# OBSTETRIC ANAESTHESIA


## Cognitive Aids

Version 1.0
2021

ASCAR

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# About us

ASCAR is all about supporting you with well-designed, researched, and tested cognitive aids that are optimised for our high-stakes environment.

Our mission is: People, Practice, and Performance.

# Introduction

This book of cognitive aids has been designed to assist the experienced non-obstetric anaesthetist when they are confronted with an obstetric patient on Birth Unit and/or in the operating theatre. To many, the unfamiliarity can be particularly daunting.

It should be considered in the same light as any other educational resource that the clinician encounters and be viewed with a similar healthy skepticism. This booklet should certainly not be used as a recipe book nor replace the clinical judgement that comes with experience. Similarly it is far from a replete manual of authority on obstetric anaesthesia. It should be noted that there are references to local guidelines and phone numbers at Royal North Shore Hospital and the Northern Sydney Local Health District.

Much effort has gone into fact-checking as of early 2021, however this process does not guarantee accuracy. We also recognise there are multiple ways of doing things whilst still achieving the desired outcome and that some may disagree with the information contained.

Where possible, we encourage you to verify all doses and clinical frameworks with other existing sources including local and national guidelines.  We welcome any feedback (including identification of errors). We will always strive to take on board your suggestions and incorporate improvements where possible in future versions.

Thank you for your support.

**ASCAR group**
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ASCAR
People. Practice. Performance.

# Foreword

These cognitive aids have been created as a resource tool to assist consultant anaesthetists who do not routinely provide anaesthesia to obstetric patients, as well as senior anaesthetic trainees, in rapidly and easily accessing relevant clinical information to support their obstetric practice.

Through the use of colourful, insightful and innovative graphics these cognitive aids present a fresh, creative and highly visual approach to the management of a variety of obstetric emergencies including PPH, pre-eclampsia/eclampsia, total spinal, LAST and cardiac arrest. Also included are planning tools for care of the obstetric patient requiring non-obstetric surgery and the patient with co-existing cardiac disease, as well as the JW patient for LSCS. The material comprises a distillation of key clinical points from current local, national and international management guidelines, including medication dosing regimens, and the practical knowledge and clinical experience of the obstetric anaesthetist.

Underlying themes throughout are the critical importance of requesting assistance early; effective communication with O + G colleagues, NICU staff and midwifery/nursing staff; prompt consultation with supporting clinical specialties as required; and the crucial need for careful planning.

In summary, this book of cognitive aids provides easily accessible, concise, practical guidance to assist the provision of excellent care to the obstetric patient. It will serve as a valuable resource for consultants and trainees alike.

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# Acknowledgements

This project would not have been possible without the support and encouragement of many colleagues. In particular, we would like to express our deepest appreciation to Dr Elizabeth Ward, Dr Gene Lee, Dr Ben Olesnicky, Dr Jon Brock, Dr Cath Traill at Royal North Shore Hospital for all their wisdom, time, and experience that enabled these cognitive aids to reach production.

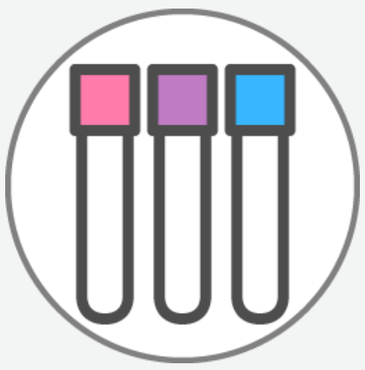
# CRISIS LOGISTICS

**OT Floor Manager:** 58386
**Duty Anaesthetist:** 58385
**Anaesthetic Obstetric Registrar:** 41082
**Anaesthetic Registrar Main Theatres:** 42075
**Midwifery Team Leader:** 0472 866 429
**O+G Registrar:** 41893
**After hours SSO / runner:** 41893


**Call for blood early in obstetric bleeding**

Request blood bank to divide PRBC into separate eskies
Return unused PRBC **to blood bank within 2 hrs**

**Birth Unit Arrest Trolley:** outside OT
**Maternity Arrest Trolley:** outside Birth Rooms 5-6
(includes perimortem C-section pack)



**ABG:** ABG machine in BU storeroom
**Bloods:** Pathology chute or use SSO/runner
**ROTEM:** Outside OT 7 (in-hours) / ICU 6E (after-hours)

# CRISIS EXPERT TIPS

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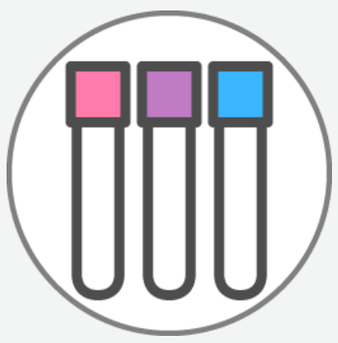
**Replace fibrinogen early in obstetric haemorrhage.**
Consider cryo (10-20 units initially) in **catastrophic bleeding.**
Use **ROTEM** to guide transfusion.



Notify pathology for urgent platelet count.
Request **manual microscopy** in thrombocytopenia.

Consider **cell salvage** for rare blood groups or JW patient.

Upgrade existing IV access in haemorrhage.
**Remove bungs** to improve flow rates.

Clinical catastrophes or puzzled with diagnosis?
Consider **Amniotic Fluid Embolism**

# POSTPARTUM HAEMORRHAGE

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**MTP if >1500 mL (or rapidly approaching)**

**Max 2 L crystalloid / 1 L colloid**

**Bair hugger, fluid warmer, OT to 25°C**

**Uterotonics**

**RBC + TXA**
**+/- Cryo**
**10-20 units**

**ROTEM + ABG**
**FFP + Platelets as needed**

**Activate MTP**

## Targets

| | |
|---|---|
| Fibrinogen > 2 g/L | Lactate < 4 |
| Platelets > 50 | pH > 7.2 |
| INR < 1.5 | BE < -6 |
| Ca++ > 1.1 mmol/L | Temp > 36 |

**Syntocinon**
**up to 5 iu slowly**
**then infusion**

→ **Ergometrine**
**250 mcg IM +/- 250 mcg IV**
**with anti-emetic**

→ **Carboprost**
**250 mcg IM/IU**
**q15 min (max 2 mg)**

**Cautions:** *Hypotension* *IHD, pre-eclampsia* *Severe asthma, pulm HTN*

## Obstetric Checks

**4T's** – identify the **cause**.
Tone/Tissue/Trauma/Thrombin
**(2nd) consultant** required?
**Hysterectomy** indicated?
**Aortic control?**

## Anaesthetic Checks

1 CaCl : 4 RBC
or iCa > 1.1

Re-dose
Antibiotics?

Titrate
anaesthesia

Low-Normal
Blood Pressure

# POSTPARTUM HAEMORRHAGE

ASCAR

**Call for help** | **Hands-off Team Leader** | **Mobilise Resources** | **Share Mental Model**

## Resuscitate

- Aim **SBP low-normal**.
- Upgrade IV access x 2. **Consider RICC line**.
- **Fluid warmer and Bair hugger**. Insert IDC.
- **2 L warmed crystalloid. Max further 1 L colloid** before PRBC.
- Activate **MTP if > 1500 mL blood loss** or haemodynamic instability.

## Recognise

- **Tone (most common):** ensure fundal massage + IDC. Give uterotonics. Proceed to OT.
- **Trauma:** consider concealed haematoma e.g., uterine rupture / cervical tear.
- **Tissue:** retained products, placenta accreta.
- **Thrombin: suspect if severe PET / abruption / sepsis / AFE**
- **Theatre:** transfer to theatre?
- **Team:** call more experienced surgeon?

## Uterotonics

- **Syntocinon: up to 5 iu SLOW** then infusion of 40 iu over 4 hrs.
- **Ergometrine:** 250 mcg IM +/- 250 mcg IV. **CI: HTN, PET.** Give anti-emetic.
- **Carboprost:** 250 mcg IM q15 minutes. Max 2 mg. **CI: severe asthma, pulmonary HTN.**

## Blood products

- **Give 1 g TXA. If activating MTP request cryoprecipitate 10-20 units.**
- **Give blood if 1500 mL or 20% EBV loss regardless of Hb** (EBV = 100 mL/kg at term).
- **Give O negative if immediate PRBC needed.**
- Consider cryoprecipitate after 4 PRBC if no immediate access to ROTEM.
- Treat coagulopathy, use **ROTEM**, replace calcium, ensure active warming.

## Stop bleeding

- If initial measures fail transfer to OT. Involve **consultant obstetrician.**
- Aim to correct acidosis, temperature, and coagulopathy.
- Consider embolisation in radiology if haemodynamically stable.
- Extremis measures include **aortic compression + hysterectomy.**
- **Liaise with Haematology re: factor VIIa** if ongoing life-threatening bleeding.

## Anaesthesia

- Get help. Consider cell salvage.
- Ketamine + midazolam RSI. Reduce doses. No neuraxial if signs of shock.
- **Avoid excessive volatile:** use BIS, consider TIVA (cautious titration).

## Differential Diagnosis

**Tone:** Uterine atony (most common)
**Trauma:** Genital tract or **concealed haematoma**
**Tissue:** Retained placenta, placenta accreta
**Thrombin:** HELLP, DIC, abruption, sepsis, AFE

## Targets

| | |
|---|---|
| **Fibrinogen > 2 g/L** | **Lactate < 4** |
| **Platelets > 50** | **pH > 7.2** |
| **INR < 1.5** | **BE < -6** |
| **Ca++ > 1.1 mmol/L** | **Temp > 36** |

# PRE-ECLAMPSIA

ASCAR

**FBC, Coags within 3-6 hrs**

**If plts < 60 consider X-match**

**Consider HFNP if APO**

**SBP < 160**
**DBP < 110**

**Labetolol 20 mg IV** q5 min (max 220 mg)
Then **hydralazine 5-10 mg IV** q20 min (max 30 mg)

**MgSO4 4 g bolus** (over 10 min)
**Then 1 g/hr infusion**

**Avoid excessive IV fluids**
**Use conc syntocinon**
**(40 iu / 40 mL)**

**Avoid ergometrine, ketamine, NSAIDS**

## GA

- Plan for **difficult airway** including smaller ETT sizes and VL
- **Suppress response to laryngoscopy:**
  Remifentanil 2-3 mcg/kg
  Alfentanil 20-30 mcg/kg

## Neuraxial

- Plt < 70 or rapidly falling: consider avoiding neuraxial; assess risk vs benefit
- Increase spinal dose if preterm to ensure adequate block
- No fluid loading
- No pre-emptive vasopressor

# PRE-ECLAMPSIA

ASCAR

**Call for help** | **Hands-off Team Leader** | **Mobilise Resources** | **Share Mental Model**

## Initial BP control

- **Target BP to < 160/110.**
- **Aim to reduce over 20 minutes to approx 140/90**. Continuous fetal monitoring.
- **Labetalol** 20mg IV q5 min (max 220 mg). **CI: asthma, LVEF < 30%.**
- **Hydralazine** 5-10 mg IV q20 min (max 30mg).
- **PO nifedipine 10 mg** q15-30 min.
- Consider GTN infusion if APO.

## Diagnosis

- **Pre eclampsia: SBP > 140, DBP > 90 after 20/40 gestation + one of:**
- **CNS:** Headache, visual disturbance, hyper-reflexia, clonus, seizure, CVA.
- **CVS:** APO.
- **Haem:** Platelets < 100, haemolysis, DIC.
- **Renal:** Oliguria, Cr > 90 umol/L or urine protein creatinine ratio > 30 mg/mmol.
- **GIT:** Epigastric/RUQ pain, raised transaminases > 70 iu/L.

## Investigations

- **FBC:** Check Hb, platelets, MCV, coags, G+H.
- **EUC:** Creatinine > 90 umol/L significant.
- **LFT:** Transaminases > 70 iu/L significant.
- **Uric acid:** > 0.38 mmol/L at term.

## Fluid management

- Avoid excessive IV fluids.
- Monitor UO. If oliguric, small IVF bolus.
- **250 mL bolus IV if required,** risk of APO due to increased capillary permeability.
- **If APO: GTN infusion treatment of choice:** 5 mcg/min up to max 100 mcg/min.

## Magnesium

- Indications: Neuro sequelae/eclampsia or neuroprotection for < 30/40 gestation.
- **4 g over 10 min** then 1 g/hr for 24 hours.
- Monitor: UO, RR, SpO2, BP, deep tendon reflexes.
- **CAUTION in renal impairment or oliguria (risk of toxicity).**

## Neuraxial (preferred if no CI)

PRE-OP:

- **Platelet count + coags within 3-4 hr.**
- Plt < 70 or rapidly decreasing: consider avoiding neuraxial.

INTRA-OP:

- **OK to use lignocaine + adrenaline to top up epidural.**
- **No prophylactic vasopressors** (but have infusion prepared and connected).
- **Avoid ergometrine and NSAIDs.**

POST-OP:

- **Decrease volume of syntocinon infusion.**
- 40 iu / 40 mL at 10 mL/hr (or, 40 iu / 100 mL at 25 mL/hr).

## GA

**Arterial line** if time permits

**Blunt hypertensive response to laryngoscopy**

- Remifentanil 1-2 mcg/kg
- Alfentanil 20-30 mcg/kg
- Lignocaine 1 mg/kg
- Esmolol 1 mg/kg
- Videolaryngoscope

**Cautious IVF** (use conc synto infusion)

**Diameter of ETT**

- glottic oedema may necessitate smaller ETT

**AVOID ergometrine, ketamine, NSAIDS**

# ECLAMPSIA

ASCAR

**Stop epidural**
**Consider LAST**

**Left lateral tilt, open airway**

**IV access, ABG, BSL, G+H, FBC, Coags**

**MgSO4 4 g bolus** (over 10 mins)
Then **1 g/hr infusion**
If seizure persists,
repeat bolus 2 g

SBP < 160
DBP < 110

**Labetalol 20 mg IV** q5 min
(max 220 mg)
Then **hydralazine 5-10 mg IV**
q20 min (max 30 mg)

**Midaz**

**Refractory**
Midazolam
RSI with alfentanil 2 mg

**Alfentanil**

**Continuous**
**CTG monitoring**

CTG

**Ensure**
**placental perfusion**

**Delivery**
Once seizure terminated

**CT brain**
If refractory seizure or focal neurology

# ECLAMPSIA

**Call for help** | **Hands-off Team Leader** | **Mobilise Resources** | **Share Mental Model**

## Resuscitate

- **Manual uterine displacement.**
- Open airway. Provide oxygen.
- IV access.
- 500 mL NS for medication flush only, **caution with excess fluid**.
- **Blood gas (+/- BSL).** Send FBC / EUC / LFT / Coags / G+H.

## Treat seizure

- **Magnesium 4 g over 10 min 1st line**. Repeat 2 g over 10 min if necessary.
- Seizures usually self-limiting.
- Midazolam 2-5 mg IV for prolonged seizure.
- Refractory seizures: thiopentone 5 mg/kg RSI (+ alfentanil for laryngoscopy).
- **Magnesium 1 g/hr** for 24 hr (see below).

## BP control

- Target **SBP < 160, DBP < 110.**
- **Reduce over 20 min.**
- **CTG monitoring** to ensure placental perfusion.
- **Labetalol** 20 mg IV q5 min. Max dose 220 mg. **CI: asthma, LVEF < 30%.**
- **Hydralazine** 5-10 mg IV q20 min. Max dose 30 mg.

## Plan delivery

- **CTG**. Discuss delivery with O+G.
- Screen for pre-eclampsia (PET bloods as above).
- **Consider DDx. 1/3 eclamptic seizures occur postpartum.**
- If eclampsia confirmed, **delivery should be expedited**.
- Consider **ICU admission.**

## Magnesium

**Infusion:** Continue $MgSO_4$ 1 g/hr for 24 hrs after last seizure.

**Monitoring:**

1. Vital signs
2. Urine output
3. Deep tendon reflexes

**Caution in renal impairment or oliguria.**
Monitor plasma levels due to risk of toxicity.

Treat magnesium toxicity with **CaCl or Ca gluconate**.

## Differential Diagnosis

**Cerebrovascular:**
Venous sinus thrombosis, SAH, CVA, tumor, AVM

**Metabolic:**
Hyponatraemia, hypoglycaemia, hypoxia

**Infectious:**
Meningitis, encephalitis

**Substance abuse / withdrawal:**
Cocaine, opioids, alcohol

**Epilepsy:**
Poorly controlled, missed medications

**CT brain if refractory seizure or focal neurology**

# TOTAL SPINAL

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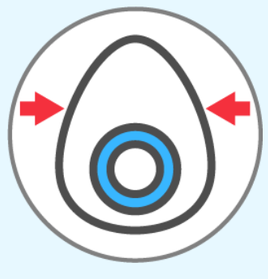
2222

**Call 2222**
**Maternal Arrest**

**Oxygenate**
**Prepare to intubate**



Ad

Atropine

## Cardiac Output

**Atropine 600 mcg**
**Ephedrine 6-9 mg**
**Adrenaline 50 mcg aliquots**

## Preload

**Manual uterine displacement**
**Fluid loading**
**Legs up (not head down)**

Thio / Propofol

Sux / Roc

## RSI

**Consider midazolam**

## Stop epidural

## Consider differentials

Aorto-caval compression, vasovagal, embolic, anaphylaxis, haemorrhage, LAST

# TOTAL SPINAL

**Call for help** | **Hands-off Team Leader** | **Mobilise Resources** | **Share Mental Model**

## Diagnosis

- Hypotension, bradycardia (T1-T4).
- Poor cough, slurred speech.
- Hypoxia, apnoea.
- Paraesthesia, upper limb weakness.
- LOC.
- **Onset may be delayed. Always consider differential diagnosis (see below).**

## Resuscitate

- Call Maternal Arrest **("2222")**. If cardiac arrest, start CPR.
- **Stop epidural infusion.**
- Manual uterine displacement.
- Airway: **RSI + cricoid – caution with induction dose.**

## CVS support

- Atropine **600 mcg IV or ephedrine 6-9 mg**.
- **IV adrenaline 10-100 mcg** for profound bradycardia/hypotension (0.1-1.0 mL 1:10,000).
- Fluid bolus.
- **Elevate legs** (NOT head down; may result in further cranial spread).

## Fetal wellbeing

- **Stabilise mother as priority** over delivery of fetus.
- Continuous fetal monitoring.
- Liaise with O+G.
- May require urgent C-section if evidence of fetal compromise.

## Stabilise

- Exclude other causes (see below).
- **Ventilation and sedation until spinal regresses (may take 2+ hrs)**
- Continuous fetal monitoring.
- Document and debrief.

**Risk of high block after failed epidural top-up and conversion to spinal**

### Risk Factors

- LA dose
- Patient
  - High BMI
  - Multiple gestation
  - Polyhydramnios
  - Anatomical
- Technique
  - High insertion level

### Differential Diagnosis

- **CVS:** Aortocaval compression, vasovagal, embolism (AFE/VAE/CVA/PE), anaphylaxis, haemorrhage
- **CNS:** SAH, eclampsia
- **Toxicity:** LAST, magnesium toxicity

# LAST (LA SYSTEMIC TOXICITY)

ASCAR

2222

**Call 2222 – "Maternal Arrest"**
**Manual uterine displacement**

**STOP EPIDURAL**


**Intralipid 20%**
Give **1.5 mL/kg** bolus and start **infusion at 15 mL/kg/hr**.


**At 5 and 10 mins**
Can give **further 1.5 mL/kg** boluses and increase **infusion to 30 mL/kg/hr**.

**Do not exceed 12 mL/kg**

**Typical values for 70 kg:**
**1.5 mL/kg:** 100 mL
**15 mL/kg/hr:** 1000 mL/hr
**30 mL/kg/hr:** 2000 mL/hr

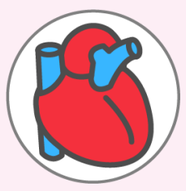
**Early intubation. 100% O2.**
**Do not hyperventilate.**

**Cardiac Arrest?**

Follow **ALS algorithm and perform CPR**
**Use <1 mcg/kg of adrenaline** (e.g., 50-100 mcg boluses)
**Perimortem C-section** (delivery by 5 mins)

Ad

## ECMO



Call Perfusion +
Cardiothoracics early.

## Do not use

High dose adrenaline
High dose propofol
Lignocaine
B-blockers
Ca blockers
Vasopressin

## Seizures

Midaz

Benzodiazepines 1st line.
Monitor for 2-6 hrs.

# LAST (LA SYSTEMIC TOXICITY)

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**Call for help** | **Hands-off Team Leader** | **Mobilise Resources** | **Share Mental Model**

## Recognise

- **May occur some time after injection. High index of suspicion.**
- **CNS:** Tinnitus, peri-oral paraesthesia, metallic taste, blurred vision, dizziness, agitation, confusion, muscle twitching, seizures, reduced level of consciousness, coma.
- **CVS:** Tachycardia, hypertension, arrhythmia, hypotension, bradycardia, conduction block, cardiac arrest.

## Resuscitate

- **Stop epidural infusion. Call for help. Manual uterine displacement.**
- **100% O2. Advanced airway if required. Avoid hyperventilation.**
- **IV access +/- arterial line. Apply defib pads. Take bloods early.**
- **Ensure intralipid available.**

## Isolated CNS

- **Benzodiazepines 1st line** for seizures.
- **Avoid large doses of propofol.**
- **Monitor** for at least **2 hours** after an isolated CNS event.
- Continuous fetal monitoring.

## CVS Disturbance

- **Consider intralipid if event deemed potentially serious**.
- **Treat haemodynamics as per ALS guidelines**.
- **Amiodarone 1st line** anti-arrhythmic agent.
- Avoid drugs listed below.
- **Monitor for at least 6 hours** after isolated CVS event.

## Intralipid 20%

- 1.5 mL/kg bolus (**100 mL for patient > 70 kg**).
- Then start 15 mL/kg/hr infusion (i.e., **1000 mL/hr for patient > 70kg**).
- **At 5 min:** can repeat 1.5 mL/kg bolus and double infusion rate (to 30 mL/kg/hr).
- **At 10 min:** can repeat 1.5 mL/kg bolus.
- Max dose is **12 mL/kg (840 mL for 70 kg patient)**, typically smaller doses needed.

## Cardiac Arrest

- Call 2222. **Declare Maternal Arrest**.
- **Start CPR**. Effective CPR essential for intralipid to work.
- Secure airway. **Do not hyperventilate.**
- Reduced-dose **adrenaline < 1 mcg/kg.**
- Obstetric team **perimortem C-section,** aim incision 4 mins, delivery by 5 mins.
- Alert **Perfusion + Cardiothoracics** early.

### Avoid drugs

- High dose propofol
- Lignocaine
- B-blockers
- Calcium channel blockers
- Vasopressin

### Dilute adrenaline

- Draw up **1 mg adrenaline** (10 mL of 1:10,000) in 20 mL syringe.
- Dilute to 20 mL with saline.
- **1 mL = 50 mcg adrenaline.**

### Differential diagnosis

- **CVS:** Aortocaval compression, vasovagal, embolism (AFE/VAE/CVA/PE), anaphylaxis, haemorrhage.
- **CNS:** SAH, eclampsia
- **Toxicity:** LAST, magnesium toxicity.

# NON-OBSTETRIC SURGERY

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CTG

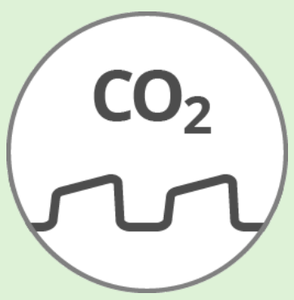
**Discuss with O+G and NICU**

Timing / trimester / steroid cover (24-34 weeks)

Pre/post CTG or FHR monitoring

GA / LA / regional anaesthesia

**Consider RSI**
**VL suggested**




**ETCO2 25-30**

**SBP**
**At baseline**

**Placental Perfusion**

## Caution with drugs

- NSAIDS

**Consider risk-benefit and trimester**

NB. Midazolam, ondansetron, N2O in clinical doses are acceptable

## Reversal strategies

- Use neuromuscular monitoring
- Neostigmine with atropine / glycopyrrolate
- Do NOT use sugammadex

# NON-OBSTETRIC SURGERY

ASCAR

**Call for help** | **Hands-off Team Leader** | **Mobilise Resources** | **Share Mental Model**

## Discuss

- **Discuss** with O+G and NICU.
- Does patient need to be transferred to a **different centre?**
- Can surgery be done under **LA / regional anaesthesia?**
- Would it be safer to **defer surgery** (e.g., to 2nd trimester)?
- Is **steroid cover required (24-34 weeks)?**
- Are **pre/post FHR monitoring** and/or intraoperative CTG required?

## Drugs

- Organogenesis (15-56 days) is highest risk time.
- Midazolam, ondansetron, and N2O have no teratogenic potential at clinical doses.
- **Avoid NSAIDs.**

## Airway

- **RSI recommended after 14/40.**
- However, gastric emptying unlikely to be prolonged outside of labor.
- Airway may be difficult – use **VL as 1st line.**
- **Ablate airway reflexes** if history of pre-eclampsia (refer pre-eclampsia card).

## Perfusion

- Ensure placental perfusion: avoid hypoxia, hypercarbia, acidosis.
- NB. respiratory alkalosis of pregnancy: aim for **PaCO2 32-34 mmHg** (on ABG).
- If using **ETCO2, aim 25-30 mmHg.**
- Aim to keep **SBP within 10% of baseline**, consider arterial line.
- **Left lateral tilt 15-30° if surgery allows.**

## Reversal

- If neostigmine used, **combine with atropine or glycopyrrolate.**
- **Sugammadex not licensed in pregnancy – do NOT use.**
- However this should be balanced with the risk of incomplete reversal.

## Document

- Ensure high quality documentation including **consent and decision making.**
- Document **pre/post CTG** and/or fetal heart rate.

## DVT Prophylaxis

- High importance – pregnancy is hyper-coagulable state.
- Full intra-operative and post-operative precautions.

## Operative considerations

- Minimise uterine manipulation.
- Minimise laparoscopic pressures (aim 12-15 cmH2O).
- If hypotensive anaesthesia or hyperventilation required (e.g. NSx), consider intra-operative fetal monitoring.
- Consider intra-operative fetal monitoring if a) fetus is viable, b) physically possible c) obstetrician willing and able to intervene, d) patient consented for Em-LSCS e) planned surgery can be interrupted safely.

# JW FOR LSCS

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**Pre-op**

Optimise haematinics (IV iron, EPO, Fol/B12). **Involve haematology.**
Document risks, consent / lack thereof to **EACH PRODUCT** below.
Identify and document risk factors for PPH.

## Usually refused

Red cells
FFP
Platelets
Own stored blood
Cell salvage (without circuit completion)

## Usually allowed

Cryoprecipitate
Fibrinogen
TXA
Prothrombinex
Recombinant factors
Albumin
DDAVP
Biostate (vWF)
Cell salvage

## Cell Salvage

Plan with Perfusion.
Complete the circuit using giving set.
Consider PV losses.

## Staff, Time, Place

Consultant presence.
2nd surgeon available?
Main OT > Birth Unit.

## Products

Utilise products above that are documented as "allowed".

## Uterotonics

Treat atony aggressively.
Cycle through options rapidly.

## Warming

OT temperature,
Bair huggers and fluid warmers.

## Prophylactic TXA

Bolus + infusion,
irrespective of
blood losses.

## Aortic occlusion

Consider EARLY

## Hysterectomy

Consider EARLY

## RSI

Paralysis + ventilation
to minimise
O2 consumption

# CARDIAC OBS PLANNING TOOL

ASCAR

## SELECT GOALS:

**Rate & Rhythm** | **Preload** | **Contractility** | **Afterload** | **PVR**

## FOUNDATION:

### Risk Stratification

- CAPREG I and CAPREG II scores
- WHO risk stratification
- Multi-disciplinary review
- Involve cardiac anaesthetist

### High risk lesions

- Pulmonary arterial hypertension
- Eisenmenger's
- Severe mitral stenosis
- Severe aortic stenosis
- Cardiomyopathy, EF < 30%, NYHA 3/4
- Coarctation
- Aortopathy (Marfans AD > 45 or biscupid valve AD > 50)

### Preparedness + Monitoring

- Arterial line and 5-lead ECG
- Central line for vasopressors + CVP monitoring
- TTE / TOE intrapartum
- Defibrillator pads
- Supplemental oxygen
- Uppers and downers as needed

### Medications

- Continue beta-blockers if advised
- Safe interval planning with anti-coagulation if neuraxial anaesthesia planned

## CONSIDER ISSUES + SOLUTIONS:

| **Autotransfusion** | **Caval compression** | **Pain** | **Pushing** |
|---|---|---|---|
| Increases preload | Reduces preload | Tachycardia + hypertension | Valsalva, Reduces preload |
| **Elective Caesarean** | **Uterine displacement**<br>**Avoid supine position** | **Excellent analgesia** | **Excellent analgesia**<br>**Assisted 2nd stage** |

| **Ergometrine** | **Syntocinon** | **Carboprost** | **Neuraxial** |
|---|---|---|---|
| Hypertension + coronary spasm | Hypotension + tachycardia | Increases PVR | Reduces SVR |
| **Avoid ergometrine** | **Infusion only**<br>**Avoid bolus** | **Avoid carboprost** | **Careful titration** |

| **Fluid overload** | **Blood Loss** | **Bubbles** | **Vasopressors** |
|---|---|---|---|
| Increases Preload | Reduces Preload + Oxygen Delivery | Air Embolism | Hypertension |
| **Concentrated infusions**<br>**Strict fluid balance** | **Pharm + Non-pharm**<br>**Cell salvage** | **LOR to saline**<br>**Caution with IV lines** | **Avoid prophylactic use** |

# MAGNESIUM

ASCAR

## Indications

**Neuro-irritability** **Eclampsia** **Fetal neuroprotection < 30/40**

## Administration

**Bolus**

20 mmol = 5 g in 10 mL
Slow **push over 10 min**

Repeat if 2nd seizure

**Infusion**

40 g MgSO4 in 500 mL H2O (pre-mix)
Infuse at **12.5 mL/hr** = 1 g/hr

Continue for 24 hrs

## Monitoring

**Tendon reflexes**

Plasma levels (only if oliguric / AKI, aim 2-3 mmol/L)

## Toxicity

**SIGNS:**

1. Areflexia
2. Respiratory depression
3. ECG changes


Stop infusion


CaCl 10 mL or
Ca gluconate 30 mL

# ROTEM GUIDE

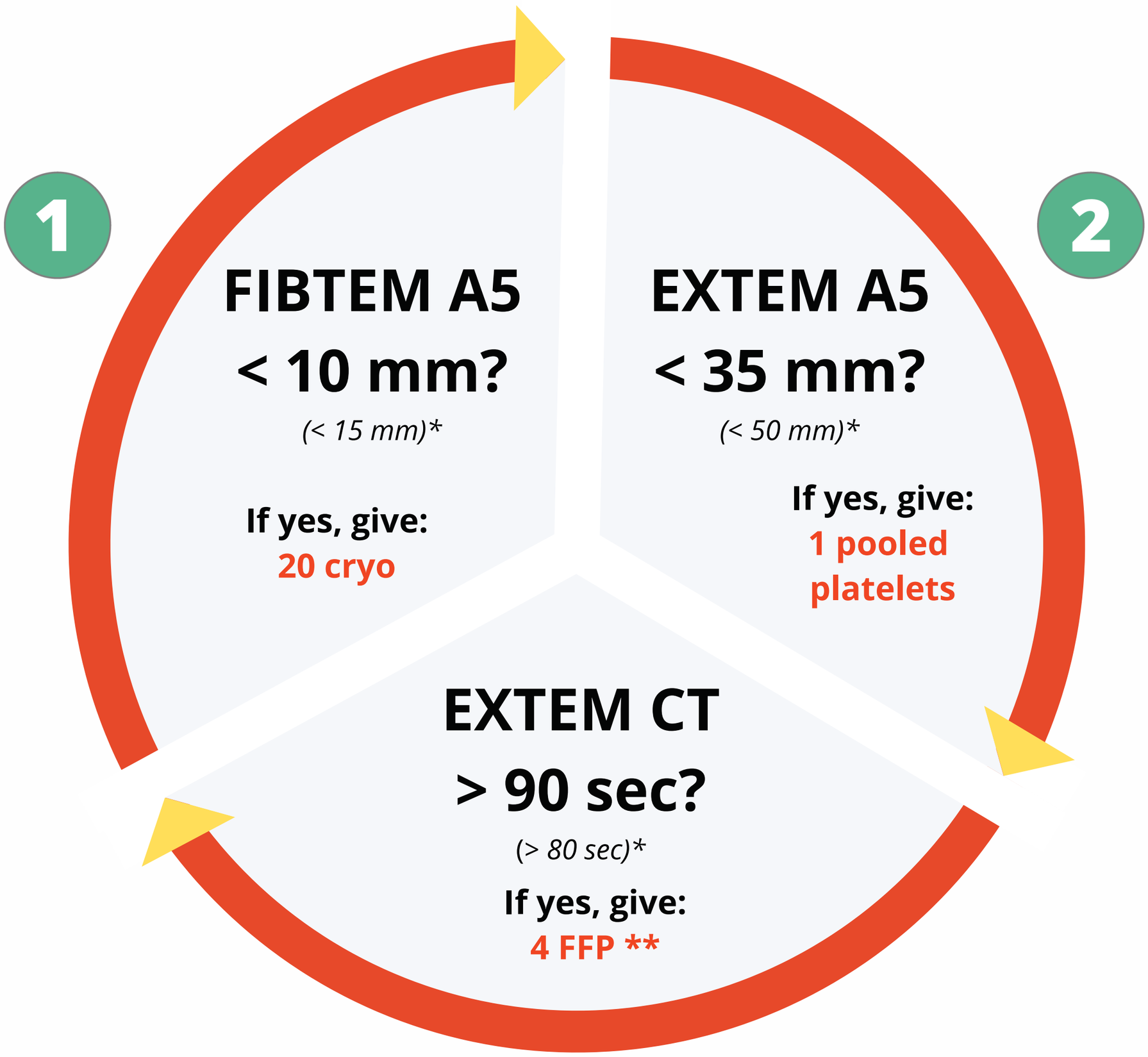
ASCAR

## Non-cardiac surgery

## If TXA not given already, give 1 g

## Is there still significant bleeding?

If yes, treat each variable before moving on to the next




## *If refractory bleeding, aim for *thresholds in brackets*

****Alternatively consider 10 iu/kg of prothrombinex**

Re-test ROTEM 10 mins after each intervention complete

# MATERNAL CARDIAC ARREST

ASCAR

## Call 2222 – "Maternal Cardiac Arrest"

# CPR + DEFIB

## Aim ETCO2 > 20 mmHg

**Manual uterine displacement**

## Non-shockable

Adrenaline **1 mg stat*** & every other cycle

## Shockable

Adrenaline **1 mg after 2nd shock**
Amiodarone **300 mg after 3rd shock**

**100% O2** | **Stop ALL infusions & anaesthesia** | **IV above diaphragm** | **Alert ECMO**

## 4Hs

**H** – hypoxia
**H** – **haemorrhage**, hypovolaemia
**H** – hypoK, hyperK, **hyperMg**
**H** – hypothermia

## 4Ts

**T** – thrombosis, **AFE**
**T** – toxins, **Mg, LAST*, total spinal**
**T** – tension PTX
**T** – tamponade

***LAST cardiac arrest:** use adrenaline dose < 1 mcg/kg (not 1 mg)
Utilise LAST cognitive aid

## Perimortem C-Section

**Incision by 4 mins**

**Delivery by 5 mins**

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