



## The NPTE Research Agenda: 2017 Update

*This article is based on a presentation by David Relling, PT, PhD, associate professor and chair of the Department of Physical Therapy at the University of North Dakota School of Medicine and Health Sciences, and Richard Woolf, PT, DPT, CSCS, FSBPT Assessment Content Manager, at the 2016 FSBPT Annual Meeting.*

This session covered research relevant to the National Physical Therapy Examination (NPTE) program, including a preliminary description of the process and results from the 2016 practice analysis for the physical therapist (PT) and physical therapist assistant (PTA) examinations, revisions to the NPTE item review process, a new model for predicting NPTE pass rates, investigations of the impact of extra-time accommodations on pass rates, ongoing efforts to examine evidence-based remediation strategies (e.g., the Practice Examination and Assessment Tool [PEAT] and Performance Feedback Reports), and an update on examination security issues. In addition, the presenters discussed future research issues, such as the possibility of integrating alternative item types into the NPTE. The presentation discussed how topics are selected and reviewed by various groups, including volunteers, task forces, the NPTE Technical Advisory Panel, and the Buros accreditation audit process.

The NPTE Research Agenda is a plan to conduct research to support the validity of the NPTE. The research agenda consists of projects that are repeated periodically, such as practice analysis and standard setting. For example, the practice analysis is done at least every five years (earlier if there are changes in practice). The results inform changes to the NPTE. The changes to the NPTE necessitate a standard setting process to revise the minimum NPTE passing score at each examination level (PT or PTA). The passing scores are established on the basis of what a panel of volunteers (representative of the physical therapy profession) determines to be required for entry-level practice at each examination level.

The research agenda also includes ad hoc projects, such as investigating the value of the PEAT for predicting NPTE scores or investigating the competencies required for safe and effective dry needling. FSBPT conducts these projects in response to member, educator, or candidate concerns.

From the perspective of the FSBPT Board of Directors, any project FSBPT initiates or supports is aligned with FSBPT's mission "to protect the public by providing service and leadership that promote safe and competent physical therapy practice." There is also a fiduciary responsibility to the organization and stakeholder groups.

The research agenda and the examination itself are required to promote validity, reliability, and security. Content validity is developed from the practice analysis, so that the clinical activities represented on the examination closely correspond with occupational requirements. The practice analysis aligns the importance and proportion of content areas between the examination and the first few years of a PT's or PTA's clinical practice. Longer practicing PTs and PTAs also are surveyed during the practice analysis to identify the knowledge and skills they believe are most critical to the clinical activities required for entry-level practice.

Security is essential to validity. Security includes procedures followed or measures taken to best ensure the safety, validity, and reliability of the NPTE. FSBPT is always on guard against the threat of item disclosure or attempts to "harvest" items (i.e., to make an effort to determine many of the questions on an NPTE form through a coordinated effort or security breach). For example, in 2010, a group of individuals worked collaboratively to harvest hundreds of items from the NPTE and share them with other candidates.

In terms of reliability, FSBPT wants to ensure that no form of the NPTE is more difficult than any other form for the typical candidate. In other words, FSBPT wants to make sure that a candidate would have about the same score on the NPTE form taken on a given testing day as the candidate would have if a different form of the examination had been taken. Without this equivalency between scores, a candidate's score is not reliable and, therefore, not a valid indicator of whether the candidate is prepared for safe and competent practice as a PT or PTA.

The practice analysis provides the foundation for the NPTE content outline, which in turn informs the process of developing relevant questions for the NPTE. The process relies on volunteer experts who write and review the items, approve the items, and approve test forms for the PT and PTA examinations. The group of volunteers is diverse in terms of background and geographic location to ensure the examination reflects the practice of PTs and PTAs. Experts in measurement, security, and testing, both in-house and contractors, are utilized as well, including psychometricians who are experts in high-stakes test development. Overall about two dozen experts, most of whom are licensed PTs or PTAs, review each test question before it is used as a scored item on the NPTE.

Item writers are PTs or PTAs who go through three days of training. They typically come to FSBPT's office for the training and then continue to write items off site for another three months. FSBPT also has initiated a program with remote workshops, where individuals receive training and begin to develop items at geographic locations closer to their homes.

After an item is written, it is reviewed by an item writer coordinator (a volunteer PT or PTA with extensive experience in item writing). If it is approved by the coordinator, it is reviewed by the Examination Development Committee (EDC). The committee reviews the quality of the item, its accuracy, and whether or not it is testing entry-level knowledge. If accepted, it goes into a secure item bank. Later, as examination forms are created, the EDC reviews the item in the context of the totality of the examination to make sure the item does not contain information that could provide an individual with an advantage from one section of the examination to another. Approved pre-test items then undergo a psychometric review, to ensure the statistics in the item fit FSBPT's standards. Items that do not pass statistically are sent back to the EDC for review and possible rewrite. Those items that pass statistical review are placed in a queue for possible use as scored items on a future

examination.

The process takes a substantial amount of time and involves numerous individuals. It may take a year or two for an item to work its way through the process.

FSBPT also utilizes a technical advisory panel of experts in the field of psychometrics, who provide a view from outside FSBPT and ask some very tough questions to ensure the examination development process is the best it can be. The technical advisory panel helps to generate and refine many of the topics on the NPTE Research Agenda.

FSBPT is continuously creating new examination forms and recruiting volunteers. FSBPT encourages member boards to identify licensees in good standing and nominate them for various volunteer task forces and committees. FSBPT likes to have a good mix of educators and clinicians to ensure the NPTE reflects both clinically relevant work activities and the knowledge and skills candidates are acquiring in school. FSBPT also reaches out to the American Physical Therapy Association (APTA) for committee and task force nominations. Highly qualified, competent volunteers who represent a range of professional perspectives are the lifeblood of our organization and the foundation of every stage of the NPTE Validity Cycle.

The NPTE Validity Cycle is generally a five-year process. It always begins with a practice analysis, which will drive the examination content and examination development for the next five years. FSBPT might conduct another practice analysis sooner if there is a big development in physical therapy that dramatically shifts the future outlook and the EDC decides the practice analysis results should be looked at again. Item development is always going on, but after a practice analysis, there may be new content areas, and those areas will need new items developed within them.

One of the first steps to conduct a practice analysis is to develop surveys. Some surveys are focused on work activities, which are sent to new graduates with one to three years of experience. FSBPT wants to know what activities they do in their practice. In addition, a knowledge and skill requirements survey will go to more experienced clinicians. They will be asked what knowledge is needed to perform these activities safely and effectively.

Separate surveys are created for both examination levels (PT and PTA). There are separate task forces for the PT examination and the PTA examination. FSBPT wants to ensure that PTAs do not feel they are being held to a PT standard, so the two processes are isolated from each other. Surveys are emailed to the appropriate respondents in FSBPT's database. The data are then analyzed. Later, FSBPT conducts a linkage exercise, in which volunteers from the profession link the work activity survey results with the knowledge and skills survey results to ensure that every single work activity has a corresponding knowledge and skill. Any knowledge or skill that does not link up to a corresponding work activity is discarded because, if a knowledge or skill is not needed to perform an entry-level activity, the examination will not cover it.

After that, FSBPT develops the test content outlines for the PT and PTA examinations. Each outline lists the examination's content areas and the number of items targeted for each section.

The key players in implementing the practice analysis include a contractor, HumRRO

(Human Resources Research Organization). HumRRO performs practice analyses for a number of private and governmental organizations and has been working with FSBPT for a number of years. The oversight panel consists of a number of volunteers who have extensive experience with examination development. There is also a task force for the PT examination and a task force for the PTA examination. Survey respondents are obviously key players. FSBPT also convenes a policy group consisting of representatives of major stakeholders, to get their feedback and to ensure all communication about the practice analysis is understandable to different groups. The final step is a review by FSBPT's Board of Directors, which takes a hard look at the revised examination outlines before giving them its stamp of approval.

In the spring of 2016, the oversight panel and the PT and PTA task forces were convened, and the survey for each examination was developed. The surveys were administered in July of 2016. In August, the oversight panel reviewed the results and highlighted areas they wanted the task forces to focus on. Then the task forces met, had some healthy discussions, and formulated new test content outlines.

The policy group met in November 2016. FSBPT's Board reviewed and approved everything during late 2016, and the new test content outlines were posted to the FSBPT website in January 2017, to be effective in January, 2018. HumRRO will issue a lengthy full report on the practice analyses that also will be posted on the FSBPT website as a public document sometime in 2017. The test content outlines are published a year early to let candidates and educational programs know what to expect on the examinations in 2018.

It is anticipated FSBPT will conduct two standard setting workshops in the summer of 2017, one for the PT examination and one for the PTA examination. Draft PT and PTA examination forms, approved by the respective Examination Development Committees, will be created to help determine the cut scores that reflect entry-level practice.

During that process, the Standard Setting Task Force at each examination level will review a form of the NPTE, item by item, and estimate how difficult the examination would be for a minimally competent candidate. Based on those estimates, each Standard Setting Task Force will determine the minimal score required to pass the NPTE and make the recommendation to FSBPT's Board of Directors. Psychometricians use the forms from the standard setting workshop and ensure the next round of testing is as difficult, but no more difficult, than preceding tests. The questions may be different, but the level of difficulty must remain the same.

In October of 2017, revised PEAT forms will be made available to match the new test content outlines for the PT and PTA examinations. People who are preparing for the NPTE generally start purchasing the PEAT about three months in advance. The NPTE forms will go live with new content in January 2018.

One of the most commonly asked questions we get about the practice analysis and standard setting process is "What is changing in 2018?" The major content discussions of the Practice Analysis Task Forces included three areas: movement system, PT evaluation of the gastrointestinal system, and dry needling. The "movement system," as defined on the APTA website, "represents the collection of systems (cardiovascular, pulmonary, endocrine, integumentary, nervous, and musculoskeletal) that interact to move the body or its component parts." At the time of the task force meetings, the movement system still had

many undefined concepts and little agreed-upon vocabulary, and the task forces felt it was too early to adopt the movement system as a guiding principle for the current practice analysis, but in five years, it could lead to a major overhaul.

In the 2013-2017 content outline, there are no questions on PTs' evaluation of the gastrointestinal system, but the PT task force felt that many PTs practice in rural areas and often are the only health professional the patient is seeing. If someone is having appendicitis, PTs need to be able to identify that.

Dry needling is not currently an entry-level skill and is not included on the NPTE, but it is developing and FSBPT is watching the trends. As a side note, FSBPT formed a Dry Needling Task Force, a group of experts who, similar to what would be done with the NPTE, identified skills and knowledge requirements for safe and effective performance of dry needling, but again this was not identified as an entry-level activity and will not be included on the NPTE.

Evidence-based examination preparation and remediation is a key part of what FSBPT does. To help with this effort, FSBPT created tools for candidates. Two of the tools are the content outlines and the candidate handbook. The candidate handbook provides a detailed description of the examination process for candidates. Like the content outlines, the handbook is a public document posted on FSBPT's website.

Another common question we get from candidates and educators is how well the PEAT predicts performance on the NPTE. The PEAT was designed to have the look and feel of the NPTE. It consists of one retired NPTE form and another form with items that are a mixture of retired NPTE items and practice items developed specifically for the PEAT. Among candidates who do not pass the NPTE, those who use the PEAT and perhaps take advantage of the Performance Feedback Report prior to retesting tend to have about a 30-point gain on the NPTE. Scores on the PEAT are highly correlated to NPTE scores, so we expect that if a candidate gets a 600 or above on the PEAT, the candidate will pass the NPTE.

The PEAT is an effective remediation after a first attempt at passing the NPTE. Those who answer a question wrong in the PEAT may review their answer, identify cited reference materials, and use this information to go back and further study areas of knowledge. For candidates who have already utilized the PEAT, Performance Feedback Reports are another effective remediation option. The reports identify areas of weakness in regard to NPTE content areas and can also be used to identify the effects of test anxiety at the beginning of the examination or test fatigue toward the end of the examination.

Another topic FSBPT regularly examines in the research agenda is the stability of passing percentages on the NPTE: quickly rising passing percentages can mean a security breach and potentially incompetent candidates getting licenses. The passing score on the NPTE is 600 at both examination levels, and this score is controlled through very precise statistical processes. On the first attempt, about 91% of candidates pass the PT examination, and the median NPTE score is 670. Those who take the test a second time have a lower median score but an average gain of about 36 points. Median scores, pass rates, and score gains continue to fall with each subsequent attempt. A few years ago FSBPT instituted a six-attempt limit based on the recommendations of the NPTE Eligibility Task Force, which reviewed substantial statistical and benchmarking information. Now, people are taking the sixth test attempt more seriously, and there has been an uptick in scores and passage rates.



The PTA test first-attempt pass rate is approximately 84%, and the median score is 657. There is similar drop-off in median scores, pass rates, and gain scores with each attempt.

To better understand periodic fluctuations in passing rates, FSBPT created a predictive model for pass rates. FSBPT wants to ensure that those who pass are not cheating. If somehow the test questions were exposed, the model helps identify that something is amiss.

FSBPT has a lot of information on which to base its prediction. FSBPT knows scores from previous examinations for candidates who are retesting. It knows if students purchased the PEAT and, if so, what their PEAT scores were. It knows whether students purchased Performance Feedback Reports, their time between graduation and taking the examination, and their school and country of education.

The predictive model FSBPT created was very accurate. On its first use, it predicted a 93.1% pass rate for an examination taker from a Commission on Accreditation in Physical Therapy Education (CAPTE)-accredited program who purchased the PEAT. The actual passing rate was 93.2%. The results for other categories of candidates were also close, so that the weighted predicted average pass rate of 76.0% was not far off from the actual 76.3%.

Another concern our members and licensees raise is whether candidates who pass the NPTE with an accommodation (such as extra time or a pencil-and-paper form) constitute a public safety concern. So FSBPT set out to try to determine how much accommodations affect NPTE scores.

FSBPT has limited data on candidates who receive accommodations, but it examined results for candidates who took the NPTE with and without extra time on their second attempt. It found no score improvement for candidates who took the NPTE with extra time versus those who did not have extra time.

Test security is consistently one of the areas represented in the NPTE Research Agenda. To enhance examination security, FSBPT has tightened its eligibility rules and greatly reduced item reuse. In our current model, we aim for “one-and-done” item use. In other words, a question that appears on one form of the NPTE will not appear on another form, and that form will only be used for a limited time.

Nevertheless, we still face challenges from people who seek to harvest items. FSBPT implemented several efforts to identify candidates who may be seeking to compromise the NPTE or who may have benefitted from harvested items. For example, candidates who have very low scores may not be taking the test to pass, but rather to view the items and share them with other candidates. FSBPT also looks at “fit” analyses. For example, someone who gets all the hard questions right but the easy questions wrong doesn’t quite “fit” our expectations. Are they getting the hard questions right because the hard items were “harvested” and exposed? FSBPT also looks for similar response patterns among groups of candidates. Are the candidates colluding or using the same cheat sheets? FSBPT gathers information on study patterns, candidate connections, and resource materials to determine if these are a threat to NPTE validity.

The Canadian Alliance for Physiotherapy Regulators (CAPR) recently went to a three-examination limit, down from five. They suspect more cheating as a result, but the evidence is not clear. In light of these kinds of issues other organizations are having, FSBPT hires an

outside firm of psychometricians who look at the raw data for abnormalities. It also has in-house psychometricians who create models to find trends the outside agency may not find. When there are score or test administration abnormalities, FSBPT looks at videos from the test centers to identify methods of harvesting. We maintain a tip-line email address ([security@fsbpt.org](mailto:security@fsbpt.org)), which has been very helpful.

Finally, FSBPT gets many questions about what we could do to make the NPTE better or to improve public protection by supplementing the NPTE with other assessments of competence. To address these questions, FSBPT is conducting a gap analysis: here is where we are; this is where we want to be. For instance, is the NPTE enough? Should there be a clinical examination or an ethics component? CAPR has a clinical examination, but it is expensive, time-consuming, very difficult to design and administer, and difficult to ensure the consistency of administration and reliability of scoring. FSBPT frequently considers ways to assess the same aspects of professional competence but in ways that might be less onerous for candidates.

FSBPT is also looking at alternate item formats to make the NPTE better. In the clinic, PTs can watch people walk and look for gait abnormalities. That skill is very difficult to test in a written question, but a test could use videos, for example, to assess students' knowledge of gait abnormalities. Clinical scenarios also could be added by presenting several sources of information, such as a patient's chart, history, and radiographs, and asking several questions about that patient.

FSBPT also supports substantial efforts to assist the educational community with school reports and curriculum development. It communicates with schools regularly regarding pass rates, performance on the different content areas covered by the examination, performance of their graduates, and standing relative to their peers. We also share our research and efforts at professional conferences and the Educators' Workshops we host.

The guiding principles of everything FSBPT does are public protection, fairness, and equal access. Every decision we make is intended to support the validity and reliability of the NPTE, and we need solid research to make evidence-based decisions. It's important that those who pass the examination will be safe and efficient clinicians.



**David Relling**, PT, PhD, associate professor and chair of the Department of Physical Therapy at the University of North Dakota School of Medicine and Health Sciences, was elected vice president of the Federation of State Boards of Physical Therapy on November 5 at the Annual Delegate Assembly meeting of the FSBPT in Columbus, Ohio.



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