Crash Facts

- 43% of crashes are due to rear impacts. 38% of rear impact occupants develop symptoms
- Current accepted terminology for rear impact injuries: Whiplash Associated Disorder (WAD)
- 18% of WAD injuries occur in crashes of less than 6.2mph.
- 60% of WAD injuries occur in crashes between 6.2-12.4mph. 78% of injuries were under 12.4mph.
- 85% of all neck injuries recorded were due to car crashes and 85% of those came from rear end impact collisions. (Am. Journal of Public Health)
- 80% of all car crashes occur at speeds of less than 10mph. Fatalities have been recorded in crashes occurring as low as 12mph. Hence the mandatory seat belt law.
- Shoulder/lap restraint systems save lives in moderate to severe impact crashes but cause increased injury to the neck in low speed crashes.
- Air bags save lives and decrease neck injuries but can also cause injury (face, hands, fingers).
- The muscles and ligaments of the neck are designed to support head (10-12lbs) allowing for bending and turning. However, the forceful, rapid, jerking motions in an auto crash can easily injure the neck.
- The duration of a single impact crash including the movements of the occupant is over in ½ second or less. Multiple directions of head, neck, torso and extremity motion occur is this short time resulting in shearing forces that can tear muscles and ligaments.
- Complete tears of ligaments, tendons, or muscles in low impact collisions are rare, but the rapid, forceful movements can stretch the tissues beyond capacity resulting in micro-tears.
- Ligaments become weaker, more sensitive, and less elastic when injured. If torn, they will never return to their full capacity. How close they do return depends on proper care and strengthening.
- The strongest ligament in the spine is the thick pad shaped disc.
- The weakest, most fragile ligament in the spine is the facet capsule ligament.
- The most prevalent neck injury in a low impact rear end collision is a facet joint ligament injury. Irritated facet ligaments can “refer” pain from the neck injury site into the head, upper back and down into the areas around shoulder blades. (Where you feel the pain isn’t where it comes from.)
- Leaning forward at the time of a rear impact crash can increase injury by 12%
- If the head-rest is more than 2 inches from the back of the head when struck from behind, the neck can lengthen (be overstretched) as much as 3.5 inches.
- Head rest height needs to be well above the mid skull area or the risk of injury in a rear impact crash in increased.
- The head acceleration compared to the vehicle in rear impact collisions. For example: An 8 mph rear impact accelerates the vehicle 2 Gs but the occupant’s head accelerates 5 Gs
- Women’s head acceleration was 70% higher than men’s due to their usually longer, thinner neck and weaker neck muscles.
- Age is a risk factor. Children, although very flexible, can be injured in a collision due to immature muscle strength and a larger by proportion size of their head.
- Patients younger than 20 healed faster than those 30 or older
- Persons between 40-60 years of age required significantly more care than younger patients.
- Seniors were much more prone to injury and long term residuals due to weaker muscles and less range of normal motion.