**Psychiatry Resident Education in Neurocognitive Disorders: a National Survey of Program Directors in Psychiatry**

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**Abstract**

**Objective** As major neurocognitive disorders increase, little research has examined how psychiatry residents are prepared to provide neurocognitive care to patients.

**Methods** A national survey was sent to program directors of general psychiatry in the USA and Canada, including questions about satisfaction, attitudes, and graduation expectations for training in major neurocognitive disorders. The authors examined descriptive statistics and a series of chi-squared analyses by training setting, residency type, and presence of subspecialty fellowships. The authors also collected free text responses about perceived needs for enhancing training.

**Results** Program directors agreed that the scope of general psychiatry includes the evaluation of cognitive disorders (78.8%) and the treatment of cognitive symptoms (77.5%) and behavioral/psychological symptoms (78.8%). Required clinical rotations were the preferred method of teaching (63.7%), but didactics were most used (93.8%). The most frequently used clinical teaching setting was geriatric psychiatry (61.3%) and didactics were most frequently taught by geriatric psychiatrists (75.0%). Fifty-six percent were satisfied or very satisfied with their clinical training and 66.3% with their didactics. There were no significant differences in satisfaction or attitudes when compared by training setting, residency type, or presence of subspecialty fellowships. Additional trained faculty were most frequently listed as a need for improving clinical and didactic training.

**Conclusions** Psychiatry program directors view major neurocognitive disorders as part of the scope of psychiatric practice. The majority of training is provided within psychiatry rotations, especially geriatric psychiatry. Program directors reported several unmet needs for optimal training, particularly related to clinical training services.

**Keywords** Education · Dementia · Neurocognitive disorders · Psychiatry residency education · Neuroscience education

Major neurocognitive disorders, also known as “dementias,” are defined by the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM 5) as a decline in cognition and functioning that create impairment or distress [1]. The number of individuals with neurocognitive disorders continues to rise. The most recent Alzheimer’s Association Facts and Figures Report indicates that over 5 million people age 65 years old and above are living with Alzheimer’s disease alone, and this number is expected to nearly triple by the year 2050 [2]. This does not include other types of major neurocognitive disorders, such as major neurocognitive disorder due to Parkinson’s disease, vascular disease, frontotemporal dementia, or numerous others.

The rapid increase in major neurocognitive disorders presents a public health crisis in the USA and globally, as our current workforce is not expected to meet the growing needs of affected individuals [3, 4]. There are many routes by which a psychiatrist may become an expert in neurocognitive disorders, including geriatric psychiatry fellowship, neuropsychiatry fellowship, and combined psychiatry-neurology residencies. However, data shows that the vast majority of individuals diagnosed with a neurocognitive disorder are diagnosed and treated by non-specialists, usually their primary care physician. By one study, 85% were diagnosed by a non-specialist, and only 36% had seen a specialist 5 years later [5].

In the spirit of an “all hands on deck” approach to the crisis, general psychiatrists are likely to be called upon to provide care for individuals with major neurocognitive
disorders. However, very little literature exists to describe training for general psychiatry residents in this area. In a recent review, we examined the literature on education of psychiatry residents in major neurocognitive disorders. While some studies examined neurocognitive education within the context of geriatric psychiatry, neuropsychiatry, or neurology, we were unable to locate any studies specifically addressing training for neurocognitive disorders in general psychiatry residency [6]. This reveals a significant gap in the literature.

In a related line of inquiry, we could not find any studies about how psychiatry residency program directors interpreted and applied the training requirements related to major neurocognitive disorders. These are complex conditions, with a constellation of clinical features including cognitive, behavioral, psychological, movement, autonomic, and other symptoms. As they occur in the watershed area between psychiatry and neurology, it may not be clear where the care of one specialty ends and the other begins. The Accreditation Council of Graduate Medical Education (ACGME) Program Requirements for Psychiatry list “dementia” and “neurocognitive disorders” as “neurologic disorders commonly seen in psychiatric practice,” and the requirements state that residents should demonstrate competence in their “knowledge of the diagnosis and treatment” of these conditions (p. 22).

The program requirements also state that every resident must complete 1 month of geriatric psychiatry training to learn “diagnosis and management, including management of the cognitive component, of degenerative disorders and functioning in the elderly” (p. 29). Two months of neurology within the general psychiatry training requirements must include training in “the diagnosis and treatment of patients with neurological disorders/conditions” (p. 27) [7], without additional explanation of what this entails.

Further, the current ACGME milestones for psychiatry include topics relevant to the care of individuals with neurocognitive disorders. For instance, residents should “[know] indications for specific neuropsychological tests and [understand] the meaning of common abnormal findings” (Medical Knowledge 3 3.1) and “explain the significance of neuropsychological testing abnormalities to patients” (Medical Knowledge 3 4.1). The milestone known as Patient Care 3.32A states that residents should be able to select treatments, giving the example of “psychopharmacology in the presence of neurodegenerative disorders or traumatic brain injury” [7]. All of these competencies and requirements are related to major neurocognitive disorders but may leave some room for interpretation about what residents should be able to do with this knowledge in their own independent practice.

In this survey study, we ask the following research questions: What are the attitudes of program directors regarding the treatment of major neurocognitive disorders in their graduates’ scope of clinical practice? What are current practices for meeting ACGME competencies related to neurocognitive disorders within psychiatry residency programs? What additional resources are needed to enhance education in major neurocognitive disorders in psychiatry? Are there significant differences between programs’ satisfaction with their neurocognitive disorder education, attitudes toward neurocognitive disorders, and graduation expectations based on location, training setting, or the presence of subspecialty fellowships at their institutions?

Answering these questions will help us better understand the current landscape of psychiatric training in major neurocognitive disorders and serve as a needs assessment for the development of future educational resources.

**Method**

**Survey Design and Study Recruitment**

We designed a survey to assess psychiatry residency faculty perceptions and attitudes toward the current neurocognitive education landscape in psychiatry residency programs. In particular, we aimed to capture components related to clinical rotations for example, where trainees receive the majority of their training in neurocognitive disorders, including the presence of elective rotations and didactic training (for example, whether didactics are provided for specific topics and by whom). Following this, respondents were asked to rate their satisfaction with both clinical and didactic training. Lastly, participants were asked to provide their level of agreement on whether the treatment of neurocognitive disorders is within the scope of practice of a general adult psychiatrist and particular competencies for graduation from residency (e.g., administer cognitive screenings).

The survey also asked respondents to provide demographic information related to their program’s training setting (i.e., community, university; rural, urban), geographic location, and residency program size as well as information related to the formal training of faculty and the presence of subspecialty programs related to neurocognitive disorders. Respondents were also asked about the methods currently used to teach cognitive disorders and which they would prefer to use.

In total, the survey was comprised of 43 items, written by two study authors (MC and KD) based upon their review of the extant literature and personal experience in residency program administration, supervision and evaluation of residents, and clinical care of individuals with neurocognitive disorders. Sixteen items were multiple choice, two items were rank choice, 19 items were Likert scaled with five response anchors, and six items were free response.
After obtaining approval from the University of Texas Southwestern Institutional Review Board, the survey, along with a description of the study purpose, was electronically distributed by email, using REDCap [8], an electronic data capture system, to 259 psychiatry residency program directors in the USA and Canada. This list was curated through searches of publicly available contact information and personal contacts. Following the initial invitation email, two follow-up emails were sent. Of the 259 potential respondents, seven emails were rejected as undeliverable without an alternate contact available. Of the remaining 252 successful emails, 80 respondents completed the survey.

**Statistical Analyses**

Following an examination of descriptive statistics (frequency and percent) for all items, a series of chi-squared analyses were conducted to examine differences in satisfaction, attitudes, and graduation expectations by training setting (rural vs. urban), residency type (community vs. academic), and presence of subspecialty fellowship. Subspecialty fellowships included geriatric psychiatry fellowship (yes/no), behavioral neurology and/or neuropsychiatry fellowship (yes/no), consult liaison psychiatry fellowship (yes/no), combined psychiatry and neurology residency program (yes/no), neurology residency program (yes/no), and neuropsychology training program (yes/no). Statistical significance was evaluated at \( p < 0.05 \).

To correct for multiple comparisons among the chi-squared tests, the false discovery rate (FDR) method was used. This approach was selected to maintain power to detect statistically significant results, while controlling for type I error [9]. The procedure was conducted for each comparison/grouping variable, leading to seven sets of comparisons. That is, all \( p \)-values derived from analyses done by training setting comprised one set, all \( p \)-values derived from analyses done by residency type comprised a second set, and \( p \)-values derived from analyses done by subspecialty fellowship comprised the remaining five sets. The false discovery rate was set at \( Q = 0.15 \). This value was chosen to remain conservative, yet still have the ability to detect statistically significant results. Although we report on the unadjusted \( p \)-calculated value, the FDR corrected \( p \)-critical value is provided in-text below to distinguish which statistical tests passed corrections for multiple comparisons. However, all \( p \)-values alongside their FDR corrections are available by request from the authors. All analyses were conducted in SPSS version 25 [10].

**Results**

We successfully located 252 emails for program directors of psychiatry in the USA and Canada and received 80 responses, for a response rate of 32%. Respondents were 53 years of age, on average, and primarily female (55%), Caucasian (70%), and non-Hispanic/Latino (90%). Additionally, respondents were primarily program directors (87.5%), located in an urban setting (81.3%), university-based residency type (60%) with a program size of 20–40 people (37.5%). Select demographic information is presented in Table 1, including fellowship and programs offered at the respondent’s institution, and training of residency program directors and clinical teaching faculty.

**Attitudes**

Overall, respondents strongly agreed or agreed that the following are within the scope of practice of a general psychiatrist: the evaluation and diagnosis of cognitive disorders (78.8%); the treatment of cognitive symptoms (77.5%); the treatment of behavioral and psychological symptoms of dementia (78.8%). Additionally, most respondents (71.3%) strongly agreed or agreed that general psychiatrists are likely to treat patients with cognitive disorders in their usual practice setting. Attitudes regarding the scope of practice of a general psychiatrist did not significantly differ by training setting, residency type, or subspecialty fellowship. Complete descriptive statistics and results from chi-squared analyses of respondents’ attitudes regarding the scope of practice of a general psychiatrist are available by request from the authors.

**Graduation Expectations**

Respondents strongly agreed or agreed that they expected their graduates to be able to (1) administer cognitive screenings (91.3%), (2) interpret the results of cognitive screenings (91.3%), (3) use diagnostic tests to work-up cognitive impairment (88.8%), (4) know the indication for specific neuropsychological tests (70.1%), (5) explain the significance of neuropsychological testing abnormalities to patients (65%), (6) know the clinical indications and limitations of testing for biomarkers for cognitive disorders (67.5%), (7) include cognitive disorders in the differential diagnosis of a psychiatric patient (87.5%), (8) independently diagnose cognitive disorders (76.3%), (9) diagnose cognitive disorders in collaboration with colleagues from neurology (82.5%), (10) appropriately prescribe cognitive enhancers (81.3%), (11) pharmacologically treat behavioral/psychological symptoms of dementia (83.8%), (12) counsel families on safety issues related to cognitive disorders (86.3%), and (13) employ behavioral management techniques for behavioral/psychological symptoms of dementia (78.8%). Graduation expectations did not significantly differ by training setting, residency type, or subspecialty fellowship, except for three comparisons. Respondents whose institution offered a neurology...
residency program more strongly agreed to item 2 of the survey items listed above ($\chi^2 [1] = 5.388$, $p = 0.036$, FDR$_{P\text{-CRIT}} = 0.016$) and item 7 ($\chi^2 [1] = 9.842$, $p = 0.007$, FDR$_{P\text{-CRIT}} = 0.008$) in comparison to those who did not offer a neurology residency program. Likewise, respondents whose institution offered a neuropsychology training program more strongly agreed to item 9 ($\chi^2 [1] = 8.000$, $p = 0.018$, FDR$_{P\text{-CRIT}} = 0.008$) in comparison to those who did not offer a neuropsychology training program. Complete descriptive statistics and results from chi-square analyses of respondents’ graduation expectations are available upon request from the authors.

**Current Educational Practices**

When asked to rank the most effective way to teach cognitive disorders, the majority of respondents chose required clinical rotations (63.7%) as most effective, followed by didactics (52.5%), elective clinical rotations (37.5%) as third most effective, and special seminars/grand rounds (47.5%) as the least effective. Percentages reflect the percent who chose that rank order, and so do not add up to 100%. The majority of respondents ranked geriatric psychiatry (61.3%) as the rotation on which trainees learn the most about cognitive disorders. Consult/liaison (C/L) psychiatry was ranked second by
the majority of the sample (51.2%), and the majority ranked neurology third (56.3%). Rankings of the most effective teaching practices did not significantly differ by training setting or residency type.

When asked about methods currently in use to teach cognitive disorders, the most commonly endorsed method was didactics (93.8%), followed by clinical rotations (76.3%), elective clinical rotations (57.5%), and special seminars/grand rounds (57.5%). Additionally, results revealed some statistically significant differences in teaching methods. Respondents in a rural training setting used special seminars/grand rounds significantly more than those in an urban setting ($\chi^2[1] = 4.969, p = 0.042, \text{FDR}_{p-	ext{CRIT}} = 0.006$). Likewise, respondents at a university-based residency type were significantly more likely to use elective clinical rotations ($\chi^2[1] = 10.501, p = 0.001, \text{FDR}_{p-	ext{CRIT}} = 0.003$) and special seminars/grand rounds ($\chi^2[1] = 7.543, p = 0.006, \text{FDR}_{p-	ext{CRIT}} = 0.006$) in comparison to those in a community-based residency type. Statistically significant results are presented in Table 2.

Respondents reported offering didactics on cognitive assessment (77.5%), diagnosing cognitive disorders (87.5%), enhancing cognition (66.3%), and treating behavioral and psychological symptoms of dementia (85.0%). Those in a rural setting offered didactics in enhancing cognition significantly more than those in an urban setting ($\chi^2[1] = 5.581, p = 0.028, \text{FDR}_{p-	ext{CRIT}} = 0.003$; Table 2). Didactics offered did not significantly differ by residency type. Full descriptive statistics and results from chi-squared analyses of teaching methods are available upon request from the authors.

When asked who gives didactics, most respondents indicated that faculty members in general psychiatry (57.5%) and geriatric psychiatry (75.0%) provide didactics on cognition or cognitive disorders. A minority of program directors indicated that they had didactics by faculty in neurology (40.0%) and neuropsychology (36.3%). Ten percent of respondents said they have didactics delivered by other, with free text responses including neuropsychiatry, internal medicine, geriatric medicine, or C/L psychiatry. Provision of didactics by these particular faculty members did not significantly differ by training setting or residency type.

Additionally, most programs offer mostly inpatient rotations (47.5%), followed by equal inpatient and outpatient (27.5%), mostly outpatient (8.8%), and all inpatient (7.5%). Rotation type did not significantly differ by training setting or residency type. Finally, some programs endorsed having electives in inpatient geriatric psychiatry (45.0%), outpatient geriatric psychiatry (56.3%), behavioral neurology (20%), integrated psychiatry/neurology services (16.3%), neuropsychology (25%), and related scholarly project or QI electives (52.5%). Electives did not significantly differ by training setting. However, those in a university-based residency type had a significantly higher proportion of electives in outpatient geriatric psychiatry ($\chi^2[1] = 6.520, p = 0.015$).

Table 2 Current educational practices by training setting and residency type with chi-square comparisons

| Training setting | Residency type |
|------------------|---------------|
|                  | Whole sample | Urban | Rural | Comparisons | University based | Community based | Comparisons |
| Methods used to teach cognitive disorders |
| Elective clinical rotations |
| Yes | Freq % | 46 57.5 | 40 61.5 | 6 54.5 | $\chi^2$ 0.193 | $p$ .744 |
| No  | Freq % | 34 42.5 | 25 38.5 | 5 45.5 |
| Special seminars/grand rounds |
| Yes | Freq % | 46 57.5 | 36 55.4 | 10 90.9 | $\chi^2$ 4.969 | $p$ .042 |
| No  | Freq % | 34 42.5 | 29 44.6 | 1 9.1  |
| Formal didactics offered by the participant’s program |
| Enhancing cognition |
| Yes | Freq % | 53 66.3 | 42 64.6 | 11 100.0 | $\chi^2$ 5.581 | $p$ .028 |
| No  | Freq % | 27 33.8 | 23 35.4 | 0 0.0 |
| Other electives in cognitive disorders offered by the participant’s program |
| Outpatient geriatric psychiatry |
| Yes | Freq % | 45 56.3 | 37 56.9 | 8 72.7 | $\chi^2$ 0.973 | $p$ .509 |
| No  | Freq % | 35 43.8 | 28 75.4 | 3 27.3 |

Note: For chi-square tests, df = 1
FDR_{p,CRT}=0.009; Table 2). Complete descriptive statistics and results from chi-square analyses of respondents’ current educational practices are available upon request by the authors.

**Training Satisfaction and Additional Resources Needed**

The majority of participants reported being very satisfied or satisfied with their program’s clinical training in cognitive disorders (56.3%) and the quality of their training in cognitive disorders using didactics (66.3%). The respondents’ level of satisfaction in both their program’s clinical training and the quality of their training did not significantly differ by training setting, residency type, or subspecialty fellowship. Complete descriptive statistics and results from chi-square analyses of respondents’ training satisfaction are available upon request from the authors.

When asked for free text responses to “What would you need to provide a stronger clinical training experience in cognitive disorders?” respondents listed faculty (n = 32), clinical training sites (n = 30), time (n = 6), teaching materials (n = 8), and a requirement for neuropsychological experiences (n = 5).

When asked for free text responses to “What would you need to provide a stronger training experience for cognitive disorders in didactics?” the most frequent responses were faculty (n = 20), time (n = 18), and educational resources (n = 9). Eight said that they were unsure, and six said that they were satisfied with their current didactics.

**Discussion**

The majority of program directors agreed that major neurocognitive disorders are within the scope of practice of psychiatrists, and that, in practice, their graduates will work with patients with major neurocognitive disorders. The majority also agreed that residents should be able to independently diagnose cognitive disorders and treat all aspects of the illness (i.e., cognitive as well as behavioral/psychological symptoms). Interestingly, over 20% of respondents were neutral or disagreed that residents should be able to “know the indications for specific neuropsychological tests,” or “explain the significance of neuropsychological testing abnormalities to patients,” which are ACGME milestones that fall within graduation targets for psychiatry residents (milestones MK3 3.2, MK3 4.1 respectively) [11]. This may indicate that greater clarity is needed about the expectation for what it means to evaluate and treat patients with major neurocognitive disorders, or it may indicate a lack of available resources for teaching neuropsychology. Only 25% of programs reported having a neuropsychology clinical elective, and six responses specifically listed neuropsychology clinical faculty or services as a need. One of these responses stated that “neuropsychology has basically disappeared here,” and the other two specified that the neuropsychology rotation should be required.

Only 12.5% of respondents were “very satisfied” with clinical rotations and 13.8% were “very satisfied” with didactics. Interestingly, 23.8% were “neutral” about their satisfaction with clinical rotations, and 17.8% were “neutral” about their didactics. We wonder if this indicates a general lack of attention to the topic, especially given free text responses indicating competing demands in the curriculum and one respondent who answered, “Never thought about it before!” when asked what they would need to strengthen their clinical training in major neurocognitive disorders.

Respondents also demonstrated a clear preference for required clinical rotations as the most effective method to teach neurocognitive disorders, but nearly a quarter of the sample said that they do not use required clinical rotations to teach major neurocognitive disorders. However, nearly every program reported the use of didactics to teach major neurocognitive disorders. We wonder if some programs are relying on didactics in the absence of available clinical services, especially since the need for additional trained faculty and subspecialty training sites were frequently mentioned in free text questions.

Program directors also reported that the most training in neurocognitive disorders happens on psychiatry rotations (geriatric psychiatry, followed by C/L psychiatry), rather than neurology. In a prior national survey of program directors of psychiatry, respondents rated their satisfaction with education on neurology as a 3.56 out of a possible 5, with the greatest needs for education in differentiating types of dementia and identifying biological substrates of dementia [12]. In our sample, free text responses about neurology were mixed, with one alluding to “turf wars” with neurology. However, many others reported wanting more engagement with neurology rotations. Another stated that “if [residents] do a neurology rotation in dementia clinic, that is a very good learning experience.”

The majority of program directors reported that education in neurocognitive disorders happens within the realm of geriatric psychiatry. While cognitive care is an important part of the psychiatric care of older adults, we wonder about education in neurocognitive disorders that happen among younger adults (for instance, neurocognitive disorders secondary to traumatic brain injury). Given the complexity and variety of neurocognitive disorders, we also wonder if a 1-month training requirement for geriatric psychiatry is sufficient to teach both neurocognitive care and other non-cognitive topics related to the care of older adults. In a prior survey of psychiatry program directors asked about geriatric psychiatry education, respondents
listed conflicting time demands as the primary barrier to implementing additional geriatric psychiatry curricula [13]. Echoing these findings, time was frequently mentioned in free text responses listing needs for enhancing education in major neurocognitive disorders.

In calculating comparisons, we did find that community-based programs reported fewer resources for teaching major neurocognitive disorders, but they did not differ in satisfaction, attitudes, or graduation expectations. Comparing on the basis of fellowships or program directors’ subspecialty training revealed a few differences on individual measures, but these differences happened somewhat sporadically and did not demonstrate broader trends.

Our paper has several limitations. A survey study may not be able to capture nuances of participant responses, especially related to attitudes about major neurocognitive disorder care. We also had several participants who did not answer all of the questions on the survey, and participants who chose to fill out the survey knew that it was about neurocognitive disorders, which may have introduced some selection bias. A higher response rate would have strengthened our results. Further, we asked participants to rate their satisfaction with their program, and we did not have more objective markers of efficacy of educational programs or impact on later practice.

This study highlights several important unmet needs for psychiatry education. Respondents frequently mentioned a need for time, educational resources, and faculty with expertise. The shortage of geriatric psychiatrists and other psychiatrists with training in neurocognitive disorders represents a pressing need, both for service delivery and for education. We also wondered whether this is an opportunity for expansion of programs already available to help supplement geriatric psychiatry education, such as the COVID-19 American Association for Geriatric PsychiatryOnline Trainee Curriculum [14] or the National Neuroscience Curriculum Initiative [15]. We did not specifically ask program directors whether they were aware of, or if they use, these types of resources. Additional research is also needed to evaluate competencies during and after residency, to better delineate whether current educational practices are equipping psychiatrists to meet the substantial need for neurocognitive care.

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Declarations

Ethical Considerations This project was approved by the UT Southwestern IRB, protocol #STU-2020-0324 on June 12th, 2020.

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