

Integrative Care Models in Neuropsychology: A National Academy of Neuropsychology Education Paper[†]

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Abstract

Although collaborative, and more specifically, integrated models of care have existed for years, the 2010 Patient Protection and Affordable Care Act expanded their use, and Medicare has adopted a value-based payment system that further emphasizes service provision within the collaborative health care setting. Neuropsychology as a field is well-situated to work within the integrated health care setting, which presents both opportunities and challenges for clinical neuropsychologists. This education paper details how different neuropsychology clinical practice settings fit into an integrated care framework; discusses challenges to service delivery and fiscal viability in such settings and other health care related settings; and examines future directions for the role of neuropsychology within a dynamic health care system.

Keywords: integrated care; collaborative care; neuropsychology practice models

Introduction

Integrated, or collaborative, care models are broadly characterized by multispecialty working relationships with coordination or care management (Gerrity, 2016). Although collaborative care models (CoCMs) have been present for many years in the United States, the passage of the Patient Protection and Affordable Care Act (ACA) in 2010 emphasized expanding these models as a primary goal for the future of health care. Key provisions of the law extend coverage to millions of citizens, and

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implement measures, including payment and care delivery changes, aimed at lowering health care costs and improving system efficiency. Although policies regarding the United States health care system are in flux, CoCMs continue to be emphasized and implemented across the country.

Recently, the American Psychological Association Practice Organization (APAPO) recommended that psychologists use the term “integrated care” to refer to collaborative practice settings, to avoid confusion with the American Psychiatric Association’s CoCM, which classifies psychologists as care managers, not doctors (The Center for Psychology and Health, 2017). Given that many neuropsychologists work within these types of settings, it is imperative to be aware of the changing landscape of health care and to understand potential professional opportunities that may arise with new models of collaborative care. We will use “integrated care model” throughout this article to emphasize the professional role neuropsychologists play in the health care setting, alongside other doctoral level providers.

The recent model of payment and delivery system reform promoted by the ACA and the Centers for Medicare and Medicaid Services (CMS) moves to a Merit-Based Incentive Payment System (MIPS), a “value based” rather than “fee-for-service” system. This is a critical development for neuropsychologists, as the Medicare payment system has been, historically, highly influential in private insurance market payments (Clemens & Gottlieb, 2017). By 2018, an estimated 90% of Medicare patient services will be reimbursed based on value rather than volume-based, traditional fee-for-service payments. The four main value-based models of care emphasize the concept of collaborative or integrated health care delivery. Neuropsychologists will need to understand how policy changes affect care and reimbursement, and should be equipped to practice in collaborative, integrated settings and demonstrate the value of neuropsychology in those settings (Kubu, Ready, Festa, Roper, & Pliskin, 2016).

Neuropsychology is well positioned to be a meaningful contributor to integrated care models. Neuropsychological evaluations provide information relevant to medical diagnoses, prognosis, and interventions (Kennedy et al., 2008; Matarazzo, 1990; Novack, Sherer, & Penna, 2010) and have been shown to contribute to reduced health care utilization and costs (Braun et al., 2011; VanKirk, Horner, Turner, Dismuke, & Muzzy, 2013). Thus, there is critical evidence for the added value of neuropsychology referrals within payment models that reward efficiency and provide economic disincentives for health care overuse.

This article details how various neuropsychology clinical practice settings in the United States fit into an integrated care framework and will discuss challenges to service delivery and fiscal viability. It will also detail directions for the future and opportunities for new service delivery in a dynamic system. A complete review of payment system changes is beyond the scope of this article, but psychologists are encouraged to become informed about changes in the payment systems through the resources of the APAPO.

Practice Framework Model for Neuropsychology in Integrated Care Settings

The roles of psychologists in the integrated patient-care setting have been discussed in recent papers (Beacham, Kinman, Harris, & Masters, 2011; Kazak, Nash, Hikoto, & Kaslow, 2017), and a continuum of integration of behavioral health services has been described in a practice model framework detailed by Collins, Hewson, Munger, and Wade (2010). The role of neuropsychology in integrated care settings has been less well defined. A survey described by Kubu and colleagues (2016) revealed that more than half of responding neuropsychologists work in at least one integrated care setting, the most common being neurology/neurosurgery (72%), followed by physical medicine and rehabilitation (25.3%), primary care (15.3%), other medical specialties (14.6%), psychiatry/psychology (13.7%), and academic/university settings (1.9%). Neuropsychology services are not typically defined based on level of integration with other specialties, despite the fact that many neuropsychologists are working in these types of settings. The practice model framework detailed by Collins and colleagues (2010) has never been directly applied to neuropsychological settings. Table 1 illustrates that there is a clear correspondence between the Behavioral Health Practice Model and current neuropsychological care settings. Given impending health care changes, it is imperative that neuropsychology highlights the skill-set and value it adds to integrated care systems and further explores integrated care opportunities.

The Collins and colleagues’ model allows one to consider the spectrum of integration of neuropsychology services, with Levels 4–8 having the greatest degree of collaboration. Services may be co-located or separate, but there is one treatment plan that includes neuropsychological services, among others. Treatment teams are composed of physicians and other specialists such as physician assistants, nursing, case management and psychologists. Data are collected and used to track patient care and response, and patients may be screened to identify the need for neuropsychological services (Collins et al., 2010). Participation in quality assurance data collection, such as tracking patient outcomes and developing preventive programs, is critical for neuropsychologists striving to demonstrate their value to these integrated health systems.

It is important for clinicians and insurers to understand the value of neuropsychology service Models 1–3, as well. For example, independent private practice clinics establish a critical link between primary care settings and community behavioral health/neuropsychological resources. The more intimate setting may help overcome cultural differences in seeking mental health-

Table 1. Application of a Behavioral Health Practice Model to neuropsychology-integrated care settings

Behavioral Health Practice Model	Application to Neuropsychology-Integrated Care Settings
(1) Improving collaboration between separate providers	Most “independent neuropsychology practices” are consistent with this model. Neuropsychologists are separate physically, administratively, financially, and in reimbursement systems. They communicate with provider or referring doctor as needed.
(2) Medical-provided behavioral health care	This is a common practice model for neuropsychologists in “private practice” and those in integrated care settings who receive referrals from outside their own systems (e.g., a clinician in a “neurology clinic” and outpatient “rehabilitation” where patients are referred from local primary care practitioners). Primary care providers manage care for patients with neurologic or psychiatric diagnoses (e.g., multiple sclerosis and traumatic brain injury), with consultation from specialists.
(3) Co-location of care	Examples include “hospital-based neuropsychology clinics” where the clinic is a stand-alone service on the same site as others but run separately. Administrative and reimbursement systems may be separate or unified.
(4) Disease management/care management	This model is seen in “psychiatric hospital” settings and in many “rehabilitation programs,” where neuropsychologists may take a lead role for patients who are medically stable but exhibit major cognitive/behavioral deficits. Management of care is provided through symptom and data monitoring, treatment compliance and education. Neuropsychologists may assist with care coordination (e.g., providing education and behavior modification strategies, and assessing patient understanding of, engagement with, and response to treatments) or as the liaison specialist with whom patient progress is reviewed.
(5) Reverse co-location of care	“Outpatient rehabilitation and multidisciplinary day treatment programs” (e.g., for traumatic brain injury and chronic pain) fit this model, in which the referring doctor (often a neurologist, neurosurgeon, and physiatrist) comes to a multispecialty setting where neuropsychologists provide services alongside physical, occupational, and speech therapists.
(6) Unified primary care and behavioral health	“Residential programs” for patients with neurologic conditions are consistent with this model. Another example is an “ambulatory primary care setting” in which neuropsychologists see patients with cognitive/behavioral challenges of sufficient complexity to compromise participation in medical care management. Services are in one location under one treatment plan.
(7) Primary care behavioral health	The “patient-centered medical home (PCMH)” fits this model, in which the neuropsychologist is integrated into the primary care setting to address problems affecting outcomes/treatment as they arise. The primary care physician manages care, but, at times, the specialist may temporarily co-manage cases.
(8) Integrative system of care	This truly integrated system includes social services/case management and can be seen in “health systems” as well as “specialty hospitals” (e.g., a specialty traumatic brain injury service with inpatient, day treatment and outpatient programs, social services, case managers, community outreach, and education).

related assistance, or other barriers to improvement. For example, smaller clinics may be less imposing or confusing, and easier to access, physically. Primary care providers (PCPs) may also utilize interventions based on consultant recommendations, for instance using a concussion-recovery algorithm to implement follow-up and further intervention as needed, or using recommended communication techniques for patients with cognitive, communication or behavioral challenges (Blount, 2003).

Care Models in Neuropsychology: Challenges and Potential Future Opportunities

Independent Practice Model

Private practice model structure varies tremendously across clinicians, ranging from large-scale multidisciplinary and multi-location services to single-provider independent offices. Many private practice providers also serve as independent contractors to hospitals or outpatient clinics to provide treatment and consultative services. Contracts may take the form of hourly rates paid to the provider by the hospital, referrals to the provider that are then billed to a patient’s insurance, or some combination of the two.

Despite a general decline in private practice clinics nationally, the independent practice model remains viable; in the 2015 practice survey, Sweet and colleagues found that private practitioners reported the highest income compared to institutionally employed clinicians. Interestingly, in stark contrast to private practitioners’ reported income, incomes of clinicians employed by institutions did not increase from 2011 levels. In addition to relative income, benefits of the private practice model include typically lower patient volume and greater independence in decision making. The independence of private practice also affords clinicians the speed and agility necessary to compete in today’s changeable health care environment. Furthermore, and perhaps most promisingly, increased direct doctor communication with patients/families may actually reduce unnecessary utilization. For example, a phone conversation during scheduling may reveal significant financial concerns or other issues precluding extensive evaluation, in which case alternatives or other resources (e.g., support group and PCP treatment) may be suggested.

An emerging model of care is the direct-pay clinic, in which neuropsychologists do not participate in insurance or third-party reimbursement (even opting out of Medicare in some cases). The direct-pay model addresses concerns about health care cost transparency, as clinicians can provide a precise quote of the cost of examination, in advance, based on time and intensity estimates. There is no denial of coverage or payment that can result in distress and financial hardship for the patient, who could receive a substantial bill for a service he or she may not have prioritized if given the choice of how to spend his or her health care dollars.

Decreased access to care combined with low reimbursement and high deductibles are expected to persist for the foreseeable future. Thus, patients will increasingly take an active role in choosing how to spend their health care dollars and determining whether the perceived benefit of neuropsychological evaluation exceeds the out-of-pocket cost. This highlights the need for neuropsychologists to demonstrate the financial and subjective value of their services directly to patients in addition to policy makers and third-party payers. Patients may place greater emphasis on immediate, concrete benefit and affordability, compared to insurers, which focus on outcome measures and overall utilization. This certainly is not specific to the independent practice model, and clinical models on the more integrated end of the collaborative spectrum may be able to incorporate lessons from the private practice setting and vice versa.

In short, the private practice model may contribute to the evolution of clinical neuropsychology in the midst of a health care transformation. An analogy can be seen in the evolution of the taxi industry since the creation of ridesharing companies that partner with private, self-scheduling drivers (paying their own vehicle/fuel expenses) to provide on-demand transportation at rates that vary with demand. With such innovative and fierce competition, the taxi industry, unchanged for decades, was forced to become more responsive to market forces; companies have begun to offer fee-for-service shuttles, “party bus” transport, reservations, and tidier vehicles with dishes of candy. In short, the quality of both ridesharing and taxi service increased, prices became more responsive to market demand, and services become more flexible and tailored to consumer needs and ability to pay. The private practice clinic model has the potential to trigger the same sort of mutually beneficial progress in neuropsychology; traditional clinics may offer personalized services found in private clinics, or private clinics may be encouraged to increase research activity, for example.

Hospital-Based Practice Setting Model

As Kubu and colleagues (2016) described, clinical neuropsychologists working in integrated care settings often work in both inpatient and integrated outpatient hospital departments or networks. These settings are commonly housed in or near an academic center or hospital. Neuropsychologists may work within a stand-alone neuropsychology or psychology clinic or within a specific medical department, such as neurology, trauma, physical medicine and rehabilitation, psychiatry, and neurosurgery. Collaboration of care is achieved through sharing the care of patients, electronic medical record sharing, participation in team meetings and rounds, and attendance at case conferences, Grand Rounds, and other multispecialty professional presentations.

An example of the hospital-based neuropsychology setting can be found in Physical Medicine and Rehabilitation Departments where psychologists and neuropsychologists are commonly an integral member of interdisciplinary treatment teams. In fact, neuropsychologists are specifically listed as an essential member of interdisciplinary teams for treatment of acquired brain injury with cognitive, emotional, or psychosocial issues ([Joint Committee on Interprofessional Relations between the American Speech-Language-Hearing Association and Division 40, 2007](#)). Another example of neuropsychology’s integral role in interdisciplinary care can be found in the epilepsy clinic ([Lee, 2010](#)), where neuropsychologists are included in the Guidelines for Essential Services, Personnel, and Facilities in Specialized Epilepsy Centers ([Gummit & Walczak, 2001](#)). The roles of neuropsychologists in specialized epilepsy centers include comprehensive assessment of neurocognitive functioning, localization of cerebral dysfunction in epilepsy surgical evaluation by neuropsychological testing, participating in presurgical intracarotid amytal (WADA) procedures and electrocortical stimulation mapping, treatment of psychogenic nonepileptic events, clinical psychological services for the assessment and treatment of emotional disorders associated with chronic epilepsy, and assessment of social and vocational needs ([Lee, 2010](#)).

Neuropsychology within inpatient hospital and hospital-based settings has the advantages of direct coordination of care for optimal effectiveness and efficiency of care, access to coordinated system electronics and coordinated billing. Neuropsychologists working within general inpatient hospital clinic settings are in a unique position also to assist in the diagnosis, treatment, and placement of patients with neurological conditions ranging from stroke, myocardial infarction, and traumatic brain injury to post-surgical or ICU-related cognitive decline. Capacity evaluation is another common referral request for neuropsychologists in the inpatient setting; capacity for medical decision making (particularly ability to make decision about discharge planning), independent living, financial management, and return to driving are common abilities targeted for evaluation.

Military and Veteran hospitals and their associated systems of care also offer neuropsychologists opportunities within integrated care systems. The VA provides examples of different levels of integration that vary by facilities as well as within the facility. Some have individual service lines specific to the specialty as well as pockets of greater integration within medical specialties, such as primary care, intensive care, neurology, TBI clinic, and rehabilitation. Psychologists and neuropsychologists in the military also have variability in their integration within practice settings. Roles may include assessment and rehabilitation of mild and more severe traumatic brain injury as well as other conditions, medical evaluation boards, force selection, and duty fitness and waiver examinations. These roles are sometimes carried out via consultation with a neuropsychologist and through telemedicine technology. Neuropsychologists also play an essential role in military research programs and hospitals that focus on recovery from traumatic brain injury and rehabilitation of other neurological insults.

Patient-Centered Medical Home Model

Outside the hospital clinic setting, there has traditionally been relatively less interaction between primary care clinics and neuropsychologists. However, a number of provisions in the ACA were designed to expand and strengthen the role of the PCP (e.g., increased reimbursement rates and investment in PCP training programs). The PCMH was envisioned as the model of care for patients with chronic conditions, and “health homes” were planned to coordinate patient care, and integrate community and social services (Davis, Abrams, & Stremikis, 2011). Typically within a PCMH model, the focus is on integrating psychology with primary care. In this model, care is largely coordinated through “warm handoffs,” with relatively less time allotted for scheduled follow-up services, more typically associated with psychological intervention. There is an emphasis on triage and brief, problem-focused therapy, and eventual transition of patients to other community-based providers if longer term psychological interventions are needed. There is also more of an emphasis on psychoeducation in this setting, with psychologists facilitating classes or groups focused on topics such as effective management of diabetes, which increases the time PCPs can spend on other patient-care issues. Because of the way this model is arranged, workloads may vary and providers tend to be salaried. It may be more difficult to account for productivity when services are bundled and/or workload varies day to day; thus income is typically not linked to billing for individual services. Instead, productivity measures may be linked to number of referrals completed, professional work value of services provided, and, ultimately, will be based on outcomes of services provided. Often these positions are federally funded, through CMS or as a Federally Funded Qualified Health Center, although insurance billing is often performed when applicable; this is often in the context of a performance improvement model of funding. Insurance billing introduces some challenges into a typical medical office in terms of learning the difference between medical, mental health, and behavioral billing codes. Additional challenges may arise in terms of providers billing for similar or overlapping services, or insurance restrictions on billing for services on the same day.

As the primary care setting has taken on more responsibility for care, opportunities for neuropsychologists to engage directly in the process have increased. Neuropsychologists may provide service at any or all stages of care in the primary care-based setting: (a) broad triage of new patients to determine who may benefit from cognitive screening, (b) administering screening instruments in person or via extenders or trained assistants in the primary care office, and (c) performing more extensive evaluation on those patients most in need of neuropsychological assessment. Positive results of an empirically supported screening could then trigger a protocol, which includes a referral to a neuropsychologist/neurologist to review the results (Perry et al., 2018; Roebuck-Spencer et al., 2017). This then leads to a decision tree, which can include referral for any or all of the following: standardized dementia laboratory profile, neuropsychological assessment, imaging, neurology work-up and consult, and/or social services intervention. Neuropsychological assessment may also be used to document response to treatment and potential barriers to medical treatment compliance. The primary care team or health home may benefit from neuropsychological evaluation of patients with conditions known to have cerebrovascular consequences such as diabetes, elevated cholesterol, and hypertension, in which neuropsychological evaluation has been shown to inform differential diagnosis and treatment management (Lezak, Howieson, Bigler, & Tranel, 2012).

Similar to how psychologists in these models receive referrals, neuropsychologists may receive patients via warm handoff from PCPs and also referrals may come from other advanced practice providers as well as PCMH team members, which often include psychiatrists and pharmacists. Patients can be seen with the PCP, while the PCP is in another room, or the PCP can simply consult with the psychologist regarding the patient’s care. As noted by Kazak and colleagues (2017), embedding psychologists in the PCMH can reduce barriers to treatment, such as long wait times, stigma of seeking care in a mental health setting, and greater use of primary care-based services for mental health treatment (vs. behavioral health clinics) by patients from ethnic/racial minority backgrounds. The authors describe activities of psychologists in the PCMH, all of which are potential opportunities for neuropsychologists, including, research, administration/team leadership, teaching/supervision,

consultation, and assessment/treatment. The integration of neuropsychologists into a PCMH setting, working side by side with physicians and residents while staffing, teaching, and rounding, also benefits the field of neuropsychology in terms of making our expertise and services to patients better known.

Shifting to value over fee-for-service will allow neuropsychologists to take more active roles in education, physician consultation, care coordination, and referral management, which arguably will improve overall patient outcomes. By working within health systems, neuropsychology also has the opportunity to educate referring physicians on how to determine when a comprehensive neuropsychological evaluation is beneficial versus a more targeted assessment and when behaviorally or environmentally based interventions may be beneficial to supplement traditional medical based interventions. Such real-time consultation enables more efficient use of personnel and financial resources. Neuropsychologists can also review potential referrals to determine if and when neuropsychological services would be of most benefit to a given patient. This expanded role of the neuropsychologist to engage in the referral management process may be a hallmark of practice in integrated care settings. Similarly, psychologists and neuropsychologists often have formal training in supervision and teaching, allowing a component of their professional duties to be dedicated to training medical residents and providing medical education to patients and their families.

Challenges in Neuropsychology-Integrated Care: Service Delivery and Fiscal Viability

A significant challenge to the practice of clinical neuropsychology, regardless of setting, is financial stability or growth in an era of ever-changing third-party reimbursement. A major challenge to the financial viability of traditional clinical neuropsychology models is the emphasis on increasing volume in the face of ACA Medicaid expansion and increased health care utilization (DeVoe et al., 2015). Contributing to the push for increased volume is the need to maintain revenue despite declining reimbursements (Sweet, Benson, Nelson, & Moberg, 2015), restrictions on allowed billable hours, penalties related to inadequate quality-improvement reporting, and increasing numbers of patients with Medicaid and similar payment plans with low reimbursement rates. On one hand, this creates incentive for neuropsychologists to develop time-limited, targeted, cost-effective assessment protocols, but when volume or demand exceeds capacity, workload may be excessive, increasing the risk for professional dissatisfaction. There is, in fact, evidence to suggest recent changes in health care have resulted in increased perceived “burnout” or professional discontent among medical providers (Shanafelt et al., 2015).

The combination of lower reliance on third-party payers and use of strategies that increase sense of control in the workplace has been associated with higher job satisfaction for psychologists (Rupert, Miller, Tuminello Hartman, & Bryant, 2012). Interestingly, these two factors are most likely to decline in a clinical environment characterized by high patient volume, burdensome compliance/billing requirements, and sometimes unpredictable actions by insurers or reform bodies that impact payment and practice.

An additional challenge to the practice of neuropsychology is the possibility of being excluded from health care system referral and reimbursement streams. Insurers may limit or exclude coverage for neuropsychological evaluation. Perhaps most importantly, the ACA led to expanded Medicaid coverage in many states, so patients who previously may have had private insurance that covered neuropsychological testing may now be covered by Medicaid, which, depending on the area, may not cover neuropsychological evaluation or may reimburse it at an unsustainably low level.

Reimbursement models utilizing value-based bundled payments (e.g., single bundled payments based on condition or group of services) also present a unique challenge to specialty clinicians such as neuropsychologists. Such models provide an economic disincentive for physicians to refer patients to specialists, highlighting the need for clinicians to provide both cost-effective and targeted assessment and reporting. Thus, neuropsychologists must also continue to demonstrate the qualitative and quantitative value of their services in such a payment system, as noted earlier.

Private insurance plans are not necessarily more viable reimbursement sources; in some states, Medicaid services are provided by private insurer plans and Medicaid-style private insurance plans are common on the ACA health care insurance exchange. These plans are notable for narrow networks, which limit or exclude coverage for out-of-network services, and limit payment for in-network services. Longer waits for in-network providers may also discourage health care utilization. High deductibles (the amount of money a patient must spend before insurance pays claims) are also increasingly common, especially in plans with lower premiums or subsidized premium assistance. Patients who are not likely to meet their deductibles must pay out of pocket the full cost for services (referred to as “cost sharing”). Thus, the substantial reduction in the number of uninsured Americans that has been associated with passage of the ACA has been, conversely, associated with reduced access to specific services (Manchikanti & Hirsch, 2016).

Although mental health and substance use disorder benefits were mandated in the ACA, plans vary in specific services covered. Neuropsychological evaluations, which are often included within mental health services, may not be covered, may be

associated with a prohibitively high out-of-pocket payment, or may be impeded by other barriers such as provider availability (wait time) and accessibility (location). Patients with high-deductible plans may also face burdensome out-of-pocket costs, as their insurance coverage may not apply to costs incurred prior to meeting a deductible. In fact, a trend towards decline in coverage or access to specialty mental health services has been documented for some time for persons with public and also private insurance (Glied & Frank, 2009; Rowan, McAlpine, & Blewett, 2013).

Neuropsychology clinics that operate independently may also face challenges from overhead costs associated with billing and compliance (e.g., quality reporting and electronic medical record use). These costs may be more difficult to contain in a small private practice than when costs are spread over an entire health system. According to the most recent survey of neuropsychologists' practices, the number of practitioners working solely in private practice has decreased, and the number of those working for institutions has increased (Sweet et al., 2015). A number of factors have likely contributed to the decline of private practice in neuropsychology since the ACA was passed in 2010. In states that have expanded Medicaid (with payment rates about 50% lower than for private insurance), the percentage of patients with private insurance has decreased. Private insurers have limited and, in some cases, attempted to eliminate coverage for neuropsychological evaluation. The administrative costs of compliance have increased, with small businesses disproportionately affected by the burden. In contrast, hospitals and health care networks offer economies of scale and a stable income.

Future Challenges

Value-based payment systems are proposed to improve health care delivery by focusing on cost containment and prevention of health care overutilization. Unfortunately, these cost-containment efforts may bring with it reduced payments to providers and present significant challenges to traditional neuropsychology clinic practices. Despite neuropsychologists' best efforts to adapt to a changing health care environment and the ACA, the winds of political change may present an entirely new set of opportunities and challenges. Alteration of the ACA seems likely; however, cost-containment will undoubtedly remain a focus for insurers and the insured regardless of policy and legislative changes that may occur in the coming months or years.

Neuropsychologists may be affected by any number of potential changes in health care policy, such as an increase in number of persons without insurance, block grants to states for management and development of Medicaid programs, and a decrease in so-called "Cadillac" plans or extensive coverage associated with employer sponsored insurance. Such changes are expected to result in higher deductibles, greater co-pays and other out-of-pocket costs, and increased consumer decision making regarding cost comparison. Cost containment efforts are likely to persist, and may include continued trends of reduced reimbursement, limitations in covered services or specialist referrals, narrowing networks, rate setting, and/or price caps. In considering the future viability of practice models in clinical neuropsychology, one challenge to neuropsychologists is to vie with other specialty services for health care dollars in a restricted pool (e.g., global payments to care for an entire patient pool) and maintain revenue despite financial incentives for providers to reduce overall cost of care.

Overcoming Barriers to New Opportunities

Although there is great opportunity for neuropsychologists to provide comprehensive patient care in these settings, there are limitations to the traditional model of providing lengthy comprehensive neuropsychological batteries, necessitating flexibility or referrals for these types of evaluations. In the primary care clinic, space restrictions and interruptions from providers with urgent patient needs may further affect the ability to effectively evaluate patients. Also, depending on the composition of the PCMH team, the neuropsychologist may have to serve multiple roles, such as providing psychotherapy, health psychology-related interventions, and even functioning more in a social service role at times. This multitude of potential roles makes it more difficult for providers to function only as a neuropsychologist; however, given that most neuropsychologists are trained as clinical psychologists and have extensive experience in medical settings, it can be argued that neuropsychologists are uniquely qualified to serve in these types of roles. That said, increased knowledge of behavioral issues associated with commonly encountered health conditions (e.g., as received through health psychology or behavioral medicine programs) may be necessary to assist with optimal treatment plans and to best serve patients in these settings. In short, neuropsychologists stand to offer a diverse array of services within the primary care clinic setting, with goals of enhancing the patient experience, increasing patient-provider communication and health care literacy, improving health outcomes and reducing cost of care.

Collins and colleagues (2010) acknowledge the challenges of integrating care in a fiscally demanding environment, and a number of their suggestions may be useful for neuropsychologists seeking to increase integration or collaboration:

- Consolidate payment information from segregated systems to make it easier to track total costs and integrate financial data for analysis.
- Create standard protocols for exchange of information between providers, clarifying confidentiality, HIPAA, and state/federal laws that may apply.
- Emphasize the value of neuropsychological resources in integrated and evidence-based care across systems.
- Highlight published evidence of neuropsychology's efficacy in reducing total cost of care and utilization, especially for models in which budget neutrality is mandated.
- Ensure that payment for services by more than one provider on the same day can occur, so neuropsychologists can bill for services with the same patient as a medical provider.
- Work with other institutions and services to find opportunities to increase knowledge/skill sets across multiple disciplines.
- Alleviate shortage of time of primary care physicians by addressing various behavioral health needs familiar to neuropsychologists, for example, problems with sleep, chronic pain, tobacco use, exercise.
- Provide PCPs with rapid access to neuropsychology services and targeted, specific and brief reports to speed patient transition through the care continuum (e.g., referral for mental health care or rehabilitation), following the recommendations in [Hilsabeck, Hietpas, and McCoy \(2014\)](#) and [Kubu and colleagues \(2016\)](#) (Adapted from [Collins and colleagues \(2010\)](#)).

Looking to the Future

In addition to the common integrated neuropsychology settings already described, and services such as medicolegal/forensic examination, there are a wide variety of potential opportunities for neuropsychology, some even within other professions and specialties, as described below (such as innovative physical therapy service models). These activities will likely require greater flexibility by neuropsychologists accustomed to working in traditional models of care. However, involvement in many of these activities will offer the opportunity for creativity and innovative thinking. It should be stressed that future directions in neuropsychological service provision may require a combination of practice models.

One opportunity is inspired by the proliferation of small, regionally based physical and rehabilitation clinics offering physical and occupational therapies. Such clinics rely on referrals from local physicians and self-referrals from patients. They offer individualized treatments in a geographically convenient and more intimate setting than the usual hospital clinic, and may have expanded or specialized services, such as treating amateur athletes for strength and conditioning, providing balance/fall prevention therapies, treating the “worried well” in an aging population who wish to stay fit, and offering in-home or mobile services on-demand. This model can be easily applied to clinical neuropsychology and is supported by recent research on non-pharmacological interventions for subjective cognitive decline ([Smart et al., 2017](#)).

The appearance of “Urgent Care” medical clinics has become more common. These clinics typically offer evening and weekend hours and serve patients on a walk-in basis. Most accept insurance, but many also have a published “menu” of pricing for different levels of service (ranging from basic care to more complex treatments). These clinics provide services on-demand without the delay of waiting in an emergency room or making an appointment in a traditional doctor's office. In contrast, clinical neuropsychology has traditionally been bound to strict operating hours and clinic locations, and even relatively rigid testing procedures, which could be construed as not particularly consumer friendly. For example, a patient with a rapidly progressive condition may be referred for neuropsychological evaluation and may face a wait of several months or more, to be seen, with a limited choice of appointment times and days. Non-traditional hours and days or “urgent care” evaluation may be a clinical service that neuropsychologists can expand.

Emergency Department (ED) services have also evolved in the past decade. Although the ACA was designed to decrease costly crisis ED visits, overall ED use has not changed significantly since 2010, despite increased insurance coverage ([Gindi, Black, & Cohen, 2016](#)). Data from the Centers for Disease Control revealed that a substantial number, nearly 30%, of such visits are related to lack of access to clinic-based doctors' offices. At least in part reflecting new value-based payment models, hospitals have designed a number of strategies to reduce wait times, including specialty EDs, online ED scheduling, medical “scribes” who complete electronic health record documentation, and triage of patients so that patients with more minor issues can be rapidly seen and discharged, often from a separate area. This creativity in response to volume pressures may provide an excellent lesson for neuropsychology, which is facing significant increases inpatient volume and simultaneous pressure to improve quality and reduce costs. For instance, a traditional hospital-based neuropsychology clinic may use a triage model in scheduling patients (as opposed to “first-come-first serve”), and extend the use of psychometrists as “scribes” who complete the electronic medical record as the clinician performs the diagnostic interview. In some VA settings, post-doctoral fellows

already provide screening examinations with a very brief battery, which allows for quicker turn around and feedback to the patients when results suggest no cognitive disorder. Such a screen and metric approach gleans the case load to allow more time for comprehensive assessments of impaired individuals.

Drugstores and pharmacies have developed patient programs, as well. Walgreens, the national drugstore chain, has begun to offer mental health services, including telemedicine and mental health screenings, relying on education and training for the company's pharmacists, nurse practitioners and physician assistants. Neuropsychologists have significant expertise to offer in both the training and service provision elements of such programs.

Telemedicine has received a great deal of attention (Clement, Brooks, Dean, & Galaz, 2001), offering an expanding practice area for neuropsychologists. The American Psychological Association Joint Task Force for the Development of Telepsychology Guidelines for Psychologists (2013) addresses critical issues relevant to the field, such as informed consent, assessment, confidentiality and interjurisdictional practice. Beyond the guidelines' operational definitions in telemedicine, however, are the potential advanced applications of telemedicine, such as "asynchronous video" reminders of doctor–patient communications, remote monitoring, and mobile device/mobile evaluation, all of which have potential application for neuropsychologists.

Partnership with insurers and providers of all types is rich with opportunity for neuropsychologists' involvement. For example, Blue Cross/Blue Shield, the nation's largest insurer, has partnered with Google and a behavioral health company, Quartet, to mine claims data to identify patients who may benefit from psychiatric referral, and to provide psychiatric telemedicine services (Highmark Expands Quartet Partnership to Improve Mental Health Integration Across Western Pennsylvania. (2017, February 23). Retrieved September 5, 2018, from <https://www.bcbs.com/news/press-releases/highmark-expands-quartet-partnership-improve-mental-health-integration-across>). Other third-party insurers are specifically recruiting psychologists to participate in emerging integrated care reimbursement models. Neuropsychologists may benefit from positioning themselves on the front lines of such developments. One such example would be neuropsychologists' expertise in the design and implementation of not only a behavioral health mobile device application for medication compliance, but design of behavior plans to increase medication compliance in various settings (e.g., nursing homes, colleges, and primary care clinics).

Effective communication with patients is another area in which neuropsychologists' expertise can be applied. With advancing medical technology, the need for consideration of health literacy is critical. Not only can neuropsychologists participate in research on health literacy, but they are distinctively prepared to design measures to assess patients' health literacy and implement interventions for increasing health literacy and/or reducing the impact of low health literacy on treatment compliance and outcomes. Moreover, neuropsychologists are uniquely qualified to identify other at-risk patients through the development and use of waiting-area screening instruments to identify patients with confusion or review of patient databases to identify patients with cognitive impairment-related admissions or ED visits.

Work site health facilities are a developing area of opportunity. In theory, they are health centers that may offer services such as primary medical care (PCMHs), walk-in clinics, pharmacies, fitness and wellness clinics, and chronic disease management, among others. Neuropsychological consultation for cognitive and behavioral issues would be a strong addition to such workplace facilities.

There are some potential directions for neuropsychologists that exist outside the traditional health care environment. Technological innovation has produced new opportunities for neuropsychologists. Virtual reality headgear and programs (e.g., Oculus Rift, an immersive virtual reality system) is perhaps the most promising development, and an area in which neuropsychological consultation and research will be important; for instance, neuropsychologists may participate in creation of neuroscience educational programs (e.g., brain "navigation"), tests using virtual reality platforms, or virtual reality rehabilitation programs for post-traumatic stress disorder.

Along those lines, artificial intelligence (AI) research has been the target of public and private sector funding, and neuropsychologists with expertise in areas such as statistics, brain–computer interfaces, game design and human factors are highly desirable in AI development programs. Finally, although this by no means represents an exhaustive list of potential directions for neuropsychologists, neuropsychological consultation in media production (e.g., television, film, gaming, and application development) may present another practice opportunity.

Conclusion

While there will be challenges for neuropsychology in the changing health care environment, the field is well positioned to demonstrate its value in collaborative or integrated care settings. It is critical for clinicians to understand and continue to document the field's contribution to cost containment and quality improvement, learn and develop services that are evidence based yet marketable, and remain proactive about adapting to changes in health care policy. Not only can the practice of

neuropsychology survive, but it can thrive and evolve in the new health care environment as neuropsychologists take a leadership role in health care innovation.

Conflict of Interest

The authors have no disclosures.

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