Helmets and Neck Injuries in Fatal Motorcycle Crashes

James V. Ouellet

David R. Thom

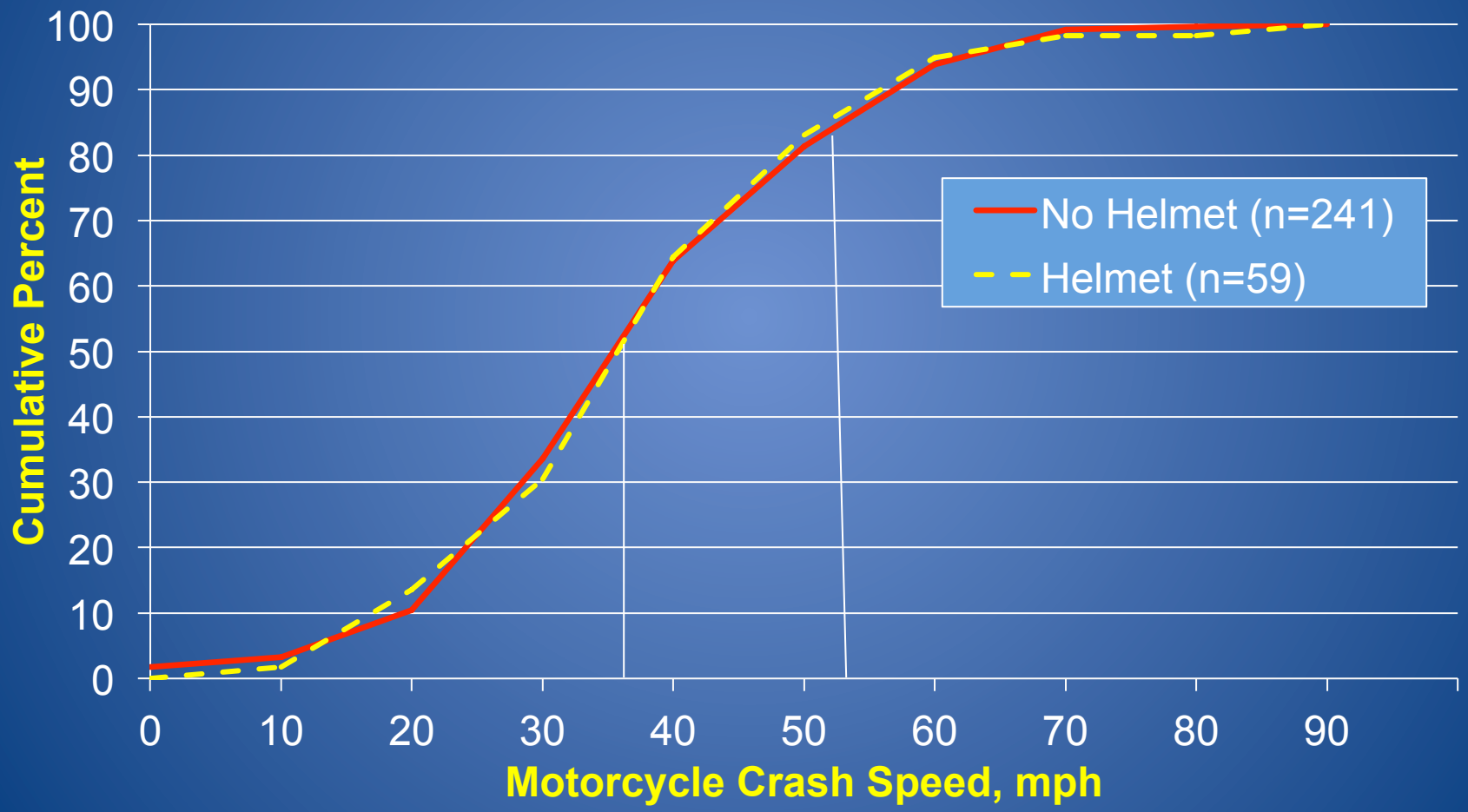
Terry A. Smith

Examination of vehicles and crash scene

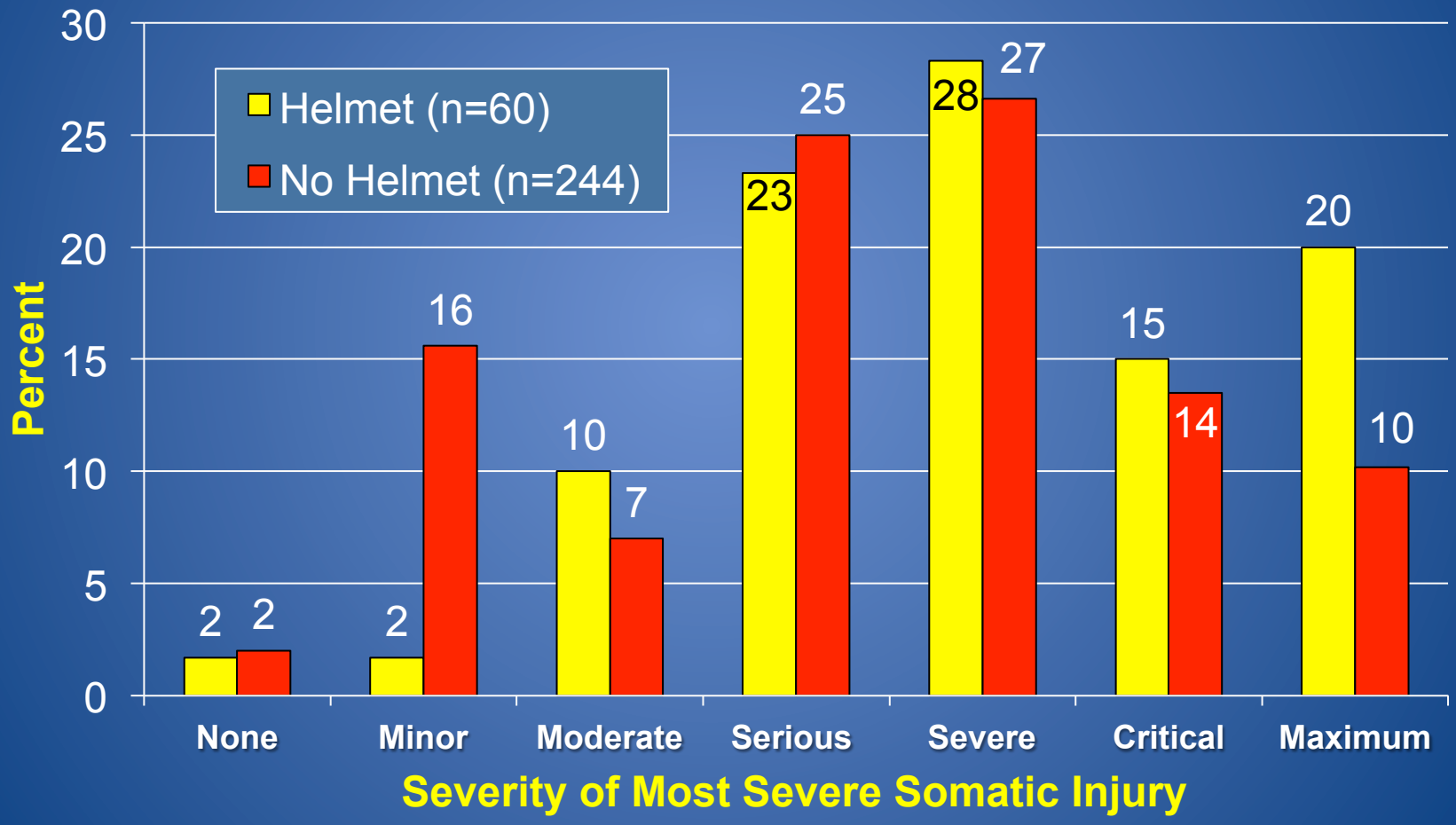

#4

Reconstruction

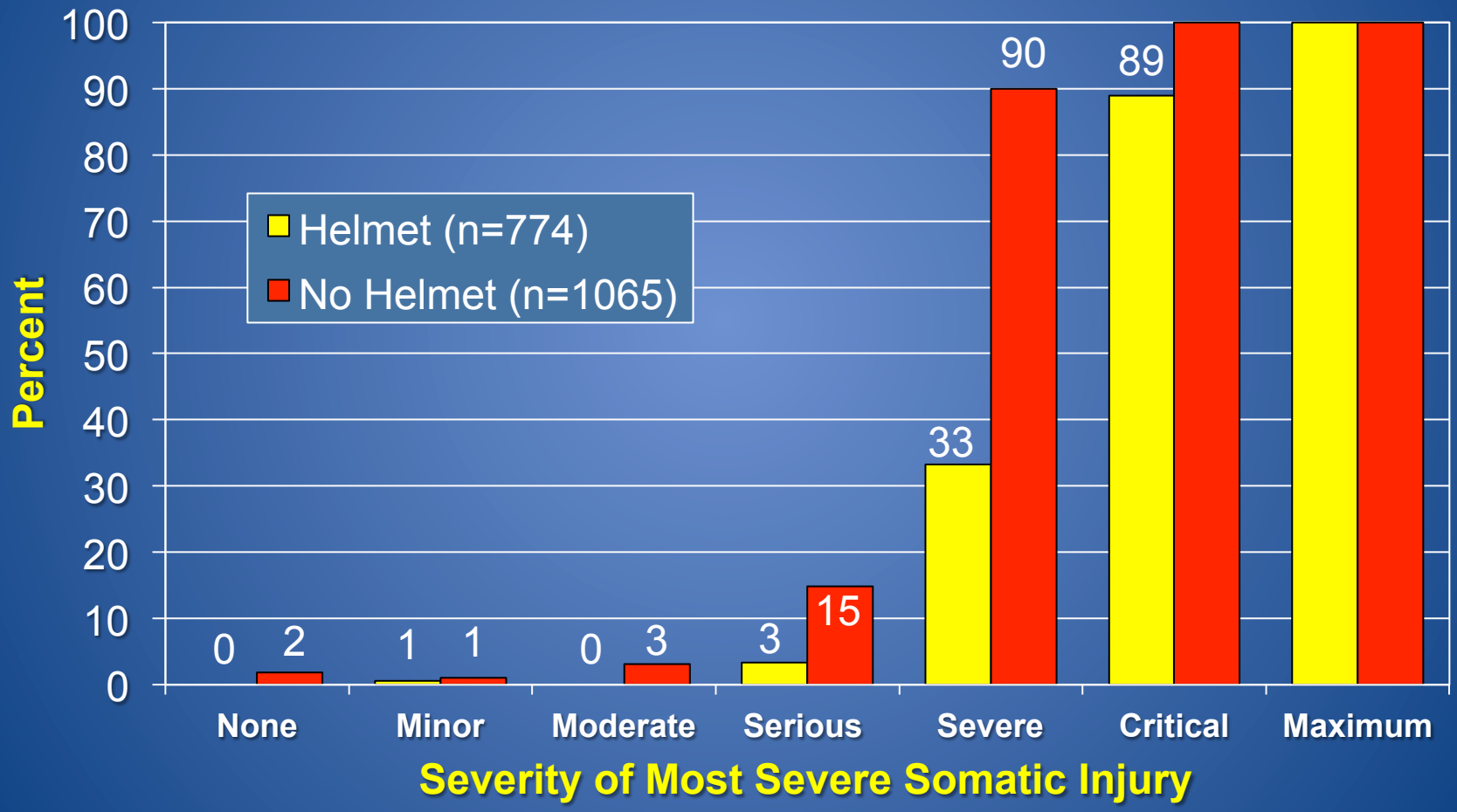
Motorcycle Crash speed



Distribution of Most Severe Somatic (Below-the-Neck) Injury in Fatal Motorcycle Crashes



Fatality Rate as a Function of Most Severe Somatic Injury, Combined USC & Thailand Data



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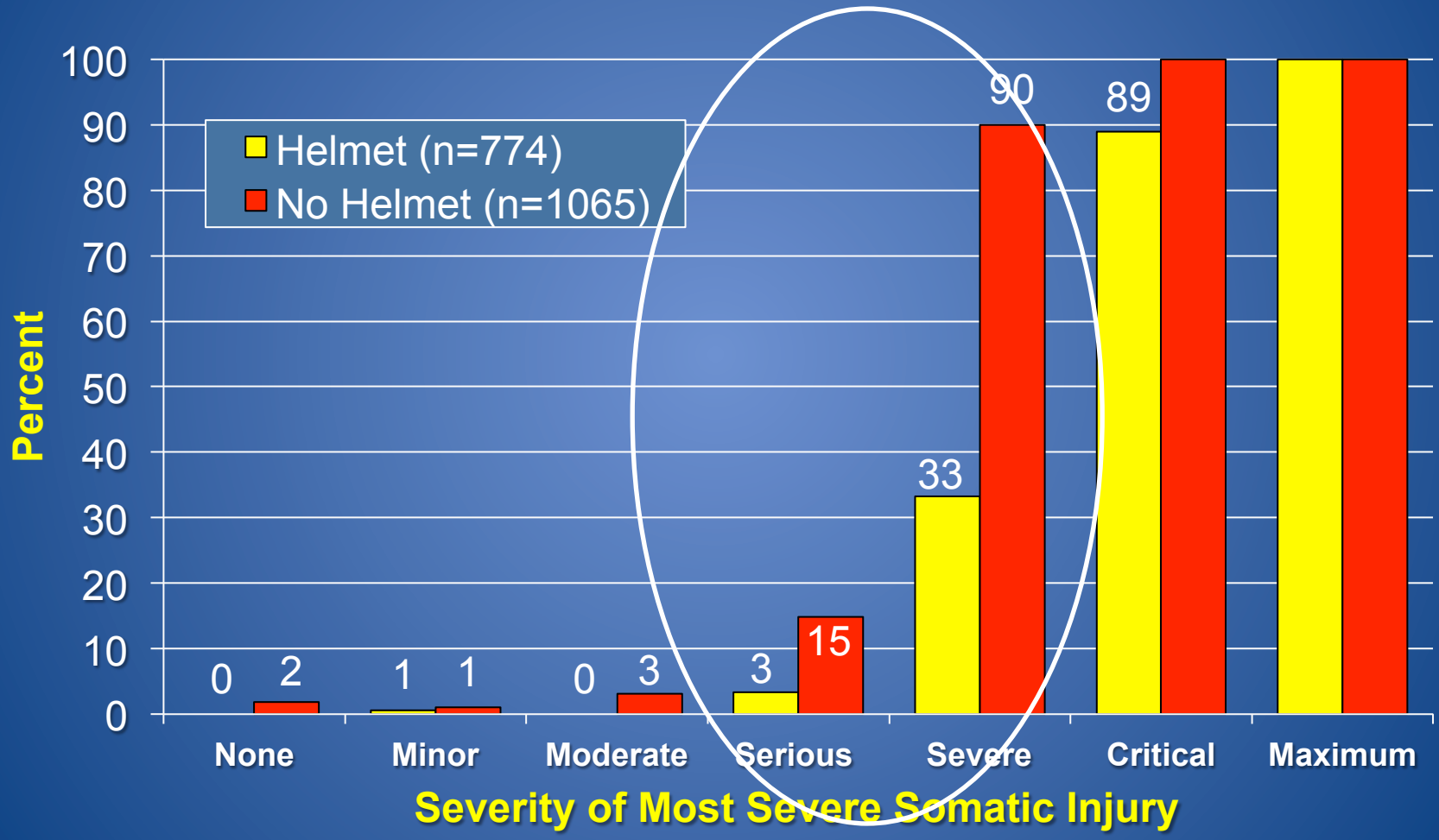
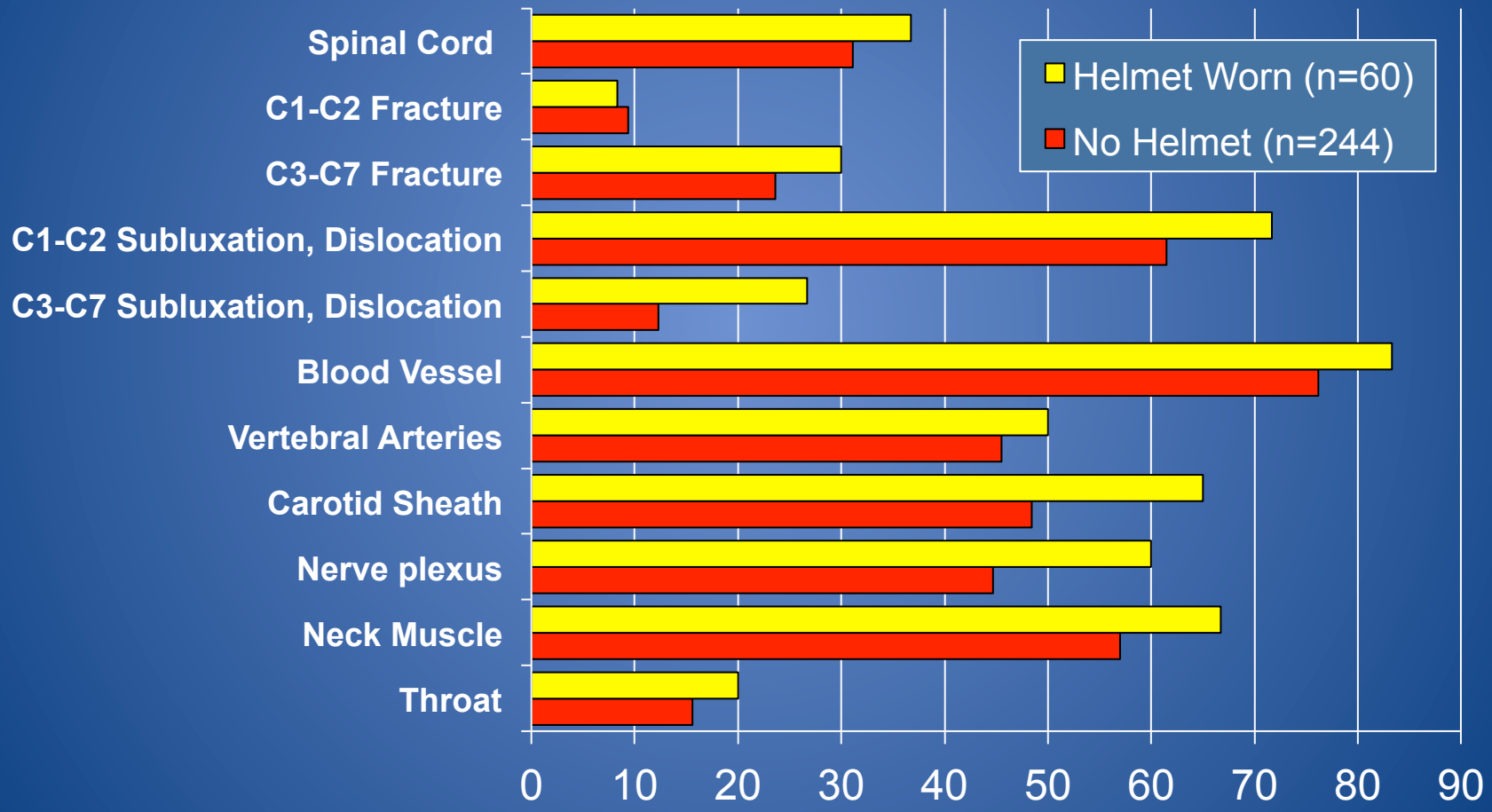
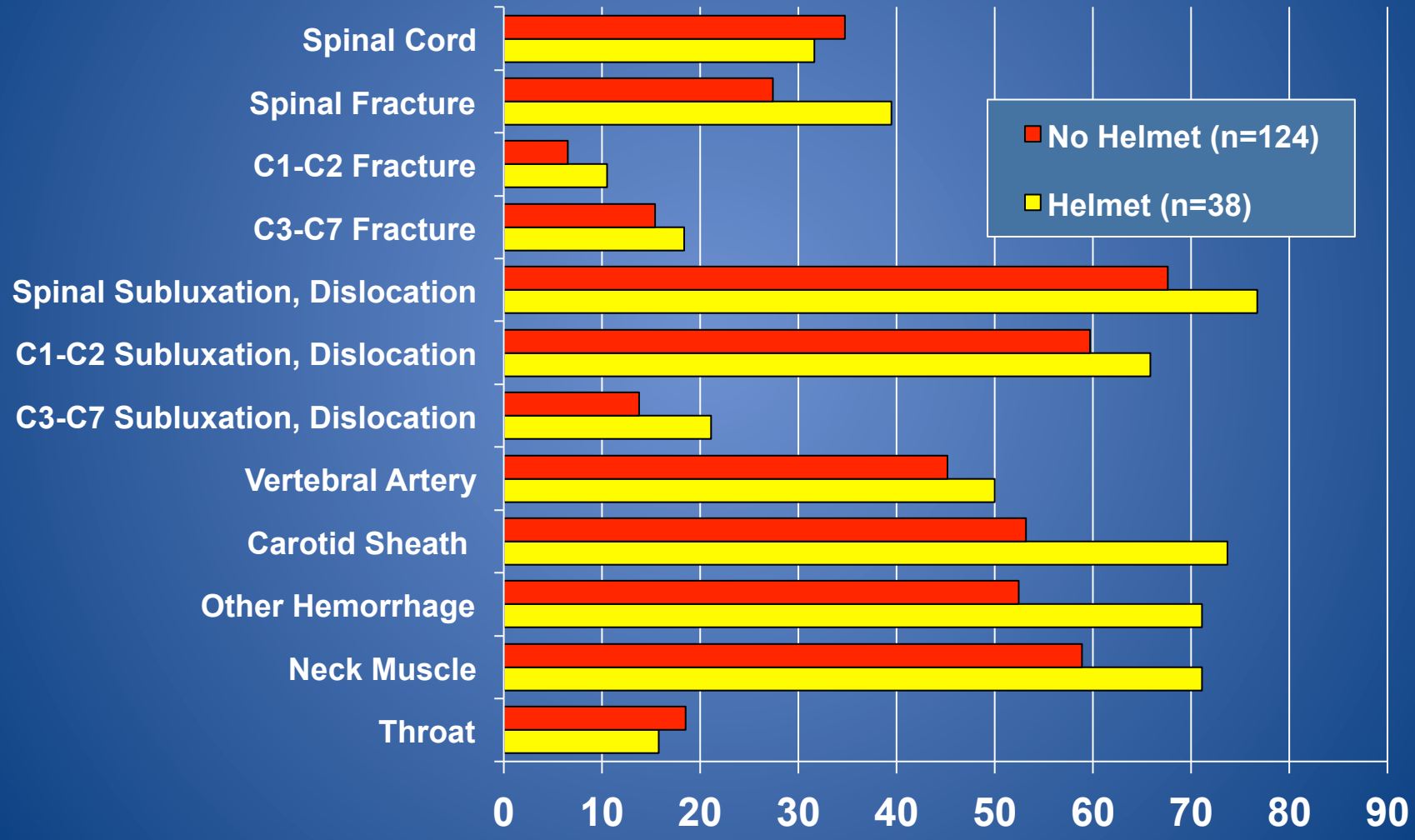


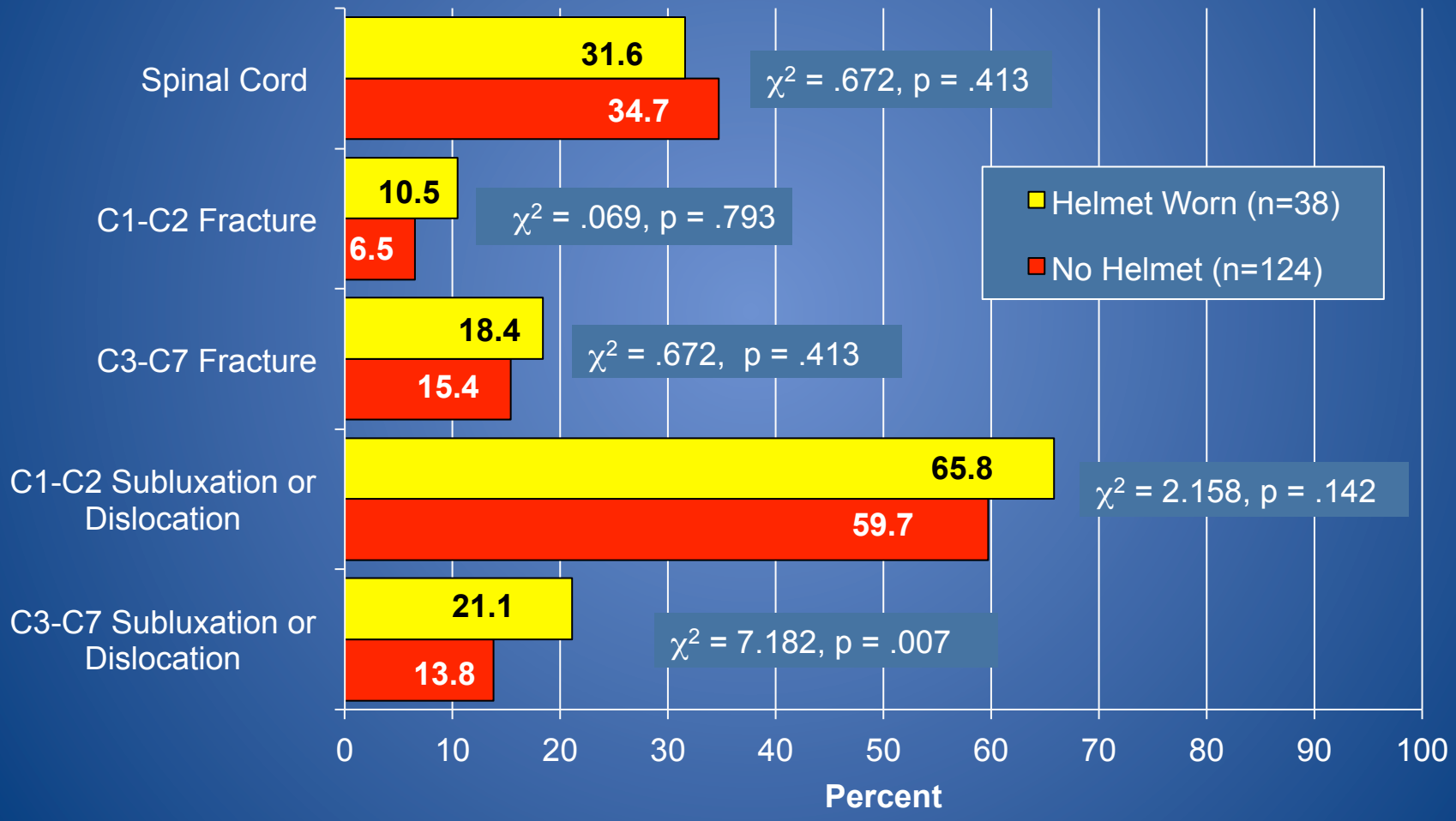
Neck Injury Type and Frequency, All 304 Riders



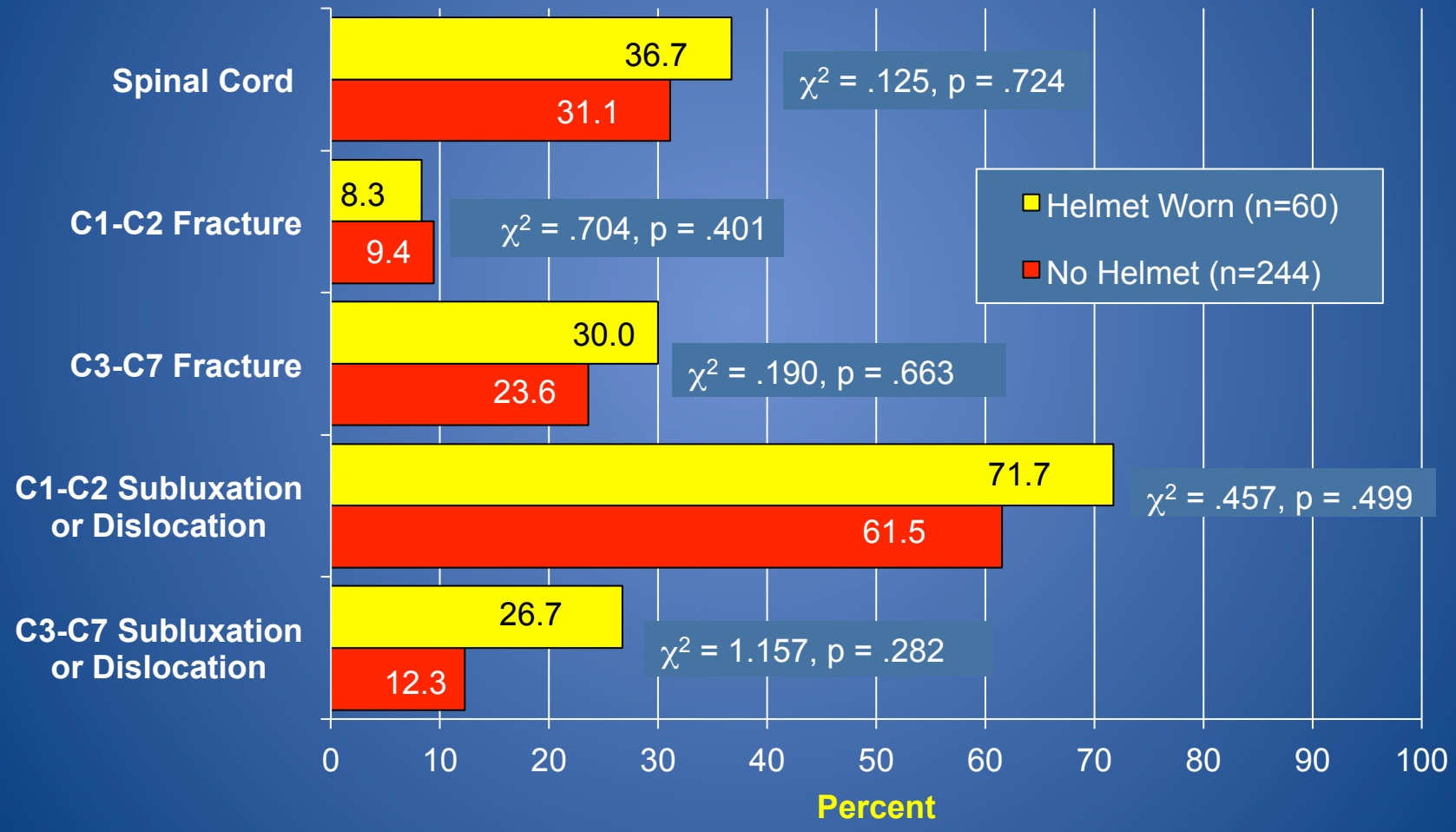
Neck Injury Type and Frequency among Riders with Most Severe Somatic AIS>3



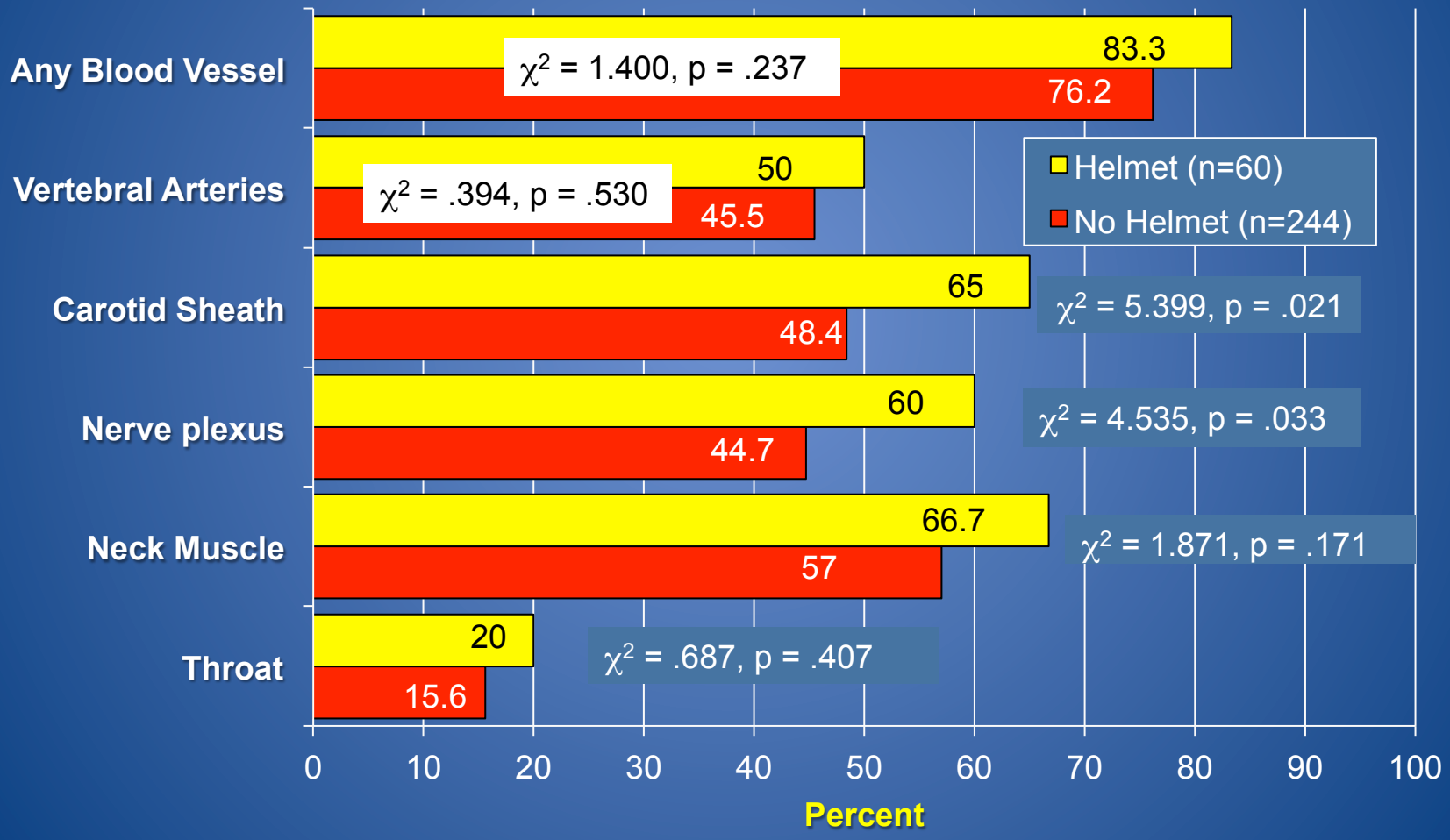
Spinal Cord & Column Injuries, All 304 Riders



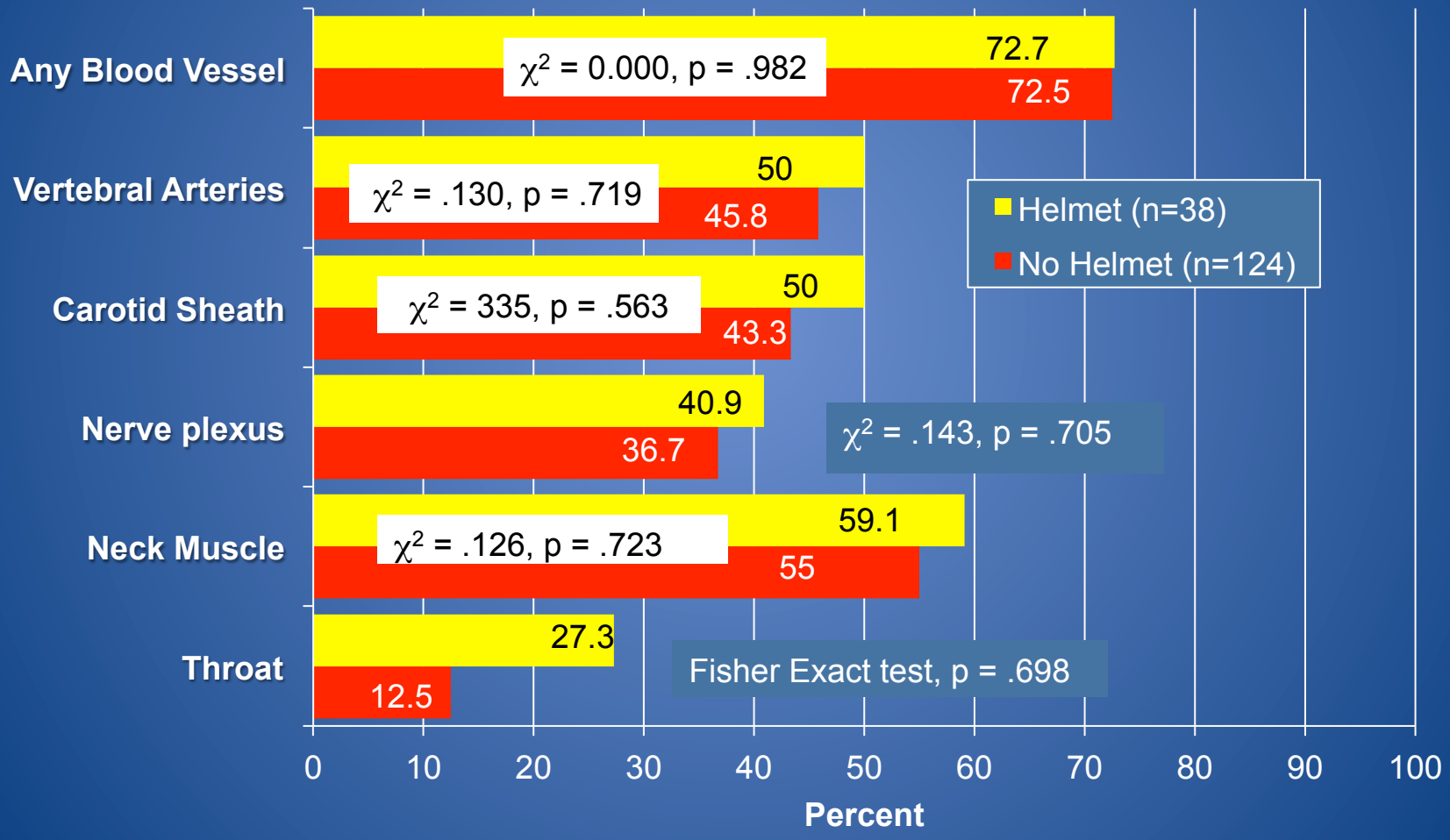
Spinal Cord & Column Injuries, Riders with AIS>3



Neck Soft Tissue Injuries, All 304 Riders

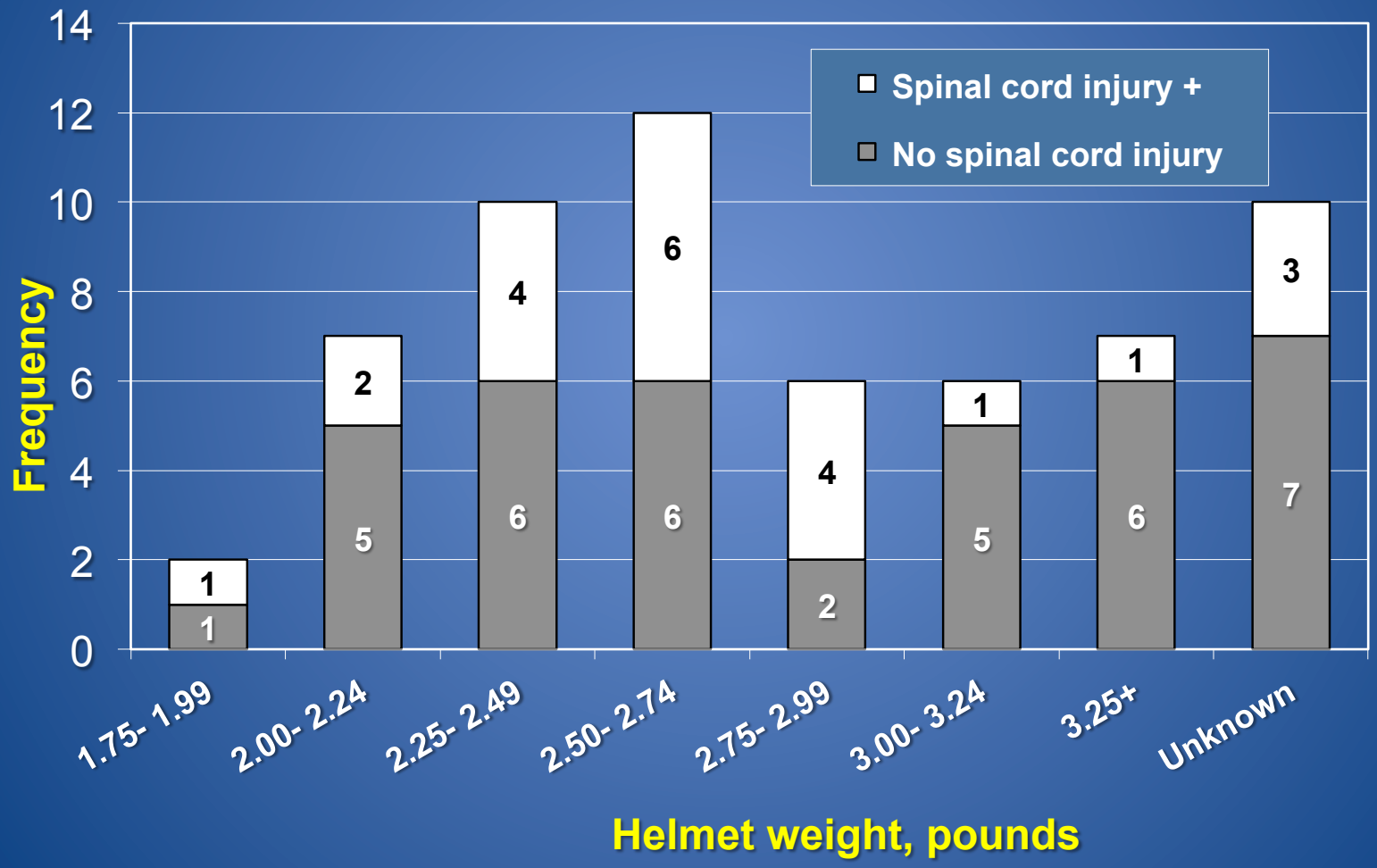


Neck Soft Tissue Injuries, Riders with Somatic AIS<4

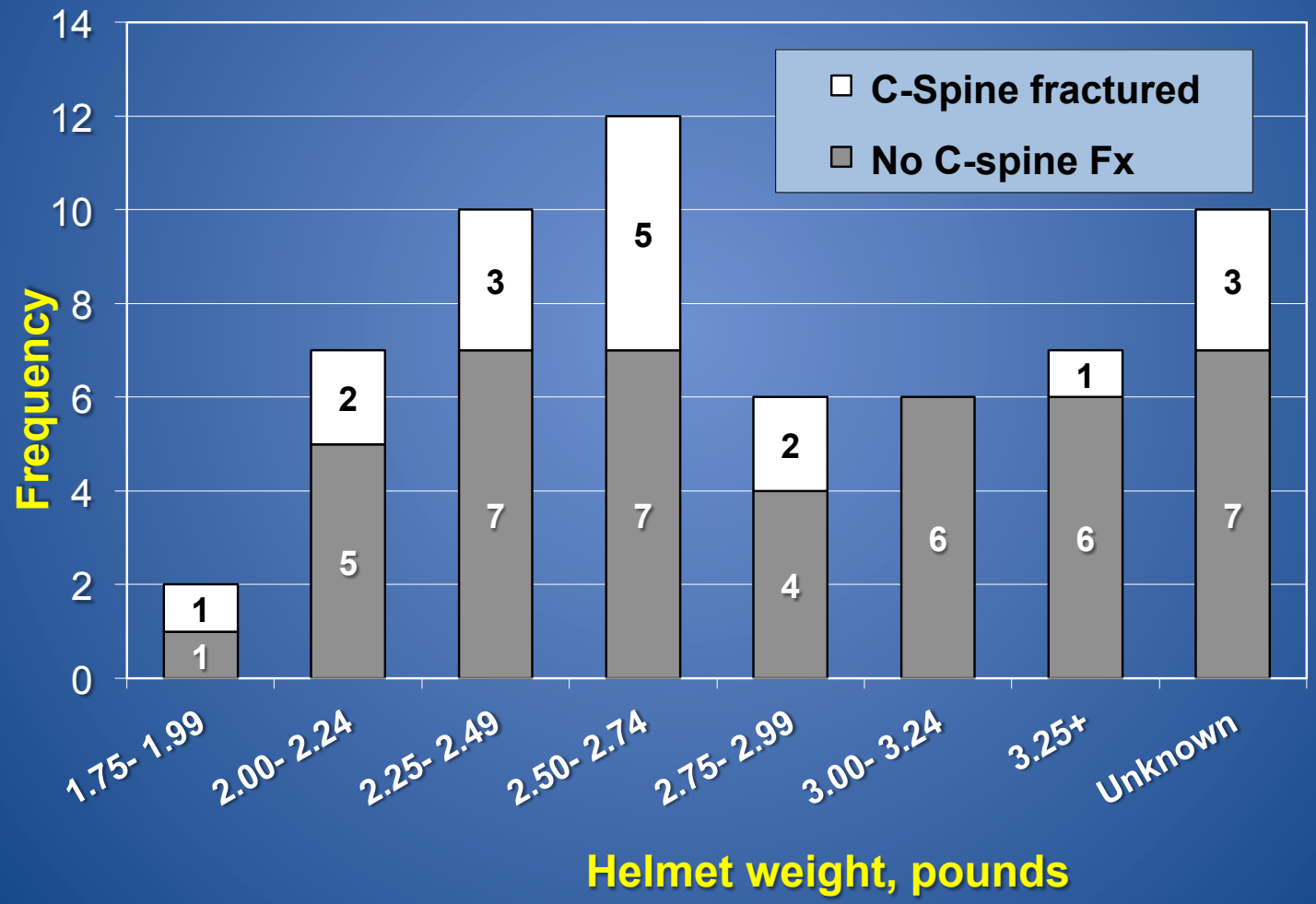


Effect of Helmet Weight

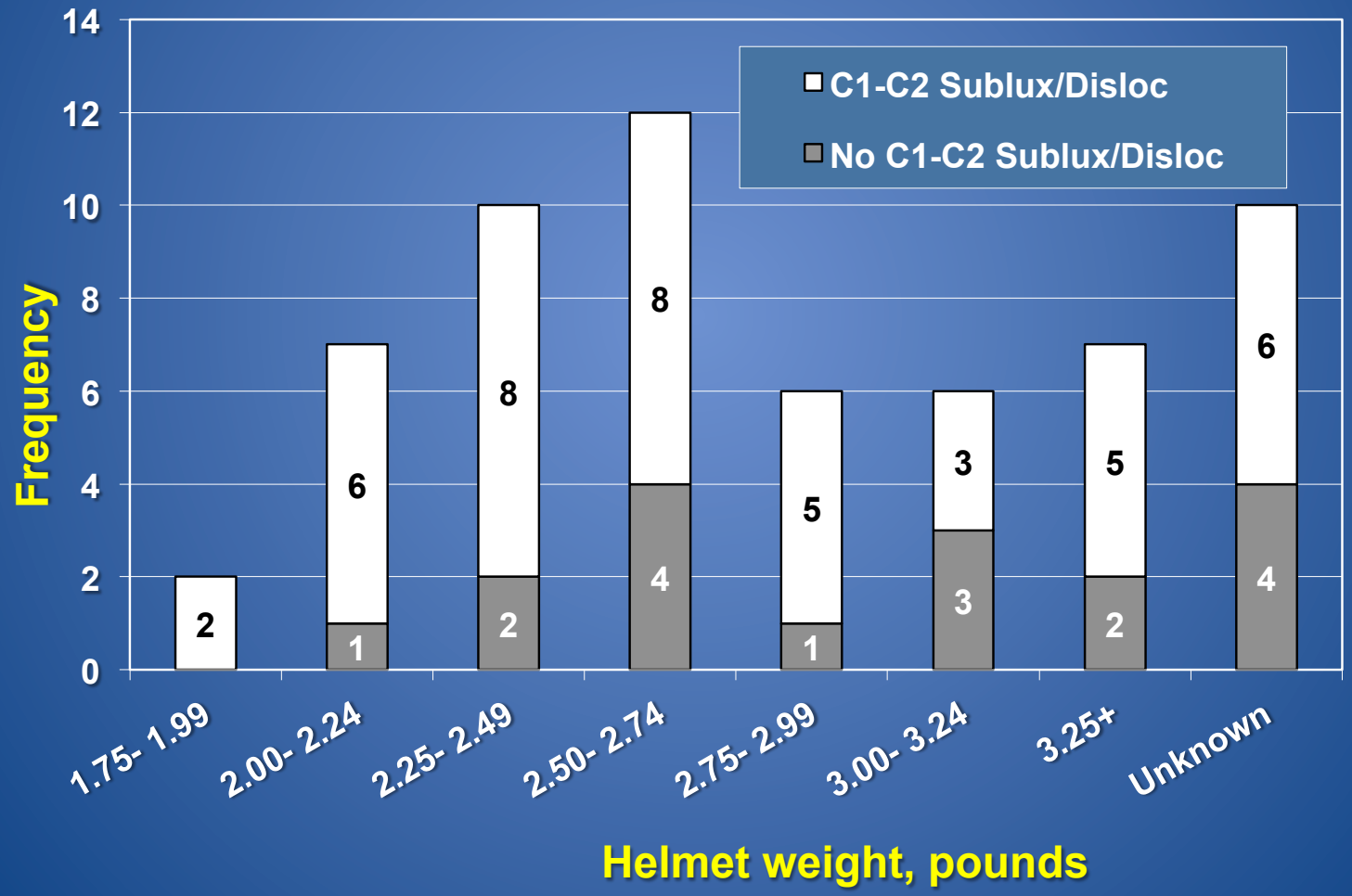
Helmet Weight and Spinal Cord Injury



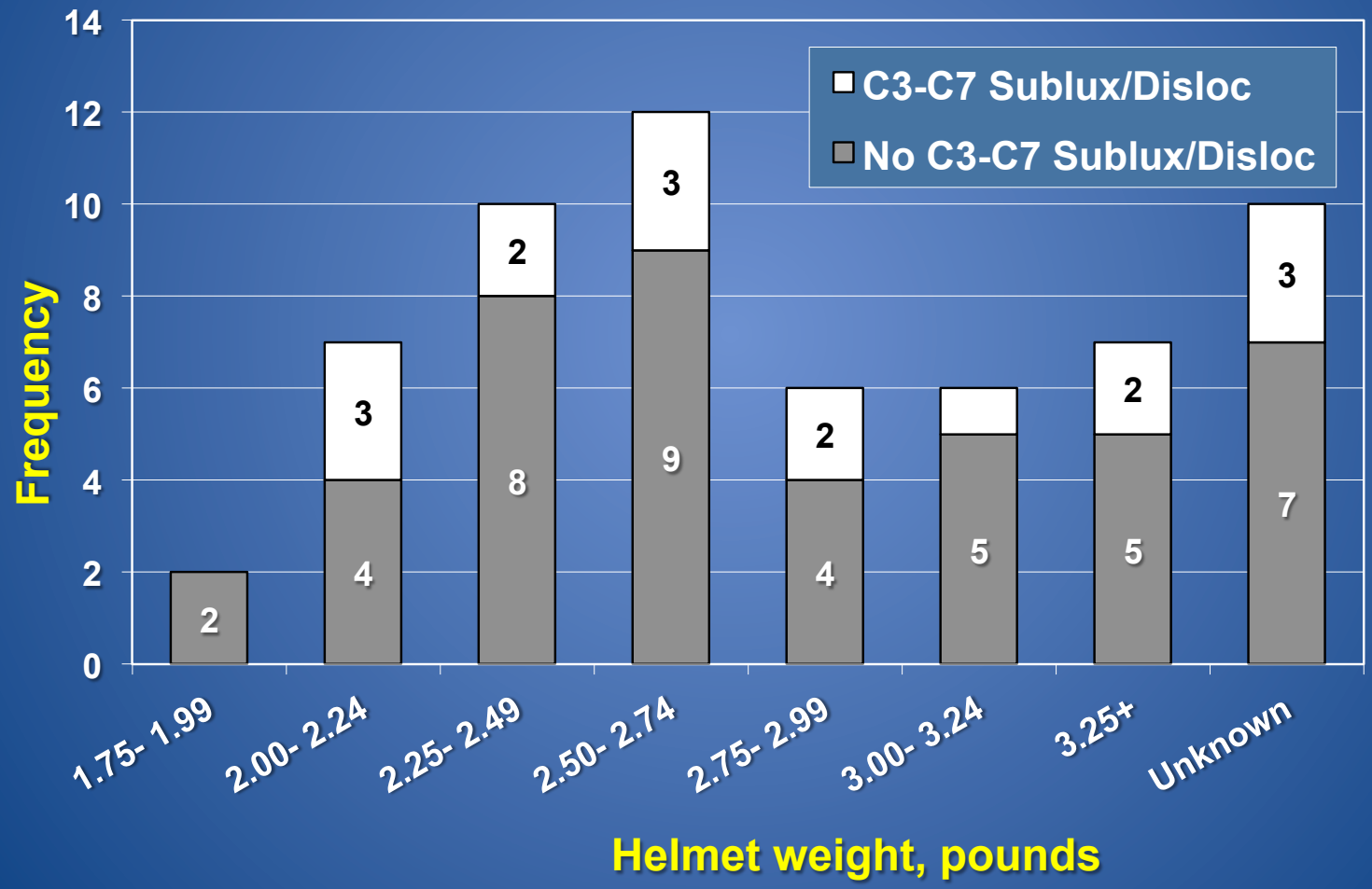
Helmet Weight and Cervical Spine Fracture



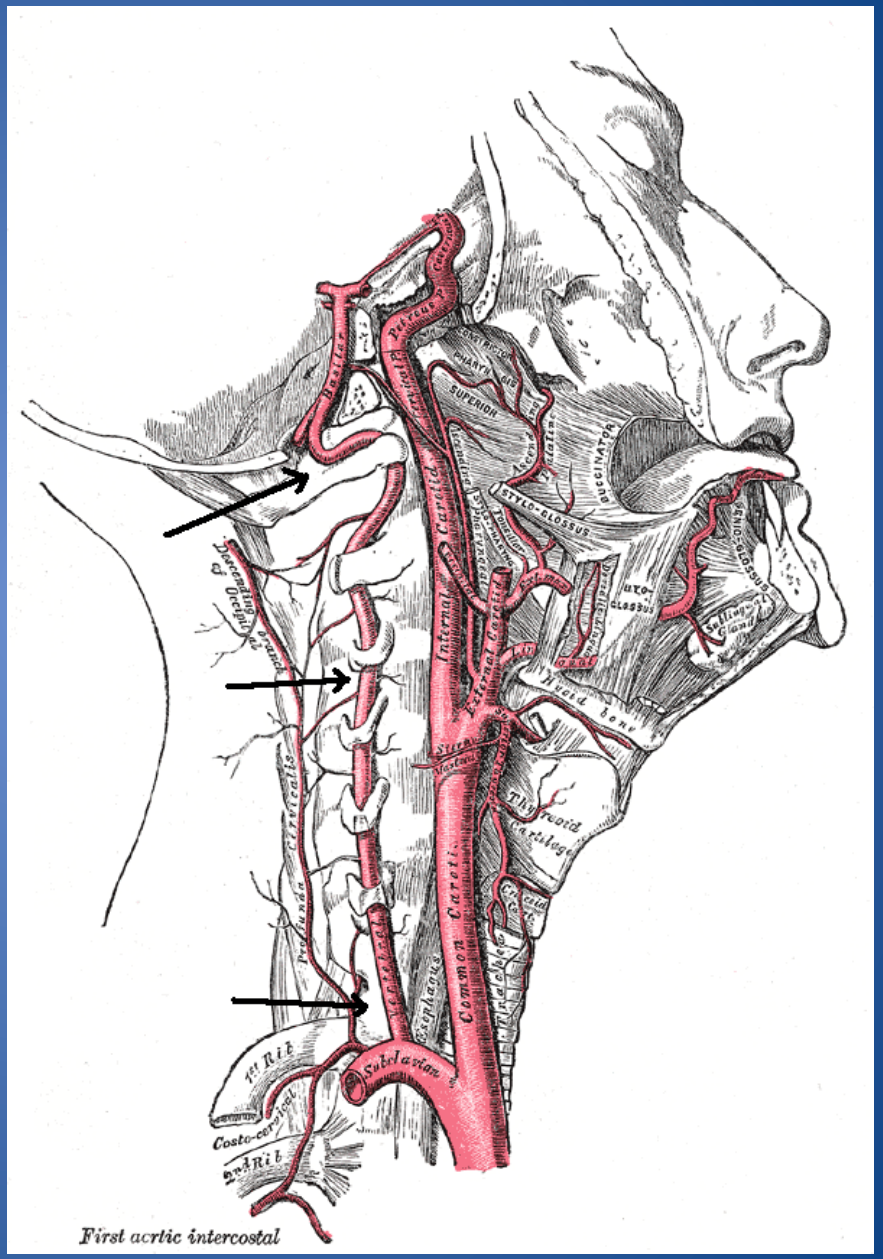
Helmet Weight and C1-C2 Subluxation or Dislocation



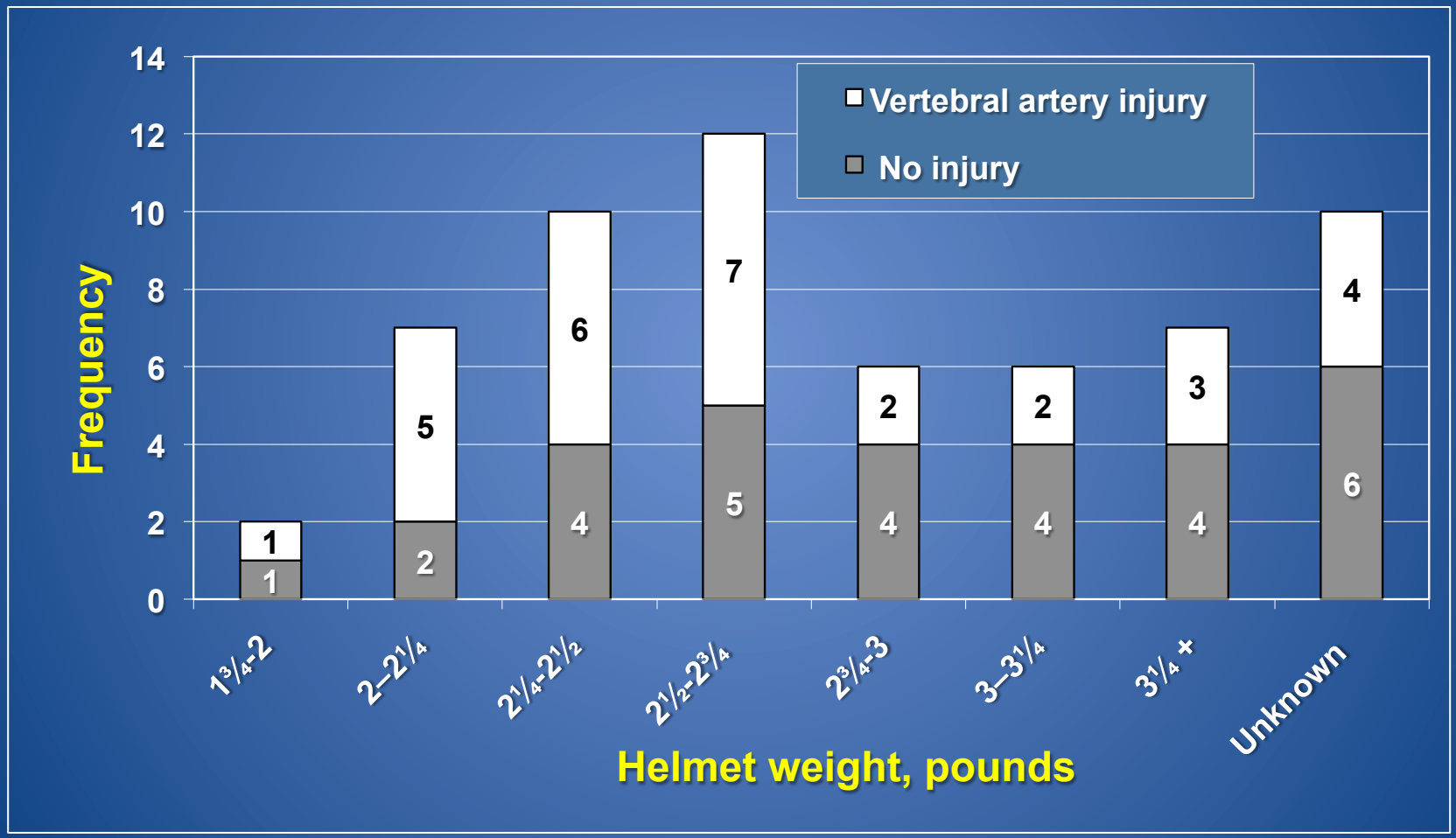
Helmet Weight and C3-C7 Subluxation or Dislocation



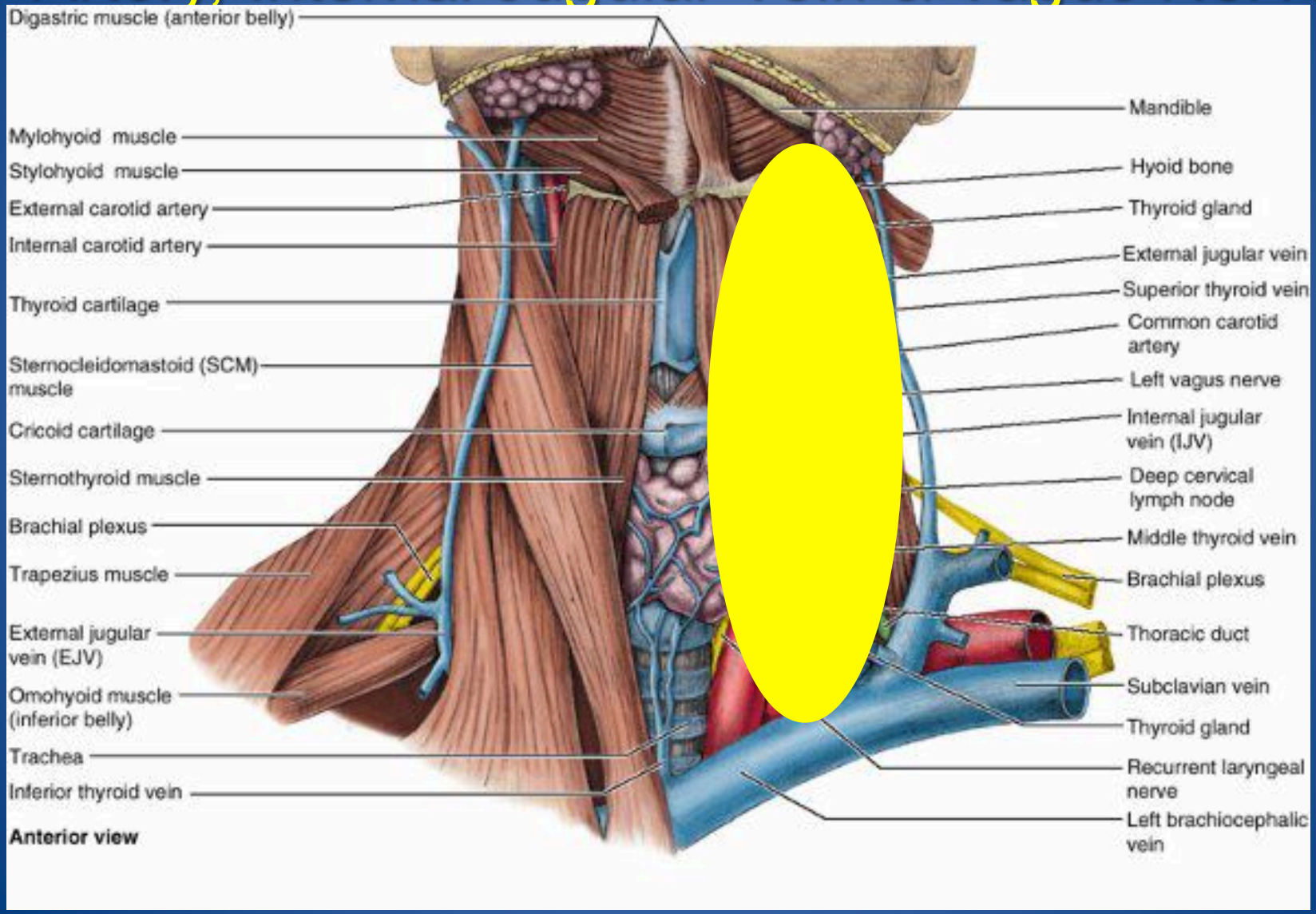
Vertebral Artery Anatomy



Helmet Weight and Vertebral Artery Injury



Carotid Sheath Contents: Common Carotid Artery, Internal Jugular Vein & Vagus Nerve



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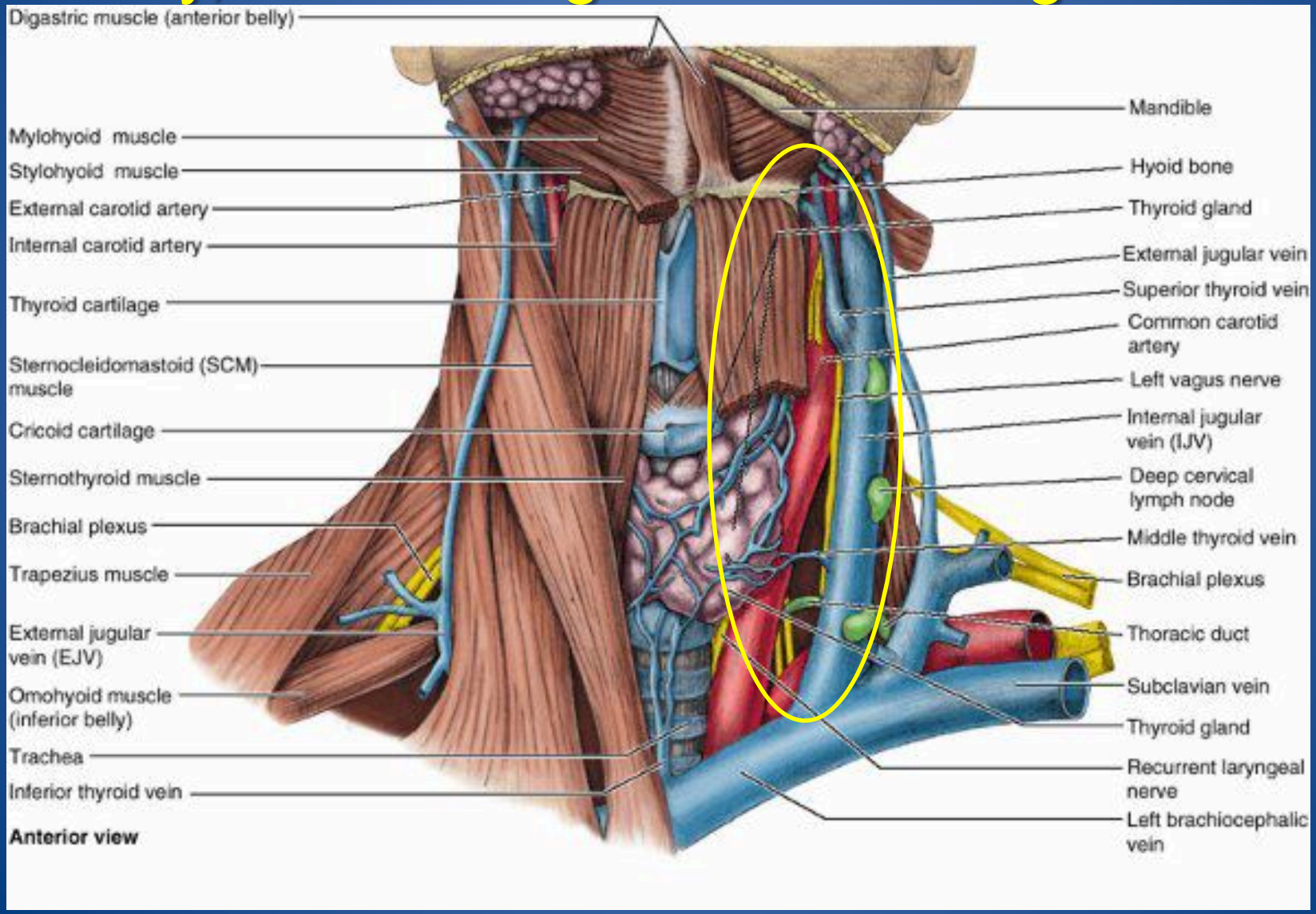
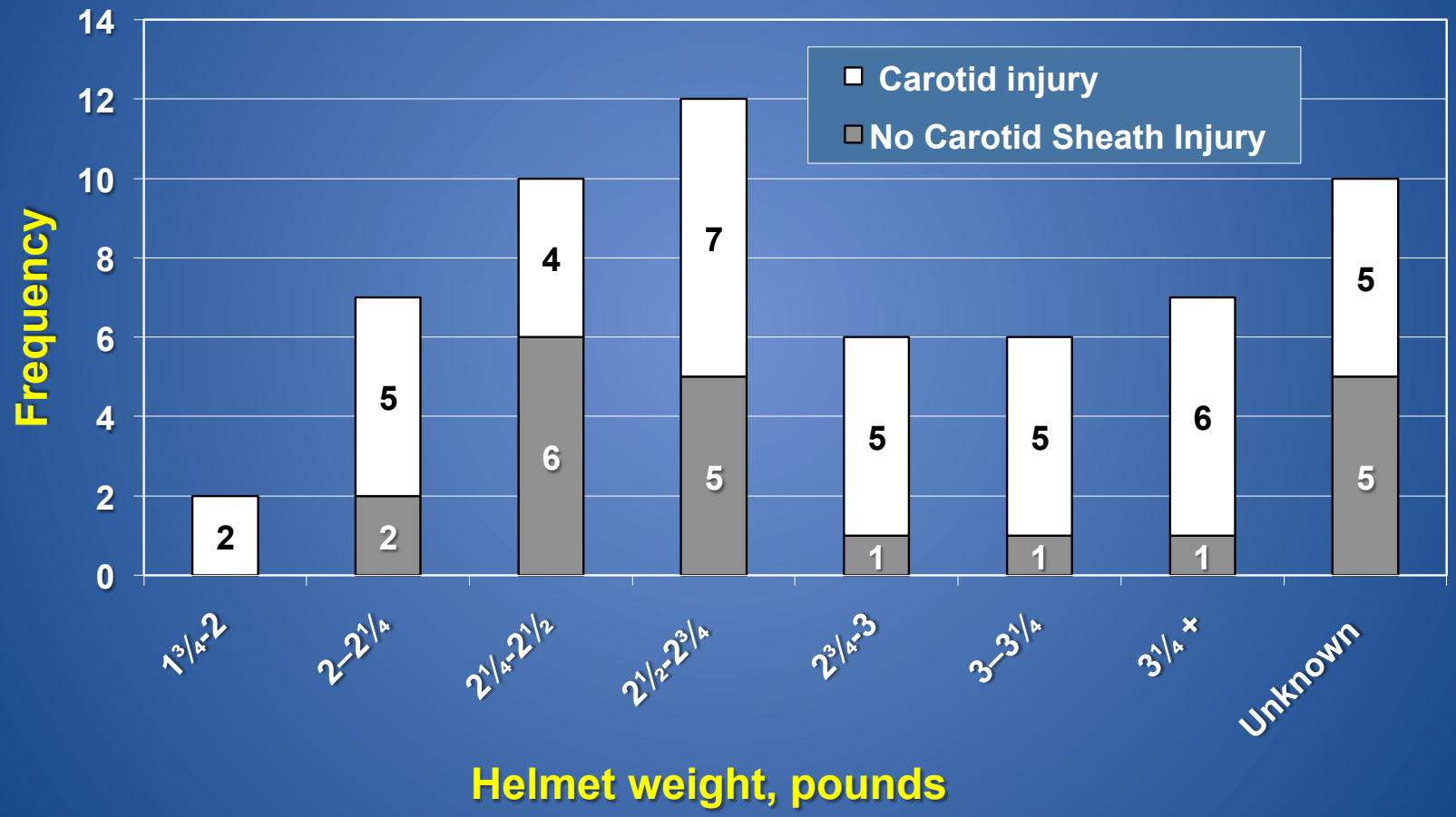
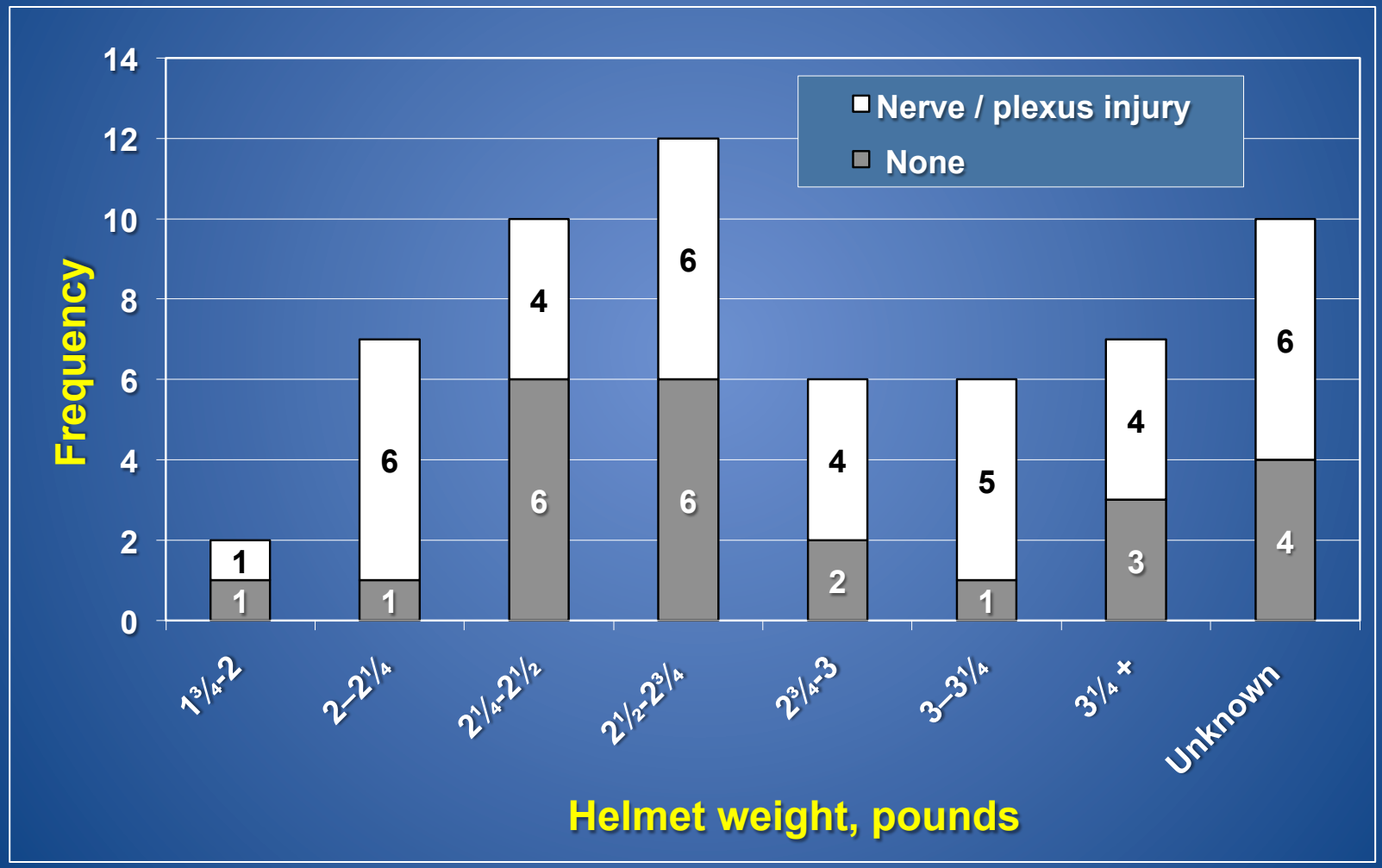


Helmet Weight and Carotid Sheath Hemorrhage



Helmet Weight and Hemorrhage Surrounding NerveTrunks or Nerve Plexes



Conclusions 1

1. About 5% of crashes are fatal. They are NOT representative of the motorcycle crash population.
2. Unhelmeted riders are 2-3 times as likely to die in a crash as helmeted riders.
3. Unhelmeted riders are more likely to die in a crash despite having only relatively minor below-the-neck injuries.
4. Helmets are especially effective in preventing death in serious-to-severe crashes.
5. Helmet users showed statistically insignificant increases in many injuries reported here.

Conclusions 2

6. The risk of spinal cord injuries or cervical spine fractures in these fatal crashes was no higher among helmet users than non-users.
7. Three kinds of injuries were more common among helmeted riders:
   a. Cervical spine subluxation and dislocation
   b. Hemorrhage in the carotid sheath
   c. Hemorrhage around nerve trunks and plexes
8. Helmet weight had no consistent effect on any injury except perhaps hemorrhage in the carotid sheath and around nerve trunks and plexes.

27

Thank You