



Maternity Education Program

Maternal Anaphylaxis

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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Maternal Anaphylaxis – Facilitator Resource Kit

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Who is this resource kit for?

This resource kit provides healthcare workers with knowledge and skills on assessing and managing an anaphylaxis event in a pregnant patient.

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:

- Prepare resources to manage a maternal antenatal anaphylaxis.
- Provide appropriate information and support to the pregnant person during and after an anaphylaxis event.
- Recognise and respond to a clinically deteriorating patient.
- Provide an ongoing plan of care.

Facilitation guide

1. Provide Participant Resource Kit to the learner.
2. Use 2D pictures to demonstrate the systemic effect of anaphylaxis.
3. Use a PowerPoint presentation to assist learners prior to the session.
4. Allow participant to apply actions in a simulated maternal anaphylaxis case.
5. Conduct group debrief after simulation.

Supporting documents

1. Participant Resource Kit
2. 2D pictures
3. List of further readings
4. Maternal anaphylaxis simulation



Emergency Management

Maternal anaphylaxis is defined as a serious, generalized or systemic, allergic or hypersensitivity reaction that can be life-threatening or fatal. Anaphylaxis is a rare event during pregnancy. The management of anaphylaxis in a pregnant person is the same as that of a non-pregnant patient. The signs and symptoms of anaphylaxis include:

- respiratory problems (e.g., wheeze, dyspnoea)
- gastrointestinal issues (e.g., vomiting, abdominal pain)
- skin and mucosal involvement (e.g., urticaria, itchy rash, swelling of lips)
- cardiovascular and central nervous systems (e.g., reduced blood pressure, feeling faint, headache)

Potential pregnancy-related signs and symptoms of anaphylaxis are:

- lower back pain
- fetal distress
- uterine cramps
- preterm labour
- vulval or vaginal itching

Anaphylaxis can also trigger maternal hypotension and hypoxemia which are potentially life-threatening to both the pregnant person and the fetus. Maternal hypoxemia can lead to intrapartum fetal asphyxia and maternal hypotension and

vasoconstriction can result in decreased uterine blood flow.

Risks to the fetus include, hypoxic-ischemic encephalopathy, severe central nervous system damage, and intra-uterine fetal death.

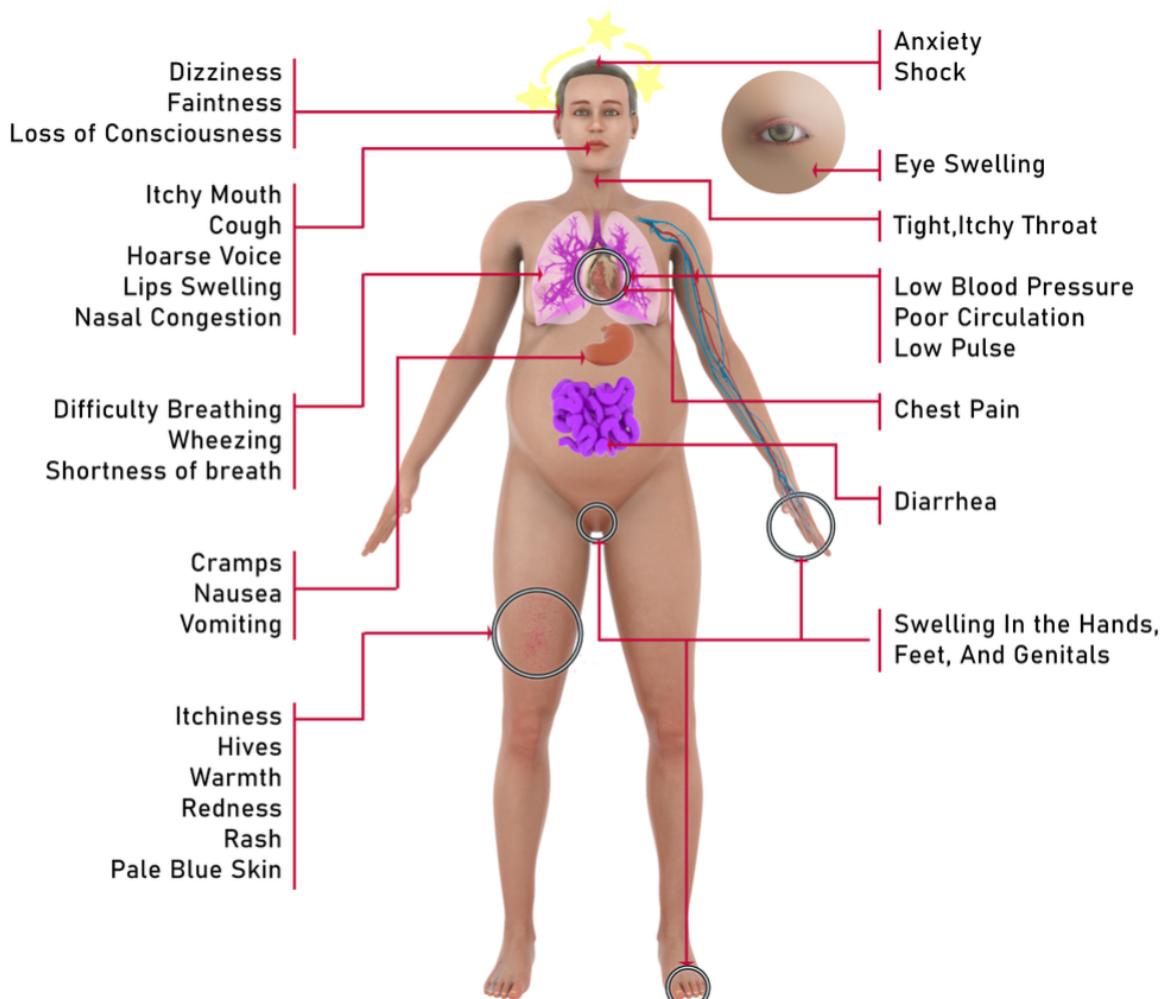
Initial treatment is basic resuscitation, maternal airway, breathing, and circulation (ABC), removal of the causative agents and administration of medication and fluid resuscitation treatment. A caesarean section may be required to avoid fetal hypoxemia and prevent severe fetal damage. In cases of anaphylaxis during pregnancy both the pregnant person and the fetus must be treated. The patient must be seen by a specialist team comprising of obstetrics, neonatology and anaesthetics, for medical and surgical obstetric management, such as fetal monitoring, maternal treatment of threatened preterm labour and possible delivery.

Treatment and management need to be rapid to prevent further anaphylactic reaction and possible fetal brain injury. Drugs such as adrenaline (epinephrine), antihistamines, glucocorticoids and vasopressors can be used safely without major side-effects in pregnancy¹. The prompt administration of adrenaline (epinephrine) is the cornerstone of anaphylaxis management in both pregnant and non-pregnant population².

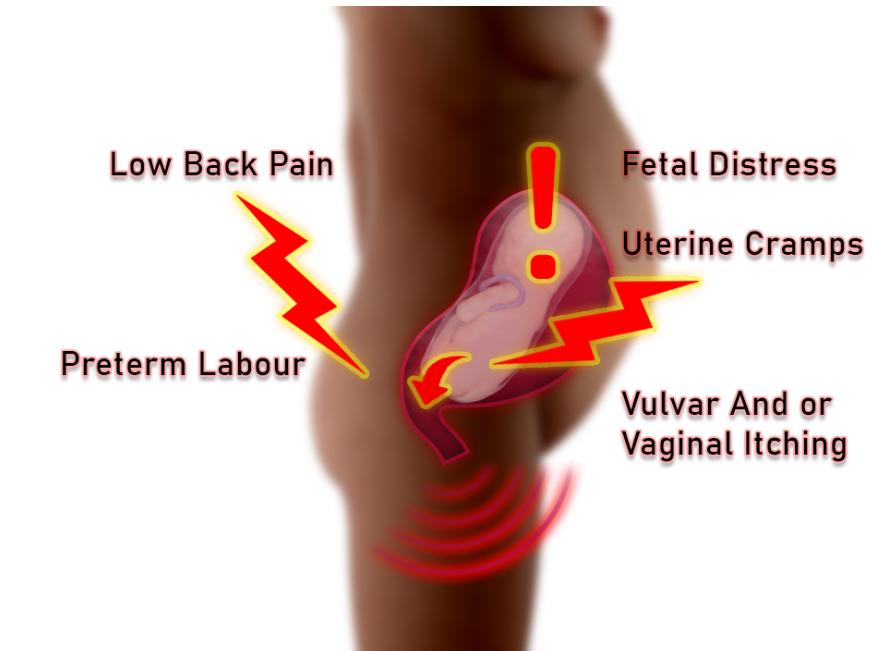


Emergency Management

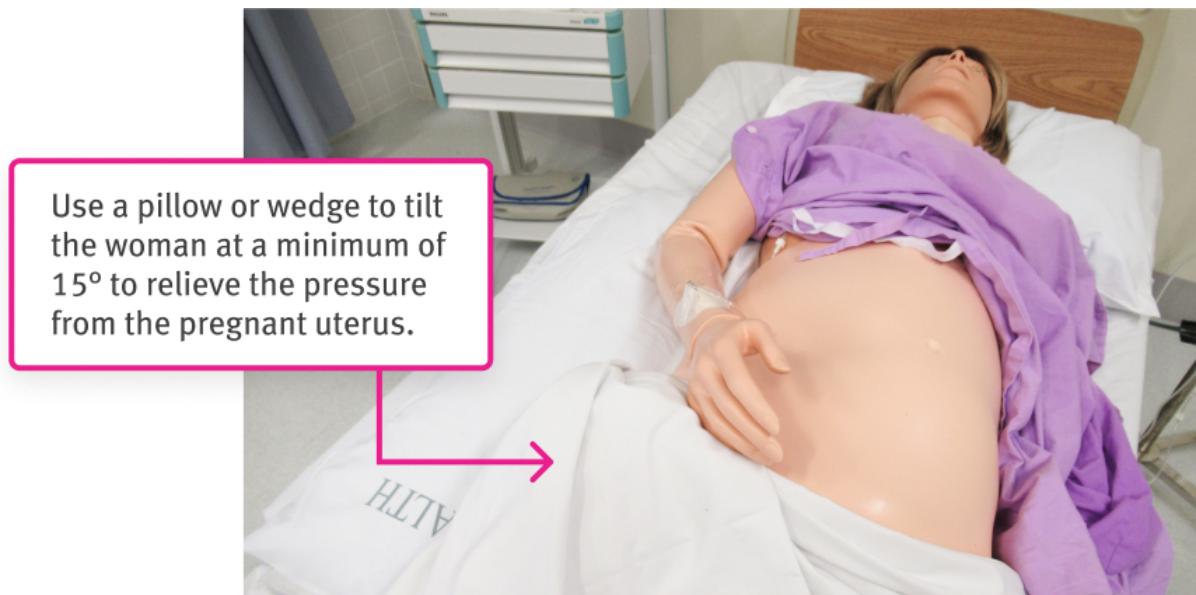
Maternal anaphylaxis effect on the body



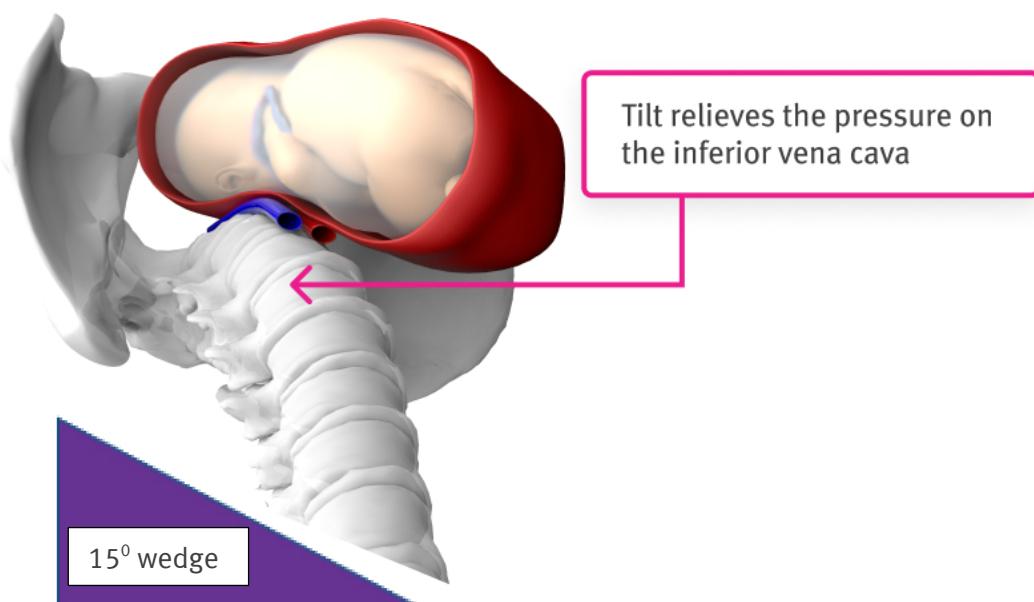
Potential signs and symptoms of maternal anaphylaxis



Left lateral 15° tilt

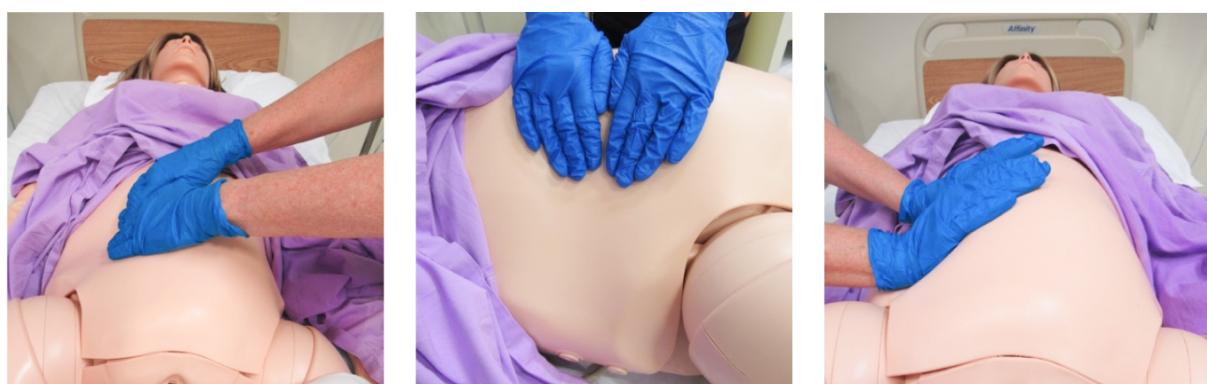


Internal view of 15° tilt



Manual uterine displacement

Displace the uterus to the left manually to prevent 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 Kara was admitted in labour at term, 5cm dilated, Group B streptococcus (GBS) positive and requires antibiotics.</p> <p>Background</p> <ul style="list-style-type: none"> • 22 years old, G1P0 • 40+2/40 gestation • Low risk pregnancy • Hb 115 @ 36/40 • O positive • GBS positive • All other serology, nothing abnormal detected • Allergies, nil known • Medical history, fractured arm at 8 years old • 20-week ultrasound scan, nothing abnormal detected <p>Assessment</p> <ul style="list-style-type: none"> • BP 110/70, MHR 78 • Temp 36.6°C • RR 14 • Admission CTG, normal <p>Recommendations</p> <ul style="list-style-type: none"> • Admit to birth suite for ongoing labour care. • Provide IV antibiotics as per guideline. 	
Learning objectives	Participants are expected to: <ul style="list-style-type: none"> • Prepare resources to manage a maternal antenatal anaphylaxis. • Provide appropriate information and support to the patient during and after an anaphylaxis event. • Recognise and respond to a clinically deteriorating patient. • Provide an ongoing plan of care. 	
Duration	Pre-brief: 10 minutes Orientation: 5 minutes Simulation: 15 mins Debrief: 15 mins	Total: 45 mins Allow 15 minutes for set up

Physical resources

Room set-up	Standard birth suite room
Simulator/s	<p>Option 1 – Simulated patient in hospital gown, sits in bed with:</p> <ul style="list-style-type: none"> • pregnant term abdomen in a hospital gown • fetus in trainer ROA position, 2/5 head above brim • CTG is not attached • ready to request N²O for pain relief.
	<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 CTG attached • birthing perineum with peri pad in situ • fetus in trainer ROT position -2cm station, 2/5 head above brim • heavy show on pad, turns to blood loss during scenario • ready to request N²O for pain relief.
Clinical equipment	Standard birth suite room set up
Access	1 IVC N/Saline 1000mls
Other	<ul style="list-style-type: none"> • Pregnancy Health Record • Chart • Relevant paperwork for emergency management

Human resources

Faculty	<p><input type="checkbox"/> 2 facilitators to take on roles of scenario lead and primary debriefer.</p> <p>Facilitators can be obstetric registrar or consultant and midwife with debriefing experience.</p>
If using a manikin	<p>Simulation Coordinators</p> <p><input type="checkbox"/> 1 simulation coordinator for manikin set-up and control of software during scenario.</p> <p>Confederates</p> <p><input type="checkbox"/> 1 midwife as patient support person</p> <p><input type="checkbox"/> 1 facilitator to provide handover</p>
If using a simulated patient	<p>Simulation Coordinators</p> <p><input type="checkbox"/> 1 simulated patient</p> <p><input type="checkbox"/> 1 midwife as patient support person</p> <p><input type="checkbox"/> 1 facilitator to provide handover</p>
Other	<p><input type="checkbox"/> 1 midwife must be present in the simulation room to receive the handover.</p> <p>The other midwives and doctors are outside the room, to be called in as needed.</p>

Simulated patient information

Name	Kara Flynn
Age	22 years old
Sex	Female
Weight	60 kg
Allergies	Nil known
Medications	Nil
Medical, Surgical	Fractured arm at 8 years old
Social history or Employment	Shop assistant at Woolworths
Partner's name	Brad
Pregnancy history	G1P0
Blood Group	A positive, antibodies negative
Hb	115, 36 weeks
Serology	Negative
Rubella	Immune
GBS	Positive
Ultrasound scan	20 weeks, posterior placenta, non-praevia

Simulated patient script

You are Kara, you are having your first baby and you started contracting earlier this morning.

You presented to the hospital as the contractions are now regular and painful, plus you know you have Group B streptococcus and need antibiotics.

Your contractions are 3:10 lasting 60 seconds and since the vaginal examination in the assessment area, they have become more painful.

You are ready to use the gas and would really like to go in the shower, but you are waiting until the antibiotics have been started.

You are finding it hard to stay still while the staff sort out the antibiotics.

Once the antibiotics have started, you request to use the shower and you get off the bed and start making your way to the bathroom, but you suddenly feel short of breath and are experiencing tightness in your throat.

You also feel like your contractions have changed and there is a constant pain in your tummy. You start to itch.

Once back on the bed continue to act like you are short of breath but don't be too dramatic. Allow the staff to examine you and start the CTG, OBS, and treatment.

Handover card

I ntroduction	This is Kara, this is ... <staff name>
S ituation	<p>Presented in spontaneous labour at 40+2/40 in active labour.</p> <ul style="list-style-type: none"> • VE 5cm dilated • Fully effaced • Membranes intact • Right occipital anterior -2cm
B ackground	<ul style="list-style-type: none"> • 22 years old, G1P0 • 40+2/40 gestation • Low risk pregnancy • Hb 115 @ 36/40 • A positive • GBS positive • All other serology, NAD • Allergies, nil known • Medical history, fractured arm at 8 years old • 20-week USS, NAD
A sessment	<ul style="list-style-type: none"> • BP 110/70, MHR 78, Temp. 36.6°C, RR 14 • In active labour, contractions 3:10 lasting 60 sec becoming stronger with membranes intact • Ready to request N²O • Requires IV antibiotics for GBS positive • Requires routine labour care • CTG in review centre, normal • OBS NAD
R ecommendation	<ul style="list-style-type: none"> • Re-assess in 4 hours. • Provide IV antibiotics as charted.

Stage 1: Initial assessment				
Vital signs		Script	Details	Expected actions
Respiration rate	14	Kara requests to use N ₂ O ₂ and asks to go in the shower once the antibiotics have been started.	<p>Introduction This is Kara, this is ... <staff name>.</p> <p>Situation Presented in spontaneous labour at 40+2/40 in active labour. VE 5cm dilated, FE, membranes intact, ROA -2cm.</p> <p>Background <ul style="list-style-type: none"> • 22-year-old, G1P0 • 40+2/40 gestation • Low risk pregnancy • Hb 115 @ 36/40 • A Pos • GBS positive • All other serology, NAD • Allergies, nil known • Medical history, fractured arm at 8 years old </p>	<input type="checkbox"/> Introduce self, find out history. <input type="checkbox"/> Take maternal OBS and perform abdominal palpation. <input type="checkbox"/> Check admission CTG. <input type="checkbox"/> Prepare N ² O for use. <input type="checkbox"/> Check resus gear.
SpO₂	98%			
Blood pressure	110/70			
Heart rate	100			
Temperature	37.2°C			
Consciousness sedation score	Alert			
Fetal heart	136			
Per vagina loss	Bloody mucous show			
Blood glucose level	N/A			

Stage 1: Initial assessment			
Vital signs	Script	Details	Expected actions
		<ul style="list-style-type: none">• 20-week USS, NAD <p>Asessment</p> <ul style="list-style-type: none">• BP 110/70, MHR 78, Temp. 36.6°C, RR 14• In active labour, contractions 3:10 lasting 60 sec becoming stronger, membranes intact.• Commences N²O at 40:60 working well• Requires IV antibiotics for GBS positive• Requires routine labour care• CTG in review centre, normal• OBS NAD <p>Recommendation</p> <ul style="list-style-type: none">• Reassess in 4 hours.• Provide IV antibiotics as charted.	

Stage 2: Ongoing management				
Vital signs		Script	Details	Expected actions
Respiration rate	24	Kara is showing signs of anaphylaxis. These signs are: <ul style="list-style-type: none"> • Shortness of breath • Tightness of chest • Hypotensive, feeling nauseated • Tachycardic, restless, uncomfortable • Itchy • Abdominal pain different from contractions 	Antibiotics commences. Patient up from the bed to go to shower. Immediately on exertion: <ul style="list-style-type: none"> • Shortness of breath • Tightness of throat • Contractions now more like constant abdominal pain • Starting to itch 	<input type="checkbox"/> Call for help. <input type="checkbox"/> Declare emergency. <input type="checkbox"/> Call MET/MERT. <input type="checkbox"/> Use DRABC. <input type="checkbox"/> Facial O ² – 10 L via rebreather <input type="checkbox"/> If hypotensive, commence IV fluids and IV bolus. <input type="checkbox"/> Cease antibiotics. <input type="checkbox"/> 2 nd IV line. <input type="checkbox"/> Left lateral position. <input type="checkbox"/> If hypotensive, elevate legs. <input type="checkbox"/> Commence CTG. <input type="checkbox"/> Consider adrenaline bolus 1mg in 10mls. <input type="checkbox"/> OBS every 5 minutes. <input type="checkbox"/> Call consultant. <input type="checkbox"/> Document actions taken. <input type="checkbox"/> Manage fetal distress with maternal resuscitation – if deteriorating, CAT1 maybe required.
SpO₂	97%			
Blood pressure	100/60			
Heart rate	118			
Temperature	NR			
Consciousness sedation score	Alert			
Fetal heart	Baseline 120 dropping dramatically to prolonged deceleration			
PV loss	Fresh bleeding			
Blood glucose level	N/A			

QMEWT OBS in 5-minute intervals (post-anaphylaxis)

	5 minutes	10 minutes	15 minutes
Respiration rate	28	24	20
SpO₂	94%	96%	98%
Flow rate	10L	10L	10L
Blood pressure	80/50	90/60	100/60
Heart rate	120	122	100
Temperature	36.8°C	37.1°C	37°C
Consciousness sedation score	Restless in pain and shortness of breath	Restless in pain and shortness of breath	Alert
PV Loss	Nil	Nil	Nil
Fetal heart	80 – 150	80 – 160	170 reduced variability
QMEWT score	10 MERT call	6	4

Stage 3: Resolution			
Vital signs	Script	Details	Expected actions
Refer to QMEWT OBS in 5-minute intervals (post-anaphylaxis) table for vital signs.	Kara is very frightened and worried about the baby. She still has shortness of breath.	Participant recognises the cause. Participant treats patient with adrenaline and patient improves.	<input type="checkbox"/> Recap management. <input type="checkbox"/> Continue OBS every 5 minutes. <input type="checkbox"/> Monitor cardiac activity. <input type="checkbox"/> Reassure patient and inform them what has happened. <input type="checkbox"/> Make a plan of care. <input type="checkbox"/> Debrief the patient before the end of the scenario. <input type="checkbox"/> Make a plan regarding mode of delivery, CAT1 or continue with vaginal birth with close observation. <input type="checkbox"/> Plan for blood Tryptase at 1 hour, 4 hours, and 24 hours post-anaphylaxis.



Supporting Resources

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

1. Laboratory reports
2. CTG reports
3. Simulation debriefing poster
4. Debriefing guide

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

Test	Result	Comment
Group and Antibody Screen		
Group	O 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	115 g/dL	13.7–17.7g/dL	
WCC	12.0	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	

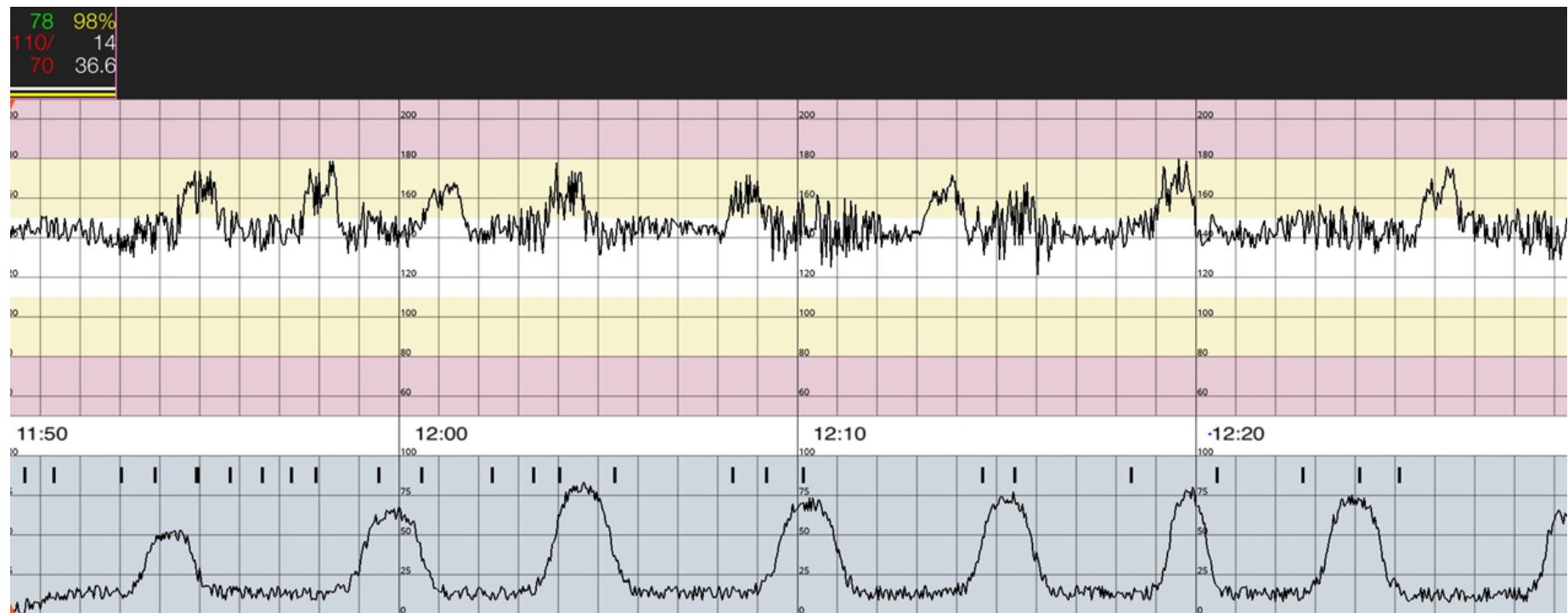
36-week Emergency Admission**DATE:****PATIENT:****DOB:****LABORATORY REPORT****PAGE: 1****REF:**

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

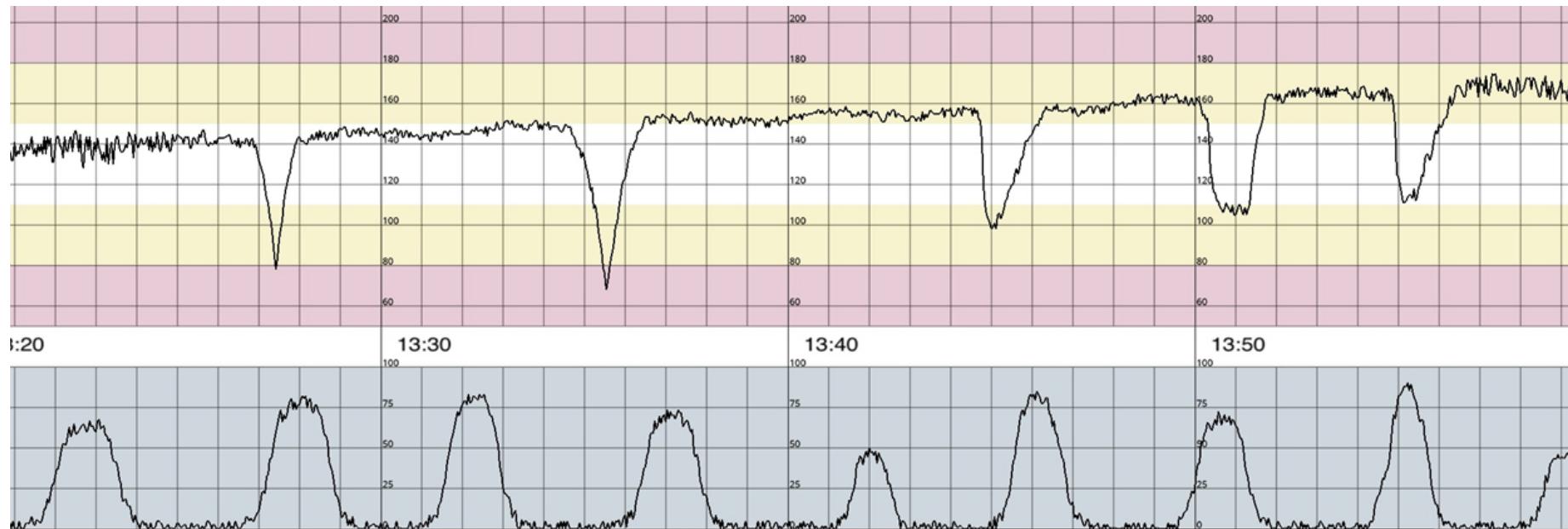
Admission Urine**DATE:****PATIENT:****DOB:****LABORATORY REPORT****PAGE: 1****REF:**

Test	Result	Comment
HSV/LVS	POSITIVE – Group B Strep.	Requires antibiotic treatment during labour

Admission CTG



Post-anaphylaxis CTG



Simulation Debriefing

Establishing a safe container for learning in simulation.



Reaction phase - “vent”

1

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



2

Description phase

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

Analysis phase

3

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

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"> • Prepare resources to manage a maternal antenatal anaphylaxis. • Provide appropriate information and support to the woman during and after an anaphylaxis event. • Recognise and respond to a clinically deteriorating patient. • Provide an ongoing plan of care.
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 post 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"> • Recognising and responding to clinical deterioration. • Making a differential diagnosis. • Managing the situation. • Communicating effectively with the team.

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. Yasunobu T, Mitsuo N, Masayuki N, Urara N. A case report: Management of maternal anaphylaxis in pregnancy. *Allergy Eur J Allergy Clin Immunol.* 2014;
2. Australian Society of Clinical Immunology and Allergy (ASCIA). Acute management of anaphylaxis guidelines [Internet]. Clinical Practice Guidelines Portal. 2019. Available from:
http://www.allergy.org.au/images/stories/pospapers/ASCIA_Acute_Management_of_Anaphylaxis_Guidelines_September_2013.pdf

Share your feedback



Please complete our online survey and help make Maternity Education Program better.

The survey should take no more than 5 minutes to complete. Scan the QR code with your device or visit this link

<https://www.surveymonkey.com/r/Z8Q398N>



Maternal Anaphylaxis – Facilitator Resource Kit

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Visit <https://csds.qld.edu.au/mep/resource-kits.html>