



**COALITION
TO IMPROVE DIAGNOSIS**

**Member Organizations
Commit to Take Action**

Having provided the impetus and funding for the National Academy of Medicine (formerly the Institute of Medicine) report on diagnosis,¹ the Society to Improve Diagnosis in Medicine (SIDM) wanted to ensure the report produced results. SIDM also knew that achieving improvement at scale would require collaborative effort. It therefore formed the Coalition to Improve Diagnosis concurrent with publication of the National Academy report in late 2015. The Coalition brings together as many non-profit organizations as possible, representing professions across all of healthcare.

Each organization that joins the Coalition pledges to take action to improve diagnosis individually as well as collectively. The Coalition currently includes 31 member organizations, many of which have begun to plan or work on individual projects. Some have produced resources that are available to the public.

Member organizations pledge to support the Coalition's three collective efforts: building awareness about diagnostic safety, identifying and disseminating effective tools, and advocating for increased research funding. The Coalition's steering committee has approved

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**SOCIETY to
IMPROVE
DIAGNOSIS in
MEDICINE**

Medical Education: Expert Clinical Reasoning for All

By Susan Carr

Intelligence and intellectual curiosity are necessary for success in medical school but not sufficient for effective clinical practice. In the past, medical students focused exclusively on science and technical medical skills. But with growing awareness that patient safety and quality improvement should be part of medical education, training in other aspects of practice has gained acceptance. Human factors engineering, communication, and teamwork are among those additional competencies. Physicians should learn *how*, as well as *what*, to practice. In the United

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States, healthcare reform has reinforced this message; medical education must adapt as care delivery changes to meet the country's needs.

Much as diagnostic error was long overlooked by the patient safety movement,¹ recent efforts to improve medical education have largely overlooked advanced areas of clinical reasoning. Clinical reasoning is a competency that should be part of every physician's education² and, beyond the basics, should include training in critical thinking, awareness of cognitive bias, and the use of decision support resources. Although many groups have identified important education gaps regarding safety and quality, there has been little mention of training in cognitive skills to help improve the accuracy, speed, and effectiveness of diagnosis.

Calls for Medical Education Reform

In a 2010 report titled *Unmet Needs: Teaching Physicians to Provide Safe Patient Care*,³ the Lucian Leape Institute at the National Patient Safety Foundation acknowledged that medical education is a priority for improving the safety of healthcare. If physicians have not been trained in the knowledge, skills, and attitudes needed to provide safe care, improvement efforts are likely to fail. The report's list of necessary competencies includes:

- systems thinking
- problem analysis
- human factors science
- communication
- patient-centered care
- teamwork

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With thanks for their assistance with this article:
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- emotional intelligence, especially regarding feelings of doubt, fear, and uncertainty following medical errors^{3(p1)}

Although the skills on this list help support effective diagnosis, there is no mention of cognitive skills.

The Accreditation Council for Graduate Medical Education (ACGME) has been analyzing the quality of clinical education that residents and fellows receive in training. Through this process, called the Clinical Learning Environment Review program, ACGME has determined that many organizations do not provide physicians in training with the experience they need in patient safety and quality.⁴ While didactic training is helpful, experience-based learning is more effective. The CLER program has also found that training is usually provided in specialty-specific settings. Given that physicians practice in inter-professional teams, they should not be educated and trained in silos.⁴

In 2014, the Institute of Medicine (IOM; now the National Academy of Medicine) asked for reforms in a report⁶ that examined the way the United States pays for graduate medical education (GME). Noting a lack of coordinated planning around national medical needs, the IOM called for the federal government, which supplies financial support to academic medical centers, to “leverage its investment in GME toward producing a physician workforce ready to provide high-quality, patient-centered, and affordable health care in all regions of the nation.”^{6(p52)} Specifically, the report noted a trend toward training more physicians for specialized and inpatient practice, at the expense of training physicians for office-based primary care.

These impluses for healthcare reform have led to re-examination of medical education. The reforms focus on doing a better job of preparing physicians to practice in interprofessional clinical environments, work effectively in diverse communities, address chronic as well as acute healthcare needs, and deliver safe care in highly complex, technology-rich practice settings. Skills in critical thinking and awareness of how people reason their way through problems are relevant for diagnosis and are not receiving attention in reform efforts on a large scale.

Teaching Clinical Reasoning

Catherine Lucey, MD, is the vice dean for education at the University of California, San Francisco School of Medicine and the principle investigator for “Accelerating Change in Medical

Education,” a 5-year grant from the American Medical Association. She has devoted much of her career to teaching clinical reasoning to medical students.

Speaking at the Diagnostic Error in Medicine (DEM) conference in November 2016,⁷ Lucey described an experience she had in medical school, which she credits with sparking her fascination with clinical reasoning. At the beginning of her third year, she observed an expert diagnostician save the life of a woman who had been admitted from a different hospital with what turned out to be a wrong diagnosis. Correctly diagnosed and treated, the woman, who had been bed-bound and near death, was able to walk out of the hospital 6 weeks later accompanied by her grandchildren. That transformation remains a vivid, motivating memory for Lucey.

The Rising Tide

Lucey believes that all patients deserve to be treated by an expert diagnostician and that all physicians can be experts. It is a myth, she says, that “expert clinical reasoning is a unique talent, not a universal skill of all physicians.” Rather than focus attention on the most accomplished physicians and gifted students, Lucey equates improving the teaching of clinical reasoning to the rising tide that lifts all boats. Referencing a podcast by Malcolm Gladwell,⁸ she called medicine a “deep bench” sport, saying, “What matters is how good the

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worst diagnostician is.” Everyone will need a good diagnostician at some point; it is a disservice to society not to ensure that all physicians are the best they can be.

Facing the reality of both the intellectual challenge of clinical reasoning and the traditional belief in the need for extraordinary talent, Lucey encourages teachers and learners to adopt a “growth” versus a “fixed” mindset. In a concept developed by psychologist Carol Dweck,⁹ growth and fixed mindsets represent alternative beliefs about innate abilities. A fixed mindset holds that accomplishment and success derive from innate intelligence and talent—a belief that imposes a limitation on an individual’s potential. A fixed mindset, for example, would believe that only the select few

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are destined to become experts in diagnosis or anything else. A growth mindset, on the other hand, puts stock in hard work, attitude, environment, and education. With a growth mindset, there is always room for improvement.

A growth mindset should not be mistaken for an endorsement of mediocrity or equated with low standards. Fearing that her popular book, *Mindset: The New Psychology of Success*,⁸ published in 2006, had been misinterpreted, Dweck explained in 2015 that she didn't intend for the growth mindset to provide meaningless praise or a rationale for complacency:

The growth mindset was intended to help close achievement gaps, not hide them. It is about telling the truth about a student's current achievement and then, together, doing something about it.^{10(np)}

Tools and Techniques for Teaching Clinical Reasoning

Lucey says a technique called “scaffolding” is an effective way to help medical students learn clinical reasoning by providing appropriate supports such as templates, guides, and coaching along the way. As students gain competence and confidence, the scaffold should be adjusted accordingly.

A mentor can help and does not have to be someone with extraordinary knowledge or accomplishments. A mentor for clinical reasoning can be a fourth-year medical student modeling behavior or the thought process for a third-year student. It is also important, Lucey says, to guide students of clinical reasoning with appropriate challenges. Too easy, and the work is boring; too hard, and discouragement may set in.

Lucey also recommends reading and writing as tools for learning, but not when done automatically or casually. “Writing is thinking,” says Lucey, who makes an argument for writing medical notes rather than clicking boxes online, saying, “Thinking

cannot be pulled down from a list.” Reasoning skills can be improved throughout a career and supported with active thinking and reading, as well as by coaching students and colleagues. In general, the more a mind is challenged in a healthy way, the better.

Collaborative Learning for Modern Practice

In a 2013 commentary,¹¹ Lucey attempted to reconcile major improvements in education—competency-based assessment, interactive teaching, simulation training, and more—with persistently poor quality in healthcare delivery. She decided that education focused on outdated goals was the problem:

Medical education targets the same physician model today that we have had since Flexner: the personally expert sovereign physician.... a self-contained clinical microsystem.^{11(pE1)}

Advanced teaching methods will not be effective if they are used in the service of the wrong goals, or, to quote Paul Batalden, MD, “Every system is perfectly designed to get the results it gets.”¹²

The world has changed, and medical education must change accordingly. Patients are more likely to present with complex chronic conditions, less likely to present with discreet, acute diseases for which the sovereign physician was trained. Physicians practice collaboratively, in interprofessional teams, with active input from patients and family members. Although clinical reasoning still originates with individuals, it now takes place in a system, with distractions but also opportunities for help from peers, experts, patients, and decision aids of all kinds.

Cognitive Bias

Cognitive bias—a subconscious deviation from an objective analysis or rational decision—is an example of a dynamic in reasoning that provides opportunities for interprofessional cooperation, as well as for error.

There is debate about how and why to teach physicians the concept of cognitive bias. In her talk at DEM, Lucey explained that although awareness of the effects of cognitive biases is valuable, some people question whether physicians will be able to recognize and correct their own bias-based errors; it's easier to recognize bias in others.¹³ Lucey points out that physicians and others can put their understanding

Principles of cognitive science, similar to effective training for patient safety, drive home lessons in human fallibility and humility.

of cognitive bias to good use by helping each other. People can recognize errors brought on by their colleagues' cognitive biases and provide feedback. That communication must be respectful and skilled, which is another opportunity for training. Because these opportunities for feedback often occur in interprofessional teams, they provide further reason to teach cognitive science, as well as teamwork and communication skills, across different disciplines and professions.

Lucey also pointed out that principles of cognitive science, similar to effective training for patient safety, drive home lessons in human fallibility and humility. They therefore support other efforts to reform medical education for the benefit of all health professionals as well as patients and family members.

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Member Organizations' Commit to Take Action

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plans for the three collective actions, which were developed by preliminary planning committees.

Member organizations periodically submit a status report with details about their individual actions. Status reports filed in late 2016 indicate

Many projects are already underway or in advanced stages of planning.

many projects are already underway or in advanced stages of planning (links are provided where available):

- Johns Hopkins University School of Medicine has established the [Armstrong Institute Center for Diagnostic Excellence](#) to catalyze improvement efforts, develop the science of diagnostic safety, and enhance research in diagnosis.
- Kaiser Permanente has implemented KP SureNet, a systematic surveillance program designed to improve diagnosis and reduce harm, along with other benefits.
- Veterans Health Administration has issued a policy that requires test results to be communicated to patients within 7 calendar days for results requiring action; 14 days for those that do not require follow up.
- The American College of Emergency Physicians will include practice patterns related to improving diagnosis in its Clinical Emergency Data Registry.
- The Institute for Healthcare Improvement (IHI) intends to work with SIDM to develop an “accelerated learning community for diagnostic error,” based on IHI’s collaborative methodology.
- Presentations and workshops about diagnostic safety have been offered or are in development

for annual meetings of various organizations, including the Association of Clinical Scientists, Association of American Medical Colleges, American College of Physicians, and American Association of Nurse Practitioners. Other organizations, including the American Society for Healthcare Risk

Management and the American Academy of Family Physicians, have published articles for their members or hosted webinars.

Some of the individual actions have resulted in materials that are publicly available online:

- The Association of American Medical Colleges published “New Focus in Medical Education on Learning to Recognize Causes of Diagnostic Errors,” in the *AAMCNews*.
- The Leapfrog Group held a Town Hall call about monitoring diagnostic errors and improving diagnostic safety. Slides and a recording of the hour-long call are available on Leapfrog’s [website](#).
- The American Board of Medical Specialties, in partnership with the National Patient Safety Foundation, held a one-day Summit on Certification and Diagnostic Accuracy. A report (available for download as a [PDF](#)) summarizes topics discussed and recommendations made at the summit.

By any standard, 2016 was a successful year. All member organizations have identified actions they are taking to improve diagnosis. The Coalition determined that it would take three collective actions, plans were developed and approved, and the Gordon and Betty Moore Foundation agreed to provide funds to SIDM to support the work of the Coalition. Even more is expected in 2017, as the collective actions are implemented, more organizations join the Coalition, and new individual actions are launched.

Going forward, each issue of *ImproveDx*, SIDM’s bimonthly newsletter, will include coverage of Coalition activities. There will be news of progress on collective actions and updates about individual projects being pursued by Coalition members, including lessons learned. Please contact the editor, [Susan Carr](#), with suggestions for future stories.

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Back issues of *ImproveDx* are archived and available at <http://www.improvediagnosis.org/page/Newsletters>

The *Coalition to Improve Diagnosis*, comprised of leading healthcare organizations, has been established to bring awareness, attention, and action to the problem of diagnostic error. SIDM established and leads the Coalition. To learn more, and to view a list of the Coalition’s 31 members, visit www.DxCoalition.org.

At 5-Year Anniversary, SIDM Welcomes New Staff Members and Looks Ahead

By Paul L. Epner, MBA, MEd
Executive Vice President, SIDM

The Society to Improve Diagnosis in Medicine (SIDM) celebrated its 5-year anniversary in fall 2016. The 2016 Annual Report, distributed at the Diagnostic Error in Medicine conference in Los Angeles in November, told the story of a start-up organization delivering outsized results. The report outlined many accomplishments, from catalyzing the National Academy of Medicine (formerly the Institute of Medicine) report on improving diagnosis to convening the Coalition to Improve Diagnosis, which now includes 31 leading organizations along with government partners.

How do we top last year's results? SIDM's continued growth will depend on expanding our capacity by adding staff. Prior to 2017, I largely ran SIDM's operations, with administrative support from Cori Smith. With the advent of the new year, we have added several new people. I'd like to introduce you to two of them.

Diana Rusz is SIDM's research associate. Diana will lead a Coalition initiative to conduct an environmental scan for all tools, practices, training programs, and any other intervention currently in use and intended to improve diagnosis or reduce harm from diagnostic error. She is also working with the program funded by the Josiah Macy Foundation to develop a consensus curriculum on diagnosis for medical schools. The project is led by SIDM President Mark Graber. Diana provides staff support to SIDM's research, education, and practice improvement committees, as well as to other submitted grant proposals, if funded.

Prior to joining SIDM, Diana was involved in academic cancer research and health education and promotion efforts centered on anti-obesity interventions in inner-city settings. Most recently, she served as a consultant at Health Management Associates. She has a baccalaureate degree in psychology and a master's degree in public health, with a focus on health policy and administration.

Sean Smith is SIDM's director of strategic engagement. In this position, Sean will build and maintain relationships with new and existing partners, with a primary focus on securing funding for SIDM's work. Programmatically, he will work with the Coalition, especially in the collective action on research funding, and will also provide staff support to SIDM's policy and patient engagement committees. Prior to joining SIDM, Sean was a consultant for a number of not-for-profit organizations and was employed in policy and development positions with the Center on Halsted, Edgewater Chamber of Commerce, Museum of Science and Industry, and Howard Brown Health Center.

In the next issue of *ImproveDx*, I will introduce other staff members and, in the June issue, I will share the strategic direction for 2017–2018 as set by the SIDM Board of Directors at their meeting in May. With our talented new resources and the clear strategy established by the board last summer, I am optimistic that 2017 will produce even more growth and greater impact than has been accomplished thus far.

FROM THE FIELD

Multiple Misdiagnoses Based on Inappropriate Use of Genetic Testing

A 13-year-old boy's sudden, unexplained death led to a series of misdiagnoses in his extended family, as reported in an article published in 2016 in *Mayo Clinic Proceedings*¹ and on the CNN website.²

An autopsy performed on the boy did not determine a clear cause of death, and although a sample was available, no post-mortem genetic testing was done. The boy's parents and brother underwent cardiac testing. The surviving brother was diagnosed with familial long QT syndrome (LGTS) and received an implanted defibrillator. He then received genetic testing, which confirmed the diagnosis. It was, therefore, assumed that his brother's death had been caused by LQTS. Genetic testing was performed among the extended family; more than 24 individuals were given a diagnosis of LQTS.

The brother and parents, plus other family members—none of whom displayed clinical symptoms of LQTS—sought a second opinion at Mayo Clinic. Genetic testing of the deceased brother's sample and his parents failed to show evidence of LQT1. The boy's death was then determined to have been caused by a different, non-familial form of heart disease.

Physicians involved with this case at Mayo Clinic found that a molecular autopsy of the brother's death would have supplied crucial information and likely have prevented the epidemic of misdiagnoses in his family. The original physicians treating the boy's family members relied on the interpretation supplied by the genetic testing company, to the exclusion of other test results or physical examination. The authors observe that "Genetic testing is a powerful tool, but it can also be a dangerous weapon. ... More than ever, we must also strive to be wise clinicians who recognize that phenotyping still matters most."^{1(p1615)}

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