



# 3centres Collaboration

Hypertension in Pregnancy,  
Preeclampsia and Eclampsia

Clinical Practice Guidelines 2010

[www.3centres.com.au](http://www.3centres.com.au)



CONTENTS	PAGE
<b>1. Aim</b>	<b>3</b>
<b>2. Comparison of international guidelines with current 3 centres guidelines</b>	<b>3</b>
<b>3. Search and appraisal</b>	<b>3</b>
<b>4. Introduction</b>	<b>3</b>
<b>5. Risk factors and prevention of preeclampsia</b>	<b>4</b>
5.1 High risk factors	4
5.2 Additional risk factors	4
5.3 Preventative supplements for women at high risk of developing preeclampsia	4
<b>6. Classification and diagnosis of hypertensive disorders of pregnancy</b>	<b>5</b>
6.1 Taking blood pressures	5
6.2 Chronic hypertension	5
6.3 Gestational hypertension	5
6.4 Preeclampsia	5
6.5 Maternal symptoms and investigations that support a diagnosis of preeclampsia	6
6.6 Potential fetal consequences of hypertension and preeclampsia	7
6.7 Preeclampsia superimposed on chronic hypertension	7
6.8 Preexisting hypertension	7
6.9 Eclampsia	7
<b>7. Management of hypertensive disorders of pregnancy</b>	<b>7</b>
7.1 Maternal and fetal surveillance	8
7.2 Place of care	8
7.3 Antihypertensive maintenance treatment	8
7.4 Antihypertensives for urgent control of severe hypertension	9
7.5 Prophylaxis of eclampsia	10
7.6 Monitoring during MgSO <sub>4</sub> infusion	10
7.7 MgSO <sub>4</sub> Signs of toxicity	10
7.8 Corticosteroids for fetal lung maturation	10
7.9 Indications for expediting birth	11
7.10 Mode of birth	11
7.11 Third stage of labour	11
7.12 Fluid management	11
7.13 Regional analgesia/anaesthesia	12
7.14 Post partum care	12
7.15 Follow-up	12
<b>8. References</b>	<b>13</b>
<b>Appendix 1. Summary of agreement across the international guidelines groups and 3 tertiary centres, before initiation of the variance process</b>	<b>14</b>
<b>Appendix 2. International Guideline Groups</b>	<b>15</b>

## 1. AIM

The aim of this guideline is to standardise the care for women with hypertension in pregnancy, preeclampsia and eclampsia among the three tertiary centres providing maternity services in the State of Victoria, and to provide a guideline for use in other hospitals where required.

The guideline will assist doctors and midwives in their decision making in the detection, treatment and care of women with hypertension in pregnancy, and those who present with or develop preeclampsia and/or eclampsia.

It is anticipated that this guideline will be used as a basis for the development of local guidelines, which will take into account local service provision and the needs of the local population.

## 2. COMPARISON OF INTERNATIONAL GUIDELINES WITH CURRENT 3 CENTRES GUIDELINES

To compile this guideline, four international guidelines were used to compare facets of care pertaining to hypertension in pregnancy, preeclampsia, and eclampsia diagnosis and treatment.

A 'Best Practice' model has been extrapolated from the consensus of opinion between the international guideline groups. Where opinion was absent or equivocal, the highest level of evidence has been used. Published guidelines from each of the three tertiary centres, namely Mercy Hospital for Women, The Royal Women's Hospital and Southern Health's Monash Medical Centre were gathered, then compared and contrasted against the international best practice model.

Following an iterative consultation process among key stakeholders, a consensus of opinion was gained in most instances. In cases of conflicting points of view, a variance process was initiated whereby the Co-Chairs of the 3centres Collaboration made the final decision. (Appendix 1.)

## 3. SEARCH AND APPRAISAL

The following methods of search and appraisal were used:

An Ovid platform database selection was made using Medline, Embase, Cochrane library and the Clinicians Health channel used to access on-line journals and databases.

Guidelines developed by specific, international guideline groups were also searched via the internet.

Search terms used were; 'Guidelines', "Preeclampsia", "Eclampsia", 'Hypertension in Pregnancy', "Toxaemia", "PIH", "Hydralazine", "Magnesium Sulphate".

The basis of international guideline selection was: The publication year being after 2000, international credibility (published by obstetric and gynaecology professional bodies) and evidence based practice. (Appendix 2.)

## 4. INTRODUCTION

Severe hypertensive disorders of pregnancy are associated with high rates of maternal and fetal morbidity and mortality. Preeclampsia is a multi-system disorder with unpredictable presentation and progression. Although the clinical progression is usually slow, occurring over days and sometimes weeks, rapid deterioration may occur and occasionally result in multisystem failure within a few hours. There is no curative treatment apart from birth, and the best management is by the involvement of a multidisciplinary team, comprising of an obstetrician, anaesthetist, experienced midwives and possibly haematologist, physician and nephrologist.

## 5. RISK FACTORS AND PREVENTION OF PREECLAMPSIA

There is no single test to predict the occurrence of preeclampsia; however it has been shown that women may benefit from a risk stratification model to identify those at greatest risk of developing the disease.

At the antenatal booking visit, women should be assessed for the following risk factors for preeclampsia and appropriate specialist referrals should be made, preferably before 20 weeks gestation.

### 5.1 High risk factors

- preeclampsia in a previous pregnancy
- multiple pregnancy
- pre-existing medical condition:
  - hypertension
  - diabetes
  - antiphospholipid antibody syndrome
  - renal disease.

Evidence levels B-D SOGC

### 5.2 Additional risk factors

Further, the risk of preeclampsia is increased in the following group of women. Additional antenatal surveillance is recommended for these women.

- obesity, BMI > 35
- vascular & connective tissue disorders
- maternal age <18 or >35
- nulliparity
- family history of preeclampsia
- new partner.

Evidence levels B-D SOGC

### 5.3 Preventative supplements for women with a high risk of preeclampsia

In women with a high risk of developing preeclampsia, studies have shown the benefit of prescribing low dose aspirin (75-150mg/day) from before 16 weeks to at least 37 weeks gestation.

Oral calcium supplementation for those with a proven low dietary intake (<600mg/day or corresponding to less than two dairy servings per day) has also been shown to reduce the incidence of preeclampsia.

There is insufficient evidence to support advising dietary salt reduction, increased exercise or bed-rest. Aspirin for the prevention of preeclampsia in low risk women is not supported.

- low dose aspirin 75-150mg/day
- Calcium 1g/day.

Evidence level I SOGC

## 6. CLASSIFICATION AND DIAGNOSIS OF HYPERTENSIVE DISORDERS OF PREGNANCY

The following classifications summarise current evidence and are consistent with most international guidelines. The term PIH should no longer be used as its meaning is unclear.

### 6.1 Taking blood pressures

A manual sphygmomanometer should be used in preference to an automated device as the latter can underestimate systolic pressures.

To accurately assess blood pressure, an appropriately sized cuff for the arm should be selected. A large cuff with an inflatable bladder covering 80% of the arm circumference should be used, if the upper arm circumference is greater than 33 cm.

The woman should be sitting comfortably with her feet on a hard surface.

The systolic blood pressure is accepted as the first sound heard (Korotkoff 1) and the diastolic blood pressure is the disappearance of sounds completely (Korotkoff 5). Where Korotkoff 5 does not occur, Korotkoff 4 (muffling) is accepted. Hypertension is confirmed by serial readings over several hours.

- appropriately sized cuff
- woman sitting with feet on a hard surface
- manual sphygmomanometer
- use Korotkoff 5 for diastolic reading
- take serial readings over several hours.

Evidence level A-B RCOG

### 6.2 Chronic hypertension

- **Essential hypertension:** systolic  $\geq$  140mmHg and/or diastolic  $\geq$  90mmHg confirmed before 20 weeks gestation, of unknown cause.
- **Secondary hypertension:** Raised blood pressure as above caused by known pre-existing medical conditions.
- **White coat hypertension:** A raised blood pressure as above, in the presence of a medical attendant.

Evidence level II SOGC

### 6.3 Gestational hypertension

Characterised by a new onset raised blood pressure after 20 weeks gestation, without maternal or fetal signs or symptoms of preeclampsia

- **Mild to moderate hypertension:** Blood pressure systolic  $\geq$  140mmHg and/or diastolic  $\geq$  90mmHg
- **Severe hypertension:** Blood pressure systolic  $\geq$  160-170mmHg and/or diastolic  $\geq$  110mmHg.

Evidence level II SOGC

### 6.4 Preeclampsia

Preeclampsia is a multi-system disorder arising after 20 weeks gestation. The usual manifestation is hypertension and proteinuria, although proteinuria is not mandatory in order to confirm the diagnosis. Suspicion of evolving or established preeclampsia may arise when hypertension is accompanied by one or more of the following signs and symptoms. (Peripheral oedema is not included in the diagnostic tools, as many pregnant women who develop oedema do not necessarily have preeclampsia.)

#### Preeclampsia classification

- **Mild to moderate:** Defined as systolic blood pressure of 140mmHg and/or diastolic blood pressure of 90mmHg or higher measured on at least two occasions over several hours, combined with proteinuria >300 mg total protein in a 24-h urine collection, or ratio of protein to creatinine >30 mg/mmol).
- **Severe preeclampsia:** Defined as systolic blood pressure 160-170 and/or diastolic blood pressure of 110mmHg or higher measured on at least two occasions over several hours, combined with proteinuria >300 mg total protein in a 24-h urine collection, or ratio of protein to creatinine >30 mg/mmol. All usually accompanied by other haematological, neurological, hepatic or renal derangement.

#### 6.5 Maternal symptoms and investigations that support a diagnosis of preeclampsia:

The diagnosis of preeclampsia can be made only after clinical examination and laboratory testing using pregnancy specific ranges. Once a diagnosis is confirmed, the management is largely based upon the findings and the gestational age. Serum uric acid levels were once routinely used as an indicator of preeclampsia; more recent studies have questioned their lack of sensitivity and specificity. Therefore caution is advised when using serum uric acid as a diagnostic tool.

#### Renal:

- proteinuria:  $\geq 1+$  on dipstick
- proteinuria confirmed by laboratory testing of a spot urine protein/creatinine ratio of  $\geq 30\text{mg/mmol}$  or 24 hour urine collection  $\geq 300\text{mg}$
- oliguria i.e.  $<500\text{mL}/24$  hours or  $<20\text{mL}/\text{hour}$
- serum or plasma creatinine  $> 0.09\text{mmol/L}$  or  $90\mu\text{mol/L}$ .
- rapid weight gain with or without generalised oedema.

#### Haematological:

- thrombocytopaenia. platelet count  $< 100 \times 10^9$
- coagulation profile derangement (**only taken if platelet count is low**)
- HELLP syndrome (haemolysis, elevated liver enzymes, and low platelet count)
- disseminated intravascular coagulation. (DIC)

#### Hepatic:

- nausea and/or vomiting
- upper abdominal pain, often at the right upper quadrant
- raised serum transaminase  $>70\text{iU/L}$ .

#### Neurological:

- headache and/or visual disturbances
- hyperreflexia with clonus
- convulsions (eclampsia).

Evidence level II SOGC

#### **6.6 Potential fetal consequences of hypertension and preeclampsia:**

Complications arising from preeclampsia include placental insufficiency, which can lead to high levels of fetal morbidity and mortality. While there is a focus on maternal manifestations, the following fetal characteristics should not be overlooked, as they may aid the diagnosis and are part of the assessment.

- Reduced fetal movements.
- Abnormal fetal heart rate on cardiotocograph (CTG)
- Reduced amniotic fluid index (AFI)
- Asymmetrical growth restriction
- Increased resistance, absent or reversed end diastolic flow on umbilical artery Doppler
- Low biophysical profile score.

Evidence level II SOGC

#### **6.7 Preeclampsia superimposed on chronic hypertension**

- Women with pre-existing hypertension with or without proteinuria before 20 weeks gestation, who later develop symptoms or signs of preeclampsia.

Evidence level II SOGC

#### **6.8 Pre-existing hypertension**

Is a strong risk factor for the development of preeclampsia. Superimposed preeclampsia is diagnosed when one or more of the features of preeclampsia develop after 20 weeks gestation in a woman with chronic hypertension.

#### **6.9 Eclampsia**

Eclampsia occurs in 1 in 200-300 women with preeclampsia in Australia. It is unpredictable and often there are no associated clinical precursors. Seizures may occur antenatally, intra-partum or postnatally, usually within 24 hours of birth but occasionally later. A differential diagnosis of eclampsia should be made until other medical, metabolic and neurological conditions have been excluded.

- New onset of grand mal seizure activity +/- unexplained coma during pregnancy, intra-partum or in the early post partum period.
- The woman may or may not have signs or symptoms of preeclampsia.

Evidence level II SOGC

### **7. MANAGEMENT OF HYPERTENSIVE DISORDERS OF PREGNANCY**

The basis of management is stabilisation, assessment, observation and if appropriate, delivery.

The frequency and place of surveillance is based upon the gestation, the severity and rate at which the condition advances.

Maternal surveillance can be as frequent as daily to weekly as a hospital in-patient, an outpatient or as part of a home care program. Similarly, fetal surveillance varies from between daily to second weekly dependent upon test performed, results, gestation and severity of disease.

### 7.1 Maternal and fetal surveillance

Maternal : Frequency - daily to weekly.

- review for new symptoms or signs
- blood pressure
- urinalysis for protein
- preeclampsia blood screen. i.e. FBE, urea and creatinine, liver function tests.

Fetal: Frequency - daily to 2<sup>nd</sup> weekly.

- CTG
- fetal umbilical artery Doppler
- AFI
- growth (2<sup>nd</sup> weekly).

Evidence level A-B RCOG

### 7.2 Place of care

Following a period of initial observation, there is no evidence to support keeping women with mild preeclampsia in antenatal hospital beds.

Depending on disease progression and severity, women can be safely monitored at home or in a day assessment centre, if there is a robust programme with good compliance.

Women with severe preeclampsia must be cared for as a hospital in-patient.

- Mild preeclampsia - Home or day assessment centre.
- Moderate to severe preeclampsia - In hospital.

Evidence level B SOGC

### 7.3 Anti hypertensive maintenance treatment.

The use of antihypertensive therapy in cases of mild preeclampsia is equivocal and its use may compromise placental perfusion. It should only be used in the presence of other disease markers or existing co-morbidities, such as type one diabetes, chronic hypertension, renal or vascular disease.

When blood pressures begin to exceed 140/90mmHg, closer surveillance and consultation with senior colleagues is recommended before commencing antihypertensive therapy. In the future, results of on-going studies will assist in guiding practice.

There is insufficient evidence to recommended one oral antihypertensive over another. The medications of choice are labetalol, methyldopa and nifedipine.

The drug of choice should depend on the clinician's experience and familiarity with a particular drug and on what is known about its adverse effects for both the woman and her baby.

- When blood pressures exceed >140/90mmHg, increase surveillance and consult with senior colleagues before the commencement of antihypertensive therapy. Evidence level C
- Definitely commence antihypertensive therapy with blood pressures > 160/100mmHg Evidence level A

Medication	Dose	Maximum dose in 24 hours
Methyldopa	250mg-500mg bd-qid	3-4g
Labetalol (avoid in women with asthma)	100mg-400mg bd-qid	1600mg
Nifedipine SR	10mg-20mg bd-tds	120mg

Evidence level II SOGC

#### 7.4 Antihypertensive medication for urgent control of severe hypertension

Research has concluded that intravenous Labetalol is the first drug of choice for the urgent control of severe hypertension in pregnancy. This is likely to be due to its lower incidence of adverse effects and therefore, its use supplants that of hydralazine; avoid in women with asthma or congestive heart failure. Its use will depend on availability and the clinicians experience and familiarity with the drug.

The optimum blood pressure range to achieve and maintain is: 140-160/90-100mmHg. Blood pressure should be monitored continuously and reduced gradually to avoid adverse fetal side effects from a rapid decrease in uteroplacental perfusion. Continuous electronic fetal monitoring should be performed concurrently, until optimal blood pressures are maintained.

Medication	Dose	Maximum dose
Intravenous Labetalol (To be avoided in women with asthma)	20mg given over 2 minutes. Repeat every 10 minutes	300mg
On-going Labetalol infusion	20-160mg/hour titrated until optimal blood pressures are achieved. Add 40mL (200mg) of Labetalol to 160mL of 0.9% sodium chloride. The resultant 200mL of solution contains 200mg Labetalol - 1mg/mL.	300mg
Intravenous Hydralazine	5-10mg given over 5-10 minutes. Repeat every 20-30 minutes X 2	3 doses
On-going Hydralazine infusion	5mg/hour to maintain optimal B/P	

Evidence level A RCOG

#### 7.5 Prophylaxis of eclampsia

Magnesium Sulphate (MgSO<sub>4</sub>) is the drug of choice for eclampsia and is recommended for women as seizure prophylaxis in cases of severe preeclampsia. Although uncommon, Magnesium toxicity can occur and Magnesium levels should be assessed if signs of toxicity are apparent.

MgSO<sub>4</sub> should be continued for at least 24 hours following birth or the last seizure, whichever is later. Phenytoin and benzodiazepines should not be used for eclampsia prophylaxis or treatment, unless there is a contraindication to MgSO<sub>4</sub>, or it is ineffective.

Medication	Dose	Maximum dose
MgSO <sub>4</sub> Intravenous loading dose	4g given over 10-15 minutes	4g
MgSO <sub>4</sub> Intravenous maintenance infusion	1g/hour	-
MgSO <sub>4</sub> Intravenous for recurrent seizures	2g bolus or increase the maintenance infusion to 1.5-2g/hour	2g

### 7.6 Monitoring during MgSO<sub>4</sub> infusion

- ½ hourly blood pressure, pulse, respiratory rate in the acute phase
- 1 hourly patellar reflexes
- 1 hourly urine output measurement + 4 hourly testing of urinary protein
- 2 hourly temperature
- continuous electronic fetal monitoring.
- ECG and oxygen saturation monitoring should be considered

Evidence level III RCOG

### 7.7 MgSO<sub>4</sub> signs of toxicity

While magnesium toxicity is relatively uncommon, women with renal impairment are at a greater risk of toxicity while receiving a MgSO<sub>4</sub> infusion.

- Suppression or loss of patellar reflexes
- Respiratory depression
- Drowsiness
- Loss of consciousness

To treat toxicity, stop the infusion and give Calcium Gluconate 1 g (10 ml) IV over 10 minutes. Take Magnesium levels to confirm that altered state is due to MgSO<sub>4</sub> and not another cause.

Evidence level I RCOG

### 7.8 Corticosteroids for fetal lung maturation

- Recommended if <34 weeks gestation. 11.4mg intramuscular injection of Betamethasone daily for two doses.

Evidence level I RCOG

- Clinicians may also consider administering antenatal glucocorticoids to women at 34-36weeks' gestation.

Evidence level Good practice point RCOG

### 7.9 Indications for expediting birth

- Severe preeclampsia is an indication for delivery regardless of gestation. However in mild or moderate preeclampsia, conservative management should be considered and particularly so if <34 weeks gestation

Evidence level A RCOG

- If 34–36 weeks gestation with non-severe preeclampsia, there is insufficient evidence to make a recommendation about the benefits or risks of expectant management.

Evidence level III SOGC

- If  $\geq$  37 weeks, women with severe or non severe preeclampsia – expediting birth should be considered.

Evidence level III SOGC

### 7.10 Mode of birth

If  $\geq$  34 weeks gestation, vaginal birth is optimal, if possible.

If <32 weeks gestation, the success of induction is reduced and a caesarean section may be necessary.

Evidence level II SOGC

### 7.11 Third stage of labour

Ergometrine and Syntometrine are to be avoided in women with hypertension, as the vasoconstrictor effect of Ergometrine increases blood pressure. They could however be considered if post partum haemorrhage occurs.

Active management of the 3<sup>rd</sup> stage with 10iu of intramuscular oxytocin. (Syntocinon®)

Or alternatively, 5iu may be given as a **slow** intravenous injection.

Evidence level RCOG-Good practice point

### 7.12 Fluid management

Pulmonary oedema from excessive fluid administration is a major cause of maternal morbidity and mortality in cases of severe preeclampsia/eclampsia. A strict limit to fluid intake should be adhered to and input/output carefully documented.

The benefits of using frusemide or dopamine for oliguria are inconclusive. They are not recommended for antenatal or intrapartum use but may be of some benefit during the post partum period.

- strict fluid balance charting
- restrict total fluid intake to 80mL/hr
- in severe preeclampsia/eclampsia – An indwelling urinary catheter with hourly urometer
- observe for oliguria - <20mL/hour for 3 or more hours
- observe for pulmonary oedema.

Evidence level Good practice point RCOG

### **7.13 Regional analgesia/anaesthesia**

- regional analgesia/analgesia is appropriate in the absence of a coagulopathy.
- preloading of fluids is not advised
- pre-referral to an anaesthetist is recommended.

Evidence level A ACOG

### **7.14 Post partum care**

In cases of preeclampsia and eclampsia, blood pressure can rise in the first 3-6 postpartum days before it begins to normalise. It can however take several weeks before the blood pressure returns to normal. The incidence of postpartum eclampsia should not be underestimated, 44% of all cases of eclampsia occur in the postpartum period.

- MgSO<sub>4</sub> should continue for a minimum of 24 hours following birth or after the last seizure which ever is later
- antihypertensives should be titrated down
- maintain blood pressure < 160/110mmHg
- In cases of severe preeclampsia, 4 days of inpatient care is prudent.

Evidence level C RCOG

### **7.15 Follow up**

- Appropriate and timely communication with the community health provider, who should continue to monitor blood pressures and manage antihypertensive therapy.
- Severe preeclampsia:- 6 week obstetric review.
- Refer to appropriate specialist if there is persistent hypertension or proteinuria.
- Preconception counselling for subsequent pregnancies.

Evidence level Good practice point RCOG

## 8. REFERENCES

- Abalos E, Duley L, Steyn DW, Henderson-Smart DJ. Antihypertensive drug therapy for mild to moderate hypertension during pregnancy. *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No.: CD002252. DOI: 10.1002/14651858.CD002252.pub2.
- Altman D, Carroli G, Duley L, Farrell B, Moodley J, Neilson J, Smith D. Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo-controlled trial. *Lancet*. 2002;359:1877-90.
- American Journal of Health Pharmacy. Pharmacotherapeutic Options for the Treatment of Preeclampsia Available from: <http://www.medscape.com/viewarticle/590260> accessed Aug. 2009
- Chronic hypertension in pregnancy. ACOG Practice Bulletin No. 29. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2001;98: 177-I 85 (Level III)
- Cote AM, Brown MA, Lam E, von Dadelszen P, Firoz T, Liston RM, Magee LA. Diagnostic accuracy of urinary spot protein:creatinine ratio for proteinuria in hypertensive pregnant women: systematic review *BMJ*. 2008;336(7651):1003-6.
- Duley L, Henderson-Smart DJ, Meher S. Drugs for treatment of very high blood pressure during pregnancy. *Cochrane Database of Systematic Reviews* 2006, Issue 3.
- Koopmans CM et al, Accuracy of serum uric acid as a predictive test for maternal complications in pre-eclampsia: Bivariate meta-analysis and decision analysis. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, Volume 146, Issue 1, September 2009, Pages 8-14
- Magee L, Sadeghi S, von Dadelszen P. Prevention and treatment of postpartum hypertension. *Cochrane Database of Systematic Reviews* 2005, Issue 1.
- Milne F et al The pre-eclampsia community guideline (PRECOG): how to screen for and detect onset of pre-eclampsia in the community *BMJ* MAR2005; 330: 576-580
- Podymow T, August P. Update on the Use of Antihypertensive Drugs in Pregnancy, *Hypertension*, Apr 2008; 51: 960 - 969.
- Poon et al, Hypertensive disorders in pregnancy: screening by *uterine artery Doppler* imaging and blood pressure at 11-13 weeks. *Ultrasound Obstet Gynecol*. 2009 Nov; Vol. 34 (5), pp. 497-502.
- Royal College of Obstetricians and Gynaecologists Guidelines: Preeclampsia – study group statement. Sep. 2003 [www.rcog.org.uk/index.asp?PageID=312](http://www.rcog.org.uk/index.asp?PageID=312) accessed Aug. 2009.
- The Geneva Foundation for Medical Education and Research Obstetrics, gynecology and reproductive medicine guidelines Pregnancy Preeclampsia, eclampsia. Available from: [http://www.gfmer.ch/Guidelines/Pregnancy\\_newborn/Preeclampsia\\_eclampsia\\_hypertension\\_in\\_pregnancy.htm](http://www.gfmer.ch/Guidelines/Pregnancy_newborn/Preeclampsia_eclampsia_hypertension_in_pregnancy.htm) accessed Aug. 2009

**APPENDIX 1. SUMMARY OF AGREEMENT ACROSS THE INTERNATIONAL GUIDELINES GROUPS AND 3 TERTIARY CENTRES, BEFORE INITIATION OF THE VARIANCE PROCESS.**

<b>Domains of care.</b>	<b>Agreement among the 4 international guideline groups.</b>	<b>Agreement among the 3 centres.</b>
Identification of risk factors.	3 of 4 cited risk factors. Most mentioned the same factors.	None of the 3 centres mentioned risk factors in their guidelines.
Prevention of preeclampsia.	2 of 4 recommend Aspirin and calcium as preventative measures.	2 of 3 centres prescribe Aspirin and calcium.
Classification of hypertensive disorders.	All 4 groups agreed on the classification titles.	1 fully agreed with the international consensus. 1 partially agreed but still uses the term PIH. 1 had very sparse information.
Diagnosis of hypertensive disorders.	3 of 4 groups agreed that mild to moderate hypertension was 140/90mmHg. The 4 <sup>th</sup> group focussed only on severe.  3 of 4 groups agreed that severe hypertension was 160/110mmHg. 1 group cited 170/110mmHg as severe.	All 3 centres agreed that 140/90mmHg was mild to moderate.  2 of the 3 centres agreed on 160/110mmHg as severe. 1 centre cited 170/110mmHg.
Investigations for the diagnosis of preeclampsia.	All 4 groups concurred on most investigations. The areas of disparity were platelet count and definition of oliguria.	The 3 centres concurred on most investigations. The areas of disparity were platelet count and definition of oliguria.
Oral medication management.	3 of the 4 groups agreed upon the use of oral Methyldopa. 1 group did not mention its use. All 4 groups agreed on the use of oral Labetalol.	2 of 3 centres endorsed the use of oral Methyldopa. No mention from 1 centre. All 3 centres use oral Labetalol.
IV medication management.	All 4 groups agreed on the use of IV Hydralazine, although all differed on the timing of repeat doses. All 4 groups agreed on the use of IV Labetalol 3 of the 4 groups mention the use of Nifedipine.	All 3 centres use IV Hydralazine. 2 of 3 agreed on the timing of repeat doses. 1 of 3 centres reported using IV Labetalol. 2 of the 3 centres mention the use of Nifedipine.
Surveillance and care.	There was general agreement of the type and frequency of maternal and fetal surveillance among the 4 groups.	Type and frequency of surveillance was mentioned less by all 3 centres compared with the international groups.
Post partum & follow up care.	2 of the 4 groups detailed post partum follow up and preconception counselling.	All 3 centres mention follow up but in less detail than the international guidelines.

## Appendix 2. International guideline groups

**The Society of Obstetric Medicine of Australia and New Zealand (SOMANZ)** was renamed in 2004, following an amalgamation with the Association for the Study of Hypertension in Pregnancy (ASSHP), and The Obstetric Medicine Group of Australasia (OMGA).

SOMANZ 'Guidelines for the management of hypertensive disorders of pregnancy' were published in 2008. The recommendations are the result of a multidisciplinary working party convened by the Society of Obstetric Medicine of Australia and New Zealand. They reflect current medical literature and the clinical experience of members of the working party. There are 161 references but no levels of evidence were cited.

Guidelines for the management of hypertensive disorders of pregnancy' Available from: <http://www.somanz.org/> accessed July 2009.

### **The Society of Obstetricians and Gynaecologists of Canada (SOGC).**

The guideline 'Diagnosis, Evaluation, and Management of the Hypertensive Disorders of Pregnancy has been reviewed and approved by the Hypertension Guideline Committee and approved by the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

It was published in the Journal of Obstetrics and Gynaecology in March 2008. It contains 397 references and the levels of evidence are described as:

Key to evidence statements and grading of recommendations, using the ranking of the Canadian Task Force on Preventive Health Care

I: Evidence obtained from at least one properly randomized controlled trial

II-1: Evidence from well-designed controlled trials without randomization

II-2: Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than one centre or research group

II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

A. There is good evidence to recommend the clinical preventive action

B. There is fair evidence to recommend the clinical preventive action

C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making

D. There is fair evidence to recommend against the clinical preventive action

E. There is good evidence to recommend against the clinical preventive action

I. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making

journal of Obstetrics and Gynecology of Canada. Available from:

<http://www.sogc.org/guidelines/documents/gui206CPG0803.pdf> (2008) accessed July 2009

**American College of Obstetricians and Gynecologists (ACOG)**

Practice Bulletins summarise current information on techniques and clinical management issues for the practice of obstetrics and gynaecology. Practice Bulletins are evidence-based documents, and recommendations are based on the available evidence.

'The diagnosis and management of preeclampsia and eclampsia' practice bulletin was published in the International Journal of Gynecology and Obstetrics in January 2002.

The summary of recommendations contains evidence levels and there are 63 references. The levels of evidence used are as follows:

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A - Recommendations are based on good and consistent scientific evidence.

Level B - Recommendations are based on limited or inconsistent scientific evidence.

Level C - Recommendations are based primarily on consensus

American College of Obstetricians and Gynecologists. Practice Bulletin no.33 January 2002. International Journal of Gynecology & Obstetrics 77 (3002) 67-75

**Royal College of Obstetricians and Gynaecologists (RCOG)**

Green-top Guidelines provide systematically developed recommendations, which assist clinicians and patients in making decisions about appropriate treatment for specific conditions. Green-top guidelines are concise documents, providing specific practice recommendations on focused areas of clinical practice. The Green-top guidelines are produced under the direction of the Guidelines and Audit Committee of the RCOG.

The Management of Severe Preeclampsia/Eclampsia is a RCOG Green Top guideline number 10a and was published in March 2006. It contains evidence levels and 52 references. The levels of evidence used are as follows:

**RCOG evidence grades**

- A Requires at least one randomised controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation.
- B Requires availability of well-conducted clinical studies but no randomised clinical trials on the topic of recommendation.
- C Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates absence of directly applicable studies of good quality.
- ✓ Good practice point. Recommended best practice based on the clinical experience of the guideline development group.

**Classification of evidence levels**

Ia Evidence obtained from meta-analysis of randomised controlled trials.

Ib Evidence obtained from at least one randomised controlled trial.

IIa Evidence obtained from at least one well designed controlled study without randomisation.

IIb Evidence obtained from at least one other type of well-designed quasi-experimental study.

III Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.

IV Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities.

Royal College of Obstetricians and Gynaecologists UK 2006. Available from:

<http://www.rcog.org.uk/files/rcog-corp/uploaded-files/GT10aManagementPreeclampsia2006.pdf> (accessed July 2009)