

CT Scans for Children with Head Injuries

Head injuries are common in children. Fortunately, most cases of head injury (head trauma) are minor and not dangerous. However, serious injuries do sometimes occur — and good medical care after a head injury always includes an assessment to rule out a serious problem. As part of this assessment, your child's doctor may or may not recommend a CT scan of your child's head.

What is a CT scan?

A **CT scan** (sometimes called a **CAT scan**) is a test that uses x-rays to create clear, detailed images of body tissues. A CT scan of the skull and brain is a good test to quickly identify a dangerous injury after head trauma. While your child may be anxious about the test, CT scans are painless and usually take less than 10 minutes.

Understanding the risks of CT scans

CT scans don't have any immediate risks, but because they use ionizing radiation, they slightly increase your child's risk of developing cancer in the future.

CT scans bring much more radiation exposure than a regular x-ray.

We are all exposed to small amounts of radiation daily from sunshine and the surrounding environment (soil, air, rocks, building materials, and so on). This everyday, naturally-occurring radiation is called **background radiation**. To understand the amount of radiation exposure from a medical test that uses x-rays, it may help to compare the test's radiation to our daily background radiation. For example:

- A chest x-ray exposes a person to approximately one day's worth of background radiation
- A head CT exposes a person to approximately 8 months' worth of background radiation



This handout gives information about how head injuries are assessed in the hospital — and how recommendations about CT scans are weighed. If you have any questions about your child's injury or care, please talk to your child's doctor.

It's impossible to determine the exact risk to a child from the radiation exposure from a head CT. While no studies have directly linked cancer to the radiation from medical tests, it's well understood that exposure to high doses of radiation — much higher than the amounts used in medical tests — carries an increased risk of cancer. Most experts agree that there is also some increased risk from the radiation associated with medical tests that use x-rays. While difficult to assess, the risk of a childhood head CT causing a fatal cancer is estimated between 1 in 1000 and 1 in 5000, with a higher risk in younger patients.

Balancing the risks and benefits of a CT scan

Fortunately, very good studies have been done to identify which children need an immediate CT scan and which children can be safely observed without an initial CT scan.

To make a recommendation for your child, the doctor will follow guidelines based on these studies. The doctor will consider a variety of factors, including how the injury happened, your child's behavior since the injury, and the findings from a physical exam of your child. The doctor will also discuss with you the risks and benefits of a CT scan for your child. In many cases, a period of observation is adequate to ensure that your child hasn't suffered a serious injury.

Is it safe for my child to go home without a CT scan?

If the doctor says it's okay to take your child home without a CT scan, you can feel comfortable doing so. Children who are suitable for discharge after minor head trauma are generally considered to have a mild brain injury, sometimes called a **concussion**.

At home, follow the general instructions in the box at right — or any special instructions your child's doctor may give you at discharge.

At home after your child's head injury

- **Realize that your child will probably have a mild headache.** Your child may also have nausea, lightheadedness, difficulty concentrating, and other minor symptoms.
- **Call your child's regular doctor (primary care provider) for follow up.** Your child should see the doctor within 1 or 2 days of the head injury.
- **Be aware that children who suffer a second head injury before the first has fully healed are at risk for serious complications.** Your child should not return to sports or other contact activities, such as bike riding, until cleared by his primary doctor.
- Watch for worsening or serious symptoms in your child — and **return to the emergency room right away if you notice any of the following:**
 - confusion or abnormal alertness
 - trouble staying alert or awake
 - frequent and repeated vomiting
 - severe headache
 - seizures
 - any symptom that worries you