

**MANAGEMENT OF SEVERE  
PRE-ECLAMPSIA  
AND ECLAMPSIA**

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**All statements in “*italics*” are direct quotes from the stated references**

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## 1.0 PREFACE

Obstetric emergency guidelines are drawn up to improve the consistency of management of pregnant women and their unborn children. As different teams of doctors and midwives are involved in the management of emergencies, standardisation should improve the efficiency of the unit. They are not intended to replace the process of critical evaluation of every case and individualised decision making. Consultant staff should always be involved in the decisions taken in the management of all obstetric emergencies but until such time as they are informed and available, these guidelines will help midwives and junior staff initiate immediate management.

*“Women with pre-eclampsia, in common with others who have poorly understood diseases, have suffered from many treatments that ultimately turned out to be ineffective or even harmful, but which were difficult to question when they were in common use.*

*...Hardly any mothers or babies die directly from a first convulsion in hospital; they die, if at all, from the underlying disease”<sup>1</sup>*

These guidelines have been collated from what is currently practised in Labour Wards in Northern Ireland, using RCOG guidelines and evidence-based information where possible. As such, they will be open to audit as recommended in “Why Mothers Die”.<sup>2</sup>

**Review Date: 2004**

## 2.0 MANAGEMENT OF SEVERE PRE-ECLAMPSIA

1. **Consider admission if:** Systolic BP  $\geq$  160 mmHg, or if  
 Diastolic BP  $\geq$  100 mmHg, or if  
 Hypertension and proteinuria  $\geq$  +, or if  
 Presence of symptoms, e.g., epigastric pain, with  
 hypertension +/- proteinuria
  
2. **Inform:** Obstetric registrar and consultant  
 Paediatric registrar and consultant  
 Anaesthetic registrar and consultant
  
3. **Assess & Observe/ Monitor:** Blood pressure  
 Generalised oedema  
 Symptoms  
 Optic fundi  
 Reflexes +/- clonus  
 Test urine for protein  
 Urinary output  
 Fluid balance charts  
  
 Fetal cardiotocograph & ultrasound scan on admission  
 Doppler studies if available
  
4. **Investigate:** Blood: FBP & platelets  
 U & E  
 Urate  
 LFTs  
 Coagulation screen  
 Group & hold serum  
  
 Urine: MSSU  
 24-hour urine collections for:
  - total protein and creatinine clearance
  - catecholamines

## 5. Principles of Management:

### • Treat hypertension if:

- Systolic BP  $\geq$  170 mmHg, or if
- Diastolic BP  $\geq$  110 mmHg, or if
- Mean Arterial Pressure  $\geq$  125 mmHg

Aim to reduce BP to around 130-140/90-100 mmHg

A rapid and precipitous fall in maternal blood pressure or maternal hypotension as a result of intravenous anti-hypertensive drugs may cause fetal heart rate abnormalities, especially in growth restricted/compromised fetuses

Monitor FH with continuous CTG during and after administration of intravenous drugs for 30 minutes

### Drugs:

**Hydralazine:** 10 mg IV slowly

Repeat doses: 5 mg IV at 20 minute intervals may be given if necessary (the effect of a single dose can last up to 6 hours)

If no lasting effect with boluses (assess over 20 minutes), consider an infusion at 2.0 mg/hour increasing by 0.5 mg/hour as required (2-20 mg/hour usually required)

**Close liaison with anaesthetists: may require plasma expansion**

**Labetalol:** If BP still uncontrolled, Labetalol 50 mg IV slowly; if necessary repeat after 20 minutes or erect IV infusion of 200 mg in 200 ml N Saline, starting at 40 mg/hour, increasing dose at  $\frac{1}{2}$  hourly intervals as required to a maximum of 160 mg/hour

If blood pressure does not respond to the above, discuss with senior renal physicians and anaesthetists

**Use of Nifedipine Antepartum:** Decision to administer nifedipine should be made by consultant staff

Oral route is safer and as effective as sublingual route

Dose: 10 mg orally. Monitor FH with CTG

**NOTE:** An interaction between nifedipine and magnesium sulphate has been reported to produce profound muscle weakness, maternal hypotension and fetal distress<sup>3,4,5</sup>

- **Initiate steroids if gestation  $\leq$  34 weeks (RCOG Guidelines) <sup>6</sup>**
- **Consider the need for anticonvulsant therapy if eclampsia imminent**
- **Principles of fluid balance:**

**BEWARE: Iatrogenic fluid overload is the main cause of maternal death in Pre-eclampsia/Eclampsia** <sup>2</sup>

Maintenance fluids should be given as crystalloid but additional fluid (colloid) may be necessary prior to vasodilatation to prevent maternal hypotension and fetal compromise.<sup>7</sup> Consideration should also be given to correcting hypovolaemia in women with oliguria

1. **Accurate recording of fluid balance** (including delivery and postpartum blood loss, input/output deficit)
2. **Maintenance crystalloid infusion** - 85 ml/hour, or urinary output in preceding hour plus 30 ml <sup>7</sup>
3. **Selective colloid expansion** - prior to pharmacological vasodilatation; oliguria with low CVP
4. **Diuretics** - only for women with confirmed pulmonary oedema
5. **Selective monitoring of CVP**

- **Consider the need for *in utero*/neonatal transfer:** <sup>7,8</sup>

If a maternity unit does not have access to HDU/ICU or is unable to cope with maternal complications, or is unable to cope with pre-term babies, it may be appropriate to consider antenatal transfer of the mother. However, maternal safety must not be jeopardized and each case should be considered on its clinical merits; in some cases it is safer to deliver the mother and then consider the need for transfer of mother and/or child

*“Referral to a regional centre for advice and/or assistance should be considered in all cases of eclampsia, particularly where there are maternal complications”* <sup>7</sup>

- **Delivery**

**A team effort involving obstetricians, midwives, anaesthetists and paediatricians**

- The need for delivery is dependent on the maternal and fetal condition. Either caesarean section or induction of labour may be appropriate depending on the clinical findings
- In eclampsia, the definitive treatment is delivery
- *“However, **it is inappropriate to deliver an unstable mother** even if there is fetal distress. Once seizures are controlled, severe hypertension treated and hypoxia corrected, delivery can be expedited”*<sup>7</sup>
- Ergometrine should not be used in severe pre-eclampsia and eclampsia
- If delivery is by caesarean section: antibiotic prophylaxis<sup>9</sup>
- Consider prophylaxis against thromboembolism (RCOG Risk Assessment Guidelines)<sup>10</sup>

**An early combined obstetric and anaesthetic approach to monitoring and management provides optimal care**

- **Principles of care after delivery**

- Maintain vigilance as the majority of eclamptic seizures occur after delivery
- High dependency care should be provided as clinically indicated (24 hours minimum)<sup>7,11</sup> **Consider the need for admission to ICU**<sup>11</sup>
- Monitoring should be undertaken by experienced staff: nurse/midwife should be allocated to provide one to one care, with input from senior medical staff
- Maintain close attention to fluid balance
- Reduce anti-hypertensive medication as indicated

- **Follow-up**

- Long-term follow-up to make sure that blood pressure resolves
- Specific investigations: anti-phospholipid antibodies, lupus anticoagulant and thrombophilia screen.<sup>12</sup> If eclampsia has occurred, consider CT scan of head<sup>7</sup>
- Discussion with mother concerning what has happened and its significance for the future
- Inform general practitioner and community midwives

## 3.0 MANAGEMENT OF IMMINENT ECLAMPSIA OR ECLAMPSIA

### 3.1 General Measures <sup>13</sup>

**DO NOT LEAVE PATIENT ALONE**

**CALL FOR HELP** - duty obstetric & anaesthetic registrars; senior midwife

**INFORM CONSULTANTS** - obstetrician & anaesthetist on call

**Is it safe to approach the patient?** - consider hazards around patient that will affect your safety

**Prevent maternal injury during convulsion** - place in semi-prone position

- **Airway:**                      Assess  
     Maintain patency  
     Apply oxygen
  
- **Breathing:**                      Assess  
     Protect airway  
     Ventilate as required
  
- **Circulation:**                      Evaluate pulse & BP  
     If absent, initiate CPR and call arrest team  
     Left lateral tilt  
     Secure IV access as soon as safely possible  
     Attach pulse oximeter, ECG & automatic BP monitors
  
- Urinary catheter - hourly urinometer readings  
     Fluid input / output chart
  
- Observations  
& Investigations:**                      As per **Management of Severe Pre-eclampsia**  
     Consider blood gases
  
- Check for  
aspiration:**                              Lungs should always be auscultated after the convulsion  
     has ended

### 3.2. Medication for the Management of Seizures

**The vast majority of the initial seizures are self-limiting** <sup>13</sup>

**MAGNESIUM SULPHATE** is the anticonvulsant drug of choice <sup>14</sup>

**Avoid polypharmacy** to treat seizures - increases risk of respiratory arrest

After ABC:

**Loading Dose:**        **4 g IV over 10-15 minutes**  
 Add 8 ml of 50% MgSO<sub>4</sub> solution to 12 ml of N Saline  
 = 4 g in 20 ml = 20% solution

**Maintenance Dose:**        **1 g per hour**  
 Add 25 g MgSO<sub>4</sub> (50 ml) to 250 ml N Saline  
 1 g MgSO<sub>4</sub> = 12 ml per hour IV  
 1 g/hour is infused for 24 hours after last fit provided that:

- respiratory rate > 16 breaths/minute
- urine output > 25 ml/hour, and
- patellar reflexes are present

Administer via infusion pump

**REMEMBER TO SUBTRACT VOLUME INFUSED FROM TOTAL MAINTENANCE INFUSION VOLUME (85 ml/hour)**

A higher maintenance dose may be required initially to prevent recurrent seizures - consultant must make this decision

**If seizure continues, or if seizures recur, give a second bolus of magnesium sulphate:**

2-4 g depending on weight of patient, over 5-10 minutes  
 (2 g if < 70 kg and 4 g if > 70 kg)  
**ONE STAT DOSE ONLY**

***If seizures continue despite a further bolus of magnesium sulphate, “options then include diazepam (10 mg) or thiopentone (50 mg IV). Intubation may become necessary in such women to protect the airway and ensure adequate oxygenation. Further seizures should be managed by intermittent positive pressure ventilation and muscle relaxation.”*** <sup>7</sup>

**When using Magnesium Sulphate:**

**Monitor:** Hourly urine output  
 Respiratory rate, oxygen saturation & patellar reflexes - every 10 minutes for first two hours and then every 30 minutes  
 Check serum magnesium levels every day if infusion is continued for > 24 hours

**Request MgSO<sub>4</sub> levels if:** Respiratory rate < 16 breaths/minute (**CARE:** lower rate may be appropriate if on opiates)  
 Urine output < 25 ml/hour for 4 hours  
 Loss of patellar reflexes  
 Further seizures occur

**Magnesium Levels:** **Therapeutic** **2.0-4.0 mmol/l**

With increasing magnesium levels, the following may occur:

Feeling of warmth, flushing, double vision, slurred speech.....3.8-5.0 mmol/l  
 Loss of tendon reflexes.....>5.0 mmol/l  
 Respiratory depression.....>6.0 mmol/l  
 Respiratory arrest.....6.3-7.1 mmol/l  
 Cardiac arrest.....>12.0 mmol/l

**Magnesium Toxicity:**

- **Urine output < 100 ml in 4 hours:** If no clinical signs of magnesium toxicity, decrease rate to 0.5 g/hour  
 Review overall management with attention to fluid balance and blood loss
- **Absent patellar reflexes:** Stop MgSO<sub>4</sub> infusion until reflexes return
- **Respiratory depression:** Stop MgSO<sub>4</sub> infusion  
 Give oxygen via facemask and place in recovery position because of impaired level of consciousness  
 Monitor closely
- **Respiratory arrest:** Stop MgSO<sub>4</sub> infusion  
 Give IV Calcium gluconate  
 Intubate and ventilate immediately
- **Cardiac arrest:** Commence CPR  
 Stop MgSO<sub>4</sub> infusion  
 Give IV Calcium gluconate  
 Intubate and ventilate immediately  
 If antenatal, immediate delivery

**Antidote:** 10% Calcium gluconate 10 ml IV over 10 minutes

### 3.3 Magnesium Sulphate Prophylaxis in Pre-eclampsia <sup>15</sup>

Even for women with severe pre-eclampsia, the risk of eclampsia is low - around 1%. The risk of eclampsia is probably reduced by magnesium sulphate, but, even if this reduction is by 50%, very large numbers of women will need to be treated to prevent a single fit.

*“ Magnesium sulphate is the anticonvulsant of choice for the treatment of eclampsia. For pre-eclampsia there is insufficient evidence to assess whether, overall, prophylactic anticonvulsants do more good than harm. If an anticonvulsant is to be used, magnesium sulphate is the best choice and is now being evaluated in a large trial.”* <sup>16</sup> (Magpie Trial <sup>15</sup>)

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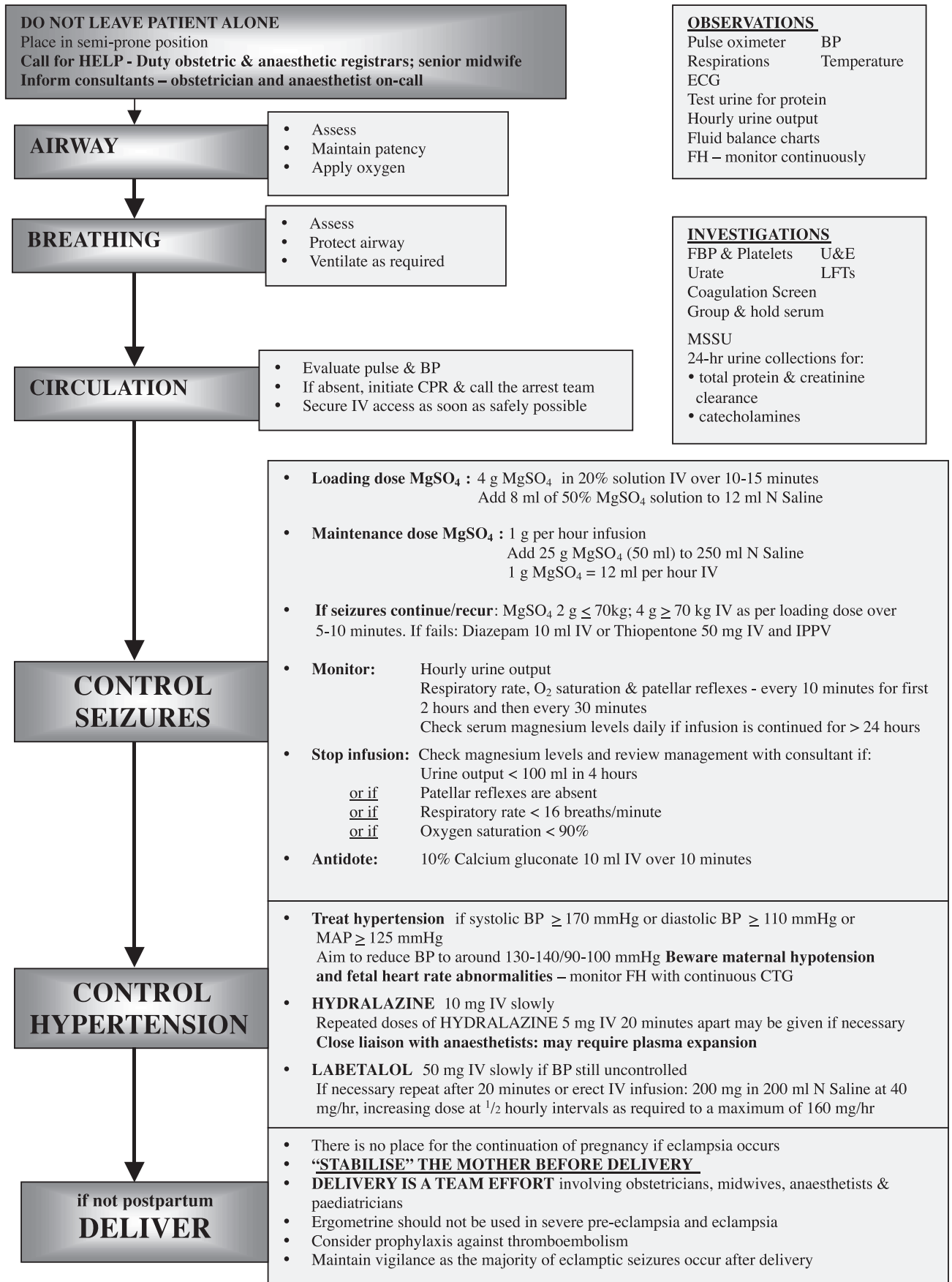
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**Management of IMMEDIATE ECLAMPSIA or ECLAMPSIA**



**Abbreviations**

BP	Blood pressure
CPR	Cardio-pulmonary resuscitation
CTG	Cardiotocography
CT	Computer assisted tomography
CVP	Central venous pressure
ECG	Electrocardiograph
FBP	Full blood picture
FH	Fetal heart
HDU	High dependency unit
ICU	Intensive care unit
IPPV	Intermittent positive pressure ventilation
IV	Intravenous
LFTs	Liver function tests
MAP	Mean arterial pressure
MgSO <sub>4</sub>	Magnesium sulphate
MSSU	Mid-stream sample of urine
RCOG	Royal College of Obstetricians and Gynaecologists
U & E	Urea & Electrolytes

**Emergency box for eclampsia**

**1. Drugs**

Magnesium sulphate 50%, 5 g in 10 ml ampoule	x 10 amps
Calcium gluconate 10%, 8.9 mg in 10 ml ampoule	x 2 amps
Hydralazine 20 mg in 1 ml ampoule	x 2 amps
Labetalol 200 mg in 20 ml ampoule	x 1 amp
Sodium chloride 10 ml ampoule	x 10 amps

**2. Intravenous fluids**

250 ml bag of Sodium chloride	x 2
1 litre of Hartmann's solution	x 1
IVAC giving set	x 1
IV blood giving set	x 1

**3. Venous access**

20G Cannula (pink)	x 2
18G Cannula (green)	x 2
16G Cannula (grey)	x 2
Tourniquet	x 1
Fixation tape	x 1 roll

**4. Airway equipment**

Guedel airways: sizes 4, 3, and 2  
 Laedal bag, mask and valve  
 Green oxygen tubing 2 meters  
 Yankeur sucker

**5. Other equipment**

50 ml syringe	x 2
20 ml syringe	x 2
10 ml syringe	x 2
Green needles	x 2
Reflex hammer	x 1

## **Patient Information**

Patient information packs can be obtained from:

### *ACTION ON PRE-ECLAMPSIA (PEC)*

31-33 College Road,

Harrow, Middx HA1 1EJ

Tel: 020-8863 3271

Fax: 020-8424 0653

Helpline: 020-8427 4217

Website: [www.apec.org.uk](http://www.apec.org.uk)

E-mail: [info@apec.org.uk](mailto:info@apec.org.uk)

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