Severe Pre Eclampsia and Eclampsia - UHL Obstetric Guideline

University Hospitals of Leicester NHS Trust

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"Currently UHL utilises the terms ‘woman’ and ‘women’ within their obstetric and maternity guidelines but these recommendations will also apply to people who do not identify as women but are pregnant or have given birth."

Contents

1. Introduction and Who Guideline applies to

This guideline is intended for use when any woman with a diagnosis of pre-eclampsia is transferred to Delivery Suite for intensive monitoring after discussion with senior staff, and where one of the following three criteria is met:

1.

a) Headache not relieved with simple analgesia
b) Visual disturbances
c) Clonus (≥3 beats), Hyper reflexia
d) Platelet count less than 100 x 10^9, ALT greater than 70 iu/L (consider HELLP)
e) Epigastric pain, vomiting

2.

Severe hypertension (Systolic Blood Pressure greater or equal to 160 mmHg or Diastolic Blood Pressure greater or equal to 110 mmHg) with proteinuria (greater or equal to 0.3g/day or more than or equal to 2+)

3.
Eclampsia (convulsions associated with pre-eclampsia)

If any of the above criteria are met, inform:

- Obstetric Consultant on call
- Anaesthetist on call for Delivery Suite
- Obstetric Senior registrar/Registrar
- Neonatal team (in case of prematurity)

Related UHL documents:

- Enhanced Maternity Care UHL Guideline
- Intrapartum Care and Fetal Heart Rate Monitoring in Labour UHL Obstetric Guideline
- Maternity Early Obstetric Warning Scoring System
- Hypertension in Pregnancy UHL Obstetric Guideline

2. Guideline Standards and Procedures

2.1 Monitoring:

- Level 2 (high dependency) observations should be recorded
- Commence MEOWS (Modified Early Obstetric Warning Scoring System) monitoring
- Patient should be fasted
- Consider Omeprazole 40mg Intravenously
- Use anti-embolic stockings

Blood pressure measurements:	- Record blood pressure every 15 minutes on HDU chart. - Start antihypertensive treatment if the systolic blood pressure exceeds 160mm Hg or if the Mean Arterial Pressure is greater than 125 mmHg on two readings, or one reading greater than 140 mmHg. (see 2.2).
Fluid intake:	- The standard intravenous regime is 85 ml/hr (this includes oxytocin administration) unless there are other fluid losses (e.g. haemorrhage, vomiting etc.)
Urine Output:	- All patients to be catheterised, one hourly urine output measurement - Inform the Senior Registrar if the output is less than 30 ml in a one hour period.

Bloods:	- 6 hourly to include full blood count, (and coagulation screen if platelet count less than 100), Urea and Electrolytes, Liver Function Tests, and Group and Save. - Blood film and LDH for haemolysis should be carried out on admission to exclude HELLP.
If concerns about urine output, consider Central Venous Pressure (CVP):	- Record hourly. - The anaesthetist is responsible for the insertion and subsequent care of the CVP line. - CVP should be less than 8mmHg
Continuous CTG	In women who are 26 weeks or above (unless stated otherwise in the intrapartum careplan). In women who are less than 26 weeks the fetal heart should be auscultated on admission, subsequent fetal monitoring should be discussed with the on call obstetric consultant

2.2 Antihypertensive treatment:

In women who meet the criteria for severe hypertension requiring intravenous therapy (see flow charts on pages 6 and 7) the first drug of choice is arbitrarily intravenous Labetalol. Intravenous Hydralazine may be used as an alternative, especially if Labetalol is contra-indicated OR the woman is already on maximum oral labetalol OR maximum IV dose of Labetalol not controlling hypertension.
There is no evidence that intravenous Labetalol is superior to intravenous hydralazine.[1,2,3]

- Give initially oral Nifedipine MR 20mg or labetalol 200mg if already on maximum dose of Nifedipine. If no response after 30 minutes or cannot tolerate oral therapy, give intravenous regime.

Intravenous Labetalol:

Contraindications:Asthma, overt cardiac failure, bradycardia, heart block. Avoid in type 1&2 Diabetes.

- Women receiving intravenous Labetalol should be in the left lateral position during the infusion and for 3 hours afterwards.
- Draw up 40 ml Labetalol (5 mg/ml). Start infusion at 20 mg/hr, and double every 30 minutes, until a satisfactory response (Mean Arterial Pressure (MAP) less than 120 mmHg), to a maximum infusion rate of 160 mg/hr. Aim for a MAP of 100 mmHg.
- If MAP is between 70 and 100 mmHg, reduce the infusion by 20 mg/hr every 30 minutes, until the MAP stabilises at 100 mmHg.
- If the MAP is less than 70 mmHg discontinue the infusion and inform the Obstetric Anaesthetist and Senior Registrar.

Intravenous Hydralazine:

If Labetalol is contra-indicated or maximum dose of **oral** labetalol is not controlling hypertension:

- **Fluids** - Consider 250 ml crystalloid before the first dose of IV hydralazine if antenatal given over 20 mins, if ≥ 26/40 commence electronic fetal monitoring as IV antihypertensives can induce CTG abnormalities, this is more likely with IV hydralazine.
- **Initial bolus of hydralazine** – 2.5 mg over 5 min
- **Repeat boluses of hydralazine** – 2.5 mg every 20 minutes, to a maximum cumulative dose of 15 mg OR heart rate more than 120 bpm.
- **Hydralazine Infusion** - 40 mg in 40 ml Normal Saline: start at 10 mgs/hr and double every 30 min until satisfactory response to maximum 40 mg/hr, tachycardia (greater than 120 bpm) or side effects (headache, flushing, dizziness).

2.3 Magnesium sulfate administration:

Magnesium sulphate should be considered for all women with severe pre- eclampsia (and if antenatal in whom delivery is planned).

Loading Dose	4g of Magnesium sulfate infused intravenously over 10 minutes. (draw up 20ml of 20% magnesium sulfate into a syringe and infuse via a syringe pump at 120ml/hr) to be administered by a doctor.
Maintenance Dose	Intravenous infusion of 1g/hour of Magnesium Sulfate (draw up 20% magnesium sulfate into a 50ml syringe and infuse via a syringe pump at 5ml/hour)
Cautions	Cardiac disease, renal failure Nifedipine should be used with caution in combination with magnesium sulphate to avoid precipitous fall of maternal blood pressure. Should they be administered simultaneously the magnesium sulphate bolus dose can be slowed down
Duration of infusion	Continue infusion for 24 hours post delivery or for 24 hours after starting. Duration of treatment should rarely exceed 24 hours. (NB THE MAJORITY OF ECLAMPTIC FITS OCCUR WITHIN THE FIRST 24 HOURS OF DELIVERY
Monitoring	• Patellar reflex After completion of loading dose, then 4 hourly Use arm reflexes in women with an epidural • Hourly urine output • ECG - Mandatory during and for one hour after loading dose • Continuous Pulse oximetry • Hourly respiratory rate ***All observations MUST be recorded on the high dependency chart ***

2.4 Management of eclamptic seizures:

Magnesium sulfate is the drug of choice for the treatment and subsequent prophylaxis of eclamptic seizures.

MANAGEMENT OF AN ECLAMPTIC FIT	
In the event of a SEIZURE	• Turn to left lateral and give facial oxygen (remember: **A**irway / **B**reathing / **C**irculation) • Ring emergency buzzer and get help (anaesthetist, senior obstetrician, core midwife) • Ensure safety of patient e.g. bed sides • IV access, bloods (U&Es, LFTs, Blood glucose, calcium, magnesium, full blood count, clotting, Group and Save) • Call consultant obstetrician • Inform consultant anaesthetist • Exclude other causes for seizure e.g. epileptic seizure in woman with a history of epilepsy • Commence magnesium sulfate (see regimen below) • Commence continuous CTG or auscultate fetal heart (if less than 26 weeks) once patient stabilised • Consider mode and timing of delivery after discussion with consultant anaesthetist and consultant obstetrician once patient is stabilized. • Document actions taken • Complete incident form once patient stable • Keep woman nil by mouth
Loading Dose	4g of Magnesium sulfate infused intravenously over 10 minutes. (draw up 20ml of 20% magnesium sulfate into a syringe and infuse via a syringe pump at 120ml/hr)
Maintenance Dose	Intravenous infusion of 1g/hour of Magnesium Sulfate (draw up 20% magnesium sulfate into a 50ml syringe and infuse via a syringe pump at 5ml/hour)
If convulsions recur	Additional 2g Magnesium sulfate intravenously over 5 min (If possible take blood for Magnesium level prior to additional bolus) Consider other causes e.g. hypoglycaemia, intracranial If further seizures occur despite above consider:- Consider ITU transfer & Thiopentone infusion If Magnesium level < 2.0 mmol/L restart maintenance dose at 2 g/hr.
Caution	Cardiac disease, renal failure
Duration of infusion	Continue infusion for 24 hours post delivery or for 24 hours after starting. Duration of treatment should rarely exceed 24 hours. (THE MAJORITY OF ECLAMPTIC FITS OCCUR WITHIN THE FIRST 24 HOURS OF DELIVERY)

Monitoring	• Patellar reflex After completion of loading dose, then 4 hourly Use arm reflexes in women with an epidural • Hourly urine output • ECG - Mandatory during and for one hour after loading dose (however in an emergency the absence of cardiac monitoring should not preclude/ delay administration of the loading dose) • Continuous Pulse oximetry • Hourly respiratory rate ***All observations MUST be recorded on the high dependency chart ***

2.5 Monitoring of magnesium levels:

In the presence of signs of toxicity, magnesium levels should be ascertained.

Experience from the Collaborative Eclampsia and Magpie Trials indicates that magnesium sulfate (according to the above regimen) can be used safely without the need to monitor any levels. [3,6] Magnesium is excreted by the kidneys and toxicity is more likely if there is oliguria (urine output less than 100 ml over 4 hrs) or urea greater than 10 mmol/L - halve the dose and check Magnesium levels.

Signs of toxicity are extremely uncommon and correlate with magnesium levels:	**Magnesium level (mmol/L)**
Therapeutic range	2-4
Loss of reflexes, weakness, nausea, feeling of warmth, flushing, somnolence, double vision, slurred speech	5
Muscle paralysis, respiratory arrest	6-7.5
Cardiac arrest	>12

Management of magnesium toxicity:	
Loss of patellar / biceps reflex	1. Stop maintenance infusion 2. Check Magnesium level 3. Withhold Magnesium until patellar reflexes return or Magnesium level known ǂ
PaO_2 persistently <94%	1. Commence oxygen, check patellar reflex, inform Anaesthetist 2. If reflex present – exclude other causes (e.g. respiratory depression due to opiates or pulmonary oedema) 3. If reflex absent – see above

Cardiorespiratory arrest	1. Stop maintenance infusion 2. Cardiopulmonary resuscitation 3. Administer 10 ml 10% Calcium Gluconate intravenously 4. Intubate immediately and manage with assisted ventilation until resumption of spontaneous respirations 5. if possible check Magnesium level
+ Once tendon reflexes return, if Magnesium level less than 4 mmol/L restart maintenance dose at 0.5 g/hr and recheck levels in 3 hrs.	

2.6 Mode and timing of delivery:

Mode and timing of delivery should be discussed with the consultant on call in all cases of eclampsia and in antenatal or intrapartum patients with severe pre-eclampsia where delivery is not imminent.

- The decision to deliver should be made once the woman is stabilised.
- If the fetus is less than 34 weeks gestation and delivery can be deferred, corticosteroids should be given, although after 24 hours the benefits of conservative management should be reassessed.
- Conservative management of early gestation should be balanced with maternal wellbeing.
- Mode of delivery is dependent on presentation of the fetus, fetal wellbeing and likelihood of success and maternal condition.

2.7 Transfers to ITU:

Transfer to the Intensive Therapy Unit should be considered in the following situations:

- Recurrent seizures
- Mean arterial pressure greater than 125 mmHg despite intravenous Labetalol and / or Hydralazine (after delivery)
- Persistent oliguria with normal / high Central Venous Pressure
- Pulmonary oedema with oliguria
- Compromised myocardial function

See Enhanced Maternity Care UHL Guideline for details of transfer to ITU.

2.8 Platelet count monitoring and management:

If the platelet count is less than 50 x 10^9/L a platelet transfusion should be considered for operative delivery, in consultation with a Haematologist.

- A platelet count less than 100 x 10^9/l (or rapidly falling count) warrants a baseline clotting screen.[13] **Consult Haematologist early** where there is clinical or haematological evidence

of Coagulopathy. If a platelet infusion is indicated as above, one adult dose of platelets should be administered prior to incision, plus a further adult dose at uterine closure.

- A low **fibrinogen** is an important indicator of Disseminated Intravascular Coagulation.[14]

- Cryoprecipitate should be given if fibrinogen is less than 1.0 g/l. Fresh frozen plasma should be used to correct a prolonged PT or APTT.

2.9 Postnatal monitoring:

Postnatal monitoring should be continued once patient warded and discharge care plan put in place.

Post-delivery care:

- Inform the hypertension team. The team will assess the appropriateness of the home BP monitoring (See postnatal management of pre-eclampsia in the Hypertension in Pregnancy UHL Obstetric Guideline)

- Maintain adequate analgesia & use anti-embolic stockings and Low Molecular Weight Heparin thromboprophylaxis (if PCR ≥300, consider low molecular weight heparin (LMWH) for 2 weeks, then repeat PCR before discontinuation).

- Diclofenac / Non-Steroidal Anti-Inflammatory Drugs to be avoided until the renal function, urine output and clotting profile has normalized.

- All women should remain on Delivery Suite for a minimum of 24 hours after delivery.

- Please ensure that when patient is transferred to the ward the staff are made aware of the need to monitor blood pressure 4-hourly.

- Clear follow up arrangements should be in place at discharge, including communication of fina diagnosis to GP, need for further blood pressure monitoring and/or drug treatment, as well as the need for follow up where clinically appropriate.
  Complete postnatal discharge information (appendix 5 in Hypertension in pregnancy Guideline)

- Follow postnatal pre-eclampsia management in the Hypertension guideline.

- Patients with severe pre-eclampsia will be followed up by the Hypertension Team

3. Education and Training

None

4. Monitoring Compliance

None

5. Supporting References

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6. Key Words

Eclampsia, pre-eclampsia, recurrent seizures, Nifedipine, Labetalol, Hydralazine, Magnesium sulfate

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The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

DEVELOPMENT AND APPROVAL RECORD FOR THIS DOCUMENT			
Original Author Job Title:	Paul Bosio Consultant Obstetrician	**Executive lead:** **Chief Nurse**	
Reviewed by:	Cornelia Wiesender		
Approved by:	Maternity Service Governance Group	**Date Approved:**	

REVIEW RECORD			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
June 2020	3	Cornelia Wiesender	Minor changes made. Postnatal follow up amended, signposted to Postnatal Pre-eclampsia guideline.
October 2022	4	Cornelia Wiesender	• Section 2.2 added - if ≥ 26/40 commence electronic fetal monitoring as IV antihypertensives can induce CTG abnormalities • Section 2.3 magnesium sulfate administration guidance updated • Added cautions when used alongside nifedipine. • Clarified duration of infusion guidance • Removed appendix 4 (CVP flowchart)

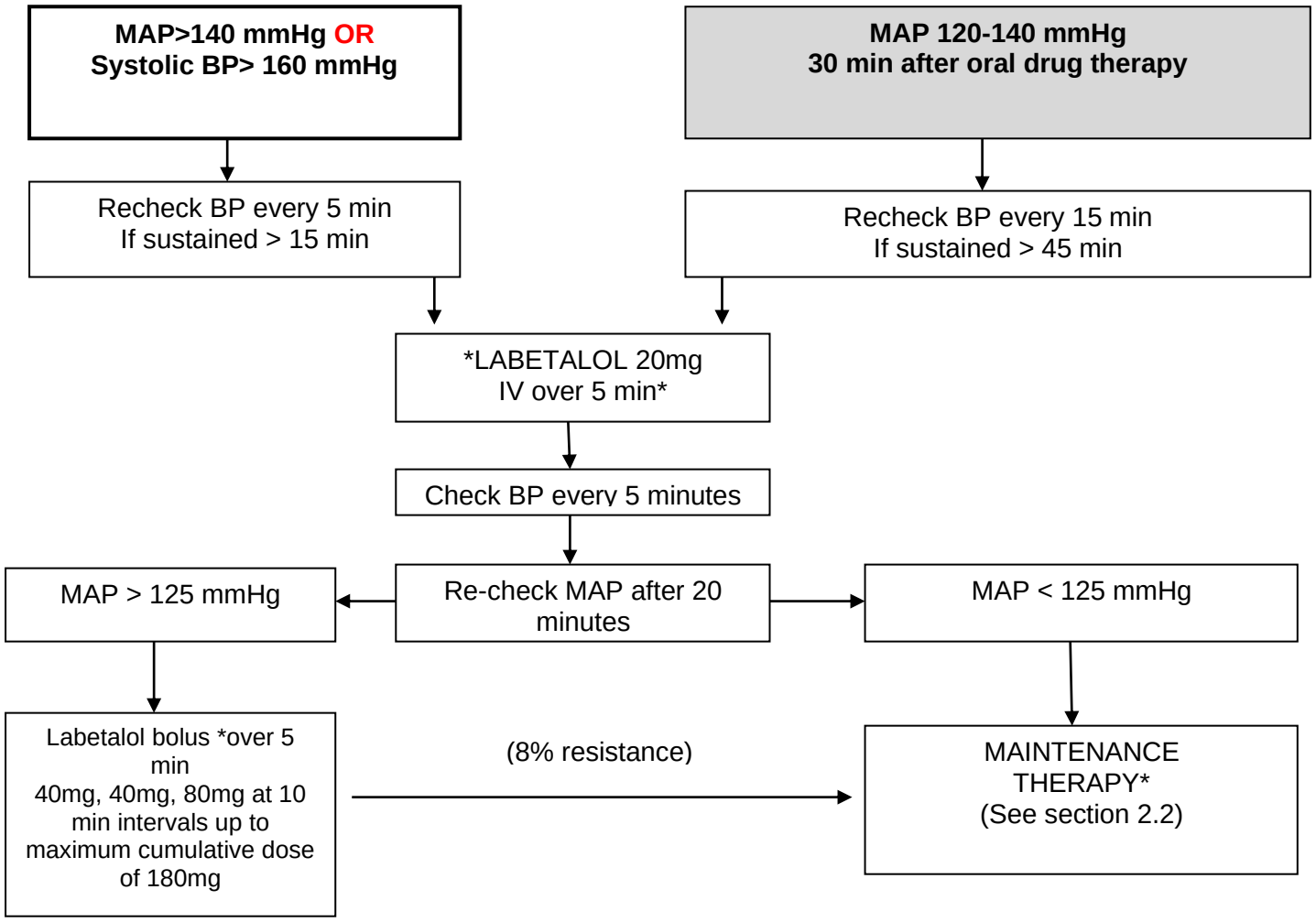
Appendix 1: Antihypertensive Therapy Guideline - LABETALOL

Mean Arterial Pressure (MAP)>140 mmHg is asscoiated with arterial injury, a loss of cerebral auto regulation and a progressively increasing risk of cerebral haemorrhage.

MAP>120mmHg OR systolic BP> 160mmHg constitutes an obstetric emergency

MAP = DMP + 1/3 (SBP-DBP)

MAP 120 – 140 mmHg (SBP~> 160mmHg DBP~> 100 mmHg)	• Oral Nifedipine MR 20mg • If the woman is already on the maximum dose of Nifedipine, Labetalol should be given • Check BP every 5 minutes for 15 minutes: if normal commence maintenance therapy as per guideline. • If MAP>120 mHg OR systolic > 160 mmHg 30 min post oral treatment commence IV guideline



- Hydralazine to be given if Labetalol contra-indicated OR maximum dose of Labetalol not controlling hypertension (I.e. Mean arterial pressure remaining greater than 125 mmHg Or the woman is already on maximum dose or oral Labetalol)

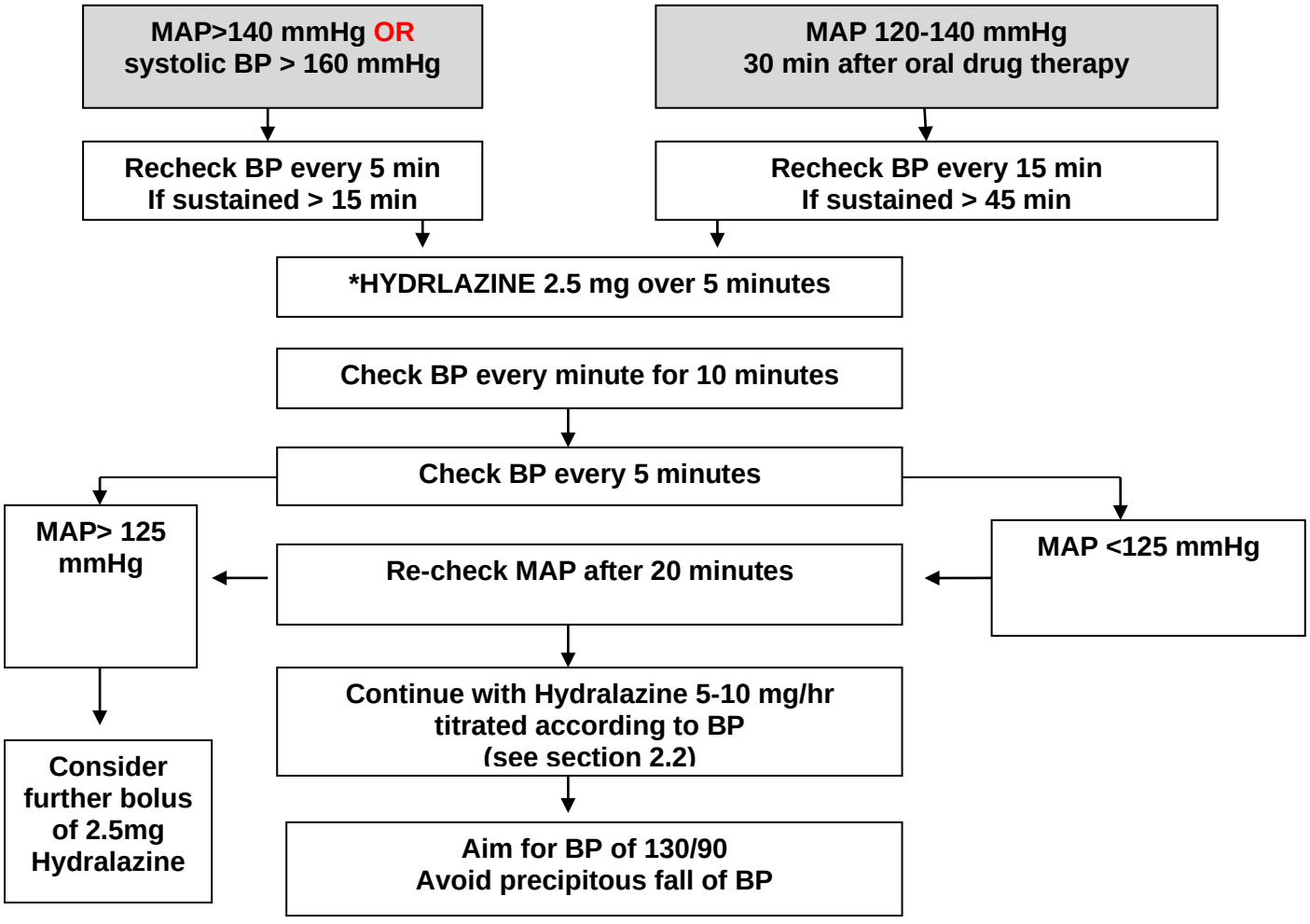
Appendix 2 Alternative Antihypertensive Therapy Guidelines – HYDRALAZINE

Mean Arterial Pressure (MAP_ > 140 mmHg or systolic BP > 160 mmHg is associated with arterial injury, a loss of cerebral autoregulation and a progressively increasing risk of cerebral haemorrhage.

MAP > 120 mmHg OR systolic BP > 160 mmHg constitutes an obstetric emergency

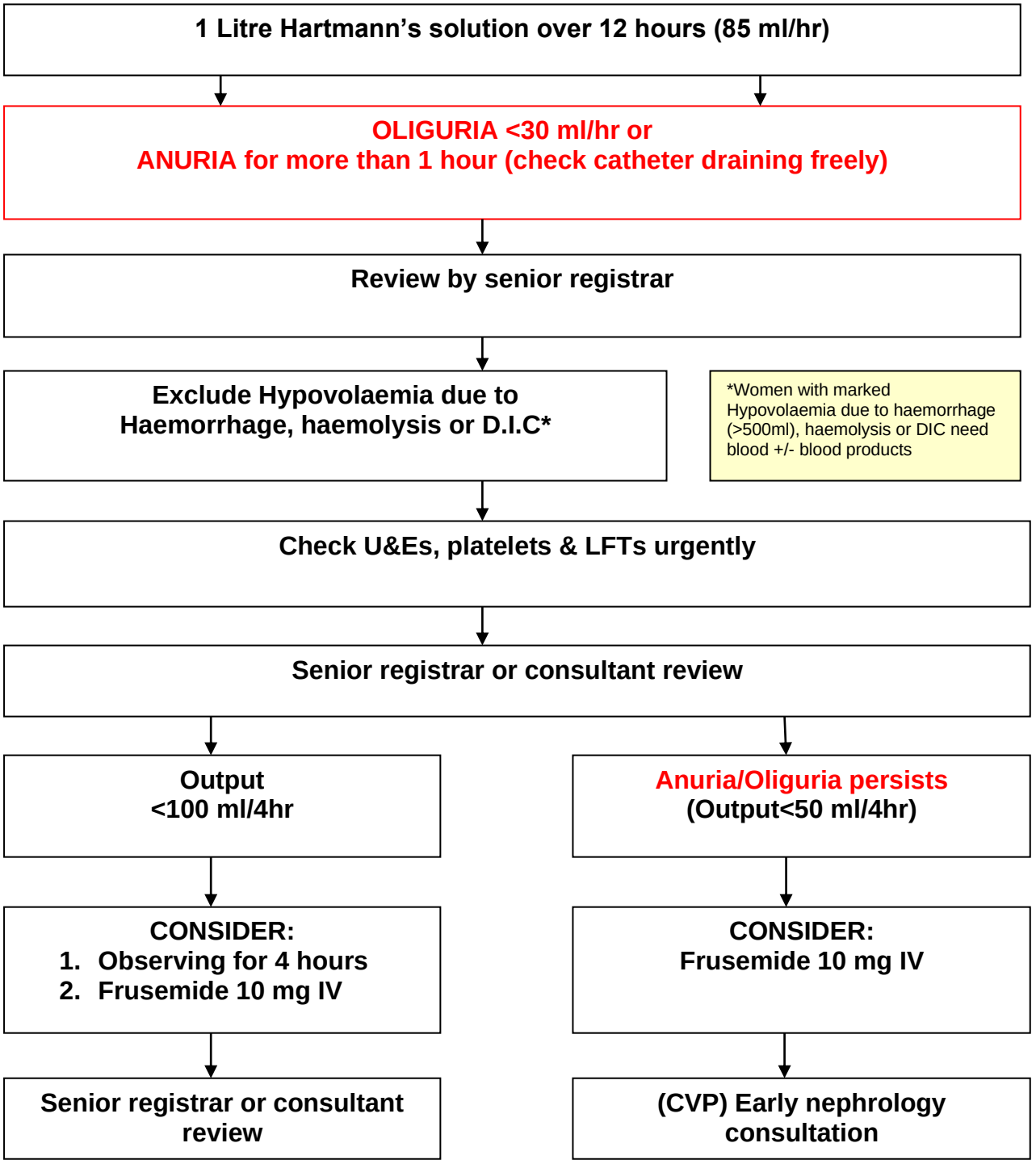
MAP = DBP + 1/3 (SBP-DBP)

MAP – 120-140 mmHg (SBP~> 160 mmHg DBP~> 100mmHg)	• Oral Nifedipine MR 20 mg • If the woman is already on the maximum dose of Nifedipine, Labetalol should be given • Check BP every 5 minutes for 15 minutes: if normal commence maintenance therapy as per guideline • If MAP>120 mmHg **OR** systolic BP> 160 mmHg 30 min post oral treatment commence IV guideline



- **Consider 250ml crystalloid fluid before or at same time as antihypertensive given over 20 min if concerns of hypovolaemia, as IV antihypertensives can induce CTG abnormalities, this is more likely with IV hydralazine.**

Appendix 3 Fluid Guidelines



CVP has not been shown to be helpful and a decision to insert one needs to be made by a Consultant and interpreted with caution.