessness that fuels unproductive encounters between patients and providers. These impacts will ultimately benefit both patients and providers by creating a clinic environment where providers work effectively alongside the community to reduce health disparities.

Contact

ari727@uw.edu

Keywords

health equity, community organizing, advocacy

Evolution-based learning and clinical coaching

Dickey RM 2017, McChesney GR 2017
Baylor College of Medicine

Identified need

With the volume of scientific knowledge doubling every nine years, the scope and fount of knowledge required to practice medicine in the 21st century is overwhelming traditional methods. Medical education must adapt in modifying its curriculum to more efficiently educate its students through the use of technology to build a new kind of medical school lecture and implant the clinician educator as a coach.

Innovation

We propose the development of a three-year medical school curriculum with a basic science year, transitional year and sub-internship year. A basic science year utilizes space-repetition software (SRS). SRS allows for the mastering of basic science knowledge at an accelerated pace, combined with competency evolutions in sequential order. The transitional year focuses on clinical coaching of physical exam, communication and writing skills. The third year is a clinical year with advanced responsibilities.

Implications

An accelerated curriculum with a focus on clinical exam skills and bedside diagnoses is intended to reduce both training costs to the student and the health care system. The future physician will practice with greater precision and efficiency through advanced learning techniques and structured mentorship, delivering more accurate and timely care to patients.

Contact

Ryan.Dickey@bcm.edu

Keywords

education, pedagogy, medical school, spaced repetition, coaching

Future-proof: A feasible model of medical school curriculum reform through a technological framework

Dodd IME 2016, O'Neal IL 2016, Menon RS 2018
Howard University College of Medicine

Identified need

Medicine is one of the slowest fields to adapt to new changes. Longitudinal studies show that medical students lose empathy for patients toward the end of medical school. Changes to medicine are accelerating exponentially, but there are no signs of the latest advances in medical education objectives. A graduating student's education quickly becomes outdated. New advances in technology that could prepare students for the future medical field go unincorporated.

Innovation

To make medical training adaptive to trends, every medical school should create an Innovation Reform Committee (IRC) as an adjunct to the Curriculum Committee as a new Liaison Committee on Medical Education accreditation standard. Each year the IRC would study each department's latest research and trends to determine how technological incorporations of cutting-edge research can supplement each year's unique challenges. The committee will meet with leading researchers, thought leaders and organizations at the innovation forefront.

Implications

Members of IRCs would attend conferences on genomics to develop coding lessons for students to learn Python and STATA to prepare for the arrival of bedside sequencing and precision medicine. These members would also attend medical device

conferences and incorporate student tracking of patients' food and workout logs within apps like 7MinWorkout and S-Health, teaching students basic telemedicine. Examples like these demonstrate improvements to medical education, creating students who are better prepared for future change.

Contact

imedodd@gmail.com

Keywords

innovation reform committee, curriculum reform model, technology in academic medicine, medical students and technology, medical education framework

Reimagining the medical education ecosystem: Local immersion focused education (L.I.F.E)

Doo F 2017, Profant C 2018, Volz N 2017
Oakland University William Beaumont School of Medicine

Identified need

Modern medical education physically and academically disengages students from their future patients' communities, leading to a gap in understanding of lifestyles, behaviors and overall health. The future physician should be intimately familiar with how the medical network is interwoven with the social fabric of our patients. Tomorrow's doctors must intuitively understand and innovatively approach disease in each unique context. We propose fundamentally restructuring the entire ecosystem of medical education.

Innovation

Local immersion focused education (L.I.F.E.) trains future physicians directly in communities where they may eventually serve. With personalized community-based curricula, students learn in natural real-world environments and health care teams. Immersed students build meaningful interprofessional and interdisciplinary networks with clinical and non-clinical partners, both within and beyond their community. L.I.F.E. experiences may lead to unique insights for students and communities, inspiring new systems and technologies.

Implications

L.I.F.E.'s innovative self-sustainable ecosystem is the future of medical training and health care. Locally immersing students and deeply rooting them in communities with focused education is more aligned with true patient care, closing both the symbolic and real gap between doctors, patients and communities. L.I.F.E.-trained physicians serving individual communities would collectively solve the health care problems of tomorrow in an ongoing, dynamic educational process.

Contact

fxdoo@oakland.edu

Keywords

immersion, ecosystem, community, innovation, education

LINCing the book to the bedside

Driver P 2018¹, Harris K 2017¹, McMullen D 2016², Williams Z 2018¹
*The Brody School of Medicine at East Carolina University¹
College of Nursing at East Carolina University²*

Identified need

Nationally there is a need to revamp undergraduate medical education to focus medical knowledge and bedside care techniques on the needs of the patient. In addition to medical knowledge, patient safety, quality and interprofessional team building all need to be incorporated into the curriculum. To give the patient the best chance at a positive outcome, students must learn how to navigate the increasingly complex health care system.

Innovation

We propose to fully integrate the pre-clerkship and clerkship curriculums from the first day of medical school. This would include systems-based learning in a block format so that the student can be fully immersed and engaged in each system of the body. Students will have their own patient panels to provide a longitudinal pre-clerkship clinical experience. Increasing skill-based and team-based learning modules will improve patient satisfaction at the bedside.

Implications

This style of medical education will allow students to integrate their medical knowledge into the practical work environment. This would sharpen students' diagnostic skills and allow them to develop their physician-patient relationship skills from day one, making them better physicians. Students will have increased exposure to the complexity of the health care system, allowing them to explore principles of health care delivery science.

Contact

driverp14@students.ecu.edu

Keywords

medical education, clinically based curriculum, patient-centered care, interprofessional teaching, healthcare delivery science

The horizontal classroom

Duckworth E 2019, Hirschmann C 2019, Murdock H 2019, Viswanathan V 2019
Perelman School of Medicine at the University of Pennsylvania

Identified need

The dynamic nature of medicine makes it simultaneously exciting and frustrating—it comprises complex medical conditions, large provider teams and changing bodies of knowledge. The current model of medical education involves a pre-clinical education that is starkly different from clinical realities. As medicine grows in complexity, students must hone three skills: the resourcefulness to find information, the capacity to analyze information and the confidence and competence to present information.

Innovation

We propose the horizontal classroom where teaching will be done by students in a “jigsaw model.” A group of students will be assigned a subject to teach the entire class. With guidance from a professor and medical professionals, they will craft a lesson plan for their classmates that is engaging, informative and useful. Each student will use the designed curriculum to actually teach a small cohort of the class.

Implications

In training medical students to educate their peers, we will train physicians who are better able to convey information, analyze data, generate hypotheses and lead health care teams. They will also have longitudinal mentoring relationships with faculty. We expect that these future physicians will be experts not only in the acquisition of knowledge, but also in communicating to individuals in all aspects of health care: peers, patients and the broader community.

Contact

Elizabeth.Duckworth@uphs.upenn.edu

Keywords

innovation, student-directed learning, medical education

HONORABLE MENTION

Incorporating high-value care into undergraduate medical education

Faber EB 2019, Wells DR 2019
University of Minnesota Medical School

Identified need

The United States spends the most per capita on health care, but it ranks much lower than most industrialized nations in quality and many health metrics. Studies have shown higher costs do not translate to high-quality care and may indeed translate to lower quality care and patient experience. Teaching high-value care (HVC) is only formally integrated into 15 percent of internal medicine residency programs and hardly integrated at all into undergraduate medical education.

Innovation

To address rising health care expenditures in the United States, the innovation trains physicians starting in year one of undergraduate medical education in an HVC-focused curriculum regarding diagnostic testing. To create the curriculum, content will be introduced throughout each year of training. Each consecutive year, the fundamental principles will be reinforced with the goal to have students practicing HVC at the end of their clinical training.

Implications

This training could help decrease unnecessary test ordering, which is common among residents and practicing physicians. Our health system will benefit through the cost savings associated with the decrease in unnecessary medical testing. Patients will also benefit because only the most valuable tests will be ordered, saving the patient unnecessary distress, time and exposure to adverse events.

Contact

faber053@umn.edu

Keywords

high value care, cost conscious care, undergraduate medical education, test ordering

The PPPLE model—Patients, peers, physicians, longitudinal encounters

Faunce N 2017, King S 2017, Grothusen J 2017, Kennedy D 2017
University of Kansas School of Medicine

Identified need

Problem-based learning (PBL) has become a new mainstay of medical education. PBLs are consistently taught based on historical cases that have been oversimplified for the early learner. Scenarios are devoid of the complicated reality of patients and underplay the working infrastructure of health care. Additionally, students are unable to see actual patients with the constructed presentation and lack appreciation for physical exam findings of the most commonly encountered diseases.

Innovation

The PPPLE model relies on pairs of upperclass students and underclass students to teach each other. The upperclass students identify patients with common pathologies and teach the underclass students to perform a history and physical—noting findings specific to the selected pathology. The upperclass students will utilize the EMR to teach important lab/radiographic findings associated with that pathology. At the group session, underclass students present their patient to an attending and review the disease pathophysiology.

Implications

The PPPLE model focuses on people—the sessions place an emphasis on patients as a way of learning through hands-on experiences. A focus on peers—students from all years interact as teachers and learners. Physicians participate as leaders and benefit from exploration of patient cases. Advancing from the first year of medical school to the fourth year gives a longitudinal encounter from learner to teacher and allows students a chance to see diseases from different learning levels.

Contact

nfaunce@kumc.edu

Keywords

PBL, longitudinal, peer teacher, case-based

Health equity and intersectional *justice for all *gender, racial, reproductive, sexual and social

Ferrel VK 2018, Tantoco NK 2018, Munir NA 2019, Chang J 2018

University of California, San Diego School, of Medicine

Identified need

Health equity and intersectional justice utilizes the platform of physicians and future physicians at the University of California, San Diego, to advocate for marginalized communities and stand up to the hierarchy of oppression. Our endeavors and initiatives demonstrate that our cause is multidimensional—a collective of socially-aware students in medicine who are passionate about peer education, community outreach, humanism, visibility, representation, health equity and justice.

Innovation

A coalition of movers and shakers, we are committed to improving public and community health as a holistic approach to eliminating health disparities, especially in the greater San Diego area. By integrating social justice education into medical education, trainees will have a greater awareness of social determinants of equity, health disparities, allostatic load and the minority stress model, the diversity of barriers patients face within the health care system and globally.

Implications

Immersing medical students in the biopsychosocial model of health is a stark contrast to the current format of medical school. Empowering students with tangible skills and knowledge will improve health disparities. Acknowledging the holistic nature of health will promote mindfulness and reduce burnout, creating physicians and practices that are thriving. As future physicians and scientists, we are responsible for improving the world around us for ourselves and our patients.

Contact

vanessa@ucsd.edu

Keywords

social justice, medical students for justice, white coats for black lives, social determinants of health

SuperLINC: Today's innovative curriculum to develop tomorrow's physician leaders

Ferruzzi E 2018¹, Kassim I 2018¹, Land J 2017², Nasser T 2018¹

*The Brody School of Medicine at East Carolina University¹
The Brody School of Medicine, Department of Public
Health²*

Identified need

In 1999 the Institute of Medicine (IOM) published the revolutionary piece, “To Err is Human,” reporting that as many as 44,000–98,000 deaths occurred each year due to preventable medical errors. Taking this into consideration, we recognize the need to address the factors of quality and safety in the context of patient care and fundamentally shift the focus from the individual to the system in which they operate.

Innovation

Our innovation is designed for select student cohorts in medical schools across the nation who will participate in a longitudinal distinction track consisting of four core principles: leadership, interprofessionalism, quality improvement with innovative care, and population health with service learning. We will create a revolutionary group of future team leaders who are highly adaptive, emotionally intelligent, and able to tackle the health disparities within our health system.

Implications

As future physicians, it is our desire—but more importantly, our responsibility—to address the preventable medical errors that continue to plague our health system. Early exposure as medical students to the issues surrounding patient safety and quality improvement will positively impact the way we approach and treat patients while simultaneously preparing us to transform our health systems as future physician leaders.

Contact

kripnerm14@students.ecu.edu

Keywords

leadership, interprofessionalism, quality, service, population health

Fostering empathy and motivation in medical students through team- based longitudinal patient care

Freret T 2017, Huth K 2017, Rana J 2017, Reynolds S 2017
Harvard Medical School

Identified need

There is a growing need for physicians who are motivated to care for patients with complex and chronic illness. Yet evidence suggests that empathy and intrinsic motivation declines throughout medical training. Medical school traditionally begins with a dedicated basic science pre-clinical curriculum, without the context of meaningful patient interactions. Apathy and burnout can result as the objectivity of textbook learning shifts abruptly into the ambiguity and complexity of clinical care.

Innovation

We propose a curriculum that is longitudinal and patient-centered from day one of medical school. Student teams will engage in the care of a panel of patients and attend medical appointments, home visits and hospitalizations. Students will provide regular updates to their team at meetings with a faculty facilitator. Building portfolios of clinical experience in a care

team will serve as a springboard for discussion of foundational science links, interprofessionalism and ethics.

Implications

Our innovation fosters intrinsic motivation and empathy by reframing traditional textbook learning through a patient lens and focusing on autonomy, self-efficacy and relevance. Instead of pre-clinical training, students will develop interpersonal skills, clinical competence and critical reflection skills through patient-centered care, alongside basic sciences. This longitudinal integrated curriculum aims to graduate empathic physicians who build strong therapeutic relationships with their patients to support patients in achieving their desired health outcomes.

Contact

taylor_freret@hms.harvard.edu

Keywords

undergraduate medical education, intrinsic motivation, empathy, patient-centeredness

Improved clinical exposure during pre-clinical years by development of family line

George A 2018, Hasani A 2018, Russell A 2018, Grandi L 2018

Lewis Katz School of Medicine at Temple University

Identified need

Our proposal addresses the need for clinical integration and skill development early in medical education. While the focus on lecture-based coursework is important during the pre-clinical years, clinical relevance needs to be further emphasized. We see an opportunity for senior medical students to teach pre-clinical students to connect coursework with clinical application; simultaneously, senior students would benefit from improving necessary teaching skills.

Innovation

We propose developing a family line of residents, clinical medical students and pre-clinical students to provide further opportunities for education and support. Pre-clinical students would participate in management of a patient with their family line and conclude with a presentation, an idea known as “reverse rounding.” Additionally, students would explore a topic encountered during clinical exposure and give a research presentation to their peers to outline clinical learning objectives.

Implications

Our proposal allows for students to have more exposure to clinical learning in the initial years of medical education. Early exposure will allow students to understand their role in the care team, thus leading to more effective involvement in patient care during clinical years. Additionally, residents and clinical medical students would have more opportunities to develop teaching skills necessary for their future roles as educators of both students and patients.

Contact

leah.grandi@temple.edu

Keywords

family line, preclinical, clinical exposure

Improving clerkships by creating a teaching service and medical student teaching rounds

Gluckstein J 2016, Mishra S 2016, Deng F 2016, Wesevich A 2017

Washington University in St. Louis School of Medicine

Identified need

Clerkship students are usually supervised by residents and attendings whose primary duty is patient care. Medical student education competes for time with resident education, scheduled talks and the administrative tasks that come with treating and discharging patients. This limits the time available for teaching and assessing students and leads students to focus on busywork rather than educational activities in order to fit in and increase exposure to attendings and residents.

Innovation

We propose creating a teaching service of faculty and residents with time to run clerkships and educate students using real patient interactions without direct responsibility for patient care. Students from different teams will meet for medical student teaching rounds with physicians from the teaching service for a few hours several times weekly. Students will present patients, perform exams, share evidence, develop self-directed goals and discuss care in an education-focused environment.

Implications

Frequent teaching rounds will ensure that students receive regular guidance from attendings and residents dedicated to medical education. Mixing students from different teams will increase the variety of cases seen. Discussions will maintain an appropriate level of discourse. These changes will increase learning and student satisfaction during clerkships. Physicians on the teaching service will develop expertise in education, improving the reliability of grades and making clerkship curricula more cohesive.

Contact

Glucksteinj@wustl.edu

Keywords

clerkship, teaching rounds, self-directed learning, clinical education, learning climate

Getting to the core: Utilizing live cases to enhance medical student education

Gracia J 2018, Hernandez M 2018, Roh E 2018
University of California, Riverside, School of Medicine

Identified need

Although medical students can learn a lot from textbooks and lectures, they are often not exposed to the other layers of patients and patients' disease. Because of this, students can miss a disease's true impact on a patient and the impact on a patient's support system.

Innovation

This innovation utilizes live cases allowing students to see the impact disease has on patients and their families. The first layer includes in-class cases allowing students to hear from a patient about his or her disease and its influence. Another layer includes having live cases with patient families who will share their perspective. Lastly, these patients would be from the surrounding community, allowing students to see the community's impact on the disease.

Implications

A switch to this type of case-based learning allows students to learn from patients and families. This change creates well-rounded medical students who are equipped with the tools to not just see a disease or the science of disease, but to develop a perspective that incorporates the impacted individual and his/her support system. Future physicians will be fully capable of treating and developing a plan that benefits the whole family.

Contact

jgraco01@ucr.edu

Keywords

patients, families, community, cases

Using visual memory techniques as a structured and efficient learning platform in medical education

Guo G 2018, Xiao S 2018
Yale School of Medicine

Identified need

Medical knowledge is immense and continues to grow each year. This is one of the biggest bottlenecks of medical education today and will forever be a challenge throughout the modern doctor's career. What is the most efficient way to learn, remember and internalize? The current way that students study is both time-consuming and emotionally draining. What we learn today, we quickly forget tomorrow.

Innovation

Humans can effortlessly create and retain visual memory. For example, one can recall an immense amount of detail and

richness from visualizing one's home or even a new location visited. We have designed a systematic way that capitalizes on this innate strength of visual memory. Here, we describe a method to convert any type of knowledge into such virtual "homes" that the learner can mentally revisit to reliably recall information.

Implications

Our system dramatically increases the speed, fidelity and depth of comprehension of knowledge acquisition for learners in both short-term and long-term memory, allowing time for other pursuits. In medicine, this has implications for an accelerated curriculum with more clinic time to apply the gained knowledge, more time focused on the art of patient care and more time for medical research endeavors.

Contact

George.guo@yale.edu

Keywords

memory, mnemonics, learning, retention, efficiency

The health systems clerkship

Hong T 2017, Lash E 2017, Danzig A 2017
University of Rochester School of Medicine and Dentistry

Identified need

The U.S. health system ranks 37th in the world in quality, fairness and efficiency, despite being the number one global spender on health care per capita. The problem revolves around complex issues of access, reimbursement and coordination of care. As the health care system evolves, so too must its doctors. We have identified three areas of deficiency in contemporary medical education: teamwork, biopsychosocial medicine and health care policy.

Innovation

The health systems clerkship (HSC) aims to cultivate a teamwork-centered ethos, empathy for disenfranchised populations and stewardship of health care resources. The first arm of the HSC is an allied professionals rotation. Arm number two is a social work rotation. The final arm provides students with an overview of U.S. health policy, economics and reform. For future leaders in the health care system, a strong foundation in these topics is essential.

Implications

For medical students, the HSC fosters professional development in areas key to successful doctoring that are outside traditional medical curricula. In the end, the most important impact of the HSC is how it benefits patients. The HSC provides innovation in medical training and practice, representing a crucial advancement as our profession continues to evolve in the service of those to whom we dedicate our work.

Contact

Timothy_Hong@urmc.rochester.edu

Keywords

training, education, medical, biopsychosocial, interdisciplinary

Patient-centered care as a new model for problem-based learning in medical education

Hubeishy MK 2019, Benton EA 2019
Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo

Identified need

The model of medical care is currently undergoing many changes in order to become more patient-centered rather than disease-centered. One way that the patient-centered care model can be integrated into medicine more effectively is by training medical students to develop effective communication skills with their patients. Furthermore, while the curriculum of several medical schools is taught by medical professionals, there seems to be little to no involvement of actual patients.

Innovation

The authors of this paper propose the use of actual patients to guide medical students in interdisciplinary problem-based learning sessions with students of other health care professions. This patient-centered teaching model will expose the students to an interdisciplinary setting while gaining an understanding of the importance of involving the patient in the development of his or her care plan.

Implications

By utilizing a patient-centered teaching model, medical students will become physicians who have the ability to approach clinical encounters with an appreciation of inclusion towards their future patients as well as the ability to collaborate with other professionals. A patient-centered care model will allow future physicians to develop a care plan that is best suited for their individual patients, thereby improving their patients' quality of life.

Contact

mkhubeis@buffalo.edu

Keywords

patient-centered care, patient-centered teaching model, problem-based learning, interdisciplinary

HONORABLE MENTION

Aligning medical education with patient care: A proposal for competency-based virtual simulation in medical school

Hunt JT 2018, Lee CT 2018, Strauss DM 2018, Warden BA 2018
Lewis Katz School of Medicine at Temple University

Identified need

Misaligned incentives plague medical education where pressure is on the student to excel on licensing exams rather than in patient care. Recent studies convey an overwhelming

dissatisfaction of clerkship directors and students alike with their knowledge and skills upon graduation. Realigning these incentives necessitates overhauling the current didactic system to ensure students master each medical school competency while seamlessly integrating the clinical skills necessary to thrive in today's health care system.

Innovation

The proposed innovation is a medical education portal that guides students through self-directed mastery of a competency-driven curriculum. The online portal employs traditional didactic methods complemented with virtual clinical encounters, which are competency-based simulations of patient cases used to facilitate both learning and self-assessment, enabling students to master their weak knowledge areas and garner a familiarity with functioning in a clinical environment.

Implications

The proposed innovation opens the door to: (1) self-directed strengthening of competency areas, (2) self-directed pacing of medical education, (3) optional units to allow students to explore interest areas, (4) clinical rotations focused on contributing and learning rather than acclimating, and (5) freeing up faculty from lecturing to allow them to teach clinically relevant material outside the lecture hall. By refocusing medical students to patient-centric learning, we build stronger patient-centric physicians.

Contact

jhunt@temple.edu

Keywords

competency-based, patient-centric, misaligned incentives, self-directed learning, virtual simulation

Individual learning pathways with early patient exposure

Jalali S 2017, Rubiano C 2017
Florida State University College of Medicine

Identified need

Many medical schools typically use lectures as their primary form of teaching students. Instead, every student has their own optimal method of learning that should be implemented to maximize absorption of the vast amounts of information presented during medical school. In addition, students lack patient exposure until their third year, which delays students in their opportunity to develop clinical skills to synthesize with their basic science knowledge.

Innovation

During the first two years students should be allowed to choose their own learning pathways: interactive lectures, small group problem-solving or independent study. Eventually, all students will gradually transition into the independent learning pathway before they start their clinical clerkships. While students are learning their basic sciences, organized by organ system blocks, each block will be concluded by a clinical mini-rotation related to that organ.

Implications

Both of these innovations will maximize students' ability to learn and retain larger amounts of information during their medical school years while developing ways to become independent lifelong learners. The use of mini-rotations will further solidify their basic science foundation by tying it to patients they will see after each block, increasing retention of medical knowledge while developing clinical skills at a much earlier stage in medical education.

Contact

sbj13@med.fsu.edu

Keywords

learning pathways, mini-rotation, independent

Pass/fail Step 1 scoring: Freeing students and educators to innovate in the pre-clinical years

Jones C 2018, Roy P 2018, Jensen A 2018, Etchill E 2016
University of Pittsburgh School of Medicine

Identified need

The USMLE Step 1 score is the most heavily weighted component of the residency application. As a result, students prioritize Step 1 preparation, foregoing opportunities to develop skills that are not assessed on this exam. Likewise, curricular innovation in the pre-clinical years has been hampered due to pressure on programs to prepare their students for Step 1. Consequently, medical knowledge is emphasized at the expense of the five other core competencies.

Innovation

We propose to make Step 1 a pass/fail examination used exclusively to ensure that students can “understand and apply important concepts of the basic sciences to the practice of medicine,” which is the examination's stated purpose by the National Board of Medical Examiners. Concomitant innovations in the evaluation of residency applicants may be necessary and beneficial as more accurate predictors of future clinical performance replace Step 1 scores.

Implications

If Step 1 scores are reported as pass/fail, we may begin to eliminate the incentive for excessive test preparation in the pre-clinical years. As a result, medical schools will be able to enrich their curricula, and students may engage in developing the full complement of skills needed to be an effective modern physician. Ultimately, this will translate to the highest quality and most appropriate care for patients.

Contact

ccj8@pitt.edu

Keywords

medical education, USMLE Step 1, pass/fail, scoring, curricular innovation, incentives

HONORABLE MENTION

Purposeful instruction and simulation-based assessment of utilizing point-of-care clinical resources

Jones RL 2017, Visenio M 2018, Smith A 2019
University of Nebraska Medical Center College of Medicine

Identified need

The implementation of evidence-based, point-of-care resources (POCR) such as UpToDate, Epocrates or FirstCONSULT has been shown to aid clinicians in clinical decision-making and to improve patient outcomes. Despite growing adoption of POCR among practicing physicians, there is an apparent deficit in undergraduate medical curriculum when it comes to instructing students how to optimally use POCR—especially in the context of an active medical practice environment.

Innovation

We propose that all students should receive instruction on best practice principles of using POCR (e.g., when to use POCR, efficient search strategies for POCR, and how to critically apply results to clinical questions). Furthermore, we propose that assessment of POCR utilization be integrated into existing simulation-based assessment models (i.e., virtual patient cases or OSCE) in order to track skill acquisition and provide learners with feedback on how to improve POCR utilization.

Implications

Our proposal is aimed at insuring that tomorrow's physicians are equipped with the knowledge, skills and attitudes to efficiently and effectively use POCR to augment their clinical practices. Additionally, training in optimal POCR utilization may have the added benefit of systemic cost savings secondary to reduced health care complication rates and shorter hospital stays. Ultimately, we envision better patient health outcomes as a result of improved POCR instruction.

Contact

Robert.jones@Unmc.edu

Keywords

point-of-care, clinical decision, simulation-based assessment, evidence-based medicine

Curriculum reform: Improving medical students' role in health care

Ju C '19¹, Dodson V '19²
*Case Western Reserve University School of Medicine¹
Rutgers, New Jersey Medical School²*

Identified need

The division between basic science and clinical education in the traditional medical school curriculum is no longer able to adequately meet the needs of the changing medical landscape. Underutilization of medical students creates a system of

economic inefficiency in the health care sector and provides suboptimal education for students.

Innovation

Various formats of an integrated curriculum have been proposed, but none has successfully generated economic value for medical students. We propose to reform medical education by prioritizing clinical training within the first year of medical school and to follow this by employing students in clinical settings. Clinical electives would also begin at the start of medical school in order to provide students with adequate exposure to all fields and subspecialties.

Implications

Because the training of student physicians would begin at the medical school level and not during residency, medical students would be able to play a larger role in patient care. We challenge the conventional standard for prioritizing science didactics within the first two years by allowing the actual practice of medicine to begin alongside classroom education.

Contact

vincent.dodson89@gmail.com

Keywords

curriculum, integration, economy, longitudinal, immersion

Physician leadership training in medical education

Kahn PA 2017¹, Gardin TM 2017²
Albert Einstein College of Medicine¹
Harvard Medical School²

Identified need

The modern landscape of payment reform and an increasing focus on economic factors in the practice of medicine has dramatically altered the nature of medicine. Medical school graduates often lack key business and management skills necessary to maximize their ability to serve patients, as well as advance their careers in this new era of medicine.

Innovation

This innovation proposes a longitudinal curriculum beginning in the first year of medical school and continuing through the fourth year of medical school, emphasizing the business aspect of medicine and medical practice. This course would focus on four core elements of business practice in the context of medicine: 1) public policy, 2) basic business skills, 3) core quantitative skills, and 4) the basics of quality improvement and project management.

Implications

Physicians who graduate after this innovation has been implemented will be uniquely prepared for leadership roles within the spheres of public health, public policy and the practice of medicine in a variety of settings. Through developing the capacity for leadership training in medical school, the landscape of health care can be permanently transformed by

well-trained physician leaders who are equipped with skills to heal both their patients and our health care system.

Contact

peter.kahn@med.einstein.yu.edu

Keywords

physician leadership, medical education, integrated curriculum

Introduction of a team-centered collaboration model in medical student education

Karan A 2016, Moheimani RS 2017
David Geffen School of Medicine at UCLA

Identified need

Medical school is stressful to a degree that has become detrimental to the training and education of America's future doctors. Depression and suicide are steadily increasing among medical students nationwide. There is a critical need to reduce the competition that contributes to much of the stress of medical school and refocus education on areas that are relevant to the training of humanistic, balanced and clinically competent physicians.

Innovation

Students will collaborate through a series of student-led personal narratives during year one. Our curriculum is pass-fail for all four years; student evaluations are comprised of qualities such as kindness, empathy and emotional understanding. Students are judged by their work with peers, faculty, staff, patients and patients' families. USMLE Step 1 exam numerical scores would not be released to residencies. Furthermore, leadership/management workshops would be a core part of the curriculum.

Implications

Our innovation would improve medical education and reduce burnout and depression among students. It would benefit team members such as nurses and social workers who would work more closely with students and help to change the hierarchical culture of medicine. It would benefit clinician educators because it would allow for more personal mentorship with students. And most importantly, patients would receive more humanistic and caring medical students and future doctors.

Contact

AKaran@mednet.ucla.edu

Keywords

teamwork, unity, patient-centered, leadership, collaboration

Pre-clinical surgical skills curriculum for the augmentation of medical school education

Kashkoush A 2018, Patel D 2018, Prabhu A 2018, Patel P 2018

University of Pittsburgh School of Medicine

Identified need

There is limited exposure to surgical specialties and techniques during medical school. During the pre-clerkship years, students are exposed to informal didactic workshops and mini-electives. Students also gain experience during their surgical clerkships in the clinical years; however, this is highly variable, informal and only passively stimulating. To the best of our knowledge, there is no medical school outcome-driven initiative to systematically foster the education of basic surgical techniques.

Innovation

We envision a formal intensive surgical skills curriculum that targets medical students during their pre-clinical years. Such a program would leverage cadavers, simulation technology and multimedia educational modules. The course would cover a wide variety of surgical fundamentals including skills such as arterial and central venous line insertion, intubation, lumbar punctures and suturing. Efficacy of the course would be assessed through pre-course and post-course surveys and practical examinations.

Implications

The long-term impacts of this program are to increase exposure across medical schools with an associated shift in competency criteria for surgical residency recruitment. Furthermore, competitive surgical subspecialties may benefit from early involvement and research productivity from prospective medical students. Early and active engagement with medical students can increase their recruitment to surgical residencies. Accordingly, this innovation may increase student interest and improve student preparedness in applying to surgical residencies.

Contact

Kashkoush.ahmed@medstudent.pitt.edu

Keywords

surgical education, simulation technology, outcomes, surgical skills, multimedia technology

Interactive 3D learning environment using EyeSim

Khanna S 2018¹, Khanna R 2017²

*Feinberg School of Medicine Northwestern University¹
Duke University²*

Identified need

Current medical students are focused on the most high yield, actively engaging modes of learning, yet the primary knowledge

transfer strategy of medical education does not reflect this trend. As such, many students prefer to forego live lectures in favor of viewing video recorded lectures at an accelerated speed in order to spend less time trying to passively absorb knowledge and more time actively learning and consolidating information.

Innovation

Given students' preferences for active learning, we propose an immersive, interactive, and experiential learning environment that utilizes 3D and virtual reality technologies such as EyeSim. EyeSim is an ophthalmic virtual simulator that includes a virtual patient and modules on ocular anatomy, motility, pupil reactivity and visual pathways. Such technology allows students to interact with the content in 3D space and thus facilitates active, clear understanding of the material.

Implications

Feedback from students has included extremely positive comments about the interactive nature of the technology. By allowing for active learning, this technology will increase medical student engagement, satisfaction and clinical preparedness. Currently, content is limited to ophthalmology, but collaboration for content creation will expand the breadth of material covered and change the learning environment in which students acquire their clinical knowledge and skills.

Contact

sheenakh@northwestern.edu

Keywords

EyeSim, virtual reality, education, active learning, 3D

HONORABLE MENTION

Health U: Providing the platform for interdisciplinary education in medical undergraduate training

Klapman S 2019¹, Salari S 2019¹, Fry B 2018¹, Hamel S 2016²
*University of Michigan Medical School¹
University of Michigan College of Pharmacy²*

Identified need

Welcome to Health U: an integrated campus where health care students discover side-by-side how to best optimize patient care. While interprofessional education (IPE) is currently valued in medical education, it tends to be incorporated in a siloed, non-integrated manner. Furthermore, due to administrative and financial obstacles, IPE remains one-dimensional and fails to be realized as a core tenant of medical education. Health U's mission is to make interdisciplinary teamwork an instinct.

Innovation

Health U's innovation has three main pillars. A fused health professions administration would streamline collaboration, planning and management of logistical issues. A multi-faceted and longitudinal integration of IPE would prepare nursing, social work, medical and pharmacy students to problem solve and think critically within interdisciplinary teams, with the primary focus on patient-centered care. Lastly, a systematic

evaluation of curricular impact would inform future changes and best practices for nationwide implementation.

Implications

Health U is a fundamental philosophy that puts team-based care at the forefront of education. This framework empowers team members to advocate for patient safety, grants individual accountability and legitimizes collaboration. By developing tools to implement and measure the impact of IPE interventions, we are not adapting education to fit the future needs of health care, but rather developing the adaptive system needed to cope with problems we cannot possibly imagine.

Contact

sklapman@med.umich.edu

Keywords

interprofessional education, medical undergraduate training, curriculum, team-based health care, educational philosophy

The straight path to medical education reform: A learning community-based model

Knefati MS 2018, Mousa-Ibrahim F 2018, Ahmed R 2018, Robinson M 2018

Lincoln Memorial University-DeBusk College of Osteopathic Medicine

Identified need

The current Flexner model of medical education yields an inherently disconnected social and academic framework that negatively impacts students' academic and social lives, as well as their ability to fully develop into competent, empathetic physicians in an ever-demanding health care system. The standard curriculum compartmentalizes basic and clinical science knowledge, and students of varying graduating classes are limited in opportunities for meaningful interaction and collaboration. Studies have shown learning community-based models are the key to address these issues. However, the majority often consist of faculty or administration randomly assigning students into peer groups, resulting in artificial relationships that do little to address the students' social and academic needs, and may also hinder opportunities for growth and leadership.

Innovation

This paper explores a learning community model in which students actively assume leadership roles to pursue their education under guidance from faculty of their choice. The pilot program was utilized as an academic enhancement opportunity for students to form and strengthen professional relationships with peers and faculty simply by further engaging their current students. First-year medical students in anatomy were asked to present notable pathologies/anomalies to professors over the course of dissection. Second-year students were then presented a list of these pathologies and given the opportunity to collaborate with first-year anatomy professors and pathology professors to study the case.

Implications

Immediate implications include natural mentorship opportunities from professors to second years to first years. First years were given an opportunity to apply their anatomical knowledge by refreshing second years in the dissection lab. The second years explained possible pathologies, giving first years a preview of future studies and enhancing second years' differential diagnosing skills. This allowed for a natural mentorship relationship to form among peers. By bringing pathology professors into the lab, second years experienced a mini-rotations-like environment, in which they pointed out the anomaly presented by first years and were quizzed on their differentials. Opportunities for case studies, research publications and five-minute case presentations have been explored, as well as utilizing the schools' scanning and imaging technology to study histological slides directly from the anatomy donors to truly bridge the gap between anatomy, pathology and clinical science. This program successfully promoted student cohesion as well as longitudinal faculty-student relationships and, by replicating the anatomy/pathology collaboration model, today's medical students across the nation have new opportunities for leadership and can make a lasting impact on their school's academic and social framework.

Contact

mस्कnefati@gmail.com

Keywords

collaboration, anatomy, pathology, interdisciplinary, learner-autonomy

Preventing a national physician shortage by restructuring the medical education timeline

Kofoed M 2018¹, Mitchell W 2018²

*Medical University of South Carolina College of Medicine¹
University of South Carolina School of Medicine²*

Identified need

The traditional approach to medical education in the United States fails to solve the problem of producing skilled, confident physicians ready to help patients in both a timely and cost-efficient manner. We must address this problem if we are to prevent the coming 46,000 to 90,000 physician shortage projected by the Association of American Medical Colleges.

Innovation

Our innovation offers a systematic rethinking of the timeline by which we mold an inquisitive learner into the physician of tomorrow. Leveraging existing technologies and digital teaching techniques will allow us to blend the pre-clinical and clinical aspects of medical school. Meanwhile, a revised rotation schedule will allow us to merge medical school and residency without sacrificing quality of training or total patient exposure.

Implications

Tearing down barriers and blending the layers of medical education lets us produce a general practitioner or hospitalist in

50 months. This represents a time savings of 45 percent while simultaneously increasing clinician skill. Focusing on six core rotations will solve the growing primary care problem while providing a meaningful path to specialization. This plan also reduces front-end costs and may allow medical education to be completed without taking on a significant debt burden.

Contact

kofoed@musc.edu

Keywords

pre-clinical, residency, videos, online, flipped

Training students to be prepared for the modern challenges of health care: Lessons learned in business school

Krajcik D 2018¹, Costa M 2017², Bialick S 2016³
Ohio University Heritage College of Osteopathic Medicine¹
Philadelphia College of Osteopathic Medicine²
Rowan University School of Osteopathic Medicine³

Identified need

As the health care system changes constantly, many physicians are unprepared for modern medical challenges. These challenges have contributed to a sharp increase in burnout. Physicians in training, who usually study very little outside of the sciences, are not formally trained to navigate the complex business that hospitals are becoming. Many lack the proper knowledge to be effective team leaders who know how to balance quality care and cost effectiveness.

Innovation

As physicians are expected to know more about business and technology, lessons can be added to medical curricula throughout the entirety of medical school to better prepare them. This includes formal management training bi-weekly for one hour on how to effectively lead diverse teams, learning how to manage money effectively, understanding how choices impact the bottom line, and gaining in-depth knowledge on how to optimize informatics systems.

Implications

By incorporating these topics into the curriculum over four years, young doctors will be better equipped to handle the stressors that come with being a physician. Young doctors will experience less stress from being underprepared. This will allow physicians to focus on what matters most to them, healing the patient.

Contact

dk756312@ohio.edu

Keywords

business, burnout, informatics, finances, leadership

A flexible resource-based model for medical education

Kreider C 2018, Sittig K 2018
Penn State College of Medicine

Identified need

With increased emphasis on USMLE Step 1 as a metric for residency applications, tension has developed between traditional medical school curriculums and third-party resources. Medical school curriculums focus on knowledge students need to succeed in the clinical setting while third-party resources cover information required to excel on USMLE Step 1. This knowledge does not always overlap. Thus, schools are faced with preparing students as clinicians and as test-takers.

Innovation

For each course, students receive access to an electronic folder with video lectures, resource documents and quizzes structured around learning objectives. The resource documents would contain learning objectives, a list of suggested websites and other resources, and a list of faculty experts and physicians who can be contacted to schedule clinical experiences within that topic. With this range of resources, this student-structured curriculum incorporates a diversity of learning.

Implications

Considering the diversity of learners and the multiple levels at which these learners need to thrive, a significant change in medical education is needed. By providing a wide range of learning modalities and integrating third-party resources more effectively into this flexible curriculum, medical schools can enable students to become more successful in the clinic and the classroom while fostering a diverse and highly competent generation of physicians.

Contact

ckreider5@hmc.psu.edu

Keywords

diversity, curriculum, third-party resources, STEP 1

Cooking and learning together (CLT) to revolutionize medical education and health care

Wongvibulsin S 2022, Knight H 2018, Cao S 2018,
Ostrander B 2018
Johns Hopkins University School of Medicine

Identified need

In general, physicians feel inadequately trained in nutrition counseling. However, in order to follow practice guidelines for the prevention or management of diseases influenced by lifestyle factors, physicians must be capable of effectively performing nutrition counseling. They must also partner with other members of the health care team and work in

interprofessional medical communities to assist their patients in changing their diets.

Innovation

“CLT” is a culinary and nutrition program for health care students and community members. Through practical activities like grocery shopping, cooking and discussion with community members, health care students will learn about nutrition in a way that is relevant to their future practices. As a result of the interprofessional nature of this program, these students will learn about the roles of other health care professionals in coordinating care.

Implications

This innovation represents a practical, hands-on approach to training future health care providers, particularly in regard to disease prevention. Additionally, with health care students and community members learning side-by-side, CLT emphasizes that the relationship between health care providers and patients is one of partnership. Finally, health care students who participate in this innovation will be prompted to consider how exhibiting positive health behaviors can play a role in their future professional identities.

Contact

swongvii@jhmi.edu

Keywords

nutrition, healthy lifestyle role models, individualized patient care, interprofessional education, disease prevention

Lung simulations for medical student education

Kreisel C 2018, Pettigrew S 2018, Xu P 2018, Gupta A 2018
Rutgers, New Jersey Medical School

Identified need

There is a disconnect between the pre-clinical knowledge gained in the first two years of medical school and the clinical skills cultivated in the third and fourth years of medical school. The development of a lung simulation program helps address this disconnect and ultimately would lead to medical students who are better prepared for entering residency.

Innovation

A lung simulation program would be able to connect the anatomy, physiology and pathology of the lungs to physical exam and radiographic findings. The program would be able to simulate a variety of lung states including normal, obstructive and restrictive patterns of respiration.

Implications

Medical students would be able to better integrate their knowledge of anatomy, physiology and pathology, better preparing them for their clinical years and their residency programs. Patients will directly benefit from the more advanced knowledge their physicians will have gained by using this program.

Contact

ckreisel@njms.rutgers.edu

Keywords

simulation, lungs, respiration

Technology-driven, clinically focused curriculum reform: An ultrasound case study

Kumar A 2018, Barman N 2018
Icahn School of Medicine at Mount Sinai

Identified need

The reality of the vast majority of curricula seen at U.S. medical schools is that meaningful clinical exposure does not begin until the third year of one’s education. We seek to ameliorate the twin problems of: (a) lack of clinical skill integration into the medical curriculum and (b) poor understanding of abstract physiological and pathophysiological concepts that form the basis of clinical practice.

Innovation

Our team developed an IRB-exempt pilot study that featured an echocardiography curriculum for second-year medical students concurrently studying cardiac pathophysiology. We modeled our instructional approach after the “A-F” paradigm, emphasizing ultrasound technique, major structures and pathology. We generated evaluation metrics through a focused echocardiography OSCE completed before and after training. Surveys on the quality of training and the role of clinical ultrasound in medical education were conducted.

Implications

OSCE results showed marked improvement in echocardiography skills from baseline. Paired t-test showed a 45.2 percentage point improvement in scores (95 percent CI [29.3, 61.2]; $p < 0.0001$). A total of 89.5 percent of students agreed the course enabled them to get more out of the cardiac pathophysiology curriculum and that “this course will make you a better and/or more competent physician.” Therefore, we believe medical education can better incorporate clinical skills in order to further learning and create better physicians.

Contact

anirudh.kumar@icahn.mssm.edu

Keywords

echocardiography

Integrated EMR use in medical school curriculum

Leander D 2019, Avery J 2019
Geisel School of Medicine at Dartmouth

Identified need

The use of electronic medical records (EMRs) in the United States has expanded tremendously in the last few years, but many physicians are unsatisfied with the user experience and administrative inefficiencies. In an effort to improve physician satisfaction and reduce administrative burden, we propose an innovative way to integrate the use of EMRs during medical school, starting with the first-year curriculum to expose and familiarize students with the technology they will encounter as physicians.

Innovation

We propose integrating EMRs into first-year curriculum to revolutionize medical education. In the classroom, we recommend using a ‘mock’ electronic health record system to provide exposure to analyzing patient charts and information gathering in conjunction with clinical and physical examination skills. By mastering these skills, students will be more efficient users at an early phase and will be enabled to do data-driven clinical research or health care delivery projects.

Implications

We feel this technological skill is critical for connecting the skills students learn in medical school. In clinical settings, students can better assist and understand cases through earlier exposure to the EMR. The hope is students will learn how to better improve the practice of medicine and patient outcomes through medical informatics. Additionally, through this earlier training, we hope to ameliorate the administrative burdens of being a physician today.

Contact

David.m.leander.med@dartmouth.edu

Keywords

EMR, EHR, technology

Introducing MedEd: An innovative fourth-year course

Leventhal J 2016, Kho I 2018, Kwan A 2018
State University of New York, Downstate Medical Center College of Medicine

Identified need

Many medical schools do not have a structured curriculum focused on preparing medical students to become skilled clinician educators. Medical students often graduate unprepared to become interns and residents who have the responsibility of teaching their junior colleagues. This, in turn, leads to a subpar clinical learning experience for third- and fourth-year medical students.

Innovation

Our innovation is to create a mandatory course in education for all fourth-year students called “MedEd.” In the classroom, senior medical students will review key points of current coursework with small groups of junior students. In the clinical setting, the senior medical student will work together with the first-year medical student and senior nursing student to take care of all aspects of patient care under appropriate supervision.

Implications

By investing in a structured curriculum that prepares medical students to become effective educators, medical schools will optimize the clinical education experienced by their senior students. Junior medical students will benefit from timely review sessions taught by senior students that reinforce key concepts with clinical relevance. The nursing and medical professionals will develop superior interdisciplinary relations by learning to work together at the graduate level.

Contact

jared.leventhal@downstate.edu

Keywords

MedEd, clinical education, fourth year, interdisciplinary, curriculum

HONORABLE MENTION

The physician advocacy lab: A project-based, flipped-classroom learning model to train future physician leaders

Liu Y 2019, Dhanani H 2019, Tanch J 2019, Leyva B 2018
The Warren Alpert Medical School of Brown University

Identified need

The prevalence of patients with multiple chronic conditions (MCCs) is increasing. These patients are more likely to experience financial barriers, fragmented care and difficulty accessing care. Regardless of specialty choice, all medical students should be equipped with the skills to drive change and advocate for these patients. However, students often graduate without such skills and are unprepared to navigate a rapidly changing health care system where MCCs are the norm.

Innovation

The physician advocacy lab (PAL) is a project-based, “flipped-classroom” learning model to train future physician leaders caring for patients with MCCs. It contains two components: (1) online didactic modules focused on the opportunities and challenges of managing patients with MCCs in virtual collaboration with nursing and pharmacy students; and (2) in-person project work in medical student teams to effect change at one of three levels: patient, provider or population.

Implications

With soaring physician burnout, advocacy training is a way to restore satisfaction to the physician profession while preparing students to better care for their patients. The PAL provides

opportunities for medical students to identify a problem, research and design solutions, and implement changes to address that problem. By building self-efficacy in creating change during medical school, the PAL prepares students to lead in their future health care settings.

Contact

yao_liu@brown.edu

Keywords

medical, education, advocacy, interdisciplinary, chronic

HONORABLE MENTION

Mindfulness meditation to improve medical care by reducing physician burnout and reducing implicit bias

Luthar J 2017, Renov V 2017, Hiltunen A 2017, Hammons L 2017

Medical College of Wisconsin

Identified need

As medicine becomes more complex, we cannot afford to lose touch with the humanistic elements of medicine where the physician heals and teaches, educating patients and advocating for prevention and wholeness. Curricular changes are needed that actively foster skills such as empathy and compassion. Developing these skills will minimize burnout and provide students with the ability to create patient/physician relationships that foster health and wellness, reducing disparities in care.

Innovation

At the Medical College of Wisconsin we established a mindfulness elective with the goal of having participants gain an experiential understanding of the mind-body connection. Thirty-five first- and second-year medical students met weekly for six 90-minute sessions and an optional six-hour “Day of Mindfulness” retreat. The curriculum consisted of both formal and informal mindfulness practices that were designed to cultivate mindful awareness of the body and its sensory experiences.

Implications

In addition to improving empathy and compassion among health care providers, expanding medical education to include mindfulness practice has the potential to address health care disparities that disproportionately affect socially marginalized groups. The course will increase students’ ability to be present with each unique patient, leading to better outcomes and utilization of health care resources and provide a framework from which students can identify and reduce their implicit biases.

Contact

jluthar@mcw.edu

Keywords

mindfulness, meditation, implicit bias, empathy, burnout

Health care fragmentation and undergraduate medical education

Mahmood E 2018¹, Oskouie R 2018¹, Mahmood B 2017²
*Feinberg School of Medicine Northwestern University¹
Albany Medical College²*

Identified need

Though fragmented care has long been recognized as a source of complications and costs, the traditional medical school curriculum does little to prepare future physicians to remedy this state of care. Our proposal hopes to develop a novel curriculum that will prepare the physicians of the future to better integrate care with other members of the health care team and take a leading role in the longitudinal management of complex patients.

Innovation

Students will be presented with the history, physical and lab results of a patient suffering from a multitude of health ailments. Students would have access to old hospital records, previous discharge records, summaries of specialty consults and advice from social workers. The students would then be tasked with prioritizing and coordinating the medical needs of the patient by writing both a progress note and a discharge summary for the patient.

Implications

The curriculum innovation in our proposal will train future physicians to take leadership in integrating care, promote interprofessional skills and appreciate the realities of managing complex patients long term. These skills will be invaluable in improving the fragmented care faced by the current health care system and will ultimately improve outcomes for patients.

Contact

e-mahmood@northwestern.edu

Keywords

fragmentation, medical education

HONORABLE MENTION

Radical transdisciplinary training (RTT)

Martin P 2017, Wang H 2016
Yale School of Medicine

Identified need

Professions allow individuals to develop specific competencies but have become silos that monopolize knowledge and mystify expertise for the purpose of power. Yet real-world problems don’t obey these socially constructed boundaries. Graduates enter the workplace lacking the requisite knowledge, skills and attitudes for meaningful collaboration; team performance and innovation ultimately suffer. Medical training is by no means an exception, as face time with other profession students is virtually nonexistent.

Innovation

Radical transdisciplinary training (RTT) involves individuals from disparate disciplines (e.g., medicine, fine arts, engineering, law) to work together to establish a shared conceptual framework, merging their ways of knowing and doing. RTT is a four-month capstone course that connects professional students from various fields, exposes them to foundational courses in group skills and partners them with an industry stakeholder to design, develop and implement a solution to a significant problem in health care.

Implications

The focus of this experience is the process of collaboration, as emphasized by intermittent assessments of divergent thinking and regular team challenges. We hypothesize that each student will emerge with transformed ways of knowing and doing as well as a drive to participate in future transdisciplinary projects. This pilot program has the potential to support and enhance the three pillars of medicine—discovery, practice, education—and improve patient outcomes.

Contact

pierre.martin@yale.edu

Keywords

collaboration, divergent thinking, problem solving, radical transdisciplinary, training

Reorganizing the medical education infrastructure to decrease student burnout

Martins BS 2020, Ragsdell JE 2017
University of Arkansas for Medical Sciences College of Medicine

Identified need

The continued growth of medical knowledge is making it increasingly difficult to teach students everything that is encompassed by the field of medicine. As a result, between 45 percent and 71 percent of medical students report being burned out before starting residency. Burnout in students is associated with impaired academic performance, cheating, substance abuse and a decrease in compassionate care towards patients.

Innovation

Restructuring the medical school experience to allow students to spend more time in their desired specialties will promote individual student achievement and decrease burnout. Students will rotate through clinical specialties and learn general pathology, physiology and pharmacology during their M2 year. By M3 year students will have chosen a specific specialty and will learn the detailed specifics of diseases and pharmacology relevant to that specialty.

Implications

Specializing earlier allows students to better pursue their interests, thus creating more dedicated and passionate students and more knowledgeable physicians. Learning the finer details

of the diseases and treatments relevant to a specialty will allow students to more easily discern the complex interactions and relationships between various diseases and treatments. These students will be better able to tailor individual treatment methods to their patients when they become physicians.

Contact

BMartins@uams.edu

Keywords

medical burnout, medical school education, medical specialty, new medical curriculum

The Meded Initiative: Moving medical education forward

McPheeters MJ 2016, Johnson MW 2017
University of Minnesota Medical School

Identified need

The rising generation of physicians will experience exponential developments in medical discovery and technology. In order to prepare future physicians to succeed in this environment, health care education delivery models must provide the foundational principles of medicine as well as the ability to routinely find, evaluate and utilize the breadth of available medical literature to continuously improve the quality of patient care physicians can offer throughout their careers.

Innovation

The “MedEd Initiative” purposely combines the high-quality teaching methods of the MedEd Tutorial System with an intuitive and adaptable primary learning, review and assessment tool in the form of the MedEd Co-Op Platform. This combination assists students in becoming self-directed, lifelong learners with the reassurance of having a foundational medical resource safely located in their pockets for quick reference and review throughout their careers.

Implications

The MedEd Initiative has broad implications for medical students as well as medical educators. For students, it provides evidence-based learning theory to prepare them for practicing in a data-driven, value-based and patient-centered environment. For medical educators, it provides teaching and assessment resources to facilitate flexible and competency-based curriculum. In addition, the MedEd Initiative allows for real-time student performance analytics for comparison against institutional and national norms.

Contact

mcph0066@umn.edu

Keywords

digital platform, education delivery, learning theory, performance analytics

The medical school of the future: Standardized learning objectives and achievement trackers for USMLE Step 1 education

Meenan C 2018¹, Scott D 2018²
University of Pittsburgh School of Medicine¹
University of Maryland²

Identified need

Lack of standardized learning objectives (SLO) and regularly utilized performance analysis slows improvement of USMLE Step 1 scores and student learning outcomes. Course directors and students lack national SLOs aligned to STEP 1 content and actionable feedback on performance through data analysis. Without specific feedback of coursework through systematic tracking of SLOs, students cannot adequately assess their preparation, leading to inefficient progress towards mastery of these foundational concepts.

Innovation

We propose creating SLOs for the first two years of medical school, paired with individual and class performance trackers that collect data for each course assessment, showing individual and group performance on assessment questions paired with SLOs. Performance trackers display overall mastery (average percent SLOs correct for each individual and class) and specific SLO mastery (percent correct per SLO). Individual student and course achievement trackers would be easily accessible online.

Implications

SLOs coupled with achievement data trackers provide school administrators and course directors a quantitative measure of success for all subjects and the ability to consistently improve instruction and curriculum development while allowing students to take mastery of their own learning. Improving effectiveness of medical school curriculum will lead to higher Step 1 scores for these future physicians and ultimately lead to improvements in physician effectiveness and patient outcomes.

Contact

ckm26@pitt.edu

Keywords

learning, standards, mastery, standardized learning objectives, assessment

Deepening local roots and global relationships at the medical school level

Mehta D 2019, Model Z 2019, Van Pratt A 2019, Pendri P 2019
Rutgers Robert Wood Johnson Medical School

Identified need

Despite the shift in medicine from a patriarchal model to one of shared decision-making over the past few decades, the rift between doctor and patient in many communities, particularly underserved ones, has grown. At the same time, globalization and transnationalism trends blur borders, and communities are more multicultural. Our project seeks to integrate medical students into their local communities and teach them about community and global health through experiential learning.

Innovation

The medical school collaborates with a foreign medical school to decide on a specific issue afflicting both their patient populations. Each medical school then partners with organizations addressing this problem within their respective communities to educate their students both through multidisciplinary lectures and frequent volunteerism. Students can form committees to communicate with their school's partners and rotate in the foreign community, reporting on the similarities and differences in their situations.

Implications

The program involves collaboration of the medical school both with its community and a global partner. While the short-term goal is a sustainable community public health program, the long-term goal is to improve the relationship between physicians and patients by bridging the gap between the physician and their community, beginning with medical school.

Contact

dmm458@rwjms.rutgers.edu

Keywords

global health, community health, interdisciplinary, service-learning, physician-patient relationship

Communication, collaboration and compassion: Medical education to optimize learning and morale

Michaelson M 2016¹, Hermel D 2016²
Tufts University School of Medicine¹
The University of Vermont College of Medicine²

Identified need

In order to produce medically competent physicians with an understanding of the interpersonal and humanistic aspects of care, medical education must be restructured to emphasize collaboration, early and consistent patient interactions and a focus on palliative care. Faced with a changing health care landscape that often encourages expediency and efficiency, students must understand the value of compassion and empathy in caring for patients.

Innovation

We propose replacing multiple-choice exams with oral tests, creating small group learning sessions in place of lecture, restructuring the evaluation system on the wards to create an atmosphere where both patients and designated faculty grade

students, requiring physical examination classes throughout all four years of training, incorporating professional theater training techniques during the first two years and mandating palliative care rotations.

Implications

By incorporating humanism and collaboration into the fabric of medical education, future physicians will be better able to work with a team of health care professionals caring for a multitude of diverse patients with varying needs. We hope that in addition to the current emphasis on innovative technology and knowledge dissemination, medical educators place equal emphasis on creating medically adept and humanly driven physicians.

Contact

melody.michaelson@tufts.edu

Keywords

collaboration, compassion, communication

HONORABLE MENTION

Empowering tomorrow's physicians: Value-based care, implicit bias and interprofessional education

Mishra S 2017, Deng F 2016, Wesevich A 2017, Gluckstein J 2016

Washington University in St. Louis School of Medicine

Identified need

Physicians determine 80 percent of health care costs, yet only 36 percent of practicing doctors believe they have a responsibility to practice value-based care. Physicians' implicit biases adversely affect interactions with patients and exacerbate health care disparities. Although interprofessional collaboration enhances patient safety, decreases errors and improves work satisfaction, there is no established medical student curriculum that incorporates an interprofessional approach to teaching value-based care and implicit bias recognition.

Innovation

We propose a two-pronged curriculum that combines a longitudinal, outpatient experience with classroom workshops to complement inpatient clerkships. The outpatient curriculum will involve multidisciplinary patient home visits where medical students will team up with other health professional students to develop a relationship with a patient over two years. These experiences will be coupled with small group explorations of implicit bias and value-based care across the four-year curriculum.

Implications

Teaching value-based care and recognizing implicit bias during medical school will set up the next generation of physicians to be more cost-conscious, collaborative, culturally sensitive and empathetic. Utilizing a longitudinal, interprofessional approach will help physicians develop more meaningful and empathetic relationships with their patients and fellow health professionals. This curriculum will empower physicians to better address the needs of a changing health care system.

Contact

shruti.mishra@wustl.edu

Keywords

interprofessional education, implicit bias, value-based care, home-visit, longitudinal learning experience

The empathy project: Teaching compassionate care using patient oral histories

Moore A 2018, Johnson L 2018, Kropf A 2018, Whalon M 2018

University of Texas Southwestern Medical School

Identified need

Medical education does not consistently address the complex needs of underserved communities (including domestic violence survivors, obese individuals and GLBT persons, among others). As a result, the education system continues to produce physicians unaware of their biases and ill-equipped to work closely with and gain the trust of these community members. Efforts must be made in medical education to combat physician stigma towards underserved patients.

Innovation

How do we stop stigma? Our answer: empathy. We hypothesize that participation in a curriculum comprised of patient oral histories presented in a documentary film format can help medical students improve their perceived empathy towards underserved populations. Through this online, free and modular curriculum, physicians in training will participate in experiential learning to develop their skills in empathic listening and be better equipped to serve a wider range of patients.

Implications

Cultivating empathy can both improve physician satisfaction and combat the threat of burnout, which is often related to perceptions of patient noncompliance and feeling hopelessly ineffective. This innovation is designed with the underserved patient in mind, with the hope that one patient's story can improve the level of care received by thousands of patients in the future.

Contact

antoinette.moore@utsouthwestern.edu

Keywords

disparities, stigma, empathy, burnout, underserved

HONORABLE MENTION

Using the arts to successfully teach cultural competency in medicine

Moore C 2017, Pacik D 2018

University of Connecticut School of Medicine

Identified need

In 1999 the Institute of Medicine found that U.S. racial and ethnic minorities are less likely to receive even routine medical procedures and experience a lower quality of health services. As a result, integrating cross-cultural education into the training of health care professionals was listed among seven recommendations toward addressing this inequity. However, the success and efficaciousness of cross-cultural education have struggled for years, with no definitive solution.

Innovation

In an effort to successfully teach cultural competency, four different art forms (visual, written, cinema/performance and crafts) along with Joseph Betancourt's three approaches (attitudes, knowledge and skills in cross-cultural education) would be used throughout medical schooling. In addition, to ensure comprehensive cultural competency, the Association of American Medical Colleges' Tool for Assessing Cultural Competence Training (TACCT) would be used as a guide when forming course objectives aimed at addressing the approaches stated.

Implications

Colors, shapes and materials are only minimal factors that influence the final art piece, and so with people, language and dress are only minimal factors that influence the character and behavior of a person. With parallels such as this, it is the hope of this proposal that through art, students become equipped to have better doctor-patient relationships and health care system trust, as well as better productivity with diverse populations in the future.

Contact

clemoore@uchc.edu

Keywords

culture competency, cross-cultural education, art, inequity, medical education

Toward a 21st century medical curriculum

Moskatel L 2017¹, Linfield R 2018²

Keck School of Medicine of the University of Southern California¹

David Geffen School of Medicine at UCLA²

Identified need

Current medical school education fails medical students—and, ultimately, patients and the medical profession—in two critical ways:

1. Medical schools provide ritualized lectures, emphasizing memorization of current medical knowledge over experiential learning or a deep understanding of research, statistics and practice.

2. Investment revolves around large-scale infrastructure projects that lead to high-tuition burden, instead of improving clinical skills and patient interaction.

Innovation

We envision a three-year, module-based curriculum comprised of discrete learning units, with clinical immersion and clinical apprenticeship that are each one-and-a-half years. Students will have heavy clinical exposure in all three years. Orientation incorporates emergency medical technician training, introduction to research and a virtual anatomy lab. Longitudinal components include student notes as part of the electronic medical record, collaboration with other health care providers, a scholarly project and a flipped classroom model.

Implications

The medical student in this new curriculum will develop a deep understanding of and skill in current medical practice but will also be prepared for a changing medical landscape throughout a 21st century medical career. Moreover, with an expedited timeline and reduced need for infrastructure, tuition and debt incurred will be lower. Patients will benefit from dynamic, creative, team-based and passionate physicians for the 21st century.

Contact

moskatel@usc.edu

Keywords

innovation, medical education, experiential, three-year program, module-based learning

Diversifying curriculum to match growing number of physician responsibilities

Nadhan K 2017, Epistola R 2017, Nethala D 2017, Deasey M 2017

Lewis Katz School of Medicine at Temple University

Identified need

In accordance with an ever evolving health care system, physicians now face problems that extend beyond the confines of patient interaction, and they are stuck in a paradox of wanting to help but not having the proper tools to do so. The majority of the workday is spent dealing with issues beyond direct patient interaction, thus having diverse basic knowledge may fuel a more efficient cohesive system of patient care.

Innovation

We propose giving students a basic understanding of alternative medical approaches, administration, insurance, pharmaceuticals and law. Basic knowledge of each of these fields interlaced in the curriculum extends physicians' abilities as caregivers by encouraging integration of components of the

health care system. This can be achieved by inviting professors and lecturers from pharmacy schools, big pharma, insurance companies, biotech companies, etc. to come speak with students biweekly.

Implications

These associated fields not only affect every level of patient care, but also directly affect the doctor and his/her ability to thrive as a provider. Educating medical students on issues they will face outside of patient interactions may help preempt burnout and thoroughly prepare students for the growing responsibility of being a physician, so they may better focus on patient care.

Contact

tue97798@temple.edu

Keywords

interdisciplinary, health care, diversify, burnout, integrate

Creating an intuitive physician with more grounded knowledge of medicine, patients and self

Nadhan K 2017, Nethala D 2017, Heckart J 2017, Deasey M 2017
Lewis Katz School of Medicine at Temple University

Identified need

According to a recent Medscape poll, physician burnout rates are nearing 50 percent. Our proposal aims to decrease physician burnout by offering an educational experience that facilitates better matching of students' interests with various medical specialties through a more streamlined curriculum. Medical school training often feels long and, at times, tedious given the plethora of quality online medical resources.

Innovation

Spread MS1-year curriculum over undergraduate coursework. Offer dual tracks: (1) accelerated three-year primary care track and (2) modified four-year track with fully problem-based learning (PBL) style. MS1-year and MS2-year students will complete six pre-rotation blocks (PRBs) in core rotations (i.e., surgery). Each PRB lasts two months, with the first three weeks in the digital PBL classroom followed by five weeks in a clinical setting working under an MS3.

Implications

These pre-rotations, a downscaled version of the traditional MS3 year, would reinforce the theory learned in the first year and reviewed in the first three weeks of the block. Moreover, students would be graded on a pass/fail scale, which would eliminate pressure to display mastery and encourage free, thoughtful learning of the pathophysiology, histology, pharmacology and sociocultural issues most relevant to each block.

Contact

tue97798@temple.edu

Keywords

pre-rotation, burnout, accelerated, PBL, dual tracks

HONORABLE MENTION

Longitudinal interprofessional LEAN curriculum

Namavar AA 2019¹, Madaa M 2019², Palosaari A 2016³, Hamad C 2016³
Stritch School of Medicine Loyola University Chicago¹
University of Iowa Carver College of Medicine²
University of California, Los Angeles³

Identified need

Technology, health care reform and scientific discoveries continue to alter the landscape of what medical school graduates need to know and apply when they enter a residency program. These catalysts have made diagnosing disease and connecting with the diverse patient population much easier. However, medical school curriculum has remained relatively stagnant even in light of these advances. Three specific areas of this problem need addressing: content, content delivery and assessment.

Innovation

A longitudinal interprofessional LEAN curriculum will innovate current medical education. Our innovation will focus on teaching allied health care professional students how to perform small tests of change and three elements of lean methodology: leadership, culture and process while subsequently presenting cases of institutions that have leveraged lean methodology to target each domain: obesity, population health, etc. Grouped students and patients will be presented opportunities to design interventions targeting each domain.

Implications

Our innovation will foster a meaningful interprofessional experience for professional students, allowing them to learn from the diversity of each discipline. Patients benefit most, as students will be able to work as part of an interprofessional team as early as their first year in training. Students will learn to design interventions to deliver high-value care while maintaining the integrity of the purpose of health care—to heal humankind, one patient at a time.

Contact

ANamavar@luc.edu

Keywords

inter-professional education, lean methodology, quality, patient-centered care, value care

Mounting change: Creating specialty medical schools for a more sustainable model of undergraduate medical education

Newbury P 2018, Abraham R 2018
Michigan State University College of Human Medicine

Identified need

Exponential growth in the depth and breadth of information in the medical sciences will necessitate a change in the way undergraduate medical education is structured. The current model is not well suited to adapt or efficiently train the physicians of the late 21st century.

Innovation

We propose a model for future undergraduate medical education that both matches the types of physicians to the needs of the public and trains next generation physicians more thoroughly and cost-effectively. Core to the model is the enablement of new and existing subspecialties to develop schools of their own. Primary care would be the first specialty to forge the way, with others to follow as indicated by demand.

Implications

This proposed model would permanently solve the primary care shortage in a period of four years. By strategically introducing various specialty medical schools, we can adequately phase out the legacy model of medical schools to prevent unnecessary student competition between legacy and proposed models. USMLE questions would evolve to become reflective of particular specialty programs. Total training time would be reduced as a result of more focused education while simultaneously increasing both competency and interdisciplinary training.

Contact

newburyp@msu.edu

Keywords

exponential, technology, specialty, UME, sustainable

HONORABLE MENTION

A novel approach to improving interprofessional communication through simulation

Nichols J 2018, Khan A 2018, Ahiagbe A 2019
Lewis Katz School of Medicine at Temple University

Identified need

Interprofessional education is recognized by the World Health Organization as “a key step in moving health systems from fragmentation to a position of strength.” By the time students graduate from medical school, they have had minimal practical training in working with non-physician health professionals. This inexperience may lead to communication challenges, medical errors and harm to patients because quality care of any

one patient requires contributions from a variety of health professionals.

Innovation

We designed a two-hour, adaptable interprofessional clinical simulation that leverages existing framework. Before the simulation, students participate in a team-building exercise. The simulation itself is a clinic run by students from various health professions and a faculty facilitator. Each standardized patient’s case has been crafted to highlight the skills of each health profession and requires effective collaboration. A debriefing and entry and exit assessments gauge achievement of learning objectives.

Implications

The next frontier in saving patients’ lives is improving health care delivery. Key aspects of health care logistics, such as interprofessional communication, are replicated in our simulation. We aim to teach students how to be effective members of a high-functioning team, prevent medical errors and improve patient safety. The goal of our simulation aligns with the Triple Aim to improve population health, reduce cost and improve patient experience.

Contact

tuf61579@temple.edu

Keywords

interprofessional education, simulation training, patient safety, health professional students, communication

MedServe: Transformative primary care experiences that transform communities’ health

O’Shea P 2017¹, Steptoe A 2017²
University of North Carolina School of Medicine¹
The Warren Alpert Medical School of Brown University²

Identified need

Only 12 percent of current medical students choose to pursue primary care residencies. Research suggests that experiences during medical school do not play an influential role in encouraging or dissuading primary care selection, with most interested students remaining so despite negative medical school experiences. We believe more attention should be paid to crafting high-quality primary care experiences for students considering medical school.

Innovation

MedServe has partnered with physicians across North Carolina to design a two-year service learning program that connects high-potential college graduates with physician mentors in medically underserved communities. MedServe fellows serve in two roles: a clinical role and a community role. Within those categories, the student’s exact roles have been identified by the physician as filling the highest needs for his/her patients and community.

Implications

MedServe provides a novel, pre-matriculation pipeline to medical school, equipping future physicians with in-depth knowledge of medically underserved communities to provide 21st century health care. As a fellow, they will provide immediate support to implement existing programming by physician leaders. Regardless of final career choice, MedServe alumni will value and appreciate the daily work completed by primary care physicians and their patients.

Contact

Patrick_oshea@med.unc.edu

Keywords

medical education, pipeline, primary care, professional identity formation

HONORABLE MENTION

Communication and Problem Solving in Healthcare (CPSH): A skills-based course for future physicians

Pan AJ 2019¹, Isidro S 2019¹, Isidro T 2017², Pan AJ 2016³
*University of Rochester School of Medicine and Dentistry*¹
*University of Texas Medical Branch School of Medicine*²
*Michigan State University*³

Identified need

A plethora of research ties effective doctor-patient communication to improved health outcomes, and changing conditions require physicians to be good negotiators and conflict mediators for effective stewardship. Disparities in such skills, which are neither taught nor evaluated in a standardized fashion in U.S. medical school curriculum, exist among medical students and professionals. A structured course would benefit society by providing protected time for future health care providers to refine these skills.

Innovation

Our “Communication and Problem Solving in Healthcare” (CPSH) course would tap the multidisciplinary experience of medical, humanities, and community leaders and educators. Students would actively engage diverse topics in interpersonal communication (verbal, non-verbal, written and presentation skills; patient interviewing; electronic communication; and communication across socioeconomic and cultural lines) and negotiation (Fisher and Ury’s *Getting to Yes* principles, rapport/team building, patient advocacy, improvisation, bioethics, conflict mediation and negotiation with numbers).

Implications

While knowledge may change, skills are adaptable. Our innovation would equip health care professionals to catalyze better outcomes in changing practice environments. Given the importance of effective interpersonal communication and negotiation in health care, even a slight improvement in efficiency, diagnostic accuracy and adherence can greatly affect outcomes, satisfaction and cost. In short, CPSH’s goal is simple:

better physicians, better patient care and outcomes and lower costs to society as a result.

Contact

Andrew_Pan@urmc.rochester.edu

Keywords

communication, negotiation, problem solving, conflict resolution, interprofessionalism

Improving pattern recognition in medical education with the Web application NDER (Novel Diagnostic Electronic Resource)

Parker E 2017¹, Parker T 2016², Jorgensen K 2017¹, Steinkruger S 2016¹
*University of Washington School of Medicine*¹
*Western Washington University*²

Identified need

Medical education is facing an intractable dilemma: students must learn an increasing amount of essential information, yet less time is devoted to each subject. Thus, the challenge facing medical students is how can we learn more information in less time? And the challenge facing medical schools is how can we teach more information in less time? Rapid pattern recognition software offers an efficient, pragmatic learning mechanism for this growing obstacle.

Innovation

The Web application NDER, or Novel Diagnostic Electronic Resource, displays an image briefly (average: four seconds), challenges users to classify the image after the time has expired, and then gives users immediate feedback. An adaptive algorithm determines the time that each subsequent image is displayed, adjusting for user performance. NDER has been used to train medical students to recognize normal histological structures, increasing accuracy from 72.6 percent pre-test to 95.7 percent post-test.

Implications

Basic science years: Students will be exposed to many radiology/pathology images, EKGs, dermatology findings and heart/lung sounds, reinforcing the link between clinical medicine and basic science.

Clinical clerkships: Having seen hundreds of high-quality examples of many diseases, students will be better prepared for clinical clerkships.

Residency and practice: Residents will accumulate a large cognitive database of disease examples, better preparing them for patient care and allowing for easy review.

Contact

eup@uw.edu

Keywords

medical education, rapid pattern recognition, interactive web application

The medical education manifesto: Training the physician change agents of tomorrow

Patel H 2016, Ohanian K 2016, Ebner D 2016, Clark A 2019
Eastern Virginia Medical School

Identified need

Medical education is preventing many of the nation's best and brightest, most altruistic and optimistic, most hopeful and passionate from fulfilling their potential and pursuing causes they care deeply about. The current system of medical education fails to preserve students' idealism and provide them with the skills needed to fulfill their visions of changing the world for the greater good.

Innovation

Our curriculum trains physician change agents by nurturing its students' desire to make a difference, helping to retain their idealism, developing their humanism, teaching them how to innovate and transforming them into leaders. We will do this by creating a culture in which students feel comfortable sharing their visions of changing the world with each other, by eliminating the shame culture and vertical hierarchy in medicine, by developing grateful, mindful, reflective practitioners, and by training students to be innovators and leaders through a longitudinal didactic and experiential innovation and leadership curriculum.

Implications

The solution to healing our ailing health care system is to create a culture in medicine that will continuously and collaboratively find answers to the intractable problems of the day by focusing on continuous improvement, innovation, experimentation and transformative leadership. We need to train a new generation of physicians who have the skills to solve the intractable problems of today and the inevitable problems that will arise tomorrow. The physicians of tomorrow are more than just clinicians. They are physician change agents.

Contact

hiteshpatel2005@gmail.com

Keywords

innovation, leadership, physician change-agent, medical education, vision-focused medicine

HONORABLE MENTION

A modern medical education curriculum: Evolving the purpose of medical school

Patel R 2018¹, Arruda N 2017¹, Musser S 2015², Garcia G 2017³

USF Health Morsani College of Medicine¹

University of Florida²

University of South Florida³

Identified need

Physicians must be trained early with the ability to speak on multiple levels to various parties; otherwise, physicians put not only themselves at risk, but more significantly, the patient at risk. Whether the risk is misinterpretation of what the physician is saying, or whether a lack of knowledge on behalf of the physician means information is not properly communicated to the patient, the patient can be at risk for negative and/or unintended outcomes.

Innovation

The integration of education from other fields is required for a physician to optimize their treatment and management of patients. This includes but is not limited to: foundations of communication (I-IV); transition to patient clinical experience, differentiation and integration; practice of medicine; MBA foundations; health care and law; ethics; as well as review courses in the fourth year for residency, MBA fundamentals and health care safety (includes nationally standardized certification course).

Implications

Instead of preparing physicians to only treat an illness, physicians manage a patient's care with far greater understanding of how to best help the patient receive the optimal care available. Physicians can now effectively communicate with the patient on subjects such as nutrition and treatment options while also having the knowledge from their education on how to optimize a patient's insurance usage to maximize preventive care.

Contact

rpatel12@health.usf.edu

Keywords

education, communication, experience, management, safety

Systems of medical practice

Ramadurai D 2016¹, Eibling P 2016²

Hofstra Northwell School of Medicine¹

Lake Erie College of Osteopathic Medicine - Seton Hill²

Identified need

With deficits in health care exposed in the 2001 report from the Institute of Medicine's Committee on Quality of Health Care in America and the national reform of the Patient Protection and Affordable Care Act of 2010 (ACA), there is a growing need to

train policy-literate health care providers. Idealistic outcomes underlying reform include improving health care affordability and outcomes as well as public awareness in parallel with the changes to undergraduate medical education curriculum structure.

Innovation

We propose a monthly curriculum in the first two years of undergraduate medical education covering non-basic science cases entitled: “Systems of Medical Practice”. This course would be conducted in small groups with a faculty facilitator who manages and does not deliver content. Groups meet twice weekly: once to establish learning objectives based off a pre-written case and then again to discuss their learning objectives after a period of self-directed learning.

Implications

Case-based curricula emphasize adult learning for medical students. This prepares trainees for dynamic thinking in common clinical situations. Does patient frustration stem from a systems problem? Is there a misunderstanding of care options or a barrier in infrastructure regarding care delivery? Delivering information regarding health policy and business practice in medicine through patient cases creates an aptitude for understanding the interdisciplinary nature of modern medical practice.

Contact

d.ramadurai@gmail.com

Keywords

medical education, case-based, problem-based, systems-based practice, self-directed learning

Connect

Rasmussen M 2019, Esce A 2019, Blegen M 2019, Campbell T 2019

University of Rochester School of Medicine and Dentistry

Identified need

Patients experience barriers to care that are not addressed by traditional medical therapies—issues that are best solved through government, policy, psychological therapy, business, law or technology. Doctors, despite working closely with and as advocates for patients, are often untrained in and unfamiliar with these other important fields that are integral to patients’ health.

Innovation

In addition to incorporating health care-relevant teachings from fields outside of medicine’s traditional scope, we propose building a consortium of professional schools, including medical schools, that will create teams of freshly graduated students for an extra year of on-site study where they will solve real-world problems that affect the health of real patients and use the tools of diverse disciplines.

Implications

The “Connect” curriculum and additional year will ensure that doctors, traditionally equipped with a purely biochemical means

of healing, will have the perspective and the tools of multiple disciplines to meet patients’ needs through connections, a broad skillset and a wide understanding of the issues facing patients’ health.

Contact

timothy_campbell@urmc.rochester.edu

Keywords

interprofessional, adaptive learner, patient advocate, leadership, lateral thinker

A Google Glass-based application for learning differential diagnoses

Ray N 2017¹, Hu L 2016², Venkataraman V 2017¹, Chang L 2021¹

Duke University School of Medicine¹

University of California, Berkeley, Department of Bioengineering²

Identified need

The current state of medical education today consists of two “silos” that, while related, are fundamentally separate. During the pre-clinical years, students learn about diseases from predisposing symptoms and clinical manifestations. During clinical rotations, students quickly realize they have learned the clinical decision-making process in the reverse order. Students start with an expansive differential diagnosis from a vague chief complaint. With further history and physical exam, they must shed items from this list in real-time. There is no efficient way to aid medical students’ transition from the pathology-based paradigm to the complaint-based one.

Innovation

Our solution is a Google Glass application that displays a differential diagnosis and updates with new findings. Using Google’s voice recognition software, a student can verbally input the chief complaint and it will generate a differential diagnosis on the display prism. With subsequent physical exam and history, the student can verbally input findings and watch the differential change. This will provide a visual representation of what they should have in mind and how the differential is reordered as new symptoms are uncovered. Other functions include managing one’s differential without software cues and inputting pretest probabilities to inform diagnoses.

Implications

This tool will expedite the conversion of didactic curriculum into practical diagnostic skills by allowing students to apply and master the clinical decision-making mindset. It will allow students to better adapt to environments that promote earlier exposure to patients. In addition, the different levels of training encourage introspection of one’s own abilities and grants better control of one’s own learning process. Another important implication is that this device will encourage students to actively listen to patients and better develop the doctor-patient relationship.

Contact

neil.ray@dm.duke.edu

Keywords

Google Glass, medical education, differential diagnosis, innovation, technology

Reaffirming medicine's social mission

Rehman T 2018, Rock R 2017, Rojiani R 2018, Cummings L 2018

Yale School of Medicine

Identified need

A central goal of medical education is to train physicians who can be stewards of our national health. Yet too often this admirable goal has been narrowly defined, and “national health” has referred disproportionately to traditionally dominant social groups at the expense of society’s marginalized populations. We propose three core innovations that steer medical education towards cultivating physicians who are committed to social responsibility and the eradication of health disparities.

Innovation

Medical curricula must be reformulated to reinforce social responsibility for physicians-in-training. We envision a new practicum component of medical education in which students learn to combine sustainable community collaboration with the advancement of medical knowledge in the service of public health. Students must be trained in contemplative practices in order to minimize physician burnout, improve joy in practice, and maintain a socially responsible mission through the development of deep and renewable compassion.

Implications

Our proposal responds to the challenges that health care providers are expected to face in the future. Relative to other countries, the U.S. health care system spends more per capita for worse outcomes, reflecting structural determinants of health our medical system needs to address. Growing rates of burnout among health workers indicate increasing dissonance and, thus, training that conventionally relies on a biomedical framework of health must be restructured to include the impact of societal factors.

Contact

tehremrehman@gmail.com

Keywords

social medicine, health disparities, health inequity, community, contemplative mindset

Development and implementation of a peer-based interdisciplinary learning activity for medical, nursing and public health students

Rodríguez Rosa A 2018, Ortíz Manso R 2018, Rodríguez Candelario I 2018, Camacho Monclova K 2018
San Juan Bautista School of Medicine

Identified need

The issue identified and addressed by this proposed innovation is the lack of interconnection and intercommunication that exists in Puerto Rico’s health system and its components.

Innovation

This proposal focuses on curriculum content and learning environment. The peer-based interdisciplinary learning activity transforms the learning process and provides an opportunity to integrate the knowledge between MD, MPH and BSN students. A restructure of the MD curriculum will allow medical students to interact with nursing and public health students from the early stages of career development to help solve real-life medical scenarios with higher diagnostic accuracy and efficiency.

Implications

This innovation proposes reforming and complementing the training of physicians on the management and integrative side of the medical practice by means of a modified medical school curriculum. This proposal intends to reform medical education for this and future generations by forging a more comprehensive and supportive method of education that will provide a more competent and efficient workforce that will significantly improve patient treatment outcomes.

Contact

arodriguezrosa@sanjuanbautista.edu

Keywords

interprofessional education, bridging, interdisciplinary, nursing, medicine

RotationsRx: Transforming the clinical rotation experience through collaboration

Sadauskas V 2017, Criscione L 2017, Moore M 2017, Belani S 2016

University of Illinois College of Medicine at Peoria

Identified need

O’Brien et al. found that of the top five struggles students have on rotations, four of them were “understanding roles and responsibilities, adjusting to clinical cultures ... learning the logistics of clinical settings, and encountering frequent changes in staff, settings and content.” The scramble to adapt to rotations can lead to unnecessary time spent learning to

function in a new environment at the expense of fulfilling other responsibilities and learning opportunities.

Innovation

RotationsRx.com is a Web app developed to facilitate student-to-student communication during the clinical years. Using this Web app, students post their experiences, comments and advice concerning practical, day-to-day features of rotations. It empowers students to prepare each other for the unique environments of each rotation, allowing them to better focus on learning clinical medicine and on developing into the physicians of tomorrow.

Implications

Medical students have identified practical aspects of changing cultures and role definition as their main struggles, possibly reducing the educational potential of the clinical years. Although attempts have been made to correct these weaknesses, they are largely outdated, relying on coordinated schedules, in-person meetings and small sample sizes. RotationsRx.com hopes to solve the student-identified pressing problems pervading clinical rotations, creating a more effective learning environment for future physicians.

Contact

victor.sadauskas@gmail.com

Keywords

rotations, clerkships, app, collaboration, software

Lifestyle medicine and motivational interviewing

Shah K 2019, Bautista S 2019
Rutgers New Jersey Medical School

Identified need

In a country where the health patterns of the population have changed and chronic diseases are the leading causes of mortality, it is up to this generation of physicians to address the root cause of all these diseases: lifestyle choices. Medical schools are currently lacking in providing proper hours of training in nutrition and physical activity, resulting in clinicians feeling uncomfortable in dealing with these problems of their patients.

Innovation

Medical schools must train physicians in prescribing their patients an array of evidence-based lifestyle modifications relevant to the patient's risk factors or chronic disease. This training would be comprised of two parts: (1) properly educating the medical student on lifestyle modifications through lecture (2) teaching the medical student how to effectively communicate this knowledge to the patient through using the Transtheoretical Model of Change and OSCE-like motivational interviewing assessments.

Implications

By incorporating evidence-based lifestyle modifications in lectures and using motivational interviewing assessments for reinforcement, physicians will hold lifestyle modifications to a

higher standard, be able to treat patients more effectively and improve patient wellbeing. Common overlaps/collaboration with other health care professionals will improve inter-professional relationships, and the cost effectiveness of this innovation will greatly benefit a health care system that is becoming unsustainable due to the rise in chronic disease.

Contact

kshah031793@gmail.com

Keywords

lifestyle medicine, motivational interviewing, chronic disease, evidence-based, nutrition, physical activity

Patient safety and quality improvement: An integrated longitudinal curriculum at the University of Toledo College of Medicine and Life Sciences

Sharaf P 2017, Dhillon N 2017
The University of Toledo College of Medicine and Life Sciences

Identified need

Health care delivery today requires not only a dedication to quality improvement and patient safety, but also the development of data-driven and systems-focused programs that address these issues. We recognize that training student learners early in their education experience, particularly in quality and patient safety, builds the next generation of physicians able to critically assess, formulate solutions and sustain improvements for a myriad of problems that arise in clinical medicine.

Innovation

The proposed curriculum to educate medical students challenges previous attempts to establish quality and safety programs. Our proposal includes:

1. Didactic lectures on the six elements of patient safety
2. Introduction to analytical tools in quality improvement
3. Participation in hands-on modules in the simulation laboratory
4. Attendance at morbidity and mortality conferences
5. Ability to perform root cause analysis
6. Elective in quality improvement and patient safety

Implications

The projects aims to improve educational competencies of medical students through the creation of a longitudinal, systems-based medical education curriculum that prepares students for roles in providing team-based, patient-centered care while impacting patient safety and quality in a rapidly evolving health care system. Through immersion in the

proposed curriculum, this project envisions building future leaders in medicine. By administering interval patient safety knowledge surveys, we intend to gauge the effectiveness of our teaching methods.

Contact

Pamela.sharaf@rockets.utoledo.edu

Keywords

patient safety, quality improvement, medical school curriculum, longitudinal

Personalized education for personalized medicine

Sharma N 2019, Dwomor L 2018, Koldhekar A 2018, Mu J 2018

University of Pittsburgh School of Medicine

Identified need

Students have different learning styles, abilities, preferences and backgrounds. The current “one size fits all” model does not meet the educational needs of most students.

Innovation

1. Dynamic online modules that match the student’s level of comprehension. 2. Real-time feedback for lecturers. 3. Increased number of online lectures, which increases the likelihood of students finding a lecturer who resonates with them.

Implications

Just as personalized medicine seeks to address patients as individuals instead of a population, personalized education seeks to do the same for students. This would facilitate enhanced comprehension for students, as well as promote a more efficient use of time.

Contact

sharma.neil@medstudent.pitt.edu

Keywords

personal, feedback, tailored, custom, individual

Curriculum 3.0: Bolstering the pipeline for primary care and customizing medical education

Shi H 2017, Hall EJ 2017

Vanderbilt University School of Medicine

Identified need

The Association of American Medical Colleges reports an overall shortage of over 90,000 primary care physicians by the year 2025. Especially in the south, including Tennessee, an aging and increasingly insured population requires a larger provider workforce. The supply of U.S.-trained medical students entering primary care-oriented residencies is also dwindling, leading to a

need for split-level curriculums with accelerated tracks for early internship and earlier clinical experience.

Innovation

Curriculum 3.0 aims to integrate three-year direct entry into a local or state primary care residency with flexible paths and multidisciplinary clinical experience. The “Accelerated” track reserves 30 primary care (pediatrics, ob-gyn, family medicine) residency spots, allowing students to bypass the traditional match after successful completion of a rigorous, six-month capstone internship. The “Integrated and Float” tracks allow earlier internship preparation, flexibility for students to explore advanced clinical electives and directed mentoring.

Implications

The nation’s health is at risk. We propose a long-term solution that will serve to provide an additional 1,500 new primary care providers annually with full implementation. Medical students should also take ownership of their education and training and, ultimately, we will create happy and experienced trainees who craft their own paths in becoming innovators, visionaries and empathetic doctors in the field of medicine.

Contact

hanyuan.shi@vanderbilt.edu

Keywords

curriculum, primary care, wellness, customization

Bridging the gap: Future physicians and future health care

Sood S 2017, Segal A 2019, Donegan P 2019

Rowan University School of Osteopathic Medicine

Identified need

Mobile health (mHealth) is the fastest growing sector in health care with over 165,000 consumer apps available. If doctors are not involved in this rapid evolution of health care, they will fall behind in their own profession. This requires a paradigm shift in medical education where students are immersed in mHealth and challenged to develop new solutions. Future physicians must be trained to understand and lead in this mobile-tech health care landscape.

Innovation

We propose a two-part, longitudinal, experiential education module through which students interact with and develop mHealth solutions for health care issues:

- 1) mHealth immersion: Students use mHealth technology to familiarize themselves with data capturing and to understand the power of social, behavioral and economic data in health.
- 2) Interdisciplinary team-based innovation—students will identify issues in health care and develop solutions that incorporate health information technology (HIT) through an interdisciplinary, team-based approach.

Implications

mHealth can enhance communication and interconnectedness between physicians and patients and help physicians understand and assess the 80 percent of health that happens outside the clinic. A longitudinal integration of mHealth and HIT into the curriculum would allow physicians to become part of this health tech evolution, and they would learn to lead and adapt more rapidly to changes in medical technology and science.

Contact

soodsr@rowan.edu

Keywords

mHealth immersion, HIT, interdisciplinary team-based innovation, health tech

Community-based curriculum: An impetus for impact

Steenbergh K 2018, Griffith M 2018, Hogikyan 2019, Silverberg J 2019
University of Michigan Medical School

Identified need

A lack of emphasis on preventive medicine in medical education, combined with removal of medical students from the communities they serve for four or more years, results in lost potential for societal impact. The traditional medical curriculum focuses on a narrow model of health and disease, failing to empower students to challenge or improve health care. This lack of contact limits important interactions with community members and professionals from other disciplines.

Innovation

Complementing the basic science curriculum, the community-based curriculum (CBC) is a longitudinal community engagement model that directly connects medical students to communities from day one. CBC fuses the principles of service learning and quality improvement through four phases: working with community partners to identify an unmet need, developing a plan to implement, assessing the intervention and seeking to improve it, and integrating the solution into the existing health care system.

Implications

CBC students will benefit from a diverse network of community partners, upperclass students and faculty advisors. Experiential learning will offer students the opportunity to impact the local community and acquire the skill set to drive change. Further, students will cultivate teaching and quality improvement skills vital for physicians. Graduates will learn to view patients within the full context of multidimensional health, re-centering patients and communities as the focus of medicine.

Contact

steenkyl@med.umich.edu

Keywords

community health, quality improvement, needs assessment, mentorship, service learning

HONORABLE MENTION

Soften the curve: Reinventing interaction for the betterment of medical education (SCRIBE)

Swiontkowski ER 2018, McCarthy EK 2018
Stritch School of Medicine Loyola University Chicago

Identified need

The pre-clinical learning curve is steep. Many agree that rote memorization is unavoidable yet not ideal for maximum retention and understanding of pathology and pharmacology. Broader applied learning methods are needed. Lived, concrete examples, rather than abstract principles, form the foundation of clinical competence among medical students. Concurrently, in the practice setting, increased administrative and medical documentation time diminishes both patient satisfaction and care quality.

Innovation

By allowing first- and second-year students to function as scribes, what is currently passive observation can be replaced with participatory learning—navigating patient records, typing new medical terminology, active listening and clarifying emerging questions. In addition to the present mentor-mentee relationship, students will observe patient-physician interactions while also partaking in subjective, objective, assessment and plan (SOAP) note creation. Students will gain proficiency in accurate and efficient electronic medical record (EMR) documentation while simultaneously contributing directly to patient care.

Implications

Medical scribing has demonstrated benefits to patient-physician interaction and has the potential to re-invent the M1/M2 experience in a concrete, clinically applicable manner. SCRIBE maximizes student retention of clinical concepts while simultaneously advancing patient care. Medical student performance will benefit from increased one-on-one time with preceptors and additional interactions with patients. We theorize that health system outcomes will reflect improved patient and provider satisfaction and increased EMR documentation accuracy and efficiency.

Contact

eswiontkowski@luc.edu

Keywords

medical scribing, electronic medical record, preclinical curriculum, applied learning, academic performance

A longitudinal simulation curriculum to address entrustable professional activities (EPAs)

Torrie AM 2016, Boushra M 2016, Li IH 2016, Tsui I 2016
Penn State College of Medicine

Identified need

Many students feel ill prepared to perform some of the 13 core EPAs by the start of their residencies. This highlights the lack of authentic experiential learning and real-world simulation within the typical medical school curriculum. Due to the ever evolving nature of the medical profession, it is critical that future physicians are trained to be lifelong, self-directed and self-motivated learners who demonstrate competency in both clinical and interpersonal skills.

Innovation

This curriculum builds on the TeamSTEPPS® conceptual framework, utilizing its key components to initiate a simulation-based curriculum throughout four years of medical education that addresses the EPAs for graduating medical students. This simulation model, coupled with the established problem-based learning (PBL) curriculum, will: (1) provide experiential learning opportunities, (2) develop interprofessional teamwork and communication skills early in medical training, and (3) prepare students for level-appropriate procedural and clinical skills.

Implications

An integrated medical school simulation curriculum based on TeamSTEPPS will have a positive impact on multiple aspects of health care, including improved physician training and more effective multidisciplinary teamwork. By allowing physicians-in-training to practice patient management in controlled settings that mimic real-life scenarios, this curriculum exposes students early on to the multi-faceted reality of patient care. Ultimately, this innovation seeks to improve patient safety and the quality of care by increasing provider competence.

Contact

amtorrie@gmail.com

Keywords

interprofessional, experiential learning, longitudinal simulation, TeamSTEPPS

Health leadership tracks: A medical education innovation proposal for the 21st century

Turgeon MK 2017, Blatt KF 2017, Havard ME 2017, Westbrook TC 2017
University of Cincinnati College of Medicine

Identified need

A disconnect remains in the training of medical students and the development of knowledge, skills and mindsets necessary for

leaders at the forefront of a shifting health care landscape. By establishing a new baseline competency in leadership ability, our structured curriculum cultivates physician leaders who are able to create a positive work environment, streamline care coordination and improve communication within health care teams, which will ultimately improve patient outcomes.

Innovation

The health leadership tracks (HLTs) are comprised of four customizable tracks: public health, education, health innovation and health administration. Students engage in a foundational leadership curriculum to develop their identity as a leader, partner with clinician mentors, complete quality improvement projects and lead interdisciplinary rounds. Students also complete a capstone project that meets the requirements to attain advanced degrees, if desired (MPH, MHA or MBA).

Implications

The HLTs training of future physicians will directly impact patient care. Students enter residency with the confidence and skills to improve care coordination. As the practice of medicine has become increasingly interdisciplinary, strong management of diverse stakeholders is essential. Graduates of our curriculum will feel comfortable identifying the key players for a patient's care, working across lines of difference, accessing additional resources when necessary and continuously improving their effectiveness.

Contact

turgeoml@mail.uc.edu

Keywords

innovation, leadership development, public health, curriculum, education

Flourishing during clerkships: Tackling medical student burnout and the empathy gap

Vijayaraghavan M 2017¹, Thakrar A 2017², Yu B 2017², Scanlon C 2017¹

Tufts University School of Medicine¹

Perelman School of Medicine at the University of Pennsylvania²

Identified need

Medical students enter medical school committed to two ideals: to understand the pathology and treatment of disease and to connect with patients about their experience of disease. However, many students burnout and lose the drive to empathize with patients. Most of this drop in empathy occurs during the year of core clerkships. How do we prevent this sudden drop and nurture students to grow into caring, empathic physicians?

Innovation

We aim to reform the curriculum of clinical clerkships by implementing four changes:

1. Anonymous bi-directional feedback modules for reporting mistreatment
2. Publicized aggregate teaching scores at each hospital where students rotate
3. One half-day every two weeks of protected time, free from clinical duties
4. A mandatory fourth-year course on pedagogy in the hospital

Implications

These interventions infuse empathy and support into the core clerkship year in three ways: they build a space for feedback and dialogue about the effectiveness of teaching at each academic institution; they give medical students time to recuperate and reflect; and they help students develop into effective educators who can mentor and teach the next generation of physicians.

Contact

mahimavijay1@gmail.com

Keywords

empathy, burnout, feedback, medical education

Innovating with the times: Medical education in context of practice, systems and patient experience

Wang P 2017, Sewanan L 2020
Yale School of Medicine

Identified need

The current emphasis of medical education is outdated, focusing on accumulation of facts and does not address the key need of the future in which physicians serve as educated, compassionate guides for patients as they navigate health care. The emphasis should not be on knowing the correct answers, but on knowing the right questions to ask and understanding how to relate objective facts to a specific patient's experience.

Innovation

We emphasize three key elements. First, to know the “lay of the land,” we prescribe active learning in context. Second, to know where to find and learn about information that is relevant to patients, we empower students to learn by asking. Third, to communicate effectively and compassionately translate information into relevant and understandable forms, we replace fact-recall exams with assessments that test practical application of knowledge.

Implications

Instead of clinging to an anachronistic model, we leverage societal change—the ability to access information in innovative ways—to shift the focus on to the end goal of medicine: translating medical knowledge and practice into competent, compassionate patient care. Medical students are empowered by patient-driven and self-driven learning within a framework for general competency. Patients are restored to their rightful place at the center of medical education.

Contact

Priscilla.Wang@yale.edu

Keywords

technology, communication, application, empowerment, active learning

United medical education: Integrated curricula across health care professions

Wang J 2019, Tran S 2016
The Warren Alpert Medical School of Brown University

Identified need

As the patient population grows older and sicker and health care reform attempts to reduce unnecessary costs, team-based health care has become the new model of medicine. Despite working so closely together, medical professions are trained separately with little opportunity to interact across fields before employment. Every year, the health care system loses \$12 billion due to communication inefficiencies within the care team. Greater interprofessional training is necessary to build better working relationships, reduce communication inefficiencies and improve patient outcomes.

Innovation

Our vision is an integrated curriculum for medical, nursing and pharmacy students in one campus. Students would share team-based learning activities, health care electives, extracurricular activities and clinical skills courses. As graduate-level students, medical and pharmacy students would share more pre-clinical courses in anatomy and physiology, pharmacology, immunology and pathology. Given the administrative challenge of integrating health care curricula, the best candidates for this model are state-funded universities with existing medical, pharmacy and nursing schools.

Implications

Our unified education model serves to build a new generation of strong, interdisciplinary teams to better address future health care needs. Current hospital-based experiments with integrated care teams have shown better outcomes in patients with chronic illnesses and lower burnout rates among health care professionals. One study on managed-care patients showed a savings of \$10.30 per patient per month upon the implementation of integrated care teams, a critical finding as health care spending increases.

Contact

jing_wang_1@brown.edu

Keywords

inter-disciplinary education, team-based learning, care teams, medical education

Augmented reality for medical textbook education

Wang L 2019, Wu H 2017, Bilici N 2019
Perelman School of Medicine at the University of Pennsylvania

Identified need

In an age of increasing smartphone and tablet use, users have access to information within seconds. While this has changed many existing educational paradigms, the vast potential of digital health is unrealized in medical education. For students and educators in medicine, the most widely utilized resource is the paper medical textbook. This creates a major discrepancy between the plethora of information available through technology and the limited resources that are in print.

Innovation

Augmented reality (AR) is the embedding of virtual learning into a physical context. Here, we propose the use of AR to embed media in the form of 3D models, videos, audio lectures, images and more in addition to print textbooks. We also propose using AR to gauge user feedback on the most high-yield information and to provide instantaneous updating of content through this user feedback.

Implications

AR has potential for students to have access to an unlimited wealth of information from a single print textbook through their smartphone or tablet. Moreover, AR can provide a customized learning experience where students can learn from what other students are using and see which resources are most helpful. It will also provide educators a platform to teach through textbooks, which has never been explored.

Contact

lwa@upenn.edu

Keywords

augmented reality, exam preparation, digital health, medical textbook

High-fidelity digital simulation for pre-clinical education

Weil J 2017¹, Noguchi K 2021²
*Georgetown University School of Medicine*¹
*Medical University of South Carolina College of Medicine*²

Identified need

Pre-clinical education connects with the realities of patient care in only the most superficial and abstract ways. While it excludes the practicalities of clinical medicine, it more importantly neglects the fact that “learning is doing,” and sustaining the basic science foundation of knowledge is nearly impossible without applied learning.

Innovation

A digital hospital simulator that faithfully reproduces all the elements of patient care, this program would integrate all the traditional elements of a basic sciences curriculum in a contextually relevant and completely student-driven environment. Real-time response to decisions for medical and surgical intervention on patients would force an active learning style desperately absent from current training programs.

Implications

Far from simply moving the needle, a high-fidelity digital learning environment would upend a curriculum largely designed for the sake of licensing exams. Students would learn in a dynamic environment that responds to every detail of their decision-making and provides a safe context in which to base their knowledge. This approach would massively enhance material retention and greatly improve the transition to the clinical years.

Contact

jw1374@georgetown.edu

Keywords

medical education, basic sciences, patient simulation

HONORABLE MENTION

Back to the Bedside: Patient-centered curriculum

Wesevich A 2017, Gluckstein J 2016, Mishra S 2017, Deng F 2016
Washington University in St. Louis School of Medicine

Identified need

Medical professionals are spending less time with patients. Clerkship students spend up to 50 percent of their time using the electronic medical record, limiting their opportunities for patient interaction. This focus on the “iPatient,” a virtual construct of the patient, decreases eye contact and social touch and, thus, perceived provider empathy. Systematic education in provider-patient communication and increasing patient interaction time will improve patient satisfaction scores and ultimately health outcomes.

Innovation

We propose the “Back to Bedside” program that includes multiple patient-centered innovations spanning the four-year curriculum. Pre-clinical students will write narratives describing patients’ illness experiences, regularly meet with patients outside the hospital system to discuss their varied health care system contacts and experience interprofessional patient instructions firsthand. Clinical students will develop patient-centered learning goals, advocate for patient preferences through digital whiteboards in patient rooms, and be evaluated by patients on clinical care and satisfaction.

Implications

The Back to the Bedside program prepares trainees to work in a health care system that focuses on patient experiences. Expected outcomes include improved patient empathy and

communication, improved delivery of care, improved patient adherence and reduced costs. By integrating patient feedback into clerkships, Back to the Bedside will ensure that students are more responsive to patient needs and will serve as a precedent for evaluations based on authentic clinical data.

Contact

wesevich@wustl.edu

Keywords

communication, patient satisfaction, curriculum, illness experience, empathy

Optimizing interprofessional education via a student run clinic model

Wessling E 2018¹, Kruzer K 2018¹, Li S 2018¹, Peterson C 2015²

Case Western Reserve University School of Medicine¹
Case Western Reserve University Frances Payne Bolton School of Nursing²

Identified need

In recent years there has been a distinct push to emphasize the value of interprofessionalism within the sphere of patient care. During the 2012 American Medical Association Interim Meeting, the AMA established Policy H-160.912 to advise on the role of interprofessionalism in the health care domain. While there has been a small trickle-down effect in shaping the goals of medical education, the educational methods to achieve these goals have yet to be adequately explored.

Innovation

Medical students will be involved in a student-run clinic as both clinic day volunteers and as administrators or development coordinators. Interprofessional teams of student volunteers see patients and work through all aspects of patient care from resource management and social service connections through medical diagnosis and treatment. As administrators or development coordinators, students work in interprofessional teams to oversee all aspects of clinic management and expansion.

Implications

Through participation in a student-run clinic as part of the required medical curriculum, students will gain early exposure to interprofessional clinical care models, health care facility management and collaborative quality improvement measures such as Plan, Do, Study, Act (PDSA) models. Students will interact in a constructive, collaborative environment in order to develop positive workspace interpersonal and interprofessional communication skills while serving the community around them.

Contact

egw22@case.edu

Keywords

student-run clinic, medical education, interprofessional education, quality improvement, communication skills

Physicians as patient advocates: Using civic engagement as a model for change

Xu A 2018, Bruce M 2018
Baylor College of Medicine

Identified need

Topics such as health care systems, the social determinants of health, health economics, quality improvement, etc. are not part of the core curriculum of most medical schools even though 96 percent of medical students believe that knowledge of health policy is important to their careers. This results in medical students graduating who are clinically proficient, but who are wholly unprepared to effectively advocate for their patients in the 21st century.

Innovation

Our three-pronged approach to create the medical school of the future consists of curriculum innovation, cultivating students' sense of initiative, and forming interdisciplinary partnerships with local and national organizations. Our students will work with a variety of interdisciplinary organizations at the local, state and national levels to enact change for the betterment of their patient population.

Implications

Medical students will have the tools necessary to become patient advocates from the day they graduate. Students will better understand the root cause of disease and the barriers against health; they will be able to evaluate the effectiveness of and actively influence health policy at the local, state and even national level, and, finally, they will be better connected and more active in their communities.

Contact

ang.xu@bcm.edu

Keywords

patient advocacy, civic engagement, policy

HONORABLE MENTION

Providing future physicians with a technical background

Yuen K 2018¹, Conroy R 2016²
Keck School of Medicine of the University of Southern California¹
Georgia Institute of Technology²

Identified need

The amount of data from which physicians must make decisions is expanding rapidly. Technology has begun to emerge that can

handle this volume of information in ways that physicians alone cannot. Health care has historically proven to be tech un-savvy, which has contributed to the relative stagnation of innovation in the field. We can change this by shaping future physicians to better fit into the complex interface of technology and medicine.

Innovation

We propose a revised premedical curriculum that requires a background in computer and data science in addition to the traditional background in biological sciences. This will be followed by a revised medical school curriculum that prepares students to optimize the ways technology augments our abilities as clinicians. Core features of the revised medical curriculum include problem-based learning with an informatics component, early clinical experiences and a required project in health informatics.

Implications

In addition to mastery of medical concepts, clinical experience and passion for patient care, the future physician has an understanding of computer and data science that enables them to utilize data for research and effectively engage with technology in practice. Just as a biochemistry background prepares students to understand pathophysiology, pharmacology and research, a technical background would allow students to understand mechanisms by which computers contribute to research and practice.

Contact

kaeliyue@usc.edu

Keywords

health information technology, big data, premedical, medical education, computer science

HONORABLE MENTION

Running the GaMut: An interprofessional, action-based leadership development initiative

Zurales K 2018¹, Pliakas M 2018¹, Wu C 2018¹, Makowske I 2016²

University of Michigan Medical School¹

University of Michigan Ross School of Business, School of Natural Resources and Environment²

Identified need

Addressing evolving demands in health care requires a team-based care delivery model—a model that calls for physicians to assume the role of leader, communicator and contributor within an interprofessional team. As this role has traditionally been underemphasized in undergraduate medical education, we propose a leadership development initiative utilizing interprofessional teams and action-based learning to create a common leadership foundation that runs the gamut of health care education.

Innovation

“GaMut” is a proprietary initiative that includes two components: a longitudinal impact project, complemented by an

overarching leadership initiative. Interdisciplinary teams collaborate on impact projects that address health care challenges while the integrated leadership initiative instills transformational leadership content through quarterly conferences, 360 reviews and continuing education. GaMut celebrates innovation, fosters an environment conducive to risk-taking, challenges students to apply lessons from failures, and promotes personal, professional and team growth.

Implications

This scalable initiative provides an experiential learning environment that fills a void in traditional undergraduate medical education. Graduates of GaMut will have shared interdisciplinary experiences addressing complex, systemic health care dilemmas. They will have built a team-focused mentality and a common leadership language. Graduates will ultimately be prepared and empowered to serve as the change agents needed to transform the health care system and improve patient care from the bottom up.

Contact

katierz@med.umich.edu

Keywords

leadership, interprofessional, action-based learning, team development, impact project