

GUIDELINE FOR THE EVALUATION OF BLUNT CEREBROVASCULAR INJURIES IN CHILDREN

REFERENCES:

- Cogbill TH, Moore EE, Meissner M, et al. The spectrum of blunt injury to the carotid artery: a multicenter perspective. *J Trauma*. 1994;37:473-479
- Davis JW, Holbrook TL, Hoyt DB, Mackersie RC, Field TO Jr, Shackford SR. Blunt carotid dissection: incidence, associated injuries, screening and treatment. *J Trauma*. 1990;30:1514-1517
- Biffi WL, Moore EE, Ryu RK, et al. The unrecognized epidemic of blunt carotid arterial injuries: early diagnosis improves neurologic outcome. *Ann Surg*. 1998;228:462-470
- Mutze S, Rademacher G, Matthes G, Hosten N, Stendgel D. Blunt cerebrovascular injury in patients with blunt multiple trauma: diagnostic accuracy of duplex Doppler US and early CT angiography. *Radiology*. 2005;237:884-892
- Bromberg et al. 2010. Blunt Cerebrovascular Injury. *J Trauma*; 68(2):471-477
<https://www.east.org/education/practice-management-guidelines/blunt-cerebrovascular-injury>
- Callcut RA, Mell MW. Modern advances in vascular trauma. *Surg Clin North Am*. 2013;93:941
- Herbert JP, Venkataraman SS, Turkmani AH et al. Pediatric blunt cerebrovascular injury: the McGovern screening score. *J Neurosurg Pediatr*. 2018;21:639-649

Any traumatically injured pediatric patient <18 y/o

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Any of the following overt signs of BCVI?

- Arterial hemorrhage from oropharynx, nasopharynx or neck
- Expanding cervical hematoma
- New cervical bruit
- Focal neurological deficit (transient ischemic attack, hemiparesis, Horner syndrome, vertebral basilar symptoms)
- Asymmetric pupils possibly consistent with Horner's Syndrome
- Neurologic deficit unexplained by initial imaging
- Stroke on initial radiographic imaging

No

Yes

Calculate McGovern Score

GCS \leq 8	1
Focal Neurological Deficit	2
Carotid Canal Fracture	2
High Risk Mechanism of Injury (e.g. High Speed MVC)	2
Petrous Temporal Bone Fracture	3
Cerebral Infarction on CT	3

Any of the following screening criteria for BCVI present?

*note that some of these criteria require non-contrast CT head and neck to be performed prior to evaluation for BCVI (follow guidelines to determine who requires imaging of head and neck)

- Any traumatic injury above the clavicles, including
 - o ICH
 - o Skull or facial fractures
 - o Cervical spine fractures
 - o Soft tissue injury, such as a cervical seat belt sign
- High risk mechanism with normal initial head CT and altered mental status not explained by other factors (e.g. intoxication)

No

Yes

MCGOVERN SCORE \geq 3

No

MCGOVERN SCORE $<$ 3

Yes

Low risk of BCVI – **NO NEED FOR ADDITIONAL IMAGING**

OBTAIN CTA HEAD AND NECK

Yes