

The Minnesota Conference Guidelines for Education and Training in Clinical Neuropsychology

Introduction¹

The American Psychological Association (APA) Committee on Recognition of Specialties and Proficiencies in Professional Psychology (CRSPPP)² first recognized clinical neuropsychology³ as a specialty in 1996. Though definitions have varied, the APA Council of Specialties in Professional Psychology (CoS) defines clinical neuropsychology as a specialty that “applies principles of assessment and intervention based upon the scientific study of human behavior as it relates to normal and abnormal functioning of the central nervous system. The specialty is dedicated to enhancing the understanding of brain-based relationships and the application of such knowledge to human problems” (CoS, 2012). Consistent with this definition, Rey-Casserly et al. (2012) highlight contributions to the development of neuropsychology from neuroscience, physiological and cognitive psychology, quantitative and qualitative psychometric methods, and syndrome approaches to understanding the effect of central nervous system damage and dysfunction. They additionally note that while there is overlap, clinical neuropsychology differs from other health service psychology specialties in its unique focus on brain-behavior relationships and its increasing recognition of how social and cultural contexts impact this relationship.

Education and training in neuropsychology has grown increasingly structured and standardized since recognition as a specialty. Publication of the policy statement from the Houston Conference on Specialty Education and Training in Clinical Neuropsychology (i.e., the Houston Conference Guidelines; Hannay et al., 1998) provided a framework for the incremental acquisition of the knowledge, skills, and attitudes necessary for the practice of neuropsychology. Key components of this framework include:

- definition of a clinical neuropsychologist;
- programmatic integration of education and training across the doctoral, internship, and residency levels;
- establishment of a 2-year full-time postdoctoral residency/fellowship as the capstone of specialty training;
- definition of exit criteria for completion of specialty training that must be met by the end of the residency program.

Aspects of the Houston Conference Guidelines (HCG) initially were considered controversial (Ardila, 2002; Reitan et al., 2004; Reynolds, 2002) though over time they gained wide acceptance (Sweet et al., 2012). The above key components are explicitly endorsed and preserved in the Minnesota Guidelines including the 2-year, full-time postdoctoral residency/fellowship (or equivalent half-time residency/fellowship over four years) for

¹ A brief historical introduction to the Minnesota Guidelines is provided. See Puente (1989) and Meier (1998) for a description of the development of neuropsychology as a specialty before and leading up to the Houston Conference. Important developments between the Houston and Minnesota Conferences will be covered in a separate paper included in a special issue of *The Clinical Neuropsychologist* on the Minnesota Conference.

² Name changed to the Commission for the Recognition of Specialties and Subspecialties in Professional Psychology in 2020.

³ Throughout this document, the terms “clinical neuropsychology” and “neuropsychology” are used interchangeably to refer to the specialty.

specialization in neuropsychology, with an exception (i.e., substitution of two years of full-time post-doctoral practice supervised by a clinical neuropsychologist) made for Canadian neuropsychologists for whom residency training opportunities may be sparse (American Board of Clinical Neuropsychology Board of Directors, 2007).

In 2010, the Inter-Organizational Summit on Education and Training (ISET) surveyed neuropsychologists' view of the impact of the HCG and concluded that the guidelines continued to provide "a solid model for training within the specialty" (Sweet et al., 2012, p. 1075). ISET, however, recognized the importance of periodic review of training models and provided examples of when guidelines might require updating. These examples included broader use of competency-based training approaches in professional psychology and the introduction of new technologies relevant to neuropsychological practice.

Twenty-seven years after the Houston Conference, both these conditions have been met. Competency-based approaches to training are now widely used in professional psychology (Health Service Education Collaborative, 2013; Kaslow et al., 2004, 2007). Neuropsychology lags other health service psychology specialties in its continued reliance on training guidelines that predate the competency movement in psychology training (Rey-Casserly et al., 2012). Although the HCG mentions that training is competency-based, the articulation of knowledge and skill areas is limited in detail in contrast to contemporary competency approaches. The Minnesota Guidelines again build upon this existing HCG content but go further in defining developmentally incremental competencies for entry level and ongoing practice in neuropsychology. The Minnesota Guidelines also incorporate training in the ethical and equitable use of innovations in technology and information sciences that were either unavailable or in limited use in the Houston Conference era (for examples, see Bauer et al., 2012; Bilder, 2011; Bilder & Reise, 2018; Parsons & Duffield, 2020).

Societal changes also motivate new guideline development. According to census projections, 38.2% to 43% of the Canadian population will be members of a racial minority group by 2041 (Statistics Canada, 2022) and the population of the United States will become majority minority by 2044 (Colby & Ortman, 2015). With existing norms and tests, neuropsychology will not be able to serve the needs of an estimated 60% of the U.S. population by 2050 (Postal, 2015), exacerbating already existing inequities in brain health service delivery. Significant expansion of neuropsychological tools and norms and greater understanding of the impact of culture on brain development and cognitive test performance are essential for neuropsychology to serve these rapidly diversifying populations.

Social determinants of health (SDoH) adversely affect neurological disease outcomes and individuals from minoritized communities disproportionately experience these adverse outcomes (Johnston & Trevathan, 2023; Majoka & Schimming, 2021). Among these social determinants are access to quality education and health care (Brenowitz et al., 2020), literacy and health literacy (Nutbeam & Lloyd, 2021), exposure to racial and sexual discrimination (Majoka et al., 2021; Rapp et al., 2022), and socioeconomic and neighborhood context (Gilsanz et al., 2017; Glymour et al., 2011; Maalouf et al., 2021; Taylor et al., 2020). With SDoH estimated to account for as much as 50% of county-level health outcomes (Hood et al., 2016), health professions including neuropsychology cannot practice as they have in the past, ignoring issues of health equity as if they were irrelevant to patient clinical presentation and clinical intervention outcome. The Minnesota Guidelines are intended to prepare entry level neuropsychology specialists for their role as healthcare professionals in mitigating the impact of SDoH on brain health.

Finally, research demonstrates that structural and systemic oppression and discrimination contribute to profound brain health inequities throughout society (Coogan et al., 2020; Mullins et al., 2021; Powell et al., 2020; Zuelsdorff et al., 2019). APA (2021) acknowledges that the psychology profession contributes to the creation and perpetuation of inequities, including through the misuse of standardized testing. Given the centrality of psychometric testing in neuropsychology, the specialty has both a unique responsibility and opportunity to address this issue. The Minnesota Guidelines provide a framework for training entry level neuropsychologists to both be aware of and mitigate brain health inequities associated with structural and systemic oppression and discrimination.

In 2020, the American Academy of Clinical Neuropsychology Relevance 2050 Committee called for the creation of an interorganizational commission to plan the process for revising neuropsychology training guidelines and, in 2021, it began a series of meetings with the Boards of Directors of the major neuropsychology organizations in the U.S. to determine interest in joining this effort. There was broad agreement that the time had come to update the HCG. A Planning Commission was formed and this began a subsequent two-year process (details of which will be published separately) involving delegates representing all major neuropsychology organizations in the U.S. and Canada, as well as at-large delegates, resulting in the following **Minnesota Conference Guidelines for Education and Training in Clinical Neuropsychology**. The Minnesota Guidelines reflect the charge given to delegates to create a competency-based approach to neuropsychology training, to appropriately embed practices that promote diversity, equity, and inclusion in professional competencies, and incorporate technological advances and innovations (Planning Commission, 2022).

Preamble

The Minnesota Conference Guidelines for Education and Training in Clinical Neuropsychology (hereafter referred to as the Minnesota Guidelines) affirm a competency-based approach to training that incorporates classroom and laboratory-based instruction and inquiry, supervised clinical practice and experiential learning, ongoing self-reflection, and a commitment to lifelong learning across the career span. The Guidelines were developed through broad input to reflect current needs and requirements for clinical neuropsychology training considering scientific and technological advances and the demographic and cultural diversity of the populations neuropsychology serves. The Guidelines outline the knowledge, skills, and attitudes required for the specialty of clinical neuropsychology and provide observable criteria that define entry level competence for professional practice.

This document is not intended to establish enforceable training standards or legal requirements. The Minnesota Guidelines are aspirational, reflecting the vision and core values of the specialty of clinical neuropsychology. Clinical neuropsychologists aspire to best practices in the development and use of technological and innovative scientific methods and tools to advance the specialty, expand access, and benefit society. Clinical neuropsychologists seek to develop an equitable and just scientific knowledge base to advance assessment, intervention, and consultation services for individuals with conditions affecting the brain and their caregivers. Clinical neuropsychologists acknowledge and strive to repair historical and contemporary sources of bias and structural and systemic oppression and discrimination (including, but not limited to racism and antisemitism), that have harmed marginalized, minoritized, and excluded populations. To that end, clinical neuropsychologists advocate for health equity and access for all persons. Members of this specialty operate with integrity and accountability in the broad professional, social, and cultural contexts in which their services are provided and promote an inclusive atmosphere in their professional activities. While these aspirations are not enforceable

solely by their assertion in this document, the Minnesota Guidelines are intended to inform the future development of accreditation and credentialing standards. The Minnesota Guidelines become an enforceable standard through accrediting and credentialing organization adoption.

Definitions and Scope of the Minnesota Guidelines

The Minnesota Guidelines provide foundational and functional competencies for the specialty of clinical neuropsychology. Foundational competencies are broad, cross-cutting areas of science, ethics, and clinical knowledge necessary for professional practice. Functional competencies reflect the ability to integrate scientific, ethical, and clinical knowledge in providing patient care, consultation, and related services. The Minnesota Guidelines ground and integrate all competencies in a framework of equity, justice, cultural respect, and inclusion consistent with APA (2017b) Multicultural Guidelines. In addition, the Minnesota Guidelines incorporate a commitment to continuous innovation and use of empirically validated technologies to promote equitable brain health outcomes. The Minnesota Guidelines are specific to the training and practice of the clinical neuropsychology specialty and do not duplicate the competencies required of all health service psychologists regardless of specialty or the guidelines specifying core knowledge, skills and attitudes that are essential for all psychologists who provide assessment services (APA, 2020). It is explicitly assumed that prior to clinical neuropsychology specialization, trainees will acquire discipline-specific knowledge and profession-wide competencies for health service psychology (APA, 2022). This includes the criteria set forth in the APA Standards of Accreditation for Health Service Psychology (Committee on Accreditation, 2015; 2022).

The Minnesota Guidelines assume that acquisition of health service psychology and clinical neuropsychology specialty competencies occurs over the course of doctoral-level graduate school, practicum training, internship, and a 2-year postdoctoral residency/fellowship (or supervised clinical experience of equivalent length for Canadian neuropsychologists). Evaluations appropriate at each level of training will occur throughout this course of instruction so that areas requiring further attention are identified and addressed as part of subsequent training experiences. At the completion of fellowship, entry level competency is expected in all areas. Finally, neuropsychologists engage in continuing education to maintain competency throughout their careers.

The Minnesota Guidelines are applicable to education and training in clinical neuropsychology in the United States and Canada. They offer guidance to educators about competency-based training outcomes and preparation for entry level practice and they inform the public about the specialty of clinical neuropsychology. It is recognized and acknowledged that in other countries and geographic areas, different models and approaches to neuropsychology training will be required that are appropriate to the local educational, social, and cultural context. In addition, variations in training and practice opportunities in the United States and Canada require an adaptive approach to implementation that is appropriate for each country, taking into consideration the available resources for training. The Minnesota Guidelines are intended to be prospective and do not apply retroactively to people trained prior to their release and adoption. The training of individuals entering the specialty prior to adoption of the Minnesota Guidelines is guided by the HCG or other preexisting standards.

Foundational Competencies

Foundational competencies in clinical neuropsychology consist of *cross-cutting and integrated*

areas of knowledge, skills and attitudes that form the basis for entry level practice. The five foundational competencies are 1) Neuroscience and Brain Behavior Relationships, 2) Integration of Science and Practice, 3) Ethics, Standards, Laws, and Policies, 4) Diversity, and 5) Professional Relationships. These competencies are cross-cutting in that they also have applications within all areas of functional competency (see below for definition and description). Doctoral and 1-year internship programs with concentrations in neuropsychology and 2-year neuropsychology fellowship/residency programs provide training in each of the foundational competencies, but also integrate them into training in each of the functional competencies. Relevant aspects of each of the five foundational competencies should be addressed during training in each of the functional competencies. While training programs will provide opportunities to acquire knowledge, skill, and attitudes associated with each foundational competency, in no instance should a foundational competency be siloed. The role and relevance of each foundational competency to each functional competency should be addressed explicitly throughout the training sequence. The following sections introduce the five foundational competencies, citing illustrative literature. A comprehensive review of the literature pertinent to each competency is beyond the scope of this document.

Competency 1: Neuroscience and Brain and Behavior Relationships

Neuropsychologists are specialists in brain-behavior relationships. They demonstrate and maintain advanced knowledge of neuroscience and neurobiology, including anatomy and physiology of the nervous system and neurotransmitter systems (Kandel et al., 2012). Neuropsychologists possess advanced knowledge of structural and functional neuroanatomy, including cortical and subcortical structures, brain organization, and neural pathways of the central nervous system encompassing primary, secondary, and polymodal association areas, primary relationships between cortical and subcortical structures, sensory and motor systems, the peripheral nervous system, and the brain's vascular system (Blumenfeld, 2021; Woolsey et al., 2017). Neuropsychologists demonstrate knowledge of normal and abnormal brain development and maturation (Anderson et al., 2018). Neuropsychologists additionally demonstrate knowledge of the neurochemistry of behavior, including neurotransmitter pathways and normal and abnormal neuroendocrine function (Erlanger et al., 2010; Kandel et al., 2012).

Neuropsychologists have knowledge of etiology, pathology, course, and treatment of injuries to or conditions impacting the central nervous system (CNS) (Ropper et al., 2019; Weiner et al., 2010). This knowledge encompasses neurological, psychiatric, neurodevelopmental, and other medical, social, and environmental conditions that directly or indirectly affect brain function across the lifespan. Their knowledge encompasses both existing and emerging areas of scientific inquiry, including familiarity with genetic factors in the diseases seen in their clinics, factors that modify gene expression (i.e., epigenetics), advances in neuroimaging, and biomarkers of neurological disease. In addition, neuropsychologists demonstrate understanding of the basis of pharmacological, surgical, and other treatments of CNS diseases and related conditions, and the effects of major classes of medication, medical therapies, and drugs on brain function.

Neuropsychologists can relate neuroanatomical regions and functional brain networks to signs and conditions associated with their dysfunction. They infer lateralization, localization, and type of abnormality or disease from key findings of neurological and neuropsychological examinations (Morgan et al., 2010; Morgan and Ricker, 2018). Neuropsychologists demonstrate sufficient knowledge of medical and neurodiagnostic techniques, including structural and functional neuroimaging, electrophysiological recording, and blood and CNS biomarker assays to integrate their results with neuropsychological data in developing diagnoses and case

conceptualizations. Neuropsychologists integrate the theories and findings of cognitive science with knowledge of brain function and brain and behavior relationships to explain the clinical neuropsychology of behavior (Heilman and Valenstein, 2011).

Table 1

Neuroscience and Brain and Behavior Relationships

Neuropsychologists demonstrate knowledge of:

- Principles of neuroscience and neurobiology, including anatomy and physiology of the nervous system.
 - Structural and functional anatomy of the brain and spinal cord and their vascular systems.
 - Principles of normal and abnormal brain development over the lifespan.
 - Neurological, psychiatric, and other medical diseases and disorders affecting the central nervous system including their etiology, pathology, course, and treatment.
 - Neurodevelopmental disorders, including their etiology, course, and treatment
 - Neurotransmitter systems and the neurochemistry of behavior.
 - The effects of major classes of medication and drugs on brain function.
 - Theories and findings of cognitive science and neuroscience relevant to the clinical neuropsychology of behavior.
 - Neuroimaging and other neurodiagnostic techniques sufficient to integrate and incorporate their results in diagnosis and case conceptualization.
 - Principles for inferring lesion lateralization, localization, and type of abnormality or disease from neurological and neuropsychological data.
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Competency 2: Integration of Science and Practice

Neuropsychologists are dedicated to the integration of science and practice. As detailed in Competency 1 (Neuroscience and Brain and Behavior Relationships), neuropsychologists apply their knowledge of neuroscience and brain and behavior relationships to assessment (see Competency 6 Assessment) and interventions and recommendations (see Competency 7 Intervention). In addition to competency requirements specified in these respective areas, neuropsychologists stay abreast of scientific developments in the specialty, particularly those that are most pertinent to their areas of professional practice and integrate those developments into their practice. Neuropsychologists develop a plan for their continuing education. This includes reading peer-reviewed scientific and clinical literature, attending neuropsychology-related workshops and conferences (in person and/or virtually), journal clubs, and case presentations with colleagues, etc. They demonstrate the ability to appropriately weigh and critically evaluate clinical and scientific research and to effectively synthesize relevant research to inform clinical decision making. Consistent with principles of equity, justice, cultural respect, and inclusion (American Psychological Association, 2017) and knowledge of historical injustices perpetrated in the conduct of scientific investigations (Buchanan et al., 2021; Winston, 2020) neuropsychologists critically consume and clinically apply research and other forms of scholarship.

Table 2
Integration of Science and Practice

Neuropsychologists:

- Demonstrate awareness of the importance of remaining current in their knowledge of scientific research pertinent to their clinical neuropsychology practice and have a plan for their continuing education.
 - Appropriately weigh and critically evaluate clinical and scientific research and effectively synthesize relevant research to inform clinical decision making.
 - Demonstrate knowledge of the historical injustices perpetrated in the conduct of scientific investigations and clinically apply research findings consistent with principles of equity, justice, cultural respect, and inclusion.
 - Integrate their knowledge of neuropsychological science in the areas and forms of scholarship in which they engage.
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Competency 3: Ethics, Standards, Laws, and Policies

Clinical neuropsychologists in the U.S. must demonstrate knowledge of the current APA Ethical Principles of Psychologists and Code of Conduct, commonly referred to as the “APA Ethics Code” (APA, 2017). Canadian neuropsychologists must demonstrate knowledge of the corresponding Canadian Code of Ethics for Psychologists (Canadian Psychological Association, 2017). In addition, specialists must demonstrate knowledge of applicable standards, laws, and policies in the jurisdictions and institutions in which they practice. This includes federal, state, and local laws, policies specific to the sector in which they practice (including but not limited to healthcare, school, forensic, research, industry, veteran/military or prison systems), applicable judicial rulings (e.g., standards for the admissibility of expert witness testimony), and official standards and guidelines adopted by professional organizations (e.g., official position papers of the National Academy of Neuropsychology or the American Academy of Clinical Neuropsychology).

Bush (2018) notes that common sources of ethical challenge for neuropsychologists tend to involve the limits of professional competence, multiple roles or relationships that create conflicts of interest, test security and release of raw test data, presence of third-party observers, maintenance and limits of confidentiality, use and interpretation of assessment instruments, tensions between ethical mandates and law, false or deceptive statements, cooperation with other professionals, third-party requests and informed consent, and recordkeeping and fees. Specialists must be able to apply their knowledge of ethics, standards, laws, and policies in these and other situations that may arise in their practice and must know the limits of their knowledge and when to seek peer, professional, or legal consultation. In addition, specialists must be able to address conflicts unique to the populations with whom they practice (e.g., the limits of confidentiality in working with adolescents, the balance between respecting autonomy and maintaining safety in dementia populations, and the importance of remaining independent, unbiased, and evidence-based even when assisting legal counsel).

Neuropsychologists go beyond minimum knowledge and compliance with codes, standards, laws, and policies to demonstrate “positive ethics” (Bush, 2018; Knapp et al., 2017). In other words, neuropsychologists aspire to the highest ethical ideals in all aspects of their work rather than solely avoiding violations that would result in professional censure. They consider society-wide issues of diversity, equity, power, and injustice to act in the best interests of their patients, supervisees, and colleagues (see for example, Frame & Williams, 2005). In doing so, they

anticipate aspects of their practice where conflicts may arise, they avoid these anticipated conflicts whenever possible, and they appropriately address ethical conflicts that do occur (Bush & Pimental, 2018). Whenever neuropsychologists become aware of ethical issues, they follow APA and CPA recommendations as well as neuropsychology-specific practice guidelines and position papers, for resolution.

Table 3

Ethics, Standards, Laws, and Policies

Neuropsychologists:

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- Demonstrate knowledge of and adherence to official, current ethical principles and codes of conduct for psychologists applicable to their geographical area.
 - Demonstrate knowledge of and adherence to applicable current standards, laws, judicial rulings, and policies in the federal, state, and local jurisdictions and institutions in which they practice.
 - Demonstrate knowledge of and adherence to official current standards, guidelines, and positions adopted by the professional psychological and neuropsychological organizations to which they belong.
 - Anticipate and, whenever possible, avoid violations or conflicts involving ethics, standards, laws, and policies.
 - Appropriately address violations or conflicts with ethics, standards, laws, and policies when they occur following current APA or CPA recommendations and neuropsychology-specific practice guidelines and position papers.
 - Consider society-wide issues of diversity, equity, power, and injustice to act in the best interests of their patients, supervisees, and colleagues.
 - Demonstrate awareness of the limits of their knowledge of ethics, standards, laws, and policies and when to seek peer, professional, or legal consultation.
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Competency 4: Diversity⁴

In this document “diversity” refers to the broad range of cultural or individual differences based on race and ethnicity, sex and gender, sexual orientation, disability, culture, language, age, religion, geography, socioeconomic status, education, etc. Considering the broad range of human diversity and the multiple identities neuropsychologists encounter in their practice, neuropsychologists must create clinical environments that are inclusive and welcoming. This includes fostering respect for diverse perspectives, ideas, backgrounds, and experiences. While they strive to provide services to a broad patient population, neuropsychologists must recognize the limits of their competence in working with diverse individuals, considering all the variables on which people may differ. They should know when it is appropriate to refer to, or consult with, other professionals who have experience in working with individuals from various backgrounds and identities. However, all neuropsychologists should be trained to address diverse patient needs. Growing recognition of this (Manly, 2008; Reyes et al., 2024) is a major factor in the development of the Minnesota Guidelines. In line with the Standards of Accreditation and CoA

⁴ This section addresses diversity-related competency in clinical environments. See Competency 11 and Competency 12 respectively for diversity-related competencies in Teaching, Supervision, and Mentoring and Advocacy for Health and Professional Equity.

requirements for competency in individual and cultural diversity (CoA, 2015; 2022), the Minnesota Guidelines intentionally place greater emphasis on and specify a larger number of diversity-related competencies in clinical assessment than in the past (see Table 4). Further, the CoA requires doctoral and internship programs to incorporate training in cultural and individual diversity as a condition for accreditation. At the postdoctoral/residency level, programs must promote advanced competency in individual and cultural diversity as a fundamental core of health service psychology.

In conducting assessments, neuropsychologists take demographic and premorbid factors into account including age; sex; quality and quantity of education; race and ethnicity; acculturation; and languages spoken and proficiency, including the impact of bilingualism/multilingualism on development (Canas et al., 2020; MacDonald et al., 2023). Neuropsychologists select the most appropriate normative reference to guide test interpretation (Lezak et al., 2012; Mitrushina et al., 2005). Validated tests and appropriate norms may not be available for patients in particular age ranges (Melikyan et al., 2019), ethnicities (Fujii, 2010), or for whom English is not the primary or preferred language (Morlett Paredes et al., 2021). In these instances, neuropsychologists must make a clinically reasonable choice among the available options and/or adapt available tests and procedures. When doing so, neuropsychologists consider the degree to which test validity is compromised when interpreting results. Neuropsychologists must also consider the benefits and potential harms when selecting norms that include variables such as race that are imperfect proxies for a range of SDoH (Gasquoin, 2022; Possin et al., 2021). Finally, premorbid or comorbid disabilities may interfere with the assessment of cognition and behavior. To improve accessibility and maintain validity, neuropsychologists must adapt testing for patients who have low hearing or vision, motor limitations, developmental disabilities, and other conditions that may interfere with standard assessment of target brain functions. Any modifications to standardized procedures must be considered when interpreting assessment data and must be well documented in reports.

Culture overlaps with and influences many of the elements of diversity already discussed (e.g., race and culture are intertwined), but its independent role in neuropsychological assessment should also be considered. Clinical neuropsychologists draw upon relevant research from cultural psychology (Heine, 2010), cross-cultural neuropsychology (Cagigas and Manly, 2014), and cultural neuroscience (Chiao, 2009). Cultural psychology conceptualizes culture as including awareness of oneself and others as cultural beings with values, biases, and intersecting identities that may differ and considers how those differences influence professional practice (Arredondo et al., 1996; Sue et al., 1992). Cross-cultural neuropsychology examines how cultural factors influence cognitive processes, and how neuropsychological test performance, diagnosis and treatment may vary across cultural contexts (Fernandez & Evans, 2022; Pedraza & Mungas, 2008). Finally, cultural neuroscience investigates how culture influences neurobiology and behavior and how neurobiological processes, in turn, influence the development of culture (Chiao, 2009). Much of this scholarly work has emerged since the Houston Conference and should be incorporated in current and future neuropsychology training curricula.

Entry level specialists demonstrate sufficient knowledge of these three areas of cultural research to practice neuropsychology in a culturally informed manner, with the ultimate goal of maximizing diagnostic accuracy and improving brain health outcomes (Manly, 2008). Operationally, this means practicing consistent with the APA Multicultural Guidelines (APA, 2017b). Competence at the entry level requires that neuropsychologists demonstrate an understanding that each person's identity is fluid, complex, and the result of many of the intersecting factors and social contexts listed above (Fujii, 2023). In practice settings, there is a dynamic interaction between the neuropsychologist's and the patient's identities.

Neuropsychologists consider how their own culture of origin, preferred language, attitudes and views may impact their clinical conceptualizations and interpretations. They strive to avoid clinical formulations based on limited cultural knowledge or biased attitudes regarding diverse individuals and communities.

Finally, among the aspects of diversity listed above, there currently is limited empirical research on the impact of transgender status (Keo-Meier & Fitzgerald, 2017) and sexual orientation (Xu et al, 2020) on neuropsychological test performance. There is a growing body of literature exploring geography-linked variables such as area deprivation and neuropsychological performance (e.g., Busch et al., 2023), though use of area deprivation indices has not yet entered clinical practice. While neuropsychological theory and methods have been used to study religious phenomena (e.g., Johnstone et al., 2016), studies have not looked at religion as a predictor of test performance. Neuropsychologists must closely monitor and evaluate these and other emerging areas of diversity research to ensure their procedures are consistent with current empirical findings. Entry level neuropsychologists develop and implement a plan for continually updating and improving their knowledge of the role of diversity in neuropsychological practice. This plan should include approaching different cultures, identities, and world views with an attitude of humility, curiosity, openness, and respect.

Table 4
Diversity

Neuropsychologists:

- Demonstrate knowledge of cultural psychology, cross-cultural neuropsychology and cultural neuroscience as they shape neuropsychological practice.
 - Demonstrate knowledge of the intersecting factors and social contexts that shape brain development and brain health.
 - Demonstrate knowledge of the influence of cultural, social, environmental, and other contextual factors on access to healthcare and delivery and receipt of neuropsychological services.
 - Create clinical environments that are inclusive and welcoming.
 - Adapt testing for patients who have conditions that may interfere with standard assessment to improve accessibility and maintain validity.
 - Take demographic factors and premorbid ability into account when selecting the appropriate normative reference.
 - Consider the benefits and potential harms when selecting norms that include variables that are proxies for social determinants of health.
 - Make clinically reasonable choices among the available norms and tests and consider the degree to which test validity is compromised by their choices.
 - Recognize the role of language and health literacy in the delivery and receipt of neuropsychological services.
 - Recognize how personal attitudes and views impact clinical conceptualizations of diverse patients and avoid clinical formulations based on limited knowledge or biases.
 - Demonstrate knowledge of how multiple identities evolve and interact with culture, acculturation, and social context within the populations and age ranges they serve.
 - Recognize the limitations of their competence in working with diverse patients.
 - Demonstrate knowledge of when to refer or consult with neuropsychologists and other professionals because of the limitations of their competence in working with diverse populations.
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- Develop and implement a plan for continually updating and improving their knowledge into the role of culture and intersectional factors in neuropsychological practice.
 - Approach diverse cultures, identities, and world views with an attitude of humility, curiosity, openness, and respect.
 - Respect the perspectives, viewpoints, ideas, backgrounds, and experiences of those with whom they interact.
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Competency 5: Professional Relationships⁵

Professional relationships in neuropsychology are governed by the currently adopted Ethical Principles of Psychologists and Code of Conduct (APA, 2017), Canadian Code of Ethics for Psychologists (CPA, 2017), and all future updates. It is not the purpose of this document to restate or duplicate the APA or CPA Ethics Codes. Neuropsychologists should have sufficient knowledge of the Ethics Codes to demonstrate the ability to comply with its principles and standards across professional relationships. Like many contemporary health service providers, neuropsychologists often work in multidisciplinary environments with other professionals and supporting staff from various backgrounds. Differing healthcare professionals (e.g., neurologists, psychiatrists, physiatrists, speech and language pathologists) may have converging or conflicting perspectives while caring for patients together. Likewise, attorneys, organizations, institutions, etc., may have converging or conflicting perspectives with neuropsychologists. Regardless, neuropsychologists should demonstrate mutual respect and collaboration with all individuals with whom they work in these settings (Interprofessional Education Collaborative Expert Panel, 2011). In addition, they should demonstrate the ability to communicate and represent their findings and conclusions in a manner that considers and appropriately integrates the opinions of other professionals without minimizing or abandoning their own evidence and experience-based conclusions. Finally, in situations where differences of opinion are common (e.g., forensic settings), neuropsychologists offer legitimate, objective, and evidence-based critique of the work and credentials of other specialists while refraining from disparaging and disrespectful comments and illegitimate complaints (American Academy of Clinical Neuropsychology, 2003).

Table 5

Professional Relationships

Neuropsychologists:

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- Demonstrate knowledge of the current American Psychological Association Ethical Principles of Psychologists and Code of Conduct or Canadian Psychological Association Canadian Code of Ethics for Psychologists (whichever applicable) and comply with its principles and standards in professional relationships.
 - Demonstrate mutual respect and collaboration with all individuals with whom they work, including during difficult communications or conflict.
 - Communicate neuropsychological findings and conclusions in a manner that considers and appropriately integrates the opinions of other professionals without minimizing or abandoning their own evidence and experience-based conclusions.
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⁵ This section covers neuropsychologists' relationships with peers, other multidisciplinary professionals, and support staff persons. See Competency 11 (Teaching, Supervision, and Mentoring) for guidelines specific to relationships with neuropsychology trainees.

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- Offer legitimate, objective, and evidence-based critique of the work and credentials of other specialists while refraining from disparaging and disrespectful comments and illegitimate complaints.
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Functional Competencies

Functional competencies in clinical neuropsychology are the activities that neuropsychologists are required to perform during their clinical practice. Functional competencies include knowledge, skills, and attitudes, and are built upon the previously described foundational competencies. For brevity, we do not repeat each of the foundational competencies within the tables below, but it is explicitly understood that relevant foundational competency elements are integrated during training in each of the functional competencies. The eight functional competencies are⁶ 6) Assessment, 7) Intervention, 8) Interdisciplinary Systems and Consultation, 9) Research and Scholarship, 10) Technology and Innovation, 11) Teaching, Supervision, and Mentoring, 12) Health and Professional Advocacy, and 13) Administration, Management, and Business. The following sections introduce the eight functional competencies, citing illustrative literature. A comprehensive review of the literature pertinent to each competency is beyond the scope of this document.

Competency 6: Assessment

Central to the specialty of neuropsychology is competency in assessment. This competency includes administering, scoring, and interpreting tests cognition, academic achievement, social/emotional/adaptive functioning, and symptom/performance validity (Chafetz et al., 2015; Lezak et al., 2012; Sweet et al., 2021). Neuropsychologists appreciate the impact of individual and demographic factors on brain functioning (Ardila, 2020; Cagigas & Manly, 2014; Ferraro, 2015; Fujii, 2018). Neuropsychologists also appreciate the impact of outside influences on testing (e.g., third party observation; Glenn et al., 2021). With those factors in mind, when conducting assessments, neuropsychologists create a welcoming and inclusive evaluation setting, particularly for marginalized or minoritized populations, which are free from outside influences that could impact assessment results.

Neuropsychologists' selection of tests and procedures is guided by their understanding of psychometric science (e.g., test construction, normative score distributions, confidence intervals, test-retest reliability). They conduct culturally informed evaluations by selecting the best available evidence-based tests and procedures that are reliable, valid, and culturally, linguistically, and normatively appropriate for the clinical situation and the patient (American Education Research Association, American Psychological Association, & the National Council on Measurement in Education, 2014; Board of Directors, 2007; Fujii, 2017; Manly, 2005; Mitrushina et al., 2005; Morlett Paredes et al., 2021). In serving the best interests of patients with limited English proficiency, and considering the limits of their competence, neuropsychologists select from a range of options including use of professional interpreter services or referral to other qualified neuropsychologists (Judd et al., 2009). Neuropsychologists understand the psychometric properties and limitations of tests and the statistical theories relevant to test interpretation within the context of each patient (e.g., the impact of base rates and positive/negative predictive values, sensitivity and specificity, principles of profile analysis) (Kiselica et al., 2023). They also consider SDoH and interpret clinical data in consideration of a patient's sociocultural context. Finally, neuropsychologists understand the issue of test security

⁶ Numbering is continued from above.

and strive to protect against threats to future uses of neuropsychological tests (Boone et al., 2022).

Neuropsychologists clarify and discern referral questions including the intent, purpose, scope, and potential uses of the assessment. They identify the client (e.g., the individual undergoing evaluation, a retaining attorney, a disability insurance company, an employer or school system) in various settings and contexts (Board of Directors, 2007). They understand the range of neuropsychological assessments and the settings in which they may be applied, including medical, mental health, forensic, educational, and employment settings. Neuropsychologists obtain a history that accounts not only for medical, psychological, and educational factors, but also sociocultural demographics and lived experiences, including intersectional identities, which may be pertinent to evaluating brain development and function. If unfamiliar with a patient's culture, neuropsychologists conduct pre-evaluation research to develop a preliminary cultural conceptualization of the patient to be refined during the evaluation.

Neuropsychologists develop an individualized conceptualization of the patient/examinee to guide data interpretation, recommendations, and treatment planning. They integrate neuropsychological, behavioral, and interview data with other diagnostic procedures such as neuroimaging and laboratory tests (McConnell, 2014; Sullivan & Bigler, 2015). They also understand and incorporate base rates of conditions and findings in the settings in which they work (e.g., base rates of neurologic diseases, low test scores, and invalid test findings). Neuropsychologists diagnose cognitive, emotional, and behavioral disorders and identify their implications for brain function and adaptive status. Neuropsychologists characterize patients' strengths and weaknesses to understand areas of vulnerability and resilience and the potential to compensate for deficits. Neuropsychologists develop tailored recommendations and/or interventions based on assessment results. Finally, neuropsychologists provide feedback and recommendations when appropriate to patients and other consumers of evaluation results, considering healthcare literacy, values, linguistic abilities, barriers to access, and sociocultural context (MacDonald et al., 2023; Postal & Armstrong, 2015).

Table 6
Assessment

Neuropsychologists:

- Utilize information from medical records and referral sources to identify the client/service recipient and clarify and discern referral questions.
 - Obtain a working knowledge of the patient's culture and intersectionalities to develop a preliminary cultural conceptualization for guiding the assessment.
 - Create welcoming and inclusive clinical evaluation settings appropriate for diverse populations.
 - Appropriately utilize professional language interpretation.
 - Demonstrate knowledge of the impact of third-party observation on test security.
 - Conduct clinical diagnostic interviews with appropriate sources to obtain relevant assessment information.
 - Obtain estimates of prior functioning using best available educational, occupational, and other demographic information or collateral report.
 - Select and accurately administer and score tests that are evidence-based, reliable, valid, and culturally and normatively appropriate.
 - Document and explain in reports the rationale for variations from standard procedures or limitations in use of norms.
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- Integrate information from medical, psychological, educational, and other available records, interviews, behavioral observations, and test data to formulate diagnoses, recommendations, and treatment plans.
 - Develop diagnostic case conceptualizations, interpretations, recommendations, and treatment plans that consider all relevant contexts, individual and demographic variables, personal identity factors and their intersectionality, base rates, threats to validity, sources of clinician bias/judgement error, and the limitations of the tests utilized.
 - Engage in differential diagnosis of cognitive, emotional, and behavioral disorders caused by or associated with brain dysfunction and other etiologies utilizing evidence-based clinical decision-making strategies.
 - Identify patients' strengths and weaknesses to create a comprehensive profile of patient functioning that describes areas of vulnerability and resilience, and the potential to compensate for deficits.
 - Provide feedback and recommendations to patients and other consumers as appropriate.
 - Report results and recommendations clearly and effectively, in a format appropriate for the setting, context, and client.
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Competency 7: Intervention

Neuropsychologists recommend and/or deliver evidence-based interventions such as psychoeducation, psychotherapy, and cognitive rehabilitation based on the results of a neuropsychological examination when possible. Conclusions and recommendations may also be made regarding forensic matters, academic and employment accommodations, home environment modifications, and increased support for activities of daily living. Additionally, when appropriate, neuropsychologists recommend or use emerging evidence-based innovative methods and technologies (e.g., digital applications, electronic devices that provide compensatory strategies, virtual reality environments for adaptive skill rehearsal) (Stringer & Nichols, 2023) and internet-based interventions (e.g., teleneuropsychology) (Mara et al., 2020) that improve access to treatments. In recommending and/or providing these interventions, neuropsychologists rely on empirical evidence for efficacy and effectiveness of the treatment (Stringer, 2018), and are careful to avoid inadequately validated treatments. Neuropsychologists use patient-centered approaches to determine the most appropriate and pragmatic evidence-based interventions. Their decisions are informed by an advanced knowledge of brain-behavior relationships and consideration of demographic and sociocultural factors that affect treatment access, acceptability, and efficacy (Azar et al., 2024).

Neuropsychologists recommend or provide interventions that are appropriate for the patient's level of functioning, and they involve family members and other care partners as appropriate. Their choice of intervention is guided by multiple factors such as availability of resources, feasibility of access, and eligibility criteria (e.g., requirements for special education services or supported employment). They aim to improve patient acceptance and adherence to treatment by considering the patient's preferences, employing effective communication strategies (Postal & Armstrong, 2015), motivational interviewing (Corsica, 2011), and maintaining a clinical environment that is welcoming to a diverse population. Whenever possible, they also use measures with strong psychometric properties to evaluate intervention outcomes, and they adjust the intervention as needed to optimize outcomes. In addition to treating identified deficits, neuropsychologists provide recommendations for activities and healthy routines (e.g., physical

activity, social engagement) to prevent the development of additional problems and promote future brain, mental health and adaptive functioning.

Table 7
Intervention

Neuropsychologists:

- Provide recommendations and interventions that are evidence-based and guided by knowledge of brain-behavior relationships, assessment results, and the impact of neuropsychological deficits on treatment response.
 - Provide recommendations and interventions that are tailored to each patient's unique circumstances and that consider individual, family, demographic, environmental, and diverse sociocultural factors.
 - Administer standardized, evidence-based interventions with targeted adaptations to address patient needs.
 - Recommend prevention, brain health promotion, and social engagement activities.
 - Provide recommendations and interventions that are appropriate, pragmatic and consider access to and availability of resources, feasibility, and eligibility criteria.
 - Use emerging evidence-based innovative methods and technologies and internet-based interventions as appropriate to the problem and setting.
 - Use effective interviewing and communication strategies and design welcoming clinical environments for diverse populations.
 - Use measures with strong psychometric properties whenever possible to evaluate and adjust interventions to optimize outcomes.
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Competency 8: Interdisciplinary Systems and Consultation

Neuropsychologists provide consultation for varied purposes across multidisciplinary systems, settings, and teams. Examples include medical clinics, medical-surgical hospitals, inpatient and outpatient rehabilitation programs, civil and criminal forensic settings, academic environments, active-duty military and veteran environments, policy-making bodies, and additional settings previously enumerated (Board of Directors, 2007). The utility and benefits of neuropsychological consultation is well established across these settings (Prigatano & Pliskin, 2003) and continues to be an area of active service provision (Sieg et al., 2019).

Neuropsychologists understand best practices to convey neuropsychological information appropriate for the setting and context. For example, consultation may relate to care or support for individual patients with brain disorders, brain health program development, forensic neuropsychological services, research in brain health and dysfunction, and/or policy and legislation relevant to neuropsychological practice and healthcare more broadly.

Neuropsychologists should demonstrate competence in the types of consultation specific to the settings in which they elect to work.

In healthcare settings, neuropsychologists are aware of and address the needs of their patients and referral sources. Neuropsychologists are aware of complementary roles and responsibilities of other health professions (e.g., physicians; physical, occupational, and speech therapists) and work to provide effective, coordinated services to address cognitive and behavioral problems.

In educational, vocational, and social service systems, neuropsychologists collaborate with non-health care professionals (e.g., teachers, counselors, and administrators) to provide consultation that is relevant to the needs of the client and the institution. Neuropsychologists

assist in determining eligibility for programmatic services, appropriateness for specific positions/programs, and recommendations for system intervention in serving client needs.

In legal/forensic systems, neuropsychologists provide consultation to assist in determining issues such as capacity/competency, medical casualty, degree of impairment and need for intervention, criminal responsibility, and the role of cognitive dysfunction in sentence mitigation to assist attorneys, juries, judges, and/or other relevant stakeholders. When providing forensic consultation, neuropsychologists must be aware of relevant laws, guidelines, and legal standards that are broadly applicable to forensic settings and to the jurisdiction in which the consultation occurs. Neuropsychologists acknowledge that their opinions and testimony are to encompass and represent evidence-based science.

Neuropsychologists are sufficiently familiar with societal inequities and institutional biases to advocate for the best interests of their patients and clients during consultations in the settings in which they work. Neuropsychologists maintain awareness of their own biases. They seek consultation, or make referrals to other providers, when their biases interfere with the provision of consultation services.

Table 8

Interdisciplinary Systems and Consultation

Neuropsychologists:

- Conduct neuropsychological consultation and demonstrate a professional identity as a clinical neuropsychologist across the multidisciplinary systems, teams, and clinical and research settings in which they work.
 - Demonstrate awareness of patient, client, and referral source needs, and address those needs appropriately during consultations.
 - Utilize best practices in conveying neuropsychological information appropriate to the setting.
 - Demonstrate awareness of complementary roles and responsibilities in their consultation settings and work to coordinate their services and collaborate with other professionals.
 - Determine eligibility for programmatic services, appropriateness for specific positions/programs, and recommendations for system intervention.
 - Demonstrate awareness of relevant laws, guidelines, and legal standards applicable to the consultation services or opinions they provide.
 - Demonstrate familiarity with societal inequities and institutional biases to advocate for the best interests of their patients/clients during the consultations they perform.
 - Maintain awareness of their own biases and seek consultation or make referrals when in the best interests of their patients/clients.
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Competency 9: Research and Scholarly Activities

Neuropsychology is an evidence-based profession grounded in rigorous peer-reviewed scientific literature and scholarly work. Neuropsychologists may elect to engage in many types of research such as conducting empirical experiments, correlational studies, case series, individual case studies, systematic reviews and meta-analyses. Similarly, they may elect to contribute to scholarship (broadly defined) in various ways, including authoring scientific papers, books, book chapters, literature or book reviews; peer-reviewing journal manuscripts; serving on editorial boards; circulating publications in traditional or social media; preparing patient or consumer information materials; and delivering presentations at scientific conferences. Entry level

neuropsychologists demonstrate the knowledge and skills relevant to their chosen level and type of engagement in research and scholarship.

Neuropsychologists critically evaluate the relevant research literature by applying an appropriately skeptical scientific mindset in the evaluation of conceptual frameworks, study hypotheses, research methodologies, statistical analyses, conclusions and application of study results (Cooper et al., 2023). Neuropsychologists carefully consider and account for relevant biological, psychological, and sociocultural factors across all stages of scientific investigation from the generation of research questions through dissemination of scientific findings. Neuropsychologists demonstrate a basic understanding of common research designs (e.g., qualitative, quantitative, correlational, and experimental designs). They identify and apply appropriate research methodology (e.g., random assignment, recruitment of socioculturally diverse and representative samples). Neuropsychologists demonstrate awareness of both classical (e.g., correlation, analysis of variance, multiple regression, classical test theory) and more recent or emerging (e.g., item response theory, Bayesian statistics, machine learning) statistical techniques (Hilsabeck, 2017).

Neuropsychologists demonstrate knowledge of historical injustices associated with psychological research (Buchanan et al., 2021; Winston, 2020), current multicultural guidelines for conducting scientific investigations (APA, 2017) and research frameworks that integrate SDoH (Griffith et al., 2023; National Institute on Minority Health and Disparities, 2017). When conducting research with vulnerable or minoritized populations, neuropsychologists employ socially responsible methods as appropriate and feasible, including stakeholder and community involvement in hypothesis generation and study design (e.g., Dutta et al., 2023; Gone, 2023). Neuropsychologists display an understanding of how innovative technologies can advance research as well as potential limitations, risks, and ethical concerns associated with emerging technologies (Borah et al., 2016).

Table 9

Research and Scholarly Activities

Neuropsychologists:

- Demonstrate the knowledge and skills relevant to their chosen level and type of engagement in research and scholarship.
 - Critically evaluate research literature.
 - Account for relevant biological, psychological, and sociocultural factors across all stages of scientific investigation.
 - Demonstrate a basic understanding of research designs, methodology, classical and emerging statistical techniques.
 - Demonstrate knowledge of historical injustices associated with psychological research and employ research frameworks that integrate social determinants of health.
 - Adhere to current APA multicultural guidelines when conducting research and scholarship.
 - Utilize socially responsible research procedures when appropriate and feasible.
 - Demonstrate knowledge of benefits, limitations, risks, and ethical concerns when using innovative methods and technologies in research and scholarship.
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Competency 10: Technology and Innovation

Neuropsychology is an evolving profession that benefits from thoughtful incorporation of innovative methods and technologies into all aspects of the specialty (Bilder, 2011). Accordingly, neuropsychologists remain abreast of new technologies that are relevant to their various professional roles and activities (e.g., Parsons et al. 2018). This requires regular updating of a neuropsychologist's knowledge of innovative developments in key areas of neuropsychological practice (e.g., assessment, intervention, consultation, and teaching), and critically evaluating the potential applications of those developments (Marcopulos & Łojek, 2019). Following the identification and evaluation of a particular innovative approach, a neuropsychologist implements the technology into practice when this is feasible, useful, and appropriate (e.g., to improve data collection, clinical feedback provision, or supervision of students).

A neuropsychologist has knowledge of the advantages and potential limitations or harms of novel technologies (Germine et al., 2019). That is, a neuropsychologist applies the relevant scientific literature when considering the use of a new technique and prioritizes important ethical concepts such as access to neuropsychological services, privacy, and fairness (Miller & Barr, 2017). For example, a neuropsychologist might consider using a telehealth platform for cognitive assessment to reduce travel burden and improve access to neuropsychological services (Van Patten, 2022). Concurrently, the neuropsychologist should consider how lack of internet access and low computer literacy limit feasibility of telehealth services and may exacerbate health inequities (Eberly et al., 2020; Fernandez, 2019). The neuropsychologist should also consider the potential for breaches of test security when engaging in telehealth.

Table 10
Technology and Innovation

Neuropsychologists:
<ul style="list-style-type: none"> • Demonstrate awareness of and the ability to incorporate innovative methods and technologies in their practice. • Critically evaluate the characteristics of relevant innovations and technologies as applied to neuropsychological practice. • Show an awareness of and appreciation for advantages and potential limitations/harms of new technologies, particularly in vulnerable, minoritized, or underserved populations. • Consider ethical issues (e.g., access to services, privacy, fairness, test security) in the use of innovative methods and technologies in their practice.

Competency 11: Teaching, Supervision, and Mentoring

Neuropsychologists engaged in education and training focus on the development of learners' professional attitudes, the breadth and depth of their knowledge and skill acquisition, and the application of knowledge, skills, and attitudes in practice. Education and training should be goal-directed and implemented in a manner that allows learners to acquire knowledge, skills, and professional attitudes in a developmental manner that supports their growing professional identities (APA, 2014; Heffelfinger et al, 2022). A separate paper on Minnesota Guideline implementation provides examples of progressively challenging experiences at the graduate school/practicum, predoctoral internship, and postdoctoral levels.

Neuropsychologists are responsible for keeping abreast of advances in evidence-based and culturally responsive pedagogical theories (Stinson et al., 2023) and for implementing these into teaching, supervision, and mentoring activities (Calamia et al., 2022; Stucky et al., 2022; Sullivan-Baca et al., 2022). Neuropsychologists should be aware of the strengths/weaknesses of various pedagogical theories and practices and apply them appropriately for specific situations, goals, and learners. This includes awareness and implementation of emerging innovations and technology when they are shown to optimize access to education and/or learning outcomes.

Diversity, equity, and inclusion are essential in healthcare practice. While the number of neuropsychologists from underrepresented backgrounds and marginalized communities is increasing, the profession continues to be predominantly White (Klipfeld et al., 2023). Neuropsychology shares this problem with other healthcare professions, and it has implications for the quality of patient experience. Concordance between the race or gender of physicians and patients substantially improves patient satisfaction with services (Alsan et al., 2019; Cooper-Patrick, 1999; Rogo-Gupta et al., 2018; Saha, 1999; Takeshita et al., 2020) such that the American Medical Association, the Association of American Medical Colleges, the Institute of Medicine (IOM), and the National Medical Association have all called for diversification of health care professionals (Alsan et al., 2019). In particular, the IOM report concludes that greater diversity in health professionals not only increases minoritized patients' satisfaction with services, but also improves access to care and provider-patient communication (Smedley et al., 2004).

Unless neuropsychology is the exception among healthcare professions, if the specialty is going to adequately serve diverse patient populations, training programs must actively recruit, support and retain diverse students. It must be acknowledged, however, that meeting this goal is challenging in the current era of anti-affirmative action lawsuits and Supreme Court decisions that prevent the use of race in training program admissions. Strategies for achieving a diverse neuropsychology workforce in the current legal environment are addressed in a separate paper on Minnesota Guidelines Implementation. Entry level neuropsychologists who engage in teaching, supervision and mentoring should have the knowledge, skills and attitudes that allow them to recruit and work with diverse trainees. Specifically, neuropsychologists recognize the importance of using social justice frameworks and principles of cultural respect, equity, justice, and inclusion when engaging in all training/mentoring activities. This includes creating training environments that are collaborative, supportive, safe, attentive to power differentials, and accessible to individuals with diverse identities, backgrounds, and needs.

Competent teaching, supervision and mentoring requires neuropsychologists to develop and maintain effective professional relationships with learners. It also requires one to critically examine and maintain self-awareness of the strengths and limitations of one's teaching style, supervision skills, and mentoring approach. This is accomplished through proactive and ongoing solicitation of constructive feedback from all learners and other professionals across all settings and integration of this feedback into future actions.

Table 11
Teaching, Supervision, and Mentoring

Neuropsychologists:

- Keep abreast of advances in neuropsychological theory and practice to ensure training content reflects the current state of the specialty (including but not limited to advances in theory, assessment methods, and evidence-based intervention).
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- Apply the appropriate evidence-based pedagogical theories, methods, and practices to support learner growth and professional identity development and advancement.
 - Create developmentally tailored training programs and activities that are collaborative; culturally sensitive; responsive, attentive to power differentials; and accessible to diverse individuals.
 - Utilize emerging innovations and technology when they are shown to optimize or improve access to education and/or learning outcomes.
 - Critically examine and maintain self-awareness of the strengths and limitations of one's teaching style, supervision skills, and mentoring through the integration and implementation of constructive feedback from learners and other professionals across all settings.
-

Competency 12: Health and Professional Advocacy

Neuropsychologists advocate for health and professional equity. This includes informing and assisting decision-makers to promote the welfare of various groups, including patients and other clinical service consumers, the public, and the profession of neuropsychology (Lating et al., 2009). The importance of advocacy is widely recognized in medicine, nursing, and other healthcare professions (Choi, 2015; Earnest et al., 2010; National Association of Social Workers, 2021), and both the American and Canadian Psychological Associations support advocacy.

Many models of advocacy have been applied to healthcare environments (for example, Ballock et al., 2020) and the Minnesota Guidelines are not prescriptive as to which model specific training programs will teach. Regardless of model, neuropsychology programs must provide training and experiences that will contribute to the specialty's active engagement in professional advocacy. While advocacy is not foundational to neuropsychological science, the Minnesota Guidelines endorse entry-level competence in the following specific areas that are directly relevant to the specialty.

First, neuropsychologists advocate effectively for their own professional career needs within their chosen work setting. Effective self-advocacy requires cognizance of the persisting inequities in neuropsychology employment including lower income among women and individuals from minoritized communities (Klipfel et al., 2023). All neuropsychologists should be trained in models of self-advocacy and should receive mentorship from a diverse team of professionals to address unique training and professional needs. To mitigate the potential negative experiences often encountered by women, nonbinary, and marginalized or minoritized professionals when engaging in self-advocacy (Amanatullah et al., 2013; Hernandez et al., 2019), it is imperative that those from diverse backgrounds receive direct mentorship and sponsorship from other professionals from similar backgrounds (Sparks et al., 2022). This underscores the importance of continued efforts to expand the diversity of academic neuropsychology faculty.

Second, neuropsychologists advocate for their patients and other consumers of their services and the public when appropriate. The populations neuropsychologists serve may encounter barriers to accessing services, limitations in insurance coverage, and a lack of protection from incompetent or negligent providers. Advocacy on behalf of neuropsychological patient populations integrates knowledge of the impact of SDoH, racism, antisemitism, and all other forms of discrimination on neuropsychological functioning and well-being (Coogan et al., 2020; Mullins et al., 2021; Powell et al., 2020). Neuropsychological advocacy is grounded in

neuropsychological and public health research rather than political ideology and in this context advocacy for equity in healthcare is an ethical imperative in serving patients and the public.

Third, neuropsychologists should demonstrate involvement in advocacy for the specialty. The specialty faces challenges related to reimbursement, governmental and healthcare policies, and unfavorable judicial decisions. Neuropsychologists may demonstrate their involvement in professional advocacy through a variety of activities, including membership in professional organizations, pursuit of board certification (reinforcing public trust in the profession), volunteering on professional committees and boards, and serving as a visible representative of the specialty within their institutions, communities, and public media. Advocacy for the specialty may occur with policymakers at the neuropsychologist's place of employment or at any governmental level with which they have contact.

Table 12 **Health and Professional Advocacy**

Neuropsychologists:

- Demonstrate knowledge of best practices for professional advocacy.
 - Ground their advocacy for patients, consumers, and the specialty in neuropsychological and public health research.
 - Advocate for their professional career needs within the work or training setting.
 - Advocate for the welfare of their patients and the public, incorporating knowledge of the impact of social determinants of health and all forms of discrimination.
 - Advocate for the specialty of neuropsychology.
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Competency 13: Administration, Management, and Business

Neuropsychologists may assume administrative and management positions at all levels of the healthcare system, from running an independent private practice to leading divisions and departments in academic medical centers and universities. As such, neuropsychologists need to employ fiscally sound operational and management principles appropriate for the context of their professional activities. This includes budgeting and accounting of income and expenditures, management of front and back-office workflow, management of insurance claim coding and billing procedures, establishing secure medical records storage, marketing and referral development, and management of human resources (Barisa, 2010). Neuropsychologists should have basic knowledge of billing and reimbursement requirements, including required documentation of services, differentiation of healthcare services from non-healthcare (e.g., forensic and psychoeducational) services, establishing the necessity of professional services, and transparency in billing in accordance with policy and ethics. Practice management also requires keeping up with emerging technology in billing and administrative procedures.

In the practice of their profession, neuropsychologists must be familiar with research on SDoH that can lead to disparities in healthcare access and outcome across race, gender, socioeconomic status, and other demographic variables (Institute of Medicine et al., 2003; Lasser et al., 2006; Towfighi et al., 2023). Based on this knowledge, neuropsychologists work to reduce disparities and inequities in the delivery and access to their services and utilize validated technologies to reach underserved populations (American Psychological Association, 2021; Kelly, 2022; Presidential Task Force on Psychology and Health Equity, 2023; Trittschuh et al., 2018).

Neuropsychologists may experience conflict between laws, institutional policies, and the fiscal demands of their practice setting on the one hand and their efforts to reduce healthcare inequity, create inclusive environments, and provide care to underserved communities on the other hand. Consequently, neuropsychologists should have a basic understanding and ability to use options for balancing conflicting management goals and expectations, including diversification of payor and referral sources, pro bono work, sliding fee and other equitable billing options, use of validated technology to increase access to care, and developing relationships with individuals and organizations in underserved communities.

Table 13*Administration, Management, and Business***Neuropsychologists:**

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- Employ fiscally sound operational and management principles appropriate for the context of their professional activities.
 - Demonstrate knowledge of billing and reimbursement models and procedures that are consistent with ethical and regulatory standards.
 - Demonstrate knowledge of emerging technology in billing and administrative processes.
 - Demonstrate knowledge of research on inequities and disparities in the provision of healthcare services.
 - Demonstrate knowledge of strategies and validated technologies to reduce inequities and disparities in the delivery of neuropsychological services.
 - Demonstrate knowledge of strategies to balance laws, policies, and fiscal demands with efforts to reduce healthcare inequity, create inclusive environments for neuropsychological practice, and provide care to underserved communities.
-

Looking Ahead

The pace of development in clinical neuropsychology will likely accelerate in coming years, particularly with the introduction of artificial intelligence and other technologies and innovations in healthcare. Similarly, growth in population diversity and the necessity of considering the impact of SDoH on brain function will continue to catalyze change across healthcare specialties. The Minnesota Guidelines are meant to guide the training of clinical neuropsychologists so that the profession can keep pace with, and take advantage of, these opportunities for growth and change. The Minnesota Guidelines will not have a long shelf life. It is likely they will require revision within 10-15 years of their publication and adoption. These Guidelines are the product of a 2-year drafting process characterized by a great deal of collaboration, dedication and hard work, but also by considerable distrust, anxious worry, and frequent conflict. This was true of the Houston Conference as well, leading to a decade-long delay in their specialty-wide adoption. As of this writing, it remains unknown how long it will take for adoption of the Minnesota Guidelines, and it remains uncertain how broadly they will be adopted. What is certain is that the clinical neuropsychology specialty must develop a streamlined and more mature process for revising, updating, and drafting future guidelines. The specialty has too important a role to play in contemporary healthcare for us to fail in this endeavor.

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