CLINICAL GUIDELINES FOR THE MANAGEMENT OF ECLAMPSIA AND SEVERE PRE-ECLAMPSIA.

		Contents Page No.
1.	INTRODUCTION	2
2.	PROTOCOL FOR THE MANAGEMENT OF SEVERE PRE-ECLAMPSIA (Inclusion Criteria)	3
3.	IMMEDIATE ACTION & CONTINUED CARE	4-6
4.	BP PROTOCOL	7-8
5.	MAGNESIUM SULPHATE PROTOCOL	9-10
6.	FLUID PROTOCOL	11-12
7.	CVP PROTOCOL	13-14
8.	CRITERIA FOR ITU ADMISSION	14
9.	PROTOCOL FOR MANAGEMENT OF ECLAMPSIA	15-16
10.	CORRECTION OF BLOOD DYSCRASIAS	17
11.	ANALGESIA	17
12.	CAESAREAN SECTION	18-19
13.	POST DELIVERY MANAGEMENT	19
14.	REFERENCES & AUDIT INDICATORS	20
15.	ENDORSEMENT	21

CLINICAL GUIDELINES FOR THE MANAGEMENT OF ECLAMPSIA AND SEVERE PRE-ECLAMPSIA

1. INTRODUCTION:

Pre-eclampsia is a syndrome of generalised endothelial dysfunction with loss of vascular integrity and disturbance of microcirculation. This results in widespread changes of hypertension, oedema, hypovolaemia, renal and hepatic damage and thombocytopaenia. Renal involvement is manifest by an early fall in urate clearance and later by proteinuria, as glomerular damage becomes established. Coagulopathy occurs in association with liver pathology which causes epigastric pain and vomiting as the capsule is stretched.

A particularly severe presentation is HELLP syndrome in which microangiopathic Haemolysis is accompanied by Elevated Liver Enzymes and Low Platelet count. Cerebral involvement may result in death secondary to haemorrhage, convulsions or both.

Eclamptic fits can occur in the absence of classical signs of pre-eclampsia. Premonitory signs include hyperreflexia, clonus, visual disturbance, epigastric pain and vomiting.

The following guidelines apply to women with severe pre eclampsia.

The importance of involving senior Obstetric and Anaesthetic staff at an early stage cannot be over-emphasised. You should never hesitate to ask for advice or help.

2. PURPOSE OF GUIDELINE:

To ensure best practice in the management of this pregnancy complication.

3. SCOPE:

The Obstetricians, Anaesthetists, Midwives and Paediatricians at the James Paget Healthcare Trust.

4. RATIONALE:

In the last confidential enquiry into maternal deaths 1997-99 there were 15 deaths due to this condition. The following areas of concern were highlighted: *delayed recognition of the severity of the condition.

*delayed delivery.

*delayed transfer to ITU.

*inadequate Consultant involvement.

This is a multi professional guide to aid recognition of the severity of the illness and for its speedy management with senior involvement.

5. PROTOCOL FOR THE MANAGEMENT OF SEVERE PRE-ECLAMPSIA

Inclusion Criteria:

The following criteria A, B, C, D singly or in combination occurring after 20 weeks of pregnancy are compatible with a diagnosis of severe pre-eclampsia.

They may be used to determine which women warrant protocol management.

- a. Eclamptic fit.
- b. Absolute BP > 170/110 mmHg on two occasions 15 minutes apart associated with one other pre-eclamptic feature (see D below)
- c. Absolute BP140/90 mmHg (or a rise in BP of > 25/15 mmHg from 1st trimester values) with proteinuria > 2+ and one other feature(see D below)
- d. At least two of the following:

*Severe epigastric / RUQ pain *Pulmonary oedema *Evidence of renal impairment : Oliguria <500mls urine/24 hrs Urate > 0.36 mmol/l Creatinine >100 mmol/l Urea > 5 mmol/l *Proteinuria >2 + protein in 2 urine samples collected > 4 hrs apart tested with protein reagent strip **OR** > 300mg protein / 24 hour urine collection. *Prodromal symptoms / signs: persistent headache visual disturbance altered mental state nausea / vomiting hyperreflexia clonus >3 beats *Platelet count < 100 x 109 /l *Deranged clotting *ALT > 50 u/l

NB: Because of the variable presentation of pre eclampsia you must at least consider combinations which fall outside theses criteria.

If these criteria are met the patient is managed according to the protocol irrespective of the mode of delivery or method of analgesia.

6. GENERAL AIMS OF MANAGEMENT IN SEVERE PRE-ECLAMPSIA

Control of hypertension and degree of vasospasm Increase in blood flow to uterus and vital organs Prophylaxis or treatment of convulsions Judicious fluid therapy Remove reverse or control primary initiating cause of pre-eclampsia

Delivery within 24 hours will normally help to achieve the above aims.

However delivery may be delayed in less severe cases where the fetus is immature.

IF the following are criteria are present:

- a. Eclampsia is not imminent
- b. The response to intensive treatment is good with hypertension under control;
- c. Urinary protein < 5g/24 hours
- d. Neurological symptoms are ABSENT
- e. Liver function may be abnormal but NO epigastric pain
- f. Urine output > 500ml/24 hours
- g. Fetal condition satisfactory

7. PLAN OF MANAGEMENT

IMMEDIATE ACTION:

- a. Treat any fit SEE ECLAMPSIA PROTOCOL
- b.. Transfer patient to delivery floor for High Dependency Care to stay until at least 24 hours after delivery
- c. Allocate experienced midwife to "special"
- d. Patient under the care of the Central Delivery Suite on- call team.
- e. Inform the Consultant Obstetrician on-call and the duty Anaesthetist. Duty Anaesthetist to inform Anaesthetist Consultant on-call or trouble shooter.
- f. Assess vital signs and commence monitoring.
- g. High Dependency monitoring chart should be commenced and meticulously updated.
- h. Inform Consultant in charge and sister in charge of ITU.
- i. Transfer to ITU if any feature is difficult to control.

8. OBSTETRICIANS CARE SpR/SHO

*Insert IV16G cannula into forearm vein and commence Hartmann's infusion at 80mls/ hour.

*Initial maternal investigations:

FBC (including haematocrit); Clotting Screen; Group and Save. Serum U and E; Urate; LFTs Glucose. Serum and urine osmolality.

*Clinical Examination.

CVS:	Pulse, BP,CVP (if in situ) Heart Sounds; Peripheral perfusion;				
	Oedema.				
RS:	Sa02; Respiratory Rate; Lung Fields.				
CNS:	Neurological status - Glasgow Coma Scale; Fundi; Reflexes;				
	Clonus				
ABDOMEN:	Uterus				
RENAL:	Urine output				
*Fetal Surveillance					
*Commence BP Protocol					

*Commence Fluid Protocol

*Commence MgS04 Protocol

*Prescribe: Dexamethasone if required - discuss with SCBU whether ventilator available

Ranitidine 150mg 6 hourly.

9. CONTINUING CARE:

The following should be recorded by the SpR / SHO at least every 4 hours:

- a. Any change in symptoms
- b. CVS parameters
- c. Respiratory System –including lung fields and Sa02
- d. Neurological status including Glasgow Coma Scale, fundi, reflexes and clonus
- e. Fluid balance over the previous 4 hours.
- f. Anti hypertensive/ anticonvulsant drugs used
- g. Serum Magnesium Concentration if patient oliguric or other signs of renal failure.

10. MIDWIFERY CARE:

*Patient to be "wedged "at all times, with oxygen 4L/min

*Assess vital signs.

*Commence CTG and Partogram.

*Catheterise - hourly urine volume measurements and urinalysis.

*BM stix on admission.

*Commence High Dependency chart. [ITU chart]. Pay meticulous attention to and recording of fluids and fluid balance.

*Infusion pumps for MGS04, HYDRALLAZINE, occasionally Syntocinon.

*TEDS

*Ice cubes to suck

11. CONTINUING CARE:

- a. After initial blood pressure measurement measure and record systolic; diastolic and MAP every 15 minutes.
- b. Monitor Sao2 continuously. Record every 15 minutes.

Inform Anaesthetist if Sao2 < 95% on room air or < 97 % on oxygen Consider pulmonary oedema (fluid overload), excess respiratory depressants or possible aspiration

If Sao2 < 95 % on room air place the patient on oxygen 4l/min immediately (if not already on oxygen).

- c. Measure and record hourly urine volumes.
- d. Record all fluid input/output and maintain meticulous fluid balance.

12. ANAESTHETIC / ODP CARE:

Use the following monitoring :

*ECG

*BP via automated machine every 15 minutes – arterial line useful in severe hypertension, hypertension difficult to control or when frequent blood sampling is required.

*CVP (transduced) if cinically indicated (most patients can be safely managed without CVP monitoring-see CVP Potocol)

*Examine patient and review fluid balance if Sa02 < 95% on room air or < 97% on oxygen.

Consider Pulmonary Oedema; excess Respiratory Depressants or possible Aspiration. Arrange Chest x ray.

13. BP PROTOCOL

Reduction of severe hypertension (MAP>125 mmHg) is mandatory to reduce the risk of cerebrovascular accident. In eclampsia antihypertensive treatment may also reduce the risk of further seizures.

Note:

- a. Placental perfusion can be compromised if blood pressure is reduced excessively.
- b. Diabetics and women with (IHD) Ischaemic Heart Disease tolerate hypotension badly give a preload and do not drop blood pressure below 30/85.

Principles:

- a. Treatment is based on Mean Arterial Pressure. Aim for MAP <125 mmHg.
- b. Hydralazine OR labetolol are the antihypertensive drugs of choice.
- c. Hydralazine may induce placental hypoperfusion in undelivered women. To avoid a precipitous fall in blood pressure a fluid preload is given. This will expand the extra vascular volume, as the systemic vascular resistance (SVR) is reduced, thus maintaining end organ blood flow.
- 1. For undelivered women with:
 - a) MAP 125 140 mmHg Recheck BP every 5 minutes for 15 minutes. If still high:

Administer a preload of 250mls crystalloid over 20 mins PRIOR to the administration of hydralazine.,

Recheck the blood pressure and heart rate.

If MAP still 125 - 140 mmHg and heart rate < 120/min $\,$ - give bolus of hydralazine.

- b) If MAP >140 mmHg give hydralazine simultaneously with fluid preload.
- 2. For women who are delivered, no prior fluid preload is necessary.
- 3. Initial dose of hydralazine 5mg IV slowly every 20 minutes (until MAP is <125mmHg OR maximum of 20mg given in 1 hour).
- Commence maintenance IV infusion of hydralazine: 100mg in 50ml saline via syringe pump to run at 2.5 – 5 mls/ hour. Double after 30 minutes if necessary.

- 5. A continuous CTG is recommended during initial boluses of hydralazine since abnormalities of the fetal heart rate may occur.
- 6. The blood pressure response to initial hydralazine should be monitored by automated BP measurement every 5 minutes until blood pressure controlled.

14. LABETALOL.

This may be used if preferred **OR** if BP not controlled by hydralazine **OR** heart rate > 120/min.

*Prepare 60mls labetalol (300mg) in syringe (5mg/ml)

*Give loading dose from syringe of 20mg (0.5ml/min) and commence infusion.

*Start rate of infusion at 20mg/hour doubling if necessary, to maintain MAP <125 $\,$ mmHg $\,$

minimum rate 4mls/hour (20mg/hour) maximum rate 32mls/hour (160mg/hour)

*Monitor BP every 5 minutes.

Important points regarding blood pressure measurement:

Conventional measurement with a mercury sphygmomanometer is still regarded as the gold standard

It is essential that

- a. The appropriate sized cuff is use (use a large cuff when the upper arm circumference exceeds 35 cm.
- b. Blood Pressure should be measured and recorded to the nearest 2mmHg.
- c. The diastolic blood pressure is measured at the DISAPPEARANCE of the sounds i.e. Korotkoff Phase V (not at Korotkoff IV(muffling).
- d. The woman should be seated with her arm at the level of the heart.

*If automated devices are used be aware that they have not been validated for use in hypertensive or pre-eclamptic pregnant women and may **UNDER READ** the blood pressure.

*Whichever method is used it is important to use a consistent method of blood pressure measurement.

15. MAGNESIUM SULPHATE PROTOCOL

INCLUSION CRITERIA:

- a Patient has eclamptic fit
- b. Severe pre-eclampsia is diagnosed i.e. patient fulfils the criteria for entry to the severe pre-eclampsia protocol.

Whenever a patient is commenced on Magnesium sulphate inform the Consultant Obstetrician and duty Anaesthetist.

1.	Give loading dose	4g over 5 - 10 minutes Intravenously
		$[4 \times 1g \text{ ampoules} = 8 \text{mls } MgS04 + 12]$
		mls NaCl in 20mls syringe]
2,	Maintenance Infusion	1.5g/hour
		$[3 \times 5g \text{ ampoules} = 30 \text{ mls } MgS04 + 20]$
		mls NaCl in 50ml syringe run at 5 mls/hr]
3.	Recurrence of convulsions	2–4 g bolus.

Any treatment of further seizures is supportive (e.g. intubation and ventilation).

MONITORING:

- ECG
- Pulse oximetry: contact Anaesthetist if Sa02 < 97% on oxygen or < 95* on air.
- BP every 15 minutes initially.
- Hourly respiratory rate: contact Anaesthetist if respirations <10 /min or >20/min *Hourly patellar reflexes/ (biceps if epidural in progress).
- Contact obstetrician if depressed or absent.

*Hourly urine output; contact Anaesthetist if urine output < 100mls in four hours.

*Measure serum magnesium levels if:

- Urine output <100mls in four hours.
- Repeat measurement 4 hourly if urine output remains low.
- Further seizures on treatment.

*Stop magnesium infusion if:

Oliguria for 4 hours (<100mls)

Toxicity suspected because of symptoms or signs e.g. falling $\hat{\mathcal{C}}$ saturation

Muscle weakness

Diplopia

Dysarthria

Dyspnoea

Loss of reflexes

Magnesium concentration above upper limit of therapeutic level

After 48 hours of infusion or discharge to ward.

If toxicity is suspected:

*Stop MgS04 infusion.
*Give 02 4l/min.
*Call Anaesthetist.
*Monitor ECG.
*Have calcium gluconate ready.
*Send blood for urgent Magnesium levels.
*Antidote: Calcium Gluconate. 10 - 20 mls of 10% solution given slowly intravenously.

Magnesium levels:

Normal serum level	0.7 - 1 mmol/litre
Therapeutic level	2 - 4 mmol/litre
Toxic levels	3.5 + mmol/litre - loss of patellar/biceps reflexes.
	5.0 + mmol/litre - respiratory depression 150 + mmol/litre - cardiac arrest.
Significant toxicity oc	ccurs at >5 mmols.
Therapeutic range	2 - 4 mmols.

16. FLUID PROTOCOL

Principles:

 It is important to strike a balance between overzealous administration of intravenous fluid and under-perfusion of vital organs. latrogenic pulmonary oedema is a real hazard in this condition and has a high morbidity and mortality.
 As oliguria for several, hours is rarely associated with renal failure, fluid

As oliguria for several hours is rarely associated with renal failure, fluid overload is far more dangerous than a few hours of oliguria.

- 2. Meticulous attention to and accurate recording of fluid balance during delivery **AND POST PARTUM** is mandatory.
- 3. A maintenance crystalloid infusion of Hartmann's 80 mls /hour should be commenced.
- 4. Selective plasma volume expansion should be given:

a. Prior to antenatal vasodilation - administration of hydralazine: (see BP Protocol)

- epidural

- b. Hypovolaemia and oliguria. see Fluid Protocol
- 5. Selective monitoring with CVP
 - a. Oliguria see Fluid Protocol.
 - b. Haemorrhage
 - c. Significant fall in platelet count
 - d. Liver tenderness
- 6.. Oliguria can be tolerated for several hours **IN THE ABSENCE OF:**

Hypovolaema / Hypotension / Liver failure

A urine output < 100mls / 4 hours is rarely associated with acute renal failure unless there is another event such as haemorrhage.

- 7. Diuretics should be used in pulmonary oedema.
- 8. Ensure any drugs including Syntocinon are infused using syringe drivers.

16.1 FLUID PROTOCOL:

- 1. Initial fluid therapy Hartmann's 80 mls/hour
- 2. If initial Haematocrit < 35 % (<0.35) continue with Hartmann's
- 3. If initial Haematocrit >35% (i.e.haemoconcentrated) give 250mls colloid over 20 minutes and then continue with Hartmann's.
- 4. Any oral intake should be subtracted from the Hartmann's.
- 5. Prior to epidural analgesia or antihypertensive drug if undelivered, give a preload of 250mls crystalloid (see BP Protocol).
- 6. Replace blood loss with colloid.
- 7. Oliguria is defined as urine output <100mls over 4 hours.
- a. If urine output < 100 mls over 4 hours and lung fields clear: give 250 mls crystalloid over 10 minutes.

Re-assess urine output 2 hours later.

If urine output < 25mls/hour Anaesthetist to insert and set up a central line (see CVP Protocol)

Correct Coagulopathy prior to insertion then check Chest X Ray.

b. If urine output > 25mls/ hour continue maintenance fluids.

17. PROTOCOL FOR CVP GUIDED MANAGEMENT OF RESISTANT OLIGURIA

Indications for insertion of central line:

- a. Oliguria that fails to respond after 4 hours on the fluid protocol and one fluid bolus
- b. Haemodynamic instability
- c. Difficulties with peripheral venous access
- d. Significant fall in platelet count
- e. Liver tenderness.

Contra-indications:

- 1. Coagulopathy
- 2. Lack of staff trained in the care of CVP lines.
- 3. Likelihood of significant technical difficulties.

CVP Measurement:

The zero reference point is not in itself critical as long as it is used consistently to permit valid comparisons. The sternal notch could be used with the patient wedged in a left lateral tilt. It is vital to avoid aortocaval compression.

17.1 CVP PROTOCOL

Urine output < 100mls / 4hours and no response to fluid bolus:

- 1. Insert CVP Line (check no coagulopathy first)
- 2. Measure CVP
- a. If CVP <4 Give 250mls crystalloid over 10 minutes (maximum 500mls)

Continue Hartmann's at 80mls/hour Reassess urine output after 1hour. If >25mls continue maintenance fluids

If < 25 mls measure CVP and follow protocol.

- b. If CVP 4 6 mmHg: (i.e. no evidence of hypovolaemia,) continue maintenance fluids only. Do not give further fluid boluses.
- c. If CVP > 6 mmHg: Stop maintenace fluids. Give frusemide 20 mg IV.Check for dyspnoea/basal crepitations.

If the lung fields are clear continue with maintenance fluids.

If dyspnoea or basal crepitations are present:

Fluid restrict

CXR

Admit to ITU.

NB: a CVP >6mm Hg is considered high in severe pre-eclampsia.

Development of Pulmonary Oedema is an indication for urgent transfer to ITU.

CRITERIA FOR ADMISSION TO ITU:

- 1. Recurrent seizures.
- 2. MAP > 125 mmHg despite IV Hydralazine and labetolol.
- 3. Persistent oliguria with normal or high CVP.
- 4. Evidence of pulmonary oedema
- 5. Additional complications such as haemorrhage.
- 6. Post LSCS for elective ventilation if risk to airway.

18. PROTOCOL FOR MANAGEMENT OF ECLAMPSIA

INTRODUCTION:

The overall incidence is 5 per 10,000 maternities but the associated mortality rate is almost 2%.

Important points to note:

- 41% of eclamptics are symptom less prior to a fit and 38% have no
- hypertension or proteinuria.
- 40% of eclamptic fits occur postpartum
- Any premonitory symptoms such as severe headache, visual disturbance, epigastric pain, "jitteriness" should always be taken seriously.
- The treatment for eclampsia is MgS04 (not phenytoin or diazepam).
- Eclampsia is an absolute indication for delivery but not until stabilisation of the mother.

The main hazards to the mother are Hypoxia and Aspiration particularly during Status Epilepticus.

ACTION PLAN:

Assume fit to be Eclamptic until proved otherwise:

- 1. Call 3333 and state: Obstetric Emergency ------ Ward.
- 2. Remember A; B; C.

Airway - Assess and maintain patency using head tilt / chin lift **OR** jaw thrust.

- Apply oxygen 15I/min via a tight fitting face mask with reservoir bag.
 - **Breathing** Assess Look, Listen, Feel.

- Ventilate if necessary.

Circulation - Place wedge under right hip (pillow; bag of fluid; use your knees)

OR turn patient into left lateral position:.

Assess pulse - feel for carotid.

CPR if necessary.

Secure intravenous access with x2 large bore cannulae.

Send blood for FBC, platelets, clotting screen, U & E, glucose urate, LFT, Group and Save.

Attach pulse oximeter; ECG;BP.

Treat peri-arrest arrhythmias.

3. Treat fit / prevent further fits:

Give Magnesium sulphate (MgS04).

Loading dose

4g intravenously over 10 minutes.

[4x1g ampoules = 8mls MgSo4 + 12ml NaCl in 20 ml syringe]

Maintenance dose:

Continuous infusion of Magnesium Sulphate 1.5 grm / hour.

[3 x 5g ampoules = 30mls MgS04 + 20 mls NaCl in 50 mls syringe] Run at 5 mls / hour.

Treat recurrent seizures with further bolus of 2g MgS04 over 5-10 minutes.

If repeated seizures still occur the Anaesthetist using rapid sequence induction may give thiopentone and intubate and ventilate the patient.

Continue MgS04 for at least 24hours after delivery.

The above treatment must be given urgently prior to transfer if the patient is not on the Central Delivery Suite (CDS).

Doctor **MUST** accompany mother in transfer to the CDS.

Contact on-call Consultant (if not already aware of the case).

If the fitting is persistent or there are neurological signs, a CT scan should be performed. This should only be done when the Anaesthetist is present and the mother's airway, ventilation and haemodynamic status secure and stable.

FOLLOW MAGNESIUM SULPHATE PROTOCOL

19. CORRECTION OF BLOOD DYSCRASIAS

Contact Haematologist for advice on platelet, cryoprecipitate infusions etc. Include volumes in total intake.

If platelets > 100 X109 coagulation problems unlikely

If frank DIC, give Fresh Frozen Plasma

Consider cryoprecipitate if fibrinogen levels <100 units Give platelets if < 40 x 109

Delivery

Discuss mode of delivery with Consultant on-call. Remember the fetus of a woman with pre-eclampsia may well have reduced physiological reserve due to placental insufficiency and therefore fetal distress may develop quickly

Analgesia

An epidural is beneficial in preventing rises in blood pressure with painful contractions and in improving placental perfusion. It also reduces the stress response and release of Catecholamines which occurs with pain.

If the platelet count is 100 x 109/l or more and the patient accepts, an epidural can be sited without a clotting screen.

If platelet count $80 - 99 \times 109/I$ a clotting screen should be taken. If this is normal, and the patient accepts, an epidural can be sited.

If platelet count is 50 - 79 x 109/I and a clotting screen is normal the relative risks and benefits of regional analgesia and anaesthesia must be considered for each patient. Discuss with Consultant Anaesthetist, Haematologist (who may recommend platelet transfusion prior to epidural and patient).

A platelet count < $50,000 \times 109/l$ is a contraindication to an epidural.

If in doubt discuss with Consultant Anaesthetist

Thromboelastography may be used where available

20. CAESAREAN SECTION

Regional Anaesthesia is again the preferred method for caesarean section. It avoids the potential problems associated with General Anaesthesia and reduces the stress response to surgery.

Epidiural

- 1. Cautious pre-load 500ml crystalloid.
- 2. Do not use adrenaline containing solutions.
- 3. Add fentanyl to the epidural mixture.
- 4. Use ephedrine IV if necessary to treat hypotension. Phenyl ephrine is a reasonable alternative.
- 5. Postoperatively diamorphine 2.5 5 mg may be administered via the epidural for postoperative pain relief.
- 6. NSAI should be avoided until diuresis is over and renal function (U and Es) are normal

Spinal / CSE

Both these techniques are acceptable. Recent studies have shown that the severity of Hypotension after spinal or epidural anaesthesia is similar. Hypotension appears to be less of a problem if the patient has been treated with antihypertensives.

The use of a CSE technique is attractive as a relatively low dose of anaesthetic solution in the subarachnoid space can be used with extension of the block using the epidural catheter.

An alternative technique may be the use of a spinal catheter.

General Anaesthesia

Problems associated with general anaesthesia in pre-eclampsia include an increased risk of difficult intubation due to oedema of the upper airway. There may be cardiovascular instability and the presser response to intubation and extubation must not be forgotten.

The airway must be assessed prior to induction. The presence of upper body oedema, especially facial is particularly worrying.

Potential treatments for the presser response in addition to a generous dose of induction agent include:

MgSo4	2g (N.B.decrease dose of nondepolarising muscle relaxant and use nerve stimulator)				
Alfentanil	1 – 2 mg				
Fentanyl	200 - 400 microgram's				
Remifentanyl	0,5 microgram's/ml				
Labetalol	20 mg				
Esmolol	1.5 mg/kg				
Use N20, Isoflurane, Atracurium.					

PCA for postoperative analgesia.

NO NSAI

POST DELIVERY MANAGEMENT:

No Ergometrine or Syntometrine

Give Syntocinon 5 IU IV slowly for the third stage.

Keep on Delivery Floor for at least 24 hours following delivery.

Continue Anihypertensives and Magnesium Sulphate for 24 hours.

Repeat all blood tests.

Restrict fluids to Hartmann's 60 mls/hour + blood loss until diuresis.

NB There is still a danger of pulmonary oedema at this time.

Continue with HDU chart and pay meticulous attention to fluid balance.

Psychological care for the mother and relatives is important. Discussion of the events surrounding the delivery and the plans for any future pregnancies will be needed.

Discharge from the protocol only on decision by the Consultant Obstetrician and Consultant Anaesthetist.

21. EVIDENCE

- Eclampsia Trial Collaborative Group (1995): Which anticonvulsant for women with eclampsia? Evidence from the Collabora tive Eclampsia Trial. Lancet: 345, 1455 – 63.
- 2. Magpie Trial Collaborative Group (2002): Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate?: .Lancet: 359, 1877-90.
- Mortl, M. G, Schneider, M. C (2000): Key Issues in assessing ,managing and treating patients with severe pre eclampsia. International Journal of Obstetric Anaesthesia: 9,39 –44.
- 4. Engelhardt, T, MacLennan, F. M (1999): Fluid Management in Pre-eclampsia. International Journal of Obstetric Anesthesia::8, 253 – 259.
- 5. Brodie, H, Malinow, A. M (1999): Anaesthetic Management of Preeclampsia/Eclampsia. International Journal of Obstetric Anaesthesia : 8, 110–124.
- 6. Duley, L, Neilson, J (1999): Magnesium sulphate and pre-eclampsia: British Medial Journal: 319, 3-4.
- 7. Cox, C, Grady, K (1999): Managing Obstetric Emergencies. .Bios Scientific Publications Ltd
- Mushambi, M. C, Halligan, A. W, Williamson, K (1996): Recent Developments in the Pathophysiology and maragement of Pre-eclampsia. British Journal of Anaesthesia: 76(1): 133 – 148.

22. AUDIT INDICATORS:

- 1. All patients with severe PET will be managed according the protocol 100%
- All patients with eclampsia will receive magnesium sulphate to stop/prevent fits -100%
- 3. The Consultant obstetrician on-call and duty Anaesthetist for delivery floor will be informed of a patient with severe PET or eclampsia 100%. Duty Anaesthetist will inform on-call Consultant Anaesthetist or trouble-shooter.
- 4. Criteria for admission to ITU to be followed 100%

23. ENDORSEMENT:

-	Consultant Anaesthetist
-	Consultant Obstetrician & Gynaecologist
-	Consultant Obstetrician & Gynaecologist
-	Consultant Anaesthetist
-	Consultant Obstetrician & Gynaecologist
-	Consultant Anaesthetist
-	Consultant Obstetrician & Gynaecologist
-	Consultant Obstetrician & Gynaecologist
-	Consultant Anaesthetist
-	Consultant Anaesthetist
-	Consultant Anaesthetist
-	Practice Development Midwife
-	Deputy Head Midwifery Services
-	Head Midwifery Services
-	Labour Ward Co-ordinator
	- - - - - - - - - - - - - - - -

24. AUTHOR AND DATES

Author: Dr S Rhodes Issue Date: December 2003

KEYWORDS: fit, dysfunction, disturbance