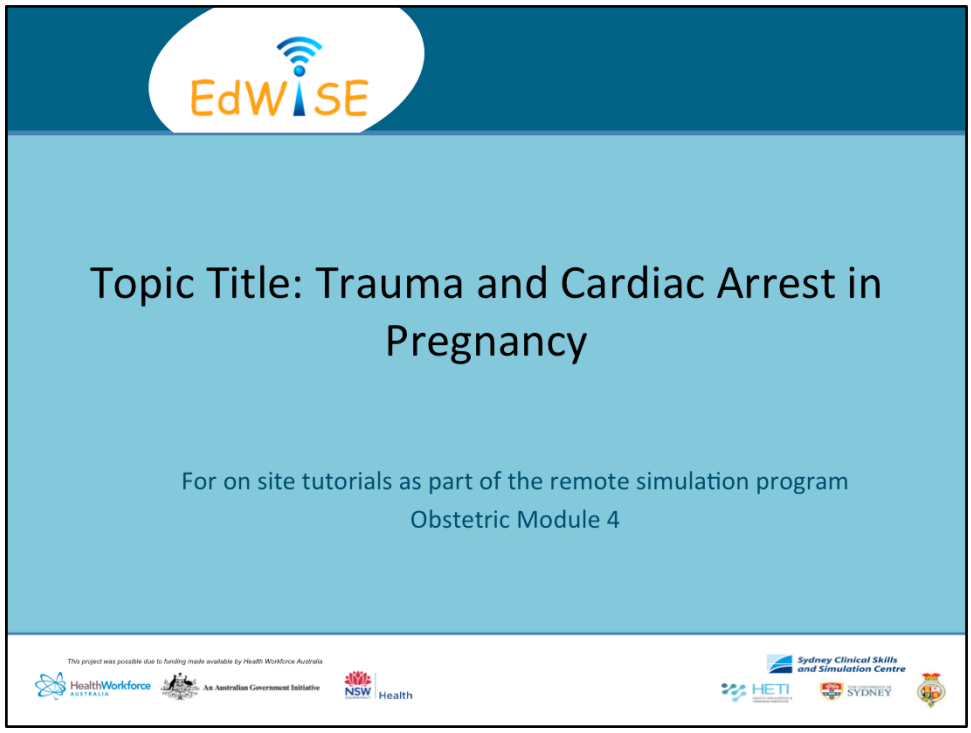
EdWiSE
Topic Title: Trauma and Cardiac Arrest in Pregnancy
For on site tutorials as part of the remote simulation program
Obstetric Module 4
This project was possible due to funding made available by Health Workforce Australia
HealthWorkforce AUSTRALIA
An Australian Government Initiative
NSW Health
Sydney Clinical Skills and Simulation Centre
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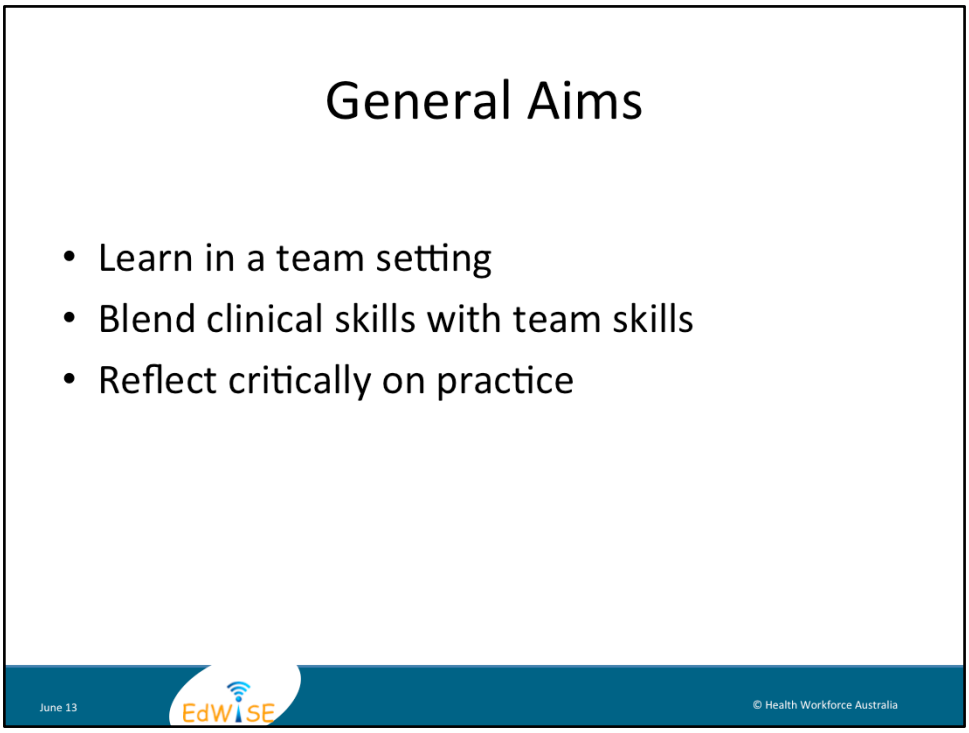
Introductions

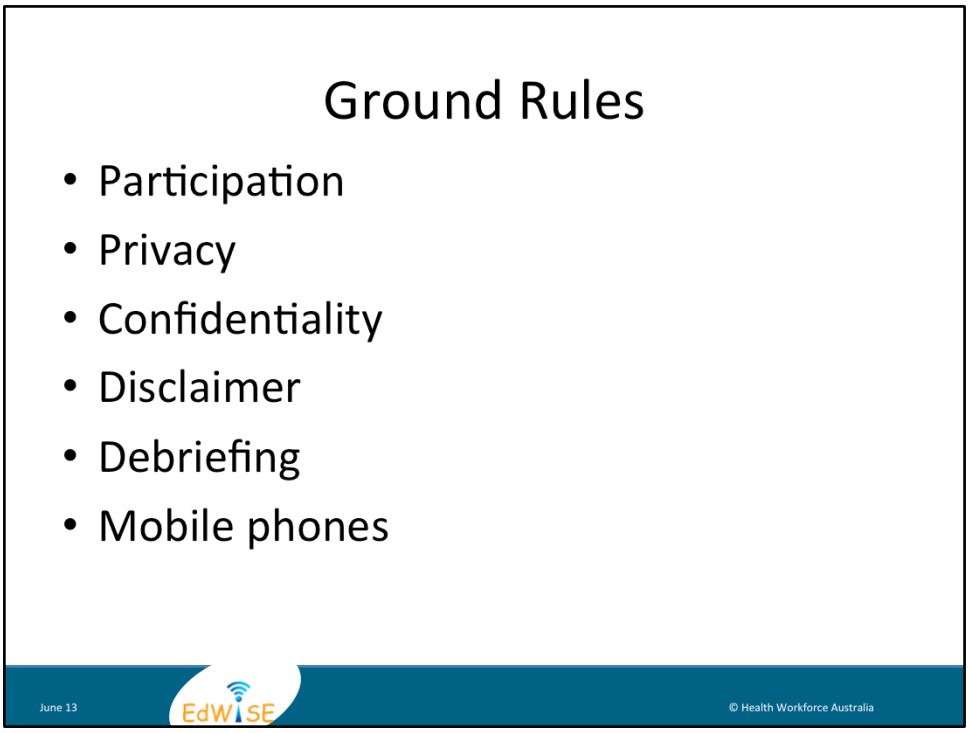
Very quick round the room to assess stage of professional development for each participant.



These aims are the same for all sessions – please do not modify

Speakers' notes

- This session, and package as a whole, involves learning together. Learning with the teams that you work with helps that team to function more efficiently and effectively. It allows you to learn from each other, explore different perspectives and to understand the importance of all members of the team.
- We are targeting higher level learning – applied skills and performance in contextualised events. This is through team discussion and also through working through simulated scenarios as a team. It also allows you to put into practice knowledge attained from the eLearning and other solo learning environments.
- To review and reflect upon our own practice and current best practice standards. During our feedback sessions we will facilitate this but we would also encourage you to reflect on your practice and experience after these sessions.



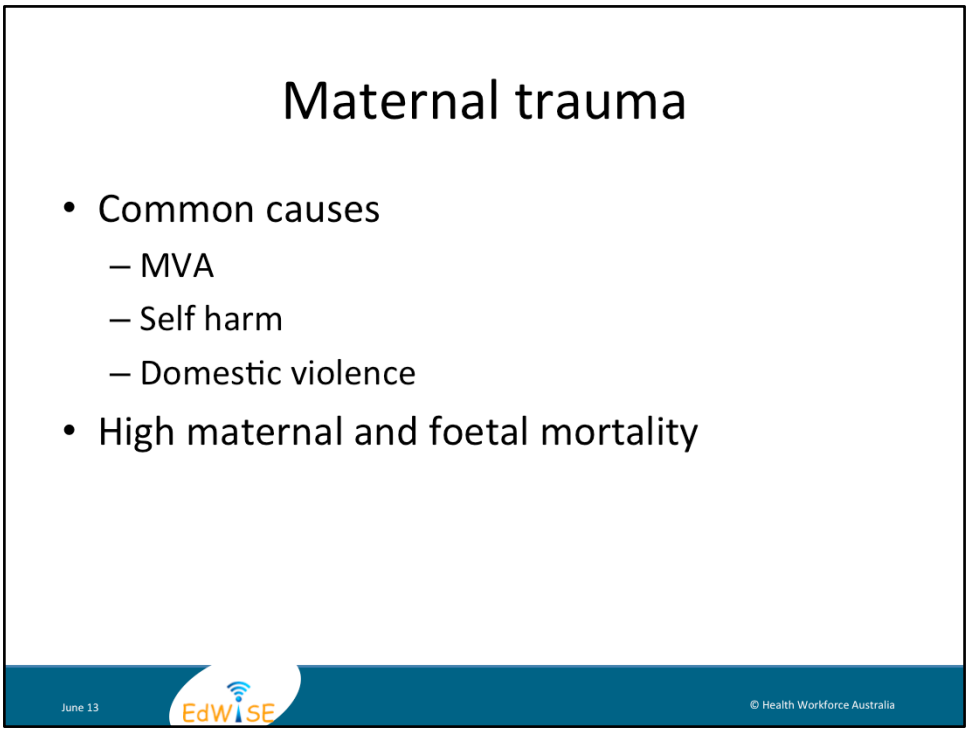
These aims are the same for all sessions – please do not modify

Speakers notes

- Challenge of video conferencing tips: don't change your seat, speak up nice & clearly
- Details collected and de-identified for reporting purposes
- Signed form, don't speak outside about how people performed as not necessarily indicative of real life. This is a chance to try new things, don't tell anyone about the scenarios as they are used again on subsequent courses.
- We try to use best evidence practice and strive to include as up-to-date material as possible. Please do refer to your local policies, guidelines and protocols.
- Debriefing is a chance to reflect upon what we did and how that translates to the workplace. Please use this time to explore the complexities of performance and decision making. Please contribute, we will all learn from each other's experiences.
- Like most things in life, the more that you put in the more you will take away with you.
- It is an open forum where everyone's ideas and thoughts are to be valued.
- If you could please switch your phones off or to silent or vibrate for the duration of the course.

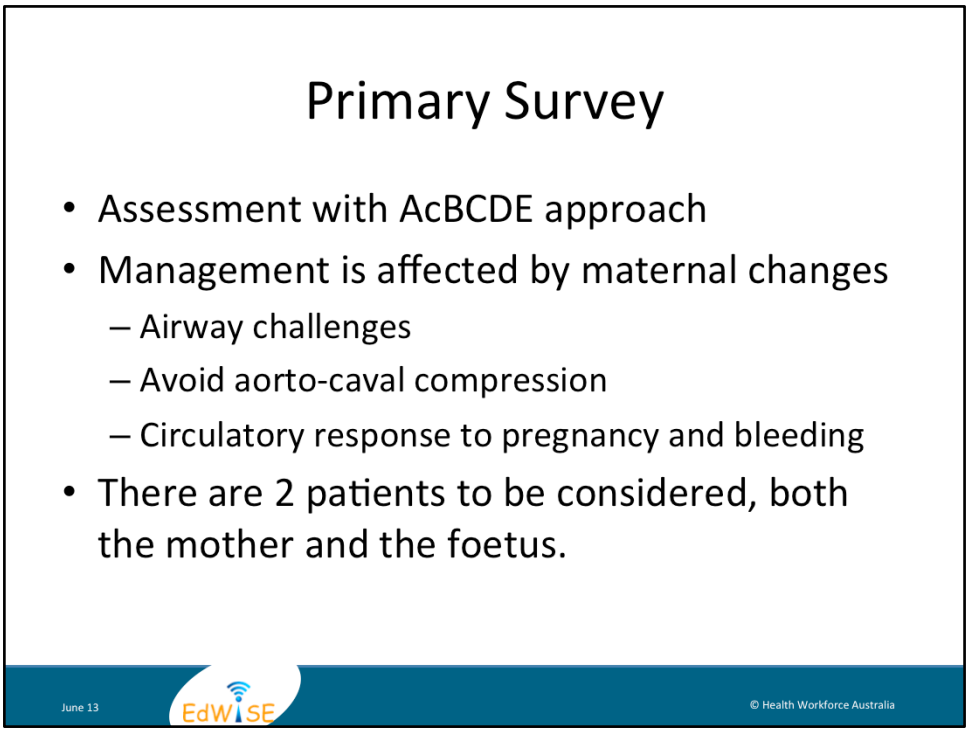
Session Objectives

- Moderate severity multi-trauma: assessment, recognition and management
- Principles of management of cardiac arrest in pregnancy



Maternal mortality in income rich countries, such as Australia, remains low, at approximately 8.4 per 100000 women giving birth. Trauma contributes significantly to maternal morbidity, though death from trauma mechanisms may not be captured in maternal mortality data because they may be classified as incidental rather than direct or indirect. The common causes of trauma in the pregnant population are motor vehicle accidents, attempted self-harm and domestic violence.

Trauma in the pregnant patient provides a challenge to the treating team. There may be difficult management decisions to be made affecting two patients, the mother and the unborn child. On occasions management decisions may appear to be in conflict, however effective maternal resuscitation is be considered the best initial treatment for the child *in utero*. The principles of assessment and management are essentially the same for the pregnant and non-pregnant patient. It is important to recognise the changes of pregnancy to both anatomy and physiology which affect injury pattern and provide implications for management.

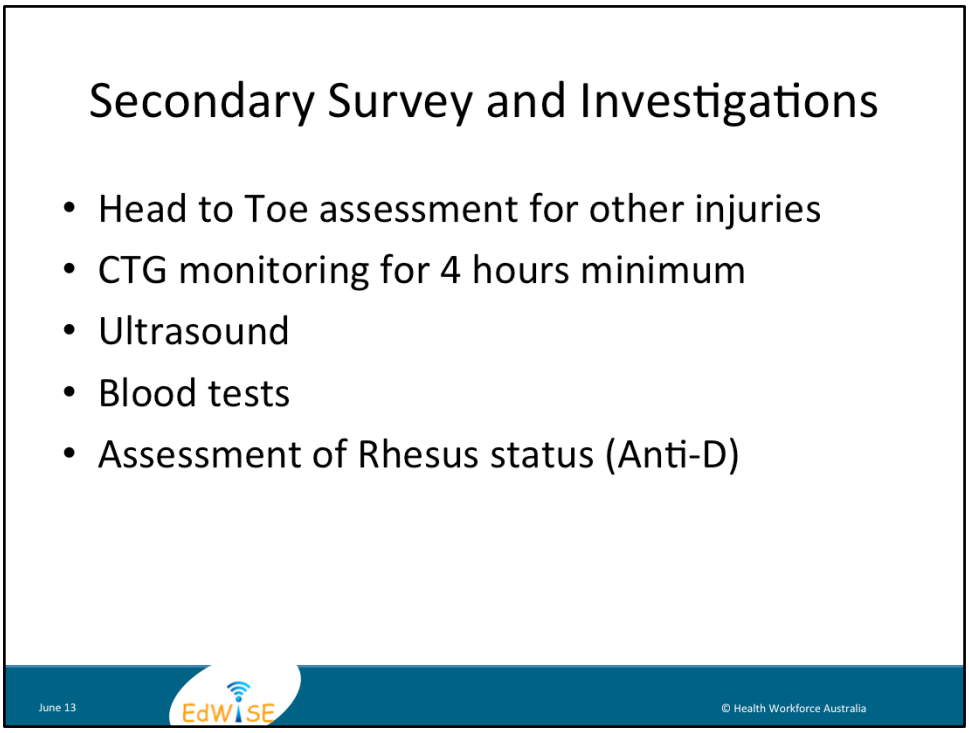


Primary Survey

Immediately life threatening injuries and complications are looked for and treated in the familiar AcBCDE fashion. Airway, breathing, circulation and disability are priorities with precautions being taken for cervical, thoracic and lumbar spine injury. Remembering that resuscitation of the mother is the best initial care for the child and that avoidance of secondary injury may reduce morbidity and mortality.

Attention needs to be drawn to the possibility of aorto-caval compression in the pregnant patient, particularly in the third trimester. Compression of the vena cava by the uterus leads to a decrease in venous return and hypotension. Left lateral tilt moves the uterus off the inferior vena cava can help decrease the effects of supine hypotension. This is achieved by manually displacing the uterus, wedging the pelvis or using a spine board to tilt the patient to maintain spinal control.

Special considerations for the pregnant patient include the increased occurrence of a difficult airway, especially with increasing gestational age. These airway challenges are amplified by the in line immobilisation usually required in trauma situations. The reasons for this include an increase in airway oedema and increased breast size making it more difficult to obtain an ideal laryngoscopic view. If the patient requires intubation, remember that the pregnant patient has higher oxygen requirements and

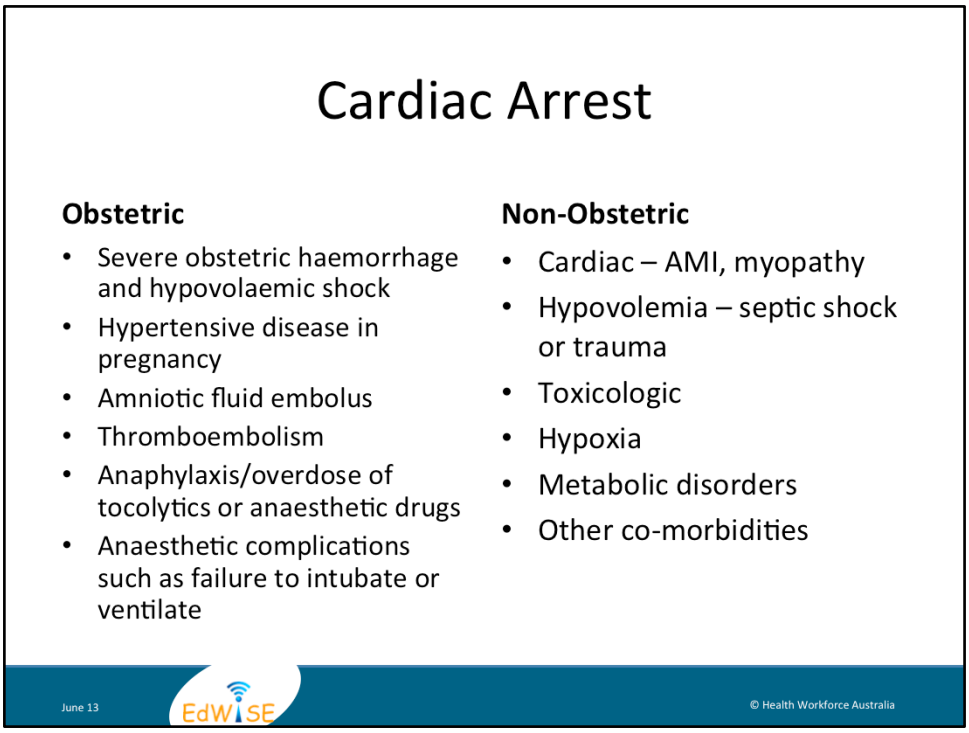


Secondary Survey and Investigations

Following initial resuscitation measures, the secondary survey involves a more detailed examination of the history and circumstances around the trauma and then the patient. This allows the diagnosis and management of other non-life threatening injuries during the head to toe assessment. Head, chest injury management in the pregnant patient is similar to that in non-pregnant patient.

Blunt trauma, such as that sustained during a motor vehicle accident is a common mechanism of injury. Assessment and investigation of abdominal injury or suspected abdominal injury provides a challenge in the pregnant patient. The usual methods of seeking intra-abdominal blood and injury can be more difficult due to increased maternal size and displacement of the internal organs. A fast scan to seek intra-abdominal blood should be performed as usual, but it is essential to recognise increased difficulty with the procedure. An ultrasound of the fetus can examine movement and the fetal heart beat, but is poorly sensitive for detecting uterine or placental injury.

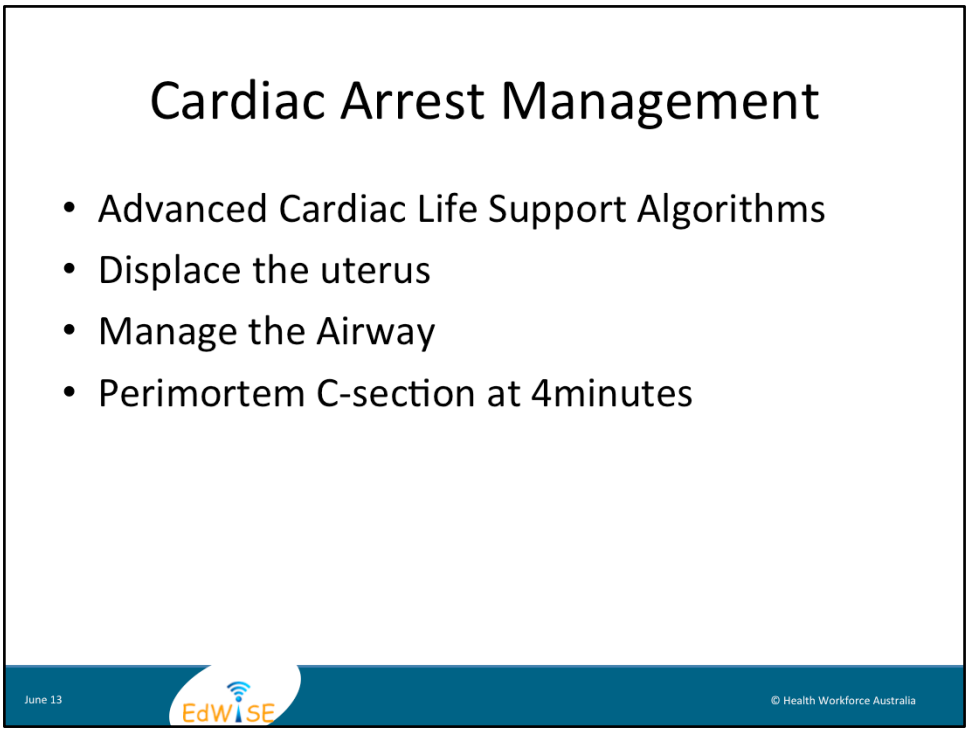
There are radiation risks to the baby from radiation exposure, which are reduced by the third trimester, however the risks to both the mother and child from unrecognised injury may significantly outweigh the risk to the fetus. The highest



Cardiac arrest in pregnant women occur suddenly without any prior warning signs. Young patients even during advanced stages of pregnancy have significant physiological reserve. Cardiac arrests in pregnant women are uncommon. Therefore when an arrest occurs, a multidisciplinary team approach and calling for senior assistance is a priority. The principles of management of a cardiac arrest in pregnant patients are similar to that in non-pregnant patients. There are specific pregnancy related causes of cardiac arrest that need to be considered and excluded or treated. As with the management of trauma, it is best to remember that timely and best care for the mother is ultimately what is best for the foetus. The unfamiliarity of the situation as well as the consideration of two patients means that there is an atmosphere of heightened stress.

Non-obstetric causes of cardiac arrest include previous cardiac disease such as valvular disease, myocardial infarction, cardiomyopathy or collagen disorders leading to aortic dissection. Septic shock and trauma also lead to cardiac arrest. Pregnancy increases the risk of pulmonary embolism, which is not an uncommon cause of cardiac arrest.

Pregnancy specific causes of cardiac arrest include
Severe obstetric haemorrhage and hypovolaemic shock
The spectrum of hypertensive disorders (preeclampsia, eclampsia, HELLP)

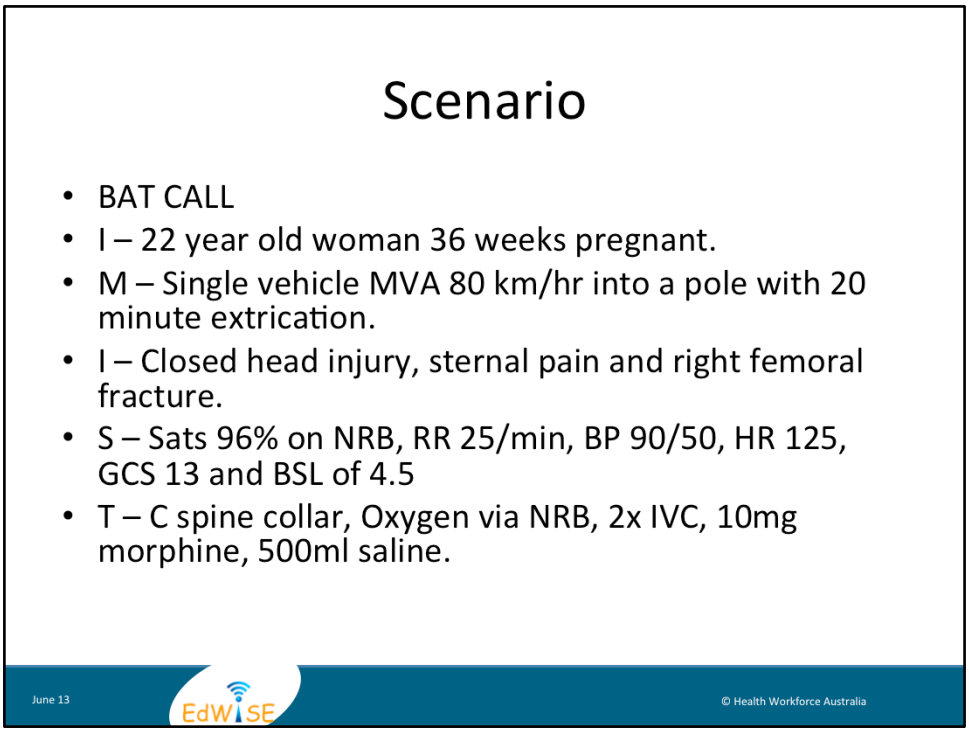


The standard advance cardiac life support (ACLS) algorithm is applied to the pregnant patient. The main additional considerations are related to the effects of the gravid uterus on resuscitation efforts. The uterus, particularly in the third trimester can cause a decrease in venous return. Manually shifting the uterus to the left off the inferior vena cava and applying some degree of left lateral tilt may be sufficient. Note however that increasing left tilt may decrease the effectiveness of chest compressions

As discussed above, timely securing of airway is important, however only experts in the area should attempt endotracheal intubation, and basic airway manoeuvres or the insertion of a laryngeal mask are considered sufficient prior to arrival of expert team members.

Perimortem Caesarean Sections

Perimortem caesarean sections are indicated in cases of maternal arrest to improve the maternal survival and potential survival of the fetus. The best outcomes for the foetus are achieved if the delivery can occur within 5 minutes of maternal cardiac arrest although longer periods of relative foetal asphyxia have been described. In cases of maternal cardiac arrest a team should be rapidly assembled and prepared to perform this should their be failure of maternal return of spontaneous circulation beyond 4 minutes



The information here is to provide them with a history, context and prepare them for the simulation.

Summary

- Trauma assessment is the AcBCDE approach
- The pregnancy should be assessed after the mother has had her primary survey
- Early involvement of obstetric services as part of the trauma team is ideal
- In cases of cardiac arrest consider causes and perimortem c-section.

Acknowledgments

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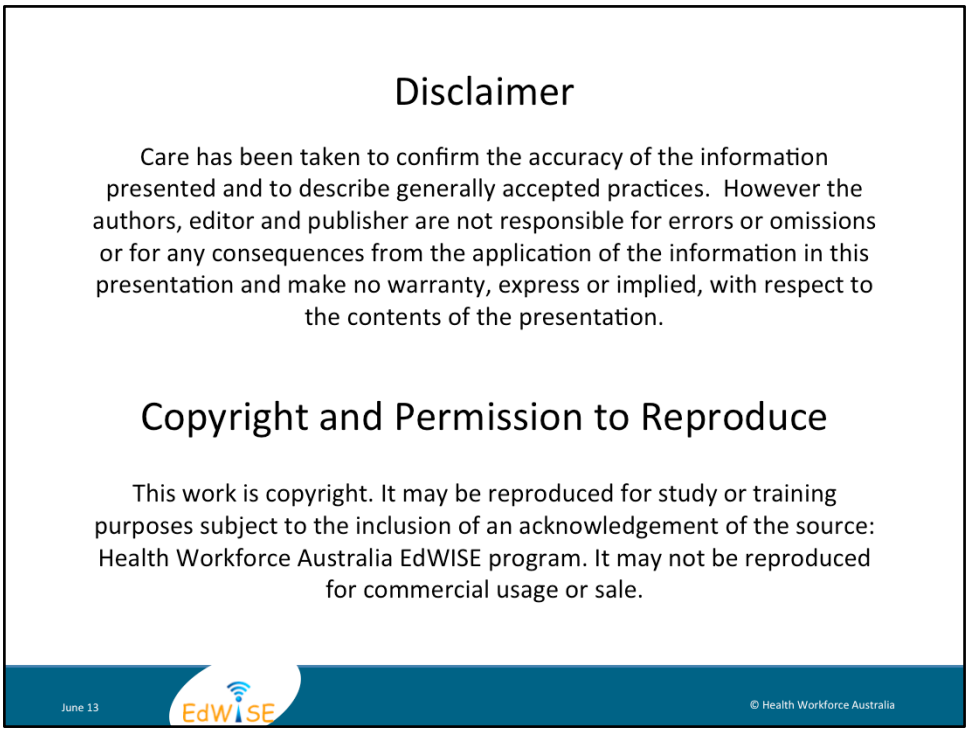

Same for all presentations