

Optimus BONUS : Head Injuries



An open access simulation pack for healthcare educators



Optimus

BONUS

Bank Of iNdependently Useful Simulations

Part of the Children's Health Queensland 'Optimus' curriculum.

Optimus BONUS : Head Injuries

Published by the State of Queensland (Queensland Health), September 2021. Last reviewed October 2023.



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An electronic version of this document is available at <https://www.childrens.health.qld.gov.au/research/education/queensland-paediatric-emergency-care-education/optimus-bonus/>

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Welcome to the CHQ Head Injury Simulation Pack

Children's Health Queensland and Health Services

Optimus BONUS

Welcome to the CHQ Head Injury Simulation Pack



STORK
Simulation Training on Resuscitation for Kids

Click the image above for a 2 minute introduction to this simulation package

This simulation package contains two separate scenarios designed to rehearse two very different skills needed when caring for children with different types of head injuries.

Simulation 1 has an emphasis on severe traumatic brain injury, and provides an overview and links to the Children's Health Queensland Paediatric Neuroprotection Checklist. The package is designed to allow teams to rehearse a structured approach to paediatric neuroprotection and to assist departments in embedding a checklist into organisational clinical practice. The simulation involves a resuscitation team taking care of an intubated patient who returns from CT with clinical deterioration from increased intracranial pressure.

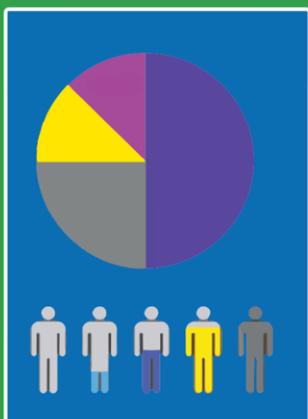
Simulation 2 is designed to promote awareness of the 2021 PREDICT guidelines for mild to moderate head injury, and to provide opportunities to mentally rehearse key decision making and negotiating family centred care. It requires the use of a simulated parent / actor and the scenario works best with a small group of participants. It can also provide opportunities to coach small groups of staff about communicating with parents.

Contents of this educational package:



Simulation

Treatment and escalation of raised intracranial pressure using a neuroprotection checklist.



Infographic

For sharing in the weeks before or after your simulation via email or in poster format.



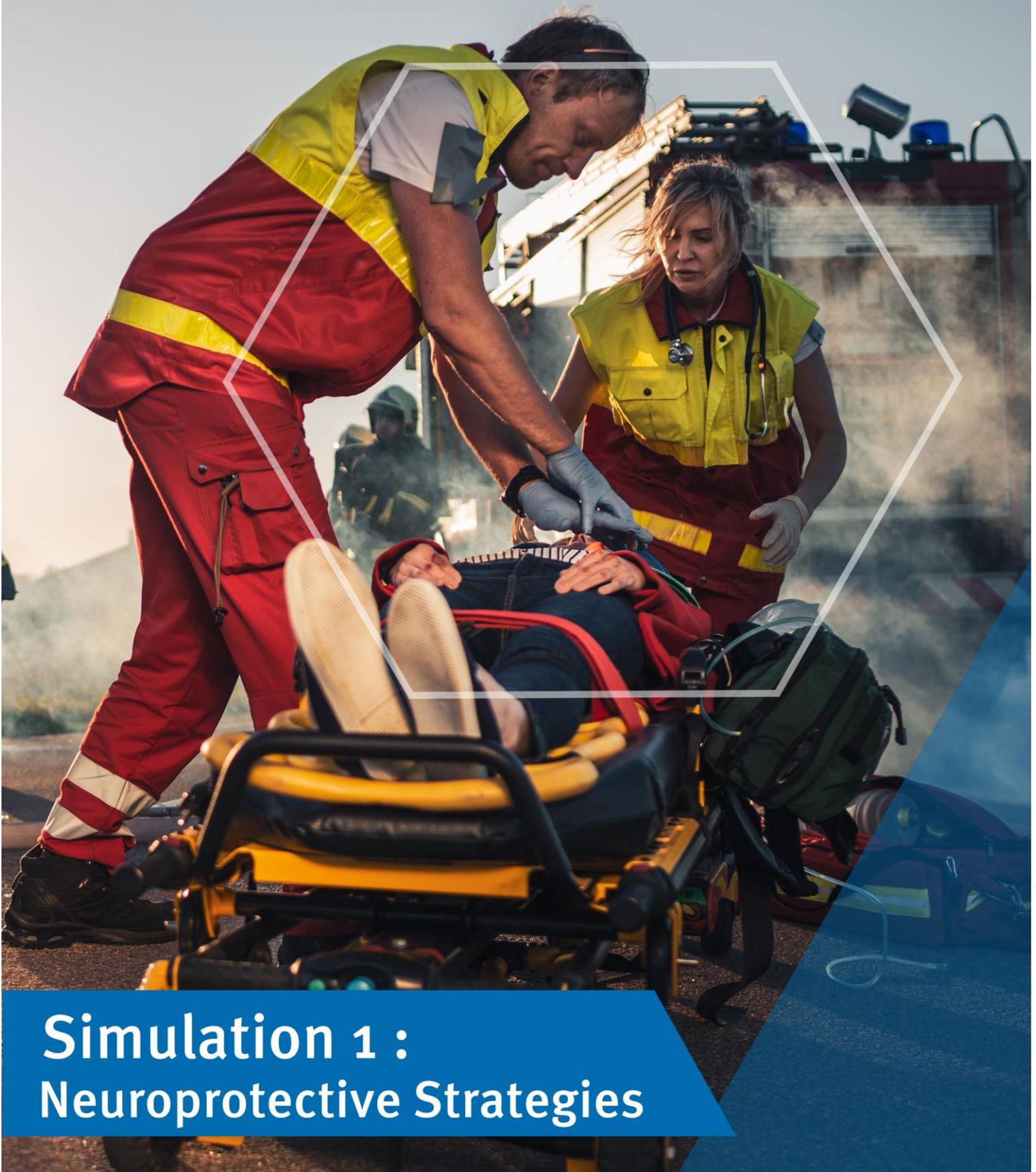
Further Reading

Podcasts and Blog Posts
Online Videos
Journal Articles

Fill out our participant survey to receive a training certificate

(Select Optimus BONUS as course)





Simulation 1 : Neuroprotective Strategies



Introduction by Dr Michaela Waak, MD/PhD, FRACP, FRACP Neurology

Twitter : @MichaelaWaak

Brain injuries and what really matters.



Dr Michaela Waak : Co-developer of the Neuroprotection Checklist Queensland Children's Hospital

Dr Waak is one of the few paediatric specialists internationally with fellowships in paediatrics, neurology and paediatric intensive care obtained in different international settings. Since arriving in Brisbane in 2012 she has helped improve care of children through quality improvement, research and guideline developments including an EEG pathway and paediatric code stroke process. She is investigating the impact of an interdisciplinary comprehensive program for paediatric neurocritical care and is inaugural faculty and manual co-author of the national education and training course: Paediatric Neuro-Critical Care - beyond BASIC, the first paediatric course of its kind. She is passionate about improving management and outcomes of critically ill children through PICU Liberation focusing on paediatric post intensive care syndrome by establishing appropriate long-term follow up programs as part of the PICOLO network.

"Life can change in a split second.

By the time we meet a child that has suffered a brain injury the trauma that will become part of their (and their family's) life has already started.

Unfortunately despite primary prevention campaigns, traumatic brain injuries are still a common cause of morbidity and long-term consequences for children. This impacts their development, schooling, daily life as well as their families and society. **We cannot go back in time and change the primary brain injury, but we can recognise and manage neurological and neurosurgical emergencies rapidly as an interdisciplinary team.**

By getting our management right from the start we can prevent secondary brain injury, keep the child and family informed, and communicate in a calm and caring way at the beginning of their journey. This resource has been developed as part of our broader neurocritical care team program, recognising that in the acute setting checklists, good team communication and trust can make a difference to mental load and team performance.

We hope this teaching will make you and your team more confident to manage neurological and neurosurgical emergencies and build trust. The ultimate aim is to benefit the children and families of the future! Your feedback will ensure we can continue to improve and share these resources as the neurocritical care community grows."

Section I: Scenario Demographics

Scenario Title:	Head Injuries
Date of Development:	January 2021
Target Learning Group:	Multidisciplinary Teams that look after Paediatric Patients

Section II: Scenario Developers

Scenario Developers:	Dr Lauren Schmitt, Dr Ben Symon
Reviewed by :	Dr Michaela Waak

Section III: Curriculum

Learning Goals & Objectives

Educational Goal:	<ul style="list-style-type: none"> Evidence based approach to the management of severe head injury in paediatric patients
Skills Rehearsal:	<ul style="list-style-type: none"> Integration of neuroprotective measures into paediatric trauma resuscitation
Systems Assessment:	<ul style="list-style-type: none"> Access to checklists and equipment relevant to neuroprotective resuscitation
Systems Intervention:	<ul style="list-style-type: none"> Embedding a neuroprotective checklist into clinical practice

Case Summary: Brief Summary of Case Progression and Major Events

A 10 year old boy has been brought to your hospital after his parent's car was struck by another vehicle. He was intubated on scene with an isolated head injury. A CT was rapidly and safely facilitated.

The simulation starts with him returning from CT with a confirmed intracranial bleed.

The goal of this simulation is to manage the patient for the 20 minutes between when the patient will be taken to OT by identifying his deterioration optimising neuroprotection. The team will be advised to systematically work through implementing a neuroprotective checklist to ensure they optimise his management prior to transfer to the operating theatre or the arrival of the retrieval team.

Local adaptation :

- You may also NOT use the neuroprotective checklist if your department doesn't wish and instead use the checklist as a prompt for discussion points and treatment targets during your debrief.
- In regional settings where the patient would need retrieval, facilitators can add advice from retrieval services suggesting use of the checklist while retrieval is arranged urgently.

Section IV: Equipment and Staffing

Scenario Cast			
Patient:	<input type="checkbox"/> Mannequin suitable for 10 yr old boy		
Clinical Expert:	Facilitator familiar with neuroprotection checklist or neuroprotective strategies for severe head injuries		
Confederate:	Radiologist, Team members authentic to your local trauma response, Neurosurgeon on call		
Required Monitors			
<input type="checkbox"/> 4 wave patient monitor	<input type="checkbox"/> Temp probe		
<input type="checkbox"/> ECG leads	<input type="checkbox"/> NIBP cuff		
<input type="checkbox"/> Pulse oximetry	<input type="checkbox"/> EtCO2		
Required Equipment			
If running this simulation In Situ, suggest using your authentic equipment if approved by your department. This will help diagnose any actual equipment / availability / layout issues.			
<input type="checkbox"/> Airway trolley	<input type="checkbox"/> Stethoscope	<input type="checkbox"/> Cervical immobilisation collar or sandbags consistent with your service	
<input type="checkbox"/> Ventilator attached to patient with following settings : - Tidal volume 200mL - RR 16, FiO2 100%.	<input type="checkbox"/> IV Fluids : Normal Saline, Hypertonic Saline, Mannitol	<input type="checkbox"/> Pen torch	
<input type="checkbox"/> ED resuscitation trolley	<input type="checkbox"/> IV Pole + 2 x IV pumps and syringe drivers	<input type="checkbox"/> ED trauma boxes consistent with your service	
Moulage			
		<ul style="list-style-type: none"> • Intubated with size 6 ETT placed at 17 cm at lip • PIVC x 2 • Bruising right side of head and face. 	
Approximate Timing			
Set-Up: 30m	Prebrief : 10m	Scenario: 20m	Debriefing: 20m

Section V : Scripts

Scenario Introduction from Facilitator



Welcome everyone. Our simulation today is focused on rehearsing neuroprotective measures in a child with a traumatic intracranial bleed. So that we can focus on this, the simulation is going to start *after* our patient has returned from CT following an appropriate primary survey and safe intubation.

To bring you up to speed :

- Rahul is a 10 year old boy (30kg) who was in a MVA.
- He has an isolated head injury which you will shortly hear about from radiology.
- His C-Spine is not cleared and he is still in a collar.
- He was intubated on scene and is appropriately sedated with a morphine and midazolam infusion running.
- His most recent dose of rocuronium was 30 minutes ago.
- He is ventilated on SIMV with a tidal volume of 200mL, respiratory rate of 16 and FiO2 100%.
- He has two functioning large bore cannulas and trauma bloods have been sent including cross match.

He has no other injuries and has no relevant past medical history. His parents are currently being treated in an adult department and they will not be present for this scenario.

The CT head is being formally reported and the images will be uploaded to the computer shortly. While in CT his heart rate has begun to gradually decrease and his BP has been rising.

To start the case, can you reconnect him to your monitoring and reassess his status post return from radiology.

Script for Radiologist Phone Call (once simulation started)



Hi, It's, I'm the radiologist reporting the CT scans today. Have you had a chance to have a look at Rahul's film? You should be able to see it now.

There is a right sided subdural haemorrhage with midline shift. There is associated subarachnoid haemorrhage, with an overlying subgaleal haematoma.

I can't see any bony injury, and the c-spine looks fine, but I'd suggest you call the neurosurgeons as soon as possible, he's going to need theatre.

Script for Neurosurgeon Phone Call (when called)



Hi, it's, I'm the neurosurgical registrar on call. How can I help?

Okay, I'm in the hospital and the boss is also available. I will go to theatre and activate the team. There should be a theatre available in around 20 minutes. Can you make sure that your team is implementing all appropriate neuroprotective measures? There's a neuroprotection checklist you can use, it's on the [QPEC Website in the resuscitation flowcharts](#) if you need it.

I'll call PICU and give them the heads up that he'll be coming to them after theatre. We'll be ready upstairs in 20 minutes.

Section VI: Scenario Progression

Scenario States

State 1 : Reassessment and Radiology Phone Call

Patient State	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State	
<p>Rhythm: Sinus HR: 80 BP: 130/90 Cap refill: 2 seconds RR: ventilated at 16 O₂ SAT: 100% on FiO₂ 1.0 Pupils: Size 3 PEARL, R) side sluggish to light ETCO₂ : 55 T : 36.4 AVPU : intubated</p>	<p>Returned from CT on bed. Adequately sedated and paralysed.</p>	<p><input type="checkbox"/> Reassess patient on return from CT</p> <p><input type="checkbox"/> VBG</p> <p><input type="checkbox"/> Check infusions and current medications</p> <p><input type="checkbox"/> Ensure equipment in appropriate place, ensure EtCO₂ in situ and that they have</p>	<p><u>Facilitator Actions :</u></p> <p>Introduce scenario and provide handover of patient.</p> <p>Prompt team to facilitate reassessment post return from CT.</p> <p>Once reassessment complete, facilitate phone call from Radiology.</p>

State 2 : Activate Neurosurgery + Treat Raised ICP using Neuroprotection Checklist

<p>Rhythm: Sinus HR: 80 BP: 130/90 Cap refill: 2 seconds RR: ventilated at 16 O₂ SAT: 100% on FiO₂ 1.0 Pupils: Size 3 PEARL, R) side sluggish to light ETCO₂ : 55 T : 36.4 AVPU : intubated</p>	<p>Adequately sedated and paralysed.</p>	<p><input type="checkbox"/> Receive phone call from Radiology</p> <p><input type="checkbox"/> Facilitate phone call to Neurosurgical Team</p> <p><input type="checkbox"/> Access and run through Neuroprotection Checklist</p>	<p><u>Facilitator Actions :</u></p> <ul style="list-style-type: none"> - Prompt for use of neuroprotection checklist if team does not do so - Adjust ETCO₂ and other obs as appropriate per learner actions
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Scenario States

State 3 : Administer Temporising Measures for Urgent Transfer

Patient State	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State	
<p>Rhythm: Sinus HR: 60 BP: 140/90 Cap refill: 3 sec RR: 16 O₂ SAT: SpO₂ 100% on FiO₂ 1.0 CO₂: 50 T: 36.4 AVPU: U – intubated Pupils: Unequal, right side 6mm and fixed, left side 3mm</p>	<p>When asked advice, prompted to use neuroprotective checklist</p>	<p><input type="checkbox"/> Administer neuroprotective measures as per your checklist or local expected actions. E.g. :</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Identify pupillary asymmetry <input checked="" type="checkbox"/> Head up at 30 degrees <input checked="" type="checkbox"/> Increase to FiO₂ 100% <input checked="" type="checkbox"/> Ventilate to CO₂ 30-35 or reversal of blown pupil <input checked="" type="checkbox"/> Administer hypertonic saline <input checked="" type="checkbox"/> Consider placement of arterial line <input checked="" type="checkbox"/> Contact Neurosurgical team for urgent evacuation of clot 	<p><u>Facilitator Actions :</u></p> <ul style="list-style-type: none"> - Adjust patient status to learner actions e.g : <ul style="list-style-type: none"> o Hypertonic saline bolus improves HR to 70, BP to 130/90 o Hyperventilation via BVM improves CO₂ to 35 cmH₂O on EtCO₂ trace <p><u>Triggers</u></p> <ul style="list-style-type: none"> - Upon completion of neuroprotective checklist, contact team and inform them that theater is ready

State 4 : Prepare for transport

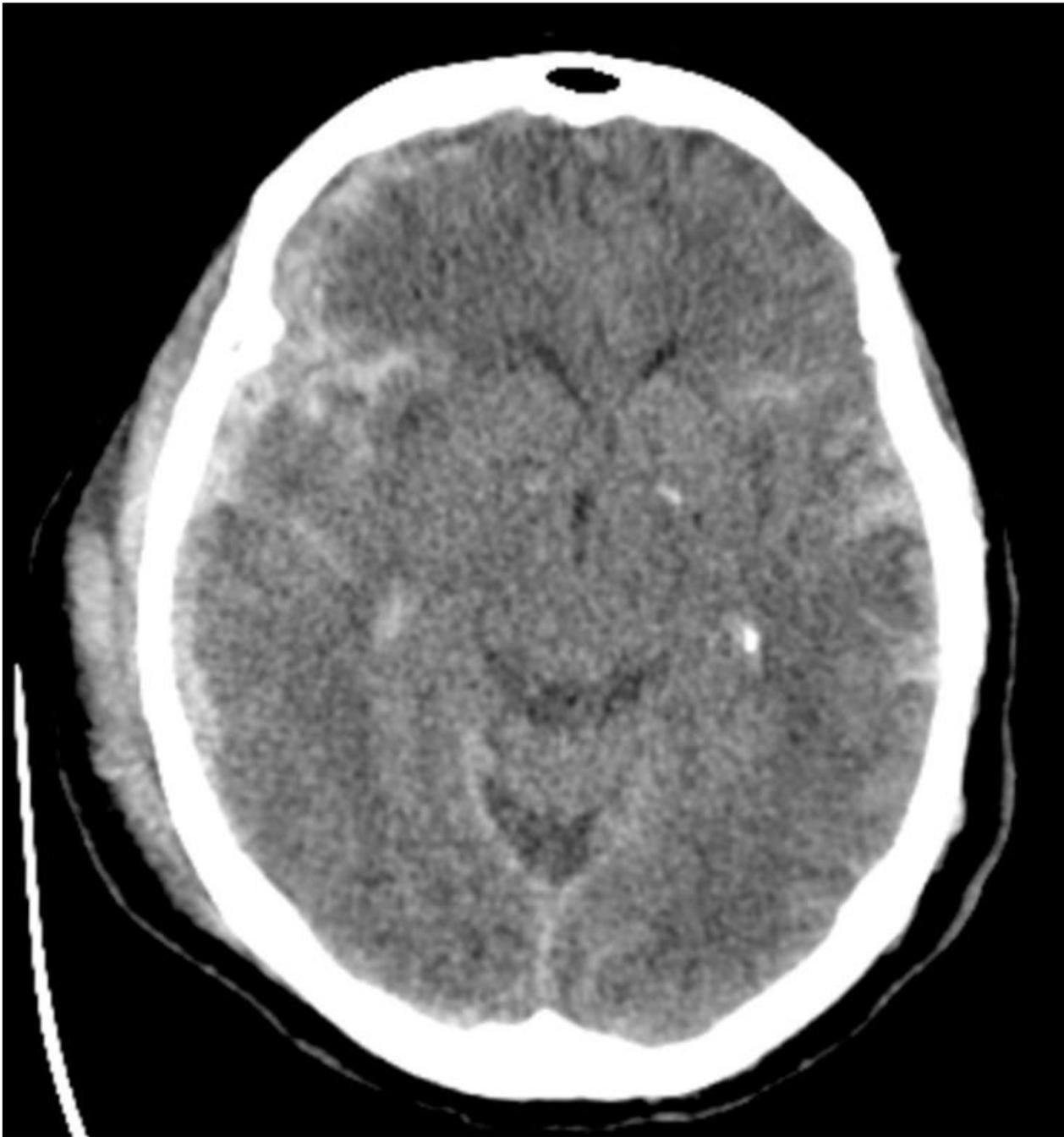
<p>Rhythm: Sinus HR: 90 BP: 120/70 Cap refill 2 sec RR: Ventilated O₂ SAT: as per FiO₂ CO₂: 34 T: 36.3 Pupils: Size 4, R) sluggish to light but no longer blown</p>	<p>Prepare patient for transfer to operating theater</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Prepare transfer Equipment <input checked="" type="checkbox"/> Assemble team including porter <input checked="" type="checkbox"/> Brief team for Transfer <input checked="" type="checkbox"/> Anticipate Deterioration 	<p><u>Facilitator Actions :</u></p> <ul style="list-style-type: none"> - Inform participants that theatre has called and is ready for the patient <p><u>Triggers</u></p> <ul style="list-style-type: none"> - Simulation is complete following assembling equipment, drugs required for transfer and preparing team including anticipating deterioration prior to transfer.
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Section VII: Supporting Documents, Laboratory Results, & Multimedia

Venous Gas Result

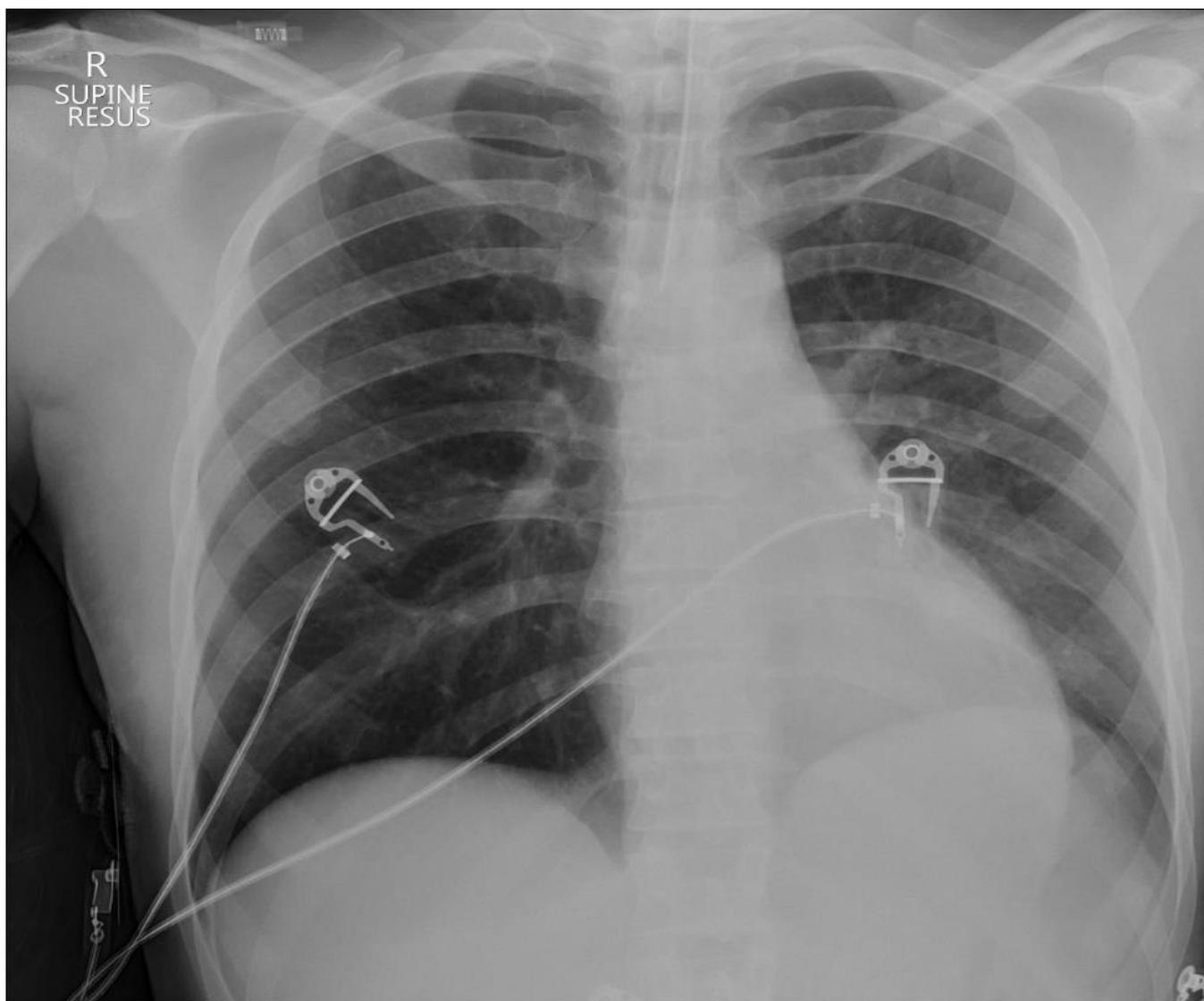
	Results	Units	Normal Range
pH	7.28		7.32 – 7.42
pCO2	58	mmHg	41 - 51
pO2	40	mmHg	25 - 40
O2 Saturations	94	%	40 - 70
Bicarb	24	mmol/L	22 - 33
BE	-2	mmol/L	-3 - +3
HCT	.36		0.3 - 0.42
Hb	112	g/L	105 - 135
Na+	133	mmol/L	135 - 145
K+	4.1	mmol/L	3.2 - 4.5
Ca++ (ionised)	1.17	mmol/L	1.15 – 1.35
Glucose	6.9	mmol/L	3.0 – 7.8
Lactate	3.5	mmol/L	0.7 – 2.5

Case courtesy of Dr David Cuete, Radiopaedia.org, rID: 26266, used under a Creative Commons Licence



CT Report :

There is a right sided subdural haemorrhage with midline shift.
There is associated subarachnoid haemorrhage, with an overlying subgaleal haematoma
Cervical spine shows no abnormalities.
Neurosurgical review is strongly recommended.
Chest X-Ray shows no abnormalities beyond an appropriately placed ETT.



CXR sourced from Radiopaedia : <https://radiopaedia.org/cases/endotracheal-tube-in-right-main-bronchus?lang=gb> under Creative Commons License

Queensland Paediatric Emergency Care

Skill Sheets

Neuroprotection Checklist

This checklist has been adapted from the Queensland Children's Hospital (QCH) "[Management of severe brain injury in the paediatric intensive care unit](#)" guideline. It has been adapted for the Emergency Department.

Airway/Breathing/C-spine

- SpO₂ target of 92%
- CO₂ target of 35-40mmHg
- Protect C-spine (sandbags are preferred)
- Consider soft collar
- Log roll

Circulation

- Ensure adequate SBP or MAP >50th percentile for age (see table 1)
- Adrenaline may be required. Refer to [CREDD](#) for dosing.
- Consider the placement of an arterial line for invasive BP monitoring

Brain

- Head up at 30 degrees, head midline
- Ensure that ETT is secured in a way that does not restrict circulation
- Adequate analgesia and deep sedation
- Hourly pupil checks

Temperature Control

- Aim for normothermia (36-37 degrees celsius)
- Avoid HYPERTHERMIA

Fluids/Medications

- Plan for use of 3mL/kg 3% Saline
- Aim for Na of 140-160mmol/L
- BSL 6-10mmol. If hypoglycemic, treat 2mL/kg 10% Glucose
- Give levetiracetam loading dose and maintenance (see [CREDD](#) for dosing)
- Consider if IV antibiotics are required
- Use 0.9% Saline as the diluent in the preparation of medications to be infused.

Age	MAP Centiles		
	50	75	95
0-3 months	55	63	77
3-6 months	61	69	86
6-9 months	66	74	93
9-12 months	69	78	97
12-18 months	70	79	99
18-24 months	70	80	98
2-3 years	71	80	98
3-4 years	72	81	98
4-6 years	73	82	99
6-8 years	75	84	101
8-12 years	76	86	103
12-15 years	78	88	105
15-18 years	78	88	104

TABLE 1: Adapted from Eytan, Goodwin, Greer, Guerguerian, Lauren (2017).



ALERT

BLOWN PUPIL

- 3mL/kg 3% Saline bolus
- Bolus of sedation infusion
- Hyperventilate, titrating to CO₂ of 30-35mmHg or reversal of pupil dilation
- Urgent CT and neurosurgical involvement

Any intervention should not delay patient transfer to neuroimaging once the child is safe to attend with an escort.



Section VIII: Debriefing Guide

Objectives

Educational Goal:	- Evidence based approach to the management of severe head injury in paediatric patients
Skills Rehearsal:	- Integration of neuroprotective measures into paediatric trauma resuscitation
Systems Assessment:	- Access to checklists and equipment relevant to neuroprotective resuscitation
Systems Intervention:	- Embedding a neuroprotective checklist into clinical practice

Sample Questions for Debriefing

That was the case of a child with a severe intracranial bleed who needed neuroprotective measures started before he went to theatre. We used this case to rehearse those skills and also to practice using a checklist to improve our consistency when managing children with traumatic neurological injury.

I'd like to talk about how intra-cranial injuries are managed within our service :

- Can we just establish as a group what staff are going to be involved in a case like this, and what systems do we use to notify them?
- What challenges occurred in the simulation that you could see playing out in our real clinical practice? What can we do about it?

As a team, how can we ensure that we systematically implement neuroprotective measure to protect this boy's brain?

It's important that teams who intend to use cognitive aides and checklists rehearse using them, and we were very specific about trying out the neuroprotective checklist today. How did it go?

- Did the checklist identify issues or interventions you might not have otherwise addressed?
- Do we need to formally integrate this checklist in our service?
- Where is a good access or storage point for it?

I'd like to talk about the teamwork today. Is it OK if we take a few moments to explore some teamwork behaviours that I thought would be useful to replicate in other clinical situations?

- I'd like to explore if there were any ways communication could have been improved?

One way of thinking about improving teamwork is to categorise changes about ourselves, our team, our environment and our system. I'm wondering if there's anything about our environment or our system that we could change to make us more effective at resuscitating this type of patient?

Fill out our participant survey
to receive a training certificate

(Select Optimus BONUS as course)



Diagnostic Report of In Situ Simulation

Simulation can provide important data about unrecognised latent safety threats within your service. This form is provided to prompt recording of any Quality and Safety / Systems issues that need escalation within your department.

It is **not** to be used as a recording of personal performance management or to violate candidates' confidentiality.

Category	Issue identified	Action recommended	Should be escalated to	Follow up date
Team				
Environment				
System				

Simulation Occurred on _____

Follow up date re : identified issues on _____

Resources for Simulation Participants



The Paediatric Neuroprotection Checklist



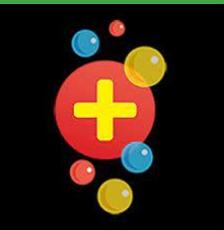
Vodcast on Paediatric Neuroprotection



eLearning module :
Interpreting CT heads
(recommended for medical staff)



PREDICT Head Injury Guidelines



DFTB – Head Injury Guidelines
Blog Post and Exercises



NSW Trauma App

A NEUROPROTECTION CHECKLIST FOR KIDS

Traumatic brain injury is a leading cause of mortality and morbidity in children.

Besides injury prevention, **minimising secondary brain injury** is our best shot at improving outcomes.

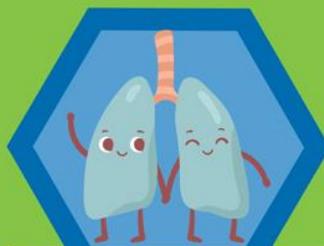
The **Paediatric Neuroprotection Checklist** can help your department maintain consistent brain resuscitation targets for children with brain injuries. Download it now via the QPEC website.



It provides your team with targets such as :



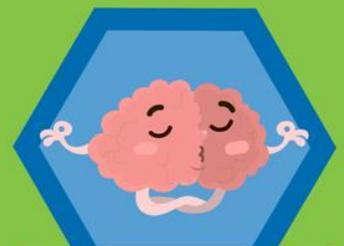
Positioning



CO₂ low normal



MAP or SBP



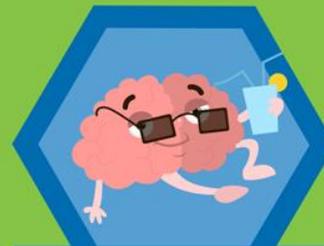
Seizure Mx



BGL 6 - 10



Na 140 - 155



Normothermia



OPTIMUS
BONUS



Curriculum

This package is designed for **individuals** to refresh and retain the following skills learned in previous OPTIMUS courses as well as add new knowledge on specific conditions.

Optimus CORE	Optimus PRIME	Optimus BONUS
Use of a paediatric drug calculation tool (CREDD)	Ventilation strategies in raised ICP	Using a paediatric neuroprotective checklist.
		IV Hypertonic Saline administration
		Neuroprotective ventilation strategies

This package is designed to offer your **department** a systems level check regarding :

Access to paediatric resources on : <ul style="list-style-type: none"> • Head Injury Guidelines • Neuroprotective strategies in raised intracranial pressure 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Equipment Check : <ul style="list-style-type: none"> • Hypertonic Saline • Paediatric C-Spine Immobilisation • Paediatric Drug Calculator (e.g. CREDD book) 	<input type="checkbox"/> <input type="checkbox"/>
Departmental Protocols on : <ul style="list-style-type: none"> • Trauma team activation • Paediatric C-Spine Immobilisation • Paediatric Neuroprotection 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

If you would like any assistance obtaining access or advice for any of the above issues, please contact stork@health.qld.gov.au

Simulation 2 : Communicating with parents



Section I: Scenario Demographics

Scenario Title:	Communicating with Parents
Date of Development:	May 2021
Target Learning Group:	Suitable for small group teaching of healthcare professionals learning a structure approach to investigating head injuries, e.g. Emergency or Paediatric residents and registrars.

Section II: Scenario Developers

Scenario Developers:	Dr Lauren Schmitt, Dr Ben Symon
Reviewed by :	Dr Michaela Waak

Section III: Curriculum

Learning Goals & Objectives	
Educational Goal:	<ul style="list-style-type: none"> Evidence based approach to the radiological investigation of children with head injuries.
Skills Rehearsal:	<ul style="list-style-type: none"> Use of the PREDICT head injury guideline Communicating decision making with parents of injured children
Systems Assessment:	<ul style="list-style-type: none"> Access to the PREDICT head injury guideline and algorithm
Systems Intervention:	<ul style="list-style-type: none"> Embedding a paediatric head injury algorithm into clinical practice

Case Summary: Brief Summary of Case Progression and Major Events

This case incorporates the PREDICT Paediatric Head Injury guideline into participant's clinical practise by asking them to negotiate with parents regarding their wishes for radiological investigation of a 14 month old boy with a minor head injury.

The patient is a previously well 14 month old boy who has fallen from the kitchen bench he climbed onto. The fall was witnessed by a parent and they are quite concerned.

The goal of the simulation is to:

- Apply appropriate decision making rules regarding a child with a minor head injury
- Engage family in discussions surrounding advanced imaging
- Discuss alternative options to advanced imaging

Localisation options :

While we have emphasised the recently released PREDICT Head Injury Algorithm in this simulation you are welcome to substitute for any clinical decision making rule (PECARN, CHALICE, CATCH) that is preferred by your service. The Queensland Children's Hospital Minor Head Injury guideline has also been included, and this document is available vial the Queensland Paediatric Emergency Care website. If you do not work in Queensland, please utilise your local guidelines and contextualise the simulation to your local service.

Section IV: Equipment and Staffing

Scenario Cast							
Patient:	Parent present only for discussion, no mannequin required						
Confederate:	Simulated parent						
Clinical Expert :	Facilitator familiar with your local head injury guidelines (eg PREDICT)						
Required Equipment							
Quiet consultation room appropriate for extended conversation with a parent.							
Appropriate seating for a discussion.							
Access to head injury algorithm							
Approximate Timing							
Set-Up:	2m	Prebrief :	3m	Scenario:	10m	Debriefing:	10m

Section V : Scripts

Scenario Orientation



Thank you for coming today.

There won't be any resuscitating or big team training in this sim, we're going to focus instead on something we do every day and see if we can do that even better.

The situation is that you are working in the emergency department and have just assessed Nitin. He has presented today because he has fallen off the kitchen bench 2 hours ago.

This fall was witnessed by his parent with no loss of consciousness. He has had 1 episode of vomiting (2 vomits within 2 minutes), and has a temporal haematoma. There is no step, no depression through the skull plate and the haematoma is not boggy. He is quiet but interactive and speaking normally with prompts. He has no signs of base of skull fracture.

On examination he has a normal neurological examination and is haemodynamically stable. He is otherwise back to baseline.

Given Nitin's symptoms and clinical findings, we want you to make a clinical decision about his assessment and management, and then talk that through with his parent and address their concerns.

Would you like to talk about that management plan first as a group before we start? What management options would be appropriate for him? Once you're happy with the management plan, we'll join his parent in the next room.

Simulated Parent Script



Thank you for playing the role of Nitin's parent.

As you are representing health care consumers in this scenario, please present as a supportive, sensible parent who knows significant detail about your child's care. You are very familiar with the healthcare system and want to give them the best information you can and advocate for your child.

The character outline below is designed to provide your understanding of Nitin's injuries, your concerns about his care, and your instincts regarding what should be done.

Negative portrayals of parents in simulation can damage participants perceptions of the families under their care. Please portray Nitin's parent as caring and intelligent with appropriate concerns that you need addressed.

Character Outline for Simulated Parent

You are the parent of Nitin, who has had a fall off the kitchen bench 2 hours ago. He is pretty adventurous and was climbing up the kitchen stools and onto the bench to get to a cake that had just been baked.

Your understanding of his injuries :

You witnessed the fall. He fell from a height greater than 1 meter. He cried immediately and was difficult to settle down. He had 2 vomits at home within about 2 minutes, since arrival to hospital, he has been okay. He has a large bruise on the side of his head, that appeared within minutes of him hitting his head. He has had no other signs of a head injury. He's not boisterous and running around like his usual self, but he is awake and interactive. You are unsure why he's quiet, but it concerns you.

Your concerns about his injuries :

You are very worried about Nitin. You are very concerned that he has a bleed in his head and will need to have an operation. When the doctor approaches you to discuss their assessment, you want Nitin to have a scan of his head. This is because you have had a cousin who died from a bleed in their brain and are concerned that Nitin will have the same thing. A CT Scan or X-ray seems to be a simple and straight forward test that could rule out a life threatening injury for your son.

Your response to the simulation participant :

If the doctor explores your concerns appropriately, open up about your cousin's death and your concerns that Nitin is still quiet. Be receptive to feedback that he is still talking and moving normally, and be receptive to feedback that there is a radiation dose involved in CT Scanning a child. If the participant uses jargon that is hard to understand, ask them to clarify what they mean.

Section VI: Scenario Progression

Scenario States	
State 1 : Introductions	
Participant actions :	Potential prompts from parent :
<ul style="list-style-type: none"> • Introduces self • Explores parent concerns 	<div style="border: 1px solid #92d050; border-radius: 15px; padding: 10px; display: inline-block; width: 80%;"> “Hi, I’m Nitin’s parent. I know his examination was normal, but I’m still concerned.” </div> 
State 2 : Explain management plan	
<ul style="list-style-type: none"> • Explain management plan to parent 	<ul style="list-style-type: none"> • If no management plan provided by participant, state : <div style="border: 1px solid #92d050; border-radius: 15px; padding: 10px; display: inline-block; width: 80%;"> “Can you tell me where we go from here?” </div> 
State 3 : Explore whether CT indicated	
<ul style="list-style-type: none"> • Discuss risks vs benefits of CT scan 	<ul style="list-style-type: none"> • Prompt a discussion about CT scanning by asking : <div style="border: 1px solid #92d050; border-radius: 15px; padding: 10px; display: inline-block; width: 80%;"> “Could we just do a head scan to make sure there’s nothing wrong?” </div>  <ul style="list-style-type: none"> • If appropriate to conversation, reveal previous history of a cousin having died from a brain bleed in their 20s.
<ul style="list-style-type: none"> • Explores parent concerns and provides rationale in a collaborative and respectful fashion. 	<ul style="list-style-type: none"> • Ask some practical questions about management at home : <div style="border: 1px solid #92d050; border-radius: 15px; padding: 10px; display: inline-block; width: 80%;"> “Do I need to wake him up tonight?” “What do I need to look out for?” “When should I come back?” </div>  <ul style="list-style-type: none"> • End scenario with agreement on management for Nitin once you feel parent has been heard and their concerns have been addressed.

Section VIII: Debriefing Guide

Objectives

Educational Goal:	<ul style="list-style-type: none"> Evidence based approach to the radiological investigation of children with head injuries.
Skills Rehearsal:	<ul style="list-style-type: none"> Use of the PREDICT head injury guideline Communicating decision making with parents of injured children
Systems Assessment:	<ul style="list-style-type: none"> Access to the PREDICT head injury guideline and algorithm
Systems Intervention :	<ul style="list-style-type: none"> Embedding a paediatric head injury algorithm into clinical practice

Sample Questions for Debriefing

This was a case of a 14 month old with a minor head injury where we explored the PREDICT head injury algorithm, and negotiating investigation and management plans with parents.

How did that feel?

Was there anything challenging about this conversation for you? Why?

Explore pros and cons of participants communication style e.g. :

- I'd like to highlight a couple great techniques you used to establish a sense of trust with Nitin's parent.
- Is it OK if I give you a couple pointers about communicating with parents? I noticed there were a couple of missed opportunities here to explore their underlying motivation for a head scan.
- What strategies did you use to try and understand why the family was concerned and wanted investigation?

I'd like to take a few minutes to explore the new PREDICT algorithm, and make sure we all know where it's stored in our department and how to use it.

- Is there anyone in the group who could talk us through it?
- Is there somewhere we should store this where it's more accessible for everyone?

Fill out our participant survey
to receive a training certificate

(Select Optimus BONUS as course)



Resources for Simulation Participants



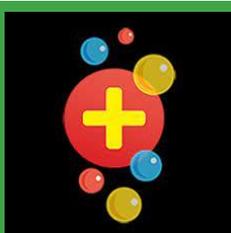
PREDICT Head Injury Guidelines



A structured approach to interpreting CT heads : an eLearning module



DFTB – Head Injury Guidelines
Blog Post and Exercises



Franz Babl – Paediatric Head Injuries
Online Lecture from DFTB17

Diagnostic Report of In Situ Simulation

Simulation can provide important data about unrecognised latent safety threats within your service. This form is provided to prompt recording of any Quality and Safety / Systems issues that need escalation within your department.

It is **not** to be used as a recording of personal performance management or to violate candidates' confidentiality.

Category	Issue identified	Action recommended	Should be escalated to	Follow up date
Team				
Environment				
System				

Simulation Occurred on _____

Follow up date re : identified issues on _____

About the Creators :



Dr Lauren Schmitt : Primary Author

Fellow, STORK (Simulation Training Optimising Resuscitation for Kids)
Emergency Physician at The Prince Charles Hospital

Lauren is a dual qualified PEM and ACEM physician. Originally from Queensland, she headed south to start her medical training at the University of Notre Dame Sydney, which allowed her to experience the big smoke of St Vincent's Sydney and regional medicine in Ballarat, and reinforced her love of emergency medicine.

She has developed a keen interest in resuscitation, and aims to make every patient's worst day just a little bit better. Coming from a family of teachers, she has always had a love of medical education, and has enjoyed the opportunity to continue to develop skills in multidisciplinary simulation, clinical and simulation debriefing, and team formation and functionality.

Lauren has developed the CHQ neuroprotective checklist in collaboration with Dr Michaela Waak.



Dr Michaela Waak : Neuroprotective Checklist Co-developer

MD/PhD, FRACP, FRACP Neurology, Queensland Children's Hospital

Dr Waak is internationally one of the few paediatric specialists with fellowships in paediatrics, neurology and paediatric intensive care including paediatric retrieval medicine and has obtained these degrees in different international settings. Since arriving in Brisbane in 2012 she has implemented significant improvements in the care of children through audits and guideline developments including an EEG pathway and paediatric code stroke process. She is CIA on projects investigating the impact of an interdisciplinary educational program for paediatric neurocritical care. She is also inaugural faculty and manual author of the national education and training course in neurocritical care (Paediatric Neuro-critical Care: beyond BASIC), the first paediatric course of its kind.



Dr Ben Symon : Consultant Supervisor, Infographics and Editor

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RACP PEM, MBBS, BAnim

Simulation Consultant and Paediatric Emergency Physician

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Dr Symon is a PEM Physician and Simulation enthusiast with a passion for translating clinical and educational research to front line health care workers. He is co-producer of the podcast '[Simulcast](#)' and facilitates the Simulcast Online Journal Club, an online journal club for simulation educators throughout the world. He is faculty for the Master Debriefing Course by [the Debriefing Academy](#). His original degree in Animation has proved surprisingly useful in his career in medical education.



Dr Carolina Ardila : eLearning and Multimedia

@caroelearning

MBBS, MPH(TH), GradDipHlthMgt

Dr Ardila is a medical doctor from Colombia with an award winning skill set in eLearning development. Carolina has been working on eLearning for the last 4 years at the Royal Brisbane and Women's Hospital and Children's Health Queensland. During these years she has developed extensive knowledge in designing, developing and implementing engaging courses and launching award winning paediatric eLearning. She has a special interest in emergency and neonatology and in her spare time loves making videos and improving her animation and drawing skills.

References

This educational package has been reviewed by content experts on behalf of Children's Health Queensland.

This Simulation Template has been adapted from the template from emsimcases.com, available at : <https://emsimcases.com/template/>

1. Atabaki, Shireen (2007) "Pediatric Head Injuries" *Pediatrics in review*. Vol 28, Number 6. June 2007
2. Predict.org.au. 2021. Australian and New Zealand Guideline for Mild to Moderate Head Injuries in Children – PREDICT. [online] Available at: <<https://www.predict.org.au/head-injury-guideline/>> [Accessed 14 May 2021].
3. CT head image taken from Radiopaedia : Case courtesy of Dr David Cuete, Radiopaedia.org, rID: 26266, used under a Creative Commons Licence
4. CXR taken from Radiopaedia : CXR sourced from Radiopaedia : <https://radiopaedia.org/cases/endotracheal-tube-in-right-main-bronchus?lang=gb> under Creative Commons License

About the BONUS Project :

The [OPTIMUS BONUS project](#) is a bank of useful scenarios that are open access and available for free use. It has been designed by the Simulation Training Optimising Resuscitation for Kids team for Children's Health Queensland.

We aim to use the packages to provide :

- Spaced repetition to reinforce learning objectives from CORE and PRIME
- Connections to high quality, up to date paediatric resources for health professionals
- Quality and Safety checks for local hospitals regarding paediatric clinical guidelines, resources and equipment

The scenarios have been designed in response to :

- Paediatric coronial investigations in Queensland, Australia.
- Clinical skills issues revealed through In Situ Translational simulations in hospitals throughout Queensland.
- Quality and Safety Initiatives

About STORK

In 2014, Children's Health Queensland funded the 'Simulation Training Optimising Resuscitation for Kids' service. STORK is a paediatric education team focused on improving healthcare outcomes for children throughout the state.

STORK has developed a number of courses aimed at different phases of paediatric critical care :

- CORE is a course for first responders to a paediatric emergency, and teaches recognition of the deteriorating patient, Children's Early Warning Tools, and resuscitation competencies
- PRIME is a course for mid phase responders who look after unwell patients while awaiting for retrieval or escalation to an Intensive Care. It aims at contextualising Seizure Management, Intubation and Inotrope Administration
- PULSE is a CPR refresher designed around the principles of Rapid Cycle Deliberate Practice
- BONUS was proposed as a solution to skill and knowledge decay after these courses are run

If you would like to know more information about STORK or acquire copies of our resources, please contact us at stork@health.qld.gov.au .