

Scenario: T7 – Head Injury		Simulator: Essential or equivalent
<p>Case Summary: Jessica Rabbit is a 33 year-old woman who has been allegedly assaulted on her way home from work. She has been hit on the side of the head with a baseball bat. She has an expanding extra-dural haematoma. She has no other injury. Her GCS deteriorates from 14 to 3 rapidly. She requires intubation, ventilation, sedation and good closed head injury management. Her Cushing’s response will improve with appropriate management of her closed head injury.</p>		<p>Participant Briefing: BAT CALL</p> <p>I – We are the crew who have just picked up this lady Jessica Rabbit. She is a 33 year-old lady who was on her way home from work. M – From what we can tell from a passer-by who made the call was that Jessica was struck from the side during an assault with a bat. The passer-by only saw one strike but the person who hit her leant over her for a bit and then ran off. She was unconscious when the passer-by reached her but had become more alert after that. I – She has a haematoma on the right side of her head, no other injuries noted. S – Sats – 98% on oxygen, RR – 16/min, Breath sounds normal, HR – 110 regular SR, BP – 125/75, she has remained alert until now, Pupils normal T – We put Jessica in a collar and placed her on the long board. We have given her oxygen and sited a couple of drips for you too. A – She seems a little confused but says that she does not have any allergies M + B – She denies any medications or previous medical history O – We could not find her phone or handbag so we assume that the person who hit her ran off with them; her wallet was in her back pocket.</p>
Clinical Issues		Human factors / Non technical issues
<p>Structured approach to the trauma patient Extra-dural haemorrhage causing rapid neurological deterioration Airway management Avoiding secondary brain injury</p>		<p>Re-evaluation of the patient to recognise deterioration Communication with patient Communication with team Situational awareness – deterioration, need for neurosurgery, resources available in hospital and at that time! Decision making – intubation, transfer of patient (CT/neurosurgical centre)</p>

This project was possible due to funding made available by Health Workforce Australia

Learning Objectives:

Systematic approach to the trauma patient. Treatment of patients with severe closed head injuries.

Communicate: With a patient with an altered conscious level. Within a team in ED. With other specialities in a neurosurgical trauma setting

Conduct: A structured approach to assessment and management of a trauma patient, in particular with a closed head injury.

Demonstrate: Sound clinical knowledge of treatment of patients with severe closed head injuries. Good use of non-technical skills and awareness of the 7 non-technical team tasks

Interpret: History and clinical findings and associated investigations

Faculty Actors:

Jessica Rabbit – Jessica was GCS 14 at the scene but has since deteriorated to a GCS of 12 (E3, M5, V4). You start by being confused and quickly deteriorate to saying inappropriate words and sentences and then become less able to verbalise over the scenario until you are unconscious. You have a terrible headache to start and as the scenario progresses you can only produce grunts or moans to pain and then nothing at all. When you arrive in the ED your eyes are closed and you open them at times when people are talking to you. Soon you only open them in response to pain and then not at all.

Faculty nurse – Act as you would in a real life setting. Be helpful and suggest actions if the team is struggling. If you would normally apply monitoring without being asked then please do so. If an investigation is ordered wait a minute or so and then give the team the appropriate laminated investigation result. Try to be alert when the team is undertaking a GCS as you will have to let the team know at the start that when they apply a painful stimulus that she is trying to localise to it. The SIMMAN Essential (from EdWISE) does not have reactive pupils. You will have to either “perform” the assessment of the pupils and relay the findings to the team or tell the team member the results of their findings after they have examined the mannequin. The former would be better for fidelity!

Host site faculty – When the faculty nurse hands the team the appropriate laminated investigation result please hand a copy of the same to the participants who are not actively taking part in the simulation.

Patient Moulage:

C-spine collar in-situ

“Blood” all over side of head and on sheet behind the head.

Cannula in situ

On a spinal board

Street clothes

Female genitals

<p>Equipment & Props: Computer/TV screen/VC unit SIMMAN Essential mannequin – preferred. 1x IV access already in place (Faculty nurse will site the other when asked by the team) “Make-up/blood” for the back of the head and the sheets/long board/collar Clothing to put on the mannequin (trousers and a t-shirt/blouse) Wig to make her female Female genitals Sheet and blankets and pillows as per the host site’s ED Gloves/gowns/lead gowns/masks – as per host site PPE for trauma Telephone for calling other specialities/colleagues/etc. X-ray plate/or simulate one</p> <p>Monitoring leads: ECG, Saturation probe, NIBP cuff Stethoscope x2 Pen torch Glucometer or calculator Infusion pump C-spine collar</p>	<p>Oxygen masks – nasal prongs/Hudson mask/ non-rebreathing mask and a bag-valve-mask should all be available. Oxygen supply – cylinders or piped wall oxygen Intubation/difficult airway trolley with appropriate equipment for an adult intubation, as present on host site’s trolley Saline/Hartmann – 1000ml bags x4 Blood – O negative 4 units (made up prior to scenario and given to the team when asked for) Blood giving sets Prefilled syringes – Saline, morphine, propofol, ketamine, thiopentone, suxamethonium, adrenaline, metaraminol, rocuronium (or which ever muscle relaxant is used in the host ED), Syringe drug labels</p> <p>Laminated resources from Instructor pack: ECG showing sinus tachycardia, ABG results (2 different results – pre and post intubation), normal CXR, lateral C-spine X-ray, normal Skull X-ray</p>	
<p>Monitor: Initially ED setting – 3 wave forms. May add others depending on team’s actions Sats 3 lead ECG NIBP</p>	<p>Investigations: Laminated 12-lead-ECG – Normal Laminated ABG results (2 different results) Laminated normal CXR Laminated Lateral C-spine X-ray – normal</p>	<p>Radiographer – If the host site has enough people then one of the faculty staff can be the radiographer and “take” the x-rays that have been ordered. They can also be in charge of delivering the x-rays to the team when they are ready. If there are not enough people then the faculty nurse can hand the x-rays to the team after a 30-60 second pause from when it was ordered. Keep the x-rays and the ECG sheets close to hand but not within the scenario so that the team cannot see them before being asked for.</p>

Patient presentation	Expected response by participants	Faculty /Actors Notes
<p>Initial Presentation: (0-5 min) Sats – 98% on oxygen RR – 16/min Breath sounds normal HR – 110 regular SR BP – 125/75 GCS – E3, M5, V4 Pupils normal</p>	<p>1 minute of preparation time following BAT CALL Power point slide to introduce the scenario</p> <p>Listen to IMIST AMBO handover</p> <p>Structured approach to assessment and management of the trauma patient AcBCDE.</p> <p>Recognise that this patient has a significant head injury and is beginning to deteriorate. Primary survey and initiating investigations</p>	<p>Jessica – Remember to open eyes at times when someone talks to you (this does not need to be all the time. Answers are a little confused and you repeat yourself asking what am I? and who are you? Over and over again. Over these 5 minutes your eyes open only to pain and you are only able to groan in response to pain (by the end of this 5 minutes). Over these 5 minutes your HR increases to 125 reg, BP to 135/70 and GCS to E2, M5, V2 (9/15).</p> <p>Faculty Nurse – Hand the team the laminated copy of the IMIST-AMBO handover after reading out what is on it. Helpful to the team and act as you would in a real situation. Do try to give the team a little bit of time to think their way through the problems though. If they have not picked up the deterioration in the patient then after the 5 minutes point out that she is less responsive “Jessica, Jess!” “she’s not really responding as well as she was!”. Hand the team any investigation results that they have performed. Wear appropriate PPE and encourage the team to do so as well!</p> <p>Host Site Faculty – Please hand out a copy of the investigation result that is handed to the team by the faculty nurse.</p>

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<p>Progression: (5-10 min) Sats – 98% on Oxygen RR – 20/min HR – 125 regular SR BP – 135/70 GCS – E2, M4, V2 (8/15) Pupils equal but sluggish to react to light</p>	<p>Finish off the primary survey Order and interpret primary survey X-rays and other investigations Notice and voice deterioration of the patient. Communication with neurosurgical team (in hospital or tertiary centre – depending upon host site facilities. Communication with team Communication with other specialities as needed (laboratories/radiology/surgery/other) Decide on need to intubate and prepare for this</p>	<p>Jessica – Over 5 minutes you deteriorate even more! The Sats stay the same as long as oxygen is continuously administered. RR – 20/min HR – Decreases to 65 over the 5 minutes with occasional ectopics BP – Increases to 160/90 over the 5 minutes GCS – Deteriorates to 3/15 over this 5 minutes Faculty Nurse – Support the team as you normally would. If the team does not notice the deterioration in the GCS then assess Jess’ GCS and comment on it dropping lower. If the team is assessing the GCS then you will need to tell them that at first you see her localising “it looks like she is trying to localise to the pain” and then towards the end of the 5 min “she’s not really responding at all to that!”. When the team decide to intubate, ask them what they would like and then help the team to organise the equipment and drugs (already drawn-up). Hand the team any investigations that they have ordered and that there are laminated sheets for. If they ask for something that is not there, tell them that you have ordered it (or ask one of the team to order it) but the result is not available. If you are assessing the pupils then they are becoming sluggishly reactive to light. Host site faculty – Please hand out a copy of the investigation result that is handed to the team by the faculty nurse.</p>
<p>Deterioration and Recovery: (10-15 min) Sats – 98% on Oxygen RR – 16/min, if possible put variation into the breathing pattern ET CO₂ – 50 once CO₂ monitor attached HR – 55/min regular with ectopics BP – 190/60 GCS – 3/15 Pupils – right dilated</p>	<p>Reassess AcBCDE prior to intubation Prepare for intubation (RSI) and proceed MILS during intubation Repeat AcBCDE assessment post intubation and ABG Institute simple severe head injury management – Head up tilt 30°, normal ETCO₂, mannitol Communication within team re deterioration, plan A/B/C, assign roles Communicate with other specialities as needed – retrieval/etc.</p>	<p>Jessica – Observations remain pretty much the same throughout the 5 min. If intubated and correct management in instituted then pupil will return to normal and ectopics will cease to occur. Faculty nurse – Continue to work as you would in reality. If investigations are asked for hand the team the appropriate laminated result. Point out the change in pupillary response – sluggish reaction to light on the right is not full correct management. If all correct management instituted then pupils will respond normally. Host site faculty – Please hand out a copy of the investigation result that is handed to the team by the faculty nurse.</p>

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Debrief Guide

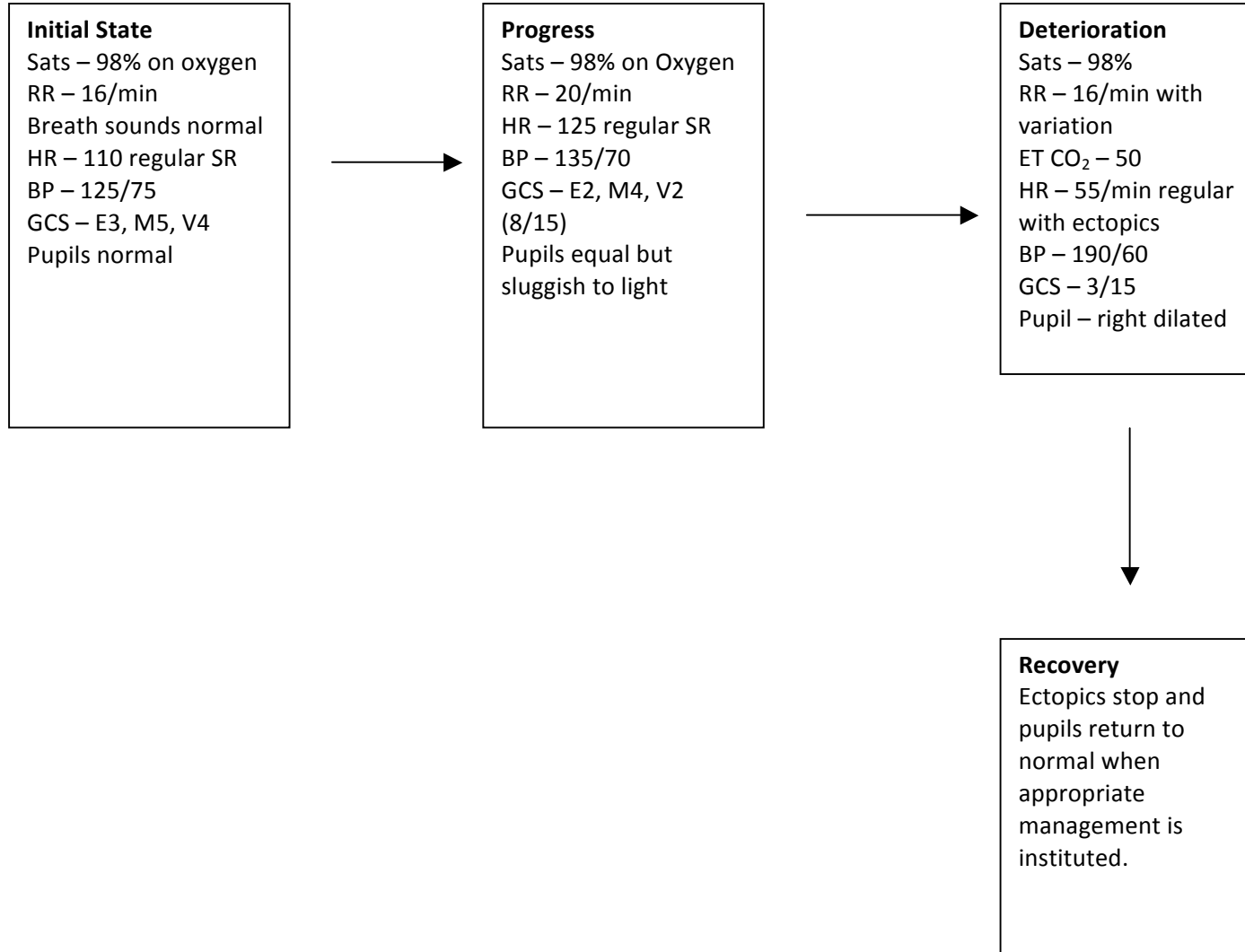
Key clinical issues: (Pick 2 max! Suggested with *)

Structured approach to the assessment and management of a trauma patient
 Investigations in a patient with severe closed head injury
 Detection of deterioration
 RSI in closed head injury *
 Management of severe closed head injury *

Key non-technical issues: (Pick 2 max! Will depend on the team. Pick at least one positive topic!)

Role allocation
 Plan and Prepare (for the trauma, for RSI, for transfer?)
 Management of resources (available at host site) and people
 Support of team members and support of team leader
 Communication within team and with appropriate specialities
 Situational awareness – deterioration and communication of this, facilities and help available at host site, early organisation of resources
 Monitor and evaluate – patient, team, and progress.
 Guidelines of host site on treatment/imaging/transfer of head injury patients

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IMIST AMBO Handover

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M – From what we can tell from a passer-by who made the call was that Jessica was struck from the side during an assault with a bat. The passer-by only saw one strike but the person who hit her leant over her for a bit and then ran off. She was unconscious when the passer-by reached her but had become more alert after that.

I – She has a haematoma on the right side of her head, no other injuries noted.

S – Sats – 98% on oxygen, RR – 16/min, Breath sounds normal, HR – 110 regular SR, BP – 125/75, she has remained alert until now, Pupils normal

T – We put Jessica in a collar and placed her on the spinal board. We have given her oxygen and sited a couple of drips for you too.

A – She seems a little confused but says that she does not have any allergies

M + B – She denies any medications or previous medical history

O – We could not find her phone or handbag so we assume that the person who hit her ran off with them; her wallet was in her back pocket.

ABG result (Pre-intubation)

pH	7.39	(7.35-7.45)
pCO₂	47	(35-45 mmHg)
pO₂	220	(80-100 mmHg)
HCO₃	19	(22-26 mEq/L)
BE	-3	(-2 to +2)
Lac	1.6	(0-2)
Hb	108	
Na	136	
K	4.3	

ABG Result (post intubation)

pH	7.35	(7.35-7.45)
pCO₂	55	(35-45 mmHg)
pO₂	238	(80-100 mmHg)
HCO₃	17	(22-26 mEq/L)
BE	-4	(-2 to +2)
Lac	1.8	(0-2)
Hb	110	
Na	141	
K	4.9	