Introduction

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Cognitive impairment following workplace injuries can be time-limited or permanent. Traumatic brain injuries, electrical injuries, neurotoxic exposure, depression, anxiety disorders, and chronic pain can be associated with subjectively reported and/or objectively documented cognitive problems. The challenge for neuropsychologists who evaluate injured workers lies in accurately identifying problems with cognition, quantifying the deficits, estimating the impact on day-to-day functioning, and apportioning causation. A goal of this book is to promote and encourage evidence-based neuropsychological assessment following work-related injuries.

SCOPE OF THE PROBLEM

Work-related injuries affect the lives of millions of people every year and are a significant public health problem. In 2006 alone, more than 3.9 million U.S. private-sector workers sustained nonfatal injuries (U.S. Department of Labor Bureau of Labor Statistics, 2007). These numbers do not include the 22% of the workforce that is not employed in the private sector. The National Institute for Occupational Safety and Health (NIOSH) defines work-related traumatic injury as "any damage inflicted to the body by energy transfer during work with a short duration between exposure and health event" (NIOSH, 2009, p. 3). Such a definition includes a wide array of physical injuries and medical problems that may be associated with cognitive and/or emotional symptoms and fall under the clinical or forensic purview of neuropsychologists. The NIOSH definition does not include injuries that are purely the result of an emotional reaction to an acute psychological trauma or stressor in the workplace, nor does it include

disorders that emerge over time as the result of prior exposure to disease-causing agents or situations. However, the *Occupational Injury and Illness Classification Manual*, developed by the U.S. Department of Labor's Bureau of Labor Statistics (1992), includes a broader range of injuries and illnesses of interest to neuropsychologists.

Work-related psychosocial stressors, injuries, and illnesses have been a specific focus of international attention (NIOSH, 2002; World Health Organization [WHO], 2010). Depression is a leading cause of disability and is projected by the WHO to become the second leading cause of the global burden of disease by 2020 (Murray & Lopez, 1996). As stated in the WHO report:

> There is strong evidence to indicate an association between work-related health complaints and exposure to psychosocial hazards, or to an interaction between physical and psychosocial hazards, to an array of health outcomes at the individual level and at the organisational level (Cox, Griffiths, & Rial-Gonzalez, 2000). Specifically, psychosocial risks in the workplace have been demonstrated to have a possible detrimental impact on workers' physical, mental and social health (e.g., Bonde, 2008; Bosma, Peter, Siegrist, & Marmot, 1998; Chen, Yu, & Wong, 2005; Fischer et al., 2005; Tennant, 2001; Wieclaw et al., 2008); in addition. . . . Exposure to physical and psychosocial hazards may affect psychological as well as physical health. The evidence suggests that such effects on health may be mediated by, at least, two processes: first, a direct pathway, and second, an indirect stress-mediated pathway. (Cox et al., 2000, p. 2)

PROFESSIONAL AND ETHICAL ISSUES

Persons who have sustained injuries in the workplace often experience complex and multifaceted disorders and syndromes. This complexity results from interactions between (1) the person's developmental, characterological, medical, and psychological status before the injury; (2) the biological aspects of the injury; (3) the timing and quality of healthcare following the injury; (4) psychosocial support following the injury; (5) treatment by the employer before and after the injury; (6) the degree of satisfaction with the workers' compensation system; and (7) litigation status. Neuropsychologists who evaluate and/or treat persons who have experienced work-related injuries examine this complexity when making diagnostic determinations, considering causality, determining disability status, offering treatment recommendations, and providing treatment.

The ethics codes of professional organizations (e.g., American Psychological Association [APA]; Canadian Psychological Association [CPA]) require clinicians to be familiar with the neuropsychological manifestations, probable etiologies, and expected recovery courses of the work-related

injuries experienced by their patients, and to be skilled in the evaluation or treatment services they provide (APA Ethical Standard 2.01, Boundaries of Competence; CPA Principle II: Responsible Caring). Similarly, clinicians who strive to learn about and understand *the person* who has sustained a work-related neuropsychological injury face a challenging task and must draw upon multiple methods, procedures, and sources of information to assist in their endeavor (APA Ethical Standards 2.04, Bases for Scientific and Professional Judgments, and 9.01, Bases for Assessments). The evolution of the field has led in recent years to an increased appreciation of the need for a biopsychosocial conceptualization of functioning, disability, and health; a need to consider the potential complexity of suboptimal performance during neuropsychological evaluations; and the impact of psychological distress and dynamics on patient functioning (Schultz, 2009). The best neuropsychological evaluations of people with work-related injuries demonstrate, through procedures and analyses, an understanding of these advances.

Clinicians explain to their patients and examinees, or their legal representatives, the nature of the neuropsychological services, including potential risks and benefits, and the foreseeable uses to which the results will be put, including who may receive the results and copies of reports (APA Ethical Standards 3.10, Informed Consent, and 9.03, Informed Consent in Assessments: CPA Principle I: Respect for the Dignity of Persons). This information allows patients to make informed decisions regarding participation in neuropsychological services (APA General Principle E, Respect for Peoples Rights and Dignity; CPA Principle I: Respect for the Dignity of Persons).

Because neuropsychological services for work-related injuries in the United States are commonly financed by workers' compensation, which may become an adversarial process, and may evolve to litigation, practitioners determine at the outset of their involvement whether their services are best conceptualized as clinical or forensic, or clinical with the potential to become forensic at a later time. Such determinations have implications for informed consent, privacy, and confidentiality, and potentially for other aspects of the evaluation or treatment provided (Bush & NAN Policy and Planning Committee, 2005).

Chibnall and Tait (2010) found that injured workers who retained the services of attorneys because of dissatisfaction with workers' compensation medical care, compared to those who did not retain an attorney or who did so for other reasons, experienced higher levels of disability and catastrophizing and had worse psychological adjustment, both in the short term and over time. Perceived injustice can be associated with greater levels of psychological distress (Sullivan et al., 2009). Moreover, people involved in compensation claims often experience a strong sense of entitlement; perceived injustice; and stress related to the claims process, an inability to move on

with life during this process, and a perceived lack of trust about having to prove impairment or disability (Murgatroyd, Cameron, & Harris, 2010). The compensation process can have an adverse effect on recovery trajectories for pain and psychological distress in some people (Sterling, Hendrikz, & Kenardy, 2010). The forensic context challenges clinicians in ways that are not experienced in many clinical settings. Schultz (2009) described the essence of such challenges: "Practitioners in forensic psychology and neuropsychology, more often than in other applied specialties in psychology, are forced to answer complex, high-stakes clinical questions that require operating on the cutting edge of science. They are even pressured to move beyond the boundaries of science where empirical and evidentiary support is absent or where lack of clarity still reigns" (p. 200).

Regardless of the context, neuropsychologists approach those receiving neuropsychological services with an attitude of "responsible caring":

> Psychologists accept as fundamental the principle of respect for the dignity of persons; that is, the belief that each person should be treated primarily as a person or an end in him/herself, not as an object or a means to an end. . . . Although psychologists have a responsibility to respect the dignity of all persons with whom they come in contact in their role as psychologists, the nature of their contract with society demands that their greatest responsibility be to those persons in the most vulnerable position. . . . This responsibility is almost always greater than their responsibility to those indirectly involved (e.g., employers, third party payers, the general public). (CPA, 2003, p. 13)

PURPOSE AND PROCESS OF THIS BOOK

The scientific research literature has much to offer practitioners who strive to understand the experience of each patient or forensic examinee. However, "the accumulation of knowledge in diagnostically defined domains of inquiry, such as depression, posttraumatic stress disorder (PTSD), traumatic brain injury (TBI), and pain disorders, proceeds more rapidly than researcher and practitioner ability to integrate the new data, develop cross-diagnostic or transdiagnostic knowledge of disability, and improve clinical practices" (Schultz, 2009, p. 20).

The goal of this book is to provide the reader with an understanding of the neuropsychological science and professional practice issues associated with work-related injuries. Part I describes common injuries that are sustained in the workplace and encountered by neuropsychologists in clinical and forensic settings. Experienced and knowledgeable researchers, clinicians, and forensic experts contributed chapters on topics such as traumatic brain injury, sports concussion, electrical injury, exposure to neurotoxic substances, and brain and psychological injuries experienced in combat.

Part II is devoted to mental health problems and chronic pain. Chapters on depression, posttraumatic stress disorder, and chronic pain are provided. The chapters in Parts I and II of this book reflect both traditional and contemporary topics of concern for clinicians, and the authors apply their knowledge of recent research in their reviews. Part III of this book is focused on professional practice issues. These chapters provide a tremendous amount of practical information relating to conducting work-related neuropsychological evaluations. By design, there is considerable overlap of topics addressed across the first three chapters, though the individual "voices" and style of the authors are nicely distinctive. Chapter 12 provides important insights into the disability determination process. Chapter 13 helps focus the clinician on the importance of writing reports that are relevant for vocational rehabilitation planning. The final chapter of the book, Chapter 14, is designed to promote and encourage evidence-based neuropsychological assessment. It provides clinicians with new psychometric information to improve their accuracy in identifying and quantifying acquired cognitive problems in daily practice. It is our hope that this information will help strengthen the scientific underpinnings of clinical judgment.

REFERENCES

American Psychological Association. (2002). *Ethical principles of psychologists and code of conduct*. Retrieved from *www.apa.org/ethics/code2002.html*.

Bonde, J. P. (2008). Psychosocial factors at work and risk of depression: A systematic review of the epidemiological evidence. *Occupational and Environmental Medicine, 65*(7), 438–445.

Bosma, H., Peter, R., Siegrist, J., & Marmot, M. (1998). Two alternative job stress models and the risk of coronary heart disease. *American Journal of Public Health, 88*(1), 68–74.

Bush, S. S., & NAN Policy and Planning Committee. (2005). Independent and court-ordered forensic neuropsychological examinations: Official statement of the National Academy of Neuropsychology. *Archives of Clinical Neuropsychology, 20*(8), 997–1007.

Canadian Psychological Association. (2003). *Canadian Code of Ethics for Psychologists, 3rd edition*. Retrieved February 5, 2011, from *www.cpa.ca/cpasite/userfiles/Documents/Canadian%20Code%20of%20Ethics%20for%20Psycho.pdf*.

Chen, W. Q., Yu, I. T., & Wong, T. W. (2005). Impact of occupational stress and other psychosocial factors on musculoskeletal pain among Chinese offshore oil installation workers. *Occupational and Environmental Medicine, 62*(4), 251–256.

Chibnall, J. T., & Tait, R. C. (2010). Legal representation and dissatisfaction with workers' compensation: Implications for claimant adjustment. *Psychological Injury and Law, 3*, 230–240.

Cox, T., Griffiths, A., & Rial-Gonzalez, E. (2000). *Research on work related stress*. Luxembourg: Office for Official Publications of the European Communities.

Fischer, F. M., Oliveira, D. C., Nagai, R., Teixeira, L. R., Lombardi Júnior, M., Latorre

Mdo, R., et al. (2005). [Job control, job demands, social support at work and health among adolescent workers]. *Revista Saúde Pública, 39*(2), 245–253.

Murgatroyd, D. F., Cameron, I. D., & Harris, I. A. (2010). Understanding the effect of compensation on recovery from severe motor vehicle crash injuries: A qualitative study. *Injury Prevention: Journal of the International Society for Child and Adolescent Injury Prevention, 17*(4), 222–227.

Murray, C. J. L., & Lopez, A. (1996). *Global Health Statistics: A compendium of incidence, prevalence and mortality estimates for over 2000 conditions*. Cambridge, MA: Harvard School of Public Health.

National Institute for Occupational Safety and Health. (2002). *The changing organization of work and the safety and health of working people: Knowledge gaps and research directions*. Retrieved February 5, 2011, from *www.cdc.gov/niosh/docs/2002-116/pdfs/2002-116.pdf*.

National Institute for Occupational Safety and Health. (2009). *Traumatic injury research at NIOSH*. Retrieved June 29, 2011, from *nap.edu/catalog/12459.html*.

Schultz, I. Z. (2009). Determining disability: New advances in conceptualization and research. *Psychological Injury and Law, 2*, 199–204.

Sterling, M., Hendrikz, J., & Kenardy, J. (2010). Compensation claim lodgement and health outcome developmental trajectories following whiplash injury: A prospective study. *Pain, 150*(1), 22–28.

Sullivan, M. J., Thibault, P., Simmonds, M. J., Milioto, M., Cantin, A. P., & Velly, A. M. (2009). Pain, perceived injustice and the persistence of post-traumatic stress symptoms during the course of rehabilitation for whiplash injuries. *Pain, 145*(3), 325–331.

Tennant, C. (2001). Work-related stress and depressive disorders. *Journal of Psychosomatic Research, 51*(5), 697–704.

U.S. Department of Labor, Bureau of Labor Statistics. (1992). *Occupational Injury and Illness Classification Manual*. Retrieved February 5, 2011, from *www.bls.gov/iif/oshwc/oiicm.pdf*.

U.S. Department of Labor, Bureau of Labor Statistics. (2007). *News release: Workplace injuries and illnesses in 2006*. Washington, DC: Author.

Wieclaw, J., Agerbo, E., Mortensen, P. B., Burr, H., Tuchsen, F., & Bonde, J. P. (2008). Psychosocial working conditions and the risk of depression and anxiety disorders in the Danish workforce. *BMC Public Health, 8*, 280.

World Health Organization. (2010). *Health impact of psychological stressors at work: An overview*. Retrieved February 5, 2011, from *whqlibdoc.who.int/publications/2010/9789241500272_eng.pdf*.