

Collisions and Injury

Part 2

- Why do we see stars when we get hit in the eye?



Injury

- Anytime there is a collision in sports, there is always some amount of deformation.



When an object hits your body

- 1. Compress and activate nerve endings
 - Example: fist in eyeball activates retinal neurons = see stars!!
- 2. Break skin and rupture veins beneath = bleeding
- 3. Rupture veins without breaking skin = bruising
- 4. Stretch/ tear tendons, ligaments, or muscles = strain, sprain
- 5. Twist or misalign joint = dislocation

Injury

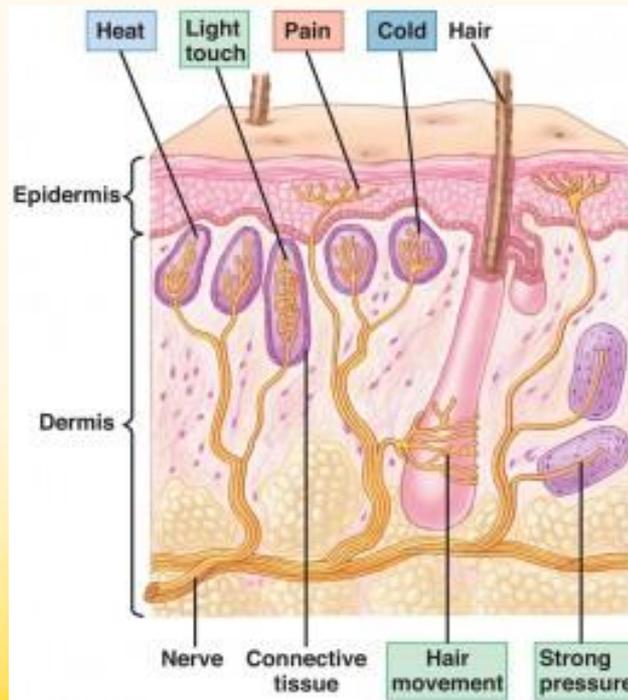
- Why do injuries swell?

Extra blood flow brings phagocytes
to fight bacteria



Pain

- Physiological – pain fibers – everyone has a different amount
- Psychological – attitude – panic “secondary gain”
 - Ex attention



Pressure

- Force per area
- Examples:

small area = bigger force



Pressure

- Protective padding is designed to distribute force over a larger area.

- Example

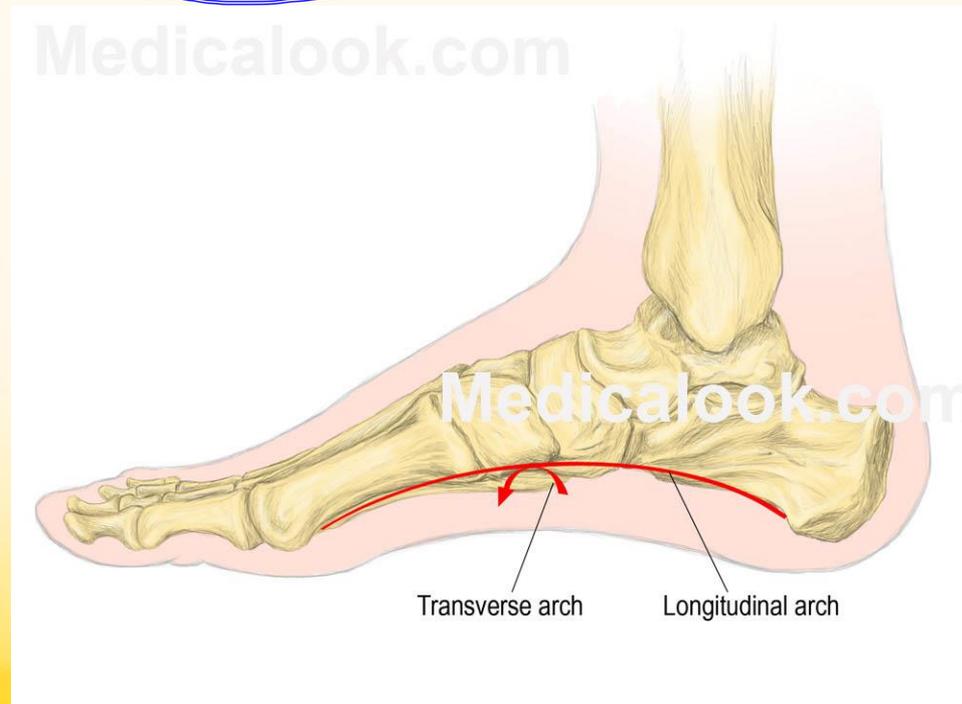
boxing gloves



- Fact: A punch to the head can cause it to accelerate at 80g's!

Feet

- Your foot has 2 arches that act as a spring to store energy each time you step. Misshapen feet (low or high arches) result in problems for athletes that can be corrected with orthotics.



Feet

- Good shoes are important prevention for foot injuries, they help absorb the shock, but only work for 60 miles!
- Different features are important for different sorts:
 - Tennis – lateral support
 - Running – shock absorption

Feet can effect knees – hips – pelvis - back

Feet

- Good running surface is also important:
 - Worst: concrete, pavement
 - Best: hardwood, gravel
- Astroturf – good or bad?
 - Good: harder surface, better friction
 - Bad: results in more injuries to toes and knees.

Many injuries happen on Astroturf even when no one is near, the surface is just so unforgiving.

Knee and Leg

- Fact: 75% of sports injuries involve the knee.
- Sudden stops or lunges tear cartilage in the knee, which doesn't heal well. (sometimes it's just removed)
- Runner's knee – uneven wear of cartilage caused by overtraining.
- ACL (anterior cruciate ligament) is often torn in knee injuries and doesn't heal.

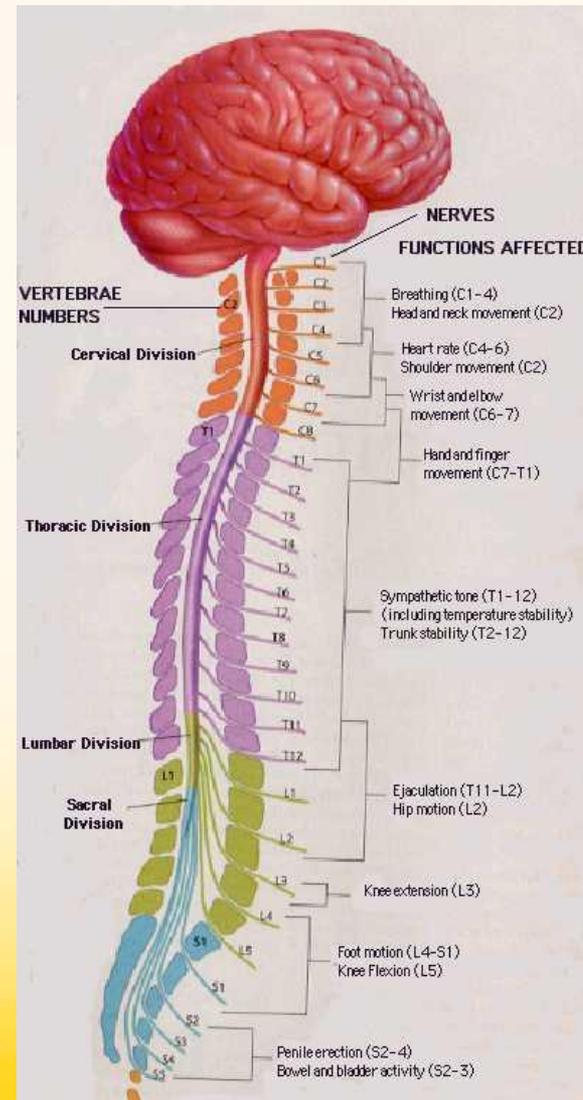
Knee and Leg

- Prevention: stretch, good shoes, strengthen leg muscles



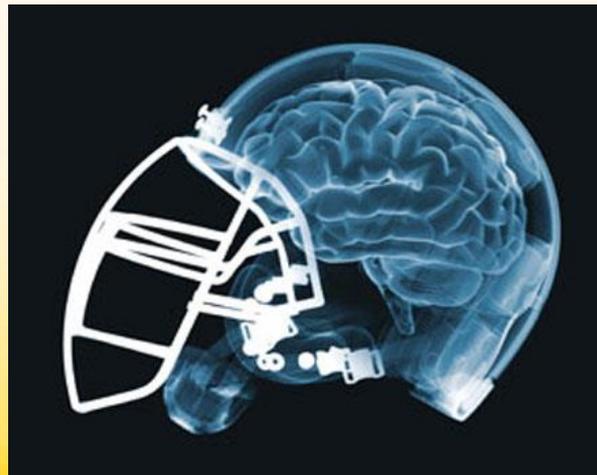
Spinal Cord and Neck

- Spinal cord transmits info from brain to body and back
- Cannot be repaired



Brain

- If the brain smashes against the side of the skull, the result can be instant death. Brain rotation in the skull can cause veins and nerves to stretch or tear. If a vein ruptures in the brain, the leaking blood compresses the brain resulting in death in minutes, hours, or days. A more minor injury can result in amnesia, loss of motor skills, or emotional disturbance.



Brain

- “punch drunk” – poor coordination, paranoia, tremors
- 10-15% of boxers become punch drunk

