



PAEA End of Rotation™ Exam

FACULTY GUIDE

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Preface

Dear Members,

It is hard to believe that it has been almost ten years since the launch of the first PAEA End of Rotation™ exams! The End of Rotation exams are a set of objective, standardized evaluations intended to serve as one measure of the medical knowledge students gain during seven core supervised clinical practice experiences. The exams have provided great value to our member programs, faculty, and students alike, and are administered 70,000 times a year at programs across the country.

This faculty guide offers context for End of Rotation exam development, including blueprints, topic lists, exam items, and core tasks and objectives, as well as the overall construct validity. We are publishing this guide in conjunction with the launch of our next-generation exam platform. While PAEA is modernizing our platform and updating the user experience, it is important to note that there are a few things that won't change. The PAEA Assessment Team will continue to anchor our test development, validation, delivery, and maintenance perspectives in a validity-centered approach that prioritizes quality and our commitment to industry standards. And PAEA exams will continue to be written and developed by PA educators for PA programs.

We hope you find this guide helpful and appreciate your continued participation in PAEA. Should you have additional questions, feel free to contact me directly at oziegler@PAEAonline.org.

In Partnership,

A handwritten signature in black ink, appearing to read 'Casey Johnson', with a long horizontal flourish extending to the right.

Casey Johnson, PhD
Senior Director, Assessment Services, Psychometrician

Contact Us

If you have any questions, please contact the Assessment Team at **301-617-7820** or exams@PAEAonline.org.

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SECTION 1

End of Rotation Exams

STATEMENT OF PURPOSE

The PAEA End of Rotation exams are a set of objective, standardized evaluations intended to serve as one measure of the medical knowledge students gain during specific supervised clinical practice experiences.

BACKGROUND

The Test Item Bank Advisory (TIBA) Committee was formed in 2011 to explore the potential of offering additional PAEA examinations. The Committee was comprised of 10 members, including representatives of the PAEA Board of Directors, program directors, program faculty, and clinical coordinators. The TIBA recommended maintaining PACKRAT[®], a self-assessment tool for student and curricular evaluation, and developing two new examination programs: End of Rotation exams and a new comprehensive examination that later became the End of Curriculum[™] exam. The TIBA determined that End of Rotation exam development should be prioritized as it was the most pressing need for members.

In 2013, with the assistance of multiple volunteer committees, PAEA published our seven core End of Rotation exams: Emergency Medicine, Family Medicine, General Surgery, Internal Medicine, Pediatrics, Psychiatry & Behavioral Health, and Women's Health. Each 120-question multiple-choice exam is built to meet specifications within the blueprint and topic lists developed specifically for PA programs by PA educators and national exam experts. PAEA End of Rotation exams are intended to be used in conjunction with other evaluation modalities when assigning a student grade for supervised clinical practice experiences.

SECTION 2

Exam Development & Construction Methods

CONTENT VALIDITY

Exam development board members, PAEA assessment staff, and psychometricians use the following resources to guide the creation of exam content and construct exam forms: exam blueprints, guiding principles, topic lists, and core tasks and objectives.

Exam items are geared toward a PA student who has completed the relevant supervised clinical practice experience. It is important to understand that PA programs may cover more than what is on the exam blueprints and topic lists. PA program faculty should also review the blueprints, topic lists, and core tasks and objectives and determine how they align with the program's overall outcomes in supervised clinical practice experiences.

BLUEPRINT

Content Areas

Each PAEA End of Rotation exam blueprint is two-dimensional, meaning that it is organized for both content and task area. Each End of Rotation exam is built to blueprint and topic list specifications. Items included on the exam are considered only a sample and may not reflect all content topics identified in the topic list.

To learn more, visit: <https://paeaonline.org/assessment/end-of-rotation/content>

Core Tasks and Objectives

A set of core tasks and objectives are assessed by all of the PAEA examinations (PACKRAT®, End of Rotation, and End of Curriculum™). The Core Tasks and Objectives along with the blueprint and topic lists for each End of Rotation exam should be provided to students to aid in their preparation for PAEA End of Rotation exams.

To learn more, visit: <https://paeaonline.org/assessment/core-tasks-and-objectives/>

Guiding Principles

Several cross-cutting criteria guide the development and delivery of the End of Rotation exams. The goal of these ideals is to assist the exam development team in ensuring that the exams, to the extent a multiple-choice exam can, evaluate a wide breadth of dimensions critical to a PA student's preparation. This list has evolved as the End of Rotation exam program has matured.

Items written for this exam expressly consider the broad diversity of patients that PAs will be called upon to treat. Item writers are trained in cultural humility in item writing and are asked to remain culturally sensitive when using variables including, but not limited to, race, ethnicity, nationality, gender identity, sexual orientation, socioeconomic status, cultural identity, religion, and functional diversity.

Items developed for the End of Rotation exams cover the lifespan and target a variety of patient care settings:

- Emergency Medicine
 - Full lifespan
 - Emergency department, urgent care
- Family Medicine
 - Full lifespan
 - Ambulatory, urgent care, and long-term care
- General Surgery
 - Full lifespan
 - Ambulatory, emergency department, inpatient, and perioperative
- Internal Medicine
 - Adult and geriatric
 - Ambulatory, inpatient, and long-term care
- Pediatrics
 - Infants, children, and adolescents
 - Ambulatory, emergency department, and inpatient
- Psychiatry & Behavioral Health
 - Full lifespan
 - Ambulatory, emergency department, and inpatient
- Women's Health
 - Adolescent and adult
 - Ambulatory, emergency department, inpatient, and perioperative

ITEM FORMAT

The End of Rotation exams use a 'one best answer' question format. Each item consists of a scenario or vignette (known as a stem), a question (known as a lead-in), and a list of potential solutions. The list of solutions consists of one correct or best answer (known as the key) and incorrect or inferior alternatives (known as distractors).

Each item on the End of Rotation exams includes a clinical vignette with a varying degree of complexity. Vignettes are a good measure for assessing higher-order thinking skills, and they provide a better approximation of real-life practice.

The following vignette is a sample item consistent with those on the End of Rotation exams:

A 27-year-old man comes to the office for evaluation of anorexia and vague abdominal pain for two days. The pain worsened this morning, becoming localized to the right lower abdomen. The patient has associated nausea, but no vomiting. His last bowel movement was yesterday and was normal in color and caliber. The patient denies melena or hematochezia. The patient has no surgical history. He takes no medications. He does not smoke or drink alcohol. Height is 182.88 cm (72 inches), weight is 81.65 kg (180 lb), and body mass index is 24.4 kg/m². Temperature is 38.3°C (101.0°F), pulse rate is 96/min and regular, respirations are 18/min and unlabored, and blood pressure is 132/90 mmHg. The patient rates his pain as a 7/10 on the pain scale. On physical examination, there are normoactive bowel sounds. There is pain in the right lower quadrant with palpation in the left lower quadrant.

← ITEM STEM

Which of the following is the most likely diagnosis? ← LEAD-IN

A. Appendicitis ← KEY

B. Cholecystitis

C. Diverticulitis

D. Duodenitis

E. Gastroenteritis

DISTRACTORS →

Note the structure of the stem and potential options. All of the items on our exams are coded to the blueprint and topic list; the coding for this specific item is as follows:

Content Area: Gastrointestinal/Nutritional
 Task Area: Diagnosis
 Diagnosis: Acute appendicitis

ITEM ANALYSIS AND PRETESTING

The End of Rotation exams are composed of 120 multiple-choice items, 100 of which are operational scored items (previously pretested items that have been validated following live exam administration). The other 20 items are unscored pretest questions (items that have gone through the extensive expert review process but have yet to be administered to students). Operational items contribute to a student's score and make up the majority of an exam form. Both types of items, pre-test and operational, undergo ongoing analyses to ensure they are performing as expected. Once enough students have taken the set of items to achieve robust statistics, the following classical test theory statistics are calculated:

- Proportion of students who responded correctly to the item (p-value)
- Proportion of students selecting each multiple-choice option
- Point-biserial correlation for the correct response, or key (r_{key})
- Point-biserial for distractor response options (r_{dis})

Consistent with best practices outlined in joint technical standards¹, PAEA uses the results of item analyses to identify items in need of further content review and key validation by subject matter experts. Given that End of Rotation exam items are all multiple-choice, a p-value lower than chance may be indicative of an item not functioning as desired. The point-biserial correlation coefficient of the correct response (r_{key}), sometimes referred to as point biserial or discrimination, is used to measure the ability of an item to distinguish between high and low performers. A high r_{key} means that high performers are more likely to answer an item correctly than low performers. A negative r_{key} means that low performers are more likely to answer an item correctly than high performers. Too many low or negative point biserial items on an exam will reduce the overall reliability of the exam. The point-biserial can also be calculated for distractors (r_{dis}). Items with large and positive r_{key} and all r_{dis} near or below zero are behaving as expected. If an r_{dis} is positive, especially if it is larger than the r_{key} , the item may be “miskeyed” (i.e., have the wrong response option marked as correct).

What follows are the criteria for the identification or “flagging” of items which require further content review and key validation by subject matter experts. Note that pretest items, because they are untested, are held to a higher standard than operational items, which have seen more administrations and have passed the flagging process at least once before.

Flagging Criteria:

Pre-Test Item Flags	Operational Item Flags
<p>p-value \leq .35 <i>Difficult items</i></p>	<p>p-value \leq 0.25 or p-value \leq 0.2; depending on number of options <i>Difficult items</i></p>
<p>$r_{key} \leq$ 0.1 & p-value $<$ 0.9 <i>Items that are not overly easy and do not discriminate well</i></p>	<p>$r_{key} \leq$ 0.0 & p-value $<$ 0.9 <i>Items that are not overly easy and do not discriminate well</i></p>
<p>$r_{key} <$ r_{dis} <i>Items with distractors that exhibit better discrimination than the key</i></p>	<p>$r_{key} <$ r_{dis} <i>Items with distractors that exhibit better discrimination than the key</i></p>

Items identified using the above criteria are reviewed by three members of the appropriate Exam Development Board. In addition to the described statistics, p-values and point-biserial correlations are provided for each performance tercile (lower third, middle third, upper third) of students. Subject matter experts review each flagged item and decide whether to keep the item as is, designate the item to be rewritten, or elect to delete the item outright from future use. A psychometrician assists with the interpretation of statistical information and tracks item-level decisions.

PROJECT PLANNING AND QUALITY

Developing a high-quality, national standardized exam is a significant endeavor. Multiple individuals and processes are involved, and a well-documented system of exam development is necessary to ensure quality. At PAEA, we utilize project management and quality assurance processes to ensure production goals are met and the quality of the End of Rotation exams are maintained through a systematic approach.

SECTION 3

Scoring & Analytical Reports

STATEMENT OF PURPOSE

There are at least two forms available for each of PAEA's seven End of Rotation exams. In the case of Family Medicine, there are three forms available. Extra forms offer programs the ability to retest students after remediation. Each form is designed to measure the same content; however, each form contains different sets of test items. Forms are built to be equivalent in difficulty, but exam forms may be found to differ slightly in difficulty once administered to students. The use of scale scores (discussed in subsequent sections) account for these minor differences in difficulty and ensures that scores are comparable between exam forms and over years, regardless of the specific exam form taken by a student. It is important to note that, while valid and substantial, an End of Rotation exam score is one data point and should be used in conjunction with other forms of SCPE assessment.

SCALE SCORES

In 2013, the PAEA End of Rotation exams were initially developed and scored using classical test theory. At the time, classical test theory was appropriate given the number of forms and students taking the exams. As the item banks and student exam administrations grew, the End of Rotation exams were migrated to item response theory (IRT). The use of IRT provides advantages over classical methods, specifically in maintaining a single "scale" across multiple exam forms. With the release of Version 6 of the End of Rotation exams in 2016, PAEA moved to reporting scale scores based on the underlying IRT metric rather than the number of correct responses ("raw scores") typical of classical test theory programs. In evaluating or comparing student performance, the use of scale scores (or transformations of them, such as percentiles or z-scores) is preferable to raw scores. Although End of Rotation exam forms are built to be similar in difficulty, raw scores are still subject to differences in difficulty between forms, while scale scores are not.

STUDENT SCORE REPORTS

Student scores are reported on the score scale of 300-500. After the completion of an exam, programs and students are provided feedback in the form of a score report. This feedback allows a student to compare their individual performance with that of peers from programs across the country. Aggregate reports of student scores are also provided to each PA education program. (See samples below.)

Subscore Reporting

In addition to reporting a student's total score, subscores across content areas (e.g., Cardiovascular, Dermatology, Endocrinology) and task areas (e.g., history and physical, diagnosis, clinical intervention) are also provided. For each area, the percent of the exam items corresponding to each area, the student's scale score on those items, and the national average in that area are presented. In a normative sense, comparisons can be made between a student's performance and the national average to gain perspective on a student's strength in an area relative to their peers. Similarly, rank ordering areas by the student's scale score can help to gain a sense of relative areas of strength or weakness. That said, in any analysis or review of this data,

it is important to keep in mind that these subscores are based on considerably less items than the total test score, and thereby are less reliable/precise than the total test score. This also holds for the different subscores reported – subscores for larger content areas are more precise (i.e., are less variable) than those of smaller content areas. Finally, it should be noted that, like End of Rotation exam forms themselves, the items on any given exam form are only a sampling of potential points that could be assessed on a given area.

Keyword Feedback

In addition to subscore feedback, keyword feedback is included on student score reports. Students are provided a list of keywords of the exam items they answered incorrectly. Keywords are given in the format of “Content Area: Task, Diagnosis” (e.g., Pulmonology: Clinical Intervention, Asthma). This is the most fine-grained and direct feedback provided to students, and it can help students identify areas where they may want to focus additional study efforts.

Considerations When Interpreting Score Reports

A range of circumstantial factors may influence student performance on End of Rotation exams, leading to differences in performance within or among programs. Some of these factors apply to any examination, while others may apply more specifically to PAEA End of Rotation exams and comparisons to national data throughout the course of clinical education. The following should be considered when interpreting score reports.

Student motivation could be affected by factors that vary at the local program level, including weight of the exam relative to the student’s overall grade and potential penalties articulated for poor performance. Students will sometimes prepare (mentally and emotionally) for End of Rotation exams based upon prior processes and procedures at the program. It is important that different testing methods (computer-based vs. paper and pen) and expectations are clearly communicated. In addition, written learning objectives that match the exam blueprint should be provided well in advance so that students have time to focus their studying during the clinical rotation.

Student clinical training experiences in the discipline may vary in length depending on the program. Considerations should be made regarding the overall length of time the student has been engaged in clinical training and also consider if this is their first clinical rotation, subsequent, or last. A student in their last rotation may be more comfortable with the exam structure and expectations of their supervised clinical practice experience.


Environmental factors need to be considered as well. It is well known that knowledge is reinforced through application. Students will have different clinical experiences based on patient volume, acuity, and disease patterns, which fluctuate by site and season. For example, students in a pediatrics rotation during the summer may be less likely to encounter patients with influenza. In addition, the degree of preceptor engagement in student clinical knowledge development through oral quizzing and assignments may help reinforce retention of content that may appear on the exam. Additionally, the unexpected can happen (e.g., the COVID-19 pandemic). The pandemic has shifted the entirety of the testing and evaluation landscape. Sudden changes

in both learning and testing environments can cause unexpected stress in students which may lead to poor testing performance.

SAMPLE REPORTS

In 2023, PAEA switched exam platforms to offer a more seamless experience for program faculty and enhancements in assessment offerings. While the reports may aesthetically look different, they will contain information consistent with previous versions. We provide annotated examples of the new Assessment Center score report dashboards. In each case a downloadable PDF or CSV file is also available.

Program Performance Report



Program: PAEA Test Account

Casey Johnson

ASSESSMENT HUB HOME
STUDENT ROSTER
SCHEDULING
SCORE REPORTS
ASSESSMENT CENTER

PROGRAM PERFORMANCE REPORTS

Sort by Year, Group, and Exam

Graduation Year 2023 ▼
Student Group All ▼
Exam End of Rotation ▼
EXPORT

Click on the exam you wish to view

Exam	Number of Students	Program Mean Score	Program Standard Deviation	National Count	National Mean Score	National Standard Deviation
Emergency Medicine End of Rotation	1	300	-	10622	410	21


The comparative national data contained in this report are based on a reference population of students nationwide. This information is updated periodically and represents a robust set of statistics against which to compare your program.

Download a PDF

Subscore Category Content Category ▼

Sort by Content Category and Task Area

	Content Blueprint Percentage	Program Mean Score	National Mean Score
Cardiovascular	20%	300	398
Orthopedics/Rheumatology	15%	300	416
Gastrointestinal/Nutritional	10%	300	413
Pulmonology	10%	322	405
Neurology	8%	300	420
ENOT/Ophthalmology	7%	300	402
Urology/Renal	6%	300	397
Dermatology	5%	300	422
Endocrinology	5%	300	408
Obstetrics/Gynecology	5%	300	405
Psychiatry/Behavioral Medicine	5%	300	400



Program: PAEA Test Account

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ASSESSMENT HUB HOME | STUDENT ROSTER | SCHEDULING | SCORE REPORTS | ASSESSMENT CENTER

PROGRAM PERFORMANCE REPORTS

Graduation Year: 2023 | Student Group: All | Exam: End of Rotation

[EXPORT](#)

Click on the exam you wish to view

Exam	Number of Students	Program Mean Score	Program Standard Deviation	National Count	National Mean Score	National Standard Deviation
Emergency Medicine End of Rotation	1	300	-	10622	410	21


The comparative national data contained in this report are based on a reference population of students nationwide. This information is updated periodically and represents a robust set of statistics against which to compare your program.

Subscore Category: Task

	Content Blueprint Percentage	Program Mean Score	National Mean Score
Diagnosis	25%	300	420
Clinical Therapeutics	20%	300	403
History & Physical	15%	300	395
Clinical Intervention	10%	300	401
Diagnostic Studies	10%	325	419
Health Maintenance	10%	300	411
Scientific Concepts	10%	300	419

The subscore table shows the percentage of exam items belonging to each subscore area, your program performance and how students performed nationwide. Please be aware that subscores are based on fewer items than total scores and are thereby less reliable than total scores. Please use this data in conjunction with other information in identifying relative areas of strength and weakness within your program, Graduation Year and/or Student Group.
For more information, go to EndOfRotation.org

Program Composite Report



Program: PAEA Test Account

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ASSESSMENT HUB HOME STUDENT ROSTER SCHEDULING SCORE REPORTS ASSESSMENT CENTER

PROGRAM COMPOSITE REPORTS

Graduation Year
2023

Exam Program
End of Rotation

Subscore Categories
Content Category

Student Group
All

Exam
Emergency Medicine End of Rotation

Sort by Content Category and Task Area

EXPORT


Download a CSV

	Student	Exam Date	ReL.	Overall	Subscore											
					1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	QuinenoStudent, Meredith	03/15/2023		300	300	300	300	322	300	300	300	300	300	300	300	302

- 1 Cardiovascular
- 2 Orthopedics/Rheumatology
- 3 Gastrointestinal/Nutrition
- 4 Pulmonology
- 5 Neurology
- 6 ENOT/Ophthalmology
- 7 Urology/Renal
- 8 Dermatology
- 9 Endocrinology
- 10 Obstetrics/Gynecology
- 11 Psychiatry/Behavioral Medicine
- 12 Hematology

RELEASE SELECTED SCORES

RELEASE ALL SCORES



Program: PAEA Test Account

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ASSESSMENT HUB HOME STUDENT ROSTER SCHEDULING SCORE REPORTS ASSESSMENT CENTER

PROGRAM COMPOSITE REPORTS

Graduation Year: 2023

Exam Program: End of Rotation

Subscore Categories: Task

Student Group: All

Exam: Emergency Medicine End of Rotation

EXPORT

Released

Key for Subscore columns

	Student	Exam Date	Rel...	Overall	Subscore						
					1	2	3	4	5	6	7
<input type="checkbox"/>	QuineneStudent, Meredith	03/15/2023		300	300	300	300	300	325	300	300


- 1 Diagnosis
- 2 Clinical Therapeutics
- 3 History & Physical
- 4 Clinical Intervention
- 5 Diagnostic Studies
- 6 Health Maintenance
- 7 Scientific Concepts

Each row shows the Student, Exam Date, if the exam has been Released, and both Overall and Subscores based on the Subscore Category selected

RELEASE SELECTED SCORES

RELEASE ALL SCORES

Individual Student Report



Program: PAEA Test Account

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ASSESSMENT HUB HOME STUDENT ROSTER SCHEDULING SCORE REPORTS ASSESSMENT CENTER

INDIVIDUAL STUDENT REPORTS

Graduation Year

2023

Student Group

All

Student

Meredith QuineneStudent

Administration Date

03/15/2023

EXPORT

Exam Program

End of Rotation

Exam

Emergency Medicine End of Rotation

Overall Score:

300

The scale for End of Rotation exams is 300 to 500. Please consult your faculty for assistance with interpreting your results.

Subscore Category


Content Category

Content Area	Content Blueprint Percentage	Your Performance	National Mean Score
Cardiovascular	20%	300	398
Orthopedics/Rheumatology	15%	300	416
Gastrointestinal/Nutritional	10%	300	413
Pulmonology	10%	322	405
Neurology	8%	300	420
ENOT/Ophthalmology	7%	300	402
Urology/Renal	6%	300	397
Dermatology	5%	300	422
Endocrinology	5%	300	408
Obstetrics/Cynecology	5%	300	405
Psychiatry/Behavioral Medicine	5%	300	400
Hematology	4%	302	398

Download a PDF

Sort by the Student and Administration Date

Sort by Content Category, Task Area, and Keyword Feedback



Program: PAEA Test Account

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ASSESSMENT HUB HOME STUDENT ROSTER SCHEDULING SCORE REPORTS ASSESSMENT CENTER

INDIVIDUAL STUDENT REPORTS

Graduation Year
2023

Student Group
All

Student
Meredith QuineneStudent

EXPORT

Exam Program
End of Rotation

Exam
Emergency Medicine End of Rotation

Administration Date
03/15/2023

Overall Score:
300

Individual Student's Overall Score


The scale for End of Rotation exams is 300 to 500. Please consult your faculty for assistance with interpreting your results.

Subscore Category
Task

Individual Student's Score by Subscore Category selected

Content Area	Content Blueprint Percentage	Your Performance	National Mean Score
Diagnosis	25%	300	420
Clinical Therapeutics	20%	300	403
History & Physical	15%	300	395
Clinical Intervention	10%	300	401
Diagnostic Studies	10%	325	419
Health Maintenance	10%	300	411
Scientific Concepts	10%	300	419

The subscore table shows the percentage of exam items belonging to each subscore area, your performance and how students performed nationwide. Please be aware that subscores are based on fewer items than total scores and are thereby less reliable than total scores. Please use this data in conjunction with other information in identifying relative areas of strength and weakness.



Program: PAEA Test Account

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ASSESSMENT HUB HOME STUDENT ROSTER SCHEDULING SCORE REPORTS ASSESSMENT CENTER

INDIVIDUAL STUDENT REPORTS

Graduation Year

2023

Student Group

All

Student

Meredith QuineneStudent

EXPORT

Exam Program

End of Rotation

Exam

Emergency Medicine End of Rotation

Administration Date

03/15/2023

Overall Score:

300

The scale for End of Rotation exams is 300 to 500. Please consult your faculty for assistance with interpreting your results.

Subscore Category

Keyword

Sort to Keyword Feedback

Content Category Coding : Task Area, Diagnosis

The following list includes keyword feedback for the questions you answered incorrectly on the exam. If you missed multiple questions in one Content Category, the topic is only listed once. Therefore, you should not assume that the number of entries below directly corresponds to the number of questions you answered incorrectly.

- Cardiovascular: Clinical Intervention, Unstable ventricular tachycardia
- Cardiovascular: Clinical Therapeutics, Aortic dissection
- Cardiovascular: Clinical Therapeutics, Atrial fibrillation with heart failure
- Cardiovascular: Clinical Therapeutics, Deep venous thrombosis
- Cardiovascular: Clinical Therapeutics, Shock
- Cardiovascular: Diagnosis, Arterial embolism
- Cardiovascular: Diagnosis, Atrial fibrillation
- Cardiovascular: Diagnosis, Mitral valve prolapse
- Cardiovascular: Diagnostic Studies, Acute pericarditis
- Cardiovascular: Diagnostic Studies, Congestive heart failure
- Cardiovascular: Health Maintenance, Bacterial endocarditis
- Orthopedics/Rheumatology: Clinical Therapeutics, Osteoporosis
- Orthopedics/Rheumatology: Diagnosis, Lisfranc injury
- Orthopedics/Rheumatology: Health Maintenance, Osteopenia
- Orthopedics/Rheumatology: Health Maintenance, Osteoporosis
- Orthopedics/Rheumatology: History & Physical, Anterior cruciate tear
- Orthopedics/Rheumatology: History & Physical, Carpal tunnel syndrome
- Orthopedics/Rheumatology: History & Physical, De Quervain tenosynovitis
- Orthopedics/Rheumatology: History & Physical, Osteoarthritis
- Orthopedics/Rheumatology: Scientific Concepts, Osteomyelitis
- Psychiatry/Behavioral Medicine: Clinical Intervention, Alcohol withdrawal
- Psychiatry/Behavioral Medicine: Clinical Intervention, Depressive disorder
- Psychiatry/Behavioral Medicine: Clinical Therapeutics, Alcohol withdrawal
- Psychiatry/Behavioral Medicine: Diagnosis, Histrionic personality disorder
- Psychiatry/Behavioral Medicine: Diagnosis, Inhalant intoxication
- Pulmonology: Clinical Therapeutics, Atypical pneumonia
- Pulmonology: Diagnosis, Chronic obstructive pulmonary disease
- Pulmonology: Health Maintenance, Pneumococcal pneumonia
- Pulmonology: History & Physical, Pulmonary embolism
- Pulmonology: Scientific Concepts, Asthma
- Pulmonology: Scientific Concepts, Bacterial pneumonia
- Urology/Renal: Clinical Intervention, Hydronephrosis
- Urology/Renal: Clinical Intervention, Nephrolithiasis

References

1. American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, eds. 2014. *Standards for Educational and Psychological Testing*. Lanham, MD: American Educational Research Association.

Glossary of Terms

Anchor Items – Examination items that are common across forms and used to ensure comparability of those forms as part of the equating process.

Assessment – The systematic collection of valid, reliable, and unbiased (to the extent possible) data about formal and informal educational activities, programs, and courses undertaken for the purpose of identifying what learners know, understand, and can do as a result of educational experiences.

Assessment Tools/Instruments – Techniques and/or instruments used to collect assessment data.

Blueprint – A structured examination outline with associated area weights usually formatted as an outline or matrix.

Clinical Vignette – Patient-related cases and scenarios that are often used to describe a problem in a multiple-choice exam.

Construct/Content Validity – Degree to which a measurement instrument accurately represents the knowledge, skill, or characteristic it is designed to measure.

Content Area – Organ systems such as Cardiovascular or Endocrinology.

Curriculum – A set of interrelated and integrated activities which facilitate student learning in a developmentally appropriate manner, designed to foster satisfactory achievement of student learning outcomes.

Data – The raw observations or measurements from which information is derived to be used as a basis to form reasoning.

Distractor – Incorrect or inferior alternatives on a multiple-choice test item.

Equating – Statistical process used to convert scores on two or more alternative forms of an assessment instrument to a common score for purposes of comparability and equivalence.

External Assessment – Use of criteria, assessment tools, or instruments external to the program (i.e. PAEA End of Rotation exams, PANCE).

Evaluation – The qualitative and/or quantitative analysis of assessment data so that it may be used to determine merit, worth, value, or significance.

Feedback – Information provided to the learner, instructor, and/or program director to guide future action.

Form – A particular set of items that conform to the specifications of a blueprint.

Goal – The end toward which one directs effort; describes the competence, skills or characteristics required at the end of a course or program.

Information – Data in context.

Items – A general term referring to questions that appear in assessment instruments to which candidates must respond.

Item Bank – The system by which test items are stored and classified to facilitate item development, item review, and exam construction.

Item Discrimination – Used to determine how well an item is able to discriminate between high- and low-performing students.

Item Response Theory (IRT) – A mathematical model of measurement in which it is assumed that a single latent trait underlies a student’s ability and the probability of a response is related to the individual’s level of underlying ability.

Key – Correct answer on a multiple-choice exam item.

Key Validation – A statistical analysis of item performance conducted after an exam to help verify that the answer key was correct and that individual test items are free of flaws.

Keyword Feedback – The keyword feedback provides information on the concept missed and is reported in the following format: Content Category: Task Area, Diagnosis. This can be used by the program and student to identify trends in knowledge deficits as well as to serve as a tool to create an individualized and focused study plan.

Lead-in – The part of the stem in a multiple-choice item that tells the student exactly what needs to be answered. For example, “what is the most likely diagnosis?”

Learning – What students know and what they can do with what they know.

Learning Indicator – A subcomponent or metric with which a learning outcome can be measured (see also Learning Outcome and Learning Objective).

Learning Objective – An expressed, anticipated, and measurable result of educational experiences based in the cognitive, affective, and/or psychomotor domain (see also Learning Outcome and Learning Indicator).

Learning Outcome – Knowledge, skills, attitudes, and abilities attained through participation in an educational experience (see also Learning Objective and Learning Indicator).

Local Assessment – Program-developed criteria, tools, instruments based upon teaching approaches, students, learning goals.

Mean – Arithmetic average obtained by adding all scores and dividing by the total number of scores.

Operational Item (scored item) – Items that have been pre-tested and are scored on an exam.

Outcome – An anticipated result.

P-value – Percentage of examinees choosing the correct answer.

Point-Biserial Correlation (r) – Measure of item discrimination used to determine if an item is behaving as expected or if it may be miskeyed.

Pre-Test Item (unscored) – Newly developed items on an exam that are being tested to evaluate if they are performing within acceptable statistical parameters prior to the item affecting a test-taker exam score.

Pre-Test Tail – A group of pre-test or unscored items added to a form to gather performance data. Referred to as a tail because they are added to the tail end of the exam during form construction (although in the testing environment they are randomly ordered).

Psychometrics – The science and technology of mental measurement, including psychology, behavioral science, education, statistics, and information technology.

Psychometricians – An expert and/or practitioner in psychometrics.

Quantitative Methods of Assessment – Methods that directly generate numerical scores or ratings, for example: surveys, inventories, institutional/departmental data, or departmental/course-level exams (locally constructed, standardized, etc.).

Raw Score – The number of items correct out of the total number of items taken. The raw score is a data point that has not been transformed.

Reliability – The degree to which scores on an assessment instrument are free of measurement error.

Remediation – Process to correct identified deficits in knowledge, skills, behavior, etc.

Reporting – The process by which assessment information is communicated to constituents for use in evaluation.

Retest/Reassessment – To test again; should be done after a deficiency is detected and remediated to confirm that the student has successfully learned the knowledge/skill or can properly demonstrate the desired behavior.

Scale Score – A general term for any of a variety of transformed scores; derived from the raw scores through mathematical conversion so that the scores from different forms of the same test can be reported on a common scale and are, therefore, comparable.

Subscore – A score on a subset of exam items related to the same topic. Subscores are reported across content areas (e.g., Cardiovascular, Dermatology, Endocrinology) and task areas (e.g., history and physical, diagnosis, clinical intervention).

Supervised Clinical Practice Experiences (SCPEs) – Supervised student encounters with patients that include comprehensive patient assessment and involvement in patient care decisions making and which result in a detailed plan for patient management (Accreditation Standards for Physician Assistant Education, 5th Edition: <http://www.arc-pa.org/wp-content/uploads/2022/03/Standards-5th-Ed-Mar-2022.pdf>)

Standard Deviation – A measure of the variability or dispersion of a distribution of scores. The more the scores cluster around the mean, the smaller the standard deviation; the greater the dispersion, the greater the standard deviation.

Standard Error of Measurement (SEM) – As applied to a single obtained score, the amount by which the score may differ from the hypothetical true score due to errors of measurement. The larger the SEM, the less reliable the score.

Stem – The scenario or problem section in a multiple-choice item.

Student Outcomes Assessment and Evaluation – The act of collecting, assembling, and analyzing quantitative and qualitative data to provide meaningful feedback.

Subject Matter Expert – A person with documented expertise in a profession, occupation, or role whose input into the development and validation of assessment instruments helps to ensure validity.

Task Area – Knowledge and skill areas on the End of Rotation exam. For example: Diagnosis and Clinical Intervention.

Validity – The degree to which accumulated evidence supports specific interpretations of all components of a certification program.



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