
NEUROLOGIC DISORDERS

Head Injury/Concussion

- 400,000-500,000 Americans suffer serious head injuries annually. A majority of these individuals complain of dizziness for up to five years following the injury, and many are disabled by this symptom.¹
- 79% of patients hospitalized for two days or less, with a normal neurological examination will experience dizziness within three months following a head injury. ²
- One in five high school football players sustains a concussion each year; 50% of college athletes have a history of concussion; 11% of ice hockey players, 17% of wrestlers, and 19% of baseball and softball players sustain concussions every season; 90% of boxers show neurological dysfunction.³
- In cases where an athlete experiences a second concussion before fully recovering from a prior concussion, second impact syndrome may occur.³
- Athletes demonstrate decreased stability up to 3 days post minor head injury; a sensory interaction problem where the injured athlete fails to use their visual system effectively. More severe injuries can take six days.⁴
- Complaints of dizziness and unsteadiness are frequent problems in accidental and job related mild head injuries.⁵
- About 5.3 million people in the United States live with a disability that was caused by a traumatic brain injury.⁶
- The National Center for Disease Control and Prevention reports that people over 75 years old have the highest rate of TBI. About 191 out of every 100,000 people in that age group suffer a TBI each year; the most common cause is falls.⁶
- Among elderly persons, brain injury is among the top 3 common types of injury.⁷

- Falls are reported to be a leading cause of TBI among those 65 and older.⁸
- Approximately 10% of occupants of the stricken vehicle in rear-end automobile collisions will develop "whiplash syndrome." The chronic symptoms may include dysequilibrium.²³
- A high percentage of patients in a study of whiplash victims were found to have faulty inner ear functioning leading to inefficient muscular control of balance and erect posture.²³
- The presence of cervical vertigo has been noted in whiplash patients with abnormal postural control response and subjective dizziness to rotational movements of the body under a stationary head.²³
- Dizziness is often mentioned as a symptom in whiplash associated disorder. The incidence of dizziness has been reported as 21% to 85%.²⁴

Multiple Sclerosis

- Approximately 400,000 Americans acknowledge having Multiple Sclerosis. An estimated 2 million individuals are affected worldwide.¹⁴
- MS is one of the most common diseases of the central nervous system in young adults.¹⁵
- MS patients may experience severe vision problems, muscle weakness in their extremities, and/or difficulty with coordination and balance.^{16, 17}
- Problems with gait or difficulty in walking are among the most common mobility limitations associated with MS. Most gait problems associated with MS can be helped to some extent by physical therapy.¹⁸

Stroke

- The National Institute for Health lists Stroke as the number one cause of adult disability in the United States, costing more than \$40 billion a year.⁹
- Approximately 600,000 Americans suffer a stroke each year; on average, someone in the US suffers a stroke every 53 seconds.¹⁰
- Stroke survivors often have problems with balance and or coordination.¹¹

- An estimated 65-75% of stroke survivors are unable to ambulate and face disability and handicap.¹²
- Roughly 40% of stroke patients suffer a serious fall within a year after having a stroke.¹³
- Stroke survivors with overall balance problems, dizziness or a spinning sensation have a fivefold increase in risk for falls.¹³

• **Parkinson's Disease**

- An estimated 1.5 million Americans are affected by Parkinson's disease.¹⁹
- Parkinson's disease affects one of every 100 persons over the age of 60.¹⁹
- There are 20 new cases of Parkinson's disease per 100,000 population per year.
- More than 35% of people with advanced Parkinson's disease experience falls and 18% sustain fractures as a result of falling.²⁰
- Gait and/or balance problems are classic signs of Parkinson's disease.¹⁹
- An estimated 38% of Parkinson's sufferers experience falls; 13% fall more than once a week.²¹

References:

1. Sataloff RT, et al (1993) *Minor Head Trauma - Assessment, Management, and Rehabilitation*. Springer Verlag, New York, NY.
2. University of Virginia Health System, Department of Otolaryngology - Head & Neck Surgery, Vestibular & Balance Center.
http://www.healthsystem.Virginia.edu/internet/otolaryngology/patient_vbc.cfm. Accessed June 2003.
3. Moser RS. Knock Knock: Concussions From Sports Injuries. *NJ Medicine*. November 1998, pg 27-29.
4. Guskiewicz, KM, et al (1997). Alternative approaches to the assessment of mild head injury in athletes; *Med Sci Sports Exerc*, Vol 29, No 7 Supplement, pp S213-221.
5. Goebel JA, et al (1997). Posturographic evidence of nonorganic sway patterns in normal subjects, patients and suspected malingerers. *Otolaryngol Head Neck Surg*; 117:293-301.
6. National Center for Disease Control and Prevention, www.cdc.gov. 2002.
7. Rapoport MJ, Feinstein A. (2000). Outcome following traumatic brain injury in the elderly: a critical review. *Brain Inj* 14:749-61.
8. <http://www.neuroadvance.com/statistics.htm>. Accessed July 2003.
9. National Institute for Health, www.ninds.nih.gov. Accessed July 1999.
10. CNN.com Health. *Cause and treatment of strokes*.
<http://www.cnn.com/2000/HEALTH/08/02/stroke.explainer/>. Accessed Mar 2003.
11. Stroke Rehab Information, National Institute of Neurological Diseases and Stroke, www.ninds.nih.gov.org. 2000.
12. Hassid, E, et al (1997). Improved Gait Symmetry, *J Neuro Rehab*; 11-21-26.
13. Health on the Net Foundation. News: *Strokes Can Strike at Balance*.
<http://www.hon.ch/News/HSN/511294.html>. Accessed Mar 2003.
14. National Multiple Sclerosis Society. Brochure: *Just the Facts* 2001-2002, MS Facts.
<http://www.nmss.org/Brochures-Just%20the.asp> accessed Mar 2003.
15. Multiple Sclerosis International Federation. MS - The Disease; *Quick Facts*.
http://www.msif.org/en/ms_the_disease/quick_facts.html. Accessed Mar 2003.
16. National Multiple Sclerosis Society. Brochure: *Just the Facts* 2001-2002, MS Facts.
<http://www.nmss.org/Brochures-Just%20the.asp> accessed Mar 2003.
17. National Institute of Neurological Diseases and Stroke. *Multiple Sclerosis*.
http://www.ninds.nih.gov/health_and_medical/disorders/multiple_sclerosis.htm. 2000.
18. National Multiple Sclerosis Society. *The MS Information Sourcebook*.
<http://www.nationalmssociety.org/Sourcebook-Gait.asp>.
19. The National Parkinson Foundation, Inc. *PD Patient Education - What the Patient Should Know*.
<http://www.parkinson.org/pdedu.htm>. Accessed Mar 2003.
20. Smithsonian, F. (1998) Performance on clinical tests of balance in Parkinson's Disease. *J Phys Ther*; 78:577-592.
21. Parkinson's Action Network. About Parkinsons: *What is Parkinson's Disease?*
<http://www.parkinsonsaction.org/aboutparkinsons/whatisparkinsons.htm>. Accessed June 2003.
22. Chester JB (1991). Whiplash, Postural Control and the Inner Ear. *Spine* 16(7):716-720.
23. Mallinson AI, et al (1996). Dizziness, Imbalance, and Whiplash. *J Musculoskeletal Pain* [The Haworth Medical Press] 4(4):105-112.