

AHRQ Grant Final Progress Report

Title of Project: Diagnostic Error in Medicine Annual Conference

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Diagnostic Error in Medicine Annual Conference Structured Abstract

Purpose: The goal of this conference grant was to further establish the DEM conference as means of increasing the visibility of the field of diagnostic error, engaging a wide range of stakeholders in diagnostic safety, identifying and supporting key research in the field, and promulgating initiatives designed to improve diagnostic reliability.

Scope: The conference convened a significant number of diverse stakeholders, including experts from the fields of nursing, risk management, patient engagement, laboratory medicine, research and clinical medicine. It created significant impact in the fields of clinical medicine, cognitive psychology, patient safety, and patient engagement.

Methods: The conference ran for 2.5 days and was preceded by half-day pre-courses designed to provide intensive instruction and discussion on specific aspects of diagnostic reliability. The main body of the conference consisted of keynote addresses and plenary sessions discussing key factors of diagnostic safety, presentation of research, concurrent sessions designed to appeal to specific stakeholder groups, and small-group workshops aimed to provide participants with means of improving diagnostic reliability.

Results: The conference achieved the stated goals as indicated by multiple parameters. Attendance was robust, with 299 individuals from multiple fields participating, including over 30 researchers in the Research Summit. Attendee feedback was very positive, with a significant majority of attendees noting the conference met the stated goals, will alter practice performance, and will result in improved patient outcomes. Over 45 scientific research abstracts were presented and discussed.

Key Words: diagnostic error, patient engagement, patient safety

Purpose

The goal of this conference grant was to further establish the Diagnostic Error in Medicine (DEM) conference as a mechanism to advance the science of diagnostic error reduction. Specific goals included the following: (1) to further increase the visibility and public awareness of the field of diagnostic error; (2) to make the DEM conference the primary vehicle of developing a national strategic plan to coordinate research, education, collaboration, and action to improve diagnostic safety; (3) to engage an increasing number of stakeholders, including patients, healthcare payers, and risk managers; (4) to develop specific means of measuring diagnostic reliability; and (5) to develop curricular and educational initiatives at all levels of medical education to improve diagnostic reliability.

Scope

Over the past decade, AHRQ has been a strong advocate for increasing understanding of patient safety and has supported the development, evaluation, implementation, and dissemination of strategies to reduce error and harm to patients. Through its sponsorship of the DEM conferences, AHRQ has also been instrumental in bringing the previously neglected topic of diagnostic error into a prominent position in the patient safety world. These nine conferences, running from 2008 through the most recent one supported by this grant in 2016, have successfully engaged increasing numbers of researchers, educators, clinicians, patient advocates and administrators in working to determine the best means of measuring, studying, preventing, and mitigating diagnostic errors.

Background and Context

The Institute of Medicine report “To Err is Human” focused significant attention on the concept of patient safety and significantly altered the manner in which medicine is practiced in the United States.(1) Neither this report, nor the subsequent AHRQ review of useful patient safety practices, “A Critical Analysis of Patient Safety Practices,” however, meaningfully addressed the concept of diagnostic error. (2) As a result, diagnostic error, defined by the Institute of Medicine as ‘the failure to assign an accurate and timely explanation of a patient’s health problems or communicate that explanation to the patient,’(3) and its effect on patients went largely unaddressed over the ensuing decade. The impact of diagnostic error on patients, however, is clear. In the inpatient population, diagnostic errors represent the second largest cause of adverse events, and diagnostic errors are estimated to occur in 5% of all outpatient encounters.(4-6) They may cause 40,000-80,000 hospital deaths annually in the United States alone.(7) The Institute of Medicine additionally has stated that most patients are likely to be subject to a diagnostic error at some point in their lifetimes.(3) The legal and financial repercussions are additionally tremendous. In a review of claims in the National Practitioner Data Bank, diagnostic errors accounted for the greatest number of claims, were most likely to result in death, and had a 25-year claims cost of \$38.8 billion.(8) The true cost of such errors is likely much greater, as this figure does not include expenses associated with unnecessary testing or treating a disorder at a later stage of disease than was possible.

In large part secondary to the DEM conferences and the formation of its sponsoring organization, the Society to Improve Diagnosis in Medicine, there has been increasing attention paid to the impact of diagnostic errors on patients. Yet, much remains unknown as to the best way in which to identify, measure, and prevent these errors. Although progress has been made, methods of measuring error rates are still being developed, and relatively few interventions have been identified that unequivocally decrease the incidence or impact of these errors.(9, 10) Diagnostic errors are often multifactorial in etiology, and contributors may include systems- and clinician-based factors as diverse as the cognitive functioning of the clinician, the workflow of a specific clinical setting, test availability, and patient characteristics.(11, 12)

A crucial function of the DEM conference is to bring together experts from a diverse array of fields to set the research agenda and identify potential means of ameliorating the problem. By convening experts in human factors, cognitive science, education, research methodology, clinical medicine, risk management, laboratory medicine, and patient advocacy, a multidisciplinary but cohesive plan of study and action may be planned and pursued. The conference also serves the crucial function of identifying and inspiring junior investigators with the interest and budding expertise to contribute to the field in the future. Current experts are spread across a great geographic area, and the conference additionally facilitates access to potential mentors for these junior investigators.

Background and Context Reference List

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Setting:

The 2016 DEM Conference was held in Los Angeles, California. The overriding goal of the conference was to improve patient safety by improving diagnostic reliability, by reducing the likelihood of and mitigating the effects of diagnostic error. The specific goals of the conference included the following:

- (1) to further increase the visibility and public awareness of the field of diagnostic error;

- (2) to make the DEM conference the primary vehicle of developing a national strategic plan to coordinate research, education, collaboration, and action to improve diagnostic safety;
- (3) to engage an increasing number of stakeholders including patients, healthcare payers, and risk managers;
- (4) to develop specific means of measuring diagnostic reliability; and
- (5) to develop curricular and educational initiatives at all levels of medical education to improve diagnostic reliability.

Participants:

Conference planning was largely completed by a multidisciplinary planning committee with representation from clinicians, diagnostic error researchers, liability insurers, and patient safety experts. Members of the 2016 Planning Committee were:

- Robert L. Trowbridge, MD, Maine Medical Center and Tufts University School of Medicine
- Paul L. Epner, MEd, MBA, Executive Vice President, Society to Improve Diagnosis in Medicine
- Hardeep Singh, MD, MPH, Baylor College of Medicine
- Mark L. Graber, MD, President, Society to Improve Diagnosis in Medicine
- P. Divya Parikh, MPH, Physician Insurers Association of America (PIAA)
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- Urmimala Sarkar, MD, MPH, University of California, San Francisco
- William Strull, MD, The Permanente Foundation

Methods

The conference served as the means of meeting the objectives of the grant.

Conference Overview: The conference had programming that was approved for 22.5 AMA PRA Category 1 Credits™ through LAMMICO.

Keynote Speakers: Brian Goldman, MD, and Catherine Lucey, MD

Pre-Conference Sessions

- Research Summit (invitation only)
- Patient Summit: Culture, Communication and Diagnostic Error "What Else Could It Be?"
- Short Course: Establishing a Learning Sciences-based Understanding of the Cognitive Factors Influencing the Development of Diagnostic Capabilities
- Short Course: Cognitive Psychology of Diagnostic Error
- Short Course: Introduction to Diagnostic Error
- Short Course: A Workshop on Reducing Diagnostic Error in Clinical Settings

Day 1 Sessions

- Keynote: The Role of Medical Culture in Diagnostic Error
- Keynote Panel: Discussion of the Role of Medical Culture in Diagnostic Error
- Oral Abstract Plenary: Presentation of Top-ranked Submitted Research Abstracts
- Research Poster Sessions and Networking Session

Day 2 Sessions

- Keynote: The Role of Medical Education in Decreasing Diagnostic Error
- Keynote Panel: Discussion of the Role of Medical Education in Decreasing Diagnostic Error
- Plenary Presentation: Purchaser and Consumer Perspectives on Improving Diagnosis
- Panel Discussion: How Payers and Patients Can Improve Diagnostic Performance
- Technology Plenary: Diagnostic Technology and Medical Education
- Plenary Presentation: How the heck did I miss that? The Human Search Engine and Medical Image Perception
- Concurrent Sessions:
 - The PIAA Medical Professional Liability Perspective: Improving Diagnosis and Patient Outcomes
 - Oral Presentation of Research Abstracts
 - Oral Presentation of Practice Improvement Innovation Abstracts
- Networking Dinners: Meet the Professor

Day 3 Sessions

- Concurrent Workshops (Attendees participated in two of four workshops)
 - Engaging Your Administration in Diagnostic Error
 - The Cognitive Psychology of Diagnostic Error
 - The Art of Uncertainty: Unlocking its Tools and Diagnostic Potentials with Visual Arts
 - Ambulatory Morbidity and Mortality Conferences: Teaching Diagnostic Reasoning and Fostering a Culture of Safety
- Plenary Presentation: Patients and Clinicians Collaborating on the Medical Note: National Expert Interviews on OpenNotes
- Plenary Presentation: Computerized Decision Support for Rare Diseases: What We Learned From Ebola
- Plenary Panel Discussion: Assessing for Accuracy: Certification's Role in Improving Diagnosis
- Plenary Presentation: Diagnostic Error and Clinical Reasoning Case Presentation
- Closing Remarks: From IOM to Action

Results

Principal Findings/Outcomes

The Diagnostic Error in Medicine Conference was held October 6-8, 2016, in Los Angeles, CA. Overall, the conference went as planned, with few logistical issues and strong attendance. As the result of significant efforts on the part of the Planning Committee, travel costs were lower than expected, and there were no significant cost over runs. A meeting management company was again contracted to help with meeting logistics and planning. This relationship has now been in place for several years, and the logistics of the conference were well managed, with no significant issues arising.

Attendance for the conference was robust, with the pre-conference workshops, the invitational summits, and the main body of the conference all showing excellent and diverse attendance.

- There were four pre-conference short courses that in total drew 178 attendees.
- The main conference had 299 attendees. Attendees represented a wide array of stakeholder groups, including nurses, risk managers, laboratory specialists, pharmacists, informaticians, researchers, patient advocates, and physicians. At least 12 specialties of medicine were represented.
- Five research abstracts were presented in the Oral Abstracts of Current Research plenary session, with an additional 15 abstracts presented during the Oral Abstracts of Current Research and Oral Abstracts of Current Practice Improvement Strategies sessions. In total, 29 scientific research abstracts were displayed and discussed at the research poster sessions.
- The invitational research summit was well attended, with over 30 researchers participating. The Society to Improve Diagnosis in Medicine Fellows in Diagnostic Medicine played a central role in the planning and execution of the Summit.

Requests for evaluation of the conference and content were sent to each conference attendee at the end of each day of the conference as well as at the conclusion of the conference. The importance of completing these evaluations was stressed regularly during the conference itself, and multiple requests were sent; 54 evaluation of the full conference were completed. An additional 57 evaluations of the individual conference days were received.

The available evaluation data was overwhelmingly positive. A significant majority of attendees agreed or strongly agreed with the following statements:

- The content presented addressed the stated objectives and outcomes. (93%)
- The program provided me with relevant and educational information that can be applied to my practice. (93%)
- The program will result in improved patient outcomes. (79%)
- Participating in the program will alter my practice performance. (85%)
- The content was objective and balanced. (91%)

Of note, the above percentages likely underestimate the number of positive evaluations. Several attendees submitted “Strongly Disagree” in response to all of the above statements but then wrote positive comments in the free-text parts of the survey. It is likely that these attendees erroneously clicked “Strongly Disagree” when attempting to “Strongly Agree” with the statements. Finally, over 95% of the participants who completed the evaluation form would recommend the conference to colleagues.

Evaluation of the individual sessions was similarly positive. The below percentages of evaluators agreed or strongly agreed with the following statements in regard to the individual sessions:

The content presented was up to date and evidence based.	93%
The content was presented in a balanced manner.	93.3%
My knowledge of diagnostic error was increased as a result of this activity .	87.9%
I will apply the information learned in this session to my practice .	84.8%

Phone and in-person debriefing sessions were held with the Planning Committee members and individual attendees representing various stakeholder groups. Overall, this feedback was very positive as well, and all felt that the goals of the conference were in large part achieved. Several areas for improvement were noted.

Specifically the theme of teamwork, one that was emphasized in the Institute of Medicine report on Diagnostic Error, was thought to be under-represented in the conference content. In addition, it was suggested that there should be increased outreach to several stakeholder groups to improve attendance and broaden the scope of the conference.

Discussion

There were several notable shifts in the structure of the 2016 conference compared to the previous conferences. The formation of the Coalition to Improve Diagnosis by the sponsoring Society to Improve Diagnosis in Medicine resulted in increased engagement in the conference by groups such as the American Board of Medical Specialties and the Leapfrog Group. These entities participated in the planning and delivery of conference sessions, substantially increasing their commitment to and visibility in efforts to improve diagnostic reliability. A second shift, as indicated by the theme of the conference (“From IOM to Action”), consisted of increased content designed to allow attendees to learn about and subsequently implement at their home institutions interventions that are expected to improve diagnostic reliability. The workshop format of the conference facilitated this shift, and it is expected this format will continue if not expand in future conferences.

A significant accomplishment of the conference was the involvement of the Society to Improve Diagnosis in Medicine Fellows in Diagnostic Medicine. The three inaugural fellows were engaged in the conference planning, presented their research projects at the Research Summit, and successfully connected with a wide group of researchers, stakeholders, and potential collaborators. The goal of the Fellowship program is to identify and nurture future leaders in the field of diagnostic safety, and the fellows’ participation in the conference represented significant progress toward achieving this objective. Their participation additionally contributed to advancing one of the major conference goals, specifically, growing the community of individuals committed to addressing diagnostic quality and safety.

Despite the clear successes of the conference, there are several areas where improvement is necessary. The number of completed evaluations, though enough to provide a good sense of overall impressions of the conference on the part of attendees, will need to be improved for future conferences. It is clear that neither paper evaluations nor the daily electronic evaluations alone resulted in exemplary completion rates. This has been a persistent issue with past conferences, and the Planning Committee is anticipating implementing an even more assertive evaluation approach for the next conferences, including definitively linking continuing education credit to evaluation submission and a multimodality, real-time evaluation process. It is likely this will include multiple means of completing evaluations, including paper evaluations, Q-code accessible real-time evaluations, and electronic surveys.

The Planning Committee also recognized that the issue of teamwork was insufficiently covered at the 2016 conference, and it will be strongly emphasized at the 2017 conference. Although planning for this conference is currently in early stages, it is anticipated that “teamwork in diagnosis” will be the major theme of the conference. Similarly, achieving wider stakeholder involvement will be a priority for future conferences. The Planning Committee will be expanded to include specific under-represented stakeholder groups, and specific actions will be taken to improve attendance among these groups.

Based on the above feedback, the Planning Committee is comfortable that the conference was a success and met both the objectives of the conference and the needs of the attendees. The planning committee plans several refinements for future conferences, including implementing a more rigorous conference evaluation program, focusing on teamwork in diagnosis as a theme, and expanding outreach to under-represented stakeholder groups.

Publications and Products (it is expected that further publications will result at a later date)

1. Abstracts of the 9th International Conference on Diagnostic Error in Medicine; Diagnosis. Available ahead of print at: <https://www.degruyter.com/view/j/dx.ahead-of-print/dx-2016-0037/dx-2016-0037.xml?format=INT>