

## Validation of the Clinical Internship Evaluation Tool

Lynn M Fitzgerald, Anthony Delitto, James J Irrgang

LM Fitzgerald, PT, MEd, PCS, is Assistant Professor and Director of Clinical Education, Department of Physical Therapy, School of Health and Rehabilitation Sciences, University of Pittsburgh, Pittsburgh, Pa 15261 (USA). Address all correspondence to Ms Fitzgerald at: [lfitzger@pitt.edu](mailto:lfitzger@pitt.edu).

A Delitto, PT, PhD, FAPTA, is Professor and Chair, Department of Physical Therapy, School of Health and Rehabilitation Sciences, University of Pittsburgh.

JJ Irrgang, PT, PhD, ATC, Associate Professor and Director of Clinical Research, Department of Orthopaedic Surgery, University of Pittsburgh School of Medicine, Pittsburgh, Pa.

[Fitzgerald LM, Delitto A, Irrgang JJ. Validation of the Clinical Internship Evaluation Tool. *Phys Ther*. 2007;87:844–860.]

© 2007 American Physical Therapy Association

### Background and Purpose

Graduates of physical therapist education programs should be expected to function as competent clinicians. Instead, the benchmark for many clinical performance assessment tools has been “as good as an entry-level graduate.” The authors developed the Clinical Internship Evaluation Tool (CIET), which measures clinical performance of the student relative to a “competent clinician.” The purpose of this study was to provide evidence for validity of the tool.

### Subjects and Methods

The CIET was used to evaluate physical therapist student clinical performance from 1999 to 2003. Data from 228 student evaluations, a survey of 26 clinical instructors (CIs), and an item review by 7 faculty members were used to collect validity evidence. The relevance of items on the CIET was examined by the survey and the item review. Coefficient alpha was calculated to estimate internal consistency among the items. A Spearman correlation was used to examine the relationship between 2 measures of clinical competence. A repeated-measures analysis of variance (ANOVA) compared the student scores at each clinical time frame to confirm expected improvements in performance longitudinally. Evidence for practicality was collected by the CI survey.

### Results

Based on the faculty item review and the CI survey, all items were representative of skills and behaviors considered important for a clinically competent physical therapist. The internal consistency (alpha) was .98 for the patient management items. The average correlation of the 2 measures of clinical competence was .76. The repeated-measures ANOVA was significant and demonstrated improved patient management scores as the student progressed through the program. The CI survey results indicated that 96% of respondents agreed or strongly agreed that the instrument was short and easy to use.

### Discussion and Conclusion

The results of the study suggest that the CIET is representative of skills and behaviors necessary for students to perform at the level of a competent therapist and that the instrument is practical to use for busy clinicians. The CIET appears to be a valid tool for measuring student clinical performance and can be a time-efficient alternative for CIs in today's demanding clinical environment.



Post a Rapid Response or  
find The Bottom Line:  
[www.ptjournal.org](http://www.ptjournal.org)

Tools used to evaluate student clinical performance should allow for comparison of student competence against predetermined standards of practice. Standards of practice in other professions include broad, authoritative statements that are used to judge the quality of practice and typically include expectations of competent, professional clinical care.<sup>1</sup> The *Standards of Practice for Physical Therapy*<sup>2</sup> were adopted in 1980 and revised in 2003 by the American Physical Therapy Association (APTA) House of Delegates. In addition, more specific expectations exist within the framework of a number of other sources.

For example, the *Guide to Physical Therapist Practice*<sup>3</sup> includes a detailed description of the scope of physical therapist practice, preferred practice patterns, and tests and measures and interventions relevant to each practice pattern. In addition, the *Guide for Professional Conduct*<sup>4</sup> is intended to serve physical therapists in interpreting APTA's *Code of Ethics*<sup>5</sup> in matters of professional conduct and provides guidelines by which physical therapists may determine the propriety of their conduct. The *Guide to Physical Therapist Practice*, the *Guide for Professional Conduct*, and the *Code of Ethics* also are intended to guide the professional development of physical therapist students. Thus, it would seem logical to base a clinical performance evaluation tool at least in part on these documents. When considering the comprehensiveness of these documents, one of the major challenges is to balance the need for assessment in a broad range of practice dimensions while allowing for an instrument that is pragmatic and sensible.

Today's busy clinical environments require efficiency when evaluating clinical performance. The increasing demands on clinicians for productivity and documentation result in less

willingness to serve as clinical instructors (CIs).<sup>6,7</sup> In addition, other limitations within the clinical environment interfere with an accurate evaluation of a student's clinical performance. In a review of performance evaluation of medical students, residents, and practicing physicians, Printen and colleagues<sup>8</sup> explored cognitive, social, and environmental factors that contribute unwanted sources of score variation (bias). They found that instructors have a 1- or 2-dimensional conception of clinical performance and typically do not recall details. Furthermore, favorable clinical performance is reported more quickly and fully than poor performance, often leading to overly generous performance evaluations. Printen and colleagues suggested that clinical performance evaluation systems should ensure broad, systematic sampling of clinical situations and require use of short instruments.

We set out to develop a clinical internship evaluation tool for assessing the performance of physical therapist students with the main purpose that it would evaluate the skills necessary for clinical competence and provide a short, easy-to-use form for our CIs. The intended uses for the instrument are to evaluate student progress, competence, and performance in the clinical environment; to determine specific areas for remediation; and to provide information for program evaluation. Our goal was to have an instrument that would evaluate a physical therapist student's performance relative to that of a competent clinician who can effectively and efficiently manage his or her patients and clients to achieve optimal clinical outcomes. Because our students would be in their final clinical setting for 1 full year, we also felt that the instrument should allow evaluation of student performance that will likely progress

beyond the level of a competent clinician.

We did not feel that previously developed instruments for measuring clinical performance of physical therapist students met the needs of our program and CIs. The New York State Performance Evaluation Instrument and several evaluation tools developed by individual programs were competency based, but not based on present standards of practice such as the *Guide to Physical Therapist Practice*.<sup>9,10</sup> The Blue MACS is a valid and reliable instrument with good acceptance by the clinicians who use it, but it evaluates individual skills rather than overall competencies.<sup>11,12</sup>

The most widely used instrument is APTA's Clinical Performance Instrument.<sup>13</sup> The anchor point for this instrument is "at the level of an entry-level physical therapist," which our faculty members believed was inadequate in many ways. First, we sought to achieve a higher level of performance. Second, we believed that our CIs could more accurately judge our definition of entry-level performance (at the level of a competent, cost-effective physical therapist) than they could an "average entry-level graduate." Finally, we believed that, with curriculum changes that we knew would eventually end with the awarding of a clinical doctorate, we were committed to a graduate who would practice at the level of a competent clinician—that is, a clinician who can effectively and efficiently manage his or her patients and clients to achieve optimal clinical outcomes. Additionally, we felt that all of the instruments were too lengthy and time consuming for today's busy CI.

The purpose of this study was to describe the process of developing and providing evidence for validity of the Clinical Internship Evaluation

Tool (CIET). This process included: (1) developing a conceptual framework and generating the items, (2) field testing the initial version for a semester and receiving feedback from CIs, (3) revising the instrument based on CI feedback, and (4) testing the final version of the instrument.

## Method

### Overview

We began using the instrument with students in our Master of Physical Therapy (MPT) program and subsequently with students in the Doctor of Physical Therapy (DPT) program. To provide evidence for validity of the instrument, we collected evidence to support our interpretations and uses of the CIET. We considered validity a unitary concept as defined by Messick's contemporary theory of test validation.<sup>14,15</sup> Rather than collecting evidence for distinct types of validity, the evidence that we collected supported an overall judgment of how we used the CIET. This included evidence related to content representativeness and relevance, the relationship among the parts of the instrument (evidence related to internal structure), the relationship of the CIET scores to other variables (evidence related to external structure), and whether the instrument was easy to use (evidence related to practicality).<sup>14</sup> Our hypothesis was that the CIET could be used for valid assessment of the clinical performance of a physical therapist student during all levels of his or her clinical education.

A committee of 3 faculty members who served as the clinical education team in our department developed the instrument. The Director of Clinical Education then implemented use of the instrument with our MPT and DPT professional-level students to evaluate their clinical performance. Data gathered from use of the CIET to evaluate clinical performance of the students from 1999 to 2003 were

used to provide validity evidence for the CIET. In addition, other faculty in the Department of Physical Therapy completed an item review of the instrument, and a survey was developed and given to clinical faculty regarding use of the instrument. All of the data were used to demonstrate evidence related to content, internal structure, relationship with external variables, and practicality. The protocol was submitted to the University of Pittsburgh Institutional Review Board (IRB) and determined to be exempt from IRB review because the data were collected and used for educational purposes.

### Development of the CIET

We began to develop the instrument by generating a list of all possible skills and behaviors that physical therapists should demonstrate using the *APTA Guide to Physical Therapist Practice*,<sup>3</sup> *A Normative Model of Physical Therapist Professional Education*,<sup>16</sup> our curriculum plan, and the Commission on Accreditation in Physical Therapy Education (CAPTE) criteria.<sup>17</sup> From a review of this list, we determined that 2 main factors were important when assessing student performance, and we divided the instrument into 2 major sections: professional behaviors and patient management skills. The professional behavior section contained 3 items related to safety, 6 items related to professional ethics, 4 items related to initiative, and 5 items related to communication. The patient management skills section contained items related to examination (8 items), evaluation (3 items), diagnosis and prognosis (5 items), and intervention (8 items). The final version of the CIET had 42 items in total, with 18 professional behavior items and 24 patient management items.

A rating scale was selected for evaluating the students on each item. For the professional behavior section,

we felt that it was most important to know the frequency of which a student was displaying the behavior. A 5-point rating scale was developed, which ranged from 0 ("never displays the behavior") to 4 ("always displays the behavior") (Appendix). To demonstrate acceptable professional behavior, the student had to achieve a score of 4 for every professional behavior item. Monitoring of student behavior was required if a student received a score of 3 ("most of the time displays the behavior") for any professional behavior item. Any score below 3 required remediation of professional behavior and could result in failure of the clinical internship if not corrected.

For the patient management section, the CI is asked to measure the student's performance against that of a "competent clinician," which was defined as a physical therapist who is "able to skillfully manage a patient in an efficient manner to achieve an effective outcome." Performance for each patient management item was rated on a 5-point scale from "well below" to "well above" a competent clinician (Appendix). *Well below* was defined as "Student requires a great deal of guidance including instructions and verbal cueing to complete a task." *Below* was defined as "Student requires some supervision or increased time to complete a task." *At that level* was defined as "Student is at the level of a competent clinician. Student can carry an appropriate caseload for your clinic and achieve an effective outcome for his or her patients."

*Above* was defined as "Student is performing above the level of a competent clinician in your clinic. Student's clinical skills are highly effective and demonstrate the most current evidence in practice. Student can carry a higher than expected caseload." *Well Above* was defined as "This is reserved for the

**Table 1.**  
Sample Size for Each Clinical Period

Clinical/Quarter	No. of Students
Clinical 1	229
Clinical 2	181
Clinical 3	194
Clinical 4	189
Clinical 5	116
Clinical 6/quarter 1	223
Clinical 7/quarter 2	213
Quarter 3	97
Quarter 4	67

master clinician or clinical specialist.” We felt the CI should be able to grade the student above “at that level,” anticipating that our students would be highly effective in the latter part of a 1-year-long clinical internship. In addition, we occasionally had students who were entering the field of physical therapy from another clinical discipline and could potentially achieve a “master clinician” level with our intensive clinical education program. The rating scale for the patient management section was assigned a numeric score from 1 (“well below”) to 5 (“well above”), and the scores for the 24 items were summed. The total score was used in analysis of the patient management section for individual students, classes, and the validation of the CIET. For grading purposes, the expectation is that the students progress from midterm to final in the early clinical internships, although they do not have to achieve a score of 3 (“at that level”). During the 1-year-long clinical internship, the expectation is that they will achieve a score of 3 for each rotation.

### Sample/Description of Program

The sample for evidence related to internal and external structure included all professional-level MPT and DPT students in the program who graduated from 2000 to 2006. Our

MPT program was 2 years long, and the DPT program is 3 years long. Each year consists of 3 terms, as our program is year-round. Our MPT students completed 7 clinical internships during their program. The DPT students completed the same first 4 clinical internships, then a year-long clinical internship. Clinicals 1, 2, and 4 were part-time semester-long clinical internships. Clinical 3 was a full-time, 7-week internship completed by both our MPT and DPT students. These first 4 clinical internships were integrated with the didactic course work in years 1 and 2. The MPT students then went on to do 3 full-time, 7-week clinical internships (5, 6, and 7) at the end of their didactic course work. Our DPT students completed a year-long clinical internship in their third year. During the year-long clinical internship, the CIET was completed every quarter. Data for the MPT students’ sixth clinical internship corresponded in time to quarter 1 of the year-long clinical internship, and data for clinical internship 7 corresponded to quarter 2 of the year-long clinical internship. Quarter 3 and 4 data apply only to students in the DPT program. The sample size was determined by the number of professional-level students who had a final evaluation completed during each clinical time frame (Tab. 1).

Our students’ clinical education experiences occur within the University of Pittsburgh Medical Center (UPMC) health system, its affiliates, and a few other select facilities within the greater Pittsburgh area. The facilities we used as clinical sites during data collection included 31 general outpatient clinics, 16 acute care hospitals, 3 subacute nursing facilities, 2 home care agencies, 2 rehabilitation hospitals, 1 women’s health hospital, 8 pediatric facilities, and 5 specialty clinics. The pediatric facilities included an acute care children’s hospital, a rehabilitation hos-

pital, school-based facilities, early intervention facilities, and more than 11 outpatient clinics connected to these sites. The specialty clinics included hand, balance and vestibular, pain, sports medicine, and facial nerve clinics.

Evidence related to content of the CIET was collected from a sample of 7 faculty members from the Department of Physical Therapy who completed an item review of the instrument. None of these faculty members were involved in the initial development of items for the CIET. Evidence related to content and practicality was collected from clinical faculty who supervised DPT students during their final year-long clinical internship. A survey instrument was sent to 76 clinical faculty, of which 26 faculty members responded. These 26 faculty members were representative of the year-long clinical faculty: 46% from acute care sites, 38% from outpatient sites, 8% from pediatric sites, 4% from a rehabilitation site, and 4% from a women’s health site.

### Procedure and Methods of Analysis

After the CIET was initially developed, CIs attended a training session to learn how to use the tool to evaluate a physical therapist student’s clinical performance. Thereafter, new CIs were trained either through periodic in-services at the clinical site or individually. The Director of Clinical Education carried out all training. Clinical instructors used the tool exclusively to evaluate the clinical performance of our physical therapist students. The CIs were asked to use the tool at the midpoint and end of all clinical affiliations, both part-time and full-time. Immediate feedback was provided to CIs if they were using the rating scale incorrectly. After using the CIET in the fall semester of the 1999 academic year, minor changes were made in



wording and format, and then collection of validity evidence to support use of the CIET began.

To provide evidence to support our intended uses and interpretation of the CIET, we collected validity evidence related to content, internal and external structure, and practicality. In collecting evidence related to content of the CIET, we wanted to determine whether the items on the CIET were representative of clinically competent behavior for physical therapists. In addition, we wanted to know whether we were teaching these behaviors in our curriculum. We used the CAPTE criteria, the *Guide to Physical Therapist Practice*,<sup>3</sup> and our program's objectives for and vision of entry-level education in developing the tool. This procedure ensured that all of the items were relevant and representative of current clinical practice and our program's vision.

An item review form was developed and completed by faculty members to provide further evidence for content of the CIET. Faculty members were asked to answer "yes" or "no" to 10 questions about each item on the CIET. Through the item review form, feedback was requested about the clarity of each item, the item's relevance to physical therapist practice, whether the item was representative of our curriculum, and whether the item could be biased. Each item review form was reviewed, and the information was summarized to determine whether any items were irrelevant or nonrepresentative or whether the item should be revised to improve clarity or prevent bias.

Finally, evidence related to content was obtained from a survey instrument developed and sent to CIs of students on the first year-long affiliation in 2003. A question was included to specifically determine

whether the CIET allowed the CIs to adequately assess a student's clinical performance. The CIs were asked to indicate how much they agreed or disagreed with the statement by checking the appropriate box on a 4-point scale from "strongly disagree" to "strongly agree." In addition, there were 2 open-ended questions on the survey instrument: (1) "What items on the CIET do you believe are irrelevant to the student's performance?" and (2) "What items should be added to the CIET?" The frequency and percentage of each response category for each of the items on the faculty item review form and the CI survey were determined to evaluate the evidence related to content of the CIET.

The second type of validity evidence we were interested in collecting was related to the internal structure of the CIET. We wanted to know whether all of the items on the CIET contributed to the evaluation of clinical competency. We hypothesized that the items within the professional behavior and patient management domains would be highly related to other items within the same domain. As such, we hypothesized that each domain would be unidimensional. To evaluate this hypothesis, we performed a factor analysis of all items within each domain.

We used the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to determine whether the data were appropriate for factor analysis.<sup>18</sup> Sharma<sup>18</sup> suggested that the KMO value should be at least .60, although KMO values greater than .80 are preferred. We used the scree plot and eigenvalue-greater-than-1 rule to determine the number of factors to extract.<sup>18</sup> We evaluated the factor loadings to interpret the meaning of identified factors. For the one-factor model, we expected each item to have a factor loading of  $\geq .50$ .

If the factor analysis identified more than one factor underlying the item responses, we performed orthogonal and oblique rotations to clarify the factor structure. If the factor analysis indicated that the underlying item responses fit a one-factor model, we estimated the consistency of responses across items (ie, internal consistency) with coefficient alpha and determined the item-to-total scale score correlations. Coefficient alpha for each clinical time frame was calculated. Coefficient alpha also was calculated with each item sequentially deleted, and the differences between the values of coefficient alpha with and without the item were compared. If coefficient alpha substantially improved when a particular item was deleted, it might indicate that the item was not contributing consistent information to the measurement scale.

If the pattern of item responses was multidimensional, calculation of internal consistency across all items within the domain and the item to total scale score correlations would have been inappropriate and thus were not calculated. The factor analysis, coefficient alpha and item-to-total scale score correlations were determined separately for the professional behavior and patient management scales for each of the 9 clinical time periods to determine whether internal structure varied based on whether it was a part-time or full-time clinical or an early or later clinical.

In considering evidence to support the external structure of the CIET, we wanted to know whether the patient management section was measuring clinical competence as we had defined it. To answer this question, we added a global rating scale to the CIET. After scoring all of the items for a student, the CI was asked to respond to the question, "On a scale from 0 to 10, how does the

student compare with a competent clinician who is able to skillfully manage patients in an efficient manner to achieve effective patient or client outcomes?" The CI responded by placing an "X" on a scale from 0 to 10, with 0 being "well below a competent clinician," 5 being "at the level of a competent clinician," and 10 being "well above a competent clinician."

We hypothesized that, if the patient management items were measuring clinical competence, there should be a high correlation between the patient management score and the score on the global rating scale of clinical performance of the student. We assessed this with Spearman correlation coefficients calculated separately for each of the 9 clinical time periods except clinical 1 because the patient management section is not completed for this clinical. We felt that the Spearman correlation coefficient was most appropriate for this analysis because the global rating of clinical performance of the students was ordinal and the total professional behavior score was quantitative.<sup>19</sup> A scatter plot of the data for each clinical period was inspected to determine whether the relationship was linear, with no apparent outliers, and demonstrated homoscedasticity prior to performing the correlation.

We also hypothesized that, as the students progressed through their clinical education, there should be an increase in their patient management scores over time. This hypothesis was assessed with a repeated-measures analysis of variance (ANOVA) for clinical internships 2, 3, and 4 and all 4 quarters of the year-long clinical for those students completing the DPT curriculum. The patient management section of the evaluation is not completed for the first clinical. Tukey *post hoc* tests were conducted to evaluate the pair-

wise comparisons between clinical time frames.

Finally, we were interested in whether we had developed a tool that was easy and practical for the CI to use. A question about the practicality of the CIET was included on the survey instrument sent in 2003 to the CIs: "Is the test short and easy to use for CIs, making less demands on their limited time for clinical training?"

## Results

### Evidence Related to Content of the CIET

Analysis of the item review demonstrated that the faculty felt all 42 items on the CIET were relevant and representative of physical therapist practice. They did not feel any items should be deleted, but they felt that some items needed to be clarified. For instance, under "initiative," it was suggested that "positive contributor to the clinic" should be operationally defined.

The survey of CIs had a 35% response rate; 26 of 75 CIs returned the survey questionnaire. In response to the item, "The Clinical Internship Evaluation Tool allowed me to adequately assess your student's performance," 4 respondents (16%) disagreed, 20 respondents (80%) agreed, and 1 respondent (4%) strongly agreed. One clinician did not answer that question. In response to the open-ended question, "What items on the CIET do you believe are irrelevant to the student's performance?," no items were believed to be irrelevant. Comments were limited to wanting clearer definitions of some items. In response to the second open-ended question, "What items should be added to the instrument?," 80.8% felt that no new items should be added, whereas 19.2% suggested that some items be expanded. For example, one CI felt

that the item on legal issues could be clarified.

### Evidence Based on Internal Structure

For the factor analysis of the professional behavior section, the KMO values ranged from .583 to .715, which implies that the data were adequate for factor analysis.<sup>18</sup> Three factors appeared to emerge based on the eigenvalue-greater-than-1 rule and the scree plots, but items did not consistently load on the 3 factors across the 9 clinical time points. Communication, initiative, and professional behavior items appeared to load as more distinct factors, whereas safety loaded on all 3 factors. Because the professional behavior scale did not conform to a one-factor model, we decided that it was not appropriate to combine all of the items into a single score; thus, we did not calculate coefficient alpha or the item to total score correlations for this scale.

For the factor analysis of the patient management section, the KMO value was greater than .95 for all clinical time frames, which is considered "marvelous."<sup>18</sup> Only one distinct factor was extracted based on the eigenvalue-greater-than-one rule and scree plots for each clinical time period. The eigenvalues for the first factor ranged from 15.7 to 17.9, and the eigenvalues for the next factor were 1.5 or less. The eigenvalue for the second factor was only greater than 1 for 2 clinical time frames, and loadings on that component were all less than .50. Factor loadings for all items on factor 1 ranged from .743 to .883 (Tab. 2).

The correlations of individual patient management items to the total patient management score ranged from .76 to .87. For patient management items, coefficient alpha averaged .98 across all clinical internships. Coefficient alpha did not change signifi-

cantly when any item was deleted. The largest change was .001.

### Evidence Based on Relationship With Other Variables

In examining the mean score for patient management for each clinical time frame, an increase was observed as the students progressed through the clinical internships (Tab. 3). The correlations of patient management scores to the global ratings of clinical performance of the students ranged from .54 to .89, with an average correlation of .76 (Tab. 4). The correlations for clinicals 3, 4, and 5 and quarter 4 were very strong ( $r > .80$ ). Correlations for clinical 2 and quarters 1 and 2 were strong ( $.60 < r < .80$ ). The correlation for quarter 3 was moderate ( $r = .54$ ). All correlations were significant at an alpha level of .01 (2-tailed).

The repeated-measures ANOVA showed a significant difference between the mean patient management scores for each clinical time frame. Pair-wise comparisons demonstrated statistically significant differences in the DPT students' performance between earlier and later clinical internships ( $P < .05$ ), but there were no significant differences between the clinical internships occurring at the midpoint (Tab. 5). For example, there was no significant difference between clinicals 3 and 4, but there was a significant difference between clinical 2 and all other clinicals.

Based on the results of the factor analysis, we adopted a criterion-referenced scoring approach for the professional behavior section of the CIET in which students had to achieve a score of 4 ("always displays the behavior") for all professional behavior items; otherwise, remediation would be required. We hypothesized that some professional behaviors would be absent or problematic during earlier clinical internships, but should quickly improve. To evaluate

**Table 2.**  
Patient Management Factor Analysis:  
Component Matrix<sup>a</sup> for Internship 1

	Component 1
Examination 1	.775
Examination 2	.790
Examination 3	.849
Examination 4	.863
Examination 5	.845
Examination 6	.843
Examination 7	.836
Examination 8	.803
Evaluation 1	.881
Evaluation 2	.880
Evaluation 3	.862
Diagnosis/ prognosis 1	.880
Diagnosis/ prognosis 2	.818
Diagnosis/ prognosis 3	.815
Diagnosis/ prognosis 4	.843
Diagnosis/ prognosis 5	.843
Intervention 1	.828
Intervention 2	.883
Intervention 3	.743
Intervention 4	.845
Intervention 5	.832
Intervention 6	.817
Intervention 7	.841
Intervention 8	.801

<sup>a</sup> One component extracted. Extraction method: principal component analysis.

this hypothesis, we calculated the frequency of students needing remediation on any of the professional behavior items for each clinical time frame. The results indicated that 29 students (20%) needed remediation during the first clinical internship. By the second clinical internship, the frequency of students needing remediation decreased to 24 students (13%). During the year-long clinical

**Table 3.**  
Patient Management Scores for Each  
Clinical Time Frame

Clinical/ Quarter	Mean	Median
Clinical 2	59.6	57
Clinical 3	71.1	72
Clinical 4	71.6	72
Clinical 5	76	72
Clinical 6/ quarter 1	73.8	72
Clinical 7/ quarter 2	77.1	74
Quarter 3	77.5	72
Quarter 4	83	79

**Table 4.**  
Correlation of Patient Management  
Scores With Clinical Competency Ratings

Clinical/Quarter	Spearman Rho <sup>a</sup>
Clinical 2	.74
Clinical 3	.83
Clinical 4	.82
Clinical 5	.80
Clinical 6/quarter 1	.74
Clinical 7/quarter 2	.73
Quarter 3	.54
Quarter 4	.89

<sup>a</sup> Correlation significant at the .01 level (2-tailed).

internships, between 2 and 8 students required remediation at each evaluation period, with no students requiring remediation of their professional behaviors at the final evaluation (Tab. 6).

### Evidence Based on Practicality

In response to the survey question, "I was able to complete the CIET in a reasonable amount of time," 1 respondent (4%) disagreed, 21 respondents (81%) agreed, and 4 respondents (15%) strongly agreed. Only 1 out of 26 CIs felt that they could not complete the CIET in a reasonable amount of time.

**Table 5.**

Pair-wise Differences Among Patient Management Scores for Each Clinical Time Frame

Clinical/Quarter	Mean Difference
Clinicals 2 and 3	11.35 <sup>a</sup>
Clinicals 2 and 4	13.90 <sup>a</sup>
Clinical 2/quarter 1	15.38 <sup>a</sup>
Clinical 2/quarter 2	18.31 <sup>a</sup>
Clinical 2/quarter 3	21.14 <sup>a</sup>
Clinical 2/quarter 4	26.67 <sup>a</sup>
Clinicals 3 and 4	2.56
Clinical 3/quarter 1	4.04
Clinical 3/quarter 2	6.96 <sup>a</sup>
Clinical 3/quarter 3	9.79 <sup>a</sup>
Clinical 3/quarter 4	15.33 <sup>a</sup>
Clinical 4/quarter 1	1.48
Clinical 4/quarter 2	4.40
Clinical 4/quarter 3	7.23
Clinical 4/quarter 4	12.77 <sup>a</sup>
Quarters 1 and 2	2.92
Quarters 1 and 3	5.75 <sup>a</sup>
Quarters 1 and 4	11.29 <sup>a</sup>
Quarters 2 and 3	2.88
Quarters 2 and 4	8.36 <sup>a</sup>
Quarters 3 and 4	5.54 <sup>a</sup>

<sup>a</sup> Significant at .05 level.

**Table 6.**

Frequency of Students Requiring Remediation of Professional Behavior

Clinical/Quarter	Frequency	Valid Percentage
Clinical 1	29	20
Clinical 2	24	13
Clinical 3	6	3.2
Clinical 4	19	10
Clinical 5	3	2.6
Quarter 1	8	3.6
Quarter 2	8	4.4
Quarter 3	2	3.1
Quarter 4	0	0

## Discussion

One of the major reasons that we developed a new evaluation instrument was to more accurately reflect the expected student performance at the completion of a professional physical therapy program, particularly one that ended with the awarding of a doctoral degree. Through the use of the CAPTE criteria,<sup>17</sup> *A Normative Model of Physical Therapist Professional Education*,<sup>16</sup> and the *Guide to Physical Therapist Practice*,<sup>3</sup> we attempted to choose items that reflected current practice in physical therapy. Results from both the faculty item review and the survey of the CIs indicate that we achieved that goal. All items appear to be representative of current clinical practice according to both our academic faculty and our clinical faculty. In addition, the items are all relevant to what is taught in the curriculum and what our CIs are evaluating in the clinic. We did not feel that we should eliminate any items or lengthen the evaluation based on these results. Issues of clarity were addressed by a review and revision of individual items.

The factor analysis of the professional behavior items suggested that each subdivision gives us some unique information and that items within a subdivision appear to be more highly correlated to each other than to items in other sections. These findings supported our use of a criterion-based scoring method for professional behaviors rather than adding the scores. In our experience, using the professional behavior section as a criterion-based evaluation makes our expectation for these criteria very clear to CIs as well as to students. We believe that all of the criteria should be met at all times regardless of the level of the clinical education experience.

The factor analysis of the patient management items clearly showed

there was one distinct component, indicating that it was acceptable to combine all of the item scores into a single composite score. Every item in the patient management section loaded substantially on that component (all factor loadings for all items across all time periods were .74), indicating all of the items represent patient management skills. In examining the correlation matrix, all of the items were highly correlated with every other item, indicating that this is a homogeneous set of items. Based on coefficient alpha for the patient management scale, it is evident that all items on the scale consistently measure patient management.

External validity was demonstrated by the high correlation between the patient management scores and the global ratings of the students' clinical competence. Clearly, the CIET is measuring a student's clinical competence. Higher patient management scores were associated with higher global ratings of clinical competence. In addition, the results of the repeated-measures ANOVA demonstrated that the CIET was measuring changes in the patient management scores as the students progressed in the clinical education sequence. In examining these data, it also was clear when students on the year-long affiliation progressed beyond "at that level," which we defined as basic competence to graduate. The CIET allowed the CIs to rate the students at a higher level.

We also demonstrated that the CIET was practical and easy to use based on the survey given to the CIs. Further anecdotal information and focus group interviews with our CIs since this survey indicate that they are able to complete this tool in a timely fashion. Clinical instructors reported that it takes between 30 and 60 minutes to complete the CIET compared with 2 to 3 hours for other clinical evaluation tools they have used. Most



of our CIs also take students from other programs who use a different instrument, and they have reported to us that they prefer the CIET.

### Limitations

Although in past evaluations of clinical tools, interrater reliability was determined, we did not feel that it was practical or appropriate in this case.<sup>13</sup> Two CIs simultaneously examining a student does not match the real-life environment of the clinic where you see one CI working with one or more students. In addition, because student behaviors and performance are the culmination of observing multiple clinical encounters over an extended period of time, providing a situation in which 2 evaluators can observe student performance is impractical. Although we did not perform a test-retest reliability study, we believe that the responsiveness of the CIET is an indication of its reliability. The tool is able to differentiate students at various points in the curriculum. If test-retest reliability were poor, we would not expect the CIET to be able to differentiate among different points in the clinical education experience.

Use of the CIET in other academic settings may be limited, as we collected evidence for validating the tool only with students graduating from our program. We do feel that use of the CIET is generalizable to similar programs such as ours that exist in a large and diverse medical system. More than 100 CIs in a variety of settings used the tool to evaluate our students.

### Future Plans

Based on the results of this study, individual items that were unclear on the CIET were reviewed and revised, and we plan to collect further data to provide validity evidence for this newer version. Other future

plans include obtaining external validity evidence to determine whether the students' scores on the CIET can predict performance on the National Physical Therapy Examination or clinical performance after graduation. In the future, we would like to have other academic programs use the CIET to demonstrate its generalizability to a variety of physical therapy clinical settings.

### Conclusion

The evidence we have collected and analyzed demonstrates that the CIET is a useful tool for evaluating clinical performance of student physical therapists. All of the items on the CIET are representative of current clinical practice and contribute to the evaluation of clinical competency. The tool is able to evaluate a student against a "competent therapist," and it measures changes in performance as the student progresses in his or her clinical education. Finally the CIET is easy and practical for the clinician to use.

All authors provided concept/idea/research design, writing, and data analysis. Ms Fitzgerald provided data collection and project management.

This work was presented as an education platform at the Combined Sections Meeting of the American Physical Therapy Association; February 23–27, 2005; New Orleans, La.

This article was received February 22, 2006, and was accepted March 5, 2007.

DOI: 10.2522/ptj.20060054

### References

- 1 Kaiser KL, Rudolph EJ. Achieving clarity in evaluation of community/public health nurse generalist competencies through development of a clinical performance evaluation tool. *Public Health Nurs.* 2003; 20:216–227.
- 2 American Physical Therapy Association, House of Delegates. Standards of Practice for Physical Therapy. Available at: [http://www.apta.org/AM/Template.cfm?Section=Policies\\_and\\_Bylaws&CONTENTID=33912&TEMPLATE=/CM/ContentDisplay.cfm](http://www.apta.org/AM/Template.cfm?Section=Policies_and_Bylaws&CONTENTID=33912&TEMPLATE=/CM/ContentDisplay.cfm).
- 3 Guide to Physical Therapist Practice. 2nd ed. *Phys Ther.* 2001;81:9–746.

- 4 American Physical Therapy Association, Ethics and Judicial Committee. Guide for Professional Conduct. Available at: <http://www.apta.org/AM/Template.cfm?Section=Home&Template=/CM/HTMLDisplay.cfm&ContentID=24781>.
- 5 American Physical Therapy Association, House of Delegates. Code of Ethics. Available at: <http://www.apta.org/AM/Template.cfm?Section=Home&Template=/CM/HTMLDisplay.cfm&ContentID=25854>.
- 6 Ladyshefsky RK, Barrie SC, Drake VM. A comparison of productivity and learning outcome in individual and cooperative physical therapy clinical education models. *Phys Ther.* 1998;78:1288–1298.
- 7 MacKinnon JR, Page GG. An analysis and comparison of the education costs of clinical placements for occupational therapy, physical therapy, and speech pathology and audiology students. *J Allied Health.* 1986;15:225–238.
- 8 Printen KJ, Chappell W, Whitney DR. Clinical performance evaluation of junior medical students. *J Med Educ.* 1973;48:343–348.
- 9 Kern BP, Mickelson JM. The development and use of an evaluation instrument for clinical education. *Phys Ther.* 1971;51:540–546.
- 10 Teschendorf B, Gramet P, Heubusch L. Group development of a clinical education instrument. *Journal of Physical Therapy Education.* 1988;2(1):10–12.
- 11 Hrachovy J, Clopton N, Baggett K, et al. Use of the Blue MACS: acceptance by clinical instructors and self-report of adherence. *Phys Ther.* 2000;80:652–661.
- 12 Stickley L. Content Validity of a clinical education performance tool: The Physical Therapist Manual for the Assessment of Clinical Skills. *J Allied Health.* 2005; 34:24–30.
- 13 Task Force for the Development of Student Clinical Performance Instruments. The development and testing of APTA clinical performance instruments. *Phys Ther.* 2004;82:329–353.
- 14 Messick S. Meaning and values in test validation: the science and ethics of assessment. *Educational Researcher.* 1989;18:5–11.
- 15 Nitko AJ. *Educational Assessment of Students.* 3rd ed. Upper Saddle River, NJ: Prentice-Hall Inc; 2001.
- 16 *A Normative Model of Physical Therapist Professional Education: Version 97.* Alexandria, Va: American Physical Therapy Association; 1997.
- 17 Commission on Accreditation in Physical Therapy Education. Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists. In: *Accreditation Handbook.* Alexandria, Va: American Physical Therapy Association; 1996.
- 18 Sharma S. *Factor Analysis: Applied Multivariate Techniques.* New York, NY: John Wiley & Sons Inc; 1995:90–143.
- 19 Huck S. *Reading Statistics and Research.* 4th ed. Upper Saddle River, NJ: Pearson Education Inc; 2004.

## Appendix.

Clinical Internship Evaluation Tool<sup>a</sup>

---

**UNIVERSITY OF PITTSBURGH  
SCHOOL OF HEALTH AND REHABILITATION SCIENCES  
DEPARTMENT OF PHYSICAL THERAPY**

**Clinical Internship Evaluation Tool**

**Student Name:** \_\_\_\_\_

**Social Security Number:** \_\_\_\_\_ **Year of Graduation:** \_\_\_\_\_

**Clinical Facility:** \_\_\_\_\_

**Type of Rotation:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Midterm:** \_\_\_\_ **Final:** \_\_\_\_ **or 1-Year Affiliation Quarter (specify):** \_\_\_\_\_

**Days Absent:** \_\_\_\_\_ **Days Made Up:** \_\_\_\_\_

**Clinical Instructor:** \_\_\_\_\_

**Clinical Instructor's Phone Number:** \_\_\_\_\_

**Clinical Instructor's E-mail:** \_\_\_\_\_

*Please Return to:*

**Lynn Fitzgerald, PT, MEd, PCS  
Director of Clinical Education  
Department of Physical Therapy  
University of Pittsburgh  
6035 Forbes Tower  
Pittsburgh, PA 15260**

## Appendix.

Continued.

## Clinical Internship Evaluation Tool Instructions

## INTRODUCTION

The University of Pittsburgh's Department of Physical Therapy recognizes that in the present day health care environment, a student graduating from an entry-level physical therapist program must be ready to "hit the ground running." The graduate should be able to skillfully manage patients in an efficient manner while achieving an effective outcome. We strive to achieve this goal through both the didactic and the clinical education portions of our curriculum. Thus, we developed a clinical performance tool that evaluates the student against this benchmark. In order for this tool to be an effective and reliable measure, students *must* be rated against the standard of a competent clinician who meets the above criteria. If students are rated against the standard of an entry-level practitioner, this tool will not provide a uniform method of evaluation. In addition, it is our belief that the criteria will be too low.

## USING THE FORM

This form is composed of 2 sections. The first section, **Professional Behaviors**, evaluates Safety, Standards of Conduct, Initiative, and Communication Skills in the clinic. The second section, **Patient Management**, evaluates the student's ability to efficiently manage a patient with an effective outcome. It is divided into 4 sections: Examination, Evaluation, Diagnosis/Prognosis, and Intervention.

When evaluating the student on **Professional Behaviors**, the frequency of appropriate behavior is the construct being measured. The occurrence of the appropriate behavior is rated as: *Never* (0% occurrence), *Rarely*, *Sometimes* (50% occurrence), *Most of the Time*, or *Always* (100% occurrence). From day 1, our expectation is that students show safe, profes-

sional behavior and demonstrate a great deal of initiative. **Note that you cannot mark "not observed" on these behaviors.** You may mark "not observed" for communication skills if the student has not had the opportunity to demonstrate a particular skill. For instance, if the student has had no opportunity to communicate with other professionals, this would be "not observed." If there are any concerns, or if you have positive feedback for the student, please elaborate in the "Comments" section. We expect the student to **ALWAYS** demonstrate **Professional Behaviors** in the clinic.

When evaluating the student's **Patient Management** skills, please keep in mind that the student should be compared to a "competent clinician who skillfully manages patients in an efficient manner to achieve an effective outcome." This form is designed for use with all patient types; thus, students can be evaluated based on your clinic population.

Scoring for the **Patient Management** section is as follows:

**Well Below:** Student requires a great deal of guidance including instructions and verbal cueing to complete a task.

**Below:** Student requires some supervision and/or increased time to complete a task.

**At That Level:** Student is at the level of a competent clinician. The student can carry an appropriate caseload for your clinic and achieve effective outcomes for his or her patients.

**Above:** Student is performing above the level of a competent clinician in your clinic. The student's clinical skills are highly effective and demonstrate the most current evidence in practice. The student can carry a higher-than-expected caseload.

**Well Above:** This is reserved for the master clinician and/or clinical specialist.

**Please use the comment page for specific areas of concern and/or positive feedback.**

On the last page, you are asked to make a global rating about the student. The academic faculty will decide if the student has passed the affiliation based on your evaluation. Our expectation is that the student will have met the level of a competent clinician for all skills by the third month of the year-long internship. Prior to that, the student may have skills that fall below that level while still receiving a passing grade. For professional skills, the student should consistently be **"Always"** appropriate. Please let the Director of Clinical Education (DCE) know immediately if there is a problem in any area of **Professional Behaviors**.

Please **complete this form and review it with the student** at midterm and at the end of the affiliation. Send the forms to the DCE at the University of Pittsburgh at both time points (midterm and final). Do not hesitate to call the Department of Physical Therapy at any time during the affiliation with questions or concerns regarding use of this tool or the student's performance. The DCE's phone number is 412-383-6638.

## REFERENCES:

1. Guide to Physical Therapist Practice. 2nd ed. *Phys Ther*. 2001;81:9-746.
2. Sackett DL, Haynes RB, Tugwell P, Guyatt GH, eds. *Clinical Epidemiology: A Basic Science for Clinical Medicine*. 2nd ed. Philadelphia, Pa: Lippincott Williams & Wilkins Publishers; 1991.

**Appendix.**

Continued.

**STUDENT NAME** \_\_\_\_\_

STANDARDS AND BENCHMARKS	RATING						
	Never	Rarely	Sometimes	Most of the Time	Always	Not Observed	
<b>PROFESSIONAL BEHAVIORS</b>							
<b>SAFETY</b>							
1. Follows health and safety precautions (eg, universal/standard precautions)							
2. Takes appropriate measures to minimize risk of injury to self							
3. Takes appropriate measures to minimize risk of injury to patient							
<b>Comments:</b>							
<b>PROFESSIONAL ETHICS</b>							
1. Demonstrates compliance with all HIPAA regulations regarding patient confidentiality							
2. Demonstrates positive regard for patients/peers during interaction							
3. Demonstrates cultural competence; shows tolerance of, and sensitivity to, individual differences							
4. Adheres to ethical and legal standards of practice							
5. Maintains appropriate appearance, attire, conduct, and demeanor							
6. Demonstrates awareness of patients' rights							
<b>Comments:</b>							



## Appendix.

Continued.

STUDENT NAME \_\_\_\_\_

STANDARDS AND BENCHMARKS	RATING						
	Never	Rarely	Sometimes	Most of the Time	Always	Not Observed	
<b>PROFESSIONAL BEHAVIORS</b>							
<b>INITIATIVE</b>							
1. Recognizes and maximizes opportunity for learning							
2. Implements constructive criticism							
3. Utilizes available resources to problem solve							
4. Is a positive contributor to the efficient operation of the clinic							
<b>Comments:</b>							
<b>COMMUNICATION SKILLS</b>							
<i>Communicates verbally with precise and appropriate terminology in a timely manner:</i>							
1. With patients and families							
2. With health care professionals (eg, MD, insurance carrier)							
<i>Communicates in writing with precise and appropriate terminology in a timely manner:</i>							
3. Documentation standards (eg, concise, accurate, legible; conforms with standard procedures)							
4. With professionals (eg, documentation, letters, plans of care)							
5. With patients and families (eg, patient home programs)							
<b>Comments:</b>							

Student

Signature \_\_\_\_\_ Date \_\_\_\_\_

Clinical Instructor

Signature \_\_\_\_\_ Date \_\_\_\_\_

## Appendix.

Continued.

STUDENT NAME \_\_\_\_\_

Please compare student to competent clinician who is able to skillfully manage patient in an efficient manner to achieve an effective outcome.

STANDARDS AND BENCHMARKS	RATING				
	Well Below	Below	At That Level	Above	Well Above
<b>PATIENT MANAGEMENT</b>					
<b>EXAMINATION</b>					
1. Obtains an accurate history of current problem					
2. Identifies problems related to functional limitations and disability using standardized outcome instruments when available					
3. Performs systems review and incorporates relevant past medical history					
4. Generates an initial hypothesis					
5. Generates an alternative hypothesis (list of differential diagnosis)					
6. Selects appropriate tests and measures to confirm or disconfirm hypotheses					
7. Recognizes contraindications for further tests and measures					
8. Demonstrates appropriate psychomotor skills when performing tests and measures					
<b>EVALUATION (analysis and synthesis of exam results)</b>					
1. Confirms or disconfirms initial hypothesis					
2. Confirms or disconfirms alternative hypothesis					
3. Administers further tests and measures as indicated					
<b>DIAGNOSIS/PROGNOSIS</b>					
1. Determines a diagnosis for physical therapist management of patient					
2. Determines expected outcomes (using standardized indices of functional limitations and disabilities where applicable) of physical therapy interventions (goals)					
3. Selects appropriate physical therapy interventions or makes appropriate consultations or referrals					
4. Determines appropriate duration and frequency of intervention; considers cost-effectiveness					
5. Determines criteria for discharge					
<b>INTERVENTION</b>					
1. Adheres to evidence during treatment selection					
2. Applies effective treatment using appropriate psychomotor skills					
3. Incorporates patient/family education into treatment					
4. Incorporates discharge planning into treatment					

## Appendix.

Continued.

---

5. Assesses progress of patient using appropriate measures					
6. Modifies intervention according to patient's/client's response to treatment					
7. Recognizes when expected outcome has been reached and makes appropriate recommendations					
8. Recognizes psychosocial influences on patient management					

**Appendix.**

Continued.

**STUDENT NAME** \_\_\_\_\_**Please comment here on specific areas of concern or areas of strength.****Examination****Evaluation****Diagnosis/Prognosis****Intervention**



## Appendix.

Continued.

### 1. GLOBAL RATING OF STUDENT CLINICAL COMPETENCE

On a scale from 0 to 10, how does the student compare to a competent clinician who is able to skillfully manage patients in an efficient manner to achieve effective patient/client outcomes?

Place an X in the box which best describes the student.

0	1	2	3	4	5	6	7	8	9	10

*Well below*  
a competent  
clinician

*At the level*  
of a competent  
clinician

*Well above*  
a competent  
clinician

### 2. Is the student performing at a level that is satisfactory for his/her current level of education?

\_\_\_\_\_ Yes

\_\_\_\_\_ No

If no, please explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\*\*\*\*\*

Student Signature \_\_\_\_\_ Date \_\_\_\_\_

Clinical Instructor Signature \_\_\_\_\_ Date \_\_\_\_\_

<sup>a</sup> Copyright 2007 American Physical Therapy Association. The Clinical Internship Evaluation Tool may be used or reproduced for use without charge; however, users must contact ptjourn@apta.org to obtain permission. Requests to modify the tool must be sent directly to the authors.