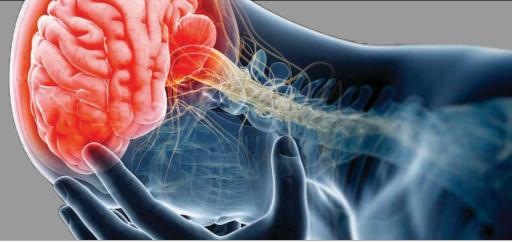


STATEWIDE IMPLEMENTATION
OF GUIDELINE FOR MANAGEMENT
OF ADULT MINOR TRAUMATIC BRAIN
INJURY



Information for Radiologists

Recent literature has demonstrated the safety of managing adult patients with minor traumatic brain injury (mTBI) less intensely than traditional algorithms. Minor injuries with minimal change in the level of consciousness have been monitored without neurosurgical consultation or follow-up head CT scan with equivalent clinical outcomes. Advantages include reducing the need for transfer for neurosurgical evaluation and sparing the patient and family from dislocation from community-based support. Several institutions in North Carolina have instituted some form of systems-based practice change with excellent system and patient outcomes. A subgroup of the NCCOT/STAC research committee has been tasked with generating recommendations surrounding this issue for statewide guidelines.

Joseph et al (2014) defined guidelines based on patient history, physical examination, and initial CT scan to identify which patients required transfer to a tertiary trauma center for neurosurgical consultation versus a period of observation. They defined three categories of brain injury: BIG-1 through BIG-3 (Table 1). They proposed that patients with minor brain injuries (BIG-1) be observed for 6 hours without neurosurgical consult or repeat CT scan. BIG 2 injuries represented moderate brain injuries, requiring inpatient admission for observation, but without neurosurgical consult or repeat head CT scan. BIG-3 injuries are severe head injuries that require hospitalization, neurosurgical consult, and repeat head CT. See guidelines for categorizing brain injuries below.

Information on the interpretation of brain imaging by the radiologists is crucial to the determination of the extent of a patient's brain injuries. As part of the goal to provide consistent care across all NC institutions, we have worked with a UNC radiologist to develop a template for reporting brain CT results. The use of the radiology template on the next page allows ED physicians to make the decision about care for a brain-injured patient. It provides clear, consistent information based on the outcome of the CT scan.

Implementation of the template at your institution should include the table below to allow easy, consistent categorization of the brain injury based on radiologic findings. Highlight the boxes representing the finding, then report the highest BIG category based on imaging findings.

	Radiologic Brain Injury Guideline (BIG) Categorization				
	No traumatic findings	BIG-1	BIG-2	BIG-3	
Skull fracture	No	No	Non-displaced	Displaced	
Subdural hemorrhage	No	< 4 mm	5 - 7	> 8 mm	
Epidural hemorrhage	No	No	No	Yes	
Intraparenchymal hemorrhage/Location count	No	< 4 mm / 1 5 - 7 mm / < 2		> 8 mm / > 3	
Subarachnoid hemorrhage	No	Trace (<1 mm in thick- ness and localized in 1-3 sulci)	thickness and more than ness or bi hemispheric		
Intraventricular hemorrhage	No	No	No	Yes	

Highest BIG category based on imaging findings: _____

Overall BIG categorization

Adult patients with a brain injury (blood seen in the brain) will be categorized using the following guidelines. If no blood is seen on the patient's CT, then the patient has a concussion, and concussion guidelines should be followed. Patients meeting any criteria in a higher category should be categorized in the higher category.

Table 1: BIG Categorizations and Therapeutic Plans for Patients with CT scan Positive for Blood						
	BIG 1	BIG 2	BIG 3			
Mechanism	Blunt	Blunt	Blunt or Penetrating			
GCS	15	15	<15			
Anticoagulation	No	No	Yes**			
Skull fracture	No	Non-displaced (no more than thickness of skull)	Displaced more than thickness of skull			
Subdural hemorrhage	< 4 mm	5-7 mm	> 8 mm			
Epidural hemorrhage	No	No	Yes			
Intraparenchymal hemorrhage location count	1	< 2	>3			
Subarachnoid Hemorrhage	Trace (<1 mm in thickness and localized in 1-3 sulci)	Localized (1-3 mm in thickness and more than 3 sulci in 1 hemisphere)	Scattered (>3 mm in thickness or bi-hemispheric)			
Intraventricular Hemorrhage	No	No	Yes			
	Thera	peutic Plan				
Admission	6 hr observation ED/OBS	24 hr observation /Admit to Non-trauma center/ Level 3 trauma center	Admit to trauma center Level 1/2			
Repeat CT scan	No	No	Yes			
Neurosurgeon	No	Yes or teleconsultation	Yes			
Contingencies	Could be retained at initial treatment site	Have plan of care in consultation with Level 1 or 2 trauma center for deterioration				
	and link to post discharg	patient discharge instructions be follow up @ 2 weeks after ropriate resources				

^{*}Some institutions may decide to keep patients with GCS-total of 13-14. We are starting conservatively by using GCS-total=15

^{**}Aspirin alone is not considered anticoagulation at some institutions. ..