

Simulation Scenario Template

Section 1: Case Summary

Scenario Title:	
Keywords:	Pediatric Trauma
Brief Description of Case:	Severe Head Injury

Goals and Objectives	
Educational Goal:	
Objectives: (Medical and CRM)	<ul style="list-style-type: none"> • Medical Management of Pediatric Trauma and Head Injury in resource limited setting • Use of RTVS Support Pathways in complex cases
EPAs Assessed:	

Learners, Setting and Personnel			
Target Learners:	<input type="checkbox"/> Junior Learners	<input type="checkbox"/> Senior Learners	<input checked="" type="checkbox"/> Staff
	<input checked="" type="checkbox"/> Physicians	<input checked="" type="checkbox"/> Nurses	<input checked="" type="checkbox"/> RTs
	<input type="checkbox"/> Other Learners:		
Location:	<input type="checkbox"/> Sim Lab	<input checked="" type="checkbox"/> In Situ	<input type="checkbox"/> Other:
Recommended Number of Facilitators:	Instructors: 1		
	Confederates: 0		
	Sim Techs: 0-1		

Scenario Development	
Date of Development:	November 16, 2020
Scenario Developer(s):	Alysha Mackenzie-Feder
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Last Revision Date:	
Revised By:	
Version Number:	



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Section 2A: Initial Patient Information

A. Patient Chart					
Patient Name: Sam		Age: 20 Month	Gender: M	Weight: 12kg	
Presenting complaint: Crush Injury from TV					
Temp: 36.5	HR: 100	BP: 110/85	RR: 8-10	O ₂ Sat: 98%	FiO ₂ : Face Mask
Cap glucose: 6.0			GCS: (E V M) 3		
Triage note: At 0630 patient climbed onto mother's dresser and pulled TV down onto himself, found immediately by Mother. Called EHS, arrived 0642 found patient obtunded with GCS of 4 and posturing. IO started Right Tibia, bolus NS 120ml x 1 given. Ativan 1.5mg via IO Given. On Arrival Vital signs as above. Pupils dilated and fixed, Slow Spontaneous Respirations					
Allergies: Penicillin					
Past Medical History: Healthy			Current Medications: None		

Section 2B: Extra Patient Information

A. Further History	
On Primary survey: Spontaneous Breathing, Airway intact, no facial trauma. Palpable pulses, normal heart sounds. GCS 3	
B. Physical Exam	
<i>List any pertinent positive and negative findings</i>	
Cardio: Normal HS	Neuro: GCS 3, Decerebrate posturing
Resp: Slow Equal AE	Head & Neck: Clear
Abdo: Soft, no bruising noted	MSK/skin: No Deformities to limbs
FAST Neg	



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Section 3: Technical Requirements/Room Vision

A. Patient
<input checked="" type="checkbox"/> Mannequin (<i>specify type and whether infant/child/adult</i>)
<input type="checkbox"/> Standardized Patient
<input checked="" type="checkbox"/> Task Trainer
<input type="checkbox"/> Hybrid
B. Special Equipment Required
Intubation equipment if available Broselow Tape Telehealth Cart
C. Required Medications
Mannitol 3% NS Dilantin
D. Moulage
None
E. Monitors at Case Onset
<input checked="" type="checkbox"/> Patient on monitor with vitals displayed
<input type="checkbox"/> Patient not yet on monitor
F. Patient Reactions and Exam
None



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Section 5: Scenario Progression

Scenario States, Modifiers and Triggers				
Patient State/Vitals	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State		Facilitator Notes
1. Baseline State Rhythm: Sinus HR: 80-100 BP: 110/85 RR: 8-10 O ₂ SAT: 97% T: 36.5°C GCS: 3	Unresponsive Pupils Fixed Posturing noted	<u>Expected Learner Actions</u> <input type="checkbox"/> Recognize signs of head injury <input type="checkbox"/> Head of bed to 30 Degrees <input type="checkbox"/> Second IV/IO <input type="checkbox"/> Support Respirations <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<u>Modifiers</u> -Desaturation if resp not supported <u>Triggers</u> For progression to next state - When actions completed, or 5 mins passed -	
2. Imaging/Support Rhythm: Sinus HR:90 BP: 112/82 RR: 8 Sat: 95% T: 36.0 GCS 3	Unresponsive Right Pupil > L	<u>Expected Learner Actions</u> <input type="checkbox"/> Initiate call to CHARLIE <input type="checkbox"/> Arrange CT if available <input type="checkbox"/> Charlie to support prep for Intubation <input type="checkbox"/> Charlie to support Giving 3% NS <input type="checkbox"/>	<u>Modifiers</u> - - - <u>Triggers</u> -When actions completed, or 5 mins passed -	
3. Resuscitation Rhythm: Sinus HR 90-100 BP 114/90 RR: Bagged 20 Sat: 100% T 35.4 GCS: 3	Unresponsive Right Pupil Reactive after 3% NS Large Subdural R with shift and herniation on imaging	<u>Expected Learner Actions</u> <input type="checkbox"/> Charlie DOC to Call PTN request Nsx and PICU on the line <input type="checkbox"/> Hyperventilate <input type="checkbox"/> Nsx advised of need for Emergent Craniotomy/Burr hole <input type="checkbox"/> Call local Surgeon if available <input type="checkbox"/> Charlie to remain on Zoom video to support local care	<u>Modifiers</u> - - - <u>Triggers</u> - -	<u>Ideally PTN, Nsx , PICU are brought in over zoom call</u>
4. Local Action Rhythm: Sinus	Unresponsive	<u>Expected Learner Actions</u> <input type="checkbox"/> Mannitol as advised by Nsx	<u>Modifiers</u>	<u>Transport can be arranged to closest neurosurgical center.</u>



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<p>HR: 80-90 BP 100/70 RR: 20 Bagged or on Vent Sats 100% T: 36.6 with warming GCS: 3</p>	<p>Pupils minimally reactive post 3% NS</p>	<p><input type="checkbox"/> Local surgeon to come in <input type="checkbox"/> Transport in 2-4 hours <input type="checkbox"/> Send labs <input type="checkbox"/> Maintain Normothermia, normal glucose, normal Sodium, normal BP</p>	<p>- If local Surgical Team Available/able Nsx to support intervention via telehealth/phone - - <u>Triggers</u> - -</p>	
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Appendix A: Laboratory Results

CBC

WBC 12

Hgb 90

Plt 255

Lytes

Na 139

K 4.5

Cl 110

HCO₃ 22

AG Normal

Urea 6.5

Cr 35

Glucose 5.0

VBG

pH 7.30

pCO₂ 37

pO₂ 35

HCO₃ 23

Lactate 2.0





PI

RTVS Pediatric Head Trauma Facilitator notes:

1) Management of increased ICP:

The dose of hypertonic saline (3%) is 3-5ml/kg and can be found on the Pedi stat App. For this case it would be 36ml over 20 min.

Most likely either hypertonic saline or mannitol would be given. If you simulate call from Neurosurgery and they suggest mannitol then dose is in pedi stat App. Mannitol (20%) IV at 0.5 -1 gram per kg so 6 -12 grams in this case.

If mannitol is given then need to place foley catheter and monitor BP q 5 min as may cause ++ diuresis and hypotension.

Review normal vital signs for one year old child in Pedi stat.

BP should be well above the lowest 5% percentile of normal. Avoid hypotension.

Hypotension (5 % percentile of normal)+ 70 plus (2x age) so in this case SBP indicating hypotension would be <72 mmHg.

2) Management of airway

When initially using Bag Valve Mask. Make sure mask size is appropriate for infant and OPA (OROPHARYNGEAL) device is also used.

Patient's airway will require assistance due to the low GCS. This can be managed in several ways. If Infant transport team is able to arrive quickly, there can be a discussion with ITT on ways to best manage. If providers are not skilled with intubation then they can try a temporizing measure such as a Laryngeal Mask airway. For example a supraglottic device such as an igel- appropriate pediatric size. Learners should be aware that this is not appropriate if patient starts to vomit or rouse. Will require sedation and there is a risk of aspiration. If learner does not have intubating skills then Bag Valve Mask ventilations may be required until more advanced help arrives.

If learners have intubating skills then perform an RSI- meds are outlined in Pedi stat App. Should always verbalize a back plan such as a supraglottic device. Ketamine can be used as an induction agent and is not an absolute contraindication to raised ICP but should probably be avoided if patient is hypertensive. Ketamine dose is 1.5mg/kg so 18mg in this patient. Succinylcholine or rocuronium can be used as a paralytic. Dose of rocuronium is 1mg/kg so 12mg in this patient.

Propofol infusion or midazolam infusion should be used for post intubation sedation- this should be used according to local protocols and with discussion of Charlie/EPOS/Neurosurgeon.