SPECTRUM HEALTH®

Blodgett Campus

Brain Injury Guidelines; The PI Process

Jennifer Haverkamp, BSN, RN

SPECTRUM HEALTH

Learning Objectives

- Describe the importance of implementing a systematic approach for managing patients with traumatic brain injuries (TBI) at a level 3 regional trauma center
- Demonstrate the use of data in the implementation of the Brain Injury Guideline (BIG) Tool
- Describe a collaborative process to develop BIG Criteria through utilization of the trauma PI committee and involvement from key stakeholders

SPECTRUM HEALTH

Background

State Designation Visit Fall 2017:

- Exit Interview:
  - Opportunity cited: "the trauma center must develop a specific plan approved by the TMD of which type of neurosurgical patients should be admitted and which are transferred".
  - Recommendation: The Trauma Medical Director should establish protocols that address but are not limited to the transferring of patients and the admission of neurosurgical patients.
  - "A Level III trauma center must have a plan approved by the trauma medical director that determines which types of neurosurgical injuries may remain and which should be transferred"
  - Recommendation: Develop a specific plan approved by the Trauma Medical Director documenting which type of neurosurgical patients should be admitted and which transferred.

Action Item

Development phase

- Trauma Performance Committee (TPC) recommended the transfer all neuro patients to Spectrum Health Butterworth (Level 1) for admission until criteria established

Identified Stakeholders

- SHMG Executive committee members, TMD BL, TMD BW, BW Neurosurgeon, BL ED liaison, TPM BL, and TPM BW

TPC to be oversight for approval of process

- Revise admission guideline to include neuro patients
- Developed standard work for the guideline process

SPECTRUM HEALTH

Literature Review:

- TBI cont' account for > 1.4 million emergency department visits annually
- Approx 75% of the patients seen in ED are minor enough, immediate intervention not needed by Neurosurgical specialist
- Management of care is evolving
- As a result… Brain Injury Guideline (BIG) were developed as result of multiple studies
- ***Goal of BIG***: formulate a therapeutic plan for management of pt's with collaboration with neurosurgeon
  - Based on CT findings: where/how to manage care safely

WTA 2014 Plenary Paper

Prospective validation of the brain injury guidelines: Managing traumatic brain injury without neurosurgical consultation

Bellal Joseph, MD, Hassan Aziz, MD, Viraj Pandit, MD, Narong Kulvatunyou, MD, Moutamn Sadoun, MD
Andrew Tang, MD, Terence O'Keeffe, MB ChB, Lynn Gries, MD, Donald J. Green, MD,
Randall S. Friese, MD, Michael G. Lemole, Jr., MD, *and* Peter Rhee, MD, *Tucson, Arizona*

BACKGROUND: To optimize neurosurgical resources, guidelines were developed at our institution, allowing the acute care surgeons to independently manage traumatic intracranial hemorrhage less than or equal to 4 mm. The aim of our study was to evaluate our established Brain Injury Guidelines (BIG 1 category) for managing patients with traumatic brain injury (TBI) without neurosurgical consultation.

METHODS: We formulated the BIG based on a 4-year retrospective chart review of all TBI patients presenting at our Level 1 trauma center. We then prospectively implemented our BIG 1 category to identify TBI patients that were to be managed without neurosurgical consultation (No-NC). Propensity scoring matched patients with No-NC to a similar cohort of patients managed with NC

WTA 2013 Plenary Paper

The BIG (brain injury guidelines) project: Defining the management of traumatic brain injury by acute care surgeons

Bellal Joseph, MD, Randall S. Friese, MD, Moutamn Sadoun, MD, Hassan Aziz, MD,
Narong Kulvatunyou, MD, Viraj Pandit, MD, Julie Wynne, MD, Andrew Tang, MD,
Terence O'Keeffe, MB, ChB, *and* Peter Rhee, MD, *Tucson, Arizona*

BACKGROUND: It is becoming a standard practice that any "positive" identification of a radiographic intracranial injury requires transfer of the patient to a trauma center for observation and repeat head computed tomography (RHCT). The purpose of this study was to define guidelines—based on each patient's history, physical examination, and initial head CT findings—regarding which patients require a period of observation, RHCT, or neurosurgical consultation.

METHODS: In our retrospective cohort analysis, we reviewed the records of 3,803 blunt traumatic brain injury patients during a 4-year

Key Questions for Implementation Process

WHO:

- Identify all neuro trauma patients

WHAT:

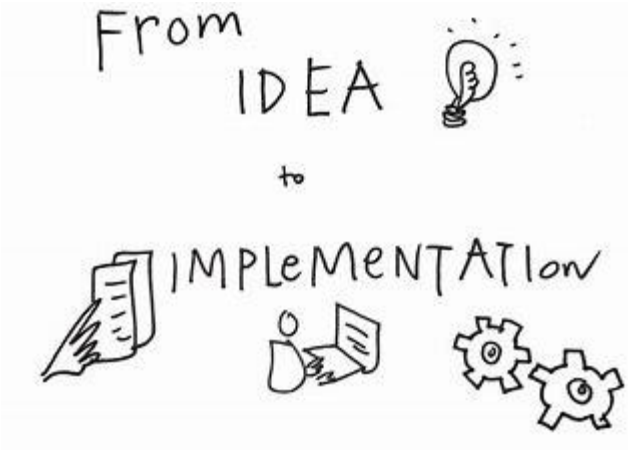
- Implement a neuro guideline **BIG** Criteria Guidelines
- Focus on management of admissions and transfers

WHERE:

- Incoming patients to the ED

WHY:

- Consistent plan of care / guideline compliance
- *PATIENT SAFETY*



HOW:

- Educate ED, Trauma Surgeons, Transfer Center, and BW physicians on guideline
- All patients have met appropriate guidelines

SPECTRUM HEALTH

What does BIG Criteria look like?

Variables	BIG 1	BIG 2	BIG 3
Loss of Consciousness (LOC)	Yes/No	Yes/No	Yes/No
Neurologic Examination	Normal	Normal	Abnormal
Intoxication	No	No/Yes	No/Yes
Coumadin, Aspirin, Plavix (CAMP)	No	No	Yes
Skull Fracture	No	Non-displaced	Displaced
Subdural Hemorrhage (SDH)	≤4mm	7. Mm	≥8mm
Epidural Hemorrhage (EDH)	≤4mm	5-7mm	≥8mm
Intraparenchymal Hemorrhage (IPH)	≤4mm, 1 location	3-7mm, 2 locations	≥8mm, multiple locations
Subarachnoid Hemorrhage (SAH)	Trace	Localized	Scattered
Intraventricular Hemorrhage (IVH)	No	No	Scattered
	THERAPEUTIC	**PLAN**	
Hospitalization	No Observation (6 hours)	Yes	Yes
Repeat Head Computed Tomography (RHCT)	No	No	Yes
Neurosurgical Consultation (NSG)	No	No	Yes

Joseph, B., Friese, R., Sadoun, M., Aziz, H., Kulvatunyou, N., Pandit, V., et al. (2013). The BIG (brain injury guidelines) project: Defining the management of traumatic brain injury by acute care surgeons. Journal of Trauma Acute Care Surgery, 76(4), 965-969.

BIG Criteria for Blodgett

Action Plan for Implementation:

- Continue collaboration with NSx liaison, SHMG Executive Committee, TMD Blodgett and Butterworth
- Developed plan for implementation & education of guideline
- Radiology liaison to review CT reads for accuracy & lesion measurement
- Trauma Systems meeting included in education process
- TPC oversight for compliance of guideline
- Communication & PI with BW Trauma

ED Process

- ED physicians at both Blodgett & Butterworth educated on guideline and admission / transfer plan
- BIG criteria and pocket cards distributed to all care providers and signs posted in ED
- ED nursing staff at both Blodgett & Butterworth included in education
- Information shared with transfer center staff

After Initial Implementation

- Continued Evaluation Process
  - Review on ALL neuro patients meeting BIG Criteria
  - Continued collaboration with radiology for compliance with correct documentation
  - Developed BIG PI Review in Trauma Base
  - Presented All patients in TPC for peer review, further revisions to admission guideline, and loop closure
  - Feed back with Butterworth PI for any opportunities

SPECTRUM HEALTH

Case Scenario

Mech:
History:
LOC:
Intoxication:
CAMP:
Skull
SDH/EDH/IPH/SAH/IVH: Size of bleed
CT Imaging
Other Injuries:
Therapeutic Plan: Hospitalization, Repeat CT, NSx Cx

SPECTRUM HEALTH

Learning Outcomes

- With continued review, discuss opportunities for identified gaps with a collaborative approach to clinical problems
- Identify an action plan that accepts feedback, evaluates and modifies based on patient outcomes
- Recognizes the importance of engaging **ALL** key stakeholders for success of implementation and utilization

Lessons Learned

Be inclusive with stakeholder group

Review the literature

Communicate, communicate, and communicate

Change in practice was important to communicate to Level 1

- All neuro trauma transferred
- Phase 2 with BIG guideline criteria.

SPECTRUM HEALTH

Special Thanks

- *Dr. Jeff Gawel;*
  Blodgett Trauma Medical Director

- *Amy Koestner, Trauma Program Manager*

- *ED Physicians, leadership and Nurses, Neurosurgery team, Hospitalists, Intensivists, and Trauma Services at both Spectrum Health Blodgett & Butterworth Campus'*