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Which Student Characteristics Are Most Important in Determining Clinical Honors in Clerkships? A Teaching Ward Attending Perspective.

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Abstract

Purpose

To explore faculty perspectives on which characteristics of high-performing clerkship students are most important when determining an honors or top grade designation for clinical performance.

Method

In 2016–2017, the authors surveyed faculty (teaching ward attendings) for internal medicine clerkships and one pediatrics clerkship in inpatient settings at five U.S. academic medical centers. Survey items were framed around competencies, 24 student characteristics, and attitudes toward evaluation. Factor analysis examined constructs defining high-performing students.

Results

Of 516 faculty invited, 319 (62%) responded. The top five characteristics as rated by respondents were taking ownership, clinical reasoning, curiosity, dependability, and high ethical standards (in descending order). Twenty-one characteristics fit into three factors (Cronbach alpha 0.81–0.87). Clinical reasoning did not fit into a factor. Factor 1 was the most important (mean rating 8.7/10 [95% CI, 8.6–8.8]). It included professionalism components (ownership, curiosity, dependability, high ethical standards), presentation and interviewing skills, seeking feedback, and documentation. Factor 2 (mean 7.9 [95% CI, 7.7– 8.0]) included aspects of teamwork and communication, such as positive attitude and comments from others. Factor 3 (mean 7.6 [95% CI, 7.4 to 7.7]) addressed systems-based thinking, including patient safety and care transitions.

Conclusions

Professionalism components, clinical reasoning, and curiosity were among the most important characteristics distinguishing high-performing clerkship students. These may represent behaviors that are highly valued, observable, and relevant to training stage. Improved definition of the characteristics associated with clinical honors would assist students, faculty, and residency program directors when interpreting clinical performance within core clerkships.

A hallmark of medical education is the clinical training and education of medical students through core clerkships. The Liaison Committee on Medical Education (LCME) requires medical schools to ensure comparable educational experiences for students and methods for student assessment across clerkship locations.[1] Effective assessment of a student's clinical performance requires consideration of the learner's knowledge, skills, and attitudes; yet how evaluators consider these and other factors when determining top-performing students for grading purposes is not well defined.

Significant variability exists across institutions in the percentage of students awarded honors or top grades in core clerkships (2–93% in some studies) as well as in the grading schema used to arrive at those grades.[2] Most medical schools use a combination of performance on the National Board of Medical Examiners (NBME) subject exam and an assessment of clinical performance for summative clerkship grading purposes.[3] Clinical performance evaluations by faculty and residents often account for 50–70% of the total clerkship grade, yet no national guidelines exist to instruct faculty how to determine which students merit a clinical honors or top grade designation.[4,5] Additionally, students' scores on the NBME subject exam, a standardized assessment of medical knowledge, are generally not available to faculty when they are evaluating students' clinical performance.

An improved understanding of the characteristics valued by teaching ward attendings (i.e., faculty teaching on inpatient wards) when determining clinical honors is important for students, evaluators, and residency programs alike. Prior studies have shown that how students are evaluated has a greater impact on their well-being than do other aspects of the curriculum structure and that students dislike the subjectivity of clinical evaluation.[6] Additionally, studies

have shown that student characteristics such as personality, demographics, and gender may influence clinical performance evaluation.[7-11]

The growth of U.S. medical schools has increased competition for residency positions. Faced with increasing applications, residency programs are seeking ways to identify the best-performing students. When coupled with a national trend toward preclinical pass/fail grading, this has led to an increased emphasis placed by programs on clerkship performance.[12,13] These factors underscore the importance of clinical performance evaluation during the core clerkships and the need for both improved understanding and standardization. In this study, we examined teaching ward attendings' perspective on the characteristics that define the highest-performing clerkship students. We set out to answer the following questions: Which constructs define high-performing students? Which characteristics within those constructs are most important? How do these faculty perceive the clinical evaluation process?

Method

Study design, setting, and participants

Five academic medical centers (AMCs) participated in the study: Emory University, The Ohio State University, Sidney Kimmel Medical College at Thomas Jefferson University, the University of Alabama at Birmingham, and the University of Kentucky. The participating AMCs were urban, tertiary-care teaching hospitals associated with large medical schools. (Appendix 1 describes each medical school's class size, clerkship grading system, and criteria for clerkship honors/top grade designation). Institutions were recruited based on expressed interest at two professional meetings and via a professional society listserv between January and June 2016. All participating institutions obtained approval of their local institutional review boards. A cross-sectional survey study design was utilized.

The teaching ward attendings participating in the study were general internal medicine faculty responsible for supervision and evaluation of third-year medical students during their core internal medicine clerkship in an inpatient setting over three academic years between 2013 and 2016. (Not all faculty were responsible for evaluation for all three years). At one institution, faculty included internal medicine subspecialists who attended on general medicine services; at another, faculty included inpatient general pediatricians who supervised pediatrics clerkship students. Faculty were invited to participate in the survey via email and received weekly reminders within the month of the invitation. The survey was administered electronically via SurveyMonkey (surveymonkey.com) between June 2016 and March 2017. A paper questionnaire was mailed to faculty who did not complete the electronic survey. Participation was voluntary and anonymous; an incentive to complete the survey was not provided.

Survey development and description

A survey was created to examine faculty perspectives within three domains: characteristics of high-performing students, evaluation experience, and attitudes toward the evaluation system. Using a literature review, we created a list of high-performing student characteristics, which were framed around the Accreditation Council for Graduate Medical Education (ACGME) core competencies: patient care; medical knowledge; practice-based learning and improvement; interpersonal and communication skills; professionalism; and systems-based practice.[14] Other domains, such as personality traits, were included as prior studies examining high-performing students and residents highlighted those characteristics.[7,9,15,16]

An initial list of characteristics was created and condensed after iterative revisions among four authors (N.H., R.K., C.E., W.W.). Cognitive interviews[17] were conducted with seven faculty members who taught students in an inpatient setting at a single institution (five general internists

and two pediatricians, including two assistant deans and an associate residency program director). During each cognitive interview, one of three authors (N.H., R.K., C.E.) showed the survey and asked the participant for ways to clarify the wording and organize the items as well as to identify new characteristics. After the iterative review and cognitive interviews were completed, a pilot survey was administered to seven different faculty from the same institution. This pilot resulted in minor changes to the survey; these responses were not included in the study results.

The final survey included 24 student characteristics. Faculty were asked to indicate how much emphasis they placed on each of these student characteristics "when designating a student as 'honors' (or the top grade)," using a 10-point Likert scale (1 = less emphasis, 10 = more emphasis). Additional survey questions addressed faculty experience with the evaluation process and attitudes toward the evaluation system. The survey instrument is available as Supplemental Digital Appendix 1 at http://links.lww.com/ACADMED/A698.

Statistical analysis

Descriptive statistics and factor analysis were utilized for data analysis. To examine composites of the characteristics of high-performing students, we performed factor analysis and grouped the items based on factors with Eigenvalues ≥ 1 and with rotated factors loading > 0.4. We then ranked items within each factor based on their mean value and calculated the mean and 95% confidence interval (CI) for each factor. We assessed internal consistency with the Cronbach alpha (> 0.9 is considered excellent, > 0.8 good). We performed sensitivity analysis by excluding responses from internal medicine subspecialty and general pediatrics faculty from the rankings.

Faculty evaluation experience and attitudes toward the evaluation system were examined with descriptive statistics. We used STATA 11.2 software (StataCorp, College Station, Texas) for analyses and defined statistical significance at $P < .05$.

Results

Participants

Of the 516 faculty invited to participate in the survey, 319 (62%) responded. The distribution of respondents included 99 (31%) internal medicine subspecialists, 86 (27%) general internists, 75 (24%) hospitalists, and 40 (13%) pediatricians or internal medicine–pediatrics physicians (Table 1). Respondents showed an even distribution of career experience and student exposure.

Rankings

The top five characteristics of high-performing students as rated by the faculty were taking ownership, clinical reasoning, curiosity, dependability, and high ethical standards (in descending order, mean rating range 9.3 to 9.1). The top five characteristics remained unchanged when responses from internal medicine subspecialty or general pediatrics faculty were excluded from the analysis (data not shown). With the exception of clinical reasoning, the top characteristics fit into Factor 1 (as described below).

The five student characteristics rated lowest by the faculty were setting learning goals, understanding social determinants of health for care transitions, physical exam skills, care coordination, and comments from staff (in descending order, mean rating range 7.5 to 6.9; Figure 1).

Factor analysis

Factor analysis was used to examine the constructs of characteristics of high-performing students. Twenty-one of the characteristics fit into three factors with Eigenvalues > 1 accounting

for 87% of the variance. Despite being highly rated by faculty, clinical reasoning did not fit into a construct and may be independent of other characteristics. For factor loadings, see Supplemental Digital Appendix 2 at http://links.lww.com/ACADMED/A698. Figure 1 shows the characteristics grouped by factor.

Factor 1 was the most important domain, with a mean rating of 8.7 (95% CI, 8.6 to 8.8). Factor 1 included professionalism components (ownership, curiosity, dependability, high ethical standards) as well as presentation and interviewing skills, seeking feedback, and documentation. The Cronbach alpha was 0.83.

Factor 2 was the next most important domain, with a mean rating of 7.9 (95% CI, 7.7 to 8.0). Factor 2 included aspects of teamwork and communication, such as having a positive attitude and comments from others (patients, residents, and staff). The Cronbach alpha was 0.81.

Factor 3 was the third most important domain, with a mean rating of 7.6 (95% CI, 7.4 to 7.7). Factor 3 included systems-based thinking items, such as patient safety, health transitions, and care coordination. The Cronbach alpha was 0.87.

Three student characteristics--clinical reasoning, application of basic science, and physical exam skills--did not fit into a factor and were designated as "Other."

Faculty experience and attitudes toward the evaluation system

Table 2 summarizes the faculty evaluation experience, and Figure 2 summarizes faculty attitudes toward the evaluation system. More than half of respondents (n =194, 61%) agreed or strongly agreed that they are aware of the grading system and understand the impact of their evaluation on grading and that they consider time of year when evaluating students. Most respondents (n = 258, 81%) indicated they received no training on their honors system. Despite this, the majority of respondents (n =276, 86%) agreed or strongly agreed that they can identify strongly

performing students, with most indicating they can identify honors students within 1 or 2 weeks (n = 133, 42%, and n = 143, 45%, respectively). The majority of respondents (n = 265, 83%) thought that 25% of students or fewer should receive honors, and many (n = 118, 37%) thought that 10% or fewer should do so. Some respondents (n = 56, 18%) reported they had been specifically asked for honors by students.

Discussion

In this multi-institutional study, we found that ownership, clinical reasoning, curiosity, dependability, and high ethical standards are the five most important characteristics that distinguish high-performing students when teaching ward attendings are considering a clinical honors or top grade designation. We also found, using factor analysis, that most characteristics fall into three broad constructs, which we interpreted as Hippocratic (Factor 1), demeanor (Factor 2), and aspirational (Factor 3).

Hippocratic construct (Factor 1)

The Hippocratic construct fits the image of the ideal physician. Ownership, dependability, and high ethical standards are essential components of professionalism. Interviewing, presentation, and documentation are essential skills of the profession. Curiosity leads the clinician to pose questions, seek out answers, and apply them to patient care. Notably, characteristics such as curiosity, dependability, high ethical standards, and ownership--noted as important to identify high-performing students--are often difficult to teach or quantify in traditional evaluation rubrics.

Demeanor construct (Factor 2)

The demeanor construct reflects how patients and their families, residents, and staff perceive students. It also includes characteristics that could be considered innate or personality traits, such as the ability to handle stress and having a positive attitude. Our findings are consistent with

evidence suggesting that personality traits and noncognitive skills are important determinants of high-performing students and residents.[7,9,16,18] These characteristics may help trainees adapt to demanding clinical environments and coordinate multidisciplinary care.

Aspirational construct (Factor 3)

The aspirational construct includes skills that may be beyond the basic competencies for a medical student during core clerkships. Such skills are more developmentally relevant for residents, as they include approaching care from the systems perspective. This factor included characteristics related to patient safety, systems-based practice, and practice-based learning and improvement competencies. Appropriate confidence in and mastery of these domains is beyond what we typically seek to imbue at the clerkship level.

Other characteristics—Knowledge-based

Clinical reasoning, application of basic science to patient care, and physical exam skills did not fit into any of the constructs and, conceivably, are independent of each other. In contrast to the characteristics in the three factors above, these characteristics are knowledge-based, rather than personality- or character-based. Clinical reasoning was rated as the second most important characteristic, after ownership, of high-performing students.

While our finding that clinical reasoning ability is an important contributor to a student's clinical performance evaluation was not surprising, we were surprised that respondents indicated they place little emphasis on physical exam skills. This may reflect a behavior that is less frequently observed on time-constrained teaching services, or it may reflect the perceived decline in value of the physical exam.[19] Additionally, teaching ward attendings may lack confidence in their own physical exam skills and therefore may not rely on this skill to evaluate students. Alternatively,

good physical exam skills may represent a basic expectation that does not distinguish high-performing students from their peers.

Impact on grading

When interpreting how each of the above characteristics influences the evaluation of clinical performance to determine a clinical honors or top grade designation, the interplay of three critical aspects should be considered: value to the evaluator, observability, and relevance to the stage of training. Many of the characteristics identified in Factor 1 meet all three criteria: They are highly valued aspects of the profession, observable,[15] and appropriate to the level of training. It therefore is not surprising that they are the most relied upon for grading consideration. Factor 2 characteristics, which include aspects of teamwork and communication, may represent behaviors that are valued and relevant to the training level but are less commonly observed by teaching ward attendings on busy inpatient services. These may be best evaluated using feedback from others (e.g., residents, nursing staff, patients and their families). Factor 3 characteristics, which include patient safety and systems-based thinking, may be perceived as valuable skills but likely are infrequently observed and more relevant for later stages of training. Additionally, these are relatively newer areas of focus and therefore may be valued less by some attendings.

Our findings are similar to those of other studies, in which characteristics of the highest-performing students and residents were generally a combination of personal traits and medical knowledge.[7,9, 16,18,20] In a consensus development study, 30 clerkship and program directors identified the 10 most important characteristics of an honors student in the core surgery clerkship.[16] In no particular order, these were professionalism, NBME subject exam scores, work ethic, self-directed learning (what we called curiosity), synthetic ability, clinical acumen (clinical reasoning), accurate and complete history and physicals, communication skills, enthusiasm, and

being an essential member of the care team. With the exception of NBME subject exam scores, which are not available to faculty at our institutions when evaluating clinical performance, these characteristics closely match the highest rated characteristics in our study.

Faculty perception of the clerkship grading process

Respondents understood the impact of their evaluation on student grading, yet most reported not receiving any training on the honors system. Despite lack of training, the majority thought they could recognize high-performing students and could do so within 2 weeks or less. More than half of the faculty indicated they account for the timing of the student's rotation in the academic year in their evaluation. Widespread national grading variability explains the varied percentages of students expected to get honors as reported in this study; however, most faculty in our study felt that 25% of students or fewer should receive honors.

Implications

The results of our study have potential implications for both students and educators. First, our study sheds light on the student characteristics valued for clinical performance evaluation, which, despite its subjectivity, is a critical component of clerkship grading. While some of the most important characteristics, such as ownership and curiosity, may prove challenging to measure objectively, it is important to reflect on the maxim that "not everything that counts can be counted."[21] Other approaches, such as 360-degree assessments providing insight from different perspectives (e.g., other health professionals, patients and their families) and discussion among multiple clinicians who observed each student, might better gauge such characteristics than the use of conventional scoring rubrics and also yield a more holistic evaluation of clinical performance.

Second, grading is a major point of stress for students in clinical rotations.[2] Students often cite the subjectivity of clinical grading,[6] an issue compounded by working with multiple evaluators who have differing expectations and little training on clinical evaluation. This system may detract from students' focusing on patient care and growth as a clinician as well as lead to students directly asking for an honors grade (reported by 18% of respondents in our study). Conversely, purely objective measures, such as NBME subject exams, do not measure the clinical skills and professional traits that can only be captured with clinical evaluation, although subjective, by faculty. Some institutions have moved their clinical grading to a pass/fail system in tandem with competency-based assessment,[22] a compromise that may add measurable endpoints for skill acquisition. Regardless, more concrete formulation of what constitutes honors-worthy clinical performance would serve to standardize the honors designation. It would also allow clinical educators to focus their students on the application of knowledge and acquisition of skills and to emphasize the traits most important to the practice of medicine.

Third, interpreting clinical grades is challenging for residency programs. Moving to a pass/fail system without effectively distinguishing top-performing students would be likely to hinder residency programs as they sort through large numbers of applications. However, with improved national standards, the meaning and value of an honors designation would be clearer and would allow programs to weigh its importance in the set of variables used to select candidates.

Strengths and limitations

Our study has several strengths and limitations. We included multiple institutions with a variety of grading schemas and locations, yet generalizability to all institutions and U.S. regions remains a limitation. In addition, other specialties, particularly procedure-based ones, were not represented in this study. The response rate was acceptable for examining attitudes and opinions

in educational research. Two of the survey items on evaluation system perceptions were double barreled and may have been confusing. We limited our study to the perspective of the clinical teacher and did not access NBME subject exam scores or other aspects of clerkship grade determination. Despite our efforts to thoughtfully include characteristics to be scored by faculty, we may have omitted some relevant characteristics; however, it is encouraging that our findings echo results of prior studies.

Conclusion

In conclusion, our study sheds light on the value given by faculty to different characteristics and behaviors of clerkship students in determining a clinical honors or top grade designation. We believe criteria for clinical honors and top grades need to be more clearly established. Such clarity would allow faculty and residents to appropriately gauge student behaviors and allow students to focus on developing the attributes most important for entering the profession and becoming a physician.

References

1. Liaison Committee on Medical Education. Standard 8.7–Comparability of education/assessment. Functions and Structure of a Medical School: Standards for Accreditaion of Medical Education Programs Leading to the MD Degree. AAMC. http://lcme.org/publications/#Standards. Published March 2018. Accessed May May 21, 2019.
2. Alexander EK, Osman NY, Walling JL, Mitchell VG. Variation and imprecision of clerkship grading in U.S. medical schools. Acad Med. 2012;87(8):1070-1076.
3. Zahn CM, Nalesnik SW, Armstrong AY, Satin AJ, Haffner WH. Variation in medical student grading criteria: A survey of clerkships in obstetrics and gynecology. Am. J. Obstet. Gynecol. 190, 1388–1393.
4. Fazio SB, Torre DM, DeFer TM. Grading practices and distributions across internal medicine clerkships. Teach Learn Med. 2016;28(3):286-292.
5. Kassebaum DG, Eaglen RH. Shortcomings in the evaluation of students' clinical skills and behaviors in medical school. Acad Med. 1999;74(7):842-849.
6. Reed DA, Shanafelt TD, Satele DW, et al. Relationship of pass/fail grading and curriculum structure with well-being among preclinical medical students: A multi-institutional study. Acad Med. 2011;86(11):1367-1373.
7. Rosenbluth G, O'Brien B, Asher EM, Cho CS. The "zing factor"—how do faculty describe the best pediatrics residents? J Grad Med Educ. 2014;6(1):106-111.
8. Takayama H, Grinsell R, Brock D, Foy H, Pellegrini C, Horvath K. Is it appropriate to use core clerkship grades in the selection of residents? Curr Surg. 2006;63(6):391-396.

9. Goldie J, Dowie A, Goldie A, Cotton P, Morrison J. What makes a good clinical student and teacher? An exploratory study. BMC Med Educ. 2015;15:40.

10. Lee KB, Vaishnavi SN, Lau SK, Andriole DA, Jeffe DB. "Making the grade": Noncognitive predictors of medical students' clinical clerkship grades. J Natl Med Assoc. 2007;99(10):1138-1150.

11. Riese A, Rappaport L, Alverson B, Park S, Rockney RM. Clinical performance evaluations of third-year medical students and association with student and evaluator gender. Acad Med. 2017;92(6):835-840.

12. Green M, Jones P, Thomas JX Jr. Selection criteria for residency: Results of a national program directors survey. Acad Med. 2009;84(3):362-367.

13. Breyer MJ, Sadosty A, Biros M. Factors affecting candidate placement on an emergency medicine residency program's rank order list. West J Emerg Med. 2012;13(6):458-462.

14. Holmboe ES, Edgar L, Hamstra S. The Milestones Guidebook. Version 2016. http://www.acgme.org/Portals/0/MilestonesGuidebook.pdf Accessed May 2, 2019.

15. Pulito AR, Donnelly MB, Plymale M, Mentzer RM Jr. What do faculty observe of medical students' clinical performance? Teach Learn Med. 2006;18(2):99-104.

16. Lipman JM, Schenarts KD. Defining honors in the surgery clerkship. J Am Coll Surg. 2016;223(4):665-669.

17. Willis GB, Artino AR Jr. What do our respondents think we're asking? Using cognitive interviewing to improve medical education surveys. J Grad Med Educ. 2013;5(3):353-356.

18. Sobowale K, Ham SA, Curlin FA, Yoon JD. Personality traits are associated with academic achievement in medical school: A nationally representative study. Acad Psychiatry. 2018;42(3):338-345.

19. Feddock CA. The lost art of clinical skills. Am J Med. 2007;120(4):374-378.

20. Wimmers PF, Kanter, SL, Splinter TW, Schmidt HG. Is clinical competence perceived differently for student daily performance on the wards versus clerkship grading? Adv Health Sci Educ Theory Pract. 2008;13(5):693–707

21. Cameron WB. Informal Sociology: A Casual Introduction to Sociological Thinking. New York, NY: Random House; 1963.

22. Holmboe ES, Sherbino J, Long DM, Swing SR, Frank JR. The role of assessment in competency-based medical education. Med Teach. 2010;32(8):676–682.

Reference cited in Appendix 1 only

23. Pangaro LN. Evaluating professional growth: A new vocabulary and other innovations for improving the descriptive evaluation of students. Acad Med. 1999;74(11): 1203-1207.

Figure Legends

Figure 1

Faculty perspectives on the student characteristics that define clinical honors or top grade performance by third-year medical students in core clinical clerkships, by factors. The specific characteristics were ranked by the emphasis placed on them by the 2016–2017 survey respondents (319 teaching ward attendings who supervised and evaluated students during their internal medicine or pediatrics clerkship in an inpatient setting at five U.S. academic medical centers). Characteristics were grouped by factor analysis into three factors (Factors 1, 2, and 3) and one "other" category that included three characteristics that did not fit into any factor. Each characteristic was assigned to an ACGME core competency or labeled "not applicable" if it did not fit into a specific competency. By factor, the characteristics (competencies) rated were: *Factor 1:* ownership (P), curiosity (MK), dependability (P), ethical (P), presentation skills (ICS), interviewing skills (PC), seeks feedback (PBLI), documentation (ICS); *Factor 2:* patient/family communication (ICS), patient comments (NA), resident comments (NA), positive attitude (NA), stress management (NA), staff comments (NA); *Factor 3:* EBM skills (PBLI), applies evidence (MK), appropriate confidence (NA), patient safety (SBP), defines goals (PBLI), care transitions (SBP), care coordination (SBP); *Other:* clinical reasoning (PC), applies basic science (MK), physical exam skills (PC). The survey, with the full wording for each characteristic, is available as Supplemental Digital Appendix 1 at http://links.lww.com/ACADMED/A698. Factor loadings for each item are available as Supplemental Digital Appendix 2 at http://links.lww.com/ACADMED/A698.

Abbreviations: ACGME indicates Accreditation Council for Graduate Medical Education; P, professionalism; MK, medical knowledge; ICS, interpersonal and communication skills; PC, patient care; PBLI, practice-based learning and improvement; SBP, systems-based practice; NA, not applicable; EBM, evidence-based medicine.

Figure 2

Faculty attitudes toward the evaluation system for clerkship students. The 319 respondents to the 2016–2017 study survey included teaching ward attendings at five U.S. academic medical centers who supervised and evaluated third-year medical students on their internal medicine (and, at one institution, pediatrics) clerkship in an inpatient setting. The figure illustrates responses to six survey items pertaining to experience with evaluating medical students on inpatient clerkship rotations. Each graph shows the distribution of answers, divided via Likert scale response, with the sum adding to 100%. The full wording of each survey item is available in Supplemental Digital Appendix 1 at http://links.lww.com/ACADMED/A698.

Table 1

Characteristics of Responding Teaching Ward Attendings (n = 319) at Five Academic Medical Centers, 2016–2017 Survey

Characteristic	No. (%)[a]
Specialty	
Internal medicine subspecialty	99 (31)
General internal medicine	86 (27)
Hospital medicine (adult)	75 (24)
Pediatrics	27 (8)
Medicine–pediatrics	13 (4)
Family medicine	2 (1)
Missing data	17 (5)
Institution	
OSU	96 (30)
UAB	91 (29)
Emory	59 (18)
UK	34 (11)
SMKC	30 (9)
Missing data	9 (3)
Years since completion of training	
< 5 years	92 (29)
5-10 years	88 (28)
> 10 years	110 (34)
Missing data	29 (9)
No. weeks/ year attending with 3rd-year students	
< 4 weeks/ year	65 (20)
4-8 weeks/ year	108 (34)
>8-16 weeks/year	90 (28)
> 16 weeks/year	33 (10)
Missing data	23 (7)
No. 3rd-year students evaluated in the past year	
< 5 students	82 (26)
5-10 students	128 (40)
> 10 students	43 (13)
Missing data	66 (21)

Abbreviations: OSU indicates The Ohio State University; UAB, University of Alabama at Birmingham; Emory, Emory University; UK, University of Kentucky; SMKC, Sidney Kimmel Medical College at Thomas Jefferson University.

[a]Percentages may not total 100 due to rounding.

Table 2

Evaluation Experience of Responding Teaching Ward Attendings (n = 319) at Five Academic Medical Centers, 2016–2017 Survey[a]

Survey item	No. (%)[b]
What percentage of students do you think should get "honors"?	
0-10%	118 (37)
11-25%	147 (46)
> 25%	37 (12)
Missing data	17 (5)
In the past year, what percent of your students received the "honors" designation from you?	
0-10%	121 (38)
11-25%	92 (29)
> 25%	68 (21)
Missing data	38 (12)
In your experience, how long does it take to identify an "honors" student?	
Few days	32 (10)
1 week	101 (32)
2 weeks	143 (45)
3-4 weeks	25 (8)
Missing data	18 (6)
How often have you been specifically asked by a student to be given "honors"?	
Never	245 (77)
Rarely	42 (13)
Occasionally	13 (4)
Often	1 (0.3)
Missing data	18 (6)
Have you received any training on the "honors" system?	
No	258 (81)
Yes (in the past year)	27 (8)
Yes (in the past 3 years)	18 (6)
Missing data	16 (5)

[a]The participating institutions were Emory University, The Ohio State University, the University of Alabama at Birmingham, the University of Kentucky, and Sidney Kimmel Medical College at Thomas Jefferson University. The survey is available as Supplemental Digital Appendix 1 at [LWW INSERT LINK].

[b]Percentages may not total 100 due to rounding.

Figure 1

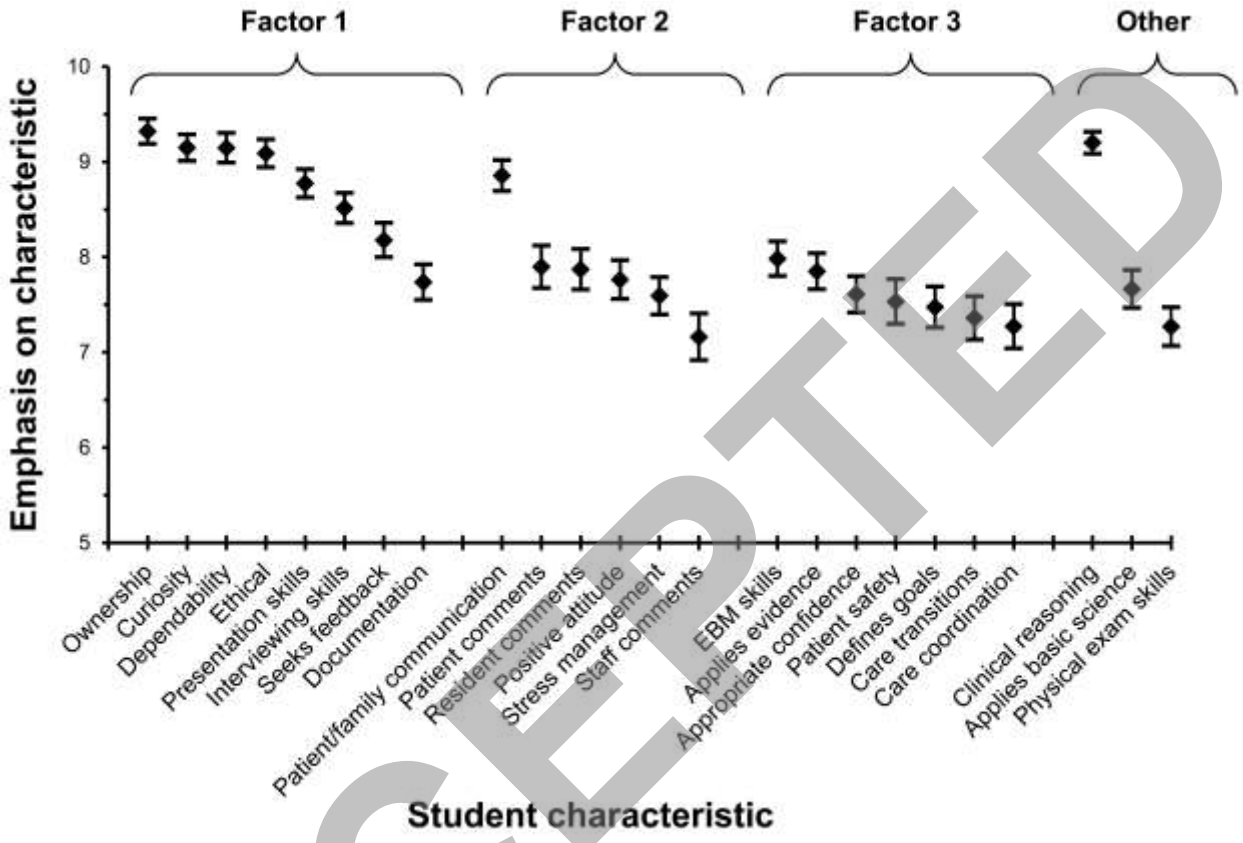
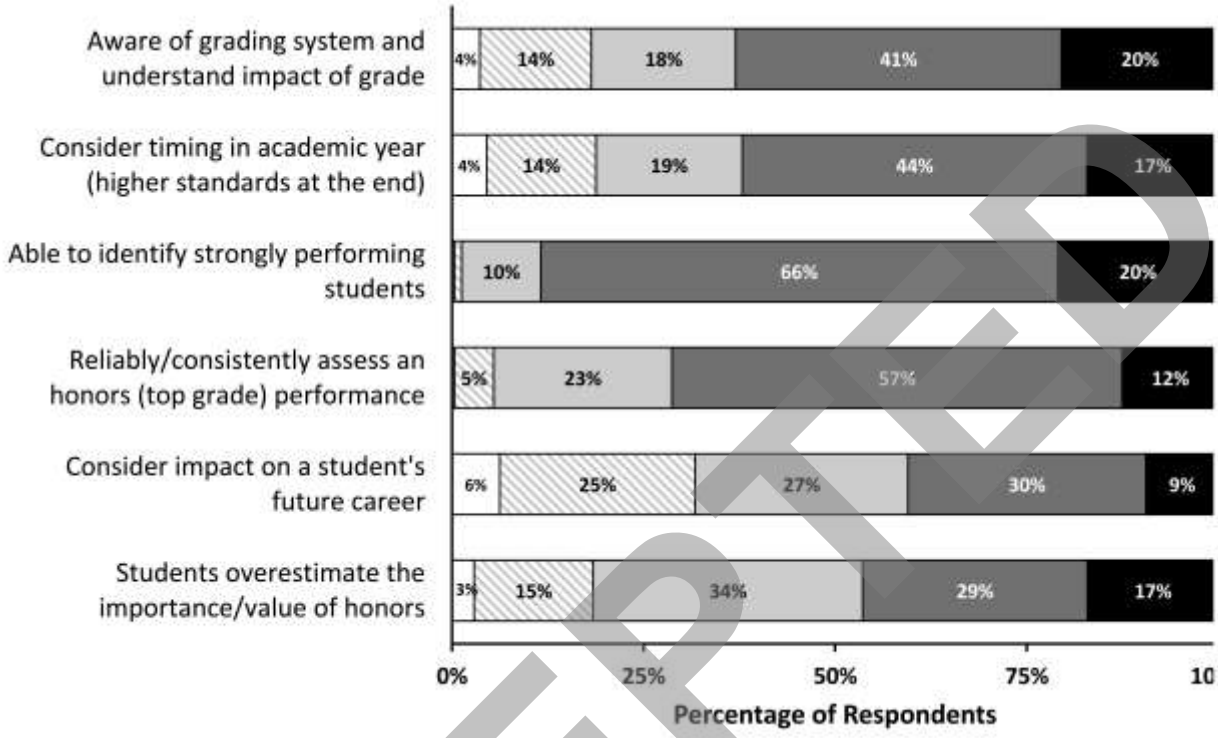


Figure 2



Appendix 1

Characteristics and Clerkship Grading Systems at Participating Institutions at the Time of the Study, 2016–2017

Institution (U.S. region)	Class size	Core clerkships in 3rd year	Clerkship grading system	Honors designation in IM
OSU (Midwest)	180–210	IM, Neuro/Psych, Surgery, OB/GYN, FM, Peds (n = 6)	Honors, Letter of commendation, Satisfactory, Unsatisfactory	IM clerkship grade is composed of clinical performance evaluation score (60%) and NBME shelf exam score (40%). To earn honors, the student must obtain a cumulative score of 86 or more. Faculty are asked to complete their evaluations based on their observations and are not asked to assign a grade such as honors.
UAB (South)	180–190	IM, Peds, Surgery, OB/GYN, Family Med, Neuro, Psych (n = 7)	Honors, High pass, Pass, Fail	IM clerkship grade is composed of clinical performance evaluation score (70%) and NBME shelf exam score (30%). To earn honors, the student must exceed the threshold for honors both on the NBME shelf exam and on clinical performance evaluations (by receiving honors designations from ≥50% of faculty and upper level residents).
Emory (South)	120–140	FM, IM, Neuro, OB/GYN, Peds, Psych, Surgery (n = 7)	A, B, C, D, F (including + and – for each letter grade)	IM clerkship grade is based on the clinical evaluation (40%), NBME shelf exam (20%), a final patient presentation (20%), and an objective structured clinical exam (20%). The distribution of grades depends on the year the student takes the 3rd-year clerkship.
UK (South)	136	IM/EM, Peds, Surgery, Neuro, Psych, OB/GYN, FM (n = 8)	Numeric	IM clerkship grade is determined by clinical scores in 15 learning objectives linked to the core competencies. No honors are awarded. Higher performance is indicated by achieving higher clinical scores.

SKMC (Northeast)	275	IM, Neuro, Surgery, OB/GYN, Psych, FM, Peds (n = 6)	Honors, Excellent, Good, Marginal, Fail	IM clerkship grade is based on a composite of clinical evaluation score (70%), NBME shelf exam score (10%), projects (15%–EBM project, pharmacology project, Choosing Wisely project) and assignment completion (5%). The clinical score is an average assigned by evaluators. A grading committee reviews narrative comments by evaluators and assigns a "clinical grade" based on characteristics described—mainly looking at where the student falls on the RIME scheme,[23] along with other characteristics, such as ownership and initiative.

Abbreviations: *Institutions:* OSU indicates The Ohio State University; UAB, University of Alabama at Birmingham; Emory, Emory University; UK, University of Kentucky; SMKC, Sidney Kimmel Medical College at Thomas Jefferson University; *clerkships*: IM, internal medicine; Neuro, neurology; Psych, psychology; OB/GYN, obstetrics and gynecology; FM, family medicine; Peds, pediatrics; EM, emergency medicine; *other:* NBME, National Board of Medical Examiners; EBM, evidence-based medicine; RIME, Reporter Interpreter Manager Educator.