VALIDATION OF A CLINICAL PRACTICE ABILITY INSTRUMENT

Jennifer J. Shin1, John Page2, Jo Shapiro3, Stacey T. Gray4, Michael J. Cunningham5

1,4,5Massachusetts Eye and Ear Infirmary, 2Brigham and Women’s Hospital, 3,4,5Harvard Medical School, 4Harvard School of Public Health

Abstract

Objective: To develop and validate an instrument to measure the progression of clinical practice ability among residents.

Methods: A Clinical Practice Instrument (CPI) was created and prospectively validated in residents at three academic institutions. The CPI is completed in response to a scenario, which is given to a resident who is presented with a patient scenario; the scenario yields one clinical diagnosis, one or more therapeutic interventions, and a post-operative or post-interventional complication. Based on the diagnosis’s response to treatment, 20 random scenarios are calculated focusing on key areas within the diagnostic and management paradigms. Internal consistency (Cronbach’s alpha), reproducibility (intraclass correlation coefficient), inter-rater reliability (Kappa statistics), criterion validity (Spearman’s correlation), and responsiveness to change over time (paired t-test) were evaluated. Discriminant validity was established by comparing performance of residents with 2 years of residency training and those with 8-12 months of residency training. Both groups had multiple random effects modeled using linear regression.

Results

There were 87 administrations of the instrument over a period of 22 months. The authors noted improved range of training from medical student to clinical fellowship. Pearson’s alpha showed strong internal consistency within each domain (range 0.66-0.94, Cronbach’s alpha = 0.85). The reproducibility of items scores was excellent (ICC range: 0.83-0.95), and the internal consistency of the overall final summary score (Cronbach’s alpha = 0.93) was also demonstrated.

Discriminant validity was established by comparing the performance of groups with <2 years of residency training (n=32) and those with >8-12 months of residency training (n=32) using a paired t-test. The performance of the <2 years group was significantly lower than the >8-12 months group for all domains (p<0.0001 for all domains).

Conclusion

The CPI serves as a reproducible and valid metric to assess clinical practice ability in trainees as they transition from “novice” to “attending equivalent” surgeons.

Methods

The CPI was administered on 87 occasions to 32 trainees (medical student n=12, 5 trainees; PGY2 n=23, 9; PGY4 n=12, 8; PGY5=16, 8; fellow n=24, 6). The CPI was administered in PCRs (PGY2/5) and PCIGs (PGY4). The scenario is a clinical problem that involves one or more of the following types of clinical reasoning.

1. A problem involving a single clinical diagnosis. In these cases, the residents were given one clinical diagnosis and one or more of the following interventions.
2. A problem involving a single diagnostic test. In these cases, the residents were given one clinical diagnosis and one or more of the following tests.
3. A problem involving two clinical diagnoses. In these cases, the residents were given two clinical diagnoses and one or more of the following interventions.
4. A problem involving two diagnostic tests. In these cases, the residents were given two clinical diagnoses and one or more of the following tests.

The CPI was completed in response to a scenario, which is given to a resident who is presented with a patient scenario; the scenario yields one clinical diagnosis, one or more therapeutic interventions, and a post-operative or post-interventional complication. Based on the diagnosis’s response to treatment, 20 random scenarios are calculated focusing on key areas within the diagnostic and management paradigms. Internal consistency (Cronbach’s alpha), reproducibility (intraclass correlation coefficient), inter-rater reliability (Kappa statistics), criterion validity (Spearman’s correlation), and responsiveness to change over time (paired t-test) were evaluated. Discriminant validity was established by comparing performance of residents with 2 years of residency training and those with 8-12 months of residency training. Both groups had multiple random effects modeled using linear regression.

Discriminant validity was established by comparing performance of residents with <2 years of residency training (n=32) and those with >8-12 months of residency training (n=32) using a paired t-test. The performance of the <2 years group was significantly lower than the >8-12 months group for all domains (p<0.0001 for all domains).

Conclusion

The CPI serves as a reproducible and valid metric to assess clinical practice ability in trainees as they transition from “novice” to “attending equivalent” surgeons.