

The Digital Rectal Examination: A Multicenter Survey of Physicians' and Students' Perceptions and Practice Patterns

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- OBJECTIVES:** The digital rectal examination (DRE) may be underutilized. We assessed the frequency of DREs among a variety of providers and explored factors affecting its performance and utilization.
- METHODS:** A total of 652 faculty, fellows, medical residents, and final-year medical students completed a questionnaire about their use of DREs.
- RESULTS:** On average, 41 DREs per year were performed. The yearly number of examinations was associated with years of experience and specialty type. Patient refusal rates were lowest among gastroenterology (GI) faculty and highest among primary-care doctors. Refusal rates were negatively correlated with comfort level of the physician in performing a DRE. More gastroenterologists used sophisticated methods to detect anorectal conditions, and gastroenterologists were more confident in diagnosing them. Confidence in making a diagnosis with a DRE was strongly associated with the number of DREs performed annually.
- CONCLUSIONS:** The higher frequencies of performing a DRE, lower refusal rate, degree of comfort, diagnostic confidence, and training adequacy were directly related to level of experience with the examination. Training in DRE technique has diminished and may be lost. The DRE's role in medical school and advanced training curricula needs to be re-established.

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Introduction

The digital rectal examination (DRE) is an important component of the physical examination. It is useful to assess for prostatic hypertrophy and prostate cancer in men and for pelvic inflammatory disease and pelvic floor prolapse (e.g., rectocele), predominantly in women. Internists also rely on a DRE to identify gastrointestinal tract bleeding and fecal impaction, and, on the basis of anal tone, to assess for spinal cord or sacral nerve injury (1,2). More recently, there is increased recognition that an adequate DRE can assess anorectal function and identify abnormal anal sphincter function at rest and during voluntary contraction, and also pelvic floor dys-synergia in patients who present with chronic constipation (3).

Despite the demonstrated utility of a DRE, it has been suggested that the examination is often not performed when

indicated or is performed in a perfunctory manner (1). The extent to which these limitations are attributable to the increased emphasis on technology over clinical skills in medicine (4) and/or to other factors specific to a DRE is incompletely understood. For example, final-year medical students reported they lacked the training and experience necessary to perform an adequate DRE (5,6). However, there are no data on utilization of DRE by physicians in clinical practice, the factors that affect utilization, and the meticulousness with which a DRE is performed. A better understanding of these issues is necessary to improve utilization and diagnostic utility of DRE in clinical practice. Hence, the aims of our study were to assess the frequency with which a DRE is performed by physicians and medical students at four academic medical centers in the United States, to identify factors

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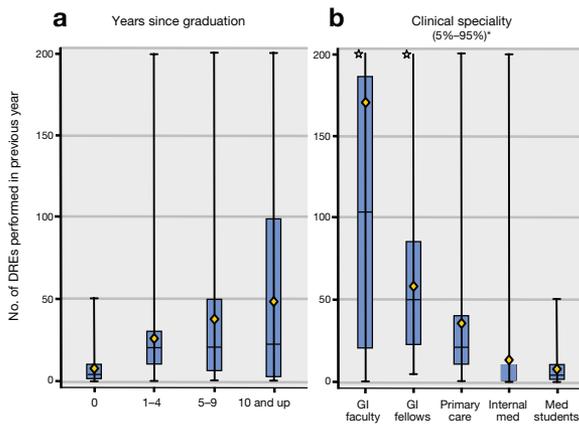


Figure 1. Rectal examinations performed in the previous year. The box plot depicts groups of numerical data through their five-number summaries. The bottom and top of the box are the 25th and 75th percentiles (the lower and upper quartiles, respectively), and the band near the middle of the box is the 50th percentile (the median). The ends of the whiskers represent the 5–95% range of the data of the overall sample. The mean is also included as a yellow diamond. DRE, digital rectal examination.

that affect the frequency, level of confidence, and utility of the performance of a DRE, and to understand differences by age, gender, training, and clinical groups with regard to these factors.

Methods

Between 2008 and 2009, a detailed questionnaire about DRE was sent to physicians and final-year medical students at four academic medical centers: the University of North Carolina at Chapel Hill; the University of Iowa, Iowa City; the University of Wisconsin–Madison; and the Mayo Clinic, Rochester, Minnesota. The physicians included medical residents, subspecialty fellows, and faculty members across different specialties

(primary-care physicians, medical internists, and gastroenterologists). All final-year medical students had been trained to perform a DRE. The distribution of responses varied across sites, but there were no significant across-site differences for each group of clinicians, so the responses were combined by each group.

After an introductory e-mail, questionnaires were mailed to physicians, with a follow-up reminder call if the surveys were not returned. Confidentiality and anonymity of the responses were maintained by only having envelopes labeled, while the survey forms themselves were unmarked. Students were predominantly surveyed on site by circulating questionnaires at conferences attended by the final-year medical students. However, when all students could not be approached at a single sitting, questionnaires were mailed.

Ethics approval. The study was approved by the institutional review boards for the protection of human subjects at the University of North Carolina at Chapel Hill, the University of Iowa, the University of Wisconsin, and Mayo Clinic in Rochester, Minnesota. As granted by the review boards, informed consent was inferred from completion and return of the questionnaires, and no signed consent was required. The questionnaires were unmarked to ensure responder anonymity.

Survey questionnaire. This three-page paper questionnaire included items about demographics, utilization and utility of a DRE, and reasons for not performing a DRE. Because there is no standard method for performing a DRE, questions pertaining to the method of performing a DRE were derived from standard recommendations (1,2). Details of prior training in DRE, perceived adequacy of that training, and confidence in making a diagnosis with a DRE were also sought (Table 1). Respondents' level of comfort with performing a DRE was also evaluated, graded into five discrete levels ("not at all" to "completely").

Table 1. Survey questionnaire components

Parameter	Question	Measure
Respondent demographics	Gender	Male/female
	Specialty	Options, e.g., gastroenterologist, general internist
	Rank	Options, e.g., student, intern, attending (consultant)
	Seniority	Years since graduation from medical school
Use of the DRE	No. of DREs performed	No. in the past year
	No. of refusals of DRE by patients	No. in the past year
	Rate of performance of the DRE in five given clinical scenarios	0–100%
Performance of the DRE	Steps in performing a DRE (rate of performance of 10 standard steps)	5-point scale
	Comfort level in performing a DRE	5-point scale
	Confidence in making a diagnosis (for 10 clinical conditions)	5-point scale
	Reasons cited for not performing a DRE	Yes/no (selecting those that applied)
Training	When was the DRE taught?	Options: medical student, intern, fellow, never taught
	Was the training received perceived as adequate?	5-point scale

DRE, digital rectal examination.

Data analysis. After collation of survey questionnaires, data entry and analysis were performed at the primary study site at the University of North Carolina at Chapel Hill. Descriptive statistics, means and standard deviations, and frequencies were calculated for the sample population, continuous variables, and categorical variables, respectively. Respondents who had not performed any DREs in the past year and physicians who were not engaged in clinical practice were eliminated from the analysis. Differences across sites were estimated by analysis of variance for key variables and with the use of Wilcoxon rank sum tests. Frequency of DREs was compared between subgroups with Procedure General Linear Model (PROC GLM) of rank values to account for the skewness of the variable, and Spearman correlation coefficients were calculated to determine rank correlations. For each physician, the prevalence of patients who declined to have a DRE was calculated by division of the number of examinations declined by the sum of DREs performed and declined (refusal rate). Respondent confidence in performing a DRE was assessed and the relationship between comfort level and refusal rate, adjusted for gender, was determined by PROC GLM. Frequencies of reasons given for not performing a DRE, as well as its use in 10 different diagnostic situations, common steps, and confidence in making a diagnosis, were determined and compared between subgroups. The relationship between the confidence in making a diagnosis in 10 different clinical situations and the number of DREs performed, adjusted for gender, was determined by PROC GLM. Overall confidence was calculated and compared by levels of training with the use of linear regression, adjusted for number of DREs performed, seniority, gender, and rank. Sufficiency of training was also examined by seniority; comparisons between sufficiency levels were performed via linear regression, adjusted by gender, with PROC GLM. Statistical analyses used SAS software, version 9.1.2 (SAS Institute, Cary, NC).

Results

Of 1,401 surveyed individuals, there were 652 respondents from all four sites (333 from the University of North Carolina, 145 from Mayo Clinic, 95 from the University of Iowa, and 79 from the University of Wisconsin). There were 196 medical students and 436 clinicians (72 gastroenterology (GI) faculty, 56 GI fellows, 217 primary-care physicians, and 91 internal medicine physicians). Twenty of the respondents were excluded from the study, as they worked primarily as researchers with minimal clinical duties or patient contact.

Utilization of DRE by physicians. Over the past one year, respondents had performed a mean of 41 ± 106 (\pm SD) DREs. However, responses were skewed, and the median number of DREs was 10; 10 physicians reported performing 500 or more DREs. The number of DREs was significantly associated with physician seniority, specialty, and gender. Specifically, the number of DREs was correlated ($r = 0.37$, $P < 0.01$) with the number of years of clinical experience, ranging from an average of 29 DREs among physicians within 4 years postgraduation to an average of 123 DREs per year among physicians who had been practicing for more than 20

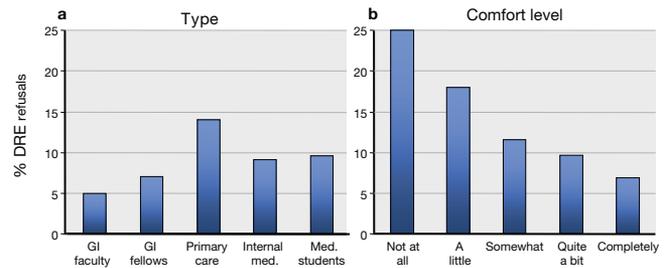


Figure 2. Refusal rate reported by clinician, based on clinician type and comfort level. DRE, digital rectal examination.

years (Figure 1a). On average, GI faculty members did 173 DREs annually, which is higher ($P < 0.0001$) than the number of examinations performed by internists (13 DREs) and final-year medical students (7 DREs) (Figure 1b). Male respondents (average 52 DREs annually) performed more DREs than females (average 28 DREs annually) ($P < 0.0001$). However, there were fewer senior female than male doctors. After adjustment for this variable, gender differences were not statistically significant.

Patients who declined to have a rectal examination. Gastroenterologists reported that 4.3% of their patients declined to have a DRE. This proportion was higher among final-year medical students (9.7%) and highest among primary-care physicians (13.8%); differences were statistically significant. See Figure 2a for the refusal rate for each specialty group.

Comfort level in performing a DRE. Among all respondents, 31% reported being completely comfortable with performing a DRE, 34% quite comfortable, 26% somewhat comfortable, and 10% either not at all or only a little comfortable. The respondents' degree of comfort in performing the DRE was plotted against their refusal rate (Figure 2b). After adjustment by gender, there was a significant inverse relationship (adjusted $r = 0.24$, $P < 0.01$) between self-reported respondent comfort and the patients' rate of refusal of a DRE; that is, physicians who were more comfortable in performing a DRE reported a lower prevalence of patient refusals.

Reasons cited for not performing a DRE. The commonly cited reasons for not performing a DRE (more than one response was permitted) included unspecified (48.3%), concern for patient modesty (43.8%), perceived invasiveness (39.6%), and deferred examination, e.g., an intention to perform a DRE at colonoscopy instead of during the clinic visit (35.6%) (Figure 3).

Respondents with less experience were more likely to cite perceived invasiveness, modesty of the patient, anticipated patient refusal, or no indication as reasons for not performing a DRE, suggesting that these reasons may diminish with clinical experience. However, religious, cultural, and gender issues were not rated as major barriers to performing a DRE, and with respect to these factors, there was no difference between the junior and senior respondents.

Utility of the DRE. Respondents were asked the likelihood that they would perform a DRE in five commonly encountered clinical situations: a general medical examination, chest discomfort, abdominal pain, fecal incontinence, and constipation with straining (Figure 4). Chest discomfort was inserted as a credibility check, as it was assumed very few of the respondents would perform a DRE in a patient with such a complaint. Also, to have a reference point for this response, the authors rated these items on the basis of their experience. The average rates were 100% for fecal incontinence, 100% for constipation, 75% for abdominal pain, 25% for chest pain, and 50% for a general physical examination. In all scenarios (i.e., for a general medical examination and for individual gastrointestinal symptoms), gastroenterologists were more likely than all other groups to perform a DRE, and these responses were similar to those endorsed by the authors.

Components of a DRE. Respondents were assessed on the frequency with which 10 standard steps in a DRE are performed routinely during an examination. The results are shown in Figure 5 and are ranked on a scale of 0–4 (0 never and 4 nearly always). Almost everyone inspected the stool, checked the perineum, palpated the prostate gland, and assessed anal tone, with no notable differences between GI physicians and other groups. GI physicians were more likely to perform specific maneuvers for anorectal conditions, such as asking the patient to strain, assessing pelvic floor descent, or palpating for levator ani tenderness or contraction.

Training and instruction on the DRE. Ninety-three percent of respondents reported they were initially trained to perform a DRE during medical school, 3.7% during residency, and 1.5% during fellowship; only 1.4% of respondents stated that they had never been instructed on how to perform and interpret a DRE. When asked about the adequacy of the training they had received, 33.6% felt completely or quite confident that their training was sufficient, whereas 27.6% responded that their training was “very little” or “not at all” sufficient. With the exception of the “not at all” adequate category, there was a positive trend ($P < 0.01$ for group contrasts) between seniority and adequate training in DRE. Respondents who

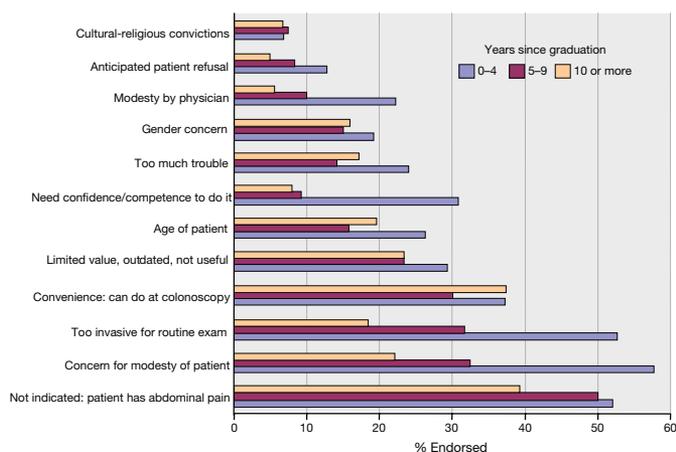


Figure 3. Reasons for not initiating a rectal examination.

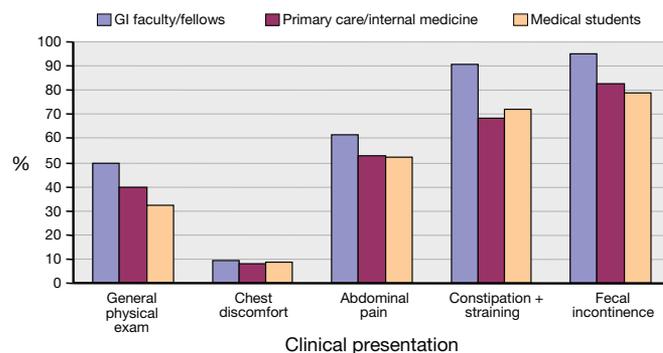


Figure 4. Effect of clinical presentation and clinician type on percentage of digital rectal examinations performed.

reported their training adequacy to be “a little” averaged 5.5 years since graduation from medical school, whereas those who reported their DRE training to be “completely sufficient” averaged 11.5 years since graduation.

Confidence in making a diagnosis based on the DRE. Respondents were surveyed about their confidence (not at all, a little bit, somewhat, quite a bit, completely) in making a diagnosis from a DRE examination in 10 commonly encountered conditions, as shown in Figure 6, which compares GI physicians, internists, and medical students. Most respondents were confident in recognizing conditions such as bleeding per rectum or prostate enlargement (scores between somewhat and quite a bit). However, the gastroenterologists were clearly more confident than the other groups in diagnosing anorectal conditions such as pelvic floor dyssynergia and levator ani syndrome, and identifying an anorectal stricture.

Also noted was a positive relationship between the number of DREs performed in the past year and the confidence in making a diagnosis in eight of ten conditions ($P < 0.001$). The exceptions were rectal/gastrointestinal bleeding and hemorrhoids. To examine this further, an overall confidence score was calculated by summing of the responses for the 10 individual diagnoses. This was compared by levels of training sufficiency, adjusted for gender, number of DREs performed, seniority, and rank. Confidence scores were significantly different between every level of training sufficiency; this ranged from a low score of 27.3 among respondents who felt their training was “not at all sufficient,” rising steadily with increasing sufficiency of training, to a high of 34.4 where respondents felt their training was “completely sufficient” (Figure 7). In conclusion, the more adequate the training in performing a DRE, the more confident the physician was in making a diagnosis using the DRE ($P < 0.0001$).

Discussion

To our knowledge, this is the first systematic assessment of the utilization and utility of DRE across medical students and a spectrum of physicians in clinical practice. The findings suggest that a simple yet effective diagnostic bedside examination technique is underutilized and, for those with recent training, is becoming inadequately taught.

Several factors probably explain the considerable variation in the number of DREs performed by physicians and students who participated in this study. First, practicing gastroenterologists and GI trainees performed the highest number of DREs, which strongly suggests that training and an appreciation of the utility of a DRE influence behavior. Second, primary-care practitioners and internists performed fewer DREs than gastroenterologists. Conceivably, these differences are partly explained by differences in patient populations, i.e., a smaller proportion of patients visiting an internist had conditions that warranted a DRE. However, the distribution of presenting symptoms was not ascertained. Third, experience and seniority influence DRE utilization, as evidenced by the association between number of DREs and length of training, even among internists. Fourth, the reasons for a visit will influence whether a DRE is performed. Clearly, patients who present with lower abdominal pain and disordered defecation or pelvic floor symptoms routinely get a DRE. For a focused examination not involving the lower gastrointestinal system (e.g., for chest pain), the DRE is uncommon. However, for a general physical examination, about half the patients receive a DRE, presumably in this case for screening purposes. Fifth, 56% of respondents reported they were not at all, a little, or somewhat comfortable with performing a DRE. This lack of comfort may be explained by several factors, including inadequate training and physician reluctance to perform a rectal examination on a patient, particularly of the opposite gender. Although a previous study observed that the need for a chaperone and concerns about competency were the two predominant reasons for not performing a DRE among medical students (5), these were lesser concerns among our respondents, including our medical students. However, these two factors were associated, i.e., respondents with less experience were more likely to cite perceived invasiveness, patient modesty, and anticipated patient refusal as reasons for not performing a DRE. Consistent with previous studies, medical students reported they performed fewer than 10 DREs in the past year (5,7). Indeed, in our study the frequency of DREs performed in the past year ranged from a low of seven among the final-year students to a high of 173 by practicing gastroenterologists.

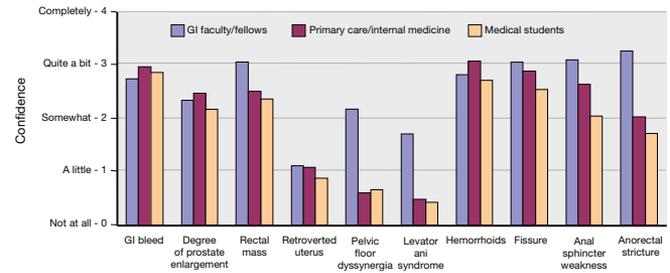


Figure 6. Confidence in making a specific diagnosis, by clinician type.

Among respondents, non-GI physicians reported the highest refusal rates in their patients. Furthermore, among GI physicians, the GI fellows of lower seniority were more likely to be refused than their faculty counterparts. There could be two reasons for this. First is the issue of legitimization. Patients seeing a gastroenterologist would expect to have a rectal examination and hence might be more likely to accede as part of their consultation process. It could be this legitimization that explains why medical students have a lower refusal rate than do primary-care physicians—patients who are being treated at the four academic medical centers where this survey was conducted were aware that these are teaching institutions and hence were prepared to be examined and interviewed by students. Second, gastroenterologists or more senior physicians in general may be more comfortable in performing rectal examinations, and more confident when asking for permission to do a DRE; this might increase their chances of a positive reply.

Twenty years ago, more than 50% of a cohort of British general practitioners reported they performed at least 72 rectal examinations per year (8), which is considerably higher than the figure of 35 reported by primary-care physicians in this study. Perhaps the reduction in utilization of DREs may be explained by a combination of factors, including differences in training over time, an increased emphasis on technology rather than clinical skills in medicine (4), an underappreciation of the utility of a DRE, and a desire to avoid disconcerting patients with a DRE. In another study, patients seen in an emergency department reacted negatively to a rectal examination (9), and many centers in the United Kingdom now require written consent for a vaginal examination. Moreover, a DRE is not very useful in adults with abdominal pain (10,11). Perhaps this explains why the mean number of DREs performed even by gastroenterologists (173 per year) is relatively low.

A considerable proportion of patients with chronic constipation have disordered defecation (12). While defecatory disorders are diagnosed by anorectal tests, many physicians, even practicing gastroenterologists, perhaps do not fully appreciate the utility of a meticulous DRE for evaluating anorectal functions, as confirmed in two recent studies. There was excellent agreement, as evidenced by a correlation coefficient of 0.8, between anal resting and squeeze pressures graded by the digital rectal examination scoring system (DRESS) and anorectal manometry in 303 patients with defecatory symptoms (13). In another cohort of 209 patients with symptoms of chronic constipation, the DRE was 75%

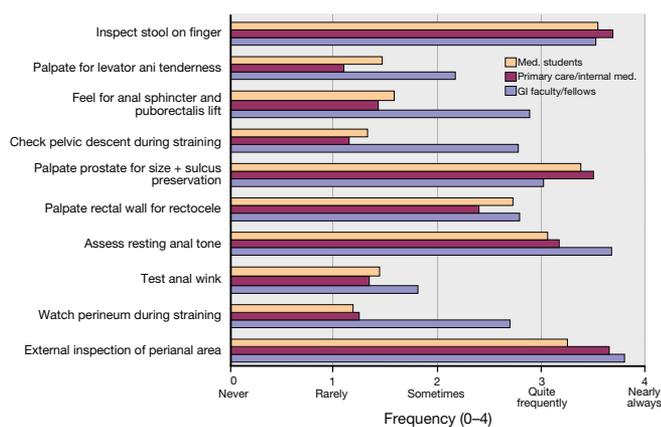


Figure 5. Frequency of maneuvers executed during digital rectal examinations, by clinician type.

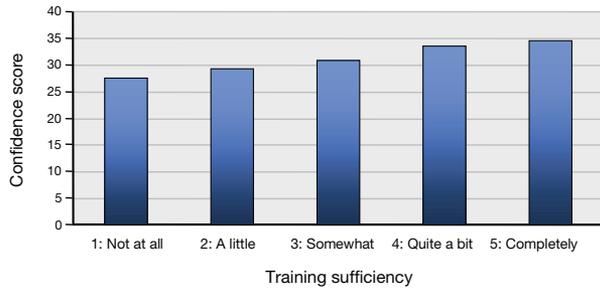


Figure 7. Mean confidence score in using a digital rectal examination to detect and diagnose, by sufficiency of training.

sensitive and 87% specific for diagnosing dyssynergia as predicted by manometry. While there was good agreement (>85%) between the DRE and manometry for identifying normal anal resting and squeeze pressures, agreement for identifying weak resting and squeeze pressures was fair (approximately 50–55%) (3). To emphasize, a DRE conducted by a seasoned clinician is very sensitive but less specific for predicting abnormal rectal balloon expulsion, as some patients with normal anorectal and pelvic floor function are unable to simulate the process of defecation during a digital examination. In chronic constipation, a normal test is more useful than an abnormal test. Current guidelines suggest that anorectal testing be performed only in patients with chronic constipation who are refractory to medical management (14). However, a plausible alternative is to consider anorectal physiologic testing at an earlier stage when a DRE indicates possible pelvic dysfunction. In these patients, establishing the diagnosis of a defecatory disorder will allow pelvic floor retraining, which is superior to laxatives for managing defecatory disorders, to be provided earlier. In the detection of prostate cancer, the European Randomized Study for Screening of Prostate Cancer found that a positive finding on DRE when combined with elevated prostate-specific antigen increased the positive predictive value of finding a cancer on prostate biopsy by 26.2%, in comparison with people who had an elevated prostate-specific antigen but a normal prostate on DRE (15). The findings of this study illustrate how the DRE could be a useful screening procedure to reduce the number of unnecessary tests and investigations.

Our findings have several important implications for medical education and practice. Medical students and physicians, particularly internists and gastroenterologists, should be educated in the method and utility of a meticulous DRE and encouraged to perform a DRE when indicated in clinical practice. These measures may reduce the likelihood, as suggested by our findings, that physicians who perform fewer DREs are less confident in making a positive diagnosis from the procedure, which in turn may reduce their enthusiasm for performing the examination, advocating its use, or teaching it to their students.

As with any broad cross-sectional, multicenter survey of this nature, a limitation of our study was a low response rate, possibly producing a non-responder bias. Our overall non-responder

rate was 56.5% across all the survey sites. However, we increased physician awareness of this study with a notification before, and a reminder after, the survey was mailed. At one institution, students were offered the survey during conferences, when they were a captive audience, thereby increasing the response rate. Furthermore, the number of DREs identified over a year may not necessarily be accurate, since this was obtained by recall rather than independent assessment. Finally, because we did not determine the number of clinic visits per year, we are unable to provide information as to the proportion of DREs performed. For example, the rate per patient visit of DREs would be much higher for a physician having clinic one half day a week rather than five days a week. However, we believe that the finding that DREs are performed so infrequently, especially by non-GI physicians, is so striking that it is likely representative of clinical practice today and is an important message to convey.

Recommendations for the future. We suggest that guidelines be established for a standardized method of performing the DRE, which could be incorporated in the teaching programs for medical students and clinicians. One suggestion would be to start with lectures on the theoretical aspects of performing a rectal examination, then follow with practical tutorials using aids such as a pelvic trainer (a mannequin device reflecting the pelvic anatomy, allowing for step-by-step instruction in a simulated setting). Teaching the physical examination on real patients remains an important part of medical education, and we advocate supervised performance of the DRE in the wards and clinics by tutors and senior clinicians. A useful follow-up study would be to repeat our survey after the implementation of a structured teaching program, to assess the value of this intervention for clinical outcome.

Conclusions

In conclusion, these findings demonstrate that the DRE is underutilized in clinical practice. Moreover, a majority of medical students were not adequately trained to perform a DRE, and a majority of physicians were not comfortable performing a DRE. Together, these observations underscore the need to improve awareness of and training for the DRE, especially among junior doctors, before it becomes a lost art.

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CONFLICT OF INTEREST

Guarantor of the article: Douglas A. Drossman, MD.

Specific author contributions: Reuben K. Wong, MBBS: conception and design of study, interpretation of data, drafting of manuscript, critical revisions of manuscript, final approval. Douglas A. Drossman, MD: conception and design of study, interpretation of data, critical revisions of manuscript, final approval. Adil E. Bharucha, MD: interpretation of data, critical revisions of manuscript, final approval. Satish S. Rao, MD: interpretation of data, critical revisions of manuscript,

final approval. Arnold Wald, MD: interpretation of data, critical revisions of manuscript, final approval. Carolyn B. Morris, PhD: design of study, analysis and interpretation of data. Amy S. Oxentenko, MD: study administration, review of manuscript, data acquisition. Karthik Ravi, MD: study administration, data acquisition. Daniel M. Van Handel, MD: study administration, data acquisition. Hollie Edwards: design of study, data interpretation, data acquisition. Yuming Hu, PhD: design of study, analysis and interpretation of data. Shrikant Bangdiwala, PhD: design of study, analysis and interpretation of data.

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