



Maternity Education Program

Anaesthetic Toxicity

Facilitator Resource Kit

Maternity Education Program (MEP)

The resources developed for MEP are designed for use in any Queensland Health facility that care for patients/women who are pregnant/birthing or postnatal. Each resource can be modified by the facilitator and scaled to the needs of the learner as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.



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Anaesthetic Toxicity – Facilitator Resource Kit

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Who is this resource kit for?

This resource kit provides educators with up-to-date information to provide knowledge and skills to clinicians on how to manage anaesthetic toxicity in a pregnant person. The resource kit provides a full scenario with supporting documents to run an anaesthetic toxicity simulation.

Target audience

Midwifery and medical staff providing maternity care

Duration

45 mins – including simulation and debrief (15 mins for set up not included)

Group size

Suited to small groups (6 – 8)

Learning objectives

By the end of the session the learner should be able to:

- Recognise the signs and symptoms of local anaesthetic systemic toxicity (LAST).
- Recognise and respond to a clinically deteriorating patient.
- Manage a maternal collapse/maternal cardiac arrest to include:
 - calling for help early
 - calling appropriate teams.
- Demonstrate clinical management for LAST including drug therapy.
- Make a plan for birth of the baby within five (5) minutes if cardiac arrest or longer with maternal collapse.

Facilitation guide

1. Utilise 2D pictures to maternal positioning.
2. Utilise a PowerPoint presentation to assist learners prior to session.
3. Allow learner to apply actions in a simulated LAST case.
4. Conduct group debrief following simulation.

Supporting documents

1. Participant Resource Kit
2. List of further readings
3. Maternal LAST flow diagram
4. LAST simulation including:
 - Simulation set up photos
 - Pathology results
 - CTG
 - ECG



Overview

Local anaesthetics are widely used in obstetric anaesthetics. With an increasing number of epidurals and spinal anaesthetics being used today clinicians need to be aware of the risks and management.

As with all drugs and interventions they are not without risks. There were a total number of five maternal deaths (both direct and indirect) due to anaesthetic causes in 2009-2018 (1). Even though the numbers are low, clinicians need to understand the importance of prompt management to prevent serious outcomes.

Local anaesthetic systemic toxicity (LAST) is a set of neurologic and cardiovascular signs and symptoms resulting from elevated plasma levels of local anaesthetic (LA). Neurologic sequelae range in severity, the central nervous system (CNS) may present with excitation or depression or might be nonspecific. Signs and symptoms of LAST include perioral (mouth) numbness, tinnitus, drowsiness, disorientation, agitation, seizure, or loss of consciousness. Cardiovascular morbidity results from electrophysiological abnormalities (dysrhythmia) or depressed cardiac contractility. Cardiovascular toxicity can present with bradycardia, tachycardia, hypotension, hypertension, ventricular tachycardia, ectopy, and asystole (2).

LAST is caused by a high circulating plasma concentration of local anaesthetic. In pregnancy there is enhanced sensitivity to local anaesthetics and there are several reasons for this increased sensitivity. Epidural vein distension increases local anaesthetic absorption and catheter migration may be more likely.

During pregnancy there is increased cardiac output with increased perfusion of potential target sites and a reduction in the clearance of local anaesthetics which may lead to accumulation of local anaesthetic when repeated doses or infusions are used.

The effects of oestrogen and progesterone appear to alter the heart muscle electrophysiology sufficiently to increase the risk of arrhythmias and cardiotoxicity in general.

If cardiac arrest develops in a pregnant patient resuscitation is further complicated by physiological changes during pregnancy including aortocaval compression by the gravid uterus which reduces venous return and cardiac output, thus causing hypotension and further complicating the cardiac arrest event. Even if clinicians suspect LAST, pregnant patients should be managed aggressively to prevent morbidity and mortality. (3)

As the obstetric demographic becomes older and more obese, new technologies and strategies can assist in controlling maternal death and major morbidity secondary to anaesthetic complications. Lipid resuscitation appears to be an effective treatment for toxicity and may be useful in treating systemic toxicity in the pregnant patient. Maternity care providers should be aware of lipid resuscitation during LAST. (4) `

Obstetric Emergency is any clinical situation involving a maternity patient where immediate medical/midwifery assistance is required.

Further readings

Local Anaesthetic Systemic Toxicity in Pregnancy - Oxford Medicine Online

Author	Brian F. S. Allen
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Link	https://bit.ly/3jrXI16
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Local anaesthetic toxicity

Author	South Australia Perinatal Practice Guideline
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Link	https://bit.ly/3DY3CuW
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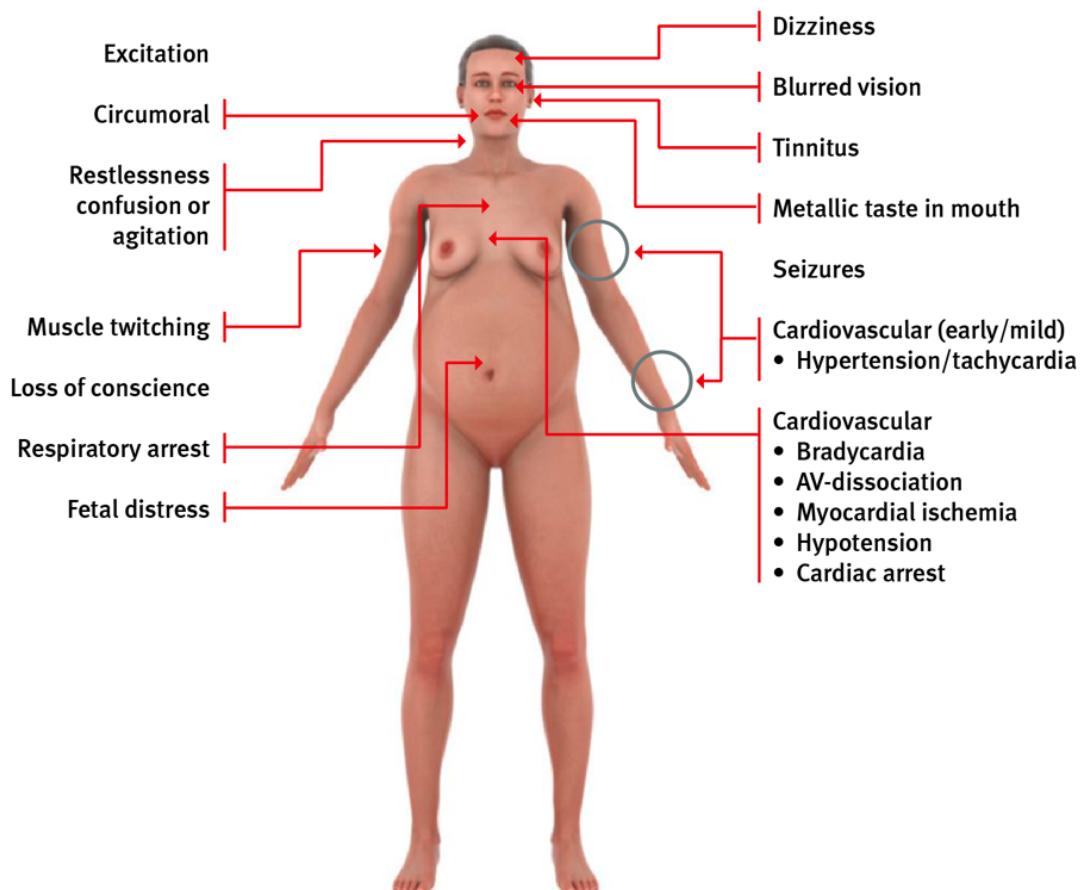
Management of severe local anaesthetic toxicity

Link	https://bit.ly/3Ktt5Py
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Emergency Management

Local anaesthetic toxicity signs and symptoms



AAGBI Safety Guideline

Management of Severe Local Anaesthetic Toxicity



1 Recognition

Signs of severe toxicity:

- Sudden alteration in mental status, severe agitation or loss of consciousness, with or without tonic-clonic convulsions
- Cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur
- Local anaesthetic (LA) toxicity may occur some time after an initial injection

2 Immediate management

- Stop injecting the LA
- Call for help
- Maintain the airway and, if necessary, secure it with a tracheal tube
- Give 100% oxygen and ensure adequate lung ventilation (hyperventilation may help by increasing plasma pH in the presence of metabolic acidosis)
- Confirm or establish intravenous access
- Control seizures: give a benzodiazepine, thiopental or propofol in small incremental doses
- Assess cardiovascular status throughout
- Consider drawing blood for analysis, but do not delay definitive treatment to do this

3 Treatment

IN CIRCULATORY ARREST

- Start cardiopulmonary resuscitation (CPR) using standard protocols
- Manage arrhythmias using the same protocols, recognising that arrhythmias may be very refractory to treatment
- Consider the use of cardiopulmonary bypass if available

GIVE INTRAVENOUS LIPID EMULSION

(following the regimen overleaf)

- Continue CPR throughout treatment with lipid emulsion
- Recovery from LA-induced cardiac arrest may take >1 h
- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine should not be used as an anti-arrhythmic therapy

WITHOUT CIRCULATORY ARREST

Use conventional therapies to treat:

- hypotension,
- bradycardia,
- tachyarrhythmia

CONSIDER INTRAVENOUS LIPID EMULSION

(following the regimen overleaf)

- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine should not be used as an anti-arrhythmic therapy

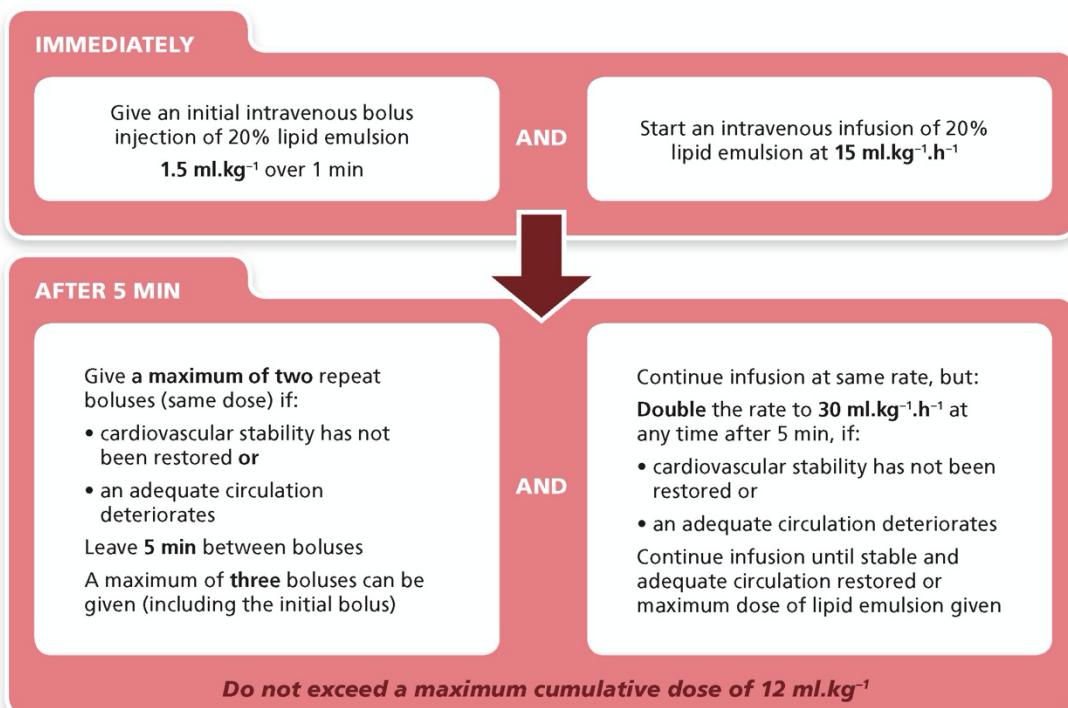
4 Follow-up

- Arrange safe transfer to a clinical area with appropriate equipment and suitable staff until sustained recovery is achieved
- Exclude pancreatitis by regular clinical review, including daily amylase or lipase assays for two days
- Report cases as follows:
 - in the United Kingdom to the National Patient Safety Agency (via www.npsa.nhs.uk)
 - in the Republic of Ireland to the Irish Medicines Board (via www.imb.ie)
- If Lipid has been given, please also report its use to the international registry at www.lipidregistry.org. Details may also be posted at www.lipidrescue.org

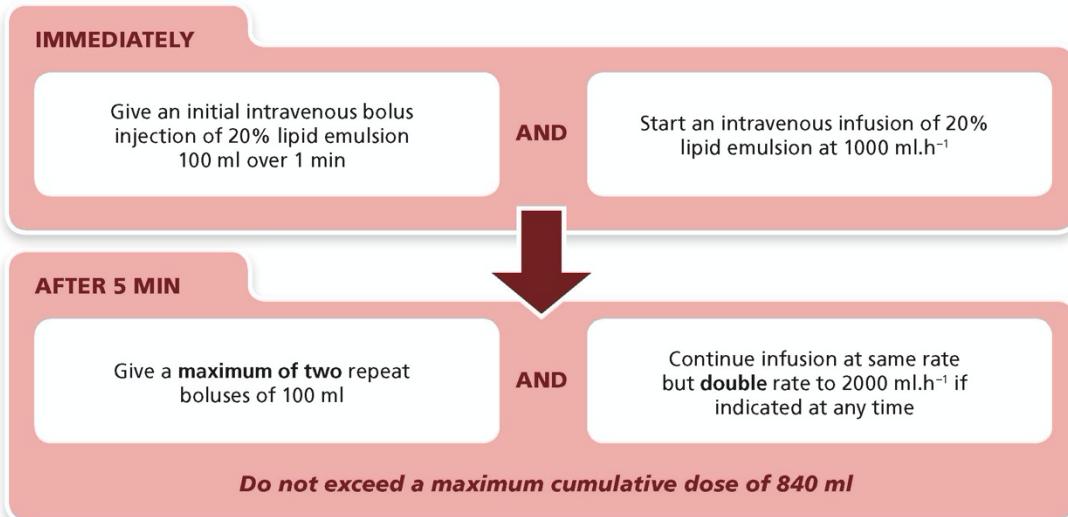
Your nearest bag of Lipid Emulsion is kept.....

This guideline is not a standard of medical care. The ultimate judgement with regard to a particular clinical procedure or treatment plan must be made by the clinician in the light of the clinical data presented and the diagnostic and treatment options available.

© The Association of Anaesthetists of Great Britain & Ireland 2010



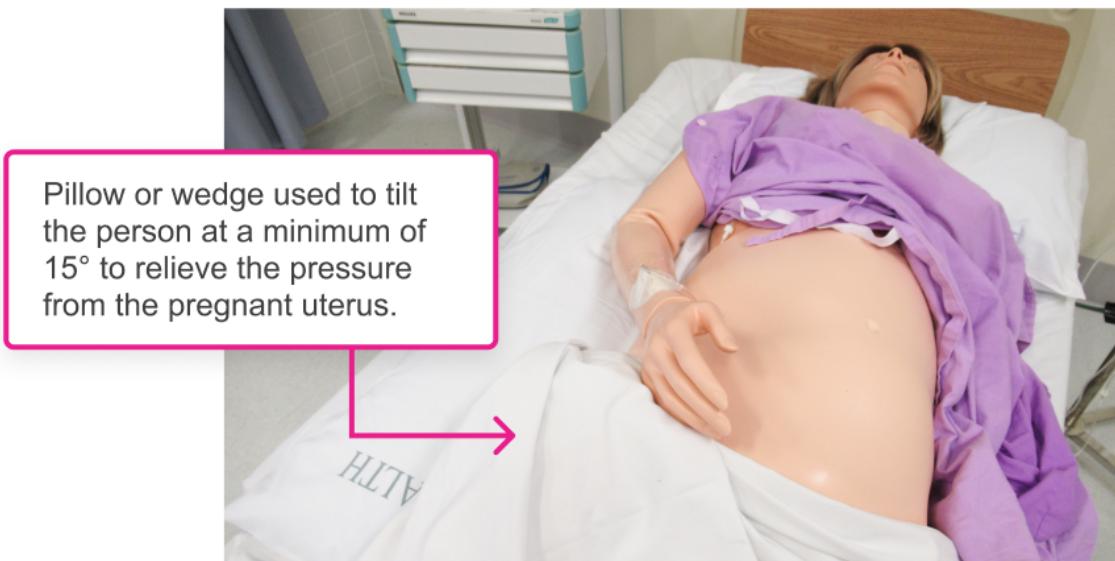
An approximate dose regimen for a 70-kg patient would be as follows:



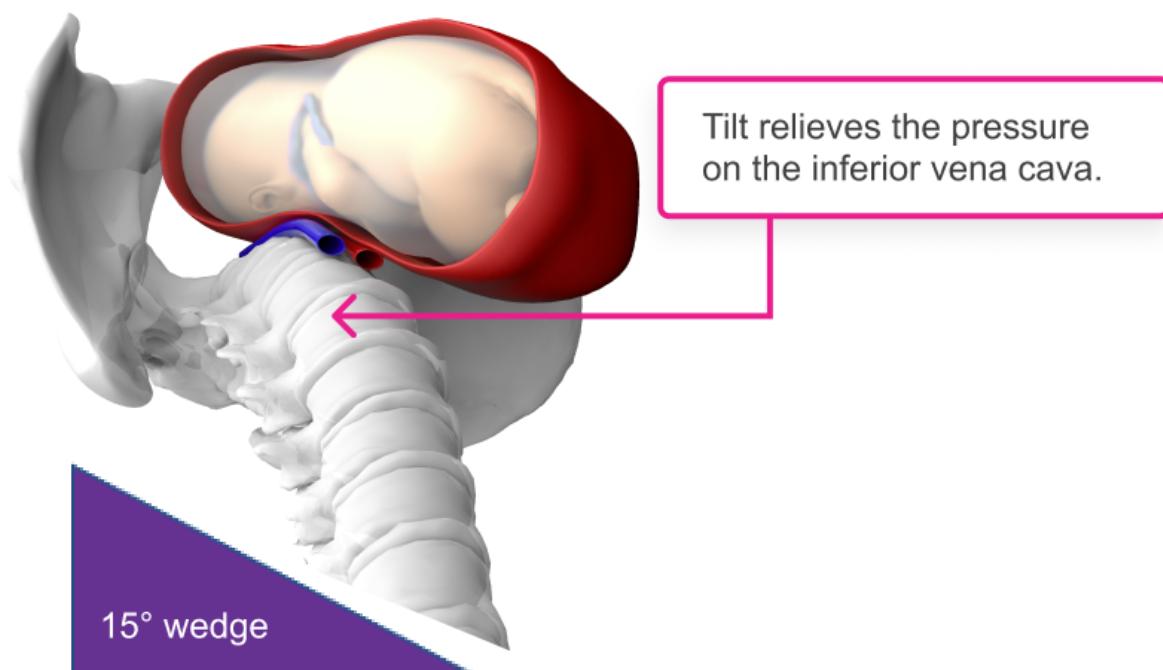
This AAGBI Safety Guideline was produced by a Working Party that comprised:
Grant Cave, Will Harrop-Griffiths (Chair), Martyn Harvey, Tim Meek, John Picard, Tim Short and Guy Weinberg.

This Safety Guideline is endorsed by the Australian and New Zealand College of Anaesthetists (ANZCA).

Left lateral 15° tilt



Internal view of 15° tilt



Manual uterine displacement

Manually displace the uterus to the left to reduce inferior vena cava compression during maternal resuscitation. The image below is an example.





Simulation Event

This section contains the following documents.

1. Pre-simulation briefing poster
2. Immersive in situ scenario
3. Physical resources
4. Human resources
5. Simulated patient information
6. Simulated patient script information
7. Handover card
8. Stage 1 – Initial assessment
9. Stage 2 – Ongoing management
10. Stage 3 – Resolution

Pre-simulation Briefing

Establishing a safe container for learning in simulation.



Clarify objectives, roles and expectations

1

- Introductions.
- Learning objectives.
- Assessment (formative vs summative).
- Facilitators and learners' roles.
- Active participants vs observers.



2

Maintain confidentiality and respect

- Transparency on who will observe.
- Individual performances.
- Maintain curiosity.

3

Establish a fiction contract

Seek a voluntary commitment between the learner and facilitator.

- Ask for buy-in.
- Acknowledge limitations.

4

Conduct a familiarisation

- Manikin/simulated patient.
- Simulated environment.
- Calling for help.

5

Address simulation safety

Identify risks.

- Medications and equipment.
- Electrical or physical hazards.
- Simulated and real patients.

Note: Adjust the pre-simulation briefing to match the demands of the simulation event, contexts or the changing of participant composition.

Adapted from Rudolph, J., Raemer, D. and Simon, R. (2014). Establishing a Safe Container for Learning in Simulation. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare*, 9(6), pp.339-349.

Immersive in situ scenario

Target audience	Obstetric medical staff and midwives
Birth suite standard set-up	<p>Situation IOL – ARM, syntocinon for post-dates. Epidural just sited 5 minutes ago.</p> <p>Background</p> <ul style="list-style-type: none"> • 22-year-old G1P0.IOL @ 40+12/40 gestation, syntocinon commenced 4 hours ago • Low risk pregnancy • Haemoglobin 116 @ 36/40 • AB Pos • Group B streptococcus negative • All other serology – NAD • Allergies – Nil • Medical history – Nil • Ultrasound scan 20 weeks – NAD <p>Assessment</p> <ul style="list-style-type: none"> • Vaginal exam – prior to epidural 4cm, fully effaced, right occipital transverse, draining pink liquor, -2cm above. • All Obs. – NAD <p>Recommendations</p> <ul style="list-style-type: none"> • Continuous CTG. • Syntocinon to be maintained as contraction 4:10 60 sec. • Routine post epidural care.
Learning objectives	Participants are expected to: <ul style="list-style-type: none"> • Recognise the signs and symptom of local anaesthetic systemic toxicity (LAST). • Recognise and respond to a clinically deteriorating patient. • Manage a maternal collapse/maternal cardiac arrest to include: <ul style="list-style-type: none"> ◦ calling for help early ◦ calling appropriate teams. • Demonstrate clinical management for LAST including drug therapy. • Make a plan for birth of the baby within five (5) minutes if cardiac arrest or longer with maternal collapse.

Duration	Pre-brief: 10 minutes Orientation: 5 minutes Simulation: 15 mins Debrief: 15 mins	Total: 45 mins Allow 15 minutes for set up
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Physical resources

Room set-up	Standard birth suite room
Simulator/s	<p>Option 1 – Simulated patient sitting in bed wearing a hospital gown with:</p> <ul style="list-style-type: none"> • pregnant abdomen at term in labour, cardiotocograph on, • part task trainer in between legs with peri pad in situ, • fetus in trainer, right occipital transverse position - 2cm station 2/5 head above brim, and • using N²O² for pain relief – epidural just sited.
	<p>Option 2 – Full manikin in hospital gown, semi-recumbent in bed with:</p> <ul style="list-style-type: none"> • pregnant term abdomen in labour with cardiotocograph attached, • birthing perineum with peri pad in situ, • fetus in trainer, right occipital transverse position - 2cm station, 2/5 head above brim, and • using N²O² for pain relief – epidural just sited.
Clinical equipment	Standard birth suite room set up
Access	<ul style="list-style-type: none"> • 1 IVC N/Saline 1000mls. • Additional line of syntocinon 30 units in 500mls N/saline in an infusion pump.
Other	<ul style="list-style-type: none"> • Pregnancy Health Record • Chart • Relevant paperwork for emergency management

Human resources

Faculty	2 facilitators (Obstetric Registrar/Consultant and midwife with debriefing experience) to take on roles of scenario commander and primary debrief.
If using a manikin	Simulation Coordinator A simulation coordinator is needed for the set-up of the manikin and control of software during the scenario.
If using a simulated patient	Simulation Coordinator 1 simulation coordinator during scenario Confederates <ul style="list-style-type: none">• 1 confederate to play the part of patient support person.• An additional person to play anaesthetist giving the loading dose. A facilitator needs to provide a handover.
Other	1 midwife must be present in the simulation room to receive the handover. The other midwives and doctors are outside the room, to be called in as needed.

Simulated patient information

Name	Yasmin Yong
Age	22 years old
Sex	Female
Weight	68 kg
Allergies	Nil
Medications	Nil
Medical, Surgical	Nil
Social history or employment	Admin officer
Partner's name	Wang Wei
Pregnancy history	G1P0
Blood group	AB positive, antibodies negative
Hb	116, 36 weeks
Serology	Negative
Rubella	Immune
GBS	Negative
Ultrasound scan	20 weeks, anterior placenta, non-praevia, NAD

Simulated patient script

You are Yasmin. You started the IOL process yesterday with prostin gel and this morning the midwife was able to break your 'waters' and the syntocinon was started. The contractions started quickly after the waters were broken. You have been using N²O² for pain relief, but it's just got too bad, so you have just had an epidural which is not working yet because you need to be repositioned on the bed following insertion. So far you have had a test dose and are still using the gas to help.

Wait until the anaesthetist gives the loading dose after you have been repositioned and following that approximately 2-3 minutes later complain of:

- metallic taste in your mouth
- feeling dizzy
- nausea
- blurred vision
- ringing in your ears
- become restless and anxious
- numb around the mouth
- heart beating fast
- difficulty breathing
- twitchy

Complain to your partner that you do not feel well, then become unresponsive.

After resuscitation and perimortem caesarean section remain unconscious do not speak.

Handover card

I ntroduction	This is Yasmin, this is ... <staff name>
S ituation	IOL – ARM, syntocinon for post-dates. Epidural just sited 5 minutes ago.
B ackground	<ul style="list-style-type: none">• 22 years old, G1P0.IOL• 40+12/40 gestation• Low risk pregnancy• Hb 116 @ 36/40• AB positive• GBS negative• All other serology, NAD• Allergies, nil• Medical history, nil• 20-week ultrasound scan, NAD
A sessment	<ul style="list-style-type: none">• VE – prior to epidural 4cm, fully effaced, right occipital transverse, draining pink liquor, -2cm above.• All Obs. NAD
R ecommendation	<ul style="list-style-type: none">• Continuous cardiotocograph• Syntocinon to be maintained as contraction 4:10 60 sec.• Routine post epidural care.

Stage 1: Initial assessment				
Vital signs		Script	Details	Expected actions
Respiration rate	16	Allow the midwife to settle into the room and give non-descript, vague answers to any questions after handover.	I ntroduction This is Jasmin, this is ... <staff name>.	<input type="checkbox"/> Introduce self, find out history. <input type="checkbox"/> Take maternal Obs. <input type="checkbox"/> Reposition onto bed post epidural. <input type="checkbox"/> Perform abdominal palpation. <input type="checkbox"/> Check CTG. <input type="checkbox"/> Check syntocinon. <input type="checkbox"/> Check resus gear.
SpO₂	98%		S ituation IOL – ARM, syntocinon for post dates. Epidural just sited 5 minutes ago.	
Blood pressure	110/70			
Heart rate	100			
Temperature	37.2°C			
Consciousness sedation score	Alert		B ackground 22-year-old G1P0.IOL @ 40+12/40 gestation, syntocinon commenced 4 hours ago. <ul style="list-style-type: none">• Low risk pregnancy.• Hb 116 @ 36/40.• AB Pos.• GBS negative.• All other serology, NAD.• Allergies, nil.• Medical history, nil.• 20-week ultrasound scan, NAD.	
Fetal heart	120 some variable decelerations – abnormal unlikely			
Per vagina loss	Bloody mucous show			
Blood glucose level	N/A			

Stage 1: Initial assessment			
Vital signs	Script	Details	Expected actions
		<p>Asessment</p> <ul style="list-style-type: none">• Abdo palpation = term, back right lateral, cephalic presentation ROL, 2/5 above.• VE – prior to epidural 4cm, fully effaced, right occipital transverse, draining pink liquor, -2cm above.• All Obs. NAD. <p>Recommendation</p> <ul style="list-style-type: none">• Continuous cardiotocograph• Syntocinon to be maintained as contraction 4:10 60 sec.• Routine post epidural care.	

Stage 2: Ongoing management				
Vital signs		Script	Details	Expected actions
Respiration rate	24	<i>After a few minutes state: "I feel funny".</i>	<ul style="list-style-type: none"> Epidural test dose commenced and completed Anaesthetist leaves the room Maternal Obs. start to deteriorate Cardiotocograph trace reduced variability with decelerations Increased RR As Obs. deteriorate BP dropping and firstly starts to seize Following seizure BP drops and HR falls leading to cardiac arrest. 	<input type="checkbox"/> Declare emergency <input type="checkbox"/> Call for help <input type="checkbox"/> MERT call – collect trolley <input type="checkbox"/> Do DRABC <input type="checkbox"/> Facial O ² – 15 L via rebreather <input type="checkbox"/> Increase IV fluids <input type="checkbox"/> 2 nd IV line – commence intralipid (20% Lipid Emulsion) – 1.5 mls/kg over 1 min <input type="checkbox"/> Make up an infusion 20% Lipid Emulsion at 15mL/kg/hr – commence infusion <input type="checkbox"/> Prepare drugs for seizure – Midazolam 5mls <input type="checkbox"/> Left lateral position <input type="checkbox"/> Commence cardiac massage <input type="checkbox"/> Secure airway – intubation/ LMA <input type="checkbox"/> Cease syntocinon <input type="checkbox"/> Call consultant <input type="checkbox"/> Call neonatal team <input type="checkbox"/> Prepare for perimortem caesarean section <input type="checkbox"/> Document actions <input type="checkbox"/> Operating theatre on standby <input type="checkbox"/> Support partner
SpO ₂	95%	<i>If asked what is wrong... mouth and tongue feel tingly with a metallic taste in her mouth.</i>		
Blood pressure	92/60	<i>Ringing in her ears and feels lightheaded.</i>		
Heart rate	118	<i>Becomes very restless then agitated.</i>		
Temperature	37.1			
Consciousness sedation score	Restless and agitated			
Fetal heart	Baseline 128 reduced variability			
PV loss	Pink liquor If vaginal exam performed 4cm ROA	Starts fitting then into cardiac arrest (see obs. next page) SEE QMEWT TABLE FOR OBS		
Blood glucose level	7.3 if taken			

QMEWT OBS

Stage 2: Vital signs									
Respiration rate	5 minutes	6 minutes		2 minutes post arrest		4 minutes post arrest		Post C/S	
SpO ₂	28	0		0		0		0	Assisted Ventilation
Flow rate	90%	83%		15L		15L		0	90%
Blood pressure	15L	15L		15L		0		15L	15L
Heart rate	76/44	40/0		0		0		0	76/44
Temperature	70	40		0		0		0	60
Consciousness sedation score	36.2°C			0		Unconscious/ not breathing/ cardiac arrest GCS = 3		0	36.2
Fetal heart	Pre seizure	Seizure		Unconscious/ not breathing/ cardiac arrest GCS = 3		Unconscious/ not breathing/ cardiac arrest GCS = 3		Unconscious/ not breathing/ cardiac arrest GCS = 3	Eyes flickering, GCS = 8
QMEWT score	60	45		0		0		Baby out	
	E	E		E		E		E	
2 nd Shock CPR 1mg Adrenaline – Prep Perimortem C/S									

Stage 3: Resolution			
Vital signs	Script	Details	Expected actions
Refer to QMEWT OBS table for vital signs.	<p>Once baby delivered HR returns. Yasmin remains unconscious but breathing.</p> <p>Partner very anxious.</p>	<ul style="list-style-type: none"> Prepared for transfer to operating theatre. Baby minimal resus and prepared for transfer to ICN for observation. Observations improving. Prepare for operating theatre admission with transfer to ICU after operating theatre. 	<input type="checkbox"/> Perform perimortem caesarean section. <input type="checkbox"/> Baby to neonatal team <input type="checkbox"/> Recap on management preparing to go to operating theatre. <input type="checkbox"/> Continue 5-minute Obs. <input type="checkbox"/> Reassure the patient and tell her what has happened. <input type="checkbox"/> Keep the partner updated. <input type="checkbox"/> Make a plan of care – arrange a bed in ICU. <input type="checkbox"/> Transfer to operating theatre. <input type="checkbox"/> Debrief partner on route.



Supporting Resources

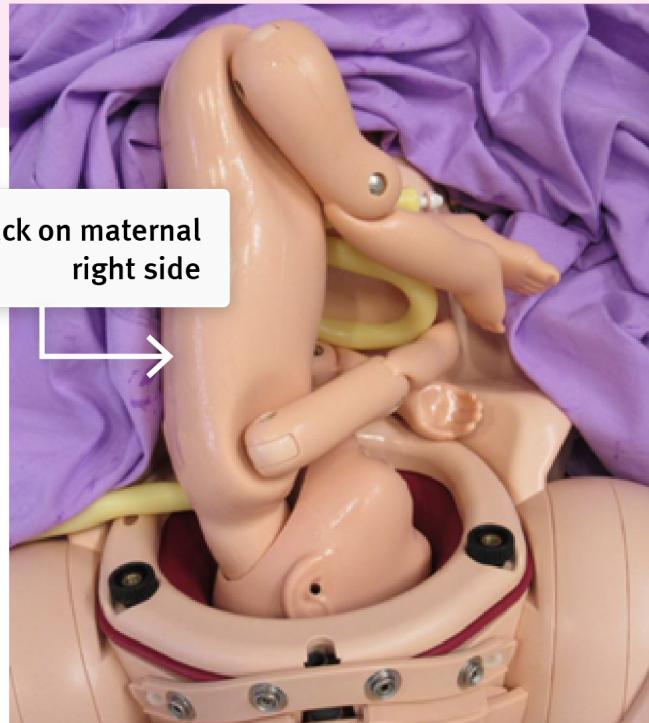
This section contains the following supporting documents that will be essential in the delivery of this learning package:

1. Manikin set-up guide
2. Laboratory reports
3. CTG reports
4. Simulation debriefing poster
5. Debriefing guide

Manikin set-up guide



Epidural and IVC placement



Fetal back on maternal right side

Epidural filter placement and securement



CTG strap placement



36-week Routine**DATE:****PATIENT:****DOB:****LABORATORY REPORT****PAGE: 1****REF:**

Test	Result	Comment
Group and Antibody Screen		
Group	AB Rh (D) Positive	
Antibody	Negative	
		Nil
Expires in 7 days		

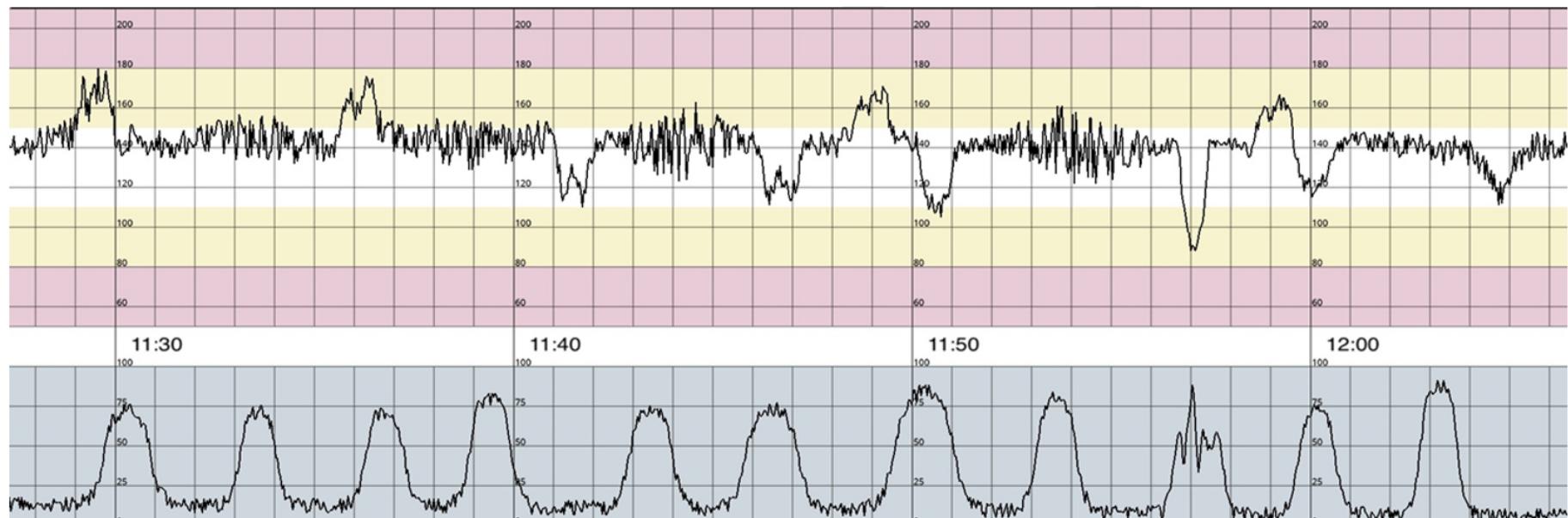
36-week Routine**DATE:****PATIENT:****DOB:****LABORATORY REPORT****PAGE: 1****REF:**

Test	Result	Reference	Comment
Haemoglobin	110 g/dL	13.7-17.7g/dL	
WCC	16.0	3.9-10.6 x 10 ⁹ /L	
Platelets	130	150-440 x 10 ⁹ /L	
Haematocrit	0.42	0.39 – 0.52	
RCC	5.00	4.50 – 6.0x10 ¹² /L	
MCV	93 fL	80 – 100 fL	
Neutrophils	(83%) 8.15	2.0 – 8.0x10 ⁹ /L	
Lymphocytes	(10%) 2.18	1.0 – 4.0x10 ⁹ /L	
Monocytes	(6%) 0.52	0.1 – 1.0x10 ⁹ /L	
Eosinophils	(0%) 0.05	<0.60x10 ⁹ /L	
Basophils	(0%) 0.07	<0.20x10 ⁹ /L	

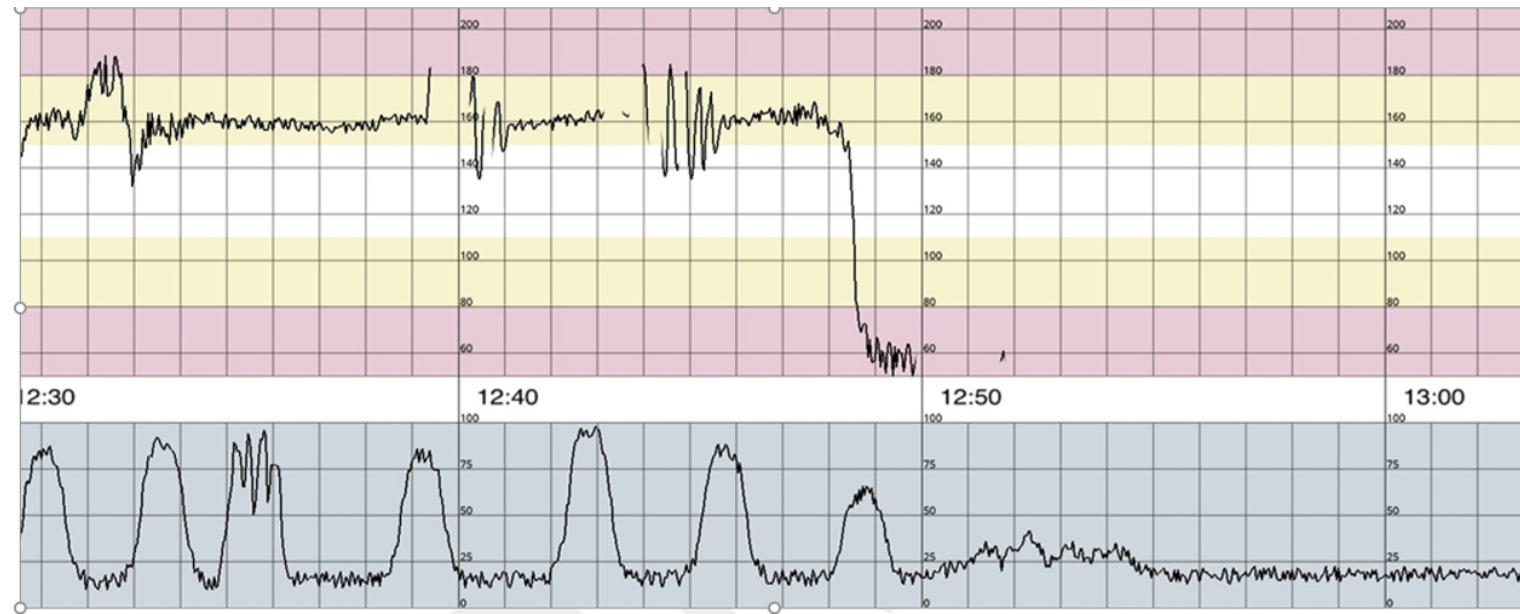
36-week Emergency Admission**DATE:****PATIENT:****DOB:****LABORATORY REPORT****PAGE: 1****REF:**

Test	Result	Reference	Test	Result	Reference
Sodium	140 mmol/L	135-145 mmol/L	Urate		
Potassium	4.2 mmol/L	3.5-5.2 mmol/L	Protein (total)	69 g/L	60-83 g/L
Chloride	100 mmol/L	95-110 mmol/L	Albumin	38 g/L	35-50 g/L
Bicarb.	26 mmol/L	18-26 mmol/L	Bilirubin (total)	20 umol/L	<20 umol/L
Anion Gap	10 mmol/L	4-13 mmol/L	Bilirubin (conj)	<4 umol/L	<4 umol/L
Glucose	4.6 mmol/L	3.0-7.8 mmol/L	Gamma GT	8 umol/L	<55 u/L
Urea	6.2 mmol/L	2.1-7.1 mmol/L	AST	30 U/L	<35
Creatine	52 umol/L	32-73 umol/L	ALT	40 U/L	<45
Urea/Creat	73	40-100	ALP	100 U/L	56 - 119
eEFG	>90 ml/min	>60 ml/min	Calcium	2.38 mmol/L	2.10-2.60 mmol/L
Phosphate	1.00 mmol/L	0.75-1.50 mmol/L	Corr ca	2.47 mmol/L	2.10-2.60 mmol/L
	0.86 mmol/L	0.70-1.10 mmol/L	OSM (calc)	280 mmol/L	270-290 mmol/L

CTG prior to epidural (1)



CTG post epidural then at cardiac arrest (2)



Simulation Debriefing

Establishing a safe container for learning in simulation.

1

Reaction phase - “vent”

- How was that?
- How are you feeling?
- Any other initial reactions?
- Learners may reveal key areas that are important to them.



3

Analysis phase

Select which strategy is suited.

- Learner Self-Assessment - learner generates objectives
What went well/what would you change?
What well/did not go well and why?
- Focused Facilitation - analyse performance related to objective

2

Description phase

- Clinical summary of the case.
- Can be shortened if it appears there is shared understanding of the case.

4

Summary phase

- Discuss take-home learning points
- Learner guided approach or
- Facilitator guided approach

Adapted from Eppich, W. and Cheng, A., 2015. Promoting Excellence and Reflective Learning in Simulation (PEARLS). *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare*, 10(2), pp.106-115.

Debriefing guide

Scenario objectives	<p>Participants are required to:</p> <ul style="list-style-type: none"> • Recognise the signs and symptom of local anaesthetic toxicity (LAST). • Recognise and respond to a clinically deteriorating patient. • Manage a maternal collapse/ maternal cardiac arrest to include: <ul style="list-style-type: none"> ◦ calling for help early ◦ calling appropriate teams • Demonstrate clinical management for LAST including drug therapy. • Make a plan for birth of the baby within 5 minutes if cardiac arrest or longer with maternal collapse.
Vent phase	<p>Example questions:</p> <ul style="list-style-type: none"> • Initial thoughts of how the simulation went? • Acknowledge emotions (note body language and tone of participants).
What happened? (Phases)	<p>Example questions:</p> <ul style="list-style-type: none"> • Tell us about your patient and what were your initial priorities? • What led to your decision to escalate management? • What clinical signs and symptoms led you to become concerned?
What was done well and why?	<p>Example question: What could have been better at each phase?</p>
Relevance to experience	<p>Example question: How would you transfer knowledge from today into your workplace?</p>
What has been learned?	<p>Example question: What actions will you take to enhance your skills and knowledge after this simulation?</p>
Transfer to clinical settings	<p>Example questions:</p> <ul style="list-style-type: none"> • What will you take away from this session? • Can you give an example of how you could apply new skills or knowledge gained during this session in your clinical setting?
Key moments	<ul style="list-style-type: none"> • Recognition of early signs of LAST.

- | | |
|--|--|
| | <ul style="list-style-type: none">• Recognition of deterioration.• Calling for HELP early.• Making a differential diagnosis.• Having key team members present.• Preparing and planning for ongoing management. |
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References

This resource kit is inspired by the Optimus BONUS project of the Children's Health Queensland's "Simulation Training Optimising Resuscitation for Kids" service. To know more information about STORK and their Optimus project, visit their website at <https://bit.ly/3km1wcZ>.

1. Maternal deaths in Australia 2000–2002 [Internet]. Australian Institute of Health and Welfare. 2006 [cited 2020 Dec 1]. p. Maternal Deaths Series no. 2. Cat. no. PER 32. Available from: <https://www.aihw.gov.au/reports/mothers-babies/maternal-deaths-in-australia/data>
2. Advanced Perioperative Crisis Management - Matthew D. McEvoy, Cory M. Furse - Oxford University Press [Internet]. [cited 2021 Jul 7]. Available from: <https://global.oup.com/academic/product/advanced-perioperative-crisis-management-9780190226459?cc=au&lang=en&>
3. Singh S, Lalin D, Verma VK. Management of local anaesthetic systemic toxicity by timely lipid resuscitation in a paraturient - A case report. Indian J Anaesth [Internet]. 2019 Jan 1 [cited 2021 Jul 7];63(1):68. Available from: [/pmc/articles/PMC6341876/](https://pmc/articles/PMC6341876/)
4. S B, G W. Local anesthetic toxicity and lipid resuscitation in pregnancy. Curr Opin Anaesthesiol [Internet]. 2011 Jun [cited 2021 Jul 7];24(3):262–7. Available from: <https://pubmed.ncbi.nlm.nih.gov/21494132/>

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Anaesthetic Toxicity – Facilitator Resource Kit

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