

UCH TACS/ Neurosurgery mBIG Protocol

Patients with isolated head injury (with injury <48 hours prior to arrival) to be managed by mBIG category.

If patient has multisystem injury (defined as head injury plus significant injury to another area: thorax, abdomen, pelvis, spine, extremity) then patient is to be admitted by TACS service.

Patients have to meet all the criteria for categorization into one of the three mBIG categories. Failure to meet even one criterion (in mBIG 1 or mBIG 2) upgrades the patient to the higher mBIG category and alters the therapeutic management plan of the patient based on the mBIG category. Given the inherent limitations of this method the implementation of this document as a decision making tool should be taken in the context of each individual clinical scenario.

Initial CTS Head is to have template reading done by Radiologist into the categories defined for skull fracture, EDH, SDH, IPH, SAH, IVH, and Edema. The radiologist will not give a mBIG category since the categorization requires the other clinical findings.

Summary

mBIG 1- minor head injury

- GCS 13-15
- Non-focal neurologic examination finding,
- No intoxication (BAL < 80 or other equivalent)
- No antiplatelet or anticoagulation medications, (ASA 81 mg and NSAIDs ok)
- Minor findings on initial head CT scan (ICH < 4 mm and no skull fracture).
- Observation (6 hours) in CDU with q 2 neurologic checks and a final exam done by the Emergency Medicine provider.

mBIG 2- moderate head injury

- GCS 13-15
- Non-focal neurologic examination finding,
- No antiplatelet or anticoagulation medications,
- Moderate injury by CTS Head
- Neurosurgery Consult with a routine repeat Head CT (RHCT).
- In-hospital overnight observation on TACS.

mBIG 3- severe head injury

- Any GCS
- Focal neurologic exam findings
- Antiplatelet or anticoagulation medications (ASA 325 mg or above, does not include NSAIDs)
- Major CT scan findings
- Non-examinable patients, intubated patients.
- The plan for these patients consists of hospitalization, a Neurosurgery Consult/ Admission and a follow-up repeat head CT. Multi-system trauma patients are to be admitted to TACS. Isolated TBI following blunt mechanism with mBIG 3 **imaging criteria** met without any other injuries will be admitted to Neurosurgery. At a minimum, the TACS service will be consulted on these patients and perform a tertiary exam the following day prior to formal handoff. Patients meeting **clinical** mBIG3 criteria with mBIG 1 or mBIG2 imaging criteria will be admitted to TACS.
- Isolated TBI following penetrating injury may be admitted primarily to Neurosurgery.
- Patients who have neurologic deterioration, irrespective of their initial categorization, are upgraded to mBIG 3 and follow the therapeutic plan based on the mBIG 3 category.

Assessment Finding	mBIG 1	mBIG 2	mBIG 3
Initial GCS	13-15	13-15	Any
Focal neuro findings/abnormal pupillary exam	No	No	Yes
Intoxication	No (BAL<80 or equivalent)	No/yes	No/yes
Anticoagulants/Antiplatelets	No	No	Yes
Skull fracture	No	Non-displaced	Displaced
EDH	No	No	Yes
SDH	< 4 mm	4-7.9 mm	≥ 8 mm
IPH	< 4 mm	4-7.9 mm	≥ 8 mm or multiple
SAH	≤3 sulci and <1mm	Single hemisphere or 1-3mm	Bi-hemispheric or >3mm
IVH	No	No	Yes
Edema	None	Edema without sulcal or ventricular effacement or midline shift >1mm	Edema with sulcal or ventricular effacement or midline shift >1mm
Management	mBIG 1	mBIG 2	mBIG 3
Hospitalization	CDU	TACS	TACS or Neurosurgery
Neurosurgery Consult	Mandatory	Mandatory	Mandatory
Repeat Head CTS	Selective	Routine	Mandatory

Treatment algorithms

mBIG 1- all patients stay for 6 hour observation in the ED. Q2 hour neuro exam by ED nursing. Repeat neurologic assessment by EM APP/resident at hour 2-4. Repeat assessment at ~6 hours prior to discharge. Patient must have a GCS of 15 and no abnormalities on neuro/pupillary exam for discharge.

mBIG 2- Admission to trauma service for observation with at least q 2 hour neuro-checks for 6 hours. Routine repeat CTS Head at 6 hours, unless deemed unnecessary by the neurosurgery consultant. Observe for 24-48 hours. Neuro assessment by trauma APP/resident at 6-12 hours and 24 hours. Patient must have a GCS of 15 and no abnormalities on neuro/pupillary exam for discharge.

mBIG 3- Admitting service will be TACS for multi-system trauma patients. Isolated TBI following blunt mechanism with mBIG 3 **imaging criteria** met without any other injuries will be admitted to Neurosurgery. At a minimum, the TACS service will be consulted on these patients and perform a tertiary exam the following day prior to formal handoff. Patients meeting **clinical** mBIG3 criteria with mBIG 1 or mBIG2 imaging criteria will be admitted to TACS. Isolated TBI following penetrating injury may be admitted primarily to Neurosurgery.

Neurosurgery Liaison Approval: Dr. Wayne Gluf, 1/19/2021 (Neurosurgery Faculty Meeting)

Trauma Medical Director Approval: Dr. Robert McIntyre, 1/19/2021 (Trauma Committee)

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