

Setting a Minimum Passing Standard for the Uncertainty Communication Checklist Through Patient and Physician Engagement

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ABSTRACT

Background Historically, medically trained experts have served as judges to establish a minimum passing standard (MPS) for mastery learning. As mastery learning expands from procedure-based skills to patient-centered domains, such as communication, there is an opportunity to incorporate patients as judges in setting the MPS.

Objective We described our process of incorporating patients as judges to set the MPS and compared the MPS set by patients and emergency medicine residency program directors (PDs).

Methods Patient and physician panels were convened to determine an MPS for a 21-item Uncertainty Communication Checklist. The MPS for both panels were independently calculated using the Mastery Angoff method. Mean scores on individual checklist items with corresponding 95% confidence intervals were also calculated for both panels and differences analyzed using a *t* test.

Results Of 240 eligible patients and 42 eligible PDs, 25 patients and 13 PDs (26% and 65% cooperation rates, respectively) completed MPS-setting procedures. The patient-generated MPS was 84.0% (range 45.2–96.2, SD 10.2) and the physician-generated MPS was 88.2% (range 79.7–98.1, SD 5.5). The overall MPS, calculated as an average of these 2 results, was 86.1% (range 45.2–98.1, SD 9.0), or 19 of 21 checklist items.

Conclusions Patients are able to serve as judges to establish an MPS using the Mastery Angoff method for a task performed by resident physicians. The patient-established MPS was nearly identical to that generated by a panel of residency PDs, indicating similar expectations of proficiency for residents to achieve skill “mastery.”

Introduction

Mastery learning is a form of competency-based medical education developed on the premise that all learners can achieve high levels of performance on a clinical task if given enough time to learn and practice.^{1,2} Mastery learning is an effective educational approach with documented improved outcomes across many domains, including procedural skills,³ operative interventions,^{4,5} and difficult conversations.^{6,7} Additionally, programs implemented using a mastery learning approach have demonstrated improved patient care outcomes and significant cost savings,^{8,9} suggesting the ability for this learning approach to improve individual and population health.¹⁰

There are 7 key components of the mastery learning bundle: (1) baseline testing; (2) clear learning objectives; (3) engagement in educational activities focused on reaching the objectives; (4) a set minimum passing standard (MPS); (5) formative testing; (6)

advancement if test achievement is at or above the passing standard; and (7) continued practice until mastery (and the MPS) is reached.¹¹ The establishment of a predetermined, objective, defensible MPS is critical to determining when a learner has achieved mastery.

The first step in setting an MPS is selection of both the method of standard setting and the panel of judges. Historically, the Angoff and Hofstee methods¹² were used for standard setting in mastery learning curricula. Experts subsequently proposed new methods to better align with the goals of mastery learning.^{13,14} The Mastery Angoff method¹⁴ has become a favored approach to establishing the MPS in the context of a mastery learning curriculum. Using this approach, judges are asked to consider the performance of a trainee who is ready and well-prepared for the next stage of training, practice, or learning, as opposed to the “borderline trainee” who is considered when using the traditional Angoff method.¹⁴ When comparing several different approaches to establish an MPS, one study found the Mastery Angoff method produced a much more

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stringent MPS, which aligns with the theoretical construct of mastery learning of ensuring that all learners are able to achieve a high level of performance in a mastery learning curriculum.¹⁵ Once the method is selected, judges are recruited. Guiding principles for judge selection include content expertise, appropriate knowledge of the learner group, willingness to follow instructions in the standard-setting process, and willingness to minimize bias.¹²

While mastery learning has been used extensively to teach clinical skills, these skills have focused primarily on procedures; thus, medically trained experts often establish the MPS.^{16–20} With applications of mastery learning expanding to teaching communication and other patient-centered care skills, there is an opportunity to incorporate patients as experts when setting the MPS. The value of obtaining patient feedback to assess the adequacy of resident communication is highlighted in research that engaged patients to provide feedback on communication skills to surgical residents.^{21,22} Furthermore, patient satisfaction questions regarding resident performance have been added to Press Ganey surveys.²³

Two prior studies incorporated patients for standard setting.^{24,25} In the first, patients determined the MPS for procedures performed by patients and/or caregivers (LVAD battery changes, controller changes, and dressing change).²⁴ In the second, the authors compared both physician and patient responses to inform ultimate determination of an MPS for a communication survey.²⁵ However, to date, patients have yet to be used as judges to set an MPS for physician performance on a task using the Mastery Angoff method.

The first goal of this project is to describe the process of utilizing patients and emergency medicine (EM) residency program directors (PDs) as judges to set the MPS for an uncertainty communication mastery learning curriculum. The second goal is to compare the MPS generated by the 2 different judge panels using the Mastery Angoff method.

Methods

This work is part of a larger project to develop and test a simulation-based mastery learning curriculum to teach EM residents to have more effective discharge conversations for patients with diagnostic uncertainty. We developed a 21-item Uncertainty Communication Checklist²⁶ for use in our simulation-based training and assessment of these physicians' communication skills.

We recruited 2 separate panels of patients and physicians to serve as judges for the standard-setting

What was known and gap

With applications of mastery learning expanding to teaching communication and other patient-centered care skills, there is an opportunity to incorporate patients as experts when setting the MPS.

What is new

A process of incorporating patients as judges to set the MPS for the Uncertainty Communication Checklist, using the Mastery Angoff method, and a comparison of the MPS set by patients and emergency medicine residency program directors.

Limitations

Patients were English-speaking and recruited from 2 institutions, reducing diversity and limiting generalizability. The total number of physician judges represented a small percentage of training programs, and additional judges may have changed the ultimate MPS.

Bottom line

Utilizing patient judges on a panel to establish an MPS, using the Mastery Angoff method, for a diagnostic uncertainty communication mastery learning curriculum for resident physicians is feasible.

process. The number of judges for each panel was based on previously published recommendations.¹²

Inclusion criteria for patients to participate as a standard-setting judge included being an English-speaking adult (≥ 18 years) with a recent emergency department (ED) visit within either the Thomas Jefferson University (TJU) Health System or Northwestern Memorial (NM) Hospital that resulted in discharge with a symptom-based diagnosis (ie, abdominal pain). Patient exclusion criteria included being admitted to the hospital as a result of their most recent ED visit; undergoing medical clearance for a detox center or any involuntary court or magistrate order; in police custody or currently incarcerated; 4 or more visits to the ED within the month preceding the study recruitment period; having a major communication barrier such as visual, hearing, or cognitive impairment (determined by 6-item screener)²⁷ that would compromise their ability to give written informed consent; or being unwilling or unable to comply with study protocol requirements, determined from research personnel's best judgment.

An electronic health record report was generated at both health systems to identify potentially eligible patients. Two study physicians independently reviewed the report to identify patients discharged with a symptom-based diagnosis and created a randomly ordered recruitment list.²⁸ Trained research personnel contacted patients by telephone to explain the study and further assess eligibility. Interested and eligible patients were invited to participate in focus groups.

Inclusion criterion for physicians included serving as a current or former PD or associate PD for an accredited EM residency program. An initial

recruitment e-mail was sent to 28 individuals selected by the study team through our professional network to balance program geography (Northeast, Midwest, South, West), PD gender, and 3- versus 4-year program designation. As the initial PD response led to a predominance of respondents from the Northeast and from 4-year programs, we sent a second recruitment e-mail to an additional 14 PDs from 3-year programs in the underrepresented 3 geographic areas to balance recruitment, resulting in the final sample.

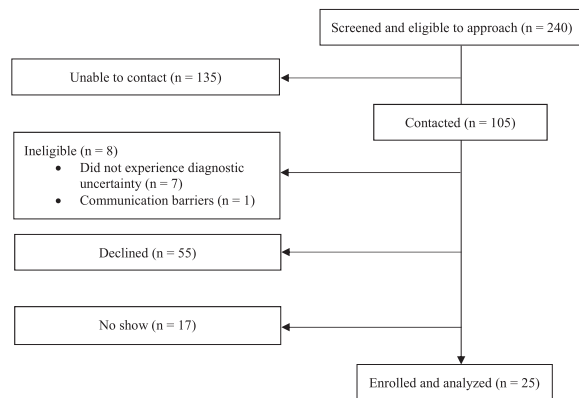
Patient Standard Setting

During May 2018, we conducted patient standard setting in groups of 5 to 8 patients. The standard-setting session included: (1) discuss the goals of the standard-setting process using the Mastery Angoff method¹⁴; (2) define mastery learning; (3) review principles of mastery learning; (4) present and review the Uncertainty Communication Checklist; and (5) complete the standard-setting activity. The same presentation slides were used to lead each group. Two study investigators at each site served as moderators. For the standard-setting activity, each judge was asked to consider a “well-prepared learner,” defined as a resident physician who had completed the uncertainty communication curriculum and would be ready to perform this task safely and appropriately without supervision. Judges then were asked to individually estimate the percentage of learners who, after completing a curriculum designed to teach the elements of the checklist, would perform each item correctly. To ensure participant comprehension of the standard-setting methodology, for the first few items, judges estimated this percentage individually and then shared their estimation and rationale with the group. Each judge independently completed the remaining checklist items; the group discussed items for which any judge had questions. Judges recorded written estimates and submitted them to the research team upon session completion.

PD Standard Setting

Each standard-setting session for the PDs occurred between April and June 2018 using Zoom video conference software. Participants viewed the presentation slides as the moderator reviewed the material. PDs completed the standard-setting activity as described above for patients and submitted their scores electronically using Qualtrics (Qualtrics LLC, Provo, UT).

Mean scores and corresponding 95% confidence intervals on individual checklist items were calculated for patient and physician participants. Mean



FIGURE

Recruitment and Screening Process to Enroll Patients as Judges

difference for individual checklist items were analyzed using a *t* test. The MPS was calculated separately for patient and physician cohorts; the final MPS for the Uncertainty Communication Checklist represents the mean score from all of the judges (each individual equally weighted).²⁹

The Institutional Review Boards of both Northwestern University (NU) and Thomas Jefferson University approved this study.

Results

Two hundred forty patients who met inclusion criteria were screened; 105 were able to be contacted, of whom 8 were ineligible and 55 declined participation. Twenty-five patients (26% cooperation rate) agreed to participate as judges in 1 of 4 standard-setting focus groups (2 at TJU, 2 at NU) occurring from May 22 to May 31, 2018 (FIGURE). Each session included 5 to 8 judges and lasted 90 minutes. We approached 42 PDs, with 20 indicating potential interest, and ultimately 13 PDs (65% cooperation rate) participated as judges in 1 of 4 standard-setting video conferences from April 3 to June 26, 2018. Each session included 2 to 4 judges and lasted 60 minutes. See TABLES 1 and 2 for patient and PD judge characteristics, respectively.

Patients assigned higher scores on 5 items, and physicians assigned higher scores on the remaining 16 items. Only 3 of 21 items had statistically significant differences between patient and physician raters (TABLE 3).

The patient judges set an MPS of 84.0% (range 45.2–96.2, SD 10.2); PD judges set an MPS of 88.2% (range 79.7–98.1, SD 5.5). The impact of the difference in the MPS between the 2 judge groups is 1 item: the patient MPS equated to a passing score of 18 out of 21 items correct, whereas the physician

TABLE 1
Patient Judge Panel Demographics (n = 25)

Demographics	n (%)
Age, mean (range), SD	44.8 (36–50), 19.5
Race	
White	8 (32)
Black	12 (48)
Asian	2 (8)
Other	2 (8)
Ethnicity	
Hispanic	3 (12)
Non-Hispanic	22 (88)
Female	11 (44)
Marital status	
Married, or in domestic partnership	7 (28)
Single (never married)	15 (60)
Widowed	2 (8)
Divorced	1 (4)
Speaks English as primary language	23 (92)
Household size, mean (SD)	2.5 ^a (1.4)
Household income	
< \$10K	4 (16)
\$10–\$24K	4 (16)
\$25–\$49K	4 (16)
\$50–\$99K	4 (16)
> \$100K	4 (16)
Educational attainment	
Less than high school	1 (4)
High school graduate	10 (40)
College degree	10 (40)
Postgraduate degree	3 (12)
Has health insurance	23 (92)
Literacy screening questions	
“Never” needs help reading medical instructions	10 (40)
“Always” feels confident filling out medical forms	10 (40)
“Never” has difficult understanding written information from a health care provider	10 (40)
Patient-identified health status	
1: excellent	1 (4)
2: very good	6 (24)
3: good	9 (36)
4: fair	7 (28)
5: poor	1 (4)
Has primary care physician	20 (80)

TABLE 1
Continued.

Demographics	n (%)
Health care utilization, mean (range)	
No. of hospital admissions	0.7 ^a (0–4)
No. of emergency department or urgent care visits	1.9 ^a (0–5)
No. of physician office visits	8.0 ^a (0–100)

^a At least 1 participant declined to answer.

MPS equated to a passing score of 19 out of 21 items correct. The overall MPS, calculated as an average of these 2 results, was 86.1% (range 45.2–98.1, SD 9.0), equating to performing 19 of 21 items correctly.

Discussion

We demonstrated that patients are able to serve as judges for a task performed by physicians using the Mastery Angoff method. Further, in this study, patients established an MPS that is nearly identical to that generated by a panel of residency PDs.

For any given checklist, there is no gold standard for the MPS. Therefore, we cannot infer if patient- or physician-generated scores are “better” or “more accurate” on our Uncertainty Communication Checklist. Instead, we can only comment on the similarities or differences among judges’ scores. We found the difference between scores generated by patients and physicians to result in only 1 more item needing to be performed correctly for the more stringent physician-generated score. This high level of agreement reflects the importance that both patients and physicians place on communication, particularly in the context of uncertainty at the time of ED discharge.

We observed a wider range of scores among patients, represented by a standard deviation of 10.2 versus 5.5 among PDs. One outlier patient was the primary driver of the difference in score range. Although statistically an outlier, the team believed that the low percentage estimations of this patient were not due to misunderstanding of the standard-setting task, but rather to their true beliefs about what could be expected of the residents achieving mastery (based on negative prior experiences). Therefore, we retained all scores for the calculations as they represented the patient perspective. Notably, removal of the scores from the patient outlier would not have altered the MPS.

Statistically significant differences among patient and PD scores were identified on only 3 of the 21 Uncertainty Communication Checklist items (items 2, 7, 8). Based on participant feedback during the standard-setting process, we believe several explanations exist for these differences. Patients reflected on

TABLE 2
Program Director Demographics (n = 13)

Demographics	n (%)
Age, mean (range), SD	42.8 (36–52), 5.2
Race	
White	11 (85)
Black	1 (8)
Asian	1 (8)
Ethnicity	
Hispanic	1 (8)
Non-Hispanic	12 (92)
Sex	
Male	5 (39)
Female	8 (62)
Training program PD attended	
3-year	3 (23)
4-year	10 (77)
Specialty ^a	
Emergency medicine	13 (100)
Internal medicine	1 (8)
Toxicology	1 (8)
Board certifications ^a	
Emergency medicine	13 (100)
Internal medicine	1 (8)
Toxicology	1 (8)
Training program PD directs, n (%)	
3-year	4 (31)
4-year	9 (69)
Years in practice since residency, mean (range), SD	3.3 (1–8), 2.6
Hospital setting	
Urban	11 (85)
Suburban	2 (15)
Hospital geographic location	
Northeast	6 (46)
Midwest	3 (23)
South	2 (15)
West	2 (15)

Abbreviation: PD, program director.

^a Program directors listed more than 1 specialty and board certification.

their own experiences in the emergency setting, which had never included such interactions (eg, items 2 and 7). While it might seem that patients would frequently experience a discussion of alternate diagnoses (item 8), in an era imbued with fear of giving the “wrong” answer, physicians may not routinely share this information unless specifically guided. PDs, however, commented that while their residents did not engage in these communication tasks routinely, the tasks were concrete items that a well-prepared resident would be able to achieve if instructed properly.

With this work, we sought to extend patient involvement in communication skills assessment by demonstrating the feasibility of engaging patients as judges in mastery learning standard setting for topics in which they have appropriate content expertise. This study extends the reach of 2 previous studies that utilized patients as judges to establish an MPS,^{24,25} and is the first to integrate patient perspectives through their participation as judges in the context of mastery learning for the assessment of physician performance.

Our findings are similar to those of Barsuk et al,²⁴ which reported a difference in an MPS set by patients and physicians of only 1 checklist item. However, the Wayne et al study²⁵ reported a much larger difference between patient and physician standards. Such differences may be due to the standard-setting approach used. The Wayne et al study used the traditional Angoff method to standard setting, which asks judges to conceptualize a “borderline” learner.²⁵ In contrast, our study used the Mastery Angoff method, asking judges to consider a “well-prepared” learner. Patients may be less familiar than physicians with what would constitute a “borderline” learner, yet better able to conceptualize a “well-prepared” learner, which could explain the similarity in scores. Further, in the Wayne et al study, judges were provided baseline performance data, which has been shown to influence standard-setting scores.^{30,31} In our study, the focus on “mastery” and the lack of provision of baseline data may have removed the influence of previous personal experience (for both patients and PDs) and served to create a shared mental model between all judges of the ideal masterful performance of the skill.

Our methodology incorporated use of a video conference to facilitate conduct of the standard-setting sessions, which allowed for a panel of judges spanning the geographical and programmatic variation inherent in EM training programs, potentially decreasing their bias. Such broad representation may increase the generalizability of the MPS for this checklist beyond a single institution.

Limitations of this study include generalizability; although physician judges were recruited nationally, patients were English-speaking and recruited from 2 institutions, which reduces diversity. The total number of physician judges represents a small percentage (18%) of overall EM training programs. It is possible that additional judges may have changed the ultimate MPS.

As this study used only one approach for setting the MPS, future studies comparing standard-setting approaches with patient judges may elucidate differences among various these approaches.

TABLE 3

Comparison of Standard Setting Between Scoring Groups

Uncertainty Communication Checklist ²⁶	Patient	Program Director	Difference
	Mean (95% CI)	Mean (95% CI)	Mean Difference (95% CI of Mean Difference)
1. Explain to the patient that they are being discharged	86.9 (79.8–93.9)	95.8 (93.4–98.3)	8.9 (-0.8–18.7)
2. Ask if there is anyone else that the patient wishes to have included in this conversation in person and/or by telephone	65.7 (56.9–74.6)	85.4 (78.2–92.5)	19.7 (6.6–32.7) ^a
3. Clearly state that either “life-threatening” or “dangerous” conditions have not been found	86.4 (78.9–93.8)	91.4 (87.7–95.0)	5.0 (-5.4–15.5)
4. Discuss diagnoses that were considered (using both medical and lay terminology)	81.0 (75.0–87.0)	84.5 (76.6–92.3)	3.5 (-6.3–13.2)
5. Communicate relevant results of tests to the patient (normal or abnormal)	84.4 (79.3–89.4)	84.6 (79.6–89.6)	0.2 (-7.4–7.9)
6. Ask patient if there are any questions about testing and/or results	88.9 (81.8–96.1)	93.8 (91.0–96.6)	4.9 (-5.1–14.9)
7. Ask if patient was expecting anything else to be done during their encounter; if yes, address reasons not done	60.0 (51.1–68.9)	82.3 (76.7–87.9)	22.3 (9.5–35.1) ^a
8. Discuss possible alternate or working diagnoses	73.9 (65.7–82.0)	86.8 (80.3–93.2)	12.9 (0.9–24.9) ^a
9. Clearly state that there is a not a confirmed explanation (diagnosis) for what the patient has been experiencing	81.7 (73.5–89.9)	89.6 (84.0–95.2)	7.9 (-3.9–19.8)
10. Validate the patient’s symptoms	81.0 (74.3–87.7)	81.2 (73.2–89.1)	0.2 (-10.4–10.7)
11. Discuss that the ED role is to identify conditions that require immediate attention	79.4 (70.4–88.3)	88.8 (85.1–92.6)	9.4 (-3.1–22.0)
12. Normalize leaving the ED with uncertainty	84.7 (79.6–89.8)	87.7 (82.8–92.6)	3.0 (-4.7–10.7)
13. Suggest realistic expectations/trajectory for symptoms	86.7 (81.8–91.6)	83.1 (77.8–88.4)	-3.6 (-11.2–3.9)
14. Discuss next tests that are needed, if any	87.8 (80.2–95.4)	88.1 (82.6–93.5)	0.3 (-10.8–11.3)
15. Discuss who to see next <i>and</i> in what time frame	91.9 (87.2–96.6)	86.5 (80.9–92.1)	-5.4 (-12.8–2.1)
16. Discuss a plan for managing symptoms at home	89.6 (84.5–94.6)	90.8 (86.3–95.2)	1.2 (-6.3–8.8)
17. Discuss any medication changes	90.2 (83.9–96.4)	86.6 (79.6–93.4)	-3.6 (-13.3–6.1)
18. Ask patient if there are any questions and/or anticipated problems related to next steps (self-care and future medical care) after discharge	88.6 (83.1–94.1)	85.2 (78.2–92.2)	-3.4 (-12.2–5.5)
19. Discuss what symptoms should prompt immediate return to the ED	90.6 (84.6–96.5)	90.6 (86.9–94.4)	0.0 (-8.5–8.6)
20. Make eye contact	89.4 (82.9–95.9)	95.0 (91.9–98.0)	5.6 (-3.5–14.7)
21. Ask patient if there are any other questions or concerns	95.8 (92.9–98.7)	93.7 (91.0–96.4)	-2.1 (-6.5–2.2)

Abbreviations: CI, confidence interval; ED, emergency department.

^a $P < .05$.

Conclusions

This study demonstrated that using patient judges on a panel to establish an MPS for the Uncertainty Communication Checklist, using the Mastery Angoff method, for a diagnostic uncertainty communication mastery learning curriculum for resident physicians is feasible. In addition, patient and expert physician judges found nearly identical MPS.

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