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Diagnostic Safety: Needs Assessment and Informed Curriculum at an Academic Children's Hospital

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ABSTRACT

Background: Diagnostic excellence is central to healthcare quality and safety. Prior literature identified a lack of psychological safety and time as barriers to diagnostic reasoning education. We performed a needs assessment to inform the development of diagnostic safety education. **Methods:** To evaluate existing educational programming and identify opportunities for content delivery, surveys were emailed to 155 interprofessional educational leaders and 627 clinicians at our hospital. Educational leaders and learners were invited to participate in focus groups to further explore beliefs, perceptions, and recommendations about diagnostic reasoning. The study team analyzed data using directed content analysis to identify themes. **Results:** Of the 57 education leaders who responded to our survey, only 2 (5%) reported having formal training on diagnostic reasoning in their respective departments. The learner survey had a response rate of 47% (293/627). Learners expressed discomfort discussing diagnostic uncertainty and preferred case-based discussions and bedside learning as avenues for learning about the topic. Focus groups, including 7 educators and 16 learners, identified the following as necessary precursors to effective teaching about diagnostic safety: (1) faculty development, (2) institutional culture change, and (3) improved reporting of missed diagnoses. Participants preferred mandatory sessions integrated into existing educational programs. **Conclusions:** Our needs assessment identified a broad interest in education regarding medical diagnosis and potential barriers to implementation. Respondents highlighted the need to develop communication skills regarding diagnostic errors and uncertainty across professions and care areas. Study findings informed a pilot diagnostic reasoning curriculum for faculty and trainees. *(Pediatr Qual Saf 2024;9:e773; doi: 10.1097/pq9.0000000000000773; Published online October 21, 2024.)*

INTRODUCTION

Diagnostic errors are a significant cause of patient harm,[1,2] and diagnostic excellence[3] has emerged as an important domain of quality and safety.[2,4,5] The Joint Commission has identified education about diagnostic principles as a critical strategy for mitigating diagnostic harm related to cognitive bias.[6] The way clinicians learn about, discuss, and collaborate around diagnostic reasoning is vital to cultivating a health-systems approach to patient safety.[7]

Prior research describing diagnostic reasoning education efforts has highlighted common barriers to meaningful participation, including discomfort

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communicating diagnostic uncertainty,[8] concerns about psychological safety when discussing diagnostic error,[7] and lack of dedicated time for curricula.[9] This study explored common barriers to diagnostic excellence at a single institution and sought to identify strategies to overcome those barriers by conducting a formal, comprehensive needs assessment.

As part of an institution-wide effort to achieve diagnostic excellence, the study team took on the task of (1) assessing baseline knowledge and safety behaviors related to diagnostic reasoning and error reporting and (2) determining the needs for diagnostic improvement efforts among stakeholders. In keeping with Kern's stepwise model for curriculum development,[10] the study team performed an interprofessional needs assessment to ground the development of a formal diagnostic reasoning curriculum across the hospital. Although the authors have taught ad hoc sessions pertinent to diagnostic reasoning in various forums in the past, the study team sought to develop a comprehensive, longitudinal curriculum for implementation across care areas and specialties. The specific objectives were to (1) identify educational sessions or resources relevant to diagnosis that the study team was previously unaware of, (2) gather stakeholder feedback on best practices for implementation of a new curriculum, (3) assess baseline understanding of established diagnostic reasoning principles, (4) characterize learners' priorities regarding content and modality preferences, and (5) use the findings to inform greater patient safety efforts across the institution.

METHODS

Study Site

This study occurred at a freestanding, 600-bed urban children's hospital in the American Northeast associated with a large medical school and a pediatric residency program. Before initiating the needs assessment, there were 2 ad hoc educational sessions at the institution for pediatric residents on diagnostic reasoning: an optional diagnostic reasoning elective and a 1-hour clinical informatics clinical reasoning simulation session.[11] The study team performed a literature review before the needs assessment to ground the study in needs assessment methodology[12] and to learn about existing curricula at other institutions.[9] The study team conducted the needs assessment from November 2021 to February 2022.

Study Population

Acknowledging the imperative of improving diagnostic decision-making across the learning continuum, the needs assessment targeted multiple stakeholder groups (Table 1). The needs assessment aimed to inform the development of a curriculum for physicians, graduate medical education (GME) physician trainees, and advanced practice providers (APPs) to ultimately expand to other health professions. To this end, input from nursing leadership also informed portions of the study data.

Table 1. Stakeholder Groups Included in the Needs Assessment

Stakeholder groups included in the needs assessment
(1) Division-level fellowship program directors and division-level education directors (eg, rotation directors)*
(2) Departmental-level educational leaders (eg, vice and associate chairs for education)*
(3) Institution-level educational leaders (including the designated institutional official)*
(4) Pediatric residency program directors*
(5) Unit-level APP leaders*
(6) Departmental safety officers*
(7) GME quality improvement educational leaders*
(8) Physician trainees (residents and fellows)
(9) Attending physicians and APPs

*These stakeholders were classified as educational leaders for the purpose of this study.

Sampling Approach

We chose a broad sampling approach to maximize the heterogeneity of opinions and experiences. The study population included all education leaders, all GME learners (residents and fellowship trainees) at the institution, and attending physicians and APPs from the two identified care areas with the intended implementation of the postneeds assessment pilot curriculum. The team collected data via anonymous surveys and opt-in focus groups to increase the diversity and trustworthiness of study findings. This dual approach allowed for broad sampling across the institution and more in-depth stakeholder insights through focus groups.

Sampling Method

The team emailed survey invitations to 155 educational leaders (program directors and additional stakeholder groups described in Table 1), 482 GME learners, 105 practicing attending physicians, and 40 APPs using each group's respective listserv distribution lists. Focus group invitations were sent using these same listservs. The listservs utilized for study sampling included diverse representatives from varied care areas, service lines, and learner groups, allowing for sampling with intentional redundancy in anticipation of challenges with response rate and variation in participation.

Surveys

The first portion of the needs assessment consisted of two survey instruments. The first was an anonymous survey sent to educational leaders (N = 155) that focused on (1) identifying existing curricula on diagnostic reasoning and (2) gathering stakeholder feedback on best practices for implementation of the curriculum. (**See Appendix I, Supplemental Digital Content 1,** which describes diagnostic reasoning educator survey, **http://links.lww.com/PQ9/A605**.) The second anonymous survey was sent to potential targets of a new curriculum (N = 627) to assess their baseline understanding of core diagnostic reasoning principles, including the diagnostic process, cognitive bias and avoidance strategies, and communication

practices that support diagnostic fidelity. (**See Appendix II, Supplemental Digital Content 2,** which describes diagnostic reasoning learner survey, **http://links.lww.com/PQ9/A606**.) Survey items consisted of Likert-type questions to assess degrees of understanding or agreement and open-ended questions to allow for free-text comments. Together, these 2 surveys provided an assessment not only of whether a new curriculum was needed at the institution but also what this curriculum should look like (content) and how it should be delivered [modality(ies)].

One improvement specialist (D.C.) and 3 physicians (I.R.R., R.J.S., and A.K.W.) experienced in GME leadership, diagnostic reasoning, and survey design developed the survey. They used the dual-process theory of clinical reasoning[13] and previously published educational strategies on teaching diagnostic reasoning[14,15] to ground survey development. Before broad distribution, the study team piloted the survey with an interprofessional group with a demonstrated interest in diagnostic excellence to ensure its usability and comprehensibility. Two study team members (M.C. and R.L.T.) analyzed the quantitative survey results using descriptive statistics; the full study team then reviewed the free-text comments for themes.

Focus Groups

The study team conducted focus groups with education leaders and learners to explore their beliefs, perceptions, and recommendations regarding diagnostic education. Although the questions were the same for all focus groups, education leaders and learners were grouped separately to enhance the psychological safety of all participants. Facilitators shared a widely accepted definition of clinical reasoning with participants at the beginning of the session to establish a shared mental model of the topic under discussion. Focus group prompts included: *What are you already doing in diagnostic reasoning education? What do you think clinicians should learn about diagnostic reasoning? How do you think a curriculum on diagnostic reasoning should be implemented?* (**See Appendix III, Supplemental Digital Content 3, http://links.lww.com/PQ9/A607**.). Five focus groups of 3–6 participants each were conducted over 3 weeks by pairs of 4 physicians (including A.C., R.J.S., and A.K.W.) and a qualitative research scientist; an improvement specialist (D.C.) was also present during each focus group to take detailed notes, omitting names of participants to protect confidentiality. Session notes were analyzed using directed content analysis for themes and participant opinions on diagnostic education. Multiple study team members (M.C., R.L.T., D.C., and A.K.W.) analyzed the qualitative data and reviewed transcript content to ensure agreement about embedded themes and thematic patterns. No new themes emerged after the fifth focus group.

Barriers to curriculum implementation were elicited in both focus groups and narrative comments from survey data. In the analysis of themes, specific barriers were delineated. The study team then assigned relative weights based on prior experience in quality improvement education and the frequency/salience of the themes within the data.

Ethics

This study was deemed exempt from review by the hospital's institutional review board.

RESULTS

Surveys

Educational Leadership Survey

Educational leaders completed 57 surveys (response rate 37%). Survey respondents included GME program directors (20, 39%), nursing educational leaders (12, 23%), APP managers (10, 19%), patient safety champions (5, 10%), and department-level educational leaders (4, 8%). Educators who completed the survey reported having direct engagement with the following learner groups: fellow physicians (30, 58% of respondents), resident physicians (26, 50%), nurses (23, 44%), APPs (22, 42%), nurse residents (11, 21%), and attending physicians (8, 15%).

Regarding formal teaching about diagnosis, 73% of respondents reported discussing diagnostic reasoning informally with their learners, whereas only 5% believed it was included in their formal curricula. Any curricular content already in place (formal or informal) related to diagnostic reasoning as reported by educators can be found in Table 2. More than half of educators (63%–84%) reported that important diagnostic decision-making topics (eg, awareness of cognitive errors and diagnostic uncertainty) were not being taught to learners in their care areas. Similarly, in most care areas, educators reported that learners were not receiving education about diagnostic error avoidance strategies (eg, shared decision-making with patients/families) or reporting methods.

Learner Survey

A total of 293 of 627 learners completed the survey (response rate 47%). Detailed demographics of survey respondents are shown in Table 3, and learners' survey responses about diagnostic reasoning, cognitive error, and communication during clinical encounters can be found in Table 4. Most learners (98%) reported they were always or often capable of gathering pertinent data related to diagnostic decision-making and were aware of potential cognitive biases. Learners reported feeling able to communicate within their clinical teams about diagnostic uncertainty (76%) but less capable regarding missed diagnoses (53%). Learners reported being less able to speak to patients and families about diagnostic uncertainty (62%) and missed diagnoses (36%). When asked about their preferred learning modes, learners preferred case-based discussions and bedside learning over other forms of synchronous content delivery, with didactic lectures being the least preferred. Respondents preferred asynchronous modalities, such as podcasts, videos, and

Table 2. Educator Survey; Description of Existing Clinical Reasoning Learning Activities (n = 57)

We would like to learn more about existing curricular content in the realm of clinical reasoning. Please indicate whether your care area or learner group receives teaching about the following:	**Yes**	**No**	**Do Not Know/ Not Sure**
Common causes of cognitive error in clinical reasoning	15 (35%)	26 (60%)	2 (5%)
Common types of cognitive error in clinical reasoning. Examples of cognitive error include: ascertainment bias, base rate neglect, anchoring, and confirmation bias	16 (37%)	25 (58%)	2 (5%)
Heuristics (eg, "mental shortcuts") in clinical reasoning	11 (26%)	28 (65%)	4 (9%)
System 1 and system 2 thinking in clinical reasoning	7 (16%)	28 (65%)	8 (19%)
The role of uncertainty in clinical reasoning	17 (40%)	23 (54%)	3 (7%)
Strategies for formulating a differential diagnosis (eg, diagnostic schema and illness scripts)	17 (39%)	24 (56%)	2 (5%)
Methods of reducing cognitive error	13 (31%)	25 (60%)	4 (9%)
Shared decision-making with patients/families as a means to reduce diagnostic errors	20 (48%)	20 (48%)	2 (5%)
Giving feedback on a diagnostic error	13 (31%)	25 (60%)	4 (9%)
Receiving feedback on a diagnostic error	14 (33%)	24 (57%)	4 (10%)
Diagnostic error reporting	12 (29%)	27 (64%)	3 (7%)
Discussion of diagnostic errors during peer review	15 (36%)	24 (57%)	3 (7%)

interactive online modules, rather than assigned readings. As one learner stated, "*If using online modules, please make them engaging, interactive, and realistic...Too often online modules are basically just a PowerPoint.*" Another learner shared, "*More hands-on learning whenever possible especially sim[ulation]s! Didactics are most often used, but [are] least helpful.*"

Table 3. Learner Survey: Demographics (n = 293)

Department	**n (%)**
Pediatrics	267 (91)
Anesthesiology and critical care	10 (3)
Child psychiatry	6 (2)
Surgery	5 (2)
Radiology	4 (1)
Pathology	1 (<1)
Bioinformatics	1 (<1)
Patient care area*	
Inpatient medical services (including intensive care units)	202 (69)
Emergency department	166 (57)
Outpatient clinics	142 (48)
Inpatient consultation services	91 (31)
Operating rooms	17 (6)
Sedation unit	11 (4)
Interventional or cardiology suite	10 (3)
Other	5 (2)
Radiology reading room	4 (1)
Laboratory	1 (<1)
Role	
Attending physician	95 (32)
Resident physician	88 (30)
Fellow physician	88 (30)
APP	22 (8)
Years of practice for attending physicians	
0–5	37 (39)
6–15	34 (36)
More than 15	24 (25)
Years of practice for APPs	
0–5	10 (46)
6–15	7 (32)
More than 15	5 (23)
Resident physician year of training	
PGY-1	27 (31)
PGY-2	29 (33)
PGY-3	27 (31)
PGY-4	5 (6)
Fellow physician year of training	
PGY-4	25 (28)
PGY-5	24 (27)
PGY-6	27 (31)
PGY-7	8 (9)
PGY-8 or above	4 (5)

*Data are not mutually exclusive as respondents may work across multiple care areas, and percentages may not equal 100%.
PGY, postgraduate year.

Focus Groups

Focus Group Findings from Education Leaders

Several pertinent themes emerged from education leaders in the focus groups (Table 5). Educator participants represented perspectives from emergency medicine and hospital medicine, pediatric subspecialists, and interdisciplinary consult services (eg, complex care and palliative care). Educators noted that successful teaching about diagnosis requires significant effort aimed at faculty development and culture change around the communication of diagnostic uncertainty both to patients and clinical team members. Many educators reported that they had not received training in diagnostic reasoning yet noted that they were expected to teach this content. They identified challenges in assessing learner competence in diagnostic reasoning, especially in written documentation. Educators also underscored the mechanisms for reporting and discussing diagnostic errors as foundational to any curricular implementation.

Focus Group Findings from Learners

Multiple additional themes were identified in the focus groups from learners (Table 5). Learners preferred sessions delivered synchronously and asynchronously and integrated into existing educational programming. Learners identified the need for greater communication about diagnostic uncertainty within clinical teams and the need for shared terminology relating to cognitive errors and the diagnostic reasoning process. Learners talked about the importance of incorporating real-time diagnostic teaching (ie, on clinical rounds) and that faculty role modeling of diagnostic reasoning skills is essential. Learners advocated for curricular content that includes practical strategies for avoiding diagnostic errors. Finally, learners discussed the need to adopt new practices to enhance communication of diagnostic uncertainty, such as diagnostic time outs, diagnostic checklists, and clinical decision support that can be built into the electronic health record.

Table 4. Learner Survey: Description of Current Practice Related to Clinical Reasoning (n = 293)

Please complete the following statements about diagnostic reasoning and cognitive error. During clinical encounters, I am able to:	Never	Rarely	Sometimes	Often	Always
Gather pertinent data (eg, history, examination, selecting laboratory results) to support making a diagnosis	2 (1%)	1 (0.5%)	3 (1%)	102 (39%)	155 (59%)
Be aware of my personal cognitive tendencies that may lead me to an incorrect diagnosis	1 (0.5%)	5 (2%)	114 (43%)	128 (49%)	15 (6%)
Avoid cognitive tendencies that may lead me to incorrect diagnosis	1 (0.5%)	7 (3%)	131 (50%)	115 (44%)	9 (3%)
Select the most likely diagnosis in the setting of multiple possibilities	1 (0.5%)	2 (1%)	33 (12%)	205 (78%)	22 (8%)
Assess the risk/benefit tradeoff of various diagnostic tests in the setting of diagnostic uncertainty	1 (0.5%)	5 (2%)	60 (23%)	158 (60%)	39 (15%)
Communicate my differential diagnosis (including leading diagnosis and alternate possibilities) to my clinical team	2 (1%)	1 (0.5%)	12 (5%)	160 (64%)	77 (31%)
Communicate my degree of diagnostic uncertainty to my clinical team while having them maintain their confidence in me	1 (0.5%)	6 (2%)	52 (21%)	155 (61%)	38 (15%)
Communicate my degree of diagnostic uncertainty to a patient and family while having them maintain their confidence in me	1 (0.5%)	4 (2%)	91 (36%)	135 (54%)	21 (8%)
Communicate about diagnoses I have missed to my clinical team	1 (0.5%)	16 (6%)	101 (40%)	103 (41%)	31 (12%)
Communicate about diagnoses I have missed to a patient and family	7 (3%)	44 (17%)	110 (44%)	64 (25%)	27 (11%)

Table 5. Learner and Educator Focus Group Themes and Exemplary Quotes

Theme	Quote
Educators	
Synchronous and asynchronous sessions	"I want a curriculum with back and forth, with feedback. Likes the podcast and providing a case to prepare for mentally in advance. Lost that factor with the asynchronous modules...Nice to have a case associated with the examples, it sticks more that way. Simulations would also be helpful."
Integrated into existing curriculum, time constraints	"As a resident, it would be most optimal to be integrated into curriculum in some way such as morning report or noon conference. I think you have to think about replacing things given busyness and ability to send."
Culture change (eg, diagnostic huddles, diagnostic "time out")	"A lot of pressure on residents to put your 'money' on something as a way to show that you understand what is going on, but it is not the best thing for the patient or for their thinking"
Mandatory	"I think everyone should be learning about this by principle and things don't happen unless they are mandatory"
Barriers to discussing diagnostic uncertainty	"[There are] fundamental issues on how it is difficult to address diagnostic uncertainty, medical school says A + B + C = diagnosis and that = this therapy. We don't have the vocabulary to discuss diagnostic uncertainty and it has never been talked about in the hospital"
Faculty development and role modeling	"Buy-in is going to be hard, so the best way to hear about these concepts is from your attending." "Faculty should make sure that they understand it first so that they can support students and it's mandatory. Faculty may not all understand these skills making it difficult to discuss."
Learners	
Case-based, frequent reinforcement	"Case based. Either asynchronous or small longitudinal events so it is able to be repeated. One lecture wouldn't help as much."
Create a celebration/recognition culture for reporting diagnostic errors	"If you can't report safety events, how will you feel comfortable/safe reporting smaller diagnostic error? There is a general less safety culture and near misses are shunned instead of celebrated. Lack of empowerment to report errors from all parties, in addition to the time delay when errors are reported."
Give learners permission and time (make this a priority for them)	"Evaluating for can't miss diagnoses, pause for alternate diagnoses, if other members of the team are seeing something that aren't consistent (tough conversations!) making space and time for clinicians to talk about these things"
Limitations of electronic health record documentation in representing diagnostic reasoning	"It is really challenging to figure out what is happening to patients. It's harder to find what the thinking was, it doesn't match, it frightens me because the ability to go back and read the chart and understand how people thought is almost absent in some places."
Many faculty members may themselves need training	"Faculty should make sure that they understand it first so that they can support students and it's mandatory. Faculty may not all understand these skills making it difficult to discuss."

Barriers to Curriculum Implementation

The 3 most salient barriers to the implementation of the curriculum identified in both focus groups and survey comments were faculty development, confidence (ie, related to communication of diagnostic uncertainty and error), and culture change. The salience of these themes and additional barriers are shown in Figure 1.

DISCUSSION

Through an institution-wide needs assessment, we identified limited pre-existing formal education in diagnosis but broad interest in expanding this content across practice areas. Both learners and educators from multiple stakeholder groups perceived a need to enhance communication skills related to diagnostic uncertainty and improve error reporting systems. Participants identified a gap in faculty development about diagnostic reasoning and uncertainty.

Learners reported confidence in their skills pertinent to the entire diagnostic process[16] (ie, skills beyond labeling the correct diagnosis), including data gathering, testing, and communication of a differential diagnosis. At the same time, they lacked confidence in their ability

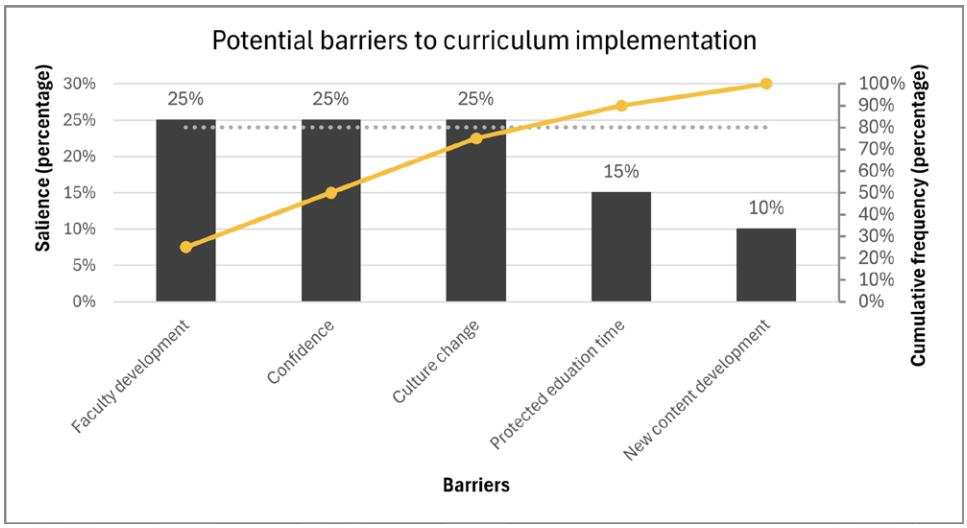

Fig. 1. Pareto chart of potential barriers to implementation of the curriculum.

to communicate diagnostic errors or uncertainty with patients and clinical teams. Our findings align with recent work around the concept of uncertainty in medicine and with guidelines for skill development in communicating uncertainty.[8,17,18] Prior educational tools have been developed to help conceptualize diagnostic uncertainty with trainees,[19,20] but less is known about best practices for developing skills to facilitate trainees' engagement in these conversations with colleagues and families.[21] Importantly, there are opportunities to restructure our educational services to allow trainees to spend more time with patients and families[22] and engage patients in the co-design of education to heighten both the salience and the utility of education.

Our qualitative analysis revealed participants' desire for more normalized and routine communication about diagnostic errors. Our findings align with the work done by Grubenhoff et al,[23] who found that clinicians were less comfortable discussing diagnostic errors than medical errors, due to being portrayed as "bad" clinicians. Additional work by Giardina et al[7] described the importance of promoting psychological safety surrounding reporting and learning from diagnostic errors. One possible concrete outcome of our study could be to build reporting systems[24] to share "good catches" or "diagnostic learning opportunities,"[25] focusing on drivers of diagnostic excellence.[26,27] By fostering discussion around diagnosis, there is potential for positive impact at the patient, provider, and systems levels.[28] Creating a psychologically safe, learning-oriented health system is fundamental to both faculty development and improving diagnostic outcomes for patients.[29]

Based on our findings from the needs assessment, we have developed a diagnostic reasoning curriculum for learners and educators. We are piloting this curriculum in the Divisions of Pediatric Hospital Medicine and Pediatric Emergency Medicine and our pediatric residency program.

Pragmatic Next Steps: what Should Diagnostic Reasoning Education Look Like, and How Do We Measure It?

Our 3-part curriculum consists of content about: (1) metacognition, cognitive bias, and strategies to avoid cognitive biases; (2) terminology and overview of the diagnostic process, diagnostic uncertainty, and diagnostic overshadowing; and (3) communication, implicit bias, and equity related to diagnosis. Key features of the curriculum include asynchronous resources (eg, podcasts) and live synchronous sessions. We have the following plan to address potential barriers to our curriculum and measure its impact:

1. **Faculty development** - develop a pilot curriculum. Our curriculum seeks to build capacity among educators/clinicians. We plan to reach two divisions each year. We will track the number of participants for each session and the level of learner (ie, medical students, residents, fellows, APPs, attendings) to ensure appropriate reach across faculty.
2. **Confidence** - leverage experiential learning activities such as simulation and case-based discussions to focus on developing communication skills. Delivering this content will allow for the development of a shared vocabulary around diagnosis and uncertainty. The postsession survey will assess gain in confidence. We will also institute meetings with stakeholders to evaluate uptake and learner confidence as a measure of the overall success of our curriculum.
3. **Culture change** - increase dialogue around diagnosis during regularly scheduled education forums. In response to the Agency for Healthcare Research and Quality's systematic review of diagnostic errors in emergency department settings, Edlow and Pronovost[30] suggest increasing transparency

regarding errors and discussing them in real-time. We have trained physicians in every division in the use of SaferDx,[31] a widely adopted instrument designed to operationalize evaluation for the presence of missed opportunities for diagnostic excellence.[31,32] It is challenging to evaluate culture change, but broad dissemination of expertise is one approach we are taking to foster a learning environment of diagnostic excellence.

We will track missed opportunities for diagnostic excellence over time using a data capture tool (REDCap[33]). Using a QR code, clinicians can submit cases for review by interprofessional team members.[31] One important caveat is that our goal is to increase awareness about error reporting systems and, therefore, any increase in case reporting may not represent an actual increase in error but rather a thriving safety culture.

4. **Protected education time** - work with stakeholders to identify existing education for synchronous content delivery. The curriculum will be delivered during 1-hour faculty division meetings, noon conferences for the residency program, and orientation sessions for APPs.
5. **Development of new content** - adapt curriculum content for institution-wide and division-specific morbidity and mortality conferences for "just-in-time" teaching related to patient safety events. These sessions accompany diagnostic-focused case reviews (ie, via SaferDx[31]) because understanding that diagnostic safety is a domain of *system* performance (rather than individual competence) is a necessary precursor to improvement-focused analysis. Offering this content proactively and responsively is crucial, given the identified gaps in faculty knowledge and the desire for culture change.

We envision future curricular development as iterative, incorporating stakeholder input and considering diverse care areas and interprofessional audiences.

Limitations

Our study findings should be contextualized within potential limitations. There was only a moderate overall participation rate with an associated risk of selection or participation bias. Although our intentional oversampling of educational leaders makes it unlikely that there are unidentified existing diagnostic educational options at our institution, there may be additional pre-existing curricular content of which we are still unaware. Recent institution-wide recognition of the importance of diagnostic excellence may also have impacted study findings. Finally, this was a single-site study at a pediatric institution, which could further limit generalizability. However, the comprehensive nature of our needs assessment allowed for input across levels of training, health profession, and subspecialty.

CONCLUSIONS

Informed from an institution-wide needs assessment, we describe a broad educational need and opportunities for implementation of diagnostic education. Our work aligns with The Joint Commission's call for deliberate approaches to reducing diagnostic error in our learning environments by highlighting several gaps in the current educational landscape, potential challenges in implementing more formalized diagnostic education, and learner-driven suggestions for successful implementation of informed diagnostic safety interventions. We outline our approach to a needs assessment that we believe others can adapt and insight into what should be for informed curricula and outcome measures to promote diagnostic excellence.

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