

## Traumatic Brain Injury (TBI) *(Includes Concussion)*

### What is traumatic brain injury (TBI)?

Traumatic brain injury (TBI) is caused by a direct blow to the head with different amounts of force that cause mild, moderate, or severe brain injury. Mild TBI can be called a *concussion*.

### How common is it?

- Of patients with TBI in the United States, 70,000 to 90,000 are left with permanent neurologic problems.
- Concussions are more common, and, in 2012, an estimated 329,290 children, adolescents, and young adults (aged 19 years and younger) were treated in emergency departments in the United States for sports and recreation-related injuries that included a diagnosis of concussion or TBI.

### What are some common characteristics of children who have TBI or of TBI as children present with it?

- Traumatic brain injury can come from a variety of injuries, including child abuse, motor vehicle–related injuries, falls, sports injuries, and other unintentional injuries. The brain damage can be caused by the direct injury, by shearing of the nerves resulting from the forceful head movement, by the disruption of blood flow following the injury, by the brain swelling that is a reaction to the injury, and by blood collections pressing on the brain. The skull or neck can also be injured.
- Children can experience headaches, difficulty with concentration and learning, disrupted sleep patterns, hyperactivity, and behavioral problems after a head injury. Seizures can occur sometimes, either temporarily or permanently. Children with severe cases might have difficulty with motor skills and self-help skills.

### Who might be on the treatment team?

- The pediatrician/primary care provider in the medical home
- Pediatric specialists, including neurologists and developmental-behavioral pediatricians
- Pediatric rehabilitation specialists
- Neuropsychologists
- Physical, occupational, and speech-language therapists

### What are some elements of a Care Plan for children with TBI?

- Medications
  - Pain relievers such as acetaminophen and ibuprofen might be needed for headaches.
  - Seizure medication is occasionally needed (see Seizures, Nonfebrile [Epilepsy], Quick Reference Sheet [page 179]).
- Environment
  - Special learning plans might need to be in place temporarily or permanently.
  - Behavior plans might need to be in place.
  - Children with TBI might need extra sleep.
  - Extra head injury precautions might need to be in place to prevent a second head injury.

### What should be considered an emergency?

Seizure precautions might be needed.

### What types of training or policies are advised?

- Staff training might be needed if special precautions, such as seizure precautions, are put into place.
- All staff who are administering medications should have medication administration training (see Chapter 6).

### What are some resources?

- Centers for Disease Control and Prevention: [www.cdc.gov](http://www.cdc.gov), 1-800-CDC-INFO (1-800-232-4636)
  - “Basic Information About Traumatic Brain Injury and Concussion” (Web page), [www.cdc.gov/traumaticbraininjury/basics.html](http://www.cdc.gov/traumaticbraininjury/basics.html)
  - “TBI: Get the Facts” (Web page), [www.cdc.gov/traumaticbraininjury/get\\_the\\_facts.html](http://www.cdc.gov/traumaticbraininjury/get_the_facts.html)
- Colorado Kids Brain Injury Resource Network: <http://cokidswithbraininjury.com>