4.11 THE INTERNAL MEDICINE IN-TRAINING EXAMINATION

CHAPTER OVERVIEW:

- Goals, development, and scoring of IM-ITE.
- Administration of IM-ITE.
- Type of feedback provided to program directors and residents after completion of IM-ITE.
- Counseling a resident who achieves low scores on IM-ITE.

Developed by the American College of Physicians (ACP), the Association of Professors of Medicine (APM), and the Association of Program Directors in Internal Medicine (APDIM), the Internal Medicine In-Training Examination (IM-ITE) is a well-validated and reliable self-assessment instrument. The examination was first offered in 1988 and is now administered annually to more than 92% of internal medicine residents in the United States, Canada, Lebanon, Japan, Jordan, Saudi Arabia, Ireland, Barbados, Jamaica, Iceland, and Qatar. Residents at all levels of training in categorical, primary care, and medicine-pediatrics programs participate in IM-ITE.

GOALS OF IM-ITE

IM-ITE is a low-stakes examination that allows residents to assess their cognitive knowledge of internal medicine compared with a cohort of their peers. IM-ITE does not assess technical and procedural skills, humanistic qualities, or professionalism. Although the examination is targeted to post-graduate year (PGY)-2 residents, most program directors encourage PGY-1 and PGY-3 residents to participate to measure their progress from year to year. Practicing physicians who wish to assess their current knowledge base (e.g., in preparation for the American Board of Internal Medicine [ABIM] Recertifying Examination) may also take IM-ITE.

Examination results allow program directors to evaluate the relative standing of their residents as a group compared with groups of residents from other programs. Program directors may also learn more about strengths and deficiencies in their program and identify areas that possibly require curricular change.

IM-ITE is neither a qualifying nor a certifying examination. Results are confidential. Scores should never be used to assign rewards or penalties; determine eligibility for fellowship programs or certifying examinations; establish clinical competency; or provide data to accrediting and review organizations or licensing bodies.

IM-ITE COMMITTEES

Members of a question-writing committee, most of whom are program directors, write IM-ITE. The committee consists of four representatives from ACP (one of whom is chair), three from APM, and three from APDIM. In 2004, a committee member was added to write geriatric-focused questions. Members are selected from community and university hospitals across the United States, and most have demonstrated proficiency in constructing test questions. In addition to expertise in general internal medicine, each member is usually a subspecialist in one of the primary content areas tested on the examination. Committee members serve staggered three-year terms to maintain a high level of continuity in the year-to-year development of the examination.

The question-writing committee reports to the six-member IM-ITE Steering Committee, which consists of two members each from ACP, APM, and APDIM. The steering committee has oversight of examination development and policy and also conducts research. Each person on the steering committee is a former member of the question-writing committee and serves a three-year rotating term.

DEVELOPMENT OF IM-ITE

IM-ITE consists of 340 single-best-answer, multiple-choice questions. It is a secure, proctored examination that takes eight hours to complete and is divided into two sessions of equal length. Test takers must complete the entire examination on the same day.

Most of the questions on IM-ITE involve patient-based clinical scenarios that require test takers to use higher-order skills of judgment, synthesis, and reasoning

rather than simple recall of isolated facts. A minority of questions test competence in areas such as interpreting and using biostatistical data and understanding medical literature. Procedural skills are not tested and standardized patient examinations are not used.

Preparation of IM-ITE begins approximately 15 months before the examination is administered. Questions are developed according to a blueprint (a list of primary content areas and the percentage of each area allocated to the examination) (**Table**).

TABLE

The 2009 IM-ITE Blueprint	
Primary Content Area	**Percentage**
Cardiology	13.5
Endocrinology	6.5
Gastroenterology	9.5
General Internal Medicine	15.0
Geriatrics	6.0
Hematology/Oncology	11.5
Infectious Diseases	9.0
Nephrology	6.0
Neurology	4.0
Pulmonology/Critical Care Medicine	10.0
Rheumatology	9.0

Each year's IM-ITE includes new and revised items. Questions from previous examinations are reviewed for performance characteristics and ability to discriminate high-scoring from low-scoring test takers. The most appropriate questions are revised and reused in the current examination.

Committee members write new questions according to the examination blueprint and the topics needed to cover each primary content area. All questions are reviewed at two different meetings to ascertain that they are accurate, relevant, and current. In addition, an ACP senior editor ensures that the questions adhere to the rigorous principles and techniques of test development.

ADMINISTRATION OF IM-ITE

IM-ITE is given annually at 418 test locations (training sites) in October. For the 2009 examination, the test window was expanded from eight days to 11 days to give programs more scheduling flexibility. Almost all internal medicine training programs in the United States participate. The number of test takers has increased steadily over the years, from 7,537 in 1988 to 22,262 in 2008.

Program directors select the most convenient day (or days) within the window for test administration. Because questions for IM-ITE are written at the level of proficiency expected of PGY-2 residents, these residents were previously required to take the examination first to maximize scoring reliability (known as the "PGY-2 rule"). However, as a result of the Accreditation Council for Graduate Medical Education resident duty hours regulation, many program directors had difficulty scheduling the examination for second-year residents in advance of other residents. The PGY-2 rule was therefore rescinded in 2005.

Program directors are responsible for the security of the examination, which must be maintained so that accurate scores and norms for evaluating residents and programs can be provided. Directors must ensure that proper procedures are followed and that examination materials are accounted for and returned in a secure manner. Finally, IM-ITE is copyrighted intellectual property owned by ACP; duplication of or providing information about questions is strictly forbidden.

SCORING IM-ITE

The National Board of Medical Examiners (NBME) scores and provides psychometric analysis of the results of IM-ITE. The examination is consistently valid and reliable (validity is the degree to which a test measures what it is supposed to measure; reliability is the degree to which test measurements are consistent after repeated measurements). Validity and reliability of IM-ITE are very high and are similar to high-stakes certifying examinations.

Statistics for each question in IM-ITE are based on the responses of all PGY-2 residents who took the examination that year. A total test score and subtest scores for each of the 11 primary content areas are then developed. Test takers with a high subtest score in one primary content area generally have high subtest scores in all primary content areas.

As anticipated, average scores are consistently higher for residents at higher levels of training. PGY-3 residents score higher than PGY-2 residents, who in turn, perform better than PGY-1 residents. This distribution is true for graduates of US, Canadian, and international medical schools. For the past several years, scores of international medical school graduates

have been similar to US and Canadian medical school graduates' scores. Mean scores for graduates with MD, DO, MBBS, or other degrees are also similar. Studies have shown a strong correlation between a test taker's performance on different multiple-choice examinations. For example, performance on the United States Medical Licensure Examination (USMLE) is highly correlated with performance on the ABIM Certifying Examination (1). Published results from clusters of internal medicine residency programs have shown that results on IM-ITE are also highly predictive of results on the ABIM examination (2-5).

FEEDBACK TO RESIDENTS AND PROGRAM DIRECTORS

NBME includes various feedback materials in the score reports for program directors and test takers. These reports were traditionally mailed to program directors approximately eight to 10 weeks after the examination was administered. However, beginning with the 2006 examination, the reports are now delivered via secure, password-protected access on the Internet. This new delivery system allows programs to receive score reports and related materials 14 days earlier than in previous years (by December 31 of the testing year). The most confidential information is available to a program director or designated staff member only if a program-specific username and password are entered at the appropriate website. For the sake of convenience, less confidential norm tables, histograms, and program performance interpretation guidelines for a program and for residents are included in the same program-specific, password-protected area of the website. Score reports and performance interpretation guidelines for faculty taking the examination are mailed directly to faculty test takers. The program rosters now include an identification number, the test taker's Social Security or Social Insurance number, total IM-ITE score, and subscores for each test taker enrolled in a program (including individuals who tested at other sites and excluding faculty test takers). This roster is available in printable (PDF) and downloadable (ASCI) formats to allow program directors to export data for program-specific analysis.

Each program director's online score report includes:

- A program roster showing the total percentage of correct scores and percentile ranking for each resident in the training program.
- A program performance report showing:
  - Total percentage of correct scores and percentiles for all training programs and for the individual training program.
  - Mean percentage correct scores and percentiles for each primary content category for all training programs and for the individual training program.
  - Mean percentage correct scores and percentiles for the last three IM-ITE examinations.
- Guidelines for interpreting performance statistics.
- Educational objectives for each question in the examination, available at a website provided on the test takers' score reports.
- Percentile rankings that allow a program director to compare an individual resident's score with that of all residents who took the current examination.

Program directors need to distribute test takers' score reports to residents after the reports have been made available online. Each resident receives the following:

- An individual performance report that includes:
  - Total percentage correct score and percentile rank by PGY level.
  - Mean percentage correct scores and percentiles by primary content area.
  - The question numbers, but not the actual questions or answers, of items answered incorrectly.
- Access to the online educational objectives and guidelines for interpreting performance statistics.

PROGRAM DIRECTOR SURVEYS AND RESIDENT QUESTIONNAIRES

ACP, APM, and APDIM collaboratively develop a survey to learn how program directors use IM-ITE results and score reports. Surveys have consistently shown that approximately 95% of program directors find IM-ITE helpful in mentoring and counseling residents and preparing them for the ABIM Certification Examination. Program directors are also asked about other issues, such as how new duty hours regulation affects their training programs.

Immediately after taking IM-ITE, residents are asked to complete a questionnaire to provide feedback about the examination experience. Each year, questions are

included about the length, difficulty, and value of the examination. Residents are asked about other issues such as career choices, training, duty hours regulation, moonlighting, sleep deprivation, and educational debt. Residents have consistently reported that IM-ITE is a valuable experience and that examination results help them identify weak areas in their knowledge base. In addition, recent survey results have shown a definite trend away from general internal medicine as a career choice and a significant increase in the number of residents who plan to seek subspecialty training.

COUNSELING THE RESIDENT WITH A LOW IM-ITE SCORE

A major challenge for program directors is to provide advice for residents who achieve a low score on IM-ITE. Although a "one size fits all" solution is not possible, several factors should be considered. The most likely reason for a low score is that the resident has an insufficient knowledge base to perform at the expected level. The program director should review the resident's performance on other standardized examinations, such as USMLE Steps 1, 2, and 3. In general, a correlation exists between performance on USMLE and performance on subsequent standardized tests of medical knowledge. A low score on both USMLE and IM-ITE may indicate that the resident had a poor knowledge base from the start of residency and must catch up with his or her peers. However, if the resident performed acceptably on USMLE, he or she may have developed inconsistent reading habits during residency or may have been experiencing an extenuating circumstance such as illness or another life stressor at the time of IM-ITE. Although it would be highly unusual for a learning disability to first manifest itself during residency, if such a disability is suspected, the resident should be referred to a neuropsychologist or other specialist for formal evaluation. Such interventions require careful communication between the resident and program director.

The program director should advise a resident who has low scores in selected content areas of the need for additional study. The resident should also be encouraged to review the educational objectives of questions answered incorrectly to gain more knowledge in these specific areas. Another possibility for low scores is that the resident did not complete a rotation in those areas before taking IM-ITE.

The program director should recommend some type of structured study program for the resident with low performance scores in multiple content areas. One resource is the ACP Medical Knowledge and Self-Assessment Program (MKSAP), which is available in print, CD-ROM, and online formats. The last two formats allow the resident to simulate taking an online examination. In addition, the 15th edition of MKSAP includes a publication called Board Basics 2, which helps residents prepare to take the ABIM Certifying Examination.

The residents should have regular follow-up sessions with the program director or faculty mentor to ensure progress. Clinical rotations that provide knowledge assessments at the beginning and end of the rotation are particularly useful for providing feedback to the resident and program director or faculty mentor. The program director or faculty mentor should also be encouraged to observe the resident working through multiple-choice questions to determine if they are being approached in a logical manner. The resident should be encouraged to approach a question in a particular way:

1. Read the clinical scenario (the "stem" of the question).
2. Read the question line at the end of the clinical scenario (understand what the question is asking).
3. Select an answer before reading the answer choices, if possible.
4. Read the choices and select the answer that provides the best fit.

Residents may request time to attend a board review course. However, it is difficult to know the impact of these courses on a specific resident. The resident must understand that such a course cannot substitute for a consistent reading program. Board review courses that combine content with practice review questions likely provide the optimal learning model.

CONCLUSION

IM-ITE has been offered for 21 years. It is a well-validated and accepted method of providing self-assessment for internal medicine residents and allowing program directors to gauge the strengths and weaknesses of individual residents and all residents in their programs compared with a cohort of peers. Examination development is not a static process. The blueprint is revised as needed and question formats are changed in accordance with changes on USMLE and the ABIM Certifying Examination. IM-ITE registration was recently expedited by changing from paper registrations forms to online registration, and score reports are now available online.

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