CDC PEDIATRIC mTBI GUIDELINE

Diagnostic Recommendations

CDC HEADS UP
SAFE BRAIN. STRONGER FUTURE.

This handout for healthcare providers describes diagnosis-related recommendations contained in the CDC Pediatric mTBI Guideline.

GOAL OF THE CDC mTBI GUIDELINE

The goal of the CDC Pediatric Mild Traumatic Brain Injury (mTBI) Guideline is to help healthcare providers take action to improve the health of their pediatric patients with mTBI. To do this, the Guideline consists of 19 clinical recommendations that cover diagnosis, prognosis, and management and treatment. These recommendations are applicable to healthcare providers working in: inpatient, emergency, primary, and outpatient care settings.

The Guideline was developed through a rigorous process guided by the American Academy of Neurology methodology and 2010 National Academy of Sciences methodology for the development of evidence-based guidelines. An extensive review of scientific literature, spanning 25 years of research, formed the basis of the Guideline.

mTBI in children

Childrens' developing brains are more vulnerable to mTBI because:

- **Their axons are not as well-myelinated.**
- **They are more susceptible to chemical and metabolic changes.**

RECOMMENDATIONS FOR THE DIAGNOSIS OF mTBI

Six sets of diagnostic recommendations are included in the Guideline. These recommendations focus on:

- **Neuroimaging**
- **Neuropsychological tools**
- **Serum Biomarkers**

Diagnostic Recommendations

NEUROIMAGING

Computed Tomography (CT)

Clinical evaluation of a child with possible mTBI includes balancing the likelihood of potentially devastating complications of a more severe injury against the risks associated with a head CT.

- Healthcare providers **should not** routinely obtain a head CT for diagnostic purposes in children with mTBI.
- Healthcare providers **should** use validated clinical decision rules to identify children with mTBI at low risk for intracranial injury (ICI), in whom a head CT is not indicated, as well as children who may be at higher risk for clinically important ICI, and therefore may warrant a head CT. Existing decision rules combine a variety of factors that, when assessed together, may increase the risk for more serious injury. Such risk factors include the following:
  - Age < 2 years old
  - Loss of consciousness
  - Severe mechanism of injury
  - Vomiting
  - Amnesia
  - Clinical suspicion for skull fracture
  - Severe or worsening headache
  - Nonfrontal scalp hematoma
  - Glasgow Coma Score < 15
- For children diagnosed with mTBI, healthcare providers **should** discuss the risk of a pediatric head CT in the context of risk factors for ICI with the patient and his/her family.

USE VALIDATED CLINICAL DECISION RULES TO IDENTIFY ICI

It is critical to rule out ICI while avoiding unnecessary risks related to exposure from a head CT. Strong clinical evidence indicates that use of clinical decision rules are effective in identifying children at low risk for ICI.

Magnetic Resonance Imaging (MRI)

There is currently insufficient evidence to recommend the use of brain MRI in the diagnosis of mTBI in children.

- Healthcare providers **should not** routinely use MRI in the acute evaluation of cases of suspected or diagnosed mTBI.

Single Photon Emission Computed Tomography (SPECT)

Insufficient evidence currently exists to recommend the use of SPECT in the diagnosis of mTBI in children.

- Healthcare providers **should not** use SPECT in the acute evaluation of cases of suspected or diagnosed mTBI.

Skull X-rays

CT is better at detecting intracranial injuries, and in the instances where CT is not available, validated clinical decision rules are better than skull X-rays when screening patients with increased risk for ICI.

- Skull X-rays **should not** be used in the diagnosis of pediatric mTBI.
- Skull X-rays **should not** be used in the screening for ICI.

Diagnostic Recommendations

EXAMPLES OF VALIDATED SCALES INCLUDE, BUT AREN'T LIMITED TO:

- Post-Concussion Symptom Scale
- Health and Behavior Inventory
- Post-Concussion Symptom Inventory
- Acute Concussion Evaluation

NEUROPSYCHOLOGICAL TOOLS

Symptom Scales

There are several validated tools that can be applied quickly and inexpensively.

- Healthcare providers **should** use an age-appropriate, validated symptom rating scale as a component of the diagnostic evaluation in children presenting with acute mTBI.

Computerized Cognitive Testing

There is insufficient evidence to determine whether baseline testing in children better identifies mTBI as compared to post-injury scores alone.

- Healthcare providers **may** use validated, age-appropriate computerized cognitive testing in the acute period of injury as a component of the diagnosis of mTBI.

Standardized Assessment of Concussion (SAC)

There is insufficient evidence to support the use of the SAC in the diagnosis of children with mTBI.

SERUM BIOMARKERS

Serum Biomarkers

There is insufficient evidence to currently recommend any of the studied biomarkers for the diagnosis of mTBI in children.

- Healthcare providers **should not** perform these tests outside of a research setting at this time for the diagnosis of children with mTBI.

Take action to improve the health of your young patients with mTBI.

To view all 19 sets of recommendations, including those that cover prognosis and management/treatment, and to learn more about the CDC Pediatric mTBI Guideline, visit **www.cdc.gov/HEADSUP**.