**Concussions**

**Important points**
- Be alert for symptoms that worsen over time.
- Understand that each head injury is different and that there is no way to speed up the recovery process.
- Testing has improved significantly to allow us to use it as a tool to diagnosis and help treat head injuries.

**What a head injury is**
- A concussion is a type of traumatic brain injury caused by a bump, blow or jolt to the head that can change the way your brain normally works.
- May also be caused by a blow to the face or elsewhere on the body.
- Effects are usually temporary, but can include problems with headaches, concentration, memory, judgment, balance and coordination.
- Needs time and rest to heal properly.

**What causes a concussion:**
- May result when the head hits an object or a moving object strikes the head.
- Can result from a fall, sports activities, and car accidents.
- Significant movement of the brain (called jarring) in any direction can cause you to lose alertness (become unconscious).
- Doesn’t always involve a loss of consciousness. Most people who have a concussion never black out. You can have a concussion and not realize it.
- When a person gets a head injury, the brain can move around inside the skull and even bang against it. This can lead to bruising of the brain, tearing of blood vessels, and injury to the nerves.
- Factors that may increase your risk of a concussion include:
  - Participating in a high risk sport, such as football, hockey, soccer or other contact sport; the risk is further increased if there’s a lack of proper safety equipment and supervision.
  - Being involved in a motor vehicle collision.
  - Being a soldier involved in combat.
  - Falling, especially in young children and older adults.
  - Having had a previous concussion.

**What does a concussion “look” like**
- There are multiple symptoms that may be present if someone has a suspected concussion.
- Some symptoms may be severe, others may be mild and others may not be present at all.
  - Signs (things you see):
    - Appears dazed or stunned
    - Confused
  - Clumsy/uncoordinated
  - Behavior changes
  - Forgets events after the hit
  - Slow reaction time
  - Confusion
  - Symptoms (things felt by the athlete):
    - Headache
    - Nausea
    - Dizziness
    - Double/fuzzy vision
    - Sensitivity to light/noise
    - Fatigue
    - Mentally “foggy”
    - Difficulty concentrating
    - Irritable
    - Sleep troubles (too much, too light, difficulty, etc.)
- The following are emergency symptoms of a concussion. Seek immediate medical care if they are:
  - Changes in alertness and consciousness
  - Convulsions (seizures)
  - Muscle weakness on one or both sides
  - Persistent confusion
  - Persistent unconsciousness (coma)
  - Repeated vomiting
  - Unequal pupils
  - Unusual eye movements
  - Walking problems
- Head injuries that result in concussion often are associated with injury to the neck and spine. Take particular care when moving patients who have had a head injury.

**Complications that may arise**
- Epilepsy: People who have had a concussion double their risk of developing epilepsy within the first five years after the injury.
- Cumulative effects of multiple brain injuries: Evidence exists indicating that people who have had multiple concussive brain injuries over the course of their lives may acquire lasting, and even progressive, cognitive impairment that limits functional ability.
- Second impact syndrome: Sometimes, experiencing a second concussion before signs and symptoms of a first concussion have resolved may result in rapid and typically fatal brain swelling. After a concussion, the levels of brain chemicals are altered. It usually takes about a week for these levels to stabilize again. However, the time it takes to recover from a concussion is continues...
variable, and it is important for athletes never to return to sports while they’re still experiencing signs and symptoms of concussion.

- Post-concussion syndrome: A complex disorder in which a variable combination of post-concussion symptoms — such as headaches and dizziness — last for weeks and sometimes months after the injury that caused the concussion. In most people, post-concussion syndrome symptoms occur within the first seven to 10 days and go away within three months, though they can persist for a year or more. Post-concussion syndrome treatments are aimed at easing specific symptoms.

Testing and Diagnosis

- Signs and symptoms of these injuries may not appear until hours or days after the injury.
- Brain imaging may be required to determine whether the injury is severe and has caused bleeding or swelling in your skull.
- Tests that may be performed include:
  - Neurological exam After your doctor asks detailed questions about your injury, he or she may perform a neurological exam. This evaluation includes checking your:
    - Memory and concentration
    - Vision
    - Hearing
    - Strength and sensation
    - Balance
    - Coordination
    - Reflexes
  - SCAT2 (Sport Concussion Assessment Tool 2): A Tool that is used to evaluate an injured athlete with a suspected concussion that is 10 years of age or older. It is designed for medical and health professionals.
  - ImPACT: Test that allows the athlete to be tested and compared to a pre-injury state. It provides information regarding the severity of injury and a standard for evaluating recovery from injury. ImPACT is a reliable, valid and extremely sensitive test to determine whether an athlete has recovered sufficiently from a concussion in order to return safely to play. The most effective utilization of ImPACT is to obtain a pre-season baseline as part of their physical at the beginning of the season.
    - Baseline takes 20 minutes and measures: attention span, working memory, sustained attention, reaction time, response variability, visual and verbal memory, selective attention, and non-verbal problem solving.
    - ImPACT is re-administered if the athlete is deemed to have sustained a concussion. Their post-concussion test results are compared to their baseline test results to determine when they are ready to return to play.
    - Imaging tests: Brain imaging isn't always required after a concussive traumatic brain injury:
      - Cranial computerized tomography (CT) scans — a detailed, two-dimensional image of your skull and brain.
      - Observation — You may need to be hospitalized overnight for observation after a concussion.

Treatment

- If the concussion occurred during a sporting event and resulted in a headache, confusion, or change in alertness, and a concussion is suspected, that athlete MUST be removed from play and may NOT return until medically cleared.
- Rest as much as possible. This includes avoiding sports or other physical activities that increase your heart rate, such as prolonged walking, or require vigorous muscle contractions, such as weight lifting.
- Minimize activities that require lots of focused attention — for example, working on the computer, watching TV, texting or playing video games.
- Treatment for a concussion may include:
  - Acetaminophen (Tylenol) for a headache. Do NOT use aspirin, ibuprofen (Motrin or Advil), naproxen, or similar drugs.
  - Eating a light diet.
  - Avoiding exercise, weight lifting, or heavy activities. Light activity around the home is okay.
- An adult should stay with you for the first 12 to 24 hours after the concussion.
- Going to sleep is okay. However, someone should wake you up every 2 or 3 hours for the at least the first 12 hours. They can ask a simple question, such as your name, and then look for any changes in the way you look or act.
- Healing or recovering from a concussion takes time. It may take days, weeks, or even months. You may be irritable, have trouble concentrating, and be unable to remember things, have headaches, dizziness, and blurry vision. These problems will probably go away slowly.

Preventing head injury

- These tips may help you to prevent or minimize your risk of head injury:
  - Wear appropriate protective gear during sports and other recreational activities.
    - Always use the appropriate protective gear for any sport you or your child undertakes.
    - Make sure the equipment fits properly, is well maintained and worn correctly.
  - Use the proper sports equipment, including personal protective equipment. In order for equipment to protect you, it must be:
    - The right equipment for the game, position, or activity worn correctly and the correct size and fit, used every time you play or practice.
  - Follow your coach’s rules for safety and the rules of the sport.
  - Teach the athlete that it’s not safe to play with a concussion. Rest is important after a concussion. Sometimes athletes wrongly believe that it shows strength and courage to play injured. Discourage others from pressuring injured athletes to play.

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