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# Guideline for Management of Severe or Fulminating Pre-Eclampsia

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Originator:	Labour Ward Forum, Maternity Services
Date Approved:	February 2020
Approved by:	Labour Ward Forum
Date for Review:	February 2023
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## Definition

Severe Pre-eclampsia - B.P. of 160/110 mm Hg or higher with significant proteinuria.

WOMEN SHOULD BE MANAGED ACCORDING TO A CAREFUL CLINICAL ASSESSMENT RATHER THAN RELYING ON OVERLY PRECISE CRITERIA

Mild (140/90-149/99) to Moderate (150/100-159/109) Hypertension and proteinuria with one or more of the following:

Severe Headache	Platelet count falling to below 100x10 <sup>9</sup> /l
Visual Disturbances	Abnormal liver enzymes( ALT or AST>70 IU/L)
Severe pain just below the Ribs and vomiting	HELLP Syndrome
Clonus> 3 beats	Papilloedema
Liver tenderness	

## Assessment

Degree of Hypertension	Mild hypertension (140/90 to 149/99 mmHg)	Moderate hypertension (150/100 to 159/109 mmHg)	Severe hypertension (160/110 mmHg or higher)
<b>Admit to Hospital</b>	Yes	Yes	Yes
<b>Treat</b>	No	With oral labetalol as first-line treatment to keep: <ul style="list-style-type: none"><li>• diastolic blood pressure between 80–100 mmHg</li><li>• systolic blood pressure less than 150 mmHg</li></ul>	<b>With oral labetalol as first line treatment to keep:</b> <ul style="list-style-type: none"><li>• diastolic blood pressure between 80–100 mmHg</li><li>• systolic blood pressure less than 150 mmHg</li></ul>

<b>Measure Blood pressure</b>	At least four times a day	At least four times a day	<b>More than four times a day, depending on clinical circumstances</b>
<b>Test for proteinuria</b>	Do not repeat quantification of proteinuria	Do not repeat quantification of proteinuria	<b>Do not repeat quantification of proteinuria</b>
<b>Blood Test</b>	Monitor using the following tests twice a week: kidney function, electrolytes, full blood count, transaminases, bilirubin	Monitor using the following tests three times a week: kidney function, electrolytes, full blood count, transaminases, bilirubin	<b>Monitor using the following tests three times a week: kidney function, electrolytes, full blood count, transaminases, bilirubin</b>

### **Management of Severe Pre-Eclampsia in Critical care setting**

ADMIT to High Dependency Unit on labour ward – level 2 care requirement.  
CONTACT: Senior obstetrician, senior midwife, anaesthetist, haematologist, neonatal team.

### **Monitoring on high dependency chart-**

- BP: every 15 min until woman stabilized then every 30 min in initial phase then
- 4 hourly if woman is stable and asymptomatic.

**Blood pressure control** – (see appendix 3 if management not controlled by oral antihypertensive)

- Start antihypertensive treatment if BP >160 /110 mmHg.
- In women with other markers of potentially severe disease (heavy proteinuria or disordered liver or haematological test results), treatment can be started at lower degrees of hypertension.
- The aim should be to stabilise the BP to 150 /80-100 mmHg.

### **Antihypertensive - (see Appendix 4)**

Hydralazine (intravenous) should be used as first line even in women on labetalol unless the woman is tachycardia  $\geq 120$ bpm  
Nifedipine (oral)

## **Hydralazine:**

### **Loading:**

- IV Hydralazine 10 mg IV over 5 min (*mix 20mg of hydralazine with 20mls of normal saline. 1mg of hydralazine per ml*)
- Give 250 ml of crystalloid IV with first dose (if patient hasn't had fluids already)
- Check BP every 5 minutes after bolus dose. If SBP  $\geq$  160 after 20 minutes – give further 5 mg over 5 minutes

### **Maintenance (if BP controlled on hydralazine):**

- Infusion of 2 mg/hr, increasing by increments of 0.5 mg/hr (0.5 ml/hr) every 15-20 mins to a maximum dose of 20 mg/hr (*mix 40mg of hydralazine with 40mls of normal saline to 40mls in a 50ml syringe. 1mg hydralazine per ml*)
- Titrate to Systolic BP of 140 – 150 mm of hr Hg  
Usual rate: 2 – 3 ml/hr      Max infusion rate: 18 ml/hr

**Reduce rate /stop infusion if significant side effect or maternal pulse  $\geq$ 120/min**

## **Labetalol**

(Should be avoided in women with severe asthma and if pulse rate is below 60/min)

Dosage-

- Initially orally 200mg before venous access. Should lead to reduction in BP in about half an hour. Second dose if needed after one hour. Over 50% of women can be controlled with oral therapy.
- IV: if no initial response or oral not tolerated  
Bolus 50mg (10ml of ampoule 5mg/ml) over 2 minutes. Should have effect by 5 min. Repeat every 5 min to maximum of 200mg labetalol until BP controlled.
- Maintenance: infusion rate of 5mg/ml Labetalol at rate of 4ml/hr (20mg/hr) via syringe pump– should be doubled every 30 min if necessary to maximum of 32 ml/hr (160 mg/hr) until BP has dropped and stabilised at acceptable level

## **Nifedipine** (oral):

If tachycardic  $\geq$  120 beats / minute and asthmatic or women with African or Caribbean family origin:

- Consider Nifedipine (MR) 10 mg orally (not sublingual)
- Recheck BP in 30 minutes
- Repeat Nifedipine (MR) 10mg orally if BP not below threshold
- If BP controlled: maintenance dose Nifedipine (MR) 10 mg orally 3 – 4 times/day

## **Fluid management prior to delivery- (Appendix 1)**

Foleys catheter with hourly urobag  
Strict hourly input output charting

## **Seizure Prophylaxis (Appendix 3)**

**Magnesium sulphate** should be commenced in women with severe preeclampsia in whom there is concern about the risk of eclampsia.

### **Dosage-**

Loading dose: **Pre-filled syringe** – 4g of MgSO<sub>4</sub> in 20ml of Normal Saline (0.2g in 1ml) given slowly over 5 minutes i.e set pump rate to 240ml/hr

Maintenance dose: **Pre-filled syringe** – 5g of MgSO<sub>4</sub> in 50ml of Normal Saline (0.1g in 1ml) to be administered via syringe pump, set pump rate to 10ml/hr

Important observations:

- Continuous pulse oximetry,
- Hourly urine output
- Hourly respiratory rate
- Deep tendon reflexes 4 hourly

Stop magnesium sulphate if:

Urine output less than 100 ml in 4 hrs

Patellar reflexes are absent after 5 hrs (assuming not due to regional block)

Respiratory rate less than 12 breaths per min

Oxygen saturation less than 90 %

**ANTIDOTE: 10ml calcium gluconate slowly IV over 10 min**

## **Seizure prophylaxis in women who are oliguric from the outset**

Give 4gm IV loading dose over 5min. Maintenance dose should be omitted until urine output normalizes.

## **Antenatal steroids**

Give two doses of betamethasone 12 mg intramuscularly 24 hours apart in women between 24 and 36 weeks. Could be given 12 hours apart if earlier delivery anticipated, however urgent delivery if indicated should not be delayed to complete course of steroids.

## **Planning delivery**

Once stabilized decision should be made regarding time and mode of delivery. After 34 weeks, vaginal delivery should be considered. Caesarean section maybe preferable under 34 weeks.

Epidural analgesia may be helpful in preventing any further rise in BP

**Second Stage** should be shortened with consideration to operative delivery

### **Third stage**

Should be managed with Bolus of Syntocinon 10 iu IV

If syntocinon infusion necessary – it should be administered via syringe driver- 40 iu of syntocinon in 40 mls of normal saline at 10mls/hour

### **Post-Partum Care**

The patient should be kept under observation in the HDU level 2 care (on labour ward if appropriate) for at least 24 hours following delivery, with careful monitoring of blood pressure, fluid balance, urine output and symptoms.

Clinicians should be aware that up to 44% of eclampsia occurs postpartum, especially at term, so women with signs or symptoms compatible with pre-eclampsia should be carefully assessed.

## **Fluid management of Severe or Fulminating Pre-eclampsia** **(see Appendix 1)**

All women with severe pre-eclampsia should have a HDU chart.

For an average sized patient, total fluid (IV + oral) input should be limited to 80ml/hr. Maintenance fluids should be Hartmann's solution.

The hourly fluid volume should include all drugs given (eg magnesium sulphate and syntocinon)

If a syntocinon drip is used, it should be at a high concentration via a syringe driver. (40iu syntocinon made up to 40ml with 0.9% Saline @ 10ml/hr)

Blood loss is replaced as required.

### Principles of fluid balance<sup>1</sup>

- Fluid management requires frequent clinical assessment and meticulous attention to charting of input and output and calculation of fluid balance.
- Other monitoring should include frequent clinical assessment, respiratory rate, oxygen saturation, hourly urine volumes.
- Most patients will have a brief period (up to 6 hours) of oliguria following delivery. 100ml of urine over 4 hours is acceptable
- Patients with moderate to severe pre-eclampsia will have a degree of glomerular endotheliosis. It will resolve spontaneously.
- The risk of death from pulmonary oedema is much greater than that from oliguric renal failure. Avoid excessive use of crystalloid solutions, and never >2 litres/day unless replacing measured losses.
- Hypovolaemia should be excluded as a cause of oliguria as per flow chart below.

## Definition

### HELLP Syndrome

HELLP syndrome is one of several possible crises that may develop as a variant of severe pre-eclampsia.

The incidence in pre-eclampsia pregnancies is approximately 5% to 20%, although many more women with pre-eclampsia perhaps 20% to 50%, have mild abnormalities of hepatic enzymes without full blown HELLP syndrome.

There is increased maternal (1%) and perinatal mortality (reported rates vary from approximately 10% to 60%).

### Clinical features

- Epigastric or right upper quadrant pain (65%)
- Nausea and vomiting (35%)
- Tenderness in the right upper quadrant
- Hypotension with or without proteinuria
- Other features of pre-eclampsia
- Acute kidney injury AKI (7%)
- Placental abruption (16%). This may be the presenting feature and should always prompt investigation for HELLP syndrome or pre-eclampsia as underlying cause's
- Metabolic acidosis

### Diagnosis

- Low grade haemolysis evident on peripheral blood smear, rarely enough to cause severe anaemia.
- Low (usually  $<100 \times 10^9 / L$ ) or falling platelets.
- Elevated transaminases.
- Elevated lactate dehydrogenase (LDH) (indicative of haemolysis).
- Raised bilirubin (unconjugated, reflecting the extent of haemolysis)

The platelet count may fall below  $30 \times 10^9 / L$  in severe cases and some women develop DIC (90%).

#### HELLP syndrome – points to remember

- **This is one of the potential crises that may develop in pre-eclampsia**
- **Other feature of pre-eclampsia including hypertension and proteinuria may be only mild.**
- **The typical features are right upper quadrant pain, abnormal liver function, low platelets and mild haemolysis.**
- **There is a risk of DIC, abruption, liver haemotoma and liver rupture.**
- **Delivery of the fetus is the correct treatment once any hypertension has been controlled. Platelet transfusion is usually required.**
- **Women may present or deteriorate postpartum and renal impairment is uncommon.**
- **Women are at a greatly increased risk of developing pre-eclampsia in future pregnancies.**
- **The risk of recurrent HELLP syndrome is low.**



## **References-**

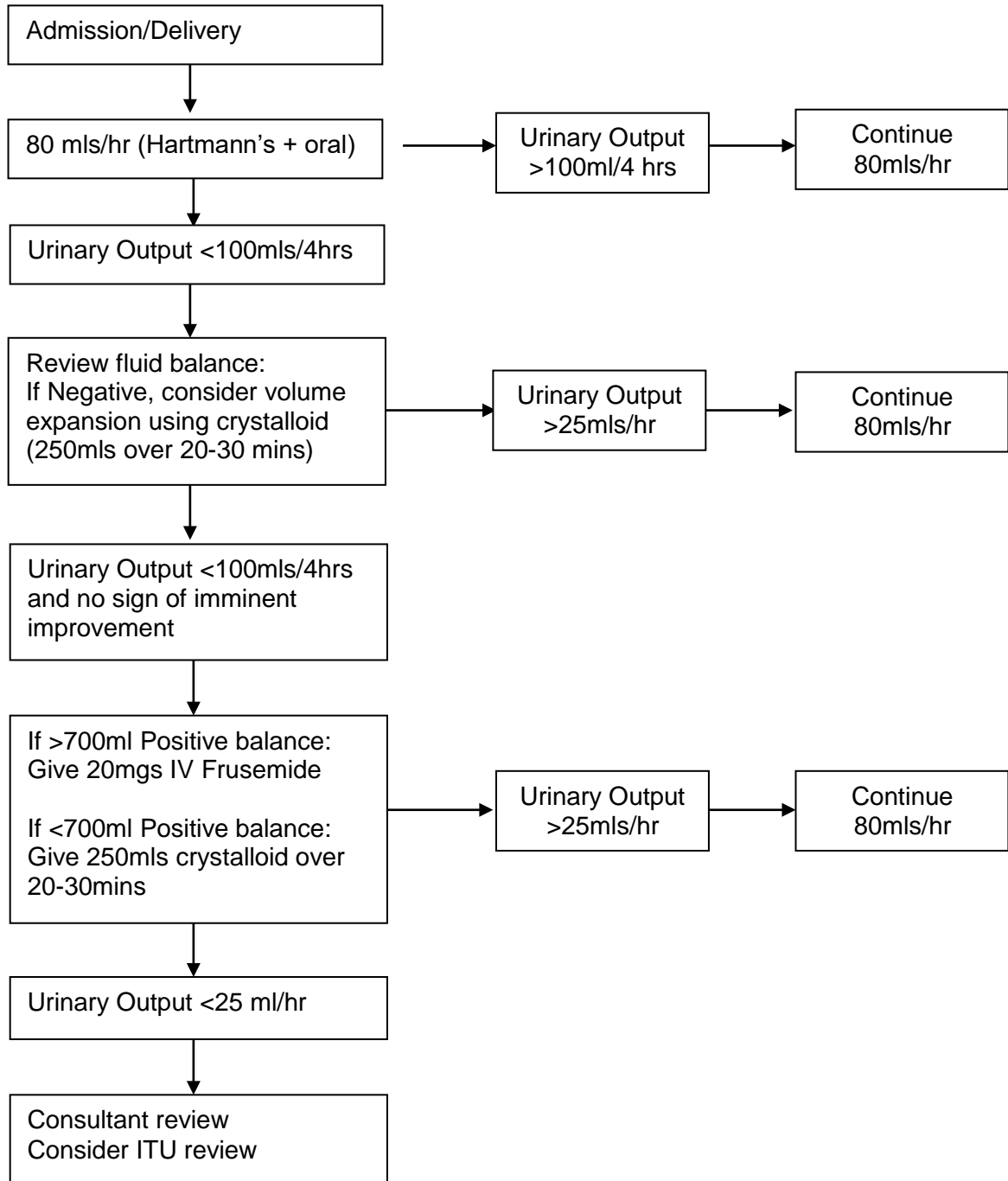
NICE guidelines on Hypertension in Pregnancy

RCOG Green top guideline No 10A March 2006: The management of severe pre-eclampsia and eclampsia

PROMPT

## APPENDIX 1

### Fluid Flowchart for Management of Severe or Fulminating Pre-eclampsia



**APPENDIX 2: Eclampsia Checklist**

		✓
<b>Call for help</b>	Emergency call bell – call for senior midwife, obstetricians and anaesthetist	
	State the problem – ‘Eclamptic Fit’	
	Ask for Eclampsia box	
<b>Team Leader &amp; Scriber identified</b>	Name: _____ / _____	
<b>Airway</b>	Turn mother to left-lateral	
	Maintain Airway	
<b>Breathing</b>	Check breathing	
	Administer high flow oxygen – 15 l /min through non rebreather mask	
	Ensure suction available	
<b>Circulation</b>	IV access x 2	
	Take blood for FBC, G&S, Clotting, U&E, LFTs, Check Blood Glucose (bedside)	
<b>Treatment of Eclampsia – loading dose of MgSO4</b>	4g IV over 5 minutes (preferably using a syringe drive)	
<b>Monitoring (start HDU MEOWS chart)</b>	BP, Pulse rate, Resp.rate, O2 sats, AVPU	
<b>Treatment of Hypertension (if needed)</b>	As per guideline	
<b>Start maintenance dose of MgSO4</b>	1g of MgSO4 / hour through syringe drive	
<b>Fetal monitoring</b>	After mother stabilised	
<b>Catheterise and dip urine for protein</b>	After mother stabilised Monitor hourly urine output	
<b>Fluids – as per guideline</b>	80 mls/hr (IV + oral)	
<b>Further management / Delivery plan discussed as appropriate Transfer to LW (if not on LW) HDU care</b>	Vaginal examination (after mother stabilised) / plan for further management	
<b>Patient and family debriefed</b>		

## Appendix 3

### **Magnesium Sulphate Dosage**

#### **Dosage-**

##### **Loading dose:**

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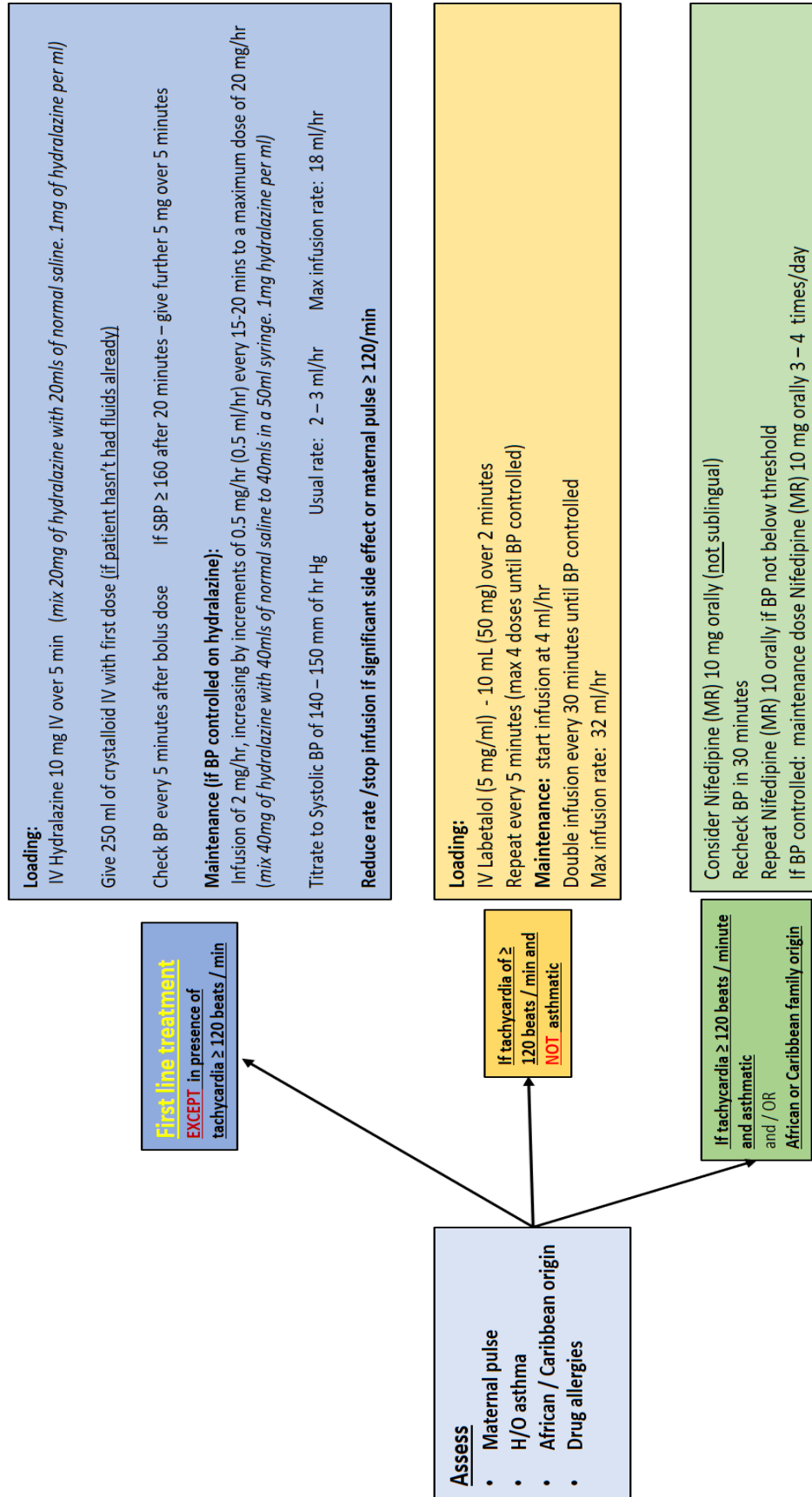
Give 4gm IV loading dose over 5min. Maintenance dose should be omitted until urine output normalizes.

## Appendix 4:

### Management of severe hypertension not controlled by oral antihypertensive

Systolic BP  $\geq$  160 mm of Hg and /or Diastolic BP  $\geq$  110 mm of Hg

(should be managed on delivery suite)



If BP not adequately controlled with one antihypertensive, consider additional antihypertensives (if no contraindication)

## Maternity Services

Title of Guideline:	Guidelines for Management of Severe or Fulminating Preeclampsia
Name(s) of Author:	Madhu Dey
Chair of Group or Committee supporting submission:	Labour Ward Forum
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Next Review / Guideline Expiry:	Feb 2023
Details of persons included in consultation process:	Labour Ward Forum
Brief outline giving reasons for document being submitted for ratification	Review time - Policies need to be reviewed every 3 years
Name of Pharmacist (mandatory if drugs involved):	N/A
Please list any policies/guidelines this document will supercede:	Guidelines for Management of Severe or Fulminating Preeclampsia 2019
Please indicate key words you wish to be linked to document	Pre-eclampsia, fulminating, severe, magnesium, eclampsia, fit
Date approved by labour ward forum:	Feb 2020
File Name: Used to locate where file is stores on hard drive	