Residents’ Self-Report on Why They Order Perceived Unnecessary Inpatient Laboratory Tests

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Resident physicians routinely order unnecessary inpatient laboratory tests. As hospitalists face growing pressures to reduce low-value services, understanding the factors that drive residents’ laboratory ordering can help steer resident training in high-value care. We conducted a qualitative analysis of internal medicine (IM) and general surgery (GS) residents at a large academic medical center to describe the frequency of perceived unnecessary ordering of inpatient laboratory tests, factors contributing to that behavior, and potential interventions to change it. The sample comprised 57.0% of IM and 54.4% of GS residents. Among respondents, perceived unnecessary inpatient laboratory test ordering was self-reported by 88.2% of IM and 67.7% of GS residents, occurring on a daily basis by 43.5% and 32.3% of responding IM and GS residents, respectively. Across both specialties, residents attributed their behaviors to the health system culture, lack of transparency of the costs associated with health care services, and lack of faculty role models that celebrate restraint. Journal of Hospital Medicine 2016;11:869–872. © 2016 Society of Hospital Medicine.

METHODS

In October 2014, we surveyed all IM and GS residents at the Hospital of the University of Pennsylvania. We reviewed the literature and conducted focus groups with residents to formulate items for the survey instrument. A draft of the survey was administered to 8 residents from both specialties, and their feedback was collated and incorporated into the final version of the instrument. The final 15-question survey was comprised of 4 components: (1) training information such as specialty and postgraduate year (PGY), (2) self-reported frequency of perceived unnecessary ordering of inpatient laboratory tests, (3) perception of factors contributing to unnecessary ordering, and (4) potential interventions to reduce unnecessary ordering. An unnecessary test was defined as a test that would not change management regardless of its result. To increase response rates, participants were entered into drawings for $5 gift cards, a $200 air travel voucher, and an iPad mini.

Descriptive statistics and \( \chi^2 \) tests were conducted with Stata version 13 (StataCorp LP, College Station, TX) to explore differences in the frequency of responses by specialty and training level. To identify themes that emerged from free-text responses, two independent reviewers (M.S.S. and E.J.K.) performed qualitative content analysis using grounded theory.\(^{10} \) Reviewers read 10% of responses to create a coding guide. Another 10% of the responses were randomly selected to assess inter-rater reliability by calculating \( \kappa \) scores. The reviewers independently coded the remaining 80% of responses. Discrepancies were adjudicated by consensus.
between the reviewers. The University of Pennsylvania Institutional Review Board deemed this study exempt from review.

RESULTS
The sample comprised 57.0% (85/149) of IM and 54.4% (31/57) of GS residents (Table 1). Among respondents, perceived unnecessary inpatient laboratory test ordering was self-reported by 88.2% of IM and 67.7% of GS residents. This behavior was reported to occur on a daily basis by 43.5% and 32.3% of respondents, respectively. Across both specialties, the most commonly reported factors contributing to these behaviors were learned practice habit/routine (90.5%), a lack of understanding of the costs associated with lab tests (86.2%), diagnostic uncertainty (82.8%), and fear of not having the lab result information when requested by an attending (75.9%). There were no significant differences in any of these contributing factors by specialty or PGY level. Among respondents who completed a free-text response (IM: 76 of 85; GS: 21 of 31), the most commonly proposed interventions to address these issues were increasing cost transparency (IM 40.8%; GS 33.3%), improvements to faculty role modeling (IM 30.2%; GS 33.3%), and computerized reminders or decision support (IM 21.1%; GS 28.6%) (Table 2).

DISCUSSION
A significant portion of inpatient laboratory testing is unnecessary,² creating an opportunity to reduce utilization and associated costs. Our findings demonstrate that these behaviors occur at high levels among residents (IM 88.2%; GS 67.7%) at a large academic medical center. These findings also reveal that residents attribute this behavior to practice habit, lack of access to cost data, and perceived expectations for daily lab ordering by faculty. Interventions to change these behaviors will need to involve changes to the health system culture, increasing transparency of the costs associated with healthcare services, and shifting to a model of education that celebrates restraint.¹¹

Our study adds to the emerging quest for delivering value in healthcare and provides several important insights for hospitalists and medical educators at academic centers. First, our findings reflect the significant role that the clinical learning environment plays in influencing practice behaviors among residents. Residency training is a critical time when physicians begin to form habits that imprint upon their future practice patterns,⁵ and our residents are aware that their behavior to order what they perceive to be unnecessary laboratory tests is driven by habit. Studies⁶,⁷ have shown that residents may implicitly accept certain styles of practice as correct and are more likely to adopt those styles during the early years of their training. In our institution, for example, the process of ordering standing or daily morning labs using a repeated “copy-forward” function in the electronic health record is a common, learned practice (a ritual) that is passed down from senior to junior residents year after year. This practice is common across both training specialties. There is a need to better understand, measure, and change the culture in the clinical learning environment to demonstrate practices and values that model high-value care for residents. Multi-pronged interventions that address culture, oversight, and systems change¹² are necessary to facilitate effective physician stewardship of inpatient laboratory testing and attack a problem so deeply ingrained in habit.

Second, residents in our study believe that access to cost information will better equip them to reduce unnecessary lab ordering. Two recent systematic reviews¹³,¹⁴ have shown that having real-time access to charges changes physician ordering and prescribing behavior. Increasing cost transparency may not only be an important intervention for hospitals to reduce overuse and control cost, but also better arm resident physicians with the information they need to make higher-value recommendations for their patients and be stewards of healthcare resources.

Third, our study highlights that residents’ unnecessary laboratory utilization is driven by perceived, unspoken expectations for such ordering by faculty. This reflects an important undercurrent in the medical education system that has historically emphasized and rewarded thoroughness while often penalizing restraint.¹¹ Hospitalists can play a major role in changing these behaviors by sharing their expectations
regarding test ordering at the beginning of teaching rotations, including teaching points that discourage overutilization during rounds, and role modeling high-value care in their own practice. Taken together and practiced routinely, these hospitalist behaviors could prevent poor habits from forming in our trainees and discourage overinvestigation. Hospitalists must be responsible to disseminate the practice of restraint to achieve more cost-effective care. Purposeful faculty development efforts in the area of high-value care are needed. Additionally, supporting physician leaders that serve as the institutional bridge between graduate medical education and the health system could foster an environment conducive to coaching residents and faculty to reduce unnecessary practice variation.

This study is subject to several limitations. First, the survey was conducted at a single academic medical center, with a modest response rate, and thus our findings may not be generalizable to other settings or residents of different training programs. Second, we did not validate residents’ perception of whether or not tests were, in fact, unnecessary. We also did not validate residents’ self-reporting of their own behavior, which may vary from actual behavior. Lack of validation at the level of the tests and at the level of the residents’ behavior are two distinct but inter-related limitations. Although self-reported responses among residents are an important indicator of their practice, validating these data with objective measures, such as a measure of necessity of ordered lab tests as determined by an expert physician or group of experienced physicians or the number of inpatient labs ordered by residents, may add further insights. Ordering of perceived unnecessary tests may be even more common if there was under-reporting of this behavior. Third, although we provided a definition within the survey, interpretation among survey respondents of the term “unnecessary” may vary, and this variation may contribute to our findings. However, we did provide a clear definition in the survey and we attempted to mitigate this with feedback from residents on our preliminary pilot.

In conclusion, this is one of the first qualitative evaluations to explore residents’ perceptions on why they order unnecessary inpatient laboratory tests. Our findings offer a rich understanding of residents’ beliefs about their own role in unnecessary lab ordering and explore possible solutions through the lens of the resident. Yet, it is unclear whether tests deemed “unnecessary” by residents would also be considered unnecessary by attending physicians or even patients. Future efforts are needed to better define which inpatient tests are unnecessary from multiple perspectives including clinicians and patients.

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