RESIDENT & FELLOW SECTION

Section Editor
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Education Research: Assessment of neurology resident clinical competencies in the neurology clinic

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ABSTRACT

Background: Objective evaluation of neurology resident clinical skills is required by the American Board of Psychiatry and Neurology and is important to insure improvement in clinical competency throughout their residency.

Methods: In this study, neurology residents from all 3 years of training and neurology faculty independently completed a form on new clinic patients documenting their decisions on anatomic localization, diagnosis, diagnostic tests, and management.

Results: Compared to the attending patient evaluation, we found significant improvement in identical scoring by year of residency training. All resident years outperformed medical students in the neurology clerkship.

Conclusion: Our clinical assessment form adds one more tool to the list of currently used assessment methods to evaluate resident clinical competency. ***Neurology*® 2009;72:e1–e3**

Neurology residency trains a physician to become a competent neurologist. For a neurology resident to qualify to take the American Board of Psychiatry and Neurology examination, the residency program director must certify that he or she has successfully completed the required training and verify successful mastery of in-residency clinical skills.[1] Objective examinations including the National neurology in-service examination as well as departmental internal examinations assess attainment of an adequate neurologic knowledge base. The greater challenge is knowing that the trainees can apply that knowledge base to patients in clinical settings. We report a method that successfully evaluated neurology residents' clinical competency on different parts of the patient encounter on multiple occasions in a general neurology clinic.

METHODS

We evaluated all neurology residents in this prospective study from July 2000 through December 2002 at the New Mexico VA Health Care System. Over the 2.5 years, 11 residents in postgraduate year (PGY) 2, 11 residents in PGY3, and 10 residents in PGY4 attended VA general neurology clinics and participated in this study approved by the VA research committee and University of New Mexico Human Research Review Committee.

Similar to our published study on neurology clerkship medical students,[2,3] residents completed forms on their new patients (see the form on the *Neurology*® Web site at www.neurology.org). Residents had available the written consultation request and the electronic medical record. Having conducted a history and examination, the residents then completed the form before they presented the patient to one of five board certified academic neurology attendings. The form requested information about the 1) anatomic location of the suspected lesion, 2) key diagnosis, 3) residents' level of diagnostic certainty regarding the diagnosis, 4) diagnostic tests they would order, and 5) management they recommended.

After the resident's oral patient presentation, the attending and resident returned to the patient where the attending independently conducted a focused history and examination and separately completed on the resident's form the same questions.

Forms were collected and scored by the authors. The attending neurologist response was considered the definitive answer. Differences in anatomic localization were defined as close (two sites were anatomically adjacent in the nervous system) or anatomically distant from each other. Specific diagnosis was scored as identical or different. Then differing diagnoses were scored as close (i.e., both diagnoses in the same broad category as in diabetic vs alcoholic peripheral neuropathy) or distant (i.e., brain tumor and tension headache). We scored proposed diagnostic tests as identical or different. When different, the form was subscored as different on neuroimaging tests, physiologic tests, blood tests, and diagnostic consultations since residents could differ from faculty in more than one test category. We also recorded whether the resident ordered fewer, more, or a similar number of tests than the attending. Proposed treatments were scored as identical, close (such as different commonly used medication for the same condition), or distant

Supplemental data at www.neurology.org

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Disclosure: The authors report no disclosures.

Table Agreement between resident by year of training and attending on different parts of examination

Scoring category	PGY2, n (%)	PGY3, n (%)	PGY4, n (%)	All residents, n (%)
Anatomic location agreement				
Identical location	124 (69)	76 (72)	101 (84)	301 (74)
Close anatomically	32 (18)	17 (16)	14 (12)	63 (16)
Distant anatomically	19 (10)	8 (8)	4 (3)	31 (8)
Resident did not know and left blank	6 (3)	4 (4)	1 (1)	11 (3)
Faculty left blank so cannot score	1	2	2	5
Diagnosis agreement				
Identical diagnosis	129 (71)	78 (73)	93 (76)	300 (73)
Same ballpark diagnosis	24 (13)	12 (11)	16 (13)	52 (13)
Very different diagnosis	25 (14)	15 (14)	4 (3)	44 (11)
Resident did not know and left blank	4 (2)	2 (2)	9 (7)	15 (4)
Faculty left blank so cannot score	0	0	0	0
Diagnostic test agreement				
Identical tests requested	110 (61)	59 (55)	94 (77)	263 (64)
Different	52 (29)	40 (37)	19 (16)	111 (27)
Resident did not know and left blank	19 (10)	8 (7)	9 (7)	36 (9)
Faculty left blank so cannot score	1	0	0	1
Number of diagnostic tests				
Same number of tests ordered	113 (70)	66 (67)	96 (84)	275 (74)
Faculty ordered more tests	4 (2)	7 (7)	4 (4)	15 (4)
Resident ordered more tests	44 (27)	26 (26)	14 (12)	84 (22)
Blank so cannot score	21	8	8	37
Diagnostic tests differing between resident and attending				
Blood test disagreement	22 (42)	11 (28)	5 (26)	38 (35)
Neuroimaging disagreement	20 (38)	16 (40)	8 (42)	44 (40)
Neurophysiologic test disagreement	18 (35)	22 (55)	9 (47)	49 (44)
Consult request disagreement	6 (12)	2 (5)	3 (16)	11 (10)
Treatment agreement				
Identical	96 (54)	61 (58)	79 (66)	236 (59)
Close	53 (30)	25 (24)	19 (16)	97 (24)
Distant	8 (4)	2 (2)	1 (1)	11 (3)
Resident did not know and left blank	21 (12)	17 (16)	21 (18)	59 (15)
Faculty left blank so cannot score	4	2	2	8

PGY = postgraduate year; n = number of evaluations.

(such as triptan vs anticonvulsant for a seizure patient). We scored categories blank when the resident placed a question mark in the area, entered only information not pertaining to the question, or left the space entirely blank. Data were entered onto a Microsoft Access database with a code for each resident and year of residency but without patient identifiers. Similarities and differences between the two responses were statistically analyzed using χ^2 and Mantel-Haenszel tests.

RESULTS We evaluated 411 new patient encounters from 17 residents. Over the 30 consecutive months of the study, 182 encounters were from 11 residents in PGY2, 107 encounters were from 11 residents in PGY3, and 122 encounters were from 10 residents in PGY4. Three forms could not be scored because attendings failed to complete any part of their form and eight additional forms had specific parts of the faculty form incomplete.

The table shows the results by parts of the examination and by resident PGY. The percent of all resident years combined demonstrating identical agreement with attending differed by parts of the patient encounter (χ^2 [3 *df*] = 30.58; $p < 0.001$). For all residents, identical agreement was 74% for anatomic lesion location, 73% for specific diagnosis, 64% for diagnostic tests recommended, and 59% for proposed treatment.

There were differences by year of resident training. Residents improved their scoring relative to faculty by year of training (table) as seen in the Mantel-Haenszel tests for trends across the 3 years of residency training for anatomic location agreement, diagnosis agreement, diagnostic test agreement, and treatment agreement ($p < 0.001$).

There was an association between resident level of certainty of diagnosis and agreement with faculty specific diagnosis (χ^2 [6 *df*] = 30.42; $p < 0.001$). Among cases where resident diagnostic certainty was high, the all resident years–faculty agreement was identical for 86% compared to only 36% identical agreement for cases where residents reported low certainty.

Residents ordered the same number of tests as the attendings in 74% of the visits but ordered more tests than attendings in 22%. The table shows how residents and attendings differed by type of test ordered. Residents and attendings differed more on types of neurophysiologic tests and neuroimaging tests ordered than in the ordering of blood tests or consultation requests.

Residents agreed with attendings on identical treatment plans 54% of the time in PGY2, 58% in PGY3, and 66% in PGY4. When the two differed in treatment plans, residents tended to neglect to propose management that included patient education, simple lifestyle modifications, referral to family support groups, and recommendations for equipment to prevent secondary complications.

Compared to our study on medical student attending the same general neurology clinics over the same time period,[2] residents in all years of their training were in closer agreement to attendings than were the medical students for all broad categories ($p < 0.001$).

DISCUSSION Although not unexpected, we were pleased to learn that residents in each training year outperformed those in previous years of training. Due to the limited 30-month duration of the study, we could not determine for an individual resident how he or she progressed over the 3 years. However, residents could easily be tracked using this form over the 3 years of residency to insure they were progressing in clinical competence. Once a residency program acquired sufficient experience with their residents using this form, specific standards for passing each year and certification of clinical competence could be developed. We also use this form to identify specific areas of clinical disease or neurophysiology where a resident is weak. When recognized, the resident is assigned a "learning issue" related to the deficiency.

Limitations of this study include that residents were able to review the consult request and electronic medical record before seeing the patient. In some circumstances, the diagnosis may have been previously made by others but the resident would still have to decide if the other diagnosis was correct. However, this is the world they will function in when they become a practicing neurologist. It is possible that some residents working with an attending over 1–2 years may have recognized the types of tests usually ordered by a given attending or their particular treatment style. When questioned about this possibility, however, residents felt this was unlikely.

To become a quality neurologist, the trainee must master large bodies of clinical and basic neuroscience knowledge. The final test of trainees' efforts is not what they know but what they do.[4] It is recognized that assessment drives learning. Careful objective assessment has the potential to inspire learning, influence values, and reinforce competence.[5] The challenge for a training program is to use objective assessment methods to evaluate clinical performance and determine both how the resident progresses from year to year and whether he or she achieves a level of clinical performance satisfactory to the training program and American Board of Psychiatry and Neurology. The clinical assessment form presented here adds one more tool to the list of currently used assessment methods utilized by many medical schools.[6]

AUTHOR CONTRIBUTIONS

Statistical analysis was performed by B.J.S.

ACKNOWLEDGMENT

The authors thank the University of New Mexico residents; Drs. John Adair, Kurt Fiedler, and Glenn Graham; and Keena Neal for data entry.

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Neurology 2009;72;e1-e3
DOI 10.1212/01.wnl.0000338600.65259.30