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A survey of clinical neuropsychologists: what recommendations do they give to adult patients?

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A SURVEY OF CLINICAL NEUROPSYCHOLOGISTS: WHAT RECOMMENDATIONS DO THEY GIVE TO ADULT PATIENTS?

by

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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To my family
My Mom and Dad, Adam, Madeline, and Miles

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ABSTRACT

There is limited information available regarding what types of recommendations clinical neuropsychologists provide to patients and the consistency of recommendations made to patients with similar presenting concerns. This dissertation aimed to start answering these open questions through surveying 309 clinical neuropsychologists about their recommendation practices for specific neurocognitive diagnoses. Analyses also examined patient and provider characteristics that are predictors of the frequency of provision of different classes of recommendations (e.g., safety versus mental health) via modeling. Results showed that neuropsychologists most frequently make recommendations to patients and their family members that can be completed independently (e.g., exercise, engage in activities to improve mood) and least frequently make recommendations that require additional services that can be costly (e.g., respite care/home health aide). For the entire sample, only 5 of 67 specific recommendations were defined as being given inconsistently by different providers suggesting that overall recommendation provision is relatively consistent. Lastly, a model that included all participants found that patient diagnosis and primary professional activity of clinical neuropsychologist both strongly predicted the frequency that certain kinds of recommendations were provided to patients and their family members. The following predictors moderately to strongly predicted how often different categories recommendations (e.g., organization/memory/attention, employment/education, driving) were provided to patients with specific neurocognitive diagnoses: the method with which the neuropsychologist originally learned the recommendations that they provide, the extent that neuropsychologist reported individualizing recommendations, referral question, whether the patient was seen in an inpatient or outpatient setting, patients' perceived level of motivation, caregiver attendance at neuropsychological appointments, and patients' level of education.

PUBLIC ABSTRACT

Clinical neuropsychologists assess the cognitive functioning of individuals with a wide range of psychiatric and neurological disorders. They provide feedback to patients that include both conclusions about their diagnosis and prognosis, as well as specific recommendations related to improving their everyday functioning. Despite the importance of this part of the assessment, there has been limited research on the types of recommendations that are provided to patients. The study surveyed 309 clinical neuropsychologists who work with adult patients to address this open question. The results from this research can be used to improve the lives of patients and their family members by informing best practices for what recommendations clinical neuropsychologists should give to patients with specific concerns.

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CHAPTER I

INTRODUCTION

The following literature review is divided into four broad sections. The first section offers an overview of feedback practices historically within clinical neuropsychology. Next, the importance of feedback and recommendations is discussed. The third section includes what is known about the current practices of the field regarding the administrations of feedback and recommendations, and the final part presents the little research that has been conducted on the effective communication of neuropsychological recommendations.

History of Neuropsychological Feedback and Recommendations

Historically, in the field of clinical neuropsychology, there was a disproportionate focus on assessment of disorders compared with patients' understanding of the results and subsequent recommendations and rehabilitation (Johnstone & Stonnington, 2002, p. 1). In fact, patients did not directly receive any feedback from neuropsychologists in part because one of the primary aims of neuropsychological testing was to detect the presence, general location, and extent of brain damage (Benton, 2000; Ruff, 2003). Just as the specialist responsible for administering an x-ray would send x-ray results back to the referring doctor rather than interpreting the x-ray and relaying information directly to the patient, neuropsychologists administered tests on behalf of a referring doctor. Under this model of practice, the neuropsychologist did not interpret test results or relay their implications to his or her patients, but instead reported the findings back to the ordering medical doctor who subsequently presented them to the patient (Grant & Adams, 2009).

Neuropsychologists' roles have evolved to include addressing questions that are relevant to patients' daily functioning. The original model of neuropsychological assessment, in which minimal importance was placed on the communication of results or making treatment recommendations to patients, is no longer sufficient. This shift can be, in part, attributed to

technological advances in clinical care that occurred in the mid 1970's when neuroimaging was introduced as a diagnostic tool (Kolb & Whishaw, 2009; Ruff, 2003). Computed tomography (CT) scans and magnetic resonance imaging (MRI) allowed health providers to see the precise location of many lesions, meaning that health providers no longer relied as heavily on neuropsychological tests to localize lesions.

Importance of Neuropsychological Feedback and Recommendations

To stay relevant neuropsychologists needed to have strategies to improve the lives of their patients with cognitive deficits (Johnstone & Stonnington, 2002, p. 1). Additionally, factors related to the process of testing (e.g., time spent and effort exerted by the patient), the expense to patients and third-party payers promoted an increased focus on the outcomes of neuropsychological assessment. The evaluation process can be long, frustrating, and anxiety provoking particularly because, neuropsychological tests are challenging and patients typically do not receive immediate feedback on their performance during test administration (Allen & et al, 1986; Westervelt, Brown, Tremont, Javorsky, & Stern, 2007). Also, the time spent interviewing and testing patients, scoring the tests, and writing a neuropsychological report makes conducting a full neuropsychological assessment expensive. These expenses (time, frustration, and monetary) make it essential that the consequences of the neuropsychological evaluation are worthwhile whether that is through informing next steps, increasing patient safety, or improving quality of life (Ruff, 2003).

Neuropsychologists began tailoring their evaluations to answer questions about their patients' everyday functioning and prognosis and make recommendations accordingly. For example, based on a patient's cognitive deficits, can the patient manage his or her own finances? Is it safe for him or her to drive? Is it appropriate for the patient to continue working? In sum,

the change in their milieu of practice influenced neuropsychologists to avoid the threat of extinction by addressing questions about patients' level of functioning in the real world and providing treatment recommendations to patients and their families. Thus, they continued to provide a valuable service to their referral sources by going beyond the information that imaging alone can provide (Lezak, Howieson, Bigler, & Tranel, 2012).

Current Practices

Based on the limitations inherent in providing no direct feedback to patients, many neuropsychologists have started to routinely incorporate explicit feedback into the conclusion of their examinations (Smith, Wiggins, & Gorske, 2007). 253 patients who underwent a neuropsychological evaluation were recruited from five medical centers in Australia to take the Neuropsychological Assessment Questionnaire. The questionnaire asked them about their experience undergoing a neuropsychological evaluation. Results indicated that 68 percent of participants received feedback from their neuropsychologist after the testing was complete (Bennett-levy, Klein-Boonschate, Batchelor, McCarter, & Walton, 1994). A more recent survey of 719 neuropsychologists indicated that a comparable percent of the sample, 71.3, usually or almost always provides in-person feedback (Smith et al., 2007). Neuropsychologists in this study took an electronic survey and were recruited via the International Neuropsychological Society (INS), the National Academy of Neuropsychology (NAN), and the Society for Personality Assessment.

It is still important to recognize that providing direct feedback to patients and their families is not a universal service in neuropsychology (Westervelt et al., 2007). Some reasons, besides historical practices, that explain why feedback does not always occur, include lack of reimbursement for feedback services and low practicality (e.g. patient does not live locally).

Lastly, in forensic cases, the person being assessed may not always be considered to be the client and therefore may not receive feedback directly from the neuropsychologist (Attix & Welsh-Bohmer, 2005).

However, it is significant to note that researchers found evidence that supports the merit of neuropsychologists administering feedback to their patients. In a survey of patients who had recently undergone a neuropsychological evaluation, 67 percent of 93 patients endorsed feedback as being useful, while the other 33 percent endorsed that they did not find it to be *useful* (Bennett-Levy et al., 1994). In the same study, 67 percent of patient endorsed learning *useful* information about their problem areas. In contrast, only 57 percent of the patients reported learning *useful* information about their strengths. In a second study that surveyed 60 neuropsychological patients, 83.3 percent of the patients rated feedback as being *very helpful* and 16.7 percent rated feedback as being *helpful* (Donofrio, Piatt, Whelihan, & DiCarlo, 1999). A final study surveyed 129 patients and 80 family members about their experience undergoing a neuropsychological evaluation one month after receiving verbal and written feedback (Westervelt et al., 2007). 78 percent of patients and 85 percent of significant others endorsed feedback as being *very much* or *mostly* helpful in understanding the patients' problems. Based on these studies, it appears that patients generally find feedback to be a beneficial component of the assessment process.

Due to the historical emphasis on assessment, the majority of neuropsychologists were not explicitly taught how to give feedback. Neuropsychologists often learn how to give feedback through observing veteran clinicians and through the process of giving feedback themselves and modifying their technique based on their personal experience of what strategies work well and what does not work effectively (Postal & Armstrong, 2013, p. 12). Neuropsychologists

administer feedback and recommendations through diverse approaches, including verbal communication, a written report, or a combination of the two methods (Lezak et al., 2012). Some clinicians prefer to write patients a separate letter that summarizes in straightforward language the most important aspects of the full technical report (Allen & et al, 1986; Attix & Welsh-Bohmer, 2005). Whether feedback is given and in what form it is administered depends on a number of factors including the neuropsychologist, the practice of the clinic, the referral question, and patient characteristics (Bennett-Levy et al., 1994).

Similarly, feedback differs in duration, structure, report length, and the timing of feedback. Some clinicians prefer to give feedback on the same day that testing occurs while others prefer to schedule feedback sessions up to one month after the evaluation (Postal & Armstrong, 2013). There seem to be advantages and disadvantages to each approach, but differences in outcomes have not been empirically examined (Carone, Iverson, & Bush, 2010; Attix & Welsh-Bohmer, 2005).

A potential advantage to conducting feedback on the same day that the patient completes the neuropsychological testing is that the patient will not need to wait up to a month to learn about the results from their assessment which can be anxiety provoking. Furthermore, the patient might remember how they felt taking specific tests, and this can be used to discuss why some tests were more challenging for them. Another likely benefit to conducting feedback the same day as the patients' appointment is that the patient will not need to return to the hospital reducing the chance that patients are lost to follow-up and do not receive the results from their evaluation. While verbal feedback can be conducted over the telephone, it is possible that some nuances of the conversation are lost when feedback is not conducted in person.

A possible disadvantage to conducting feedback on the same day as the rest of the

neuropsychological evaluation is that oftentimes patients are tired after taking hours of cognitive tests and they might not be able to understand or remember the results as well as if they were more alert. Future research is necessary to help the field learn whether one approach is more effective than another.

Since there are many inconsistencies in how feedback sessions are conducted, it is important to define the term feedback. Verbal feedback typically ranges between 15 to 90 minutes in length (Postal & Armstrong, 2013). Almost half of 719 clinicians, who responded to an electronic survey on assessment feedback practices, reported that an average feedback session takes from 50 to 60 minutes (Smith et al., 2007). While the official feedback occurs after the testing is complete and the results have been interpreted, many clinicians intentionally establish prerequisites for the feedback session upon their initial meeting with the patient by developing good rapport and educating the patient about what type of information can be expected from the evaluation (Allen et al., 1986).

Feedback itself typically consists of multiple components. The first part of feedback entails sharing the results from the assessment. This includes discussing the patients' strengths and weaknesses and how this relates to their brain functioning and behavior in daily life (Gass & Brown, 1992; Postal & Armstrong, 2013). Clinicians also educate patients and their families about the patients' expected cognitive trajectory given their neurocognitive diagnosis (Gass & Brown, 1992; Johnstone & Stonnington, 2002). For example, it can be helpful for families to be informed about anticipated cognitive and functional decline for patients with progressive degenerative conditions to facilitate future planning. In contrast, after neurologic insult to the brain, such as through stroke, some recovery can be expected and knowing this can provide hope to the patient and family.

The assessment results are used to justify the second part of feedback, which is the provision of recommendations. The following information regarding the types of recommendations that neuropsychologists typically give was obtained from the literature, but there is little research regarding what recommendations neuropsychologists are actually providing to their patients in practice. Neuropsychologists' recommendations cover a wide range of areas, ranging from patient safety, to medication adherence, to initiation of therapy (Westervelt et al., 2007). They often deliver recommendations to modify a patient's level of support (e.g., the patient should stop driving; the patient is no longer capable of independent living) (Attix & Welsh-Bohmer, 2005; Postal & Armstrong, 2013). Providers also encourage the use of compensatory strategies to mitigate cognitive deficits so that the patient can continue to lead a meaningful life (Johnstone & Stonnington, 2002). Recommendations are sometimes directed at family members to help support caregiving (Postal & Armstrong, 2013). Lastly, since feedback sessions are conducted by psychologists, they can be therapeutic in nature and be a place for the patient and the family to process emotions and grieve losses associated with deficits. While the different components of feedback are often connected and referred to collectively as feedback, the focus of the current study will be specifically on the content of recommendations provided to patients.

Basic guidelines based on expert opinion, rather than empirical evidence, are available regarding suggested strategies that neuropsychologists have perceived to be helpful based on their clinical experience to explain neuropsychological concepts and make recommendations to their patients (Barkley, 2010; Gass & Brown, 1992; Johnstone & Stonnington, 2002; Postal & Armstrong, 2013). It is believed that if feedback is communicated effectively that patients' adherence to recommendations will be increased (Attix & Welsh-Bohmer, 2005, p. 23). Some

clinicians have posited that recommendations are also more likely to be followed if patients are encouraged to be active participants in developing them (Gorske & Smith, 2008, p. 41). Best practices for communicating feedback suggest the use of clear and understandable language and developing good therapeutic rapport when making recommendations (Postal & Armstrong, 2013, p. 17). Techniques suggested to explain concepts well, include the use of metaphors, visual aids, and engagement of emotions. For example, a neuropsychologist could ask adult children whether they would feel safe having their parent drive their grandchildren to emphasize the point that it is no longer safe for the patient to drive (Postal & Armstrong, 2013, p. 22). Neuropsychologists will often normalize the use of compensatory strategies through self-disclosure. For example, they might disclose that they also use a planner to keep track of their own schedule (Postal & Armstrong, 2013). Some clinicians also intentionally maintain their own credibility in making certain recommendations through communicating that other patients have found the strategy to be helpful, the rationale behind the recommendation, and the provision of specific resources.

Experts posit that it is critical to try and keep patients engaged while communicating recommendations (Gass & Brown, 1992). This can be done by modeling recommendations in session. For example, by demonstrating what it looks like to talk with the patient more slowly at a rate of speech that they are more likely to understand. Based on clinical experience, it is thought that applying the recommendations specifically to the patient and their lifestyle both enhances clinician credibility and maintains patients' attention (Gass & Brown, 1992; Postal & Armstrong, 2013). It is important to note that while a recommendation might theoretically be helpful to a patient, it is often not useful if the patient does not live in a location that is accessible to the resources necessary to carry out the recommendation to completion. In this vain, it is also important to discuss recommendations at a level commensurate with the patient's education and

cognitive capacity. As stated previously, some recommendations will be directed at caregivers due to the level of the patients' deficits (Gass & Brown, 1992).

In the literature, there appears to be two predominant approaches as to how neuropsychologists provide feedback to patients. The first approach is more directive and evolved as a result of neuropsychology having its roots in the medical setting. It assumes that the neuropsychologist is the expert on brain behavior relationships. Therefore, the neuropsychologist communicates 'facts' elicited from the assessment to the patient.

However, some neuropsychologists are starting to advocate for a more collaborative approach to feedback based in theories underlying motivational interviewing (MI). MI focuses on exploring clients' ambivalence about change (Hettema, Steele, & Miller, 2005). It is a collaborative process in which the person conducting the MI emphasizes the autonomy of the patient and expresses empathy towards him. It also supports the client's own ability to reach his goals. Unlike historical approaches in which clients who use substances were confronted and told that they have a serious problem and must stop, MI encourages facilitators to roll with resistance and explore the advantages and disadvantages of changing versus not changing their behavior. Lastly, the facilitator works to develop discrepancy. This process involves helping the client to understand the inconsistencies between their current behavior and their goals. In a collaborative neuropsychology feedback session, patients are encouraged to reflect on their reactions to the findings and assist in the interpretation of test results (Gorske & Smith, 2008). Feedback itself is conceptualized as an intervention, and patients are encouraged to develop questions regarding how the results can be applied to impact their daily life. One research study compared collaborative feedback with treatment as usual in individuals who abused alcohol (Gorske & Smith, 2009). In the collaborative feedback condition, a clinician discussed with the patient his

or her strengths and weaknesses derived from a brief neuropsychological battery of tests, and how the test results related to problems that the patient was experiencing in his or her daily life. Treatment as usual consisted of the counselor discussing the importance of attending treatment sessions. Both groups were given information about enrolling in a hospital program to treat their alcohol abuse. Participants who received the collaborative feedback session attended significantly more of the group treatment days (d=.78.) While it is possible that the receipt of information about their own performance drove results, the large effects seen in this study might also be attributable to the collaborative nature of the feedback session. More research would be helpful to further understand the effectiveness of different approaches to communicating feedback in specific contexts with particular patient populations.

Available Research on Communicating Effective Feedback and Recommendations

Despite recent clinical interest in delivering effective recommendations, there is a lack of empirical studies on this issue in neuropsychology. Some preliminary research has been conducted using survey methodology to look at different parties' satisfaction with neuropsychological recommendations. A survey of 60 outpatients who underwent neuropsychological evaluations indicates that 73.3 percent of the sample surveyed rated that the recommendations that they received were *very helpful* and 21.7 percent of the sample surveyed rated the recommendations that they received as being *helpful* (Donofrio, Piatt, Whelihan, & DiCarlo, 1999). Westervelt et al. (2007) surveyed patients and their caregivers on the usefulness of recommendation received after being given an average of one hour of verbal feedback and a two page written summary of the results from patients' neuropsychological evaluation. Over 78 percent of patients and significant others rated the neuropsychological assessment as *very much* or *mostly* helpful in dealing with problems, and three fourths of caregivers endorsed that

feedback helped them in *reducing stress*. 97.7 percent of 119 physicians, who regularly refer patients for outpatient neuropsychological assessment at an outpatient hospital based practice, rated that they *strongly* or *mostly agree* with the recommendations that neuropsychologists give to their patients (Tremont, Westervelt, Javorsky, Podolanczuk, & Stern, 2002). These findings did not differ based on the specialty of the physician surveyed or by diagnosis of the patient who they referred for neuropsychological assessment. Conversely, in a third survey of satisfaction of recommendations received, half of patients responded that the recommendations did not help them to surmount their problem areas and 43 percent of respondents endorsed that the feedback was not useful to understand how the results from the neuropsychological assessment applied to their everyday life (Bennett-levy et al., 1994). While it is unclear as to why these findings are inconsistent with the results from other research on this topic, it is possible that the discrepancy can be explained by the fact that this research was conducted at five centers in Australia in contrast with the other studies that recruited patients from hospitals the United States. Results from this study suggest that patient satisfaction was correlated with the center where they were assessed and not the individual clinician with which they worked with. Since length of feedback was not recorded, it is conceivable that some centers emphasized spending more time and effort on this portion of the evaluation. Lastly, it should be noted that all of these studies asked about helpfulness of recommendations in their entirety, and they did not ask about the helpfulness of individual recommendations. Future research is necessary to explore whether patients and their family members find certain recommendations to be more useful than others.

There has also been some work looking at memory for and adherence to neuropsychological recommendations. Smith et al. (2007) recruited 719 psychologists from the International Neuropsychological Society, the National Academy of Neuropsychology, and the

Society for Personality Assessment. They were electronically surveyed on whether they thought giving verbal feedback encourages clients to be more motivated to follow recommendations. Half of the participants responded *usually* or *almost always*, a third responded *sometimes*, and a small minority responded *never*. Results from this study suggest that a majority of the sample believed in the importance of communicating verbal feedback.

Two experimental studies address whether giving different forms of feedback impacts recall and adherence to neuropsychological recommendations. Fallows and Hilsabeck (2013) randomized 72 veterans into one of two groups: oral feedback only or oral feedback with written information. The written information consisted of a two page report that summarized the reason for referral, results from the evaluation including recommendations. Participants were interviewed immediately after their feedback session to assess for understanding and called one month later to evaluate recall of the feedback session and adherence to recommendations. Participants who also received written information freely recalled more recommendations at the one month follow-up phone interview. However, there was no significant difference of completion of recommendations between the two groups.

Another study which included both patients and their family members recruited from an outpatient clinic at a large teaching hospital found contrasting findings. In this study, the patients' recall of neuropsychologists' recommendations were not significantly improved by receiving an additional letter summarizing the information imparted to them in a feedback session (Meth, Calamia, & Tranel, 2015). However, family members' recall was significantly improved by the receipt of a summarized letter, a finding that provides support for the importance of including family members in the feedback process. Poor overall patient recall of recommendations is a consistent finding in both studies. Since adherence was not impacted by

supplemental written information in both studies, the results suggest that increasing adherence is challenging and complicated. It cannot be easily changed by the addition of written recommendations.

Interestingly, the content of neuropsychological recommendations does seem to predict the percentage of patients that adhere to specific recommendations. Westervelt et al. (2007) surveyed patients one month after they received verbal and written feedback to assess whether they had adhered to each recommendation, and whether or not they planned to adhere to each recommendation in the future. If the recommendation pertained to the patient's safety, there was a 63.6 percent follow-through rate. However, only 31.8 percent of participants adhered to recommendations pertaining to coping or support. Specifically for recommendations pertaining to increases in environmental structure and organization to address memory problems, differences in adherence were once again seen dependent on the type of recommendation made. Participants reported a 64.9 percent follow-through with specific behavioral strategies (e.g. use a calendar, set a reminder phone, put your keys in the same place), but only a 41.8 percent follow-through with the recommendation to read books relevant to addressing their difficulties and none of the participants reporting adhering to the recommendation to contact a personal consultant. The study did not address the specific mechanisms underlying these findings, but the authors did a qualitative overview of participants' explanations for not following through with recommendations generally. Reasons included disagreement with recommendations, confusion regarding referral processes, difficulties with initiation, inadequate insurance coverage of services, and concern regarding the time required to complete the recommendation.

Since the type of neuropsychological recommendation seems to predict the portion of patients that adhere to it, it would be valuable to know what recommendations

neuropsychologists are giving to their patients. There are books available for clinicians that give suggestions of recommendations for patients with cognitive problems in different domains (Attix & Welsh-Bohmer, 2005; Barkley, 2010; Johnstone & Stonnington, 2002). Recommendations include limitations on independence to promote safety (e.g. boundaries in areas like cooking, driving, and finances) and compensatory methods (e.g. planner) (Attix & Welsh-Bohmer, 2005). Follow-up services are also recommended (e.g. therapist) as well as suggestions on how to encourage the patients and their family to utilize their support system to help cope with the associated challenges of having a neurocognitive disorder.

There also books written for patients with specific disorders such as Attention Deficit Hyperactivity Disorder (ADHD) or patients who struggle with a specific cognitive problem (e.g. poor memory) that give suggestions on how to manage their symptoms in order to maximize daily functioning (Barkley, 2010; Mason, Kohn, & Clark, 2001).

However, it is still unclear what recommendations neuropsychologists are giving to their adult patients in practice. There are limited data available to address this question. One study surveyed clinicians on their beliefs regarding effective methods for treating post-concussion syndrome (Mittenberg & Burton, 2012). Surveys were mailed to 470 randomly selected members of National Academy of Neuropsychology and International Neuropsychological Society and participants were asked to check as many interventions as they found useful to treat post-concussion syndrome from a list of seventeen options. 38 percent of clinicians surveyed responded for a final sample size of 165. The majority of clinicians endorsed education, support/reassurance, and a graded increase in activity as being useful treatments. In contrast, less than 10 percent of the sample survey endorsed the following interventions as being useful to treat post-concussion syndrome: analgesic medication, thermal biofeedback, hypnotherapy, and

systematic desensitization. Participants were also asked to rate their perception of the effectiveness of psychological and pharmacological treatment for post-concussion syndrome from not effective to very effective. Results indicated that 86.5 percent of the sample believed that psychological treatment is *somewhat* to *very effective* while only 54 percent of the sample endorsed medication as being a *somewhat* to *moderately* effective treatment for post-concussion syndrome. This study begins to answer what types of interventions neuropsychologists believe are effective for a specific syndrome, but it does not give us information about what types of recommendations neuropsychologists provide to patients with different neurocognitive disorders in practice.

Study Rationale and Specific Aims

As can be seen from the review above, there is minimal research conducted regarding neuropsychological feedback and recommendations. Many unanswered questions remain about what recommendations neuropsychologists give to their patients. The goal of this study is to explore what recommendations neuropsychologists provide to their patients in practice, and this study will begin to address a significant gap in the literature. This work uses an electronic survey to address this open question.

Additionally, this research addresses whether patients with the same diagnosis can expect to receive the same recommendations from different neuropsychologists. For example, it would seem reasonable for patients to expect a certain level of consistency between neuropsychologists. They might expect relatively similar recommendations if they saw two different providers with comparable presenting concerns (and comparable test findings). Lastly, this research begins to identify variables that impact what recommendations neuropsychologists choose to give their patients.

This research is important because it has real word implications that will likely improve the care that patients' receive. After receiving emotionally difficult diagnostic information, patients and their family members often want to know what they should do next. The provision of recommendations, regarding what can be done to help improve patients' daily life and safety, is essential. Recommendations are ineffective if they are never communicated to patients (Geffken, Keeley, Kellison, Storch, & Rodrigue, 2006). This project begins to elucidate the current status of recommendation usage amongst neuropsychologists working with adult patients in the United States.

The results from this study can be used by practitioners to compare the recommendations they use with what others report using. In this way, this work would serve as a resource to help clinicians decide what recommendations to make to their patients. Data from this research can also be used in training programs, at the graduate and postdoctoral levels, to inform students about the recommendation provision standards of the field and guide future recommendation practices. In summary, the results from this research will elucidate what the current standard of practice is in within the field which can be used as a baseline for future research focused on optimizing patient outcome.

Aim 1. To examine what recommendations neuropsychologists make to patients with specific neurocognitive diagnoses. The frequency provision of each recommendation will be rated on a Likert scale from 1 (*never*) to 5 (*always*).

Aim 2. To study the level of consistency between the recommendations that neuropsychologists provide to patients with similar neurocognitive diagnoses.

Aim 3. To model patient, practitioner, and general practice characteristics as predictors of the frequency of provision of different classes of recommendations (e.g., recommendations

having to do with *level of supervision/independence*, *educational resources*, *driving*, *medical referrals*, *mental health*, *personal health*, *employment/education*, and *organizational/memory/attention strategies*). It is unclear what variables are associated with how often neuropsychologists provide certain types of recommendations to their patients. The survey used to collect data was designed to be exploratory to see what recommendation practice looks like in these individuals and to gather more systematic data. Due to limited work in this area, no formal hypotheses were generated, but it is expected that possible findings might include, but are not limited to the following:

- Neuropsychologists will report higher frequency of providing recommendations having to do with the patients' *level of supervision and independence* if they work with patients diagnosed with dementia, have severe functional impairment, or who bring a caregiver with them to the appointment.
- Neuropsychologists who work in rural areas are less likely than neuropsychologists who work in urban settings to make recommendations referring patients for medical follow-up care specialty services (e.g., speech therapy, occupational therapy).
- Neuropsychologists who work in rural areas are less likely to make recommendations to their patients pertaining to *driving* than neuropsychologists who work in urban settings, because there is less likelihood of getting into an accident when there are less cars on the road. Also, living in a rural area, there are less options to take public transportation so asking someone to stop driving might have more isolating effects (which neuropsychologists might have reservations about) than for someone who has a greater access to alternative modes of transportation.
- Neuropsychologists who report the frequency with which they have given

recommendations to patients with psychiatric concerns in the past year (as opposed to patients with dementia, TBI, stroke, epilepsy, movement disorder, or MS) will be more likely to endorse frequently giving recommendations having to do with *mental health*.

- Neuropsychologists who work with highly educated patients as opposed to less educated patients will be more likely to provide recommendations concerning *organizational, memory, and attention strategies* to address cognitive deficits.
- The recommendations that neuropsychologists provide will be consistent with their most often received referral question. For example, if practitioners endorse frequently receiving referrals regarding capacity to work, the content of their recommendations will be more likely to focus on *employment/education*.

CHAPTER II

METHODS

Participants

The participants in this study were licensed clinical psychologists who regularly conduct neuropsychological assessments in the United States with patients over the age of eighteen. To meet inclusion criteria, they also must have worked regularly with patients with one of the following diagnoses in the past year:

Dementia
Traumatic brain injury (TBI)
Stroke
Multiple sclerosis (MS)
Epilepsy
Movement disorders (e.g., Parkinson's disease, Huntington's disease)
Psychiatric disorders (e.g., personality, mood, anxiety, or psychotic disorders)

Proposed Sample Size. Surveys are a common and useful method to gather information about the status of the field (Rabin, 2002). Previous questionnaires sent to neuropsychologists have covered a large variety of topics, including but not limited to, training opportunities, cost of neuropsychological assessment, content and format of reports, salary and practices in cognitive rehabilitation (Donders, 2001; McCaffrey, Malloy, & Brief, 1985; Putnam & Deluca, 1991; Stringer, 2003; Sweet, Meyer, Nelson, & Moberg, 2011) A brief review of the literature revealed that the majority of research within the field of clinical neuropsychology that uses survey methodology was conducted prior to 2008. Therefore, hardcopies of the survey were sent to participants through the postal service with pre-stamped return envelopes. Samples ranged from 110 to 1569 with an average sample size of 434 (Bowers, Ricker, Regan, Malina, & Boake, 2002; Donders, 2001; Guilmette, Hagan, & Giuliano, 2008; McMordie, 1988; Mittenberg & Burton, 1994.; Rabin, Barr, & Burton, 2005; Stringer, 2003; Sweet & Moberg, 1990; Sweet,

Peck III, Abramowitz, & Etzweiler, 2003; Sweet, Westergaard, & Moberg, 1995). Most researchers sent a follow-up reminder with no incentives and received response rates from neuropsychologists that ranged from 27 to 63 percent.

A few studies have electronically surveyed clinical neuropsychologists. In those available, samples have ranged from as few as 52 to as many as 1685 participants (McCarter, Walton, Brooks, & Powell, 2009; Mullaly et al., 2007; Sweet et al., 2011). In two studies, response rates for electronically surveying neuropsychologists were approximately 25% (McCarter et al., 2009; Mullaly et al., 2007) Another study was unable to calculate its response rate, as the survey was sent electronically through multiple large list serves with overlapping members (Sweet et al., 2011).

Given that the participants in this study are busy professionals, the survey was intentionally designed to make participation in the study as simple and straightforward as possible. In a meta-analysis of response rates of internet based surveys, results indicated that participants rated electronic surveys as easy to use (Cook, Heath, & Thompson, 2000). Therefore, the survey in this study was administered to participants electronically through a link included in an email invitation to participate. Due to the large range of acceptable sample sizes in previous work, a power analysis was conducted to determine an appropriate sample size based on aim three. It was decided to base the intended sample size on aim three, because this aim requires modeling via linear regression and an adequate sample size is needed to detect statistical significance of the predictors used in the model.

A multiple regression power analysis was conducted for three fixed models. Table A1. shows different possible sample sizes for three models with differing numbers of predictors and levels of power. The first model will be based on patient characteristics specific to a particular

neurocognitive diagnosis. Examples of predictors in this category include percentage of patients who the clinician would consider to be ethnic or racial minorities and the severity of functional impairment of the patients that the clinician assesses. The second model is based off provider characteristics and practices when working with a predetermined neurocognitive diagnosis. For example, how often they conduct assessments with patients with this diagnosis and what types of referral questions they typically receive when assessing patients with this diagnosis. The last model involves general predictors that are not specific to a particular patient population. This includes questions regarding how the neuropsychologists allocate their professional time and the setting in which they work.

The power analysis was based on the maximum number of covariates that would be included in any one model. Based off of feasibility and the power analysis, it was determined to aim for a sample size of 392 neuropsychologists. This sample size has a power of 0.8, with 0.2 of the outcome being explained by the proposed predictors and a detection difference of .05 accounted for by additional covariates. Assuming a response rate of approximately 25 percent, it was determined that the survey needed to target a minimum of 1,600 neuropsychologists to invite their participation in this research in order to obtain the sample size goal.

Procedure and Recruitment

This research was approved by the University of Iowa institutional review board. A copy of the email invitation that was sent to recruit clinical neuropsychologists to participate in this research can be viewed in Appendix D. It begins by introducing the principal investigator (PI) and her advisor, Dr. Daniel Tranel. He is well known in the field, and it is likely that using his name early in the invitation provided additional legitimacy to the request. The email invitation continues by inviting participation in doctoral research that examines what

recommendations clinical neuropsychologists give to their patients in practice to further understand what the standards in the field are. It then discusses the importance of the research (e.g., results will allow practitioners to compare the recommendations they use with what others report using which can be used to inform best practices of recommendations to neuropsychological patients). Discussing the significance of the research was intentional, because research salience has been shown to increase survey response rates (Sheehan, 2001). Next, inclusion criteria were outlined as well as what participating in the study would involve (taking a brief online survey that could be completed in approximately fifteen minutes). Potential participants were then informed that after completing they survey, they would be given an option of being emailed a ten dollar electronic Amazon gift card if they wished to provide their email address. They were also notified that their contact information which would be kept separate from their survey responses in order to ensure that their responses remained anonymous. Finally, they were encouraged to forward the invitation on to any other neuropsychologists who might be interested in participating in the study, and they were provided with a hyperlink to the study hosted by Qualitrix, an online survey software product.

An email was sent recruiting clinical neuropsychologists to participate in this study starting in September 2015. Multiple organizations were contacted in order to increase the representativeness of the results from this study to a wide range of clinical neuropsychologists and to help ensure an adequate sample size. Different list serves were contacted at different times depending on when permission was received from the organization to send out recruitment information. A reminder was sent two weeks after the initial invitation, thanking those who already participated, and inviting those who had not to once again consider participating in the survey. This was done because survey follow-up has also been correlated with higher survey

response rates (Cook et al., 2000). Respondents were given two weeks to participate after the reminder before data collection was concluded. Data collection was terminated in November of 2015.

The email invitation was sent through the American Academy of Clinical Neuropsychology (AACN) list serve, which at the time had 825 members, from Dr. Daniel Tranel's email address. The PI, Molly Meth, emailed the invitation to 625 board certified neuropsychologists whose emails were obtained from the AACN online directory from her University of Iowa email address. The PI also sent the email through NPSYCH, an international list serve focused on neuropsychology, which at the time that the study was conducted had 3,528 subscribers. The invitation to participate in this research was also made available to neuropsychologists employed through Veterans Affairs Healthcare Systems via a neuropsychology list serve with 393 subscribors. In addition, The PI personally emailed the invitation to 1,000 neuropsychologists whose contact information was publically available on the internet, and 20 personal contacts.

The following recruitment methods did not receive a reminder email, because invitations were sent out as a favor by neuropsychologists who were not directly involved with the study. The invitation was sent as an "Item of Interest" in a mass email from the International Neuropsychological Society (INS). INS currently has more than 4,700 members throughout the world from various areas of practice. Not all of these individuals would qualify for participation in the current research study as members include professionals who are primarily researchers. Certain state neuropsychological societies agreed to send out the invitation to their members including the North Carolina Neuropsychological Society (60 members), Arizona Neuropsychological Society, Connecticut Neuropsychological Society, and Colorado

Neuropsychological Society. Other relevant neuropsychological groups were contacted for their permission to send out the invitation to their members, but some organizations had rules against allowing their members to be contacted about potential research participation, and others did not respond to the PI's inquiries.

It is unclear what the response rate was for this study, because it is likely that there was substantial overlap between the providers emailed from multiple recruitment settings. Also the numbers mentioned above refer to the neuropsychologists contacted, but not all neuropsychologists who were sent the invitation to participate in this research were eligible. For example, pediatric neuropsychologists and neuropsychologists who assessed patients for research purposes did not meet inclusion criteria. Finally, it is unknown how many neuropsychologists saw the email invitation to participate in this research, because as busy professional they are likely inundated with email correspondence. It is possible that the invitation, especially if it was included in a mass email by a neuropsychological organization was deleted without having ever being seen.

That being said, according to Dr. Sweet, a neuropsychologist who has conducted multiple surveys of neuropsychologists, there is approximately 3,300 clinical neuropsychologists in the United States who work with adult patients. Therefore, it is estimated that the final sample from this research (309 neuropsychologists) is representative of six to ten percent of the population of interest.

Final Recruited Sample Size. The final sample size for this study was 309 clinical neuropsychologists. Recruitment was discontinued before reaching the original recruitment goal of 392 neuropsychologists, because it was determined that reasonable recruitment strategies were exhausted, and the number of clinical neuropsychologists in the United States who were eligible

for the study is a finite number.

Sample Characteristics. As stated previously, the final sample consisted of 309 clinical neuropsychologists. Each participant was asked to choose up to three diagnoses of patients that they have worked with in the past year. They were then randomly assigned to answer the majority of the survey with this patient population in mind. As a result, there are different sample sizes for each diagnosis which the survey concentrates. Table A2. provides data regarding the number of participants assigned to each diagnosis and participant demographic data including information about sex, degree, post-doctoral residency completion in neuropsychology, board certification, and region of practice stratified by participants assigned to each disorder. It should be noted that more participants were assigned to answer the survey regarding their work with patients with diagnoses of dementia (N = 91), TBI (N = 81), psychiatric disorders (N = 63), and stroke (N = 37), than epilepsy (N = 13), movement disorders (N = 13), or MS (N = 11). It is believed that this difference in sample size reflects the frequency with which these patient populations are seen by neuropsychologists in practice.

The final sample consisted of 59 percent women and 41 percent men. Participants reported that they have been conducting neuropsychological assessments as licensed psychologists for an average of 14.25 years (SD = 10.37). A strong majority of the sample (80%) reported having PhD degrees with a smaller minority (19%) reported having PsyD degrees. 78 percent of the sample graduated from a graduate program in clinical psychology, and 85 percent completed postdoctoral residencies in neuropsychology. A comparably smaller percentage identified as having completed board certification in neuropsychology (44%). Participants were relatively evenly distributed as practicing across the United States (a range between 21-26%) between four regions with a smaller portion of participants being located in the

Southwest (9%). 56 percent of participants endorsed practicing in an urban area. In contrast, only 33 percent of the sample reported practicing in suburban locations and 11 percent endorsed practicing in rural locations.

To gain a better sense of how representative the sample from the current study is of clinical neuropsychologists in the United States, it was compared to demographics of 1685 neuropsychologists who responded to the TCN/AACN 2010 salary survey (Sweet et al., 2011). It is important to note that 54% of their sample worked with adults only and 25.5% worked with both adults and pediatrics so at a minimum 20.5% of their sample would not have been eligible to participate in the current research. Their sample consisted of 82.5% participants with PhD degrees and 14.3% with PsyD degrees. Excluding post-doctoral residents, participants were licensed on average for 14 years. The majority of their sample worked in urban areas (79.0%), and 39.9% of their sample reported having completed board certification.

Measures

Survey methodology was chosen as a means to collect data for this study. A survey was created specifically for this study, because no prior work has been conducted looking at neuropsychological recommendation usage. A hardcopy of the survey distributed can be found in appendix D. It was designed to be able to be completed within fifteen minutes. When the survey was developed, it was intended that it could be finished in a brief time period, because increased survey length has been correlated with decreased survey response rates (Fan & Yan, 2010).

The first page of the study included an informed consent document that emphasized that participation in the survey was voluntary and research participants could discontinue the survey at any time if they wished. If they continued to the next page of the survey, this was understood as granting informed consent. The second page included screening questions to ensure that

participants met the inclusion criteria. If participants answered "no" to any of the screening questions, they were presented with the following message: "Unfortunately, you do not meet inclusion criteria to participate in this survey. Thank you for your interest in participating". Once again, inclusion criteria required that participants were licensed psychologists who conducted neuropsychological assessments with adult patients and practiced in the United States. In addition they must regularly have worked with patients with at least one of the following diagnoses (*dementia*, *TBI*, *stroke*, *epilepsy*, *MS*, *movement disorders*, or *psychiatric disorders*) in the past year. If they met all of the inclusion criteria, they were taken to the next page of the survey which asked them to choose up to three diagnoses of seven that they assess the most often when conducting neuropsychological assessments with adult patients. Once their selections were submitted, the survey program randomized them to one of choices that they made. The next three of four sections of the survey asked them questions pertaining to the diagnosis that they were assigned.

Section one asked participants to check the frequency (*never*, *rarely*, *sometimes*, *often*, or *always*) from 1 (*never*) to 5 (*always*) with which they give 67 specific recommendations in practice for patients with the diagnosis that they were just assigned (e.g., *psychiatric concerns*, *TBI*, *dementia*, *stroke*, *epilepsy*, *MS*, or *movement disorders*) in the past year. The recommendations were categorized into eight groups (recommendations having to do with *level of supervision/independence*, *driving*, *educational resources*, *mental health*, *medical referrals*, *health*, *employment/education*, and *organization/memory/attention strategies*) for increased clarity. After the participants rated the frequency with which they have given each recommendation to patients with a specific neurocognitive diagnosis, they were given an opportunity to add any recommendations that they gave to adult patients with that diagnosis or

their caregivers in the past year that were not already listed above.

The final recommendations used in the survey were acquired in the following manner. 70 recommendations were compiled from recommendations frequently given to 80 patients at the Benton Neuropsychology Clinic and the literature. Eight clinical neuropsychologists were consulted and sent the original list of recommendations and asked if they would add any recommendations that they routinely provide to their adult patients. Once all of the suggestions were added to the original list, the PI and Dr. Tranel combined any redundant recommendations and shortened the final list to 67 recommendations.

Section two asked participants to provide information about the patients that they have seen in the past year specific to the diagnosis they were assigned at the beginning. Respondents provided information about the patients that they assessed on a number of different variables including (a) caregiver attendance at appointment, (b) ethnic or racial minority group membership, (c) level of functional impairment, (d) educational level, (e) average age, and (f) perceived motivation to follow through with recommendations. These items were chosen as possible patient characteristics that might illuminate the frequency with which certain categories of recommendations are given by neuropsychologists. It is not an exhaustive list of possible predictors, and it is recognized that other patient related variables likely influence what recommendations neuropsychologists choose to provide to their patients.

Section three asked neuropsychologists about their views and practices conducting neuropsychological assessments with adult patients diagnosed with the neurocognitive diagnosis that they were assigned at the beginning of the survey. More specifically they were asked (a) percentage of time they spent working with the patient group, (b) their most frequent referral question, (c) the frequency with which they individualized recommendations, (c) how they

originally learned the recommendations that they provide, (d) whether they primarily worked in an inpatient or outpatient setting, and (e) how many recommendations they gave on average to each patient in the past year.

The final portion of the survey asks the neuropsychologist questions about themselves and neuropsychological assessment practices in general (not in regard to working with a specific patient population). This part of the survey was modeled after demographic and practice-related portions of other surveys that have been conducted in this field, such as in Rabin et al. (2005). Questions asked about (a) ages of the patients that they assessed, (b) most frequent professional activity, (c) primary employment setting, (d) average number of neuropsychological reports generated per month, (e) how recommendations were communicated to patients/caregivers and referral sources, (f) time spent conducting verbal feedback, (g) gender, (h) highest professional degree, (i) field their degree was awarded, (j) completion of post-doctoral fellowship, (k) board certification, (l) years conducting assessments as a licensed clinical psychologist, (m) location of practice, and (n) population density of location of practice.

CHAPTER III

RESULTS

Aim 1

The frequency that clinicians endorsed giving each recommendation was compared using descriptive statistics. Participants were asked to rate the frequency with which they have given each recommendation in the past year to a specific population on a Likert scale from 1 (*never*) to 5 (*always*). Results were calculated for all participants, and also stratified by type of disorder the neuropsychologist was randomized to respond about at the beginning of the survey. The percentage of the sample that endorsed giving each recommendation *never*, *rarely*, *sometimes*, *often*, and *always* was calculated. Afterwards, the percentage of the sample that endorsed *often* or *always* (OA) was summed and the percentage of the sample that endorsed *never or rarely* (NR) was summed. The results section for aim one outlines the most frequently reported recommendations for each disorder (highest percent of sample that endorsed *often* or *always*) and the least frequently reported recommendations for each disorder (highest percent of sample that endorsed recommendations as *never* or *rarely*) . Please see table A6 to see what percentage of the sample endorsed different provision frequencies for every recommendation surveyed.

All Diagnoses (N=309). The upper quartile of most frequently endorsed recommendations by neuropsychologists in this sample for all diagnoses of patients were the following: (1) engage in activities known to improve mood (OA = 84.36%), (2) adherence to medications (OA = 83.33%), (3) calendar, memory notebook or audio recorder (OA = 78.32%), (4) external cues (e.g., alarms, reminders, labels) (OA = 77.20 %), (5) exercise (OA = 76.62%), (6) eat healthy/diet (OA = 73.46%), (7) develop a schedule/routine (OA = 71.75%), (8) centralized location to keep important items (OA = 71.75%), (9) engage in one task at a time

(OA = 69.90%), (10) sleep hygiene (OA = 67.64%), (11) pill box (OA = 66.99%), (12) allow extra time to complete tasks or express thoughts (OA = 66.45%) , (13) limit distraction (OA = 66.34%), (14) engage in activities to promote mental stimulation (OA = 66.23%), (15) neuropsychological re-evaluation after a specific time period has elapsed (OA = 64.08%), (16) increased supervision of patient's activities of daily living (OA = 62.78%), and (17) pace activities (OA = 62.78%).

In contrast, the lower quartile of least frequently endorsed recommendations by neuropsychologists in this sample for all diagnoses of patients were the following: (1) dietician (NR = 74.75%), (2) identification bracelet for patient with caregivers contact information (NR = 66.56%), (3) life alert System (NR = 57.65%), (4) group therapy (NR = 57.28%), (5) family therapy (NR = 57.28%), (6) marital therapy (NR = 52.60%), (7) adult daycare (NR = 52.27%), (8) use a phrase or action that decrease the likelihood of impulsive behavior (NR = 49.84%), (9) substance abuse treatment (NR = 49.19%), (10) physical therapist (NR = 46.58%), (11) assisted living (NR = 44.95%), (12) specific book or website (NR = 44.16%), (13) respite care/home health aide (NR = 43.37%), (14) occupational therapist (NR = 43.09%), (15) maximize steps to avoid head injury (NR = 42.39%), (16) speech therapist (NR = 40.85%), and (17) current position is no longer appropriate (NR = 39.87%).

Individual recommendations in the upper and lower quartile of frequency given were reviewed for each diagnosis. Recommendations that differed by disorder from the overall sample are noted since many of the recommendations overlapped between particular disorders and the sample in its entirety. In other words the recommendations identified below are recommendations that are given more or less often for each individual diagnosis than they are for the entire sample.

Dementia (N=91). For patients with diagnosed dementia, neuropsychologists frequently recommended (1) referral to an agency (e.g., Alzheimer's association) (OA = 71.4%), (2) medical doctor (OA = 67.78%), and (3) power of attorney (OA = 62.64%). They were less likely to recommend (1) gradual return to work or school (NR = 76.67%), (2) vocational rehabilitation services (NR = 65.56%), (3) consider other employment positions that may be more appropriate (NR = 58.89%), (4) cognitive rehabilitation (NR = 58.24%), (5) reasonable accommodations at work or school (NR = 51.11%), (6) adjust responsibilities at work or school (NR = 46.647%), and (7) apply for disability (NR = 43.33%).

TBI (N=81). For patients who incurred a TBI, neuropsychologists were more likely to recommend (1) reduce use of drugs (OA = 72.84%), (2) individual therapy (OA = 68.75%), and (3) self-care (OA = 66.67%). They were less likely to communicate the following recommendations: (1) social worker (NR = 45%), (2) stop driving (NR = 40.51%), (3) family members should routinely observe patients driving to check safety (NR = 38.75%), (4) apply for disability (NR = 36.25%), (5) CPAP machine use (NR = 34.57%), and (6) arrange environment at home to mitigate safety risks (NR = 34.57%).

Psychiatric Disorders (N=63). Neuropsychologists were more likely to make the following recommendations to patients diagnosed with psychiatric disorders: (1) psychiatrist (OA = 82.54%), (2) individual therapy (OA = 82.54%), (3) self-care (OA = 58.73%), (4) medication management by primary care physician (PCP) for mental health concerns (OA = 52.38%), and (5) reduce use of drugs (OA = 50.79%). They were less likely to make the following recommendations to these patients: (1) stop driving (NR = 73.02%), (2) alternative modes of transportation (NR = 68.25%), (3) on-the-road assessment (NR = 63.49%), (4) limit driving to low-demand conditions (NR = 57.14%) and (5) family members should routinely

observe patients driving to check safety (NR = 53.97%).

Stroke (N=37). Clinicians endorsed communicating (1) supervision over patient's important decisions (OA = 72.97%) and (2) engage in self-care (OA = 67.57%) more often to patients who had incurred a stroke. They less frequently told these patients (1) limit distractions while driving (NR = 37.84%), (2) utilize memory elaboration strategies (NR = 35.14%), (3) social worker (NR = 35.14%), and (4) caregiver attendance at patient's medical appointments (NR = 32.43%).

Epilepsy (N=13). Patients with epilepsy were more often given recommendations related to (1) individual therapy (OA = 64.54%), (2) medical doctor (OA = 53.85%), (3) reasonable accommodations at work or school (OA = 53.85%), (4) social worker (OA = 46.15%), (5) psychiatrist (OA = 46.15), and (6) engage in self-care (OA = 46.15%). They were less often told (1) family members should routinely observe patients driving to check safety (NR = 61.54%), (2) limit distractions while driving (NR = 50.00%), (3) social worker (NR = 46.15%), (4) alternative modes of transportation (NR = 46.15%), (5) power of attorney (NR = 46.15%), and (6) arrange environment at home to mitigate safety risks (NR = 46.15%).

Movement Disorders (N=13). Patients with movement disorders were more often communicated the following recommendations (1) engage in challenging tasks at most alert/effective time during the day (OA = 84.62%), (2) check work regularly (OA = 84.62%), and (3) CPAP machine use (OA = 76.92%). Discussions were less likely surrounding (1) gradual return to work or school (NR = 53.85%), (2) vocational rehabilitation services (NR = 46.15%), (3) cognitive rehabilitation (NR = 38.46%), (4) reasonable accommodations at work or school (NR = 30.77%), (5) social worker (NR = 30.77%), (6) alternative modes of transportation (NR = 30.77%), and (7) arranging environment at home to mitigate safety risks (NR = 30.77%).

MS (N=11). Lastly, patients diagnosed with MS were more often told to (1) engage in challenging tasks at the most alert/effective time during the day (OA = 90.91%), (2) individual therapy (OA = 72.73%), and (3) engage in self-care (OA = 72.73%). In contrast, they comparably less often made recommendations regarding (1) alternative modes of transportation (NR = 63.64%), (2) arranging environment at home to mitigate safety risks (NR = 63.64%), (3) sleep study (NR = 54.55%), (4) stop driving (NR = 54.55%), and (5) supervision over patient's important decisions (NR = 54.55%).

Free Response Supplemental Recommendations. See table A7. for a complete list of recommendations stratified by disorder that neuropsychologists responded that they have provided in the past year, but were not one of the 67 recommendations that were specifically asked about in this research.

Aim 2

The purpose of aim two was to assess which recommendations neuropsychologists endorsed communicating at differential frequencies to patients with the same disorder (e.g., cases where individual neuropsychologists responded in opposing manners so there was quite a bit of variability overall responses). It was assumed that recommendations that were not identified had more consistent responses from participants. Recommendations with variable frequency responses were recognized using a twofold process. First, the percentage of neuropsychologists that reported that they gave the recommendation either *never* or *rarely* was summed for each recommendation, and then the percentage of neuropsychologists that reported that they gave the recommendation either *often* or *always* was summed for each recommendation. It was then calculated for which recommendations there was less than a ten percent difference between the percentage of neuropsychologists who chose *never* or *rarely* and *often* or *always.* This was done

with the logic that if a large proportion of the sample chose both extremes on the Likert scale, then this represents disagreement. However, it was deemed that this step was not sufficient to determine inconsistency in responses within the sample in some situations. For example, if *never* or *rarely* and *often* or *always* were within ten percent of each other, but both small percentages due to what would be expected from normal variability. Also, it is important to take into consideration that there are different samples sizes of neuropsychologists who responded with a different neuropsychological disorder in mind. These issues were taken into account through the second step of analysis. In the second step, the mean and standard deviation was calculated for each recommendation stratified by disorder. This was done by assigning a number one through five corresponding to whether neuropsychologists chose *never*, *rarely*, *sometimes*, *often*, or *always*. Recommendations were only considered inconsistently endorsed if they met the first criteria and had a standard deviation over the number one, which was used as a second indication of inconsistency.

All Diagnoses (N=309). The five recommendations that were identified as being endorsed inconsistently by neuropsychologists responding in regards to all patients in the sample regardless of diagnosis were (1) limit distractions while driving, (2) limit driving to low-demand conditions, (3) cognitive rehabilitation, (4) elaboration strategies to improve memory encoding, and (5) family members should routinely observe patient's driving to check safety.

Dementia (N=91). The five recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with dementia were (1) family members should routinely observe patients driving to check for safety, (2) limit distractions while driving, (3) specific book or website, (4) social worker, and (5) elaboration strategies to improve memory encoding.

TBI (N=81). The five recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with TBI were (1) arrange environment at home to mitigate safety risks, (2) referral to an agency (e.g., Alzheimer's Association) (3) limit driving to low demand conditions, (4) CPAP machine use, and (5) elaboration strategies to improve memory encoding.

Psychiatric Disorders (N=63). The five recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with psychiatric disorders were (1) check work regularly, (2) CPAP machine use, (3) engage in challenging tasks at most alert/effective time of day, (4) link behaviors that occur naturally together (e.g., always take medication when brush teeth), and (5) increased supervision of patient's activities of daily living.

Stroke (N=37). The two recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with stroke were (1) maximize protective steps to avoid head injury (e.g., wear helmet, install support bards in shower, play non-contact sports), and (2) elaboration strategies to improve memory encoding.

Epilepsy (N=13). The four recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with epilepsy were (1) social worker, (2) on-the-road assessment, (3) referral to an agency (e.g., Alzheimer's Association), and (4) increased supervision over patient's important decisions (e.g., medical, financial, legal).

Movement Disorders (N=13). The two recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with movement disorders were (1) cognitive rehabilitation, and (2) maximize protective steps to avoid

head injury (e.g., wear helmet, install support bards in shower, and play non-contact sports).

MS (N=11). The three recommendations that were identified as being endorsed inconsistently by neuropsychologists in this sample for patients diagnosed with MS were (1) referral to a medical doctor, (2) use a phrase or action that decreases the likelihood of impulsive behavior, and (3) a specific book or website.

Aim 3

The objective of aim three was to identify what variables predict the types of recommendations that neuropsychologists endorsed giving to their patients. To start answering this question, each recommendation was a priori assigned into the following eight categories based on the content of the recommendation:

Level of supervision/independence
Educational resources
Driving
Medical referrals: doctor, occupational therapist, speech therapist
Mental health: participation in support groups, individual therapy, or psychiatric consultation
Personal health: eating, exercise, sleep
Employment/education
Organization/memory/attention strategies

These categories were based from work by Westervelt et al. (2007) looking at patients' adherence to different types of recommendations. For this study, recommendations pertaining to personal health were added.

A single measure for each of the eight categories was derived via principal components analyses and Cronbach's alpha to use as outcome variables for aim three. The total variability for each of the categories (sum of the variances from neuropsychologists' frequency ratings in each category) was calculated. The first principal component explains the maximum proportion of this total variability. Using all principal components would explain the same total variability as using the original questions; however, the goal is to find a single measure for each category that still

explains a large proportion of the total variability. All the items were put on the same scale by standardizing. The first principal component is usually found as a measure of what is common to all variables. Based on the principal component analyses, it was determined that some items were weighted low and did not measure the construct of interest, and these items were removed from that category.

The recommendation to consult with a social worker which was categorized under the category *educational resources* did not fit with the other variables and was removed. By removing the social worker recommendation from the educational resource category, the proportion of variability explained by the first principal component increased from 0.59 to .79 and the Cronbach's Alpha increased from 0.64 to 0.73. Medication management by PCP, support group, and neuropsychological reevaluation did not fit well with the rest of the *mental health* category and were removed. By removing medication management by PCP, support group, and neuropsychological reevaluation the proportion of variation increased from 0.29 to 0.41 and Cronbach's alpha increased from 0.70 to 0.75. The category, *medical referrals* was divided into two sub categories, *medical referrals* and *therapist referrals*. When medical referrals was one category, 0.48 of the proportion of variation was explained with a Cronbach's alpha of 0.76. Split into two categories, the proportion explained for therapist referrals (speech therapy, physical therapy, and occupational therapy) becomes 0.78 with a Chronbach's alpha of 0.86. The proportion explained for medical referrals (doctor, sleep study, dietician) was 0.51 with a Chronbach's alpha of 0.85. However, it was ultimately decided to remove the recommendations to work with a dietician and undergo a sleep study from the category *medical referrals,* because recommendations for a dietician and sleep study were so rarely endorsed comparatively and brought the average of down significantly when they were included. The category, *medical referrals*, now consists of only one recommendation: referral to a medical doctor.

After removing those items that were clearly different, the first principal component analysis revealed that each of the remaining items were weighted almost equally, meaning they are measuring the same domain. They also explained a good proportion of the variation that would be explained if we used all the questions that represent a category. Please see table B1. for the average proportion of variance explained by the first principal component and the Cronbach's Alpha for each category. The average proportion of variance explain by the first principal component ranged from 0.41(*mental health*) to 0.79 (*educational resources*). Additionally, each construct had a fairly high Cronbach's Alpha indicating a strong correlation between the variables that were identified as measuring the same construct. The standardized Cronbach's Alpha ranged from 0.73 (*educational resources*) to 0.94 (*organization/memory/attention strategies*). Therefore, the outcome variable for aim three was the mean standardized response from all items identified by the principal component analyses within each category.

Graphs. Please see Appendix C for bar graphs that visually assess the variability in frequency ratings for categories of recommendations by particular disorder. The Y axis of the graphs represents the average percent of neuropsychologists that endorsed each category of recommendations for each diagnosis both *never* or *rarely* (NR) and *often* or *always (OA)*.

Neuropsychologists were more likely to make recommendations having to do with *supervision/independence* to patients with dementia (OA = 46.63%), stroke (OA = 37.57%), and movement disorders (OA = 36.15%) than to patients with MS (NR = 59.09%), psychiatric disorders (NR = 57.46%), epilepsy (NR = 47.69%), or TBI (NR = 44.58%).

Similarly, neuropsychologists were more likely to make recommendations having to do with *driving* to patients with movement disorders (OA = 53.85%), dementia (OA = 46.00%) and

stroke (OA = 39.98%) than to patients diagnosed with psychiatric disorders (NR = 61.38%), epilepsy (NR = 39.53%), or MS (NR = 34.85%).

Neuropsychologists were more likely to suggest *educational resources* (specific book or referral to an agency like the Alzheimer's Association) to patients, diagnosed with dementia (OA = 48.00%) or movement disorders (OA = 38.46%) or their family members. These types of recommendations were less often given to patients with psychiatric disorders (NR = 50.26%), epilepsy (NR = 51.28%), TBI (NR = 41.25), or stroke (NR = 36.04%).

Mental health recommendations were most often given to patients diagnosed with TBI (OA = 38.47%), and least often communicated to patients diagnosed with dementia (NR = 24.79%). For patients diagnosed with stroke, epilepsy, MS, movement disorders, and psychiatric disorders the split was relatively even between neuropsychologists who endorsed *never* or *rarely* or *often* or *always* having given mental health recommendations to these patients in the past year.

Behavioral health recommendations (e.g., exercise, eat a healthy diet, adherence to medications) that patients could incorporate into their daily lives were endorsed strongly across diagnoses (OA = 51.22%-70.77%).

Recommendations having to do with *employment/education* were most often given to patients with TBI (OA = 33.54%) or stroke (OA = 28.39%) and less often made to patients diagnosed with dementia (NR = 54.60%), psychiatric disorders (NR = 38.01%), and movement disorders (31.87%).

Recommendations having to do with *organization/memory/attention* strategies were given frequently regardless of patient diagnosis (OA = 35.26%-74.36%), but comparatively less often to patients diagnosed with epilepsy (OA = 35.26%) or psychiatric disorders (OA = 40.41%).

Recommendations to consult with *medical doctors* were given across the board regardless of diagnosis (OA = 35.48%-69.23%), but communicated relatively more frequently to patients diagnosed with movement disorders (OA = 69.23%) or dementia (OA = 67.78%) and relatively less often to patients with diagnosed MS (OA =45.45%, NR = 36.36%) or psychiatric disorders (OA =35.48%).

Recommendations to work with *therapists* (e.g., speech, physical, occupational) were given the most often to patients with movement disorders (OA = 38.46%), and very little to patients with psychiatric disorders (NR = 2.15%), epilepsy (NR = 2.56%), dementia (NR = 8.51%), or MS (NR = 15.15%).

Modeling. Nine models were conducted using linear regression with the goal of identifying which variables significantly predict the frequency that neuropsychologists make recommendations for each category (e.g., *supervision/independence*, *driving* etc.). The first model included all participants and used predictors having to do with general practices (e.g., most frequent professional activity, employment setting, minutes spend conducting verbal feedback). Models using patient characteristics and provider characteristics were carried out for the four conditions that had the highest sample sizes of neuropsychologists (*dementia*, *TBI*, *psychiatric disorders*, and *stroke*). It was determined that sample sized for the other diagnoses were two low to conduct meaningful models that would yield significant results using patient characteristics and provider characteristics as predictors. The mean standardized score for the frequency ratings of the nine categories of interest were used as outcome variables. Standardized scores were calculated by taking the frequency score and subtracting the overall recommendation mean and dividing this number by the overall standard deviation. Each person received a single score for each category by taking the average of the standardized scores for their responses

within a particular category.

All questions in the survey were originally included in one of the models (general practices, patient characteristics or provider characteristics and practices) except for three questions which were asked to collect data solely for descriptive purposes. Question 13 was not included as a predictor. It asked neuropsychologists to indicate the percentage of time when conducting neuropsychological evaluations that they work with patients of the following age groups: children, adolescents, young adults, older adults, geriatrics. This question was not included in the model, because this study only asks about neuropsychologists work with adult patients. It was also not included in the model to avoid redundancy with question five, which asks about average patient age of the patients in the diagnostic group that they were originally assigned at the beginning of the survey that they have worked with in the past year, and was used as a predictor. Questions 13 and 17 were also not included in any of the models. They asked about how often recommendations were communicated in different formats (verbally, written, both verbally and written, or no communication) to patients, their caregivers, and referral sources. While the format of the delivery of recommendations by neuropsychologists was of interest, it was decided not to include these questions as predictors due to limited sample size. Instead, this data was collected to be described and not included as predictors in the models.

There were a number of different types of questions in the survey that were coded in different ways. For questions where the response was continuous, as seen in items 2, 5, 7, 12, 16, 18, 25, the number that the neuropsychologist chose was inputted into the model. In Questions that asked participants to choose *never*, *rarely*, *sometimes*, *often*, or *always*, the responses *never* or *rarely* were coded together and the responses *sometimes*, *often*, or *always* were coded together (items 1, 6, 9). For question three that asked neuropsychologists to indicate the percentage of

time that they assess patients with different levels of functional impairment, if the percent that they endorsed *moderate* or *severe* added up to 50 or more their response was coded one way and another if the percent was less than 50. Finally, only participants' highest choice was inputted in the model for multiple choice questions and questions where participants were asked to rank their top two choices (items 4, 8, 10, 11, 14, 15, 20, 21, 22, 23, 24, 26, 27).

The automated procedure of stepwise selection was used to identify statistically significant predictors ($p<.05$). This method was chosen, because the survey contains questions that were coded categorically. Stepwise selection was used as the model selection procedure. Stepwise selection starts by including the predictor with the lowest p value in the model. At each step, the procedure adds the next predictor with the lowest p value, and removes any predictor that is currently in the model, but became nonsignificant with the addition of the new predictor. The procedure is continued until all significant predictors are included in the model. In other words, two variables that explain the data in the same way were not both included in the model thereby reducing potential problems with collinearity. The variable with the stronger effect identified by the p value was kept in the model. Stepwise selection with overall F statistic p values was used to choose models that were parsimonious yet still described the data well. Please see tables B2., B3., B4., B5., and B6. for a summary of significant predictors for models including parameter estimates and P values.

General Practices Models

Nine models were conducted (one for each category of recommendations) using general practice data from the entire sample of 309 participants. A main finding was that diagnosis was a significant predictor for eight of nine of the outcome measures. Additionally, the primary professional activity that neuropsychologists reported engaging in was a significant predictor for

five of nine outcomes (*driving*, *educational resources*, *therapist referrals*, *employment/education*, and *organization/memory/attention strategies*). Employment setting significantly predicted the frequency that *mental health* and *referrals to medical providers* were made.

Smaller findings across domains included that minutes spent conducting verbal feedback predicted the frequency that certain types of recommendations were provided for eight out of nine of the outcomes. For each increased minute spent on average that neuropsychologists reported conducting verbal feedback, the average provision of recommendations for every category, except referral to a *medical provider*, increased the outcome by less than 0.01 standard deviations. The number of neuropsychological reports written monthly was a significant predictor in three of the nine outcomes. For each additional neuropsychological report written per month, the average frequency of the provision of recommendations having to do with *driving*, *health*, or *employment/education* increased by less than 0.01 standard deviations. For each additional year conducting neuropsychological assessments as a licensed clinical neuropsychologist the average provision of recommendations regarding *supervision/independence* and *employment/education* increased by 0.02 standard deviations or less. The providers' gender significantly predicted the frequency that recommendations having to do with *health* or *organization/memory/attention* strategies were communicated. These recommendations were approximately 0.2 standard deviations more likely to be given by a female practitioner than male.

More specific findings regarding predictors for each category of recommendations are specified below. General practice factors that did not significantly predict outcomes in this sample included highest professional degree, field degree was awarded, post-doctoral fellowship

completion in neuropsychology, and whether the clinician endorsed practicing in an urban, suburban, or rural area.

Supervision and Independence. Statistically significant general practice predictors of how often recommendations related to *supervision/independence* were given were diagnosis, years conducting neuropsychological assessments as a licensed psychologist, minutes spent providing verbal feedback, and location of practice.

The average provision of *supervision/independence* recommendations to patients diagnosed with MS, TBI, and psychiatric concerns were between 0.3 and 0.7 standard deviations below those given to patients who incurred a stroke.

Neuropsychologists practicing in the Northeast and Midwest of the United States were 0.21-0.41 standard deviations more likely to give recommendations pertaining to *supervision/ independence* than neuropsychologists seeing patients in the West.

Driving. Statistically significant general practice predictors for frequency that *driving* recommendations were communicated were diagnosis, professional activities, minutes spent providing verbal feedback, and number of neuropsychological reports written per month.

The average *driving* recommendations increased by 0.88 standard deviations for neuropsychologists whose most frequent professional activity was rehabilitation compared to teaching.

On average, patients with *psychiatric disorders* received *driving* recommendations 0.86 standard deviations less often than *stroke* patients.

Mental Health. The following general practice variables were statistically significant for predicting provision of *mental health* recommendations: diagnosis, minutes spent conducting verbal feedback, employment setting, and professional activities.

On average patients with *epilepsy*, *TBI*, and *psychiatric disorders* were more likely to receive *mental health* recommendations than patients who incurred a *stroke* (0.35-0.5 standard deviation increased chance). In contrast, patients with *dementia* received *mental health* recommendations on average 0.3 standard deviations less often than *stroke* patients.

While professional activity was a significant predictor, other professional activities did not significantly differ from the referent group, teaching. However, *mental health* recommendations increased by 0.4 standard deviations if psychotherapy was the primary professional activity and decreased by 0.2 if research was the primary professional activity, suggesting a possible significant difference between the provision of mental recommendation dependent on whether the neuropsychologist spends more time at work conducting therapy or research.

Employment setting also significantly predicted whether *mental health* recommendations were given. Neuropsychologists employed by medical hospitals and rehabilitation settings recommended mental health recommendations between 0.14-0.2 standard deviations less than average. Whereas neuropsychologists employed in VA, private practice, and college or university settings gave mental health recommendations between 0.07-0.14 standard deviations more than average.

Educational Resources. General practice statistically significant predictors for the provision of recommendations having to do with educational resources were: diagnosis and minutes spent communicating verbal feedback.

On average, patients diagnosed with *dementia* were .66 standard deviations more likely to receive recommendations regarding *educational resources* than *stroke* patients. Conversely, *psychiatric patients* were 0.37 standard deviations less likely to receive recommendation having

to do with *educational resources* than stroke patients.

Therapist Referral. On average, patients diagnosed with *dementia* or *psychiatric disorders* were less likely (between 0.50-0.96 standard deviations respectively) to receive recommendations to work with therapists (e.g., speech, occupational) than *stroke* patients. Patients with *movement disorders* are 0.47 standard deviations more likely to be told to work with a therapist than *stroke* patients.

While professional activity was a significant predictor, none of the variables significantly differed from teaching. However, therapist referrals increased by 0.41 standard deviations if psychotherapy was chosen as the main professional activity and decreased by 0.64 standard deviations if the primary professional activity was research suggesting there could be a significant difference in therapist referral between neuropsychologists who primarily engage in psychotherapy versus research.

Medical Referral. Patients diagnosed with MS or psychiatric disorders were less likely to receive *medical referrals* than stroke patients (0.67, 0.59 standard deviations respectively).

Neuropsychologists employed by Colleges or Universities gave recommendations in the form of *medical referrals* an average of 0.47 standard deviations more often than the mean. Whereas neuropsychologists who worked at Veterans Affairs (VA) hospitals were on average 0.22 standard deviations less likely than the mean to recommend consultation with a medical doctor.

Health. The communication of *health* recommendations increased approximately 0.2 standard deviations for board certified neuropsychologists compared to those who are not board certified.

Employment and Education. The average provision of recommendations having to do

with *employment/education* increased by 1.32 standard deviations for neuropsychologists who's most frequent professional activity was rehabilitation compared with teaching.

On average patients diagnosed with dementia, movement disorders, or psychiatric disorders are less likely to receive recommendations regarding *employment/education* than patients who incurred a stroke (decrease of 0.98, 0.46, and 0.30 respectively).

Organization, Memory, and Attention Strategies. The average frequency that *organization/memory/attention* recommendations were communicated increased by 1.53 standard deviations for neuropsychologists whose primary professional activity was rehabilitation compared with teaching.

On average, patients with psychiatric disorders were 0.39 standard deviations less likely to receive *organization/memory/attention* recommendations than stroke patients.

Patient Characteristics Model

Dementia (91). For most outcomes, patient characteristics (caregiver attendance at neuropsychology appointment, whether patient is member of minority group, level of functional impairment, patient education and age) did not significantly impact the provision of different categories of recommendations.

Neuropsychologists who rated on average that the patients that they work with were less motivated were less often given the recommendation to see additional medical providers (1.38 1.38 standard deviations) than neuropsychologists who typically work with patients who they perceive as being more likely to follow through with recommendations made to them.

TBI (81). Overall whether neuropsychologists typically saw patients who brought a caregiver with them to their neuropsychology or not significantly predicted the frequency that seven of nine types of recommendations were provided. If the neuropsychologist worked with

patients who more often bring caregivers with them to their appointment, it was between 0.54-1.48 standard deviations more likely that the patient and their family member received recommendations regarding *supervision/independence*, *driving*, *educational resources*, *therapist referrals*, *medical referrals*, *employment/education*, and *organization/memory/attention strategies*.

Perceived motivation to follow through was a significant predictor for two out of nine outcome measures. If the neuropsychologist on average saw patients who they perceived as being *never* or *rarely* motivated to follow through with recommendations, they received less *health* recommendations (decrease of .90 standard deviations) and less recommendations regarding *organization/memory/attention* strategies (decrease of .73 standard deviations).

For each percentage increase that neuropsychologists reported that they worked with patients who were members of ethnic or racial minority groups, the average *mental health* recommendations increased by less than .01 standard deviations.

Psychiatric Disorders (63). Level of patients' completed education significantly predicted how often recommendations regarding *driving*, *mental health*, and *educational resources* were communicated. Neuropsychologists' average *driving* recommendations increased by 0.58 standard deviations when they more often saw patients whose highest level of education was completion of high school compared to those who completed college. Provision of *mental health* recommendations increased by 0.38 standard deviations for neuropsychologists who more often worked with patients with some college compared to college graduates. While this finding is not significant at the 0.05 level, the provision of *mental health* recommendations decreased by 0.41 standard deviations for neuropsychologists who more often worked with patients who did not finish high school compared to college graduates. By transitive property, it is likely that

patients with some college education received more mental health recommendations than patients who did not graduate from high school. Neuropsychologists increased *educational resource* recommendations by 0.58 standard deviations if they more often work with patients with some college compared to college graduates and decreased *educational resource* recommendations by 0.92 standard deviations for those with less than twelve years of education compared to college graduates.

Neuropsychologists were between 0.75-0.86 standard deviations less likely to make recommendations regarding *supervision/independence* and *employment/education* to patients if they more often work with patients who they perceived as being unmotivated to follow through with recommendations compared to neuropsychologists who rated the patients that they assess on average as being more motivated.

Neuropsychologists increased their average provision of *mental health* recommendation by 0.40 standard deviations if they rated themselves as more often working with patients with moderate to severe impairments compared with patients with more mild functional impairments.

For each year increase in patient age that neuropsychologists work with on average, the average amount of supervision/independence and *driving* recommendations increased by 0.02 standard deviations or less.

Stroke (37). Neuropsychologists decreased the average amount of recommendations related to *supervision/independence* and *driving* between 1.36-1.69 standard deviations when they more often worked with patients with less than 12 years of schooling compared to college graduates.

For stroke patients, with each increased year in patient age, the average frequency that *mental health* recommendations were provided decreased by 0.02 standard deviations.

Provider Characteristics and Practices Models

Dementia. The only provider practice that was significantly associated with changes in recommendation provision was the overall average number of recommendations that the neuropsychologist reported making to patients diagnosed with *dementia*. Average number of recommendations was significant for seven out of nine categories of recommendations. In these cases, for each additional recommendations that neuropsychologists report that they make to their patients on average, the frequency that recommendations in these categories were made increased by .04 to .08 standard deviations. Average number of recommendations did not significantly predict recommendations having to do with *medical referrals*, and *employment/education*.

TBI. The extent that providers endorsed individualizing recommendations was significant for seven out of nine outcome measures (*supervision/independence*, *driving*, *educational resources*, *medical referrals*, *health*, *employment/education*, and *organization/memory/attention strategies*) for neuropsychologists answering the survey about their work with TBI patients. The average frequency that recommendations in these categories were communicated decreased between 0.60-1.05 standard deviations for neuropsychologists who reported that they were less likely to individualize recommendations.

While type of referral was a significant predictor for how often recommendations regarding *educational resources* and *employment/education* were provided, none of the referral types significantly differed from the referent group (pre- and post- medical intervention). However, neuropsychologists who most often received referrals asking them to assess patients' capacity to work demonstrated an increase of 1.14 standard deviations above pre-and post-medical interventions, whereas neuropsychologists who most often received referrals regarding

establishing a baseline of functioning demonstrated a decrease of 0.50 standard deviations suggesting this difference could be driving the significance of referral question being a significant predictor of provision of educational resource recommendations. For employment/education recommendations, a referral question based on determination of diagnosis demonstrated a decrease of 0.44 standard deviations suggesting that this difference could be driving significance of referral type for communicating *employment/education* recommendations to patients with *TBI*.

The average therapist referrals increase by 0.74 standard deviations for neuropsychologists who more often on average conducted inpatient assessments of *TBI* patients compared with outpatient assessments.

The average number of recommendations that neuropsychologists reported making per patient was a significant predictor of the frequency that four of the nine categories of recommendations were communicated. For each additional recommendation given, the frequency that recommendations having to do with *educational resources*, *medical referrals*, *employment/education*, or *organization/memory/attention strategies* increased between 0.05-0.09 standard deviations.

Psychiatric Disorders. Compared to the method of consulting with colleagues, neuropsychologists increased their communication of *supervision/independence* recommendations and *health* recommendations between 0.70-1.75 standard deviations if they originally learned about the recommendations mostly through clinical experience, books, or formal didactics. While the primary method that neuropsychologists learned the recommendations that they make was an important predictor of provision of *medical* recommendations, none of the categories were significantly different from the method of

consulting with colleagues. Compared to consultation with colleagues, empirical data, books, and formal didactics seem to encourage an increase in *medical referrals* by approximately 0.50 standard deviations, whereas learning from supervisors or clinical experience seem to decrease the average medical referrals by about 0.50 standard deviations.

Compared to neuropsychologists who more often individualize the recommendations that they make to patients, the average number of *mental health* recommendations given by those who never or rarely individualize recommendations decreased by 0.62 standard deviations.

For each additional recommendation that neuropsychologists reported making on average per patient, the frequency that recommendations having to do with *driving*, *educational resources*, *therapist referral*, *health*, and *organization/memory/attention strategies* increased between 0.06-0.12 standard deviations.

For each additional percent of neuropsychologists' time that they endorsed working with *psychiatric* patients out of their total time conducting neuropsychological assessment, average *mental health* and *medical referral* recommendations increased by 0.01 standard deviations or less.

Stroke. Neuropsychologists who more often on average received referrals regarding patients' capacity for independent living compared with forensic referrals increased the amount of *supervision/independence* recommendations that they gave by 1.19 standard deviations. Similarly, neuropsychologists who more often received referrals regarding patients' capacity for independent living compared with determination of diagnosis or establishment of baseline functioning were between 0.99-1.21 standard deviations more likely to make *therapist* related recommendations.

The average recommendations having to do with *organizational/memory/attention*

strategies decreased by 0.50 standard deviations for neuropsychologists who more often conduct inpatient assessments compared to outpatient assessments.

Neuropsychologists who reported making an additional recommendation on average to stroke patients gave approximately 0.13 standard deviations more recommendations pertaining to *supervision/independence* and *driving*.

Neuropsychologists who spent an additional percent of their time assessing stroke patients in particular were more likely by 0.03 standard deviations to give the recommendation to consult with a medical doctor.

CHAPTER IV

DISCUSSION

The sample surveyed consisted of well-trained and experienced clinical neuropsychologists who have been practicing as licensed psychologists for an average of almost fifteen years. It is believed that the sample is relatively representative of neuropsychological practices across the United States. It is notable that fewer participants reported living in the Southwest. It is important to reiterate, though, that the data are a better representation of the provision of neuropsychological recommendations to certain patient populations (dementia (N=91), TBI (N=81), psychiatric disorders (N=63), and stroke (N=37)) than others (epilepsy (N=13), movement disorders (N=13), and MS (N=11)) due to sample size differences based from survey response.

Aim 1

The first aim of this study was to identify which recommendations are given most and least often to neuropsychological patients in general and whether differences existed in the frequency that recommendations were provided to particular patient populations.

An interesting pattern that emerged was that the recommendations that were given the most often (upper quartile) to the entire sample were almost all recommendations that could be completed by the patient or caregiver without additional assistance from outside sources. The only exception to this was the recommendation to return for a neuropsychological re-evaluation after a specified amount of time. The recommendations that could be followed independently appear to fall into two main categories, recommendations having to do with self-care/health (e.g., activities to improve mood, adherence to medications, exercise) and recommendations regarding compensatory strategies to address cognitive deficits (e.g., use of calendar, memory notebook,

alarms). While compensatory strategies were given frequently across the board to all patient diagnoses in this sample, these types of recommendations were give relatively less frequently to patients with psychiatric disorders. This might be, because taking care of mental health concerns as a means of improving cognition is a higher priority for patients with psychological disorders than discussing organization, memory, and attention strategies as a means to cope with problems with cognition.

In contrast, recommendations that were given infrequently (lowest quartile) to the entire sample included many recommendations that involved seeking out additional services that would require further appointments that can be costly or dependent on individuals' insurance coverage (e.g., dietician, group therapy, family therapy, marital therapy, adult daycare, substance abuse treatment, physical therapist, assisted living, respite care/home health aide, occupational therapist, and speech therapist). Similarly, the recommendation to see a social worker, was infrequently given to TBI, stroke, epilepsy, and movement disorder patients. It is possible that these findings can be explained by how the provision of multidisciplinary care typically operates (medical doctors oversee the case and making referrals to these services if necessary). It is important to note that the recommendation to work with an individual therapist is not included on this list and is a recommendation that was on average provided to the entire sample *sometimes-often*. While recommendations to work with physical therapists, occupational therapists, and speech therapists were *rarely* to *sometimes* communicated, they were given the most often to patients with movement disorders and stroke relatively and very little to patients with psychiatric disorders, epilepsy, dementia, or MS. This finding likely reflects that patients who have incurred a stroke are often hospitalized and need help recovering their physical strength and mobility with services like physical therapy. Additionally, speech therapy is likely

appropriate for patients with movement disorders when their condition deteriorates to the point that they are having problems with swallowing.

Other recommendations that were infrequently made to the entire sample included having the patient wear an ID bracelet with caregiver contact information, life alert system, phrase or action likely to decrease impulsive behavior, specific book or website, maximize steps to avoid head injury, and current employment position is no longer appropriate. One potential reason why these recommendations were communicated less often than other recommendations surveyed is because these recommendations address relatively specific concerns. It makes sense that recommendations that apply to people regardless of their individual characteristics and profile (e.g., exercise) would be given more often. Given this hypothesis, it is a little surprising that specific books or websites was not recommended more frequently as this recommendation could be relevant for all diagnoses in this study. However, it is likely that the majority of neuropsychologists include education about the disorder and prognosis as part of their feedback session, and it is possible that this information is sufficient for some patients. Additionally, it is likely that the patients who would follow through with this recommendation are more highly educated and of a higher socioeconomic class, because they would need to be able to easily access the internet or have extra money to spend on books to ease access to these resources. Results from analysis of aim two indicate that neuropsychologists vary on how often the recommendation to seek out additional information from a specific book or website is communicated to patients with dementia and epilepsy. Regardless, neuropsychologists were more likely to suggest educational resources (specific book or website or referral to an agency) to family members or patients with dementia, movement disorders, or stroke compared with psychiatric disorders, epilepsy, or TBI. This finding likely reflects the influence of certain

agencies like the Alzheimer's association, availability of resources pertaining to each diagnosis, and level of caregiver involvement in care.

Findings indicate that diagnosis was a significant predictor of the frequency that certain categories of recommendations were given across outcomes except for health recommendations. Health recommendations were likely not predicted by diagnosis, because they were communicated frequently regardless of diagnosis.

The recommendation to consult with a medical doctor (e.g., for non-psychiatric medication, surgical intervention, or imaging) was communicated *sometimes-often* to all patients regardless of diagnoses, but relatively more frequently to patients with dementia, movement disorders, stroke, and epilepsy. This makes sense given the co-occurring medical complications present with these conditions. Patients with psychological disorders were told relatively less often to consult with a medical doctor.

Neuropsychologists were more likely to make recommendations having to do with supervision, independence, and driving to patients with dementia, stroke, and movement disorders than to patients with psychiatric disorders, epilepsy, or MS. In line with this finding, obtaining power of attorney was most often made to caregivers of patients with dementia. This result seems to point to safety recommendations being given most often to populations that are typically more impaired on activities of daily living. Consistently, disorders in which individuals can be higher functioning or their functioning varies were less likely to be given safety recommendations. For example, driving recommendations were *never* or *rarely* given to patients with psychological disorders, and the recommendation to establish power of attorney was *never* or *rarely* given to patients with epilepsy. Similarly, the recommendation, "arrange home to mitigate safety risk" was *never* or *rarely* given to patients with epilepsy or MS. It seems that

recommendations focused more on improved functioning and quality of life than increased safety for patients with MS. This might be due to increased insight about their difficulties compared to some other patient groups (e.g., dementia). Additionally, patients with MS often experience periods of high and low energy in which ability to function can fluctuate dependent on whether an individual is amidst an attack. Consistent with this symptom, MS patients were frequently told to, "engage in challenging tasks at most alert and effective time of day."

In accordance with the theme of level of functioning varying based on diagnosis, recommendations having to do with *employment/education* were most often made to patients with TBI or stroke. This result makes sense, because these are two population in which cognitive problems can interfere with work functioning, but improvement is expected over time. Work related recommendations were given less often to patients with dementia, movement disorders, or psychiatric disorders. This is likely, because patients with psychiatric disorders are less likely to have significant cognitive deficits that will interfere with work functioning compared with the other diagnoses surveyed about in this research. Patients diagnosed with dementia or movement disorders are often older so they may already be retired, but also functioning is expected to continue to decline given the neurodegenerative nature of these disorders so it is reasonable to expect that they would not work in the future thereby reducing the need for work related accommodations. This reasoning also can be applied as to why cognitive rehabilitation is infrequently recommended for dementia patients. With continued decline expected, and cognitive deficits so severe that these patients will likely have a hard time implementing strategies learning in cognitive rehabilitation. However, it is important to remember that caregivers could benefit from working with a cognitive rehabilitation counselor to learn strategies helpful in caring for a family member with dementia.

Patients with psychiatric disorders and epilepsy were more likely to receive mental health recommendations compared with patients with stroke and dementia. While it is expected that mental health recommendations would be high for patients diagnosed with psychological disorders, it was a little surprising that individual therapy was the fourth most communicated recommendation for patients with epilepsy. It is important to note that only 13 neuropsychologists took the survey regarding patients with epilepsy so a higher sample is needed to see if this finding is representative of neuropsychological practices in general. However, if the finding is accurate, a high provision of recommendations like individualized therapy, engage in activities know to improve mood, psychiatrist, and self-care might reflect a couple of causes. First of all, seizures can be comorbid with non-epileptic spells. The treatment for non-epileptic spells is psychologically based as spells are physical manifestations of psychological distress. Other explanations could involve having seizures being a health complication that can occur in a younger population. It might be helpful for individuals with seizures to work with a therapist to learn how to best manage their symptoms (e.g., medication adherence, a consistent sleep schedule, refraining from taking drugs that were not prescribed by their doctor) and grieve the loss of control associated with being susceptible to seizures.

Consistent with the finding that patients with psychiatric disorders frequently received mental health recommendations, they were also *sometimes* to *often* told to reduce their use of drugs (e.g., alcohol, narcotics, marijuana, caffeine, nicotine). Frequent provision of this recommendation is likely made so that drug use does not exacerbate symptoms of mental illness (e.g., mania for a patient diagnosed with bipolar disorder) or interfere with prescribed psychological medications (e.g., lithium). Patients who incurred TBI were *often* told to reduce drug use. This finding suggests a number of possible explanations. First, it is important that drug

use does not impede plasticity and brain recovery from injury. Second, not all patients, but many patients who incur TBIs are primarily male and often have a history of engaging in externalizing behavior such as driving while intoxicated which may have led to their injury. This population might have a higher baseline of drug use than patients with other diagnoses asked about in this survey.

Aim 2

The second aim of this dissertation was to examine whether neuropsychologists tend to make the same recommendations to patients with the same disorder. The frequency that 67 recommendations were given to specific patient populations was rated by clinical neuropsychologists. For the entire sample, five recommendations were deemed as being provided inconsistently. These five recommendations were endorsed both frequently (*often* and *always*) and infrequently (*never* and *rarely*) by large numbers of neuropsychologists. Five recommendations also met criteria for being inconsistently given to patients diagnosed with dementia, TBI, and psychiatric disorders. Four recommendations were reported to be inconsistently made to patients with epilepsy, three to patients with MS, and two to patients with movement disorders and stroke. Based on these results, provision of recommendation appears to be overall relatively consistent.

For recommendations that were considered inconsistent the following patterns emerged. There were a couple of recommendations having to do with driving that were found to be inconsistent for the entire sample (limit distractions while driving (e.g., phone conversations, radio), limit driving to low demand conditions (e.g., stay in familiar areas with low traffic), and family members should routinely observe patients driving to check safety). Overall, driving recommendations were given *rarely* to *sometimes*. The driving recommendation that was given

the most often by neuropsychologists was for the patient to undergo an on-the-road assessment with the department of motor vehicles or a hospital based safety driving evaluation. From this, it seems that neuropsychologists are more divided regarded giving recommendations that put the onus on family members to decide whether the patient's driving is safe and how to set limits on driving. Some of this inconstancy might also be attributable to states having different legal requirements and regulations pertaining to driving safety and the process of reporting medical conditions that might interfere with driving safety to the DMV. Interestingly, the discussion of "alternative modes of transportation" transpired the least often out of all of the driving recommendations made to all patients. This suggests that neuropsychologists are more likely to discuss driving safety, but less likely to have conversations about how a patient could continue to maintain independence by utilizing other transportation options. It is possible that this finding also indicates that if a patient is having trouble with driving, they might not be able to be as active in other activities that they used to enjoy independently and so the discussion about alternative modes of transportation is not as relevant as it might have once been.

The recommendation to engage in cognitive rehabilitation was also inconsistently provided to the entire sample. A possible reason for this might be differences in availability of this service depending on where the neuropsychologist practices. Some neuropsychologists might have a cognitive rehabilitation specialist in-house that patients can be easily referred to whereas others would be asking patients to devote an unrealistic amount of time traveling to appointments that are not conveniently located. Furthermore, cognitive rehabilitation can be expensive and is only covered by certain insurance providers.

Elaboration strategies to address memory problems was another recommendation that was inconsistently made to the entire sample as well as specifically to TBI, stroke, and dementia

patients. While other recommendations having to do with strategies to address cognitive deficits were given on average *sometimes* to *always*, elaboration strategies such as mnemonics was given *rarely* to *sometimes*. One possible explanation for this difference is that elaboration strategies can take longer to explain to patients in order for the strategy to generalize to real life use than more concrete recommendations such as, "centralized location to keep important items." Also, some neuropsychologists might view going over elaborations strategies to address memory concerns as more appropriate for a rehabilitation counselor to discuss with patients. Furthermore, while higher functioning patients might benefit from elaboration strategies, it is likely that patients who have more severe problems with memory will 'forget' when it is helpful to utilize these strategies making the strategies impractical.

There were other recommendations that were deemed inconsistent for specific diagnoses, but not the entire sample. For example, adherence to continuous positive airway pressure (CPAP) machine was a recommendation that was inconsistently made for patients with TBI and psychiatric disorders. Another example, is the recommendation, "maximize protective steps to avoid head injury" which was inconsistently told to patients with stroke and movement disorders. For these two examples, it seems that these recommendations are made specific to individual situations. For example, a recommendation regarding CPAP use only makes sense for someone who experiences sleep apnea. Likewise, maximizing steps to avoid head injury is most appropriate for someone who is at risk for falls or has a history of concussions. Therefore it is reasonable to conclude that these recommendations were inconsistently made, because they are appropriate for specific concerns that are not relevant to every patient.

The last notable finding for aim two was that four recommendations were deemed inconsistent for psychiatric disorders and no other diagnoses. These were, "check work

regularly", "engage in most challenging tasks at most alert/effective time during the day", "link behaviors that occur naturally together (e.g., always take medication when brush teeth)", and "increased supervision over patient daily activities (e.g., finances, medications, meal planning, cooking, childcare." Psychiatric disorders is a broad umbrella encompassing many specific disorders. Therefore these recommendations may be important for some of the psychiatric disorders and less relevant for others.

Aim 3

Effect sizes for findings will be described based off the parameter coefficient which is a measure of the strength of an association. The following interpretations of effect sizes are used based from suggestions for social science data (Ferguson, 2009). Parameter coefficients from 0-0.19 are considered to be "not clinically meaningful effect," 0.2-0.49 "a small but meaningful effect," 0.5-0.79 "a moderate effect," and above 0.8 "a strong effect."

General Practices. All 309 neuropsychologists' responses were included in the general practices model. All of the questions that were included in this model were answered with no specific diagnosis in mind. Questions asked about survey respondents' primary professional activity, primary employment setting, average number of psychological reports written per month, minutes spent conducting verbal feedback, gender, highest professional degree, field degree was awarded, years conducting assessments as a licensed clinical psychologist, location/density of where practice, and status of completion of postdoctoral fellowship and board certification in neuropsychology.

What type of professional activity the neuropsychologist endorsed primarily engaging in was a significant predictor for the frequency provision of five out of the nine categories of recommendations used as outcome variables. *Strong* effects were found for increased provision

of organization/memory/attention, employment/education, and driving recommendations by neuropsychologists who conducted more rehabilitation compared with teaching. This result likely reflects that neuropsychologists involved in rehabilitation are more focused on patients' daily functioning. They might have a better sense of how the patient's deficits are interfering with their lives. Their job, by definition, is to help patients to improve their cognition or work around their problem areas so that they can live life to its fullest despite problems with cognitive functioning. Therefore, it makes sense that they would emphasize recommendations related to this goal. Similar reasoning likely explains the finding of suggested *moderate* to *strong* effects for increased provision of mental health and therapist (e.g., speech therapist) recommendations by neuropsychologists who primarily conduct psychotherapy compared with research.

A *small*, *but meaningful* effect was obtained for primary employment setting significantly predicting the likelihood that the recommendation to consult with a medical doctor was made. Neuropsychologists employed by Colleges or Universities gave this recommendation more often neuropsychologists who worked at Veterans Affairs (VA) hospitals. It is possible that this reflects the need for neuropsychologists who are working outside a medical system to refer out to doctors whereas VAs services are interconnected. In other words, it was likely a doctor within the VA system that referred the patient for neuropsychological testing in the first place so it would be unnecessary for the neuropsychologist to suggest that the patient consult with a physician.

There was a *not clinically meaningful* to *small* effect indicating that neuropsychologists practicing in the Northeast and Midwest of the United States were more likely to give recommendations pertaining to *supervision/ independence* than neuropsychologists seeing patients in the West. It is unclear what the explanation is behind this result. Other general

practice predictors that were significant, but *not clinically meaningful* included minutes spent conducting verbal feedback, average number of neuropsychological reports written monthly, years practiced as a licensed clinical neuropsychologist, provider's gender, and board certification status.

General practice factors that did not significantly predict outcomes in this sample included highest professional degree, field degree was awarded, post-doctoral fellowship completion in neuropsychology, and whether the clinician endorsed practicing in an urban, suburban, or rural area. For many predictors that were not found to be significant, there was little variability within the sample on these variables. It was originally hypothesized that density of population might predict referral to specialty clinics due to availability of resources, but results from this research do not support this idea. However, it is important to remember that the majority of the sample identified as being located in an urban area. Also, the survey respondents likely had different mental definitions of the terms urban versus suburban versus rural. Future research could ask about population density using better defined language or more concrete options (e.g., population density per square mile).

Patient Characteristics. Questions related to patient characteristics were answered in relation to a particular diagnosis. Separate models were conducted looking at patient characteristics as potential predictors for four diagnoses (dementia, TBI, psychiatric disorders, and stroke). Questions that were tested in the model for patient characteristics included patients' level of functional impairment, education, age, perceived motivation to adhere to recommendations, minority group membership, and whether a caregiver attended their neuropsychological appointment.

Level of motivation *moderately* to *strongly* predicted a number of outcome measures for

certain patient populations. Neuropsychologists were more likely to make particular recommendations if they on average worked with patients who they perceived as being motivated to follow through with recommendations including to *consult with a medical provider* for dementia patients, *behavioral health* and *organization/memory/attention strategies* for TBI patients, and *supervision/independence* and *employment/education* recommendations for patients with psychological disorders. It is reasonable to believe that neuropsychologists would be disinclined to make recommendations to patients who appear unmotivated to follow through with them. It also could be a marker of a strong clinician that they tailor their recommendations to meet the patient at the motivation level that they are at. In other words, it might not make sense for a neuropsychologist to persist in telling a patient who smokes two packs of cigarettes per day to quit smoking when the patient shows no interest in quitting smoking, because the neuropsychologist might prioritize maintaining a strong working alliance with the patient by showing them that they have heard them. It could be more fruitful for the neuropsychologist to focus on recommendation areas in which the patient might be more inclined to make behavioral changes at this time. However, it is important to note that neuropsychologists could misperceive a patient's motivation and not make recommendations based on an inaccurate conclusion regarding their motivation even though the recommendations might be useful to the patient or their family members at some point.

Whether a neuropsychologist typically works with patients who bring a caregiver with them to their neuropsychological appointment had a strong effect on the provision of six categories of recommendations (*driving*, *educational resources*, *therapist referrals*, *medical referrals*, *employment/education*, *supervision/independence*) and a moderate effect on one (*organization/memory/attention strategies*) for TBI patients. Having a caregiver accompany a

patient to appointments could reflect having more problems and needing more support which could warrant additional recommendations. However, this does not seem to explain the findings, because level of functional impairment was not significant for any outcomes for TBI patients. Another possible explanation is that a caregiver coming to appointments oftentimes points to their investment in the patient's care. Neuropsychologists will respond to this by giving recommendations that they think have a higher likelihood of being followed through with, with the caregiver's help. It is also possible that the predictors used in the patient and provider characteristics models proxy outcomes. For example, having a caregiver attend the neuropsychology appointment might reflect the kind of setting that these patients are being evaluated in. To test this, correlations between predictors could be calculated to gage the extent that collinearity between variables might be impacting the results.

Level of education had *moderate* to *strong* effects on the provision of some types of recommendations to psychiatric and stroke patients. More mental health recommendations were given to patients with psychological disorders if their neuropsychologist typically worked with patients with some college education compared to patients who did not graduate from high school. It is possible that there is less of a stigma associated with seeking mental health services for patients who have higher levels of education and are therefore more open to utilizing services. In line with this finding, more educational resource recommendations were given to these patients who had completed some college compared with those with less than 12 years of education. This finding suggests that neuropsychologists don't believe that people who have not graduated from high school will benefit from learning more information about their condition through reading. They likely have lower proficiency in reading abilities than patients who have completed some college who might find additional written information to be more useful.

The opposite result was seen for *driving* recommendations communicated to patients with psychological disorders. Recommendations having to do with *driving* were increased for patients whose neuropsychologists typically work with patients whose highest level of education was completion of high school compared with college, but driving recommendations were decreased for stroke patients with no high school degree compared to stroke patients who were college graduates. It is difficult to reconcile these seemingly opposing findings, but one explanation might be that *driving* recommendations were made so rarely to patients with psychological disorders as a whole. More *supervision/independence* recommendations were given to stroke patients with college degrees compared to patients with less than 12 years of schooling. College graduates on average are probably more likely to implement recommendations regarding *supervision/independence*. While socioeconomic status was not asked about specifically in this survey, college graduates likely have more economic resources and time to follow through with these types of recommendations.

There was a *small* effect showing that neuropsychologists who more often worked with patients with psychological disorders who were rated as having *moderate* to *severe* functional impairments were more likely to receive *mental health* recommendations than patients with *mild* functional impairments. This finding likely reflects that someone who is having more trouble coping with life's challenges independently could benefit from additional therapeutic support.

Not clinically meaningful, but significant predictors included that neuropsychologists were more likely to make *mental health* recommendations to TBI patients if they more often worked with patients who were members of ethnic or racial minority groups. Older stroke patients were less likely to receive *mental health* recommendations than younger stroke patients. Older patients with psychological disorders were more likely to receive

supervision/independence and *driving* recommendations.

Provider Characteristics and Practices. The last models examined provider characteristics and practices in regard to a particular patient population (dementia, TBI, psychiatric disorders, or stroke). Variables tested in these models included employment setting (inpatient versus outpatient), extent recommendations were individualized to each patient, referral question, method recommendations were originally learned, average number of recommendations given to each patient, and percent of time spent conducting neuropsychological assessments that work with patient group assigned at the beginning of the survey.

Moderate to *strong* effects were found for neuropsychologists' self-reported tendency to individualize recommendations predicting the frequency that certain outcome categories were provided to TBI and psychiatric patients. Neuropsychologists who endorsed being more likely to individualize recommendations more frequently made *supervision/independence*, *driving*, *educational resources*, *medical referrals*, *health*, *employment/education*, and *organization/memory/attention strategy* recommendations to their TBI patients. Similarly, neuropsychologists working with patients who have psychological disorders more frequently made recommendations having to do with mental health if they tended to individualize recommendations compared with neuropsychologists who *never* or *rarely* did. Intuitively this finding makes sense given that neuropsychologists who individualize the recommendations that they communicate to patients are likely putting more time and effort into making appropriate recommendations for each patient. Instead of utilizing standard recommendations, they are more likely to give a variety of recommendations dependent on the patient and their circumstance. That being said, this finding was apparent only for patients with TBI and psychological disorders

and not dementia or stroke patients. One potential explanation for this disparity is that the model assessing predictors for recommendation provision to stroke patients had the fewest number of participants with a sample size of 37. It is possible that had there been a larger sample size, additional provider practice predictors would have been yielded. Although, 91 neuropsychologists responded about the recommendations that they make to patients with dementia, there were very few significant dementia patient characteristic and provider practice predictors that were significant. This likely reflects that neuropsychologists were largely in agreement with what types of recommendations that they made to patients with dementia. For example, employment recommendations were *rarely* made to patients diagnosed with dementia. Therefore, predictors besides diagnosis will not have much of an impact on *employment/education* recommendation provision.

It appears that certain referral questions over others pull for certain types of recommendations. This was seen in TBI patients where there was a suggested *strong* effect for neuropsychologists who more often received referrals to assess a patients' capacity to work which predicted an increase in provision of *employment* related recommendations compared with neuropsychologists who were more often asked to establish a patients' baseline functioning. Another suggested *strong* effect was seen for neuropsychologists working with TBI patients. Practitioners were more likely to make *employment/education* recommendations when they were more often asked to assess patients' capacity to work compared with neuropsychologists who were often asked to determine a diagnosis. It is logical that a referral asking about work capacity will pull for more recommendations having to do with employment to answer the referral question. Similar reasoning can be used to explain the finding of a strong effect for the referral, "assess patients' capacity for independent living" predicting an increased provision of

supervision/independence recommendations over a forensic evaluation referral. In line with this, there was a strong effect showing that stroke patients who saw providers who were often asked to conduct assessments in order to assess their capacity for independent living were more likely to receive *therapist referrals* (e.g., speech therapy) than patients who saw neuropsychologists where the referral question was to determine a diagnosis or establish baseline functioning.

Whether neuropsychologists more often worked with patients assessed in an inpatient or outpatient setting yielded moderate effects for TBI and stroke patients. TBI patients were more often given therapist referrals (e.g., speech therapy) when they were assessed inpatient. This is expected as TBI patients who are being assessed in an inpatient setting as opposed to an outpatient setting will typically be closer to injury and lower functioning. They will need services like speech therapy to regain skills like speaking. TBI patients who are being assessed in an outpatient setting will have already started the transition of acclimating back to their life and there will likely be a larger focus on higher order cognitive functioning. In keeping with this theory, stroke patients were more often given recommendations having to do with *organizational/memory/attention strategies* when assessed in an outpatient setting.

For patients with psychiatric disorders, how their neuropsychologist originally learned the recommendations had *moderate* to *strong* effects on the likelihood that they received, *supervision/independence*, *health*, and *medical recommendations*. It seems that neuropsychologists who primarily learned about the recommendations that they give through consulting with colleagues or their supervisors were less likely to make these types of recommendations than if they originally learned the recommendations through reading books, articles, or through formal didactics. It seems that a stronger focus in training on learning from empirical work as opposed to clinical experience leads to increased provision of

supervision/independence, *health*, and *medical* recommendations to patients with psychological disorders.

There were a number of significant, but *not clinically meaningful* practitioner predictors including average number of recommendations neuropsychologists reported making per patient for dementia, TBI, stroke and psychiatric disorders. This is intuitive as the more recommendations being given overall, the more likely more recommendations will be given of the outcome measures (e.g., medical referrals, educational resources). Other small not clinically meaningful findings for provider characteristics included the result that the higher percentage of time that neuropsychologists who were surveyed about the recommendations that they gave to stroke patients assessed stroke patients, the more likely they made recommendations to consult with a medical doctor. Similarly, for neuropsychologists who answered the survey regarding patients with psychological disorders, the more they worked with psychiatric patients, the more often they made *mental health* and *medical referral* recommendations.

Limitations

Ideally the results from this survey would be representative of all neuropsychologists' recommendation practices. The invitation to participate in the survey was intentionally sent through multiple mechanisms/organizations to try and reach a broad sample of neuropsychologists. Regardless it is unrealistic to think that all eligible neuropsychologists who might have been interested in taking the survey were contacted. A limitation of this study as with most research is that participants were self-selected. There might be differences between neuropsychologists who choose to participate versus those who declined participation. For example, neuropsychologists who took the time to complete the survey might not be as busy as those who choose not to participate. Additionally, neuropsychologists who choose to participate

in the survey might have a higher interest in the topic of recommendations than those who choose not to complete it.

Neuropsychologists in this study were asked to retrospectively think about their average frequency provision of recommendations to patients with a specific diagnosis over the past year. While this approach was useful to collect data from a large number of neuropsychologists in a brief survey format, a limitation is that this type of recollection can be biased and imprecise. Future work could answer similar questions asked in this research, but use different methodology, e.g., by coding neuropsychological reports of individual patients. It should also be mentioned that the study design for this project was not experimental. Therefore, the data could correlated, but no causal interpretations could be deduced.

When developing the survey for this project, there was a great deal of consideration on how to maximize the data collected while ensuring that the survey was brief to complete so as not to dissuade clinicians from participating. Therefore, some questions were omitted that would have likely shed further light on research questions of interest. For example, potentially important predictors that were not tested in the models are patients' socioeconomic status, specific cognitive deficits, and insurance coverage.

Lastly, based on power analysis, the goal was to recruit 392 neuropsychologists, but recruitment was discontinued at 309 after exhausting reasonable recruitment methods. Models were only conducted for four out of seven diagnoses surveyed due to smaller than expected sample sizes. Meaningful results were found for the models conducted based on work with stroke patients (the group with the smallest sample size that was modeled), but it is possible that given a larger sample sizes, additional predictors would have been statistically significant. Additionally, sample sizes for neuropsychologists who took the survey in regard to their work

with patients with epilepsy, movement disorders, or MS patients were lower than anticipated. Due to this, no strong conclusions can be made based on this data as findings likely are not representative of neuropsychologists' practices as a whole. It is important that recommendations practices for these groups of patients are investigated with more participants in future work.

Implications for the Field and Future Directions

A significant finding from this research is that almost all of the most frequent recommendations that neuropsychologists make to their patients involve behavior change that the patient or their caregiver could implement independently without seeing another provider including compensatory strategies to address cognitive deficits and behavioral health changes like exercising more and eating a healthier diet. Based off of this data, it is clear that neuropsychologists are talking about incorporating these changes into patients' lives, but it is unclear the extent that these recommendations are being followed. Overall there is limited work looking at this question. A study looked at patient and caregiver adherence to certain types of recommendations after a neuropsychological evaluation (Westervelt et al., 2007). After patients and their family members received an average of one hour of verbal feedback and were provided a two-page written summary of what was discussed, they were surveyed one month later about each recommendation that they were given and asked if they had followed, planned to follow, or did not plan to follow it. Depending on the type of recommendation, there was very different levels of follow through. For example patients reported having followed 74.7% of organization/memory/attention strategy recommendations, but only 23.5% followed through and read educational materials that were recommended. Adherence to behavioral health recommendations was not measured in this research. Additional research shows that patients who receive supplementary written reminders that summarizes the recommendations discussed

in a verbal feedback session do not increase their adherence to neuropsychological recommendations (Fallows & Hilsabeck, 2013; Meth, Calamia, & Tranel, 2015). As stated previously, there is limited research on recommendation adherence in neuropsychology both to understand as a baseline what percentage of recommendations are typically adhered to and what factors predict adherence and how adherence can be improved. It is essential that more work is done on this topic to ensure that patients' receive the best care and receive the support they need to make meaningful changes in their lives to improve their quality of life. Additionally, future research could measure adherence to neuropsychological recommendations more accurately. Up until this point, adherence measures have been based off of patient self-report, and hasn't taken into account varying difficulty levels of following through with different recommendations by defining the current behavior that the patient engages in and the size of the behavior change goal. For example, it is likely easier for a person who smokes a cigarette a day to quit smoking than a person who smokes two packs of cigarettes per day.

This research surveyed neuropsychologists on the frequency that they provided 67 recommendations to eight different patient populations. However, this research did not adequately address how recommendations were made. For example, perhaps two different neuropsychologists both discuss the importance of increased exercise, but one takes it one step further and formulates an exercise plan with their patient increasing the possibility that the patient does not feel overwhelmed and successfully incorporates the recommended exercise into their life. Increased information regarding differences in specificity and how recommendations are communicated by practitioners is important.

It is our hope that this research can be a resource for neuropsychologists to see what tendencies are present in the field in regards to recommendation provision. For example, there

was evidence supporting that neuropsychologists made more recommendations in certain areas to patients who bring a caregiver with them to their appointment and patients who they perceive as being more motivated. While this finding is reasonable given that patients who are more motivated and have caregiver support will probably be more likely to follow through and benefit from certain recommendations, it elicits the question of how the field can work with patients who are less motivated or do not have caregiver support. Findings from this project can be used as a baseline for neuropsychologists to better understand the recommendations that they are more likely to make based on their training and patient population that they work with compared to others in their field. This will allow practitioners to make informed and intentional decisions about their recommendation provision. Now that some preliminary research has been conducted on what is typically done, future research can examine whether what is currently being done can be improved.

Lastly, two findings from this research support the possibility that access to care is an important concern for the field. Neuropsychologists were more likely to recommend a resource like the Alzheimer's association to patients with dementia, and neuropsychologists were inconsistent regarding their provision of the recommendation to seek cognitive rehabilitation for the entire sample. These findings suggests that when good resources are available and affordable, neuropsychologists are in the position to offer them to their patients. It is essential that patients are able to access relevant treatments or they will be unable to benefit from resources that could be useful to them.

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APPENDIX A

SAMPLE DEMOGRAPHICS AND AIMS ONE AND TWO TABLES

Table A3. Power Analysis to Determine Appropriate Recruitment Goal

Detecting a difference in R^2 of 0.05		**Patient Characteristics/Diagnosis 12 predictors**	**Provider Views & Practices/Diagnosis 18 predictors**	**General Practice 26 predictors**
Full R^2 value		**0.20**	**0.20**	**0.20**
Power	**0.70**	241	284	331
	0.75	263	309	359
	0.80	289	337	**392**
	0.85	320	372	430
	0.90	360	418	481

Table A4. Characteristics of Neuropsychologists based from Percentages

	Dementia 91	**TBI 81**	**Psych Disorders 63**	**Stroke 37**	**Epilepsy 13**	**Movement Disorders 13**	**MS 11**	**Total 309**
Gender								
Female	60%	48%	65%	62%	62%	62%	73%	59%
Male	40%	52%	35%	38%	38%	38%	27%	41%
Highest Degree								
PhD	80%	88%	75%	68%	100%	77%	73%	80%
PsyD	20%	10%	24%	32%	0%	23%	18%	19%
Field of Psychology Degree								
Clinical	80%	68%	84%	83%	69%	77%	100%	78%
Neuropsychology	14%	12%	5%	3%	31%	23%	0%	11%
Counseling	3%	14%	5%	8%	0%	0%	0%	6%
Postdoctoral Residency in Neuropsychology								
Yes	87%	83%	84%	89%	92%	92%	73%	85%
Board Certified								
Yes	43%	48%	38%	24%	77%	62%	55%	44%
Region of Practice								
Midwest	19%	23%	21%	32%	8%	15%	9%	21%
Northeast	29%	26%	19%	8%	33%	0%	18%	22%
Southeast	21%	11%	25%	32%	25%	31%	27%	21%
Southwest	7%	10%	14%	8%	0%	23%	0%	9%
West	24%	30%	21%	19%	33%	31%	45%	26%
Population Density of Location Practice								
Urban	57%	56%	59%	43%	69%	62%	64%	56%
Suburban	35%	33%	29%	43%	15%	31%	27%	33%
Rural	8%	11%	13%	14%	15%	8%	9%	11%
Employment Setting								
Medical Hospital	33%	17%	33%	31%	69%	46%	36%	31%
VA	19%	23%	17%	19%	8%	0%	9%	18%
Private practice	29%	35%	32%	31%	15%	31%	36%	31%
Rehabilitation Setting	12%	11%	2%	17%	0%	8%	0%	9%
College or University	4%	7%	8%	0%	8%	8%	9%	6%
Method of Communication of Recommendations to Patients and Caregivers								
Verbally	26%	19%	20%	30%	15%	12%	10%	22%
Written	15%	14%	13%	7%	4%	17%	14%	13%
Both	57%	62%	64%	61%	70%	57%	76%	62%
No Communication	3%	4%	3%	2%	11%	13%	0%	4%
Method of Communication of Recommendations to Referral Source								
Verbally	6%	7%	8%	5%	2%	7%	4%	6%

Table A5. Continued

Written	77%	77%	69%	77%	66%	90%	87%	76%
Both	17%	16%	22%	18%	33%	4%	9%	18%
No Communication	0%	0%	1%	0%	0%	0%	0%	0%
Setting								
Inpatient	7%	11%	5%	27%	0%	15%	0%	10%
Outpatient	93%	89%	95%	73%	100%	85%	100%	90%
Time Spent Assessing Different Ages								
Children	3%	3%	5%	1%	3%	1%	2%	3%
Adolescents	5%	7%	7%	5%	6%	1%	4%	6%
Young Adults	19%	32%	29%	22%	23%	16%	25%	25%
Older Adults	33%	33%	30%	34%	33%	31%	35%	32%
Geriatric	40%	25%	29%	39%	35%	51%	34%	34%

Table A3. Characteristics of Neuropsychologists based from Means

Means (Standard Deviations)							
Dementia 91	**TBI 81**	**Psych Disorders 63**	**Stroke 37**	**Epilepsy 13**	**Movement Disorders 13**	**MS 11**	**Total 309**
Years Conducting Assessments as a Licensed Psychologist							
13.32 (10.04)	16.34 (10.93)	12.83 (10.54)	12.97 (9.60)	20.23 (11.71)	12.54 (8.89)	14.30 (7.66)	14.25 (10.37)
Individualize Recommendations (1-5)							
3.99 (0.81)	3.84 (0.94)	3.74 (0.85)	3.95 (0.81)	3.77 (0.93)	4.00 (0.82)	4.18 (0.60)	3.89 (0.85)
Number of Recommendations Provided per Patient							
7.53 (3.00)	7.47 (3.28)	6.71 (3.78)	7.25 (2.35)	6.08 (2.36)	6.92 (1.71)	7.09 (2.74)	7.21 (3.11)
Neuropsychological Reports per Month							
16.68 (8.36)	13.99 (10.48)	16.24 (19.76)	18.28 (7.92)	21.15 (11.70)	22.46 (12.56)	19.64 (9.76)	16.61 (12.43)
Minutes Conduct Verbal Feedback per Patient							
47.29 (23.79)	47.78 (23.55)	43.62 (23.46)	46.03 (16.88)	41.77 (15.53)	43.31 (17.03)	45.55 (14.22)	46.06 (21.98)

Table A4. Patient Characteristics based from Percentages

	Dementia 91	**TBI 81**	**Psych Disorders 63**	**Stroke 37**	**Epilepsy 13**	**Movement Disorders 13**	**MS 11**	**Total 309**
Member of minority group	29%	32%	30%	26%	36%	13%	17%	29%

Table A5. Patient Characteristics based from Means and Standard Deviations

Means (Standard Deviations)							
Dementia 91	**TBI 81**	**Psych Disorders 63**	**Stroke 37**	**Epilepsy 13**	**Movement Disorders 13**	**MS 11**	**Total 309**
Caregiver attendance at neuropsychological appointment (1-5)							
3.97 (0.50)	3.67 (0.82)	3.05 (0.85)	3.95 (0.57)	3.54 (0.78)	4.23 (0.44)	3.27 (0.65)	3.67 (0.78)
Age							
54.31 (5.60)	21.59 (11.23)	27.02 (14.20)	43.17 (12.38)	22.38 (6.46)	47.15 (4.10)	27.6 (4.59)	36.33 (17.19)
Motivation (1-5)							
3.40 (0.60)	3.26 (0.55)	3.16 (0.55)	3.41 (0.64)	3.38 (0.77)	3.77 (0.60)	3.45 (0.52)	3.33 (0.60)

Table A6. A. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for All Diagnoses

All Diagnoses	Often Always		Never Rarely
Engage in activities known to improve mood	84.36%	Adherence to medications	1.63%
Adherence to medications	83.33%	Engage in activities known to improve mood	3.58%
Calendar, memory notebook, or audio recorder	78.32%	Calendar, memory notebook, or audio recorder	4.21%
External cues (e.g., alarms, reminders, labels)	77.20%	External cues (e.g., alarms, reminders, labels)	5.21%
Exercise	76.62%	Exercise	5.52%
Eat healthy/diet	73.46%	Sleep hygiene	6.47%
Develop a schedule/routine	71.75%	Neuropsychological re-evaluation after a specific time period has elapsed	8.09%
Centralized location to keep important items	71.57%	Psychiatrist	8.44%
Engage in one task at a time	69.90%	Develop a schedule/routine	8.44%
Sleep hygiene	67.64%	Allow extra time to complete tasks or express thoughts	8.47%
Pill box	66.99%	Engage in one task at a time	9.06%
Allow extra time to complete tasks or express thoughts	66.45%	Eat healthy/diet	9.39%
Limit distraction	66.34%	Reduce use of drugs	9.74%
Engage in activities to promote mental stimulation	66.23%	Engage in activities to promote mental stimulation	10.39%
Neuropsychological re-evaluation after a specific time period has elapsed	64.08%	Pill box	10.68%
Increased supervision of patient's activities of daily living	62.78%	Centralized location to keep important items	10.78%
Pace activities	62.78%	Limit distraction	11.33%
Self-care	62.46%	Pace activities	11.65%
Individual therapy	54.10%	Increased supervision of patient's activities of daily living	11.97%
Medical doctor	53.11%	Individual therapy	12.13%
Reduce use of drugs	52.60%	Medical doctor	13.44%
Supervision over patient's important decisions	52.10%	Medication management by primary care physician (PCP) for mental health concerns	13.73%
Engage in challenging tasks at most alert/effective time during the day	49.51%	Self-care	14.89%
Psychiatrist	48.70%	Supervision over patient's important decisions	17.15%
Check work regularly	48.05%	Support group	20.59%
Medication management by primary care physician (PCP) for mental health concerns	47.39%	Check work regularly	20.78%

Table A6. A. Continued

On-the-road assessment	44.16%	Reasonable accommodations	22.48%
Link behaviors that occur naturally together	44.16%	Engage in challenging tasks at most alert/effective time during the day	23.62%
Referral to an agency	43.83%	Modification in caregiver communication style with patient	23.70%
Caregiver attendance at patients medical appointments	43.51%	CPAP machine use	24.43%
CPAP machine use	41.37%	Adjust responsibilities at work or school	24.68%
Power of attorney	41.10%	On-the-road assessment	25.00%
Arrange environment at home to mitigate safety risks	40.45%	Power of attorney	25.89%
Limit distractions while driving	39.47%	Referral to an agency	25.97%
Modification in caregiver communication style with patient	39.29%	Caregiver attendance at patients medical appointments	27.27%
Support group	38.56%	Sleep study	27.45%
Limit driving to low-demand conditions	35.50%	Link behaviors that occur naturally together	28.57%
Reasonable accommodations	34.85%	Arrange environment at home to mitigate safety risks	29.45%
Adjust responsibilities at work or school	32.14%	Stop driving	33.01%
Maximize protective steps to avoid head injury	30.74%	Limit driving to low-demand conditions	33.22%
Cognitive rehabilitation	29.55%	Elaboration strategies	33.66%
Elaboration strategies	29.41%	Vocational rehabilitation services	35.06%
Family members should routinely observe patients driving to check safety	29.22%	Limit distractions while driving	35.53%
Social worker	25.97%	Gradual return to work or school	36.69%
Gradual return to work or school	25.97%	Cognitive rehabilitation	37.01%
Specific book or website	25.65%	Consider other positions that may be more appropriate	37.01%
Stop driving	23.86%	Alternative modes of transportation	37.46%
Use a phrase or action that decreases likelihood of impulsive behavior	23.30%	Apply for disability	37.46%
Alternative modes of transportation	20.85%	Social worker	37.66%
Sleep study	18.30%	Family members should routinely observe patients driving to check safety	38.64%
Speech therapist	17.97%	Current position is no longer appropriate	39.87%
Vocational rehabilitation services	17.86%	Speech therapist	40.85%
Respite care/Home health aid	16.50%	Maximize protective steps to avoid head injury	42.39%
Life alert system	14.33%	Occupational therapist	43.09%
Assisted living	13.68%	Respite care/Home health aid	43.37%
Group Therapy	12.62%	Specific book or website	44.16%
Identification bracelet for patient with caregivers contact information	11.69%	Assisted living	44.95%

Table A6. A. Continued

Occupational therapist Apply for disability	11.51% 10.75%	Physical therapist Substance abuse treatment	46.58% 49.19%
Current position is no longer appropriate	10.13%	Use a phrase or action that decreases likelihood of impulsive behavior	49.84%
Physical therapist	10.10%	Adult daycare	52.27%
Consider other positions that may be more appropriate	10.06%	Marital therapy	52.60%
Adult daycare	9.74%	Family therapy	57.28%
Substance abuse treatment	8.41%	Group Therapy	57.28%
Family therapy	4.21%	Life alert system	57.65%
Marital therapy	3.90%	Identification bracelet for patient with caregivers contact information	66.56%
Dietician	2.62%	Dietician	74.75%

Table A6. B. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for Dementia Patients

Dementia	**Often Always**		**Never Rarely**
Increased supervision of patient's activities of daily living	93.41%	Increased supervision of patient's activities of daily living	0.00%
Engage in activities known to improve mood	86.81%	Adherence to medications	0.00%
Adherence to medications	85.23%	Supervision over patient's important decisions	1.10%
Calendar, memory notebook, or audio recorder	84.62%	Calendar, memory notebook, or audio recorder	1.10%
Pill box	84.62%	Pill box	2.20%
External cues (e.g., alarms, reminders, labels)	84.44%	Neuropsychological re-evaluation after a specific time period has elapsed	3.30%
Exercise	80.22%	Engage in activities known to improve mood	3.30%
Centralized location to keep important items	80.22%	External cues (e.g., alarms, reminders, labels)	3.33%
Supervision over patient's important decisions	79.12%	Exercise	4.40%
Neuropsychological re-evaluation after a specific time period has elapsed	78.02%	Referral to an agency	4.4%
Engage in activities to promote mental stimulation	76.92%	Medical doctor	4.44%
Eat healthy/diet	75.82%	Engage in activities to promote mental stimulation	6.59%
Develop a schedule/routine	74.73%	Centralized location to keep important items	6.59%

Table A6. B. Continued

Referral to an agency	71.4%	On-the-road assessment	6.6%
Engage in one task at a time	68.13%	Power of attorney	7.69%
Medical doctor	67.78%	Sleep hygiene	7.69%
Power of attorney	62.64%	Eat healthy/diet	9.89%
Allow extra time to complete tasks or express thoughts	62.64%	Develop a schedule/routine	9.89%
On-the-road assessment	62.6%	Self-care	10.99%
Self-care	61.54%	Stop driving	11.0%
Limit distraction	60.44%	Engage in one task at a time	12.09%
Sleep hygiene	58.24%	Reduce use of drugs	13.33%
Caregiver attendance at patients medical appointments	56.67%	Assisted living	14.44%
Pace activities	56.04%	CPAP machine use	14.61%
Arrange environment at home to mitigate safety risks	52.75%	Modification in caregiver communication style with patient	15.56%
Modification in caregiver communication style with patient	52.22%	Medication management by primary care physician (PCP) for mental health concerns	15.73%
Limit driving to low-demand conditions	49.5%	Arrange environment at home to mitigate safety risks	16.48%
Stop driving	49.5%	Limit distraction	16.48%
Engage in challenging tasks at most alert/effective time during the day	47.25%	Allow extra time to complete tasks or express thoughts	16.48%
Support group	46.67%	Support group	17.78%
Link behaviors that occur naturally together	46.15%	Psychiatrist	18.68%
Reduce use of drugs	44.44%	Pace activities	19.78%
Medication management by primary care physician (PCP) for mental health concerns	43.82%	Alternative modes of transportation	22.0%
Family members should routinely observe patients driving to check safety	42.9%	Caregiver attendance at patients medical appointments	22.22%
CPAP machine use	42.70%	Respite care/Home health aid	23.08%
Check work regularly	41.76%	Sleep study	25.27%
Specific book or website	37.4%	Check work regularly	25.27%
Limit distractions while driving	36.7%	Engage in challenging tasks at most alert/effective time during the day	26.37%

Table A6. B. Continued

Alternative modes of transportation	35.2%	Limit driving to low-demand conditions	27.5%
Social worker	35.2%	Link behaviors that occur naturally together	28.57%
Elaboration strategies	34.44%	Adult daycare	29.67%
Assisted living	30.00%	Social worker	29.7%
Psychiatrist	29.67%	Specific book or website	30.8%
Respite care/Home health aid	27.47%	Life alert system	33.33%
Life alert system	26.67%	Individual therapy	33.33%
Individual therapy	26.67%	Family members should routinely observe patients driving to check safety	34.1%
Use a phrase or action that decreases likelihood of impulsive behavior	24.18%	Elaboration strategies	34.44%
Maximize protective steps to avoid head injury	23.08%	Limit distractions while driving	38.9%
Identification bracelet for patient with caregivers contact information	20.00%	Current position is no longer appropriate	40.00%
Adult daycare	17.58%	Maximize protective steps to avoid head injury	42.86%
Current position is no longer appropriate	15.56%	Apply for disability	43.33%
Cognitive rehabilitation	15.38%	Adjust responsibilities at work or school	46.67%
Sleep study	15.38%	Identification bracelet for patient with caregivers contact information	47.78%
Apply for disability	14.44%	Occupational therapist	49.44%
Adjust responsibilities at work or school	13.33%	Speech therapist	51.11%
Physical therapist	9.89%	Reasonable accommodations	51.11%
Speech therapist	8.89%	Physical therapist	51.65%
Reasonable accommodations	7.78%	Use a phrase or action that decreases likelihood of impulsive behavior	56.04%
Occupational therapist	6.74%	Cognitive rehabilitation	58.24%
Consider other positions that may be more appropriate	6.67%	Consider other positions that may be more appropriate	58.89%
Vocational rehabilitation services	5.56%	Vocational rehabilitation services	65.56%
Group Therapy	4.40%	Family therapy	68.13%
Dietician	3.33%	Dietician	71.11%
Substance abuse treatment	2.20%	Group Therapy	73.63%
Gradual return to work or school	1.11%	Marital therapy	74.44%
Family therapy	1.10%	Substance abuse treatment	74.73%
Marital therapy	0.00%	Gradual return to work or school	76.67%

Table A6. C. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for TBI Patients

Traumatic Brain Injury (TBI)	**Often Always**		**Never Rarely**
Calendar, memory notebook, or audio recorder	93.83%	Sleep hygiene	1.23%
External cues (e.g., alarms, reminders, labels)	90.12%	Individual therapy	1.25%
Adherence to medications	83.95%	Reduce use of drugs	2.47%
Limit distraction	82.72%	Engage in one task at a time	2.47%
Sleep hygiene	80.25%	Calendar, memory notebook, or audio recorder	2.47%
Engage in activities known to improve mood	80.25%	Psychiatrist	2.50%
Engage in one task at a time	79.01%	Neuropsychological re-evaluation after a specific time period has elapsed	3.70%
Develop a schedule/routine	79.01%	Adherence to medications	3.70%
Pace activities	77.78%	Engage in activities known to improve mood	3.70%
Centralized location to keep important items	77.22%	Limit distraction	3.70%
Allow extra time to complete tasks or express thoughts	76.54%	Pace activities	3.70%
Reduce use of drugs	72.84%	Allow extra time to complete tasks or express thoughts	3.70%
Exercise	71.60%	External cues (e.g., alarms, reminders, labels)	3.70%
Eat healthy/diet	71.60%	Reasonable accommodations	4.94%
Individual therapy	68.75%	Vocational rehabilitation services	6.17%
Self-care	66.67%	Develop a schedule/routine	6.17%
Neuropsychological re-evaluation after a specific time period has elapsed	64.20%	Exercise	7.41%
Engage in activities to promote mental stimulation	61.73%	Gradual return to work or school	8.64%
Pill box	61.73%	Engage in activities to promote mental stimulation	9.88%
Reasonable accommodations	60.49%	Medication management by primary care physician (PCP) for mental health concerns	10.00%
Psychiatrist	58.75%	Eat healthy/diet	11.11%
Check work regularly	58.02%	Adjust responsibilities at work or school	11.11%
Increased supervision of patient's activities of daily living	55.56%	Cognitive rehabilitation	12.35%
Cognitive rehabilitation	54.32%	Check work regularly	12.35%
Gradual return to work or school	53.09%	Centralized location to keep important items	12.66%

Table A6. C. Continued

Limit distractions while driving	51.28%	Increased supervision of patient's activities of daily living	13.58%
Medical doctor	50.63%	Self-care	13.58%
Adjust responsibilities at work or school	50.62%	Medical doctor	13.92%
Medication management by primary care physician (PCP) for mental health concerns	50.00%	Pill box	16.05%
Maximize protective steps to avoid head injury	48.15%	Support group	16.46%
Engage in challenging tasks at most alert/effective time during the day	48.15%	Supervision over patient's important decisions	17.28%
Supervision over patient's important decisions	46.91%	Consider other positions that may be more appropriate	18.52%
Link behaviors that occur naturally together	46.91%	Speech therapist	18.75%
On-the-road assessment	46.25%	Engage in challenging tasks at most alert/effective time during the day	19.75%
Support group	41.77%	On-the-road assessment	20.00%
Arrange environment at home to mitigate safety risks	40.74%	Caregiver attendance at patients medical appointments	22.22%
Caregiver attendance at patients medical appointments	39.51%	Substance abuse treatment	22.22%
Referral to an agency	38.75%	Modification in caregiver communication style with patient	22.22%
Modification in caregiver communication style with patient	38.27%	Limit distractions while driving	23.08%
Limit driving to low-demand conditions	37.50%	Occupational therapist	25.00%
Vocational rehabilitation services	35.80%	Maximize protective steps to avoid head injury	25.93%
Power of attorney	34.57%	Power of attorney	27.16%
Speech therapist	33.75%	Link behaviors that occur naturally together	27.16%
CPAP machine use	33.33%	Elaboration strategies	30.00%
Elaboration strategies	31.25%	Physical therapist	31.25%
Use a phrase or action that decreases likelihood of impulsive behavior	28.40%	Sleep study	31.25%
Family members should routinely observe patients driving to check safety	26.25%	Current position is no longer appropriate	31.25%
Specific book or website	25.00%	Alternative modes of transportation	32.50%
Sleep study	25.00%	Referral to an agency	32.50%
Social worker	17.50%	Limit driving to low-demand conditions	33.75%
Occupational therapist	17.50%	Arrange environment at home to mitigate safety risks	34.57%
Consider other positions that may be more appropriate	17.28%	CPAP machine use	34.57%
Group Therapy	16.05%	Apply for disability	36.25%

Table A6. C. Continued

Substance abuse treatment	14.81%	Family members should routinely observe patients driving to check safety	38.75%
Alternative modes of transportation	13.75%	Stop driving	40.51%
Current position is no longer appropriate	11.25%	Marital therapy	40.74%
Stop driving	10.13%	Group Therapy	43.21%
Physical therapist	10.00%	Family therapy	44.44%
Respite care/Home health aid	9.88%	Use a phrase or action that decreases likelihood of impulsive behavior	44.44%
Adult daycare	8.75%	Social worker	45.00%
Marital therapy	8.64%	Specific book or website	46.25%
Life alert system	7.50%	Respite care/Home health aid	51.85%
Assisted living	7.50%	Assisted living	63.75%
Identification bracelet for patient with caregivers contact information	7.41%	Adult daycare	70.00%
Family therapy	7.41%	Life alert system	72.50%
Apply for disability	6.25%	Identification bracelet for patient with caregivers contact information	72.84%
Dietician	0.00%	Dietician	76.25%

Table A6. D. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for Psychiatric Disorder Patients

Psychiatric Disorders	**Often Always**		**Never Rarely**
Psychiatrist	82.54%	Psychiatrist	0.00%
Individual therapy	82.54%	Individual therapy	1.59%
Engage in activities known to improve mood	82.26%	Adherence to medications	1.59%
Adherence to medications	77.78%	Engage in activities known to improve mood	4.84%
Exercise	73.02%	Exercise	6.35%
Sleep hygiene	69.84%	Reduce use of drugs	7.94%
Eat healthy/diet	68.25%	Sleep hygiene	7.94%
Self-care	58.73%	Allow extra time to complete tasks or express thoughts	8.06%
Develop a schedule/routine	57.14%	Eat healthy/diet	11.11%
Medication management by primary care physician (PCP) for mental health concerns	52.38%	External cues (e.g., alarms, reminders, labels)	11.29%
Engage in activities to promote mental stimulation	52.38%	Pace activities	12.70%
Limit distraction	52.38%	Develop a schedule/routine	12.70%
Reduce use of drugs	50.79%	Calendar, memory notebook, or audio recorder	12.70%
Engage in one task at a time	50.79%	Engage in one task at a time	14.29%
Calendar, memory notebook, or audio recorder	50.79%	Limit distraction	15.87%

Table A6. D. Continued

Centralized location to keep important items	46.77%	Centralized location to keep important items	16.13%
Pace activities	46.03%	Self-care	19.05%
Pill box	46.03%	Reasonable accommodations	19.05%
External cues (e.g., alarms, reminders, labels)	45.16%	Medication management by primary care physician (PCP) for mental health concerns	22.22%
Allow extra time to complete tasks or express thoughts	43.55%	Engage in activities to promote mental stimulation	22.22%
Medical doctor	35.48%	Pill box	22.22%
Check work regularly	35.48%	Neuropsychological re-evaluation after a specific time period has elapsed	23.81%
CPAP machine use	34.92%	Medical doctor	24.19%
Engage in challenging tasks at most alert/effective time during the day	34.92%	Adjust responsibilities at work or school	25.40%
Link behaviors that occur naturally together	34.92%	Sleep study	25.81%
Neuropsychological re-evaluation after a specific time period has elapsed	33.33%	Check work regularly	25.81%
Reasonable accommodations	30.16%	Increased supervision of patient's activities of daily living	26.98%
Adjust responsibilities at work or school	30.16%	Gradual return to work or school	26.98%
Increased supervision of patient's activities of daily living	26.98%	Substance abuse treatment	28.57%
Modification in caregiver communication style with patient	26.98%	CPAP machine use	30.16%
Arrange environment at home to mitigate safety risks	23.81%	Support group	31.75%
Caregiver attendance at patients medical appointments	23.81%	Engage in challenging tasks at most alert/effective time during the day	33.33%
Group Therapy	22.22%	Group Therapy	36.51%
Power of attorney	20.63%	Vocational rehabilitation services	38.10%
Support group	20.63%	Marital therapy	39.68%
Elaboration strategies	19.35%	Arrange environment at home to mitigate safety risks	41.27%
Limit distractions while driving	19.05%	Supervision over patient's important decisions	41.27%
Gradual return to work or school	19.05%	Social worker	41.27%
Referral to an agency	17.46%	Link behaviors that occur naturally together	41.27%
Maximize protective steps to avoid head injury	17.46%	Elaboration strategies	43.55%
Supervision over patient's important decisions	15.87%	Caregiver attendance at patients medical appointments	44.44%
Social worker	15.87%	Consider other positions that may be more appropriate	44.44%

Table A6. D. Continued

Vocational rehabilitation services	15.87%	Modification in caregiver communication style with patient	46.03%
Use a phrase or action that decreases likelihood of impulsive behavior	15.87%	Apply for disability	47.62%
Cognitive rehabilitation	14.52%	Power of attorney	50.79%
Substance abuse treatment	14.29%	Referral to an agency	50.79%
Sleep study	12.90%	Limit distractions while driving	52.38%
Specific book or website	12.70%	Family therapy	52.38%
Respite care/Home health aid	9.52%	Use a phrase or action that decreases likelihood of impulsive behavior	52.38%
Limit driving to low-demand conditions	9.52%	Cognitive rehabilitation	53.23%
Family members should routinely observe patients driving to check safety	9.52%	Family members should routinely observe patients driving to check safety	53.97%
Marital therapy	7.94%	Limit driving to low-demand conditions	57.14%
Consider other positions that may be more appropriate	7.94%	Specific book or website	58.73%
Apply for disability	7.94%	Maximize protective steps to avoid head injury	61.90%
Alternative modes of transportation	6.35%	On-the-road assessment	63.49%
Family therapy	6.35%	Current position is no longer appropriate	64.52%
Adult daycare	4.76%	Speech therapist	66.13%
Identification bracelet for patient with caregivers contact information	4.76%	Respite care/Home health aid	66.67%
On-the-road assessment	4.76%	Adult daycare	68.25%
Physical therapist	3.23%	Assisted living	68.25%
Life alert system	3.17%	Alternative modes of transportation	68.25%
Assisted living	3.17%	Physical therapist	69.35%
Speech therapist	1.61%	Occupational therapist	70.97%
Occupational therapist	1.61%	Stop driving	73.02%
Dietician	1.61%	Dietician	77.42%
Current position is no longer appropriate	1.61%	Life alert system	80.95%
Stop driving	0.00%	Identification bracelet for patient with caregivers contact information	85.71%

Table A6. E. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for Stroke Patients

Stroke	**Often Always**		**Never Rarely**
Engage in activities known to improve mood	88.89%	Neuropsychological re-evaluation after a specific time period has elapsed	0.00%
Exercise	86.49%	Adherence to medications	0.00%
Eat healthy/diet	86.49%	Increased supervision of patient's activities of daily living	2.70%
Adherence to medications	86.49%	Exercise	2.70%

Table A6. E. Continued

Increased supervision of patient's activities of daily living	83.78%	Calendar, memory notebook, or audio recorder	2.70%
External cues (e.g., alarms, reminders, labels)	83.78%	External cues (e.g., alarms, reminders, labels)	2.70%
Develop a schedule/routine	83.33%	Engage in activities known to improve mood	2.78%
Calendar, memory notebook, or audio recorder	81.08%	Supervision over patient's important decisions	5.41%
Centralized location to keep important items	81.08%	Eat healthy/diet	5.41%
Pill box	81.08%	Allow extra time to complete tasks or express thoughts	5.41%
Engage in one task at a time	78.38%	Pill box	5.41%
Allow extra time to complete tasks or express thoughts	78.38%	Engage in activities to promote mental stimulation	5.56%
Neuropsychological re-evaluation after a specific time period has elapsed	75.68%	Develop a schedule/routine	5.56%
Supervision over patient's important decisions	72.97%	On-the-road assessment	8.11%
Engage in activities to promote mental stimulation	69.44%	Medication management by primary care physician (PCP) for mental health concerns	8.11%
Self-care	67.57%	Medical doctor	8.11%
Limit distraction	64.86%	Reduce use of drugs	8.11%
Pace activities	62.16%	Sleep hygiene	8.11%
Engage in challenging tasks at most alert/effective time during the day	62.16%	Engage in one task at a time	8.11%
On-the-road assessment	59.46%	Individual therapy	8.33%
CPAP machine use	59.46%	Reasonable accommodations	8.33%
Sleep hygiene	56.76%	Psychiatrist	10.81%
Caregiver attendance at patients medical appointments	54.05%	Stop driving	11.11%
Reasonable accommodations	52.78%	Arrange environment at home to mitigate safety risks	13.51%
Check work regularly	51.35%	CPAP machine use	13.51%
Link behaviors that occur naturally together	51.35%	Gradual return to work or school	13.51%
Limit distractions while driving	48.65%	Adjust responsibilities at work or school	13.51%
Medical doctor	48.65%	Limit distraction	13.51%
Arrange environment at home to mitigate safety risks	45.95%	Pace activities	13.51%
Power of attorney	45.95%	Centralized location to keep important items	13.51%
Reduce use of drugs	45.95%	Power of attorney	16.22%
Limit driving to low-demand conditions	43.24%	Limit driving to low-demand conditions	16.22%
Adjust responsibilities at work or school	43.24%	Self-care	16.22%

Table A6. E. Continued

Medication management by primary care physician (PCP) for mental health concerns	40.54%	Assisted living	18.92%
Gradual return to work or school	40.54%	Cognitive rehabilitation	18.92%
Referral to an agency	37.84%	Engage in challenging tasks at most alert/effective time during the day	18.92%
Maximize protective steps to avoid head injury	35.14%	Modification in caregiver communication style with patient	18.92%
Modification in caregiver communication style with patient	35.14%	Link behaviors that occur naturally together	18.92%
Individual therapy	33.33%	Family members should routinely observe patients driving to check safety	24.32%
Support group	32.43%	Support group	24.32%
Cognitive rehabilitation	32.43%	Current position is no longer appropriate	24.32%
Elaboration strategies	32.43%	Consider other positions that may be more appropriate	24.32%
Family members should routinely observe patients driving to check safety	29.73%	Alternative modes of transportation	25.00%
Stop driving	27.78%	Respite care/Home health aid	27.03%
Alternative modes of transportation	25.00%	Referral to an agency	27.03%
Occupational therapist	25.00%	Speech therapist	27.03%
Life alert system	24.32%	Apply for disability	27.03%
Social worker	24.32%	Check work regularly	27.03%
Psychiatrist	24.32%	Sleep study	27.78%
Speech therapist	24.32%	Vocational rehabilitation services	29.73%
Use a phrase or action that decreases likelihood of impulsive behavior	24.32%	Occupational therapist	30.56%
Respite care/Home health aid	21.62%	Caregiver attendance at patients medical appointments	32.43%
Vocational rehabilitation services	21.62%	Social worker	35.14%
Sleep study	19.44%	Elaboration strategies	35.14%
Specific book or website	18.92%	Adult daycare	37.84%
Physical therapist	16.22%	Limit distractions while driving	37.84%
Apply for disability	16.22%	Physical therapist	37.84%
Current position is no longer appropriate	13.51%	Maximize protective steps to avoid head injury	37.84%
Assisted living	10.81%	Life alert system	40.54%
Identification bracelet for patient with caregivers contact information	10.81%	Specific book or website	45.95%
Group Therapy	10.81%	Use a phrase or action that decreases likelihood of impulsive behavior	48.65%
Consider other positions that may be more appropriate	10.81%	Substance abuse treatment	54.05%
Dietician	5.56%	Marital therapy	54.05%
Adult daycare	5.41%	Family therapy	56.76%
Substance abuse treatment	2.70%	Identification bracelet for patient with caregivers contact information	67.57%
Family therapy	2.70%	Group Therapy	67.57%

Table A6. E. Continued

Marital therapy	0.00%	Dietician	75.00%

Table A6. F. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for Epilepsy Patients

Epilepsy	**Often Always**		**Never Rarely**
Adherence to medications	84.62%	Adherence to medications	0.00%
Neuropsychological re-evaluation after a specific time period has elapsed	76.92%	Reasonable accommodations	0.00%
Sleep hygiene	69.23%	Adjust responsibilities at work or school	0.00%
Individual therapy	61.54%	Psychiatrist	7.69%
Engage in activities known to improve mood	61.54%	Medication management by primary care physician (PCP) for mental health concerns	7.69%
Exercise	58.33%	Individual therapy	7.69%
Medical doctor	53.85%	Sleep study	7.69%
Eat healthy/diet	53.85%	Eat healthy/diet	7.69%
Reasonable accommodations	53.85%	Engage in activities known to improve mood	7.69%
Centralized location to keep important items	53.85%	Vocational rehabilitation services	7.69%
Allow extra time to complete tasks or express thoughts	50.00%	Modification in caregiver communication style with patient	7.69%
Social worker	46.15%	Calendar, memory notebook, or audio recorder	7.69%
Psychiatrist	46.15%	Exercise	8.33%
Engage in activities to promote mental stimulation	46.15%	Allow extra time to complete tasks or express thoughts	8.33%
Self-care	46.15%	Increased supervision of patient's activities of daily living	15.38%
Limit distraction	46.15%	Caregiver attendance at patients medical appointments	15.38%
Pace activities	46.15%	Stop driving	15.38%
Engage in one task at a time	46.15%	Support group	15.38%
Develop a schedule/routine	46.15%	Neuropsychological re-evaluation after a specific time period has elapsed	15.38%
External cues (e.g., alarms, reminders, labels)	46.15%	Medical doctor	15.38%
On-the-road assessment	38.46%	Reduce use of drugs	15.38%
Referral to an agency	38.46%	Sleep hygiene	15.38%
Engage in challenging tasks at most alert/effective time during the day	38.46%	Engage in activities to promote mental stimulation	15.38%
Limit distractions while driving	33.33%	Apply for disability	15.38%
Arrange environment at home to mitigate safety risks	30.77%	Limit distraction	15.38%
Supervision over patient's important decisions	30.77%	Pace activities	15.38%

Table A6. F. Continued

Caregiver attendance at patients medical appointments	30.77%	Develop a schedule/routine	15.38%
Identification bracelet for patient with caregivers contact information	30.77%	Centralized location to keep important items	15.38%
Stop driving	30.77%	Pill box	15.38%
Cognitive rehabilitation	30.77%	External cues (e.g., alarms, reminders, labels)	15.38%
CPAP machine use	30.77%	Consider other positions that may be more appropriate	23.08%
Reduce use of drugs	30.77%	Engage in one task at a time	23.08%
Maximize protective steps to avoid head injury	30.77%	Engage in challenging tasks at most alert/effective time during the day	23.08%
Check work regularly	30.77%	Check work regularly	23.08%
Calendar, memory notebook, or audio recorder	30.77%	Link behaviors that occur naturally together	25.00%
Pill box	30.77%	Supervision over patient's important decisions	30.77%
Limit driving to low-demand conditions	25.00%	On-the-road assessment	30.77%
Link behaviors that occur naturally together	25.00%	Cognitive rehabilitation	30.77%
Power of attorney	23.08%	CPAP machine use	30.77%
Increased supervision of patient's activities of daily living	23.08%	Self-care	30.77%
Family members should routinely observe patients driving to check safety	23.08%	Gradual return to work or school	30.77%
Alternative modes of transportation	23.08%	Limit driving to low-demand conditions	33.33%
Specific book or website	23.08%	Referral to an agency	38.46%
Medication management by primary care physician (PCP) for mental health concerns	23.08%	Speech therapist	38.46%
Support group	23.08%	Occupational therapist	38.46%
Gradual return to work or school	23.08%	Current position is no longer appropriate	38.46%
Adjust responsibilities at work or school	23.08%	Elaboration strategies	38.46%
Modification in caregiver communication style with patient	23.08%	Arrange environment at home to mitigate safety risks	46.15%
Life alert system	15.38%	Power of attorney	46.15%
Assisted living	15.38%	Alternative modes of transportation	46.15%
Substance abuse treatment	15.38%	Social worker	46.15%
Group Therapy	15.38%	Marital therapy	46.15%
Apply for disability	15.38%	Use a phrase or action that decreases likelihood of impulsive behavior	46.15%
Respite care/Home health aid	7.69%	Limit distractions while driving	50.00%
Adult daycare	7.69%	Substance abuse treatment	53.85%
Family therapy	7.69%	Maximize protective steps to avoid head injury	53.85%
Speech therapist	7.69%	Life alert system	61.54%
Sleep study	7.69%	Respite care/Home health aid	61.54%

Table A6. F. Continued

Use a phrase or action that decreases likelihood of impulsive behavior	7.69%	Identification bracelet for patient with caregivers contact information	61.54%
Elaboration strategies	7.69%	Family members should routinely observe patients driving to check safety	61.54%
Marital therapy	0.00%	Family therapy	61.54%
Physical therapist	0.00%	Group Therapy	61.54%
Occupational therapist	0.00%	Adult daycare	69.23%
Dietician	0.00%	Assisted living	69.23%
Current position is no longer appropriate	0.00%	Specific book or website	69.23%
Consider other positions that may be more appropriate	0.00%	Physical therapist	69.23%
Vocational rehabilitation services	0.00%	Dietician	69.23%

Table A6. G. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for MS Patients

Multiple Sclerosis (MS)	**Often Always**		**Never Rarely**
Engage in activities known to improve mood	100.00%	Limit distractions while driving	0.00%
Pace activities	100.00%	Psychiatrist	0.00%
Engage in one task at a time	100.00%	Individual therapy	0.00%
Calendar, memory notebook, or audio recorder	100.00%	Engage in activities to promote mental stimulation	0.00%
Engage in activities to promote mental stimulation	90.91%	Engage in activities known to improve mood	0.00%
Engage in challenging tasks at most alert/effective time during the day	90.91%	Self-care	0.00%
Allow extra time to complete tasks or express thoughts	90.91%	Reasonable accommodations	0.00%
Develop a schedule/routine	90.91%	Limit distraction	0.00%
External cues (e.g., alarms, reminders, labels)	90.91%	Pace activities	0.00%
Exercise	81.82%	Engage in one task at a time	0.00%
Sleep hygiene	81.82%	Allow extra time to complete tasks or express thoughts	0.00%
Limit distraction	81.82%	Develop a schedule/routine	0.00%
Centralized location to keep important items	81.82%	Calendar, memory notebook, or audio recorder	0.00%
Individual therapy	72.73%	Centralized location to keep important items	0.00%
Eat healthy/diet	72.73%	Pill box	0.00%
Adherence to medications	72.73%	External cues (e.g., alarms, reminders, labels)	0.00%
Self-care	72.73%	Limit driving to low-demand conditions	9.09%
Medication management by primary care physician (PCP) for mental health concerns	63.64%	Exercise	9.09%
Support group	63.64%	Eat healthy/diet	9.09%

Table A6. G. Continued

Check work regularly	63.64%	Adherence to medications	9.09%
Neuropsychological re-evaluation after a specific time period has elapsed	54.55%	Sleep hygiene	9.09%
Link behaviors that occur naturally together	54.55%	Adjust responsibilities at work or school	9.09%
Pill box	54.55%	Engage in challenging tasks at most alert/effective time during the day	9.09%
Limit distractions while driving	45.45%	Elaboration strategies	9.09%
Medical doctor	45.45%	Referral to an agency	18.18%
Use a phrase or action that decreases likelihood of impulsive behavior	45.45%	Medication management by primary care physician (PCP) for mental health concerns	18.18%
Specific book or website	36.36%	Support group	18.18%
Psychiatrist	36.36%	Neuropsychological re-evaluation after a specific time period has elapsed	18.18%
CPAP machine use	36.36%	Cognitive rehabilitation	18.18%
Reduce use of drugs	36.36%	Vocational rehabilitation services	18.18%
Adjust responsibilities at work or school	36.36%	Check work regularly	18.18%
Power of attorney	27.27%	Link behaviors that occur naturally together	18.18%
Caregiver attendance at patients medical appointments	27.27%	Specific book or website	27.27%
Limit driving to low-demand conditions	27.27%	Reduce use of drugs	27.27%
On-the-road assessment	27.27%	Current position is no longer appropriate	27.27%
Referral to an agency	27.27%	Consider other positions that may be more appropriate	27.27%
Social worker	27.27%	Apply for disability	27.27%
Cognitive rehabilitation	27.27%	Modification in caregiver communication style with patient	27.27%
Speech therapist	27.27%	Power of attorney	36.36%
Gradual return to work or school	27.27%	Increased supervision of patient's activities of daily living	36.36%
Reasonable accommodations	27.27%	Caregiver attendance at patients medical appointments	36.36%
Increased supervision of patient's activities of daily living	18.18%	Family members should routinely observe patients driving to check safety	36.36%
Supervision over patient's important decisions	18.18%	Social worker	36.36%
Family members should routinely observe patients driving to check safety	18.18%	Marital therapy	36.36%
Occupational therapist	18.18%	Medical doctor	36.36%
Sleep study	18.18%	Gradual return to work or school	36.36%
Maximize protective steps to avoid head injury	18.18%	On-the-road assessment	45.45%
Modification in caregiver communication style with patient	18.18%	Physical therapist	45.45%
Elaboration strategies	18.18%	CPAP machine use	45.45%
Arrange environment at home to mitigate safety risks	9.09%	Use a phrase or action that decreases likelihood of impulsive behavior	45.45%

Table A6. G. Continued

Respite care/Home health aid	9.09%	Supervision over patient's important decisions	54.55%
Dietician	9.09%	Stop driving	54.55%
Consider other positions that may be more appropriate	9.09%	Speech therapist	54.55%
Vocational rehabilitation services	9.09%	Occupational therapist	54.55%
Life alert system	0.00%	Sleep study	54.55%
Adult daycare	0.00%	Maximize protective steps to avoid head injury	54.55%
Assisted living	0.00%	Arrange environment at home to mitigate safety risks	63.64%
Identification bracelet for patient with caregivers contact information	0.00%	Respite care/Home health aid	63.64%
Stop driving	0.00%	Alternative modes of transportation	63.64%
Alternative modes of transportation	0.00%	Family therapy	63.64%
Substance abuse treatment	0.00%	Adult daycare	72.73%
Marital therapy	0.00%	Assisted living	72.73%
Family therapy	0.00%	Identification bracelet for patient with caregivers contact information	72.73%
Group Therapy	0.00%	Life alert system	81.82%
Physical therapist	0.00%	Dietician	81.82%
Current position is no longer appropriate	0.00%	Group Therapy	90.91%
Apply for disability	0.00%	Substance abuse treatment	100.00%

Table A6. H. Percent of Neuropsychologists who endorsed Often/Always and Never/Rarely for each Recommendation for Movement Disorder Patients

Movement Disorders	**Often Always**		**Never Rarely**
Engage in activities known to improve mood	100.00%	Supervision over patient's important decisions	0.00%
Allow extra time to complete tasks or express thoughts	100.00%	Caregiver attendance at patients medical appointments	0.00%
External cues (e.g., alarms, reminders, labels)	100.00%	Medication management by primary care physician (PCP) for mental health concerns	0.00%
Adherence to medications	92.31%	Neuropsychological re-evaluation after a specific time period has elapsed	0.00%
Engage in one task at a time	92.31%	Physical therapist	0.00%
Calendar, memory notebook, or audio recorder	92.31%	Exercise	0.00%
Increased supervision of patient's activities of daily living	84.62%	Eat healthy/diet	0.00%
Exercise	84.62%	Adherence to medications	0.00%
Limit distraction	84.62%	Engage in activities to promote mental stimulation	0.00%
Pace activities	84.62%	Engage in activities known to improve mood	0.00%
Engage in challenging tasks at most alert/effective time during the day	84.62%	Limit distraction	0.00%

Table A6. H. Continued

Check work regularly	84.62%	Pace activities	0.00%
Pill box	84.62%	Engage in one task at a time	0.00%
Neuropsychological re-evaluation after a specific time period has elapsed	76.92%	Check work regularly	0.00%
Eat healthy/diet	76.92%	Allow extra time to complete tasks or express thoughts	0.00%
CPAP machine use	76.92%	Develop a schedule/routine	0.00%
Engage in activities to promote mental stimulation	76.92%	Calendar, memory notebook, or audio recorder	0.00%
Centralized location to keep important items	76.92%	Centralized location to keep important items	0.00%
Caregiver attendance at patients medical appointments	69.23%	Pill box	0.00%
On-the-road assessment	69.23%	External cues (e.g., alarms, reminders, labels)	0.00%
Medical doctor	69.23%	Stop driving	7.69%
Supervision over patient's important decisions	61.54%	Referral to an agency	7.69%
Limit distractions while driving	61.54%	Support group	7.69%
Family members should routinely observe patients driving to check safety	61.54%	Occupational therapist	7.69%
Medication management by primary care physician (PCP) for mental health concerns	61.54%	CPAP machine use	7.69%
Support group	61.54%	Sleep hygiene	7.69%
Sleep hygiene	61.54%	Engage in challenging tasks at most alert/effective time during the day	7.69%
Modification in caregiver communication style with patient	61.54%	Modification in caregiver communication style with patient	7.69%
Arrange environment at home to mitigate safety risks	53.85%	Individual therapy	8.33%
Self-care	53.85%	Increased supervision of patient's activities of daily living	15.38%
Develop a schedule/routine	53.85%	Limit distractions while driving	15.38%
Elaboration strategies	53.85%	Family members should routinely observe patients driving to check safety	15.38%
Individual therapy	50.00%	Psychiatrist	15.38%
Power of attorney	46.15%	Medical doctor	15.38%
Limit driving to low-demand conditions	46.15%	Speech therapist	15.38%
Stop driving	46.15%	Apply for disability	15.38%
Referral to an agency	46.15%	Link behaviors that occur naturally together	15.38%
Social worker	46.15%	Elaboration strategies	15.38%
Physical therapist	46.15%	Power of attorney	23.08%
Speech therapist	46.15%	Limit driving to low-demand conditions	23.08%
Reduce use of drugs	46.15%	On-the-road assessment	23.08%
Link behaviors that occur naturally together	46.15%	Sleep study	23.08%
Alternative modes of transportation	38.46%	Reduce use of drugs	23.08%
Psychiatrist	38.46%	Self-care	23.08%

Table A6. H. Continued

Cognitive rehabilitation	38.46%	Adjust responsibilities at work or school	23.08%
Maximize protective steps to avoid head injury	38.46%	Consider other positions that may be more appropriate	23.08%
Sleep study	30.77%	Arrange environment at home to mitigate safety risks	30.77%
Adjust responsibilities at work or school	30.77%	Respite care/Home health aid	30.77%
Specific book or website	23.08%	Adult daycare	30.77%
Occupational therapist	23.08%	Alternative modes of transportation	30.77%
Gradual return to work or school	23.08%	Social worker	30.77%
Reasonable accommodations	23.08%	Reasonable accommodations	30.77%
Respite care/Home health aid	15.38%	Current position is no longer appropriate	30.77%
Group Therapy	15.38%	Specific book or website	38.46%
Current position is no longer appropriate	15.38%	Cognitive rehabilitation	38.46%
Apply for disability	15.38%	Maximize protective steps to avoid head injury	38.46%
Vocational rehabilitation services	15.38%	Use a phrase or action that decreases likelihood of impulsive behavior	38.46%
Use a phrase or action that decreases likelihood of impulsive behavior	15.38%	Life alert system	46.15%
Life alert system	7.69%	Vocational rehabilitation services	46.15%
Adult daycare	7.69%	Assisted living	53.85%
Assisted living	7.69%	Marital therapy	53.85%
Identification bracelet for patient with caregivers contact information	7.69%	Gradual return to work or school	53.85%
Dietician	7.69%	Identification bracelet for patient with caregivers contact information	61.54%
Consider other positions that may be more appropriate	7.69%	Group Therapy	69.23%
Substance abuse treatment	0.00%	Substance abuse treatment	76.92%
Marital therapy	0.00%	Family therapy	76.92%
Family therapy	0.00%	Dietician	76.92%

Table A7. A. Additional Recommendations Neuropsychologists Reported Making to Dementia Patients

Dementia (N=20)
Therapy for caregivers
Tell caregivers not to argue with the patient about the accuracy of delusions, instead respond to the emotion associated with the delusion (e.g., reassure)
Relaxation strategies
Discuss adjusting of medications that could contribute to cognitive/mood issues with physicians
Neurofeedback
Increased lighting in the home
Case manager
Tell caregivers to generally keep climate/tone calm
Removal of rugs to avoid possible falls
Elder law attorney
Tell caregivers to choose battles, safety is priority
Have family listen to television (TV) with headsets if the patients gets disturbed by upsetting TV content
Refer to website about financial scams/how to limit mail from sweepstakes schemes
Review estate documents
Medical workup to rule-out reversible causes of cognitive impairment
Living will
Use medical neuropsychologist with prescriptive authority rather than a psychiatrist for medication management
Advance directives
Patient and family engage in future care planning (e.g., will, medical directives, what care will look like etc.)
Planning for future care needs with family
Mood monitoring
Referral to a memory Disorder Clinic
Focus on quality of life over productivity
Behavior management
Monitor for significant change in behavior of mental status
Complete durable power of attorney (DPOA) for healthcare and finances
Respite care for family members
Capacity evaluation
Imaging: if none completed
Family educate self on prognosis/future decline
Home health for specific deficit or RN
Create living will
Consider move to appropriate facility as early as possible to assist in adjustment
Refer to private fiduciary
Involve family and friends in the education of diagnosis and prognosis
Formal behavioral plan for assisted living or home caregivers
Family must care for themselves in order to care for the patient
Plan early for future needs (i.e., placement, living will etc.)
Teach younger family members how to interact
Education family and friends on change in behavior is a result of neurologic change and does not reflect on patient's character
Obtain GPS tracker earlier and do not wait until something happens

Table A7. B. Additional Recommendations Neuropsychologists Reported Making to TBI Patients

TBI (N=18)
Structured schedule for predictability
Referral to BVR
Continue working on symptoms of PTSD in hopes of cognitive symptom reduction/elimination
Redirect energy towards recovery activities instead of dwelling on injury
Referral for re-testing once Veteran has adequate psychological symptom remission
Eye exam
Sexual activity
Use mood ratings/monitoring app
Mindfulness based stress reduction/meditation
Probate/POA
Consider use of assistive device in order to best reduce fall risk and subsequent risk of TBI
Referral for re-testing once veteran has sustained sobriety
Assistive technology
Recreation
Guided meditation audios (mp3 or CD)
Maintain a healthy lifestyle in order to enhance/sustain optimal cognition. Better brain health may be accomplished with the following: healthy diet, regular (physician-approved) aerobic exercise, adequate sleep, regular mental stimulation, supportive social interaction, and avoidance of alcohol/drug abuse
Smoking cessation
Audiologist
Check out online support groups through recognized organizations if no physical ones are available
Books for caregiver not just for the patient
Meditation
Return to old hobbies
Volunteer
Conservatorship
Balance checkbook without calculator first
Case management
Peer network
Individual neurocognitive rehab consultation
Stress reduction
Reduce TV except educational channels
Day treatment for TBI
Brain Injury Association
Veteran's support groups (e.g., wounded warriors)
Knowledge Resources
Consultation to psychiatry for consideration of cognitive medication
Awareness practice
Provide self-monitoring skills
Consultation to neurologist for cognitive medication
Use old knowledge
Self-monitor emotional state in particular
Express feeling as they evolve

Table A7. C. Additional Recommendations Neuropsychologists Reported Making to Psychiatric Disorder Patients

Psychiatric Disorders (N=9)
Psychiatry provider for medications, not psychiatrist (e.g., APNP)
Yoga, meditation, tai chi
Specific ways to enhance learning and recall
Long term care placement
Further psychological assessment
Increase Exercise
Mindfulness and meditation
In home safety evaluation
Always return to PCP for follow-up
Emotion regulation groups
Neurology consult
Improve diet
Yoga
Can call my office for any question they might have in the future
Interpersonal skills groups
Keep the neuropsychological evaluation in a safe place because it contains sensitive information

Table A7. D. Additional Recommendations Neuropsychologists Reported Making to Stroke Patients

Stroke (N=6)
Reduce cardiovascular risk factors such as smoking and alcohol
Repetition of information
Guardianship
Expect adjustment problems
Read out loud
Compliance with medications and interventions
Use of prompts/cues/closed-ended questions if can't freely recall answers
Normalize depression and treat aggressively
Use checklist
Obtain legal advice for financial planning
Assistance with finances/representative payee if necessary
Smartphone apps
Discuss advance directives with family members
Reminders (e.g., phone calls, timers, etc) to take meds at the right time
Tablet apps
Phonemic cueing if unable to identify an intended word while engaging in conversation
Checklists
Errorless learning

Table A7. E. Additional Recommendations Neuropsychologists Reported Making to Movement Disorder Patients

Movement Disorders (N=3)
Remove firearms
Specify by exercise types: cardiovascular, stretching, strengthening, balance.
Health care advanced directives and other future planning (in addition to power of attorney)
Education about DA agonists and hallucinations
Referral to caregiver support group for spouse
Referral to respite care for spouse
Relaxation strategies such as meditation
Referral to a neuropath

Table A7. F. Additional Recommendations Neuropsychologists Reported Making to Epilepsy Patients

Epilepsy (N=3)
Non-therapeutic social involvement
Follow-up with a neurologist
Video/EEG monitoring
Leisure management
Not driving if have seizures with LOC
Recreational activities

Table A7. G. Additional Recommendations Neuropsychologists Reported Making to MS Patients

MS (N=4)
Bibliotherapy
Educate others/advocate for yourself
Mindfulness training/practice
Sexual Health
Spirituality (broadly defined)

APPENDIX B

AIM THREE TABLES

Table B1. Principal Component's Analysis and Chronbach's Alpha

Principal Component's Analysis and Cronbach's Alpha				
Construct	**n**	**Variables**	**Proportion of variance explained by first principal component**	**Cronbach's Alpha (standardized)**
Supervision and Independence	306	Arrange environment at home to mitigate safety risks Life alert system Power of attorney Increased supervision of patient's ASLs Supervision over patient's important decisions Caregiver attendance at patient's medical appointments Respite care/Home health aid Adult daycare Assisted living ID for patient with caregiver's contact information	0.55	0.91
Driving	300	Limit distractions Limit driving to low-demand conditions Family members should routinely observe patient's driving to check safety On-the-road assessment Stop driving Alternative modes of transportation	0.56	0.84
Educational Resources	308	Specific book Referral to an agency	0.79	0.73
Mental Health	303	Psychiatrist Substance abuse treatment Marital therapy Family therapy Individual therapy Group Therapy Cognitive rehabilitation	0.41	0.75
Therapists	303	Physical therapist Speech therapist Occupational therapist	0.78	0.86
Medical Referrals	304	Medical doctor	N/A	N/A
Health	299	Exercise Eat healthy/diet CPAP machine use Adherence to medications Reduce use of drugs Maximize protective steps to avoid head injury Sleep hygiene Engage in activities to promote mental stimulation Engage in activities known to improve mood Self-care	0.44	0.85

Table B1. Continued.

Employment and Education	307	Current position is no longer appropriate Consider other positions that may be more appropriate Gradual return to work or school Reasonable accommodations Adjust responsibilities at work or school Apply for disability Vocational rehabilitation services	0.68	0.88
Organization Memory and Attention	296	Limit distraction Pace activities Engage in one task at a time Engage in challenging tasks at most alert/effective time during the day Check work regularly Allow extra time to complete tasks or express thoughts Use a phrase or action that decreases likelihood of impulsive behavior Develop a schedule/routine Modification in caregiver communication style with patient Calendar, memory notebook, or audio recorder External cues Centralized location to keep important items Link behaviors that occur naturally together Pill box Elaboration strategies	0.56	0.94

Table B2. General Practice Modeling Summary of Significant Predictors

Outcome Measure	General Practice (N=309): Predictor Variables Selected
Supervision and Independence	Condition, Years Licensed, Minutes Verbal Feedback, Location of Practice
Driving	Condition, Professional Activities, Minutes Verbal Feedback, Number Neuropsych Reports Monthly
Mental Health	Condition, Minutes Verbal Feedback, Employment Setting, Professional Activities
Education Resources	Condition, Minutes Verbal Feedback
Therapist Referrals	Condition, Minutes Verbal Feedback, Professional Activities
Medical Referrals	Condition, Employment Setting
Health	Minutes Verbal Feedback, Practitioner Gender, Board Certified, Number Neuropsych Reports Monthly
Employment and Education	Condition, Years Licensed, Professional Activities, Minutes Verbal Feedback, Number Neuropscyh Reports Monthly
Organization, Memory, and Attention	Condition, Minutes Verbal Feedback, Professional Activities, Practitioner Gender

Table B2. A. General Practice: Supervision and Independence Predictors

General Practice: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.376940	0.153799	6.0068	0.0143
Condition MS	-0.644584	0.214829	9.0027	0.0027
Condition TBI	-0.330771	0.126079	6.8829	0.0087
Condition dementia	0.306538	0.121817	6.3322	0.0119
Condition epilepsy	-0.389129	0.202693	3.6856	0.0549
Condition Movement Disorder	0.067385	0.200250	0.1132	0.7365
Condition Psychiatric Disorder	-0.689696	0.128739	28.7007	<.0001
Condition stroke	0	.	.	.
Minutes Verbal Feedback	0.005926	0.001668	12.6210	0.0004
Years Licensed	0.009963	0.003540	7.9205	0.0049
Northeast	0.416184	0.105908	15.4423	<.0001
Southeast	0.050621	0.103051	0.2413	0.6233
Midwest	0.211659	0.103595	4.1744	0.0410
Southwest	0.038377	0.134083	0.0819	0.7747
West	0	.	.	.

Table B2. B. General Practice: Driving Predictors

General Practice: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.291600	0.474679	0.3774	0.5390
Condition MS	-0.237331	0.228911	1.0749	0.2998
Condition TBI	-0.179246	0.135587	1.7477	0.1862
Condition dementia	0.087423	0.131029	0.4452	0.5046
Condition epilepsy	-0.247067	0.229893	1.1550	0.2825
Condition Movement Disorder	0.250420	0.214024	1.3690	0.2420
Condition Psychiatric Disorder	-0.859300	0.138705	38.3802	<.0001
Condition stroke	0	.	.	.
Professional Activity: Neuropsych Assessment	0.149688	0.450264	0.1105	0.7396
Professional Activity: Rehab and Cognitive Remediation	0.876138	0.494546	3.1386	0.0765
Professional Activity: Psychotherapy	0.283062	0.479446	0.3486	0.5549
Professional Activity: Clinical Supervision or Training	0.291601	0.485979	0.3600	0.5485
Professional Activity: Research	-0.320793	0.496384	0.4177	0.5181
Professional Activity: Teaching	0	.	.	.
Number Neuropsych Reports Monthly	0.007063	0.003224	4.8013	0.0284
Minutes Verbal Feedback	0.004476	0.001778	6.3372	0.0118

Table B2. C. General Practice: Mental Health Predictors

General Practice: Mental Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.272415	0.421796	0.4171	0.5184
Condition MS	0.083658	0.180562	0.2147	0.6431
Condition TBI	0.479493	0.104656	20.9913	<.0001
Condition dementia	-0.291146	0.101262	8.2666	0.0040
Condition epilepsy	0.369997	0.171848	4.6356	0.0313

Table B2. C. Continued

Condition Movement Disorder	0.099053	0.173758	0.3250	0.5686
Condition Psychiatric Disorder	0.460631	0.109572	17.6729	<.0001
Condition stroke	0	.	.	.
Professional Activity: Neuropsych Assessment	-0.007295	0.382349	0.0004	0.9848
Professional Activity: Rehab and Cognitive Remediation	0.366248	0.419882	0.7608	0.3831
Professional Activity: Psychotherapy	0.409638	0.409677	0.9998	0.3174
Professional Activity: Clinical Supervision or Training	-0.068489	0.400935	0.0292	0.8644
Professional Activity: Research	-0.222006	0.394797	0.3162	0.5739
Professional Activity: Teaching	0	.	.	.
Medical Hospital	-0.262455	0.145524	3.2527	0.0713
VA	0.031362	0.150999	0.0431	0.8355
Private Practice	-0.104715	0.144755	0.5233	0.4694
Rehabilitation Setting	-0.283820	0.171234	2.7473	0.0974
College or University	-0.038683	0.196449	0.0388	0.8439
Other	0	.	.	.

Table B2. D. General Practice: Educational Resources Predictors

General Practice: Educational Resources				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.409699	0.163423	6.2850	0.0122
Condition MS	0.236243	0.277290	0.7259	0.3942
Condition TBI	-0.038123	0.159383	0.0572	0.8110
Condition dementia	0.660606	0.155952	17.9434	<.0001
Condition epilepsy	-0.312726	0.258956	1.4584	0.2272
Condition Movement Disorder	0.354433	0.258927	1.8738	0.1710
Condition Psychiatric Disorder	-0.369381	0.166090	4.9461	0.0261
Condition stroke	0	.	.	.
Minutes Verbal Feedback	0.006301	0.002101	8.9912	0.0027

Table B2. E. General Practice: Therapist Referral Predictors

General Practice: Therapist Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.004328	0.761236	0.0000	0.9955
Condition MS	-0.291765	0.266420	1.1993	0.2735
Condition TBI	0.020704	0.154109	0.0180	0.8931
Condition dementia	-0.503931	0.150746	11.1750	0.0008
Condition epilepsy	-0.345014	0.251397	1.8835	0.1699
Condition Movement Disorder	0.468817	0.248574	3.5571	0.0593
Condition Psychiatric Disorder	-0.957194	0.159654	35.9451	<.0001
Condition stroke	0	.	.	.
Professional Activity: Neuropsych Assessment	-0.030043	0.742671	0.0016	0.9677
Professional Activity: Rehab and Cognitive Remediation	0.275587	0.781489	0.1244	0.7244
Professional Activity: Psychotherapy	0.413021	0.769333	0.2882	0.5914
Professional Activity: Clinical Supervision or Training	-0.215920	0.770198	0.0786	0.7792
Professional Activity: Research	-0.644193	0.778623	0.6845	0.4080
Professional Activity: Teaching	0	.	.	.
Minutes Verbal Feedback	0.008347	0.002045	16.6626	<.0001

Table B2. F. General Practice: Medical Referral Predictors

General Practice: Medical Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.340040	0.292141	1.3548	0.2444
Condition MS	-0.676123	0.339980	3.9550	0.0467
Condition TBI	-0.173414	0.196600	0.7780	0.3777
Condition dementia	0.231085	0.190102	1.4776	0.2241
Condition epilepsy	0.076019	0.319999	0.0564	0.8122
Condition Movement Disorder	0.231354	0.316775	0.5334	0.4652
Condition Psychiatric Disorder	-0.592271	0.205520	8.3048	0.0040

Table B2. F. Continued

Condition stroke	0	.	.	.
Medical Hospital	-0.403819	0.264724	2.3270	0.1272
VA	-0.461045	0.274559	2.8198	0.0931
Private Practice	-0.007446	0.262782	0.0008	0.9774
Rehabilitation Setting	-0.491732	0.311463	2.4926	0.1144
College or University	0.410201	0.342768	1.4322	0.2314
Other	0	.	.	.

Table B2. G. General Practice: Health Predictors

General Practice: Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.625744	0.117818	28.2079	<.0001
Number Neuropsych Reports Monthly	0.006548	0.002881	5.1646	0.0231
Minutes Verbal Feedback	0.006212	0.001683	13.6209	0.0002
Female	0.196209	0.073474	7.1314	0.0076
Male	0	.	.	.
Board Certified: No	0.209176	0.073807	8.0322	0.0046
Board Certified: Yes	0	.	.	.

Table B2. H. General Practice: Employment and Education Predictors

General Practice: Employment and Education				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.549013	0.469872	1.3652	0.2426
Condition MS	-0.115411	0.224879	0.2634	0.6078
Condition TBI	0.155318	0.132088	1.3827	0.2396
Condition dementia	-0.976275	0.127730	58.4194	<.0001
Condition epilepsy	-0.127753	0.213372	0.3585	0.5494
Condition Movement Disorder	-0.446212	0.210077	4.5115	0.0337
Condition Psychiatric Disorder	-0.303991	0.135746	5.0150	0.0251
Condition stroke	0	.	.	.

Table B2. H. Continued

Professional Activity: Neuropsych Assessment	0.227673	0.443975	0.2630	0.6081
Professional Activity: Rehab and Cognitive Remediation	1.318642	0.493095	7.1514	0.0075
Professional Activity: Psychotherapy	0.633472	0.472800	1.7951	0.1803
Professional Activity: Clinical Supervision or Training	0.146688	0.476616	0.0947	0.7583
Professional Activity: Research	0.137145	0.485034	0.0799	0.7774
Professional Activity: Teaching	0	.	.	.
Number Neuropsych Reports Monthly	0.007413	0.003097	5.7314	0.0167
Minutes Verbal Feedback	0.004268	0.001760	5.8795	0.0153
Years Licensed	0.019880	0.003697	28.9114	<.0001

Table B2. I. General Practice: Organization, Memory, and Attention Predictors

General Practice: Organization, Memory, and Attention				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.950751	0.501927	3.5880	0.0582
Condition MS	0.268423	0.241247	1.2380	0.2659
Condition TBI	0.084092	0.141264	0.3544	0.5517
Condition dementia	-0.095420	0.137312	0.4829	0.4871
Condition epilepsy	-0.429481	0.244779	3.0785	0.0793
Condition Movement Disorder	0.332602	0.225058	2.1841	0.1394
Condition Psychiatric Disorder	-0.391864	0.147138	7.0929	0.0077
Condition stroke	0	.	.	.
Professional Activity: Neuropsych Assessment	0.539992	0.474458	1.2953	0.2551
Professional Activity: Rehab and Cognitive Remediation	1.534764	0.530641	8.3653	0.0038
Professional Activity: Psychotherapy	0.874881	0.509876	2.9442	0.0862
Professional Activity: Clinical Supervision or Training	0.906725	0.510068	3.1601	0.0755
Professional Activity: Research	0.307410	0.525072	0.3428	0.5582
Professional Activity: Teaching	0	.	.	.

Table B2. I. Continued

Minutes Verbal Feedback	0.006819	0.001867	13.3439	0.0003
Female	0.211160	0.083241	6.4349	0.0112
Male	0	.	.	.

Table B3. Summary of Dementia Patient Characteristics and Provider Practices Significant Predictors

Outcome Measure	Dementia (N=91)	
Predictor Variables	**Patient Characteristics**	**Provider Practices**
Supervision and Independence	None	Average Number of Recommendations
Driving	None	Average Number of Recommendations
Mental Health	None	Average Number of Recommendations
Education Resources	None	Average Number of Recommendations
Therapist Referrals	None	Average Number of Recommendations
Medical Referrals	Motivated Follow Recommendations	None
Health	None	Average Number of Recommendations
Employment and Education	None	None
Organization, Memory, and Attention	None	Average Number of Recommendations

Table B3. A. i. Dementia Patient Characteristics: Medical Referral Predictors

Dementia Patient Characteristics: Medical Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.322841	0.084404	14.6303	0.0001
Not Motivated to Follow through with Recommendations	-1.381739	0.563043	6.0224	0.0141
Motivated to Follow through with Recommendations	0	.	.	.

Table B3. A. ii. Dementia Provider Practice: Supervision and Independence Predictors

Dementia Provider Practice: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.092576	0.125640	0.5429	0.4612
Average Number of Recommendations	0.076543	0.015425	24.6226	<.0001

Table B3. B. ii. Dementia Provider Practice: Driving Predictors

Dementia Provider Practice: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.029636	0.170198	0.0303	0.8618
Average Number of Recommendations	0.047087	0.020822	5.1142	0.0237

Table B3. C. ii. Dementia Provider Practice: Mental Health Predictors

Dementia Provider Practice: Mental Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.851037	0.174318	23.8348	<.0001
Average Number of Recommendations	0.052119	0.021326	5.9729	0.0145

Table B3. D. ii. Dementia Provider Practice: Educational Resources Predictors

Dementia Provider Practice: Educational Resources				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.134282	0.190588	0.4964	0.4811
Average Number of Recommendations	0.055230	0.023399	5.5711	0.0183

Table B3. E. ii. Dementia Provider Practice: Therapist Referral Predictors

Dementia Provider Practice: Therapist Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.637133	0.231361	7.5837	0.0059
Average Number of Recommendations	0.068455	0.028180	5.9011	0.0151

Table B3. F.ii. Dementia Provider Practice: Health Predictors

Dementia Provider Practice: Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.506660	0.184664	7.5278	0.0061
Average Number of Recommendations	0.079705	0.022731	12.2956	0.0005

Table B4. Summary of Significant TBI Patient Characteristics and Provider Practice Predictors

Outcome Measure	TBI	
Predictor Variables	**Patient Characteristics**	**Provider Practice**
Supervision and Independence	Patient Bring a Caregiver	Individualize Recommendations
Driving	Patient Bring a Caregiver	Individualize Recommendations
Mental Health	Percent Patients Minority	None
Education Resources	Patient Bring a Caregiver	Individualize Recommendations, Average Number of Recommendations, Most Frequent Referral Source
Therapist Referrals	Patient Bring a Caregiver	Assessment Setting
Medical Referrals	Patient Bring a Caregiver	Individualize Recommendations, Average Number of Recommendations
Health	Motivated Follow Recommendations	Individualize Recommendations
Employment and Education	Patient Bring a Caregiver	Individualize Recommendations, Average Number of Recommendations, Most Frequent Referral Source
Organization, Memory, and Attention	Motivated Follow Recommendations, Patient Bring a Caregiver	Individualize Recommendations, Average Number of Recommendations

Table B4. A. i. TBI Patient Characteristics: Supervision and Independence Predictors

TBI Patient Characteristics: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.007349	0.064607	0.0129	0.9094
Rarely Bring a Caregiver	-1.385803	0.210061	43.5223	<.0001
Bring a Caregiver	0	.	.	.

Table B4. B. i. TBI Patient Characteristics: Driving Predictors

TBI Patient Characteristics: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.135372	0.072320	3.5039	0.0612
Rarely Bring a Caregiver	-1.479699	0.233544	40.1429	<.0001
Bring a Caregiver	0	.	.	.

Table B4. C. i. TBI Patient Characteristics: Mental Health Predictors

TBI Patient Characteristics: Mental Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.166751	0.097312	2.9363	0.0866
Percentage of Patients in Group Minority	0.005669	0.002655	4.5599	0.0327

Table B4. D. i. TBI Patient Characteristics: Education Resource Predictors

TBI Patient Characteristics: Education Resources				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.070537	0.097999	0.5181	0.4717
Rarely Bring a Caregiver	-1.212958	0.320776	14.2984	0.0002
Bring a Caregiver	0	.	.	.

Table B4. E. i. TBI Patient Characteristics: Therapist Referral Predictors

TBI Patient Characteristics: Therapist Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.464936	0.084324	30.4004	<.0001
Rarely Bring a Caregiver	-1.208348	0.276017	19.1652	<.0001
Bring a Caregiver	0	.	.	.

Table B4. F. i. TBI Patient Characteristics: Medical Referral Predictors

TBI Patient Characteristics: Medical Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.057308	0.102531	0.3124	0.5762
Rarely Bring a Caregiver	-1.037068	0.333366	9.6777	0.0019
Bring a Caregiver	0	.	.	.

Table B4. G. i. TBI Patient Characteristics: Health Predictors

TBI Patient Characteristics: Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.067027	0.068641	0.9535	0.3288
Not Motivated to Follow through with Recommendations	-0.901068	0.299199	9.0697	0.0026
Motivated to Follow through with Recommendations	0	.	.	.

Table B4. H. i. TBI Patient Characteristics: Employment and Education Predictors

TBI Patient Characteristics: Employment and Education				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.594250	0.068289	75.7240	<.0001
Rarely Bring a Caregiver	-1.271596	0.225014	31.9358	<.0001
Bring a Caregiver	0	.	.	.

Table B4. I. i. TBI Patient Characteristics: Organization, Memory, and Attention Predictors

TBI Patient Characteristics: Organization, Memory, and Attention				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.207525	0.074022	7.8599	0.0051
Rarely Bring a Caregiver	-0.538808	0.251022	4.6073	0.0318
Bring a Caregiver	0	.	.	.
Not Motivated to Follow through with Recommendations	-0.733593	0.324771	5.1022	0.0239
Motivated to Follow through with Recommendations	0	.	.	.

Table B4. A. ii. TBI Provider Practice: Supervision and Independence Predictors

TBI Provider Practice: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.047847	0.070984	0.4543	0.5003
Rarely Individualize Recommendations	-0.981674	0.235428	17.3868	<.0001
Individualize Recommendations	0	.	.	.

Table B4. B. ii. TBI Provider Practice: Driving Predictors

TBI Provider Practice: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.097880	0.079899	1.5007	0.2206
Rarely Individualize Recommendations	-1.047075	0.261532	16.0289	<.0001
Individualize Recommendations	0	.	.	.

Table B4. C. ii. TBI Provider Practice: Educational Resource Predictors

TBI Provider Practice: Educational Resources				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.312219	0.728623	3.2434	0.0717
Referral: Determination of Diagnosis	0.681370	0.728069	0.8758	0.3493
Referral: Rehabilitation/ Treatment planning	0.396710	0.722304	0.3017	0.5828
Referral: Forensic	0.867159	0.741664	1.3670	0.2423
Referral: Assess Capacity to Work	1.139861	0.778324	2.1448	0.1431
Referral: Establish Baseline of Function	-0.502922	0.841775	0.3570	0.5502
Referral: Assess Capacity for Independent Living	-0.221238	0.872623	0.0643	0.7999
Referral: Pre-and-Post Medical Intervention	0	.	.	.
Rarely Individualize Recommendations	-1.024269	0.291307	12.3631	0.0004
Individualize Recommendations	0	.	.	.
Average Number of Recommendations	0.093448	0.027022	11.9597	0.0005

Table B4. D. ii. TBI Provider Practice: Therapist Referral Predictors

TBI Provider Practice: Therapist Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.290754	0.088891	10.6987	0.0011
Inpatient	0.739837	0.277563	7.1047	0.0077
Outpatient	0	.	.	.

Table B4. E. ii. TBI Provider Practice: Medical Referral Predictors

TBI Provider Practice: Medical Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.439167	0.241408	3.3095	0.0689
Rarely Individualize Recommendations	-0.726667	0.331301	4.8109	0.0283
Individualize Recommendations	0	.	.	.
Average Number of Recommendations	0.061807	0.028852	4.5891	0.0322

Table B4. F. ii. TBI Provider Practice: Health Predictors

TBI Provider Practice: Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.112633	0.067139	2.8143	0.0934
Rarely Individualize Recommendations	-0.635231	0.225550	7.9319	0.0049
Individualize Recommendations	0	.	.	.

Table B4. G. ii. TBI Provider Practice: Employment and Education Predictors

TBI Provider Practice: Employment and Education				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.237002	0.568823	0.1736	0.6769
Referral: Determination of Diagnosis	-0.439412	0.568542	0.5973	0.4396
Referral: Rehabilitation/ Treatment planning	-0.007495	0.563852	0.0002	0.9894
Referral: Forensic	0.154267	0.579141	0.0710	0.7900
Referral: Assess Capacity to Work	0.449928	0.607787	0.5480	0.4591
Referral: Establish Baseline of Function	-0.122823	0.657155	0.0349	0.8517
Referral: Assess Capacity for Independent Living	-0.339100	0.681404	0.2477	0.6187
Referral: Pre-and-Post Medical Intervention	0	.	.	.
Rarely Individualize Recommendations	-0.595238	0.227477	6.8471	0.0089
Individualize Recommendations	0	.	.	.
Average Number of Recommendations	0.056533	0.020985	7.2576	0.0071

Table B4. H. ii. TBI Provider Practice: Organization, Memory, and Attention Predictors

TBI Provider Practice: Organization, Memory, and Attention				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.141469	0.170678	0.6870	0.4072
Rarely Individualize Recommendations	-0.727930	0.230703	9.9557	0.0016
Individualize Recommendations	0	.	.	.
Average Number of Recommendations	0.047402	0.020298	5.4537	0.0195

Table B5. Summary of Psychiatric Disorder Patient Characteristics and Provider Practices Significant Predictors

Outcome Measure	**Psychiatric Disorders (N=63)**	
Predictor Variables	**Patient Characteristics**	**Provider Practice**
Supervision and Independence	Patient Age, Motivated Follow Recommendations	Provider Learned Recommendations
Driving	Patient Age, Patient Education	Average Number of Recommendations
Mental Health	Patient Level Functioning, Patient Education	Individualize Recommendations, Average Number of Recommendations, Percent Time with Patient Group
Education Resources	Patient Education	Average Number of Recommendations
Therapist Referrals	None	Average Number of Recommendations
Medical Referrals	None	Percent Time with Patient Group, Provider Learned Recommendations
Health	None	Average Number of Recommendations, Provider Learned Recommendations
Employment and Education	Motivated Follow Recommendations	None
Organization, Memory, and Attention	None	Average Number of Recommendations

Table B5. A. i. Psychiatric Disorders Patient Characteristics: Supervision and Independence Predictors

Psychiatric Disorders Patient Characteristics: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.079006	0.175819	37.6631	<.0001
Patient Age	0.022575	0.005685	15.7681	<.0001
Not Motivated to Follow through with Recommendations	-0.859191	0.316394	7.3743	0.0066
Motivated to Follow through with Recommendations	0	.	.	.

Table B5. B. i. Psychiatric Disorders Patient Characteristics: Driving Predictors

Psychiatric Disorders Patient Characteristics: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.444832	0.274604	27.6836	<.0001
Patient Education: < 12 years	-0.102646	0.365502	0.0789	0.7788
Patient Education: High School Grad	0.580967	0.219371	7.0137	0.0081
Patient Education: Some College	0.349242	0.276516	1.5952	0.2066
Patient Education: College Graduate	0	.	.	.
Patient Age	0.015759	0.006041	6.8039	0.0091

Table B5. C. i. Psychiatric Disorders Patient Characteristics: Mental Health Predictors

Psychiatric Disorders Patient Characteristics: Mental Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.584899	0.175712	11.0805	0.0009
Patient Functional Impairment: None to Mild	-0.398435	0.133814	8.8656	0.0029
Patient Functional Impairment: Moderate to Severe	0	.	.	.
Patient Education: < 12 years	-0.410986	0.263748	2.4282	0.1192
Patient Education: High School Grad	-0.054955	0.159155	0.1192	0.7299
Patient Education: Some College	0.381696	0.192767	3.9208	0.0477
Patient Education: College Graduate	0	.	.	.

Table B5. D. i. Psychiatric Disorders Patient Characteristics: Education Resource Predictors

Psychiatric Disorders Patient Characteristics: Education Resources				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.666794	0.230928	8.3374	0.0039
Patient Education: < 12 years	-0.917742	0.447190	4.2117	0.0401
Patient Education: High School Grad	0.259556	0.266653	0.9475	0.3304
Patient Education: Some College	0.581469	0.326581	3.1701	0.0750
Patient Education: College Graduate	0	.	.	.

Table B5. E. i. Psychiatric Disorders Patient Characteristics: Employment and Education Predictors

Psychiatric Disorders Patient Characteristics: Employment and Education				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.077773	0.089318	0.7582	0.3839
Not Motivated to Follow through with Recommendations	-0.752583	0.343033	4.8132	0.0282
Motivated to Follow through with Recommendations	0	.	.	.

Table B5. A. ii. Psychiatric Disorders Provider Practice: Supervision and Independence Predictors

Psychiatric Disorders Provider Practice: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.026159	0.254674	16.2352	<.0001
Learn: Supervisors	0.002522	0.311911	0.0001	0.9935
Learn: Empirical Data	0.502621	0.307886	2.6650	0.1026
Learn: Clinical Experiences	0.696977	0.288774	5.8253	0.0158
Learn: Books	1.233971	0.402676	9.3907	0.0022
Learn: Formal Didactics	0.716329	0.377743	3.5961	0.0579
Learn: Consultation with Colleagues	0	.	.	.

Table B5. B. ii. Psychiatric Disorders Provider Practice: Driving Predictors

Psychiatric Disorders Provider Practice: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.065834	0.193079	30.4727	<.0001
Average Number of Recommendations	0.062243	0.026371	5.5710	0.0183

Table B5. C. ii. Psychiatric Disorders Provider Practice: Mental Health Predictors

Psychiatric Disorders Provider Practice: Mental Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.136239	0.153404	0.7887	0.3745
Percentage of Time Spent with Patient Group	0.005174	0.002303	5.0481	0.0247
Rarely Individualize Recommendations	-0.615145	0.219134	7.8802	0.0050
Individualize Recommendations	0	.	.	.
Average Number of Recommendations	0.042795	0.016366	6.8373	0.0089

Table B5. D.ii. Psychiatric Disorders Provider Practice: Educational Resource Predictors

Psychiatric Disorders Provider Practice: Educational Resources				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.063587	0.226513	22.0475	<.0001
Average Number of Recommendations	0.084603	0.030937	7.4782	0.0062

Table B5. E. ii. Psychiatric Disorders Provider Practice: Therapist Referral Predictors

Psychiatric Disorders Provider Practice: Therapist Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.181084	0.215199	30.1219	<.0001
Average Number of Recommendations	0.085649	0.029371	8.5036	0.0035

Table B5. F. ii. Psychiatric Disorders Provider Practice: Medical Referral Predictors

Psychiatric Disorders Provider Practice: Medical Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.881824	0.425719	4.2906	0.0383
Percentage of Time Spent with Patient Group	0.013059	0.004972	6.8997	0.0086
Learn: Supervisors	-0.518231	0.451402	1.3180	0.2509
Learn: Empirical Data	0.430256	0.451484	0.9082	0.3406
Learn: Clinical Experiences	-0.436535	0.418167	1.0898	0.2965
Learn: Books	0.587530	0.582524	1.0173	0.3132
Learn: Formal Didactics	0.506225	0.546143	0.8592	0.3540
Learn: Consultation with Colleagues	0	.	.	.

Table B5. G. ii. Psychiatric Disorders Provider Practice: Health Predictors

Psychiatric Disorders Provider Practice: Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.350061	0.279698	23.2985	<.0001
Learn: Supervisors	0.948917	0.298706	10.0918	0.0015
Learn: Empirical Data	0.815154	0.298157	7.4746	0.0063
Learn: Clinical Experiences	1.107875	0.282910	15.3351	<.0001
Learn: Books	0.752079	0.389761	3.7233	0.0537
Learn: Formal Didactics	0.586708	0.361917	2.6280	0.1050
Learn: Consultation with Colleagues	0	.	.	.
Average Number of Recommendaions	0.058707	0.025088	5.4761	0.0193

Table B5. H. ii. Psychiatric Disorders Provider Practice: Organization, Memory, and Attention Predictors

Psychiatric Disorders Provider Practice: Organization, Memory, and Attention				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-1.144544	0.206000	30.8696	<.0001
Average Number of Recommendations	0.119155	0.027680	18.5307	<.0001

Table B6. Summary of Stroke Patient Characteristics and Provider Practices Significant Predictors

Outcome Measure	Stroke (N=37)	
Predictor Variables	**Patient Characteristics**	**Provider Practice**
Supervision and Independence	Patient Education	Average Number of Recommendations, Most Frequent Referral Source
Driving	Patient Education	Average Number of Recommendations
Mental Health	Patient Age	None
Education Resources	None	None
Therapist Referrals	None	Most Frequent Referral Source
Medical Referrals	None	Percent Time with Patient Group
Health	None	None
Employment and Education	None	None
Organization, Memory, and Attention	None	Assessment Setting

Table B6. A. i. Stroke Patient Characteristics: Supervision and Independence Predictors

Stroke Patient Characteristics: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.073517	0.262904	0.0782	0.7798
Patient Education: < 12 years	-1.355210	0.525807	6.6429	0.0100
Patient Education: High School Grad	0.315190	0.278231	1.2833	0.2573
Patient Education: Some College	-0.011091	0.314230	0.0012	0.9718
Patient Education: College Graduate	0	.	.	.

Table B6. B. i. Stroke Patient Characteristics: Driving Predictors

Stroke Patient Characteristics: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.159738	0.286691	0.3104	0.5774
Patient Education: < 12 years	-1.689571	0.573381	8.6829	0.0032
Patient Education: High School Grad	0.087223	0.304081	0.0823	0.7742
Patient Education: Some College	0.148525	0.351123	0.1789	0.6723
Patient Education: College Graduate	0	.	.	.

Table B6. C. i. Stroke Patient Characteristics: Mental Health Predictors

Stroke Patient Characteristics: Mental Health				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.763639	0.398614	3.6700	0.0554
Patient Age	-0.020762	0.008775	5.5980	0.0180

Table B6. A. ii. Stroke Provider Practice: Supervision and Independence Predictors

Stroke Provider Practice: Supervision and Independence				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.491808	0.272379	3.2602	0.0710
Referral: Determination of Diagnosis	0.172339	0.244168	0.4982	0.4803
Referral: Rehabilitation/ Treatment planning	-0.022318	0.224884	0.0098	0.9209
Referral: Forensic	-1.190937	0.446640	7.1099	0.0077
Referral: Assess Capacity to Work	0.502456	0.302443	2.7600	0.0966
Referral: Establish Baseline of Function	-0.158632	0.271293	0.3419	0.5587
Referral: Assess Capacity for Independent Living	0	.	.	.
Average Number of Recommendations	0.100263	0.030021	11.1540	0.0008

Table B6. B. ii. Stroke Provider Practice: Driving Predictors

Stroke Provider Practice: Driving				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.758991	0.275342	7.5985	0.0058
Average Number of Recommendations	0.133205	0.036191	13.5470	0.0002

Table B6. C. ii. Stroke Provider Practice: Therapist Referral Predictors

Stroke Provider Practice: Therapist Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.939559	0.313576	8.9776	0.0027
Referral: Determination of Diagnosis	-1.210759	0.384051	9.9389	0.0016
Referral: Rehabilitation/ Treatment planning	-0.328302	0.352919	0.8654	0.3522
Referral: Forensic	0.626532	0.701178	0.7984	0.3716
Referral: Assess Capacity to Work	-0.447101	0.478996	0.8713	0.3506
Referral: Establish Baseline of Function	-0.986550	0.443464	4.9490	0.0261
Referral: Assess Capacity for Independent Living	0	.	.	.

Table B6. D. ii. Stroke Provider Practice: Medical Referrals Predictors

Stroke Provider Practice: Medical Referrals				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	-0.787561	0.386903	4.1435	0.0418
Percentage of Time Spent with Patient Group	0.028595	0.011414	6.2761	0.0122

Table B6.E. ii. Stroke Provider Practice: Organization, Memory, and Attention Predictors

Stroke Provider Practice: Organization, Memory, and Attention				
Parameter	**Parameter Estimate**	**Standard Error**	**Chi-Square**	**P value**
Intercept	0.248281	0.121190	4.1971	0.0405
Inpatient	-0.502903	0.226726	4.9200	0.0265
Outpatient	0	.	.	.

APPENDIX C

AIM THREE FIGURES

Figure A. 1. Percentage of Neuropsychologists who endorsed Supervision/Independence Recommendations Never/Rarely compared with Often/Always for each diagnosis

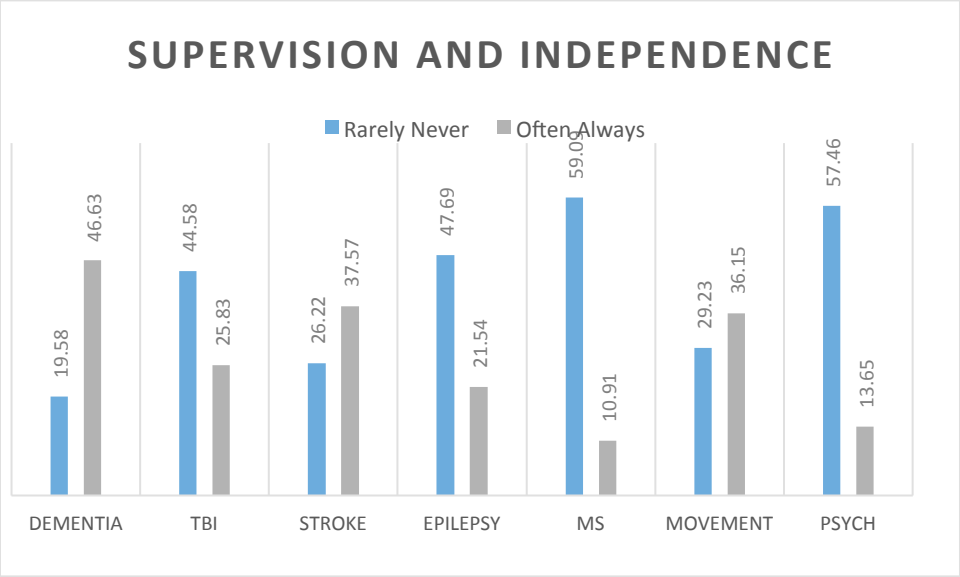


Figure A. 2. Percentage of Neuropsychologists who endorsed Driving Recommendations Never/Rarely compared with Often/Always for each diagnosis

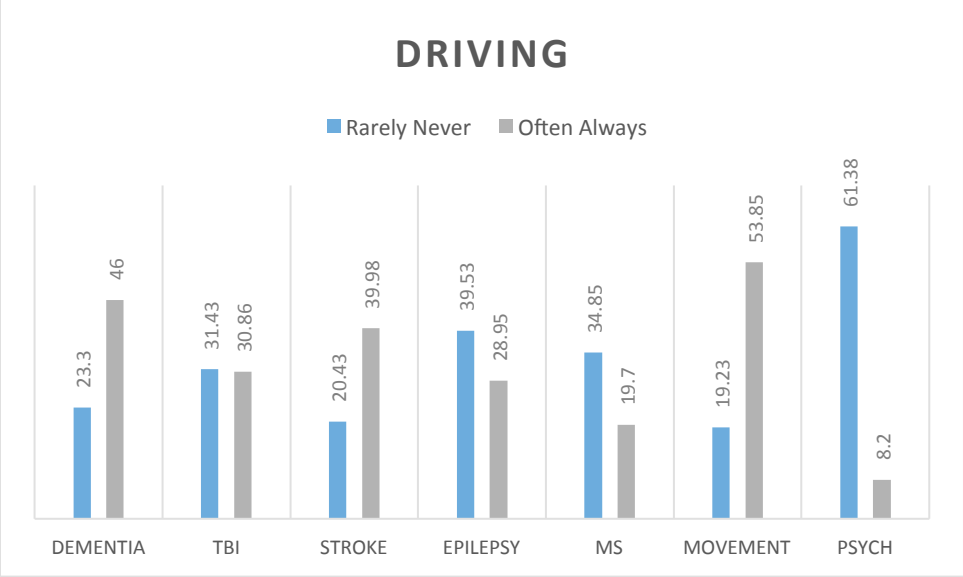


Figure A. 3. Percentage of Neuropsychologists who endorsed Educational Resource Recommendations Never/Rarely compared with Often/Always for each diagnosis

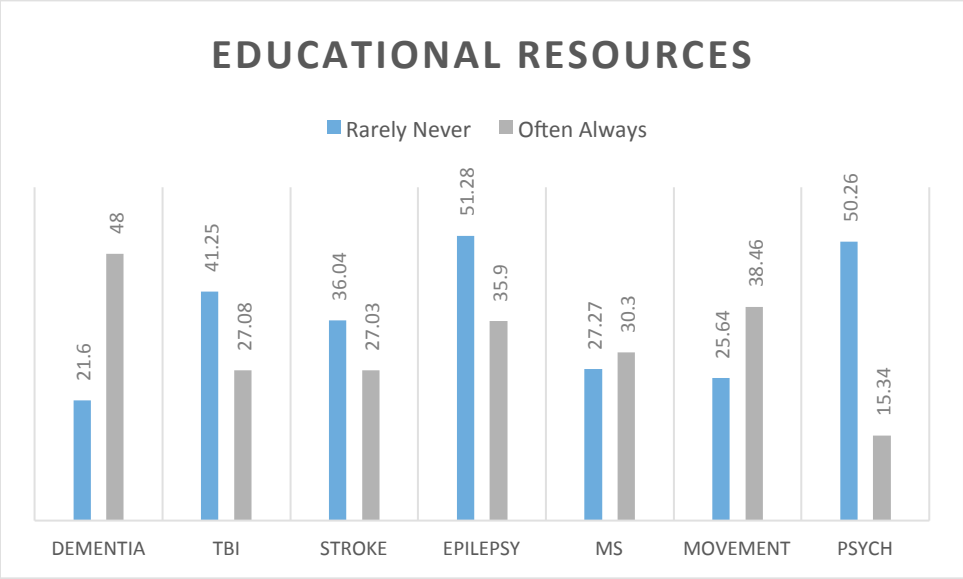


Figure A. 4. Percentage of Neuropsychologists who endorsed Mental Health Recommendations Never/Rarely compared with Often/Always for each diagnosis

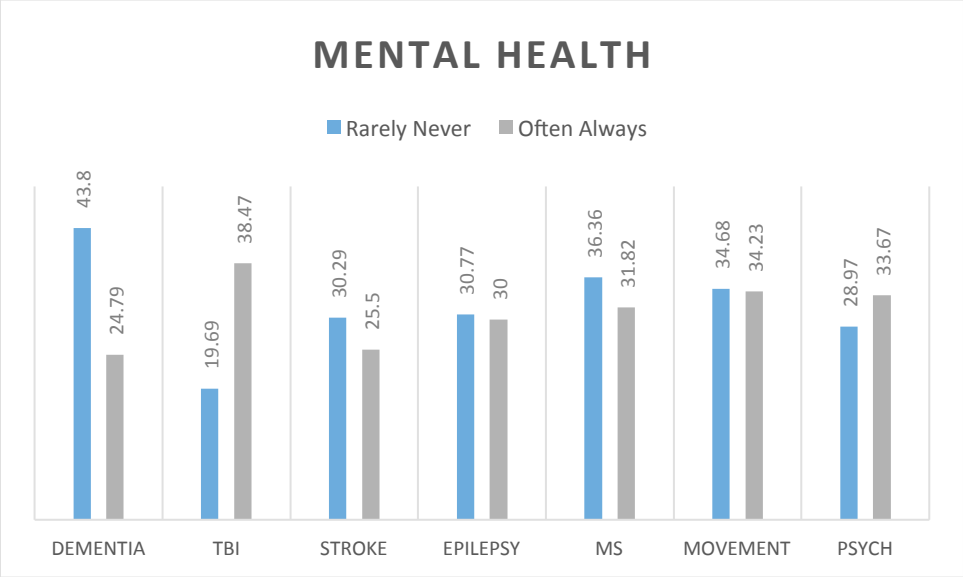


Figure A. 5. Percentage of Neuropsychologists who endorsed Health Recommendations Never/Rarely compared with Often/Always for each diagnosis

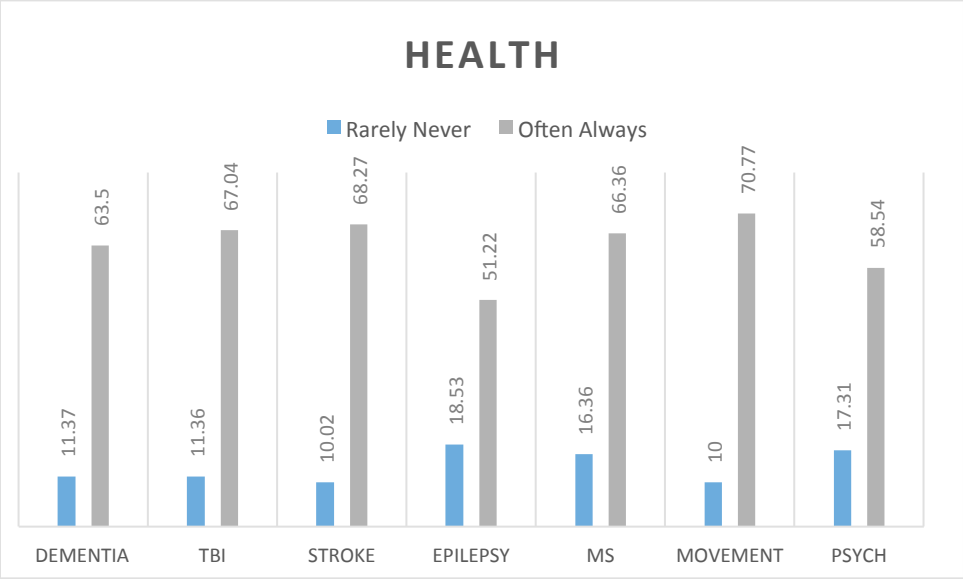


Figure A. 6. Percentage of Neuropsychologists who endorsed Employment/Education Recommendations Never/Rarely compared with Often/Always for each diagnosis

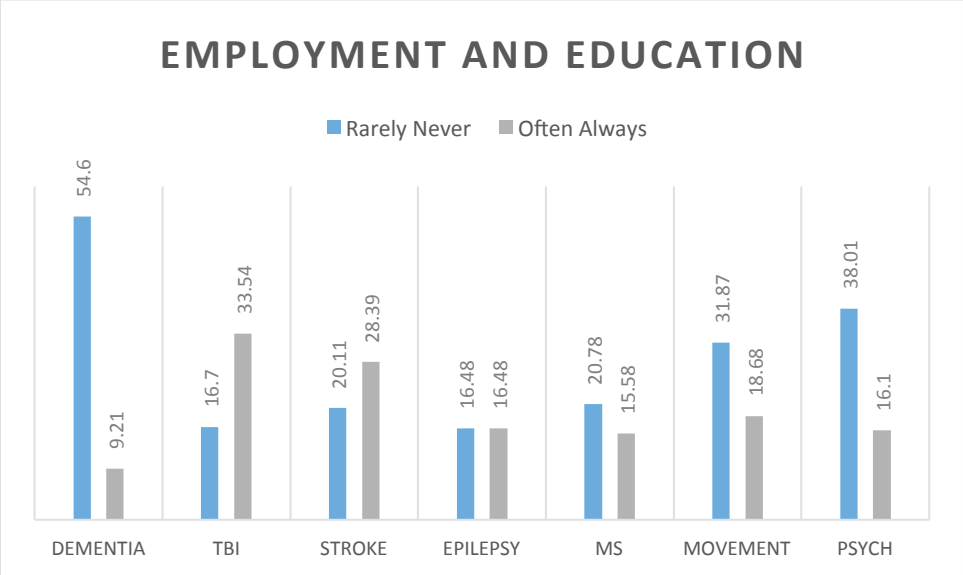


Figure A. 7. Percentage of Neuropsychologists who endorsed Organization/Memory/Attention Recommendations Never/Rarely compared with Often/Always for each diagnosis

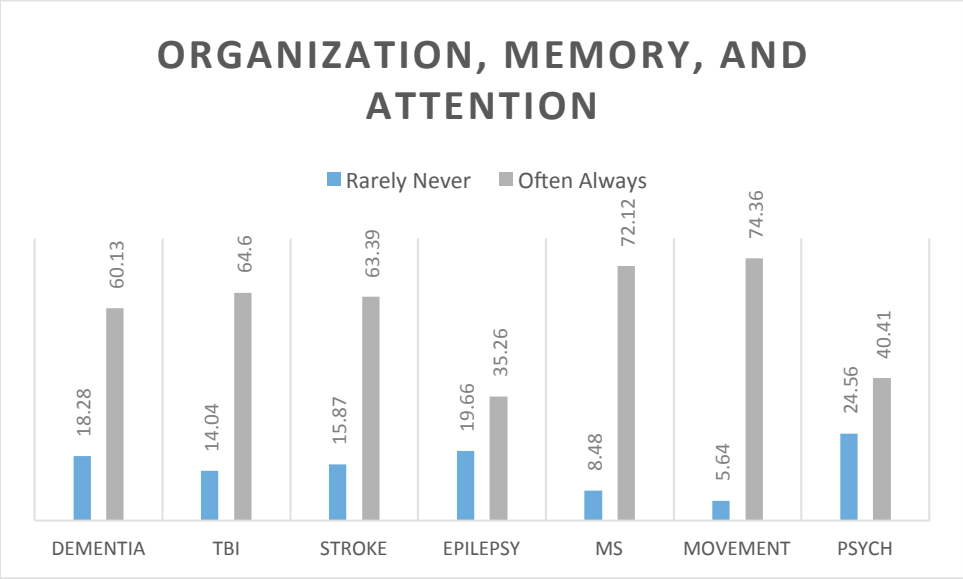


Figure A. 8. Percentage of Neuropsychologists who endorsed Medical Referral Recommendations Never/Rarely compared with Often/Always for each diagnosis

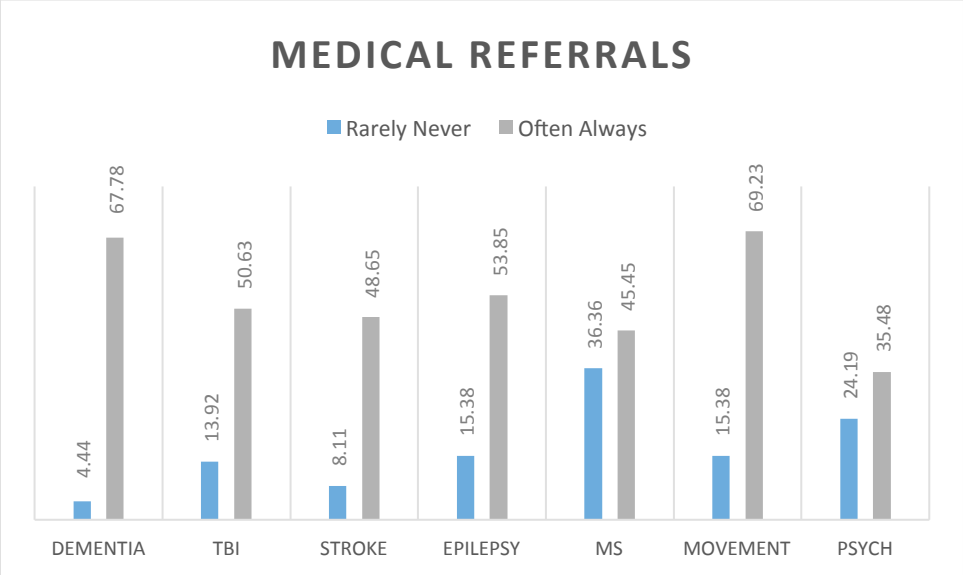
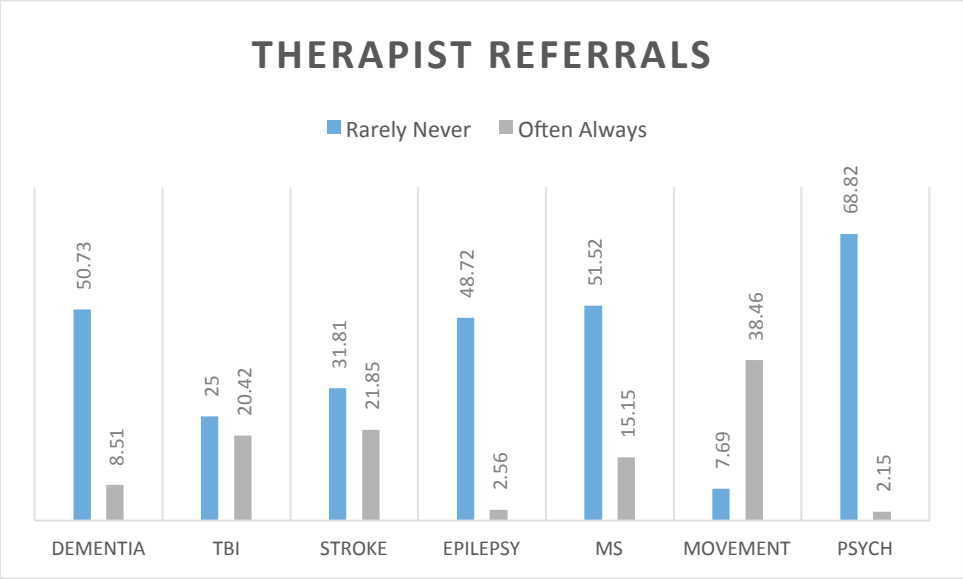


Figure A. 9. Percentage of Neuropsychologists who endorsed Therapist Referral Recommendations Never/Rarely compared with Often/Always for each diagnosis



APPENDIX D

RECRUITMENT MATERIAL AND SURVEY

Figure C1. Letter Inviting Participation in Research

Email Subject Line: Invitation to Participate in Research on Neuropsychological Recommendations

Dear Clinical Neuropsychologist,

My name is Molly Meth, and I am a doctoral candidate in clinical psychology at the University of Iowa working under the mentorship of Dr. Daniel Tranel. I am writing to invite you to participate in my dissertation research that examines what recommendations clinical neuropsychologists give to their patients in practice to further understand what the standards are in our field. The results from this study will allow practitioners to compare the recommendations they use with what others report using and inform best practices for the communication of effective recommendations to neuropsychological patients.
I am seeking participation from clinical neuropsychologists who are licensed to practice in the United States and regularly conduct neuropsychological assessments with patients over the age of 18. Additionally, participants must work with patients with at least one of the following diagnoses:

Dementia
Traumatic brain injury (TBI)
Stroke
Epilepsy
Multiple sclerosis (MS)
Movement disorders (e.g., Parkinson's disease, Huntington's disease)
Psychiatric disorders (e.g., personality disorders, mood disorders, anxiety disorders, or psychotic disorders)

This study involves completing a brief online survey. It is estimated that this survey can be completed in approximately 15 minutes. I am aware that your time is valuable, and I greatly appreciate if you would be willing to consider participating in this research. In order to express my gratitude, participants who complete this survey will have the option to receive a $10 Amazon gift card in compensation. If you know other clinical neuropsychologists who might be interested in participating in this study, please feel free to forward them this email invitation.

If you choose to participate in this study, the survey can be accessed at the following URL:

https://uiowa.qualtrics.com/SE/?SID=SV_1GMeZm2L678stG5

If you have any questions, please feel free to contact me at: molly-meth@uiowa.edu

Sincerely,

Molly Meth, MA and Daniel Tranel, PhD

Figure C2. Reminder Letter Inviting Participation in Research

Email Subject Line: Last Chance to Participate in Research on Neuropsychological Recommendations

Dear Clinical Neuropsychologist,

Thank you to those of you who have already participated in this survey. If you have not yet participated, we would still value your input. The survey will be open for the next two weeks if you decide that you would like to partake.

As a reminder, I am a doctoral candidate in Clinical Psychology at the University of Iowa working under the mentorship of Dr. Daniel Tranel. I am writing to invite you to participate in my dissertation research that examines what recommendations clinical neuropsychologists give to their patients in practice to further understand what the standards are in our field. The results from this study will allow practitioners to compare the recommendations they use with what others report using and inform best practices.

I am seeking participation from clinical neuropsychologists who are licensed to practice in the United States and regularly conduct neuropsychological assessments with patients over the age of 18. Additionally, participants must work with patients with at least one of the following diagnoses:

Dementia
Traumatic brain injury (TBI)
Stroke
Epilepsy
Multiple sclerosis (MS)
Movement disorders (e.g., Parkinson's disease, Huntington's disease)
Psychiatric disorders (e.g., personality disorders, mood disorders, anxiety disorders, or psychotic disorders)

This study involves completing a brief online survey. It is estimated that this survey can be completed in approximately 15 minutes. I am aware that your time is valuable, and I greatly appreciate if you would be willing to consider participating in this research. In order to express my gratitude, participants who complete this survey will have the option to receive a $10 Amazon gift card in compensation. If you know other clinical neuropsychologists who might be interested in participating in this study, please feel free to forward them this email invitation.

If you choose to participate in this study, the survey can be accessed at the following URL:

https://uiowa.qualtrics.com/SE/?SID=SV_1GMeZm2L678stG5

If you have any questions, please feel free to contact me at: molly-meth@uiowa.edu

Sincerely,

Molly Meth, MA and Daniel Tranel, PhD

Figure C3. Survey

We invite you to participate in a research study being conducted by investigators from The University of Iowa. The purpose of the study is to learn what recommendations neuropsychologists give to their patients in practice. If you agree to participate, we would like you to take a brief survey that asks about the frequency with which you give certain recommendations to patients. You are free to skip any questions that you prefer not to answer. It is estimated that the electronic survey takes approximately 15 minutes to complete. We will not collect your name or any identifying information about you. It will not be possible to link you to your responses on the survey. Once you have completed the survey, you will be given the option to provide your email address if you would like to receive a $10 Amazon gift card. It is not required that you provide this information. If you decide to provide your email address in order to receive the $10 gift card, your email will not be linked in any way with your responses to the survey. Therefore, your responses will remain anonymous. Once the electronic gift card has been sent to you via email, we will delete any record of your email address. Taking part in this research study is completely voluntary. If you do not wish to participate in this study, please feel free to decline participation in the electronic survey. If you have questions about the rights of research subjects, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA

Are you a licensed psychologist who conducts neuropsychological assessments?

- ❍ No
- ❍ Yes

Do you practice in the United States?

- ❍ No
- ❍ Yes

Do you regularly work with adult patients (18 years of age or older)?

- ❍ No
- ❍ Yes

Do you regularly see patients with at least one of the following diagnoses?
Dementia
Traumatic brain injury (TBI)
Stroke
Multiple sclerosis (MS)
Movement disorders (e.g., Parkinson's disease, Huntington's disease)
Psychiatric disorders (e.g., personality disorders, mood disorders,anxiety disorders, or psychotic disorders)

- ❍ No
- ❍ Yes

Choose up to three diagnoses that you assess the most often when conducting neuropsychological assessments with adult patients (18 years of age or older).

- ❑ dementia
- ❑ traumatic brain injury (TBI)
- ❑ stroke
- ❑ epilepsy
- ❑ multiple sclerosis (MS)
- ❑ movement disorders (e.g., Parkinson's disease, Huntington's disease)

❑ psychiatric disorders (e.g., personality disorders, mood disorders, anxiety disorders, or psychotic disorders)

Indicate the frequency with which you have given each recommendation, pertaining to level of supervision and independence, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always
Arrange environment at home to mitigate safety risks (e.g., restrict access to firearms and power tools)	❍	❍	❍	❍	❍
Life alert system	❍	❍	❍	❍	❍
Identification bracelet for patient with caregiver's contact information	❍	❍	❍	❍	❍
Increased supervision of patient's activities of daily living (e.g., finances, medications, meal planning, cooking, childcare)	❍	❍	❍	❍	❍
Power of attorney	❍	❍	❍	❍	❍
Supervision over patient's important decisions (e.g., medical, financial, legal)	❍	❍	❍	❍	❍
Caregiver attendance at patient's medical appointments	❍	❍	❍	❍	❍
Respite	❍	❍	❍	❍	❍

care/Home health aid					
Adult daycare	❍	❍	❍	❍	❍
Assisted living	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to driving, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always
Stop driving	❍	❍	❍	❍	❍
Limit distractions (e.g., phone conversations, radio) while driving	❍	❍	❍	❍	❍
Limit driving to low-demand conditions (e.g., stay in familiar areas with low traffic)	❍	❍	❍	❍	❍
Family members should routinely observe patient's driving to check safety	❍	❍	❍	❍	❍
On-the-road assessment (e.g., Department of Motor Vehicles (DMV), hospital-based driving safety evaluation)	❍	❍	❍	❍	❍
Alternative modes of transportation	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to educational resources, in the past year to your adult patients diagnosed with or their caregivers.

	Never	Rarely	Sometimes	Often	Always

Specific book (e.g., "36-hour Day") or website	❍	❍	❍	❍	❍
Referral to an agency (e.g., Alzheimer's Association)	❍	❍	❍	❍	❍
Social worker	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to mental health, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always
Psychiatrist	❍	❍	❍	❍	❍
Medication management by primary care physician (PCP) for mental health concerns	❍	❍	❍	❍	❍
Cognitive rehabilitation	❍	❍	❍	❍	❍
Marital therapy	❍	❍	❍	❍	❍
Family therapy	❍	❍	❍	❍	❍
Substance abuse treatment	❍	❍	❍	❍	❍
Individual therapy	❍	❍	❍	❍	❍
Group Therapy	❍	❍	❍	❍	❍
Support group	❍	❍	❍	❍	❍
Neuropsychological re-evaluation after a specific time period has elapsed	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to medical referrals, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always

Medical doctor (e.g., prescribe nonpsychatric medication, surgical intervention, imaging)	❍	❍	❍	❍	❍
Physical therapist	❍	❍	❍	❍	❍
Speech therapist	❍	❍	❍	❍	❍
Occupational therapist	❍	❍	❍	❍	❍
Dietician	❍	❍	❍	❍	❍
Sleep study	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to health, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always
Exercise	❍	❍	❍	❍	❍
Eat healthy/diet	❍	❍	❍	❍	❍
CPAP machine use	❍	❍	❍	❍	❍
Adherence to medications	❍	❍	❍	❍	❍
Reduce use of drugs (e.g., alcohol, narcotics, marijuana, caffeine, nicotine)	❍	❍	❍	❍	❍
Maximize protective steps to avoid head injury (e.g., wear helmet, install support bars in shower, play non-contact	❍	❍	❍	❍	❍

sports)					
Sleep hygiene	❍	❍	❍	❍	❍
Engage in activities to promote mental stimulation (e.g., cross word puzzle, reading)	❍	❍	❍	❍	❍
Engage in activities known to improve mood (e.g., socialize, partake in enjoyable activities)	❍	❍	❍	❍	❍
Self-care (e.g., elicit support from family and friends, practice self-compassion)	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to employment and education, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always
Current position is no longer appropriate	❍	❍	❍	❍	❍
Consider other positions that may be more appropriate	❍	❍	❍	❍	❍
Gradual return to work or school	❍	❍	❍	❍	❍
Reasonable accommodations (e.g., reduced distraction environment)	❍	❍	❍	❍	❍

Adjust responsibilities at work or school (e.g., reduced workload)	❍	❍	❍	❍	❍
Apply for disability	❍	❍	❍	❍	❍
Vocational rehabilitation services	❍	❍	❍	❍	❍

Indicate the frequency with which you have given each recommendation, pertaining to organization, memory, and attention strategies, in the past year to your adult patients diagnosed with XXXX or their caregivers.

	Never	Rarely	Sometimes	Often	Always
Limit distraction (e.g., clutter free/quiet work environment)	❍	❍	❍	❍	❍
Pace activities (e.g., plan activities short in duration with frequent breaks)	❍	❍	❍	❍	❍
Engage in one task at a time (e.g., limit multitasking)	❍	❍	❍	❍	❍
Engage in challenging tasks at most alert/effective time during the day	❍	❍	❍	❍	❍
Check work regularly	❍	❍	❍	❍	❍
Allow extra time to complete tasks or express thoughts	❍	❍	❍	❍	❍
Use a phrase or	❍	❍	❍	❍	❍

action that decreases likelihood of impulsive behavior (e.g., deep breath)					
Develop a schedule/routine	❍	❍	❍	❍	❍
Modification in caregiver communication style with patient (e.g., speak at reduced speed)	❍	❍	❍	❍	❍
Calendar, memory notebook, or audio recorder	❍	❍	❍	❍	❍
External cues (e.g., alarms, reminders, labels)	❍	❍	❍	❍	❍
Centralized location to keep important items (e.g., cell phone, wallet, keys)	❍	❍	❍	❍	❍
Link behaviors that occur naturally together (e.g., always take medication when brush teeth)	❍	❍	❍	❍	❍
Pill box	❍	❍	❍	❍	❍
Elaboration strategies (e.g., mnemonics)	❍	❍	❍	❍	❍

List any other recommendations that you gave to adult patients with XXXX or their caregivers in the past year that were not already listed above, and then indicate the frequency with which you gave them.

	Never	Rarely	Sometimes	Often	Always
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍

Provide the following information about the adult patients that you assessed with a diagnosis of XXXX in the past year.

1. How often did the patient group mentioned above bring a family member or a caregiver with them to their appointment with you?

❍ Never
❍ Rarely
❍ Sometimes
❍ Often
❍ Always

2. Indicate the percentage of patients in the group mentioned above that were members of ethnic or racial minority groups.

_____ 0%

3. Indicate the percentage of time that you assessed the patient group mentioned above with the following levels of functional impairment (responses should total to 100 percent).

_____ No Impairment
_____ Very Mild
_____ Mild
_____ Moderate
_____ Severe

4. Numerically rank the two most commonly reported levels of education for the patient group mentioned above by assigning ranks to the top two, where '1' = 'most frequent education level' and '2' = 'second most frequent education level'.

_____
_____ 12 years (high school graduate)
_____ 13-15 (some college)
_____ 16 (college graduate)
_____ 18 (master's degree)
_____ >20

5. What was the average age of the patient group mentioned above?

6. In your opinion, how often was the patient group mentioned above motivated to follow through with recommendations?

- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ Always

Answer the following questions about your views and practices conducting neuropsychological assessments with adult patients diagnosed with XXXX in the past year.

7. While conducting neuropsychological assessments, what percentage of your time did you spend working with the patient group mentioned above?

_____ %

8. Numerically rank the two most frequent referral questions that you received regarding the patient group mentioned above by assigning ranks to your top two, where '1' = 'most frequent referral source' and '2' = 'second most frequent referral source'.

_____ Determination of diagnosis
_____ Rehabilitation/treatment planning
_____ Forensic
_____ Educational planning
_____ Assess capacity to work
_____ Establish baseline of function for subsequent testing
_____ Assess capacity for independent living
_____ Pre-and post-medical intervention
_____ Localization of lesion

9. How often did you individualize recommendations for the patient group mentioned above and their family members (e.g., look up specific resources)?

- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ Always

10. Please numerically rank the top two means by which you learned of the recommendations that you currently give to the patient group mentioned above by assigning ranks to your top two, where '1' = 'most frequent mean' and '2' =

'second most frequent mean'.

_____ Supervisors
_____ Empirical data (e.g., journal articles)
_____ Clinical experiences (trial and error through practice)
_____ Books (e.g., "36-hour Day", "Taking Charge of Adult ADHD")
_____ Formal didactics (e.g., educational workshops, classes)
_____ Consultation with colleagues

11. In what setting do you most often assess the patient group mentioned above?

- ❍ Inpatient
- ❍ Outpatient

12. How many recommendations, on average, did you give to the patient group mentioned above after conducting a neuropsychological assessment?

Answer the following questions about yourself and your neuropsychological assessment practices in general (not in regard to working with a specific patient population).

13. When conducting neuropsychological evaluations, please indicate the percentage of your time that you assess patients who are the following ages (responses should total to 100 percent).

_____ Children (ages 0-11):
_____ Adolescents (ages 12-18):
_____ Young Adults (ages 19-39):
_____ Older Adults (ages 40-65):
_____ Geriatrics (ages > 65):

14. Numerically rank the two most frequent professional activities that you engage in by assigning ranks to your top two, where '1' = 'most frequent professional activity' and '2' = 'second most frequent professional activity'.
_____ Neuropsychological Assessment
_____ Rehabilitation and/or cognitive remediation
_____ Psychotherapy
_____ Clinical supervision or training
_____ Research
_____ Teaching
_____ Service in professional organizations

15. What best describes your primary employment setting?

- ❍ Medical Hospital
- ❍ VA
- ❍ Private Practice
- ❍ Rehabilitation Setting
- ❍ College or University
- ❍ Other _____

16. On average, how many neuropsychological reports do you generate per month?

17. Indicate the percentage of time you communicate recommendations via the following methods to patients/caregivers (responses should total to 100 percent).

_____ Verbally
_____ Written
_____ Both Verbally and written
_____ No communication

18. Indicate the average number of minutes that you spend conducting feedback sessions (communicating results from the assessment and discussing recommendations) with each patient and/or their family.

19. Indicate the percentage of time you communicate recommendations via the following methods to the referral source (responses should total to 100 percent).

_____ Verbally
_____ Written
_____ Both verbally and written
_____ No communication

20. What is your gender?

- ❍ Female
- ❍ Male

21. What is your highest professional degree?

- ❍ PhD
- ❍ PsyD
- ❍ EdD
- ❍ Other _____

22. What is the field in which degree your was awarded?

- ❍ Clinical Psychology
- ❍ Neuropsychology
- ❍ Counseling Psychology
- ❍ School Psychology
- ❍ Other _____

23. Have you completed a post-doctoral fellowship in neuropsychology?

- ❍ No
- ❍ Yes

24. Are you board certified in neuropsychology?

- ❍ No
- ❍ Yes

25. How many years have you been conducting neuropsychological assessments as a licensed clinical psychologist?

26. Where do you practice?

- ❍ Northeast
- ❍ Southeast

- Midwest
- Southwest
- West

27. What is the term that best describes the population density of where you practice?

- Urban
- Suburban
- Rural

Thank you for your time and effort. To submit your completed survey, please click on the right arrow at the bottom of the page. Once you have submitted your responses, you will be redirected to a link that will give you the option of entering your email address in order to receive a $10 Amazon gift card via email as a token of our gratitude for your participation in this survey.