Vehicle Head Restraints: an Essential Safety Feature

In the United States, 30% of 6 million police reported vehicle crashes are rear-end collisions[1]. The most common symptom of whiplash or whiplash associated disorders (WAD) is pain due to mild muscle strain or mild tearing of soft tissue. Other injuries include nerve damage or damage to the intervertebral disc[2].

There is evidence that the risk of injury in rear-end collisions is independent of vehicle damage. In fact, little or no crush damage to a vehicle can result in injury with or without immediate symptoms[3]. It has also been shown that if there is little or no movement of the head relative to the torso in a collision, people may escape neck injury even in severe crashes[2].

In a rear end collision, the head rises above the head restraint and there is a temporary straightening of thoracic (upper back) and cervical (neck) curves upon impact (Figure 1)[1]. Head restraints contribute in limiting the neck distortion that occurs before the head starts to follow the torso. Effective head restraints reduce rearward motion of an occupant's head in a rear-end crash and decrease the likelihood of sustaining a whiplash injury.

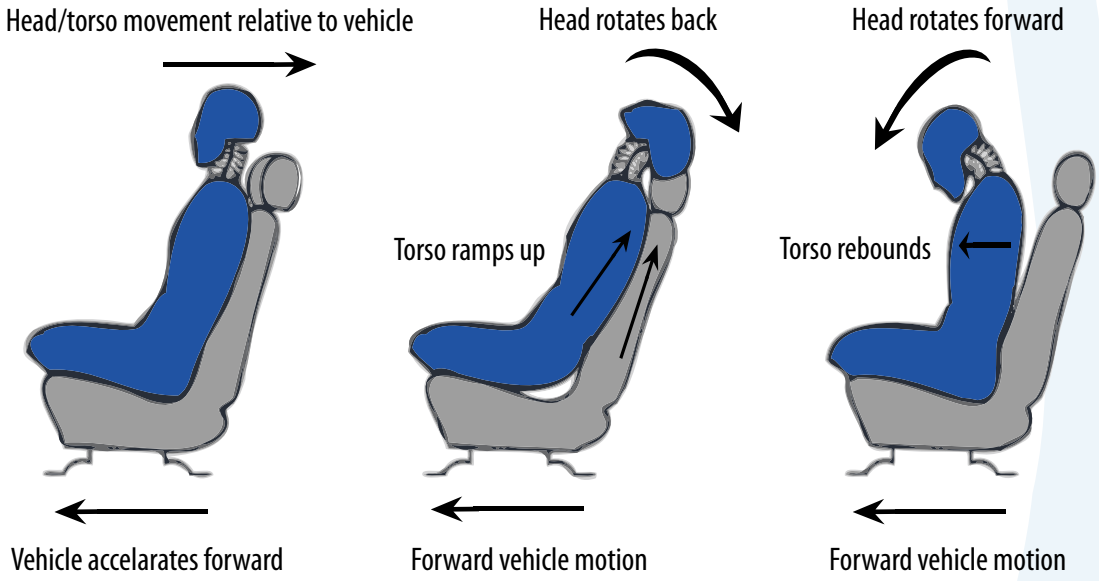

Figure 1. Effects of rear-end collision

Recommendations:

A head restraint should be positioned at < 6cm below the top of the head or at least level with the top of the ears (Figure 2). The distance from the back of the head to the restraint should be as small as possible or < 6 cm from the back of the head (Figure 3)[1].

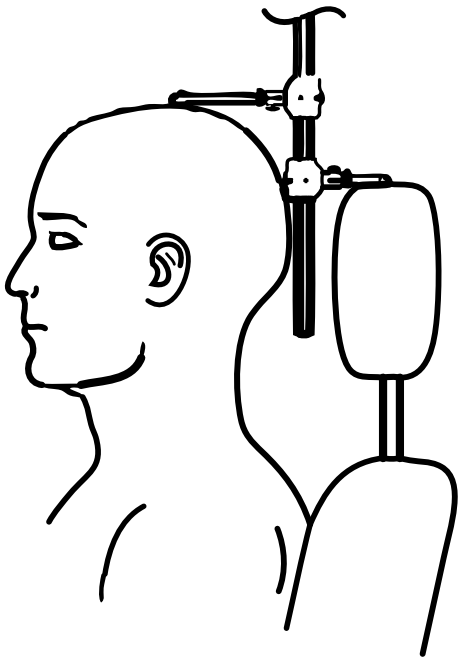

Figure 2. Vertical Distance

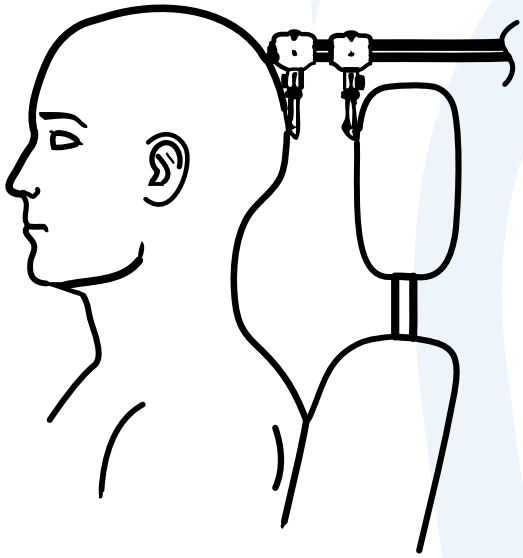

Figure 3. Horizontal Distance

1. Taylor, JAM, et al. Car seat head restraint. J Can Chiropr Assoc. (2005). 49(1).
2. Insurance Institute for Highway Safety www.iihs.org