PREFACE

The previous labour ward manual was updated in early 2010. Over the last 2 years, there have been a number of changes and development in obstetric practice. It is due to this reason an updated version of this manual becomes necessary. It has also come to our knowledge that the previous manual was printed and used in other hospitals in Sarawak. It should be noted that the appropriate obstetric practice and plan of management for various clinical situations may differ slightly depending on the location, facilities, availability of clinical specialties and other support services. For the current manual some reference towards appropriate management in district hospitals are included.

This is the 2nd reprint of the earlier publication and 2 additional topics on ‘Maternal Collapse’ and ‘Drugs in Pregnancy’ have been added

We hope that this manual would serve as a useful guide to doctors managing obstetric patients in the labour ward.

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2nd reprint
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2.1 PATIENT ADMISSION AREA / LW TRIAGE

The Sarawak General Hospital’s labour ward is the designated ‘Patient Admission Centre’. All antenatal patients are reviewed and admitted through the triage area of labour ward.

Pregnant patients are admitted to receive inpatient care based on their identified health care needs and the organization’s mission and resources

Intent:

1) The department should accept cases referred from the primary/secondary sources or ‘walk in’ cases for further pregnancy management of gestation more than 24 weeks. Those earlier than 24 weeks can be reviewed in the PAC but if requiring admission would be admitted to the gynaecology ward.

2) All obstetric wards are integrated wards (combined antenatal and postnatal care).

3) ‘Walk in’ and referred patients need to be clerked, assessed and documented in patient’s record at triage area by the nurses at the nursing counter. The patients will then have a CTG done and reviewed by a house officer. Any patients clerked by a house officer should be informed to a medical officer and the management agreed upon.

4) Admission shall be decided by the medical officer or the specialist on duty after his/her assessment.

5) Patients in labour shall be admitted directly to labour suite / labour room and other patients will be provided a bed in the obstetric ward as soon as a bed is available.

6) Patients waiting to be seen or are waiting for a bed to be available should be given breakfast/lunch or dinner at the time food is being served for other inpatients.

7) Postnatal mothers referred from outside agencies or birth before arrival (BBA) within 24 hours shall be admitted directly to the obstetric ward together with their...
babies. Newborn babies with complications shall be admitted to the Paediatric Unit.

8) All patients for admission need to have an admission form (Borang Arahan Kemasukan Wad – JRP 3/94(Pin. 1/06) and must be registered at the Admission Registration Counter.

9) All patients for admission need to fill up an acknowledgment form regarding their valuables/belongings (Borang Akuan Harta Benda Pesakit) at the Patient Admission Counter (PAC), including patients admitted from the antenatal clinic.

10) All inpatients shall be given a wrist identification tag and the babies would also be tagged accordingly.

11) Antenatal patients who are allowed to go home after being reviewed at the triage area by the house officer and the medical officer on duty. Should be counselled and given appropriate explanation. Such patients should be registered in a book placed in the nurse’s counter. Input should include patient’s data and a brief clinical finding. It should also state the name of the medical officer who has reviewed the patient. The patient’s contact number should also be recorded and the husband or the person accompanying the patient should sign on the book. The patient should not be allowed to return home alone.

12) Patient who requested to be admitted even though the clinical finding does not necessitate an admission should be admitted for observation if a bed is available.

13) Patients who have difficulty to come back to the hospital, or who stays far from the hospital should be admitted.

**Intent:**

1) Patients with emergency or immediate needs such as severe preeclampsia, bleeding placenta praevia are assessed and receive care as quickly as necessary.

2) Patients who need further attention or with immediate need, should be informed immediately to the medical officer / specialist in charge of the PAC or the Specialist On Call.

3) Appropriate referrals to other department shall be made accordingly.

**Measurable elements:**

◊ 1) Staff shall recognize and prioritize patients with immediate needs

◊ 2) Medical officer / specialist shall be informed immediately.

◊ 3) Patients are prioritized based on the urgency of their needs.
Emergency patients to be seen within 5 minutes by medical officer (Std: >95%)

All patients cared for by the organization have their health care needs identified through established assessment process.

Access of care and Continuation of Care: Standard
Each patient assessment(s) include an evaluation of physical, psychological, social and economic factors, including a physical examination and health history.

Intent:

1) The assessment(s) of patient provide the information to:
   .i.1.a) understand the care the patient is seeking
   .i.1.b) select the best care setting for the patient
   .i.1.c) form the initial diagnosis
   .i.1.d) understand the patient’s response to any previous care

2) Relevant investigations to form the diagnosis shall be sent
   .i.1.a) Refer circulars on handling/ordering of lab investigations (Pengendalian Spesimen Makmal)
   .i.1.b) Ordering radiological investigations (Permohonan Pemeriksaan Radiologi)

Measurable elements:

All patients shall have an initial assessment in Patient Admission Centre / in the wards for the elective admission by the house officer / medical officer

◇ 1) The initial assessment(s) results in understanding any previous care and the care the patient is currently seeking.
◇ 2) The initial assessment(s) result in selecting the best setting for the care
◇ 3) The initial assessment(s) results in an initial diagnosis.

Inappropriate admissions rate (Std: < 1%)

Intent:

Patient and family shall receive sufficient information to make knowledgeable decision.
Information is provided about above matters. When financial constraints related to the cost of care are present, the relevant authorities shall seek ways to overcome those constraints.

Measurable elements:

◊ 1) The staff and doctors shall provide the patient / family with information at admission on proposed care and the expected outcome.
◊ 2) Proper documentation shall be written in the patient’s record regarding the information provided.
◊ 3) Patient shall receive sufficient information to make knowledgeable decisions.

LABOUR ROOM/SUITE

Labour room / suite is a specialize area, taking care of mothers in labour. To ensure optimum patient care and safety to mothers and their babies, appropriate guidelines shall be followed for all procedures and activities.

1) During intrapartum period / postnatal period
   b) Management of CTG: ‘Pengendalian CTG’
   c) Management of the placenta: ‘Pengendalian Uri’
   d) Vaginal examination: ‘Proses pemeriksaan faraj’

2) Ensure babies’ safety

3) Nurses and doctors are to follow strictly available SOP for the various steps in the management of patients and other clinical work processes.

Discharges from labour ward

1) Staffs from labour room are responsible for transfer of postnatal mothers and their babies to the maternity wards
2) On receiving the mother and baby, the ward staff shall check their tags to verify their identification – ‘Correct baby to the correct mother’. Ward staff shall go through the checklist – ‘Penilaian Postnatal’
3) Ensure babies’ safety
   Refer ‘Pekeliling Ketua Pengarah Kesihatan Bil 1/2007 : Garispanduan Sistem"
Transfer of babies from Labour ward

1) Labour suite staffs are responsible to transfer the babies that need to be admitted to Maternity Neonatal Intensive Care Unit (MNICU) after the Paediatric medical officer had discussed with the specialist and the approval obtained and documented.

2) Transfer of patient to other departments need to follow the hospital policy.
   a. Refer Guidelines on referrals to other departments: Pindah Keluar ke Wad Lain Dalam Hospital.

3) Transport arrangement shall be made for transfer to other department / hospital
   a. Refer Format for request for transport : Permohonan Perkhidmatan Kenderaan

MATERNITY OPERATION THEATRE

Standards
Patients are planned for elective and emergency caesarean section at maternity operation theatre or the main OT.

Standard:

1) Elective cases are planned earlier and performed from pre-determined hours (Monday to Friday, 8am-5pm).

2) All cases listed for operation are by a specialist

3) The patients are counseled regarding the indication, procedure and associated complications prior to the surgery and they are admitted one day prior to the day of operation.

4) The patients together with the husband are reviewed again by the obstetrician and gynaecologist who is planned to perform the operation.

5) Necessary investigations are taken and reviewed prior to the operation.

6) All patients are reviewed by the anesthetist one day prior to the operation and are counseled again regarding the operation and type of anesthesia planned.
7) All high risk cases are performed by specialist/consultant.

8) Once the patient has been counseled, a written consent is taken from the patient.

9) Blood is group and cross matched for all high risk cases according to the hospital protocols. Other patients shall have blood grouped and saved as appropriate.

10) A day prior to surgery a list is drawn up of all the cases and the Maternity Operation theater list is signed by the Head of Department.

11) The staff from the respective wards/units shall notify the staff of the Maternity Operation Theatre by means of an OT dispatch book prior to the surgery.

12) The respective wards shall be responsible for transporting the patients to and from the Maternity Operation Theatre after being informed by the OT staff.

13) The Operation Theatre guidelines for patient’s attire shall be adhered to.

14) At the Operation Theatre “transfer bay” the ward staff shall “hand over” the patient to the theatre nurse to ensure patient’s safety. Any special instructions shall be conveyed to the Operation Theatre nurse.

15) The Operation Theatre staff shall carry out the necessary checklist in accordance to the standard procedures.

16) The ward staff shall be informed of any cancellation of cases.

17) All OT staff and relatives accompanying patients shall abide by the rules’ and regulations pertaining to the Operation Theatre attire.

18) Mentally handicapped and psychiatric patients may be accompanied into the Operation Theatre by a single relative who signed the operation consent.

19) No food and drinks are allowed in the OT except in the designated rest rooms.

20) The OT shall receive all their sterile supplies from CSSD.

21) All linen and instruments shall be packed in OT before being sent to CSSD for sterilization.

22) Short cycle sterilization for dropped instruments shall be carried out in the OT

23) The Operation Theatre shall be cleaned following set guidelines and procedures of the Operation Theatre.

24) The Operation Theatre shall be closed for routine cleaning for a few hours once a week
25) Existing regulations on cleaning, sterilization and disinfection as stated in the “Guidelines on control of Hospital Acquired Infections and the Disinfections and Sterilization Policy and Practice”, MOH, 1997 (Revised) shall be observed.

26) For infectious cases, the appropriate guidelines issued by the MOH to be adhered

27) The sterility tests for air and equipment in OT and the bacteria surveillance tests shall be carried out as and when indicated.

**Measurable elements:**

- 1) Cases reviewed by medical officer/registrar.
- 2) Cases reviewed by specialist
- 3) Cases reviewed by anaesthetist
- 4) Counselling of patients and relatives
- 5) Consent taken from patient
- 6) Blood investigations taken and reviewed by doctor
- 7) OT checklist
- 8) Sterile supplies from CSSD
- 9) Air sterility and bacteria sterility test in OT
- 10) Cleaning roster for OT
- 11) OT list prepared and signed by HOD

*The standard for all the above measurable elements shall be 100%*
ADMISSION CLERKING SHEET (88.H314.01)

1. All columns must be filled
2. Identified risk factors - write in RED
3. Ensure recording of salient information - such as blood group / rhesus factor/ allergies

The follow up notes form is designed to allow recording of information of a particular antenatal visit in a SINGLE row. Record new and current information obtained during a particular visit.

WARD NOTES:

1. Each review should include complaints, findings, results, assessment, diagnosis working diagnosis and plan of management. In booked cases, this plan should be stated clearly in the notes.

2. Specialist input is required in all patients with risk factors

3. All entry in the case notes must include:

   3.1 Date (include the year)
   3.2 Time (use the 24 hour clock)
   3.3 Signature and name clearly printed or stamped

4. Self-inking rubber stamp is recommended (Compulsory for all house officers).

5. House officers to write "H.O" below their names.

6. When notes are written on behalf of others, the names of the senior doctor should head the entry

   6.1 S/B: SEEN BY
   6.2 D/W: DISCUSSED WITH
   6.3 S/W: SEEN WITH

7. Entry on behalf of the head of department / unit should be written in red.

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7. Each review should include a short note regarding the case, salient features, risk factors and working diagnosis.

9. Every patient who is admitted to the ward must have a written plan of management.

**OBSTETRIC OPERATIVE NOTES:**

1. Completeness is the responsibility of the surgeon.
2. Names of doctors should be in full.
3. All notes must end with the name and signature of the person writing the notes.
4. Blood loss 500ml and more must be written in red and include the term 'PPH'.
5. Post-operative orders should be tailored to the case including relevant investigations.

6. HPE Forms:

   6.1 Must contain a short case summary of the patient.
   6.2 Specimen must be identified and described correctly.
   6.3 The name of the doctor requesting the examination should be that of the Surgeon.
   6.4 If the house officer writes the form, his/her name should follow that of the Surgeon.
   6.5 All forms especially for specimen suspicious of malignancy must be counter checked by Specialist / Medical Officer before submission.

7. Indications for LSCS should follow the standard list, (refer appendix)

**DISCHARGE SUMMARY:**

- Discharge note should be given to patient. This should contain only the diagnosis and plan of management. The proper discharge summary should be clipped to the patient’s case note.

**Antenatal Ward**

- A patient admitted and discharged should have a discharge summary of her admission and to be clipped in her antenatal care booklet (Pink Book). It should include the date of admission, date of discharge, reason for her admission and the management

**Postnatal Ward**

In Caesarean sections / Hysterectomies, details on:
1. Indication
2. Operative difficulties / complications
3. Blood transfusion, if any

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4. Post operative recovery
5. Plan for next delivery (mode)

6. Any contraindication for subsequent trial of scar should be included in the Red Book/Patient Held record/Home Based Card

**E-NOTIFICATIONS:**

1) E-notifications for all postnatal discharge need to be done by the designated nurse in each maternity ward on a daily basis every morning. The notifications will be e-mailed to respective Divisional Health Office. The DHO will then relay this information to the respective MCH clinics within their area. The purpose of this exercise is to inform the respective clinics that their patients have delivered and home visits can be arranged and prioritized.

2) The last column on the e-notification chart should have adequate data on the plan of management for each postnatal mother. If specific home visits are required then it should be stated clearly.

**WEEKLY IN-PATIENT SUMMARY:**

Any patient managed as an in-patient for duration of five days or more should have a weekly summary. A review of such patients by the ward consultant is compulsory.
2.2.2 GUIDELINES ON GENERAL SAFETY PRECAUTIONS

PROTECT YOURSELF
1. Wear gloves when setting intravenous lines and handling blood specimen.
2. All specimens and needles and syringes must be placed in a kidney dish when carried from place to place to avoid accidental injury
3. Gown-up when conducting delivery or performing procedures
4. Use disposable sterile gown / visor / goggles / boots when conducting labour in a biohazard case (positive for HBsAg / HIV).
5. Use long gloves / elbow length gloves when performing MRP.
6. Use of eye protection is recommended during delivery and episiotomies repair.
7. Use OT garment while on duty in labour room.
8. Use plastic gown during delivery.
9. Use sterile gown while doing MRP.
10. Test yourself for Hepatitis B Antibody levels.
11. Obtain immunization against Hepatitis B.

PROTECT YOUR COLLEAGUE
1. Identify high-risk patients (eg. Positive for Hepatitis B) whenever a patient; is passed over during shift changes or when a patient is transferred from one station / ward to another.
2. Label all blood specimens from high-risk patients using the special biohazard stickers stamp.
3. Personally dispose all sharps (injection needles / suture needles) into the "sharps bin". Sharps should not be left unattended.

PROTECT YOUR PATIENT
1. Label all blood specimen bottles. The person taking blood must label all specimen
1. Wash your hands before and after examination of patients.
2. In the labour room, wear a mask before doing vaginal examination.
3. Swab the vulva with sterile water before doing a vaginal examination.
4. Drape (sterile) patient before delivery.
5. Use aseptic techniques to insert a Foley's catheter.
6. Use prophylactic antibiotics where applicable (eg. MRP).
7. Use sedation/local or general anaesthesia appropriately.

8.1 Local anaesthesia (episiotomies)
8.2 Pudendal block (instrumental delivery).
8.3 Manual removal of placenta (MRP) should be performed in OT.
9. 'ALL OR NONE LAW'. The doctor who conducts the delivery is expected to see the patient through till the end (till the episiotomy wound is repaired). This should also be strictly followed in instrumental deliveries and Caesarean sections.
10. Doctors and nurses performing procedures or suturing the perineum/episiotomy MUST complete the procedure and not ask another staff to complete the procedure unless he or she is unable to complete the procedure due to technical difficulties.
11. Doctors and nurses who are unable to complete a procedure due to difficulties must obtain help from someone more experienced or senior. A House Officer should not ask another House officer to take over.
12. Inform patient of relevant details of current pregnancy, which may have a bearing upon management of her future pregnancy (eg. Extended tear of uterus during LSCS). This information should be reinforced once again to both couple upon discharge.
13. Details of such complications must be documented (in red pen) in the patient held card/Red Book.
14. All staff must follow available standard operating procedures and guidelines when performing various work processes in the labour ward.
15. Available CPG related to O&G practice needs to be followed.
16. Obstetric drills should be carried out regularly in the labour ward.

PROTECT THE DEPARTMENT

1. Commence partogram recording as soon as patient is in established labour.
2. Be aware of standing orders, ward procedures and evidence based clinical practice guidelines.
3. Call for help whenever necessary as:
   3.1 you may need an extra pair of hands;
   3.2 a senior may be more competent to handle the situation;
   3.3 a witness can attest that you are taking the appropriate action.
4. Use “RED ALERT” team when appropriate.
5. Counsel the patient regarding progress, line of management and intended procedure. Whenever feasible, counsel the husband next of kin.
6. Clear documentation of all steps taken in management including counseling.
7. All morbidities, mortalities, potential medico-legal cases must involve the consultant of the ward.
8. Loose talk increases risk of litigation. This is discouraged at all times.
9. All patients are to be treated with care and politeness.
10. Shouting at patients in labour in any situation is not acceptable.

HUSBAND FRIENDLY INITIATIVE:

1. It is a policy of the Ministry of health to promote Husband Friendly when the patient is in active labour. This is more practical when there are individual delivery suites or rooms

2. The husband should be offered to stay with his wife during labour

3. Husband should not enter or leave the delivery suite unescorted

4. Allow one person at each time to be with the patient during labour (husband or a close relative)

5. Husband can observe normal vaginal deliveries but should leave the room during instrumental deliveries or if there is an obstetric emergency

6. Video taking is prohibited

7. NO LOOSE TALK PLEASE!
2.2.3  MINISTRY OF HEALTH - COLOR CODING FOR LEVEL OF OBSTETRIC RISK

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Low risk cases; level of care - PHN/JM in Health Clinic / Klinik Desa</td>
</tr>
<tr>
<td>Green</td>
<td>Level of care - MO in Health Clinic</td>
</tr>
<tr>
<td>Yellow</td>
<td>Urgent referral to hospital with OBGYN specialist/FMS in health clinic within 48 h</td>
</tr>
<tr>
<td>Red</td>
<td>Urgent admission to the hospital</td>
</tr>
</tbody>
</table>

* Antenatal colour coding system is currently being reviewed

CODE WHITE: Low risk, suitable for delivery at Alternative Birthing Center (ABC)

1. Gravida 2 - 5.
2. No past obstetric complication(s).
3. No past medical complication(s).
4. No antenatal complication in this pregnancy.
5. Height > 145cm.
6. Age 18-40 years.
7. POA 37-41 weeks.
8. Estimated fetal weight 2-3.5kg

CODE WHITE: Low risk, but for hospital delivery
1. Primigravida
2. Age < 18 years or > 40 years
3. Gravida 6 or above should deliver in specialist hospitals (e.g. SGH)
4. Birth interval < 2 years or > 5 years
5. Associated problems
   5.1 height < 145cm
   5.2 Single mother

**CODE GREEN: Refer to Family Medicine Specialist or MO**

1. Rhesus negative.
2. Mother's pre-pregnancy weight or weight at booking < 45kg.
3. Associated medical complications including psychiatry & physical disability.
4. Previous gynaecological surgery.
5. Drug addiction / smoking.
6. Unsure of LNMP.
7. History of 3 consecutive miscarriages.
   Past obstetric history of:
   8.1 Previous caesarean section.
   8.2 Past history of PIH / eclampsia / diabetes.
   8.3 Perinatal death.
   8.4 History of baby's birth weight < 2.5kg or > 4kg.
   8.5 3rd degree perineal tears.
   8.6 Retained placenta.
   8.7 PPH.
   8.8 Instrumental delivery.
   8.9 Prolonged labour.
9. Multiple pregnancies.
10. High BP (> 140/90 mmHg) without proteinuria.
11. Hb < 11g.m%.
12. 2 episodes of glycosuria.
14. Excessive weight gain > 2kg in a week.
15. Weight > 80kg.
16. SFH < or > POA/POG.
17. Malpresentation at 36 weeks.
18. Head not engaged at 37 weeks in a primigravida.

**CODE YELLOW: Refer to FMS / hospital with OBGYN Specialist / nearest hospital (within 48 hours)**
1. Mother with positive HIV status.
2. Mother with Hepatitis B positive.
3. BP 140/90 to 160/110 mmHg, without proteinuria.
4. Diabetic mother.
5. Reduced fetal movements at POA / POG >32 weeks.
6. POA/POG>41 weeks.

**CODE RED: Urgent admission to hospital**

1. Eclampsia.
2. Pre-eclampsia (high BP with proteinuria) or symptomatic / impending eclampsia or BP> 160/110 mmHg.
3. Heart disease and symptomatic.
4. Dyspnoea on exertion.
5. Uncontrolled diabetes (glycosuria 'brick red') with ketonuria (>1+)
6. APH (including miscarriage)
7. Abnormal fetal heart rate:
   7.1  FHR<110/min  >26/52.
   7.2  FHR>160/min  >34/52.
8. Symptomatic anemia at any POA / POG
10. PPROM/ PROM.
11. Severe asthmatic attacks.
2.2.4 CONSENT FOR CAESAREAN SECTION

1. Informed consent should be obtained prior to surgery.
2. To be obtained preferably by the doctor who makes the decision / or the surgeon.
3. Review the patient's medical notes.
4. Explain the indication and the procedure to the patient and document clearly in the case notes.
5. The patient must be informed of the general risks associated with the operation, while stressing the benefits.
6. If a patient refuses to consent, the discussion with the patient should be clearly documented in the medical notes. The case should subsequently be referred to the specialist in charge.
7. If a patient is unconscious, informed consent should be obtained from the next of kin (preferably, the husband).
2.2.5 PROPHYLAXIS FOR ACID ASPIRATION IN CAESAREAN SECTIONS

1. Generally the use of regional anaesthesia like spinal and epidural will greatly reduce the risk of acid aspiration. It is the preferred method for most cases of caesarean sections.
2. When general anaesthesia is used, the use of cricoid pressure (Sellick's manoeuvre) and rapid sequence induction are effective ways to prevent reflux of gastric contents.
3. Whenever anaesthesia is given to a pregnant patient, skilled assistance must be available for the anaesthetist.
4. A drill for "failed intubation" should form part of the training for any doctor administering anaesthesia to the pregnant patient.
5. The use of clear oral antacids is effective in raising the pH of gastric secretions.
6. Routine preoperative use of H₂ receptor antagonists is justified as it effectively reduces gastric fluid volume. When administered intravenously, care should be taken to administer the dose over 5 to 10 minutes to avoid the potential for hypotension especially with Cimetidine. The use of (5) and (6) does not however guarantee against aspiration, except that it reduces the severity of the pneumonitis.
7. Metoclopramide given IV 10mg/dose may be useful as a prophylactic by increasing lower oesophageal sphincter tone.
8. The use of nasogastric tube to empty gastric content should be avoided.
9. Suggested schedule for the administration of pharmacological agents in the prophylaxis for acid aspiration

**9.1 Elective Caesarean Section**
9.1.1 Ranitidine 150 mg or Cimetidine 400mg orally the night before surgery.
9.1.2 Ranitidine 150 mg or Cimetidine 400mg orally on the day of surgery, preferably 2 hours or more before surgery.
9.1.3 Sodium Citrate (0.3 molar) 30ml orally before leaving for the theatre.

**9.2 Emergency Caesarean Section**
9.2.1 IV Ranitidine 50mg or IV Cimetidine 200mg as soon as the decision is made for Caesarean section. The drug should be administered over 10 minutes by the staff nurse.
9.2.2 Oral Sodium Citrate solution (0.3 molar) 30ml orally before leaving for the theatre.
9.2.3 IV Metoclopramide 10mg may also be administered at the same time as
Ranitidine or Cimetidine. This is however optional.

2.2.6 ULTRASOUND SCAN DURING LABOUR
2.2.7 THROMBOPROPHYLAXIS IN PREGNANCY

1. Thromboembolism remains a preventable cause of maternal deaths
2. Pregnancy is a hypercoagulable state
3. Increased in factor VIII, IX, X, fibrinogen
4. Decreased fibrinolytic activity, anti-thrombin and protein S fall
5. Venous stasis in pregnancy
6. Pregnancy increases risk to 6 folds (from first trimester till 6 weeks post-partum)
7. Caesarean sections further increases the risk approximately by 10-20 folds

2.2.7.1 THROMBOPROPHYLAXIS GUIDELINES IN VAGINAL DELIVERY

LOW RISK:
Assessment  Uncomplicated pregnancy

Therapy  Early mobilization
         Avoidance of dehydration

MODERATE RISK:
Assessment  Any 2 of these factors:
1. Age >35 years
2. Obesity >80kg at booking
3. Parity >4
4. Labour >12 hours
5. Gross varicose veins
6. Current infection
7. Pre-eclampsia
8. Immobility prior to labour for >4 days
9. Mid-cavity or rotational forceps delivery
10. Major current medical illness

**Therapy**
- S/C Enoxaparin 40mg daily or S/C Tinzaparin 0.45mls (50-90Kg)
- or S/C unfractionated Heparin 5,000iu BD

Where heparin is contraindicated, use graduated elastic compression stockings.

**Commence**
- After at least 6 hours post-delivery (allow 3 hours between removal of the epidural cannula and first administration)

**Duration**
- Should continue until discharge
- If discharged prior to day 7, discontinue therapy
- If hospital stay continues beyond day 7, the indication needs to be reviewed by medical officer or specialist.

**HIGH RISK:**

**Assessment:** Any vaginal delivery with any 1 of these factors:

1. Patient with >4 moderate risk factors
2. Extended major pelvic or abdominal surgery
3. Patient with family history of DVT / pulmonary embolism or
4. Thrombophilia
5. Paralysis of lower limbs
6. Patient with anti-phospholipid antibody or lupus anticoagulant

**Therapy:**
- S/C Enoxaparin 40mg daily
- or S/C unfractionated Heparin 7,500-10,000iu BD plus graduated elastic compression stockings

**Commence:**
- Within 6 hours (allow 3 hours between removal of the epidural cannula and first administration)

**Duration:**
- Should continue until discharge

- Patients with a past history of venous thromboembolism or underlying thrombotic problem, should continue the therapy for a minimum of 6 weeks. Specialist advices should be sought for those with a family history of thrombophilia
Heparin and warfarin are not contraindicated in breastfeeding.

2.2.7.2 THROMBOPROPHYLAXIS GUIDELINES FOR CAESAREAN SECTION
(This guideline applies to all pregnant women delivered by Caesarean section)

ALL women who had caesarean section should be given low molecular weight heparin (LMWH) /Unfractionated heparin unless contraindicated.

**Dosage:**
Antenatal and postnatal prophylactic dose of LMWH

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Enoxaparin (Clexane)</th>
<th>Tinzaparin</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>20mg daily</td>
<td>3500 units daily</td>
</tr>
<tr>
<td>50-90</td>
<td>40mg daily</td>
<td>4500 units daily</td>
</tr>
<tr>
<td>91-130</td>
<td>60mg daily</td>
<td>7000 units daily</td>
</tr>
<tr>
<td>131-170</td>
<td>80mg daily</td>
<td>9000 units daily</td>
</tr>
<tr>
<td>&gt;170</td>
<td>0.6mg/kg/day</td>
<td>75 units/kg/day</td>
</tr>
</tbody>
</table>

- Heparin: Subcutaneous 5000 units every 12 hourly (for patient who are uncomfortable with porcine-based LMWH)

- Alternative: Fondaparinux (subcutaneous 2.5mg daily) can be considered for women intolerant of heparin compound.

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**Timing:**
- Should be started 6 hours after delivery and given till discharged from ward or for 7 days if high risk or still admitted in the ward, provided that there is no postpartum haemorrhage (PPH).
- High Risk patients should continue with LMWH for 7 days even after discharge
- Those with PPH should be fitted with TEDS/Venaflow. (if available)

**Contraindications:** LMWH should be avoided or postponed in women who are at high risk of bleeding after careful consideration of the balance of risk of bleeding and clotting. Risk factors for bleeding are:

**General Advice:**
- All patients should be advised to use ‘thromboembolic deterrent stoking’ (TEDs) for 6 weeks after caesarean section. (may not be available in districts)
- MOs should ensure all patients are adequately hydrated and encouraged to ambulate early whilst in the ward.
- Adequate post-operative pain relief is recommended to aid in early ambulation
- Consult the O&G specialist on-call when necessary
- Upon discharge, all patients must be counseled to ambulate and drink adequately.
- They must seek medical attention early if they experience symptoms suggestive of venous thromboembolism (VTE) such as shortness of breath, palpitation, chest pain, fever, calf/thigh pain/swelling or if they generally feel unwell.

### 2.2.7.3 THROMBOPROPHYLAXIS GUIDELINES IN PREGNANCY AND Puerperium

1. **Women with a previous history of venous thromboembolism and no other known thrombotic risk factors**

Such patients require prophylaxis at least during-postpartum period:
1.1 Within 12 hours of delivery, introduce (or reintroduce) S/C Heparin 7,500-10,000 IU BD.

1.2 And 24-48 hours after delivery, commence warfarin.

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1.3 Continue Heparin until INR is 2.0-2.5
1.4 Anticoagulation should continue 6-12 weeks.
1.5 Some women may prefer to continue S/C Heparin (7,500-10,000 IU BD) instead of warfarin, however the risk of osteoporosis should be considered.
1.6 Where anticoagulants are contraindicated, graduated elastic compression stockings worn for 6-12 weeks following delivery may be effective.

2. Women with a previous thrombotic event during pregnancy and no other known risk.

2.1 Such women should consider antenatal thromboprophylaxis, commencing 4-6 weeks ahead of the gestation stage at which the previous thrombosis occurred.
2.2 S/C Heparin 5000iu BD and / or
2.3 Graduated elastic compression stockings or
2.4 Clinical (+/- radiological) surveillance for evidence of thromboembolism may be considered.

3. Women with a known heritable thrombophilic defect eg. deficiency of antithrombin (AT), protein C (PC) or protein S (PS); activated protein C resistance; whether or not they have had a previous thrombosis.

3.1 Such women usually merit referral to a unit experienced in managing pregnancy in thrombophilic women.
3.2 These women require thromboprophylaxis at least during postpartum period as outlined earlier.
3.3 Many women with thrombophilic defects in addition, merit antenatal thromboprophylaxis.
3.4 The timing of introduction and the dose of anticoagulant must be decided on an individual basis, aiming to minimize the total exposure to heparin.
3.5 For PC and PS deficient women, S/C Heparin 7500-1000iu BD, or LMWH commencing late 2\textsuperscript{nd} or early 3\textsuperscript{rd} is appropriate.
3.6 Women with certain type of AT deficiency are at high risk of pregnancy-associated thrombosis. In these women, thromboprophylaxis usually requires S/C Heparin in doses adjusted to achieve a plasma heparin concentration of 0.2 - 0.4 iu/ml. These women in particular usually merit referral to a unit experienced in managing pregnancy in thrombophilic women.


4.1 Those who have already had a thrombotic event should be managed as outlined in 1
4.2 Those who have had no previous thrombotic event may merit at least postpartum
thromboprophylaxis as outlined in 1.

5. Women with no past history of thrombosis and no known thrombophilic defect, but with other thrombotic risk factors particularly where these risk factors occur in combination, eg:

   a) Age >35 years
   b) Caesarean section, particularly if carried out as an emergency procedure
   c) Obesity
   d) Immobilization, >4 days bed rest
   e) Pre-eclampsia
   f) Concurrent infection
   g) Parity > 4
   h) Extended major surgery eg. Caesarean hysterectomy
   i) Medical conditions eg nephritic syndrome

5.1 Postpartum thromboprophylaxis should be considered

5.2 A LMWH may be considered in women who have heparin-induced thrombocytopenia; however, cross-reactivity should be excluded.

2.2.7.4 GUIDELINES FOR EPIDURAL ANAESTHESIA IF THE PATIENT IS ON THROMBOPROPHYLAXIS

Heparin

1. Wait 4 hours after giving dose before setting block or removing catheter
2. Next dose no less than 2 hours after giving block.

LMWH

1. Wait 10-12 hours after dose before inserting block or removing catheter.
2. Next dose no less than 6 hour later
3. Beware of other anticoagulant / NSAIDs which may increase risk.

In all patients, extreme vigilance is required to detect new numbness, weakness or bladder / bowel dysfunction.

Any neurological problem must be investigated as an emergency.
2.3.1 PIH/PE

1.3.4 Antihypertensive therapy
1.3.4.1 Hydralazine Infusion Regime
2.3.2.2 Labetalol Infusion Regime

1.3.5 Eclampsia
1.3.5.1 Magnesium Sulphate Regime
1.3.3.2 Diazepam Regime

2.3.11 HELLP Syndrome
2.3.12 Cardiac Disease in Pregnancy
2.3.13 Bronchial Asthma in labour
2.3.14 Diabetic mother in labour
2.3.15 Rhesus negative mother
2.3.16 HIV in pregnancy
2.3.17  Breech/ECV
2.3.11  Twins in labour
2.3.12  Trial of scar
2.3.13  Intrauterine death

2.3.1  PREGNANCY INDUCED HYPERTENSION (PIH/PE)

- Daily low dose aspirin 75mg (1/4 tab of 300mg tablets) to be given to antenatal mothers from 12 weeks onwards till 36 weeks or till delivery
TIMING OF DELIVERY:

- Timing of delivery for antenatal mothers with PRE-ECLAMPSIA (PE) is by 37 weeks POA

- Timing for delivery for antenatal mothers with PIH on anti-hypertensive is by 38-39 weeks POA (depending on cervical favourability)

- Timing of delivery for PIH not on anti-hypertensives by 40 weeks POA

- Patients with severe PIH/PE should be given IM 5GM of Magnesium Sulphate in each buttock before being transferred to a specialist hospital
2.3.2 ANTIHYPERTENSIVE THERAPY

Indication:
1. Severe hypertension (160/110mmHg) and symptomatic (MgSO4 as well)
2. Mean arterial pressure (MAP) >125 mmHg or 2 consistent readings of >160/110mmHg, 15 minutes apart if asymptomatic

* Refer table in the protocol

- Rapid control
- Maintenance
- Infusion drip set
- Infusion syringe pump

Aim:
1. To stabilize diastolic pressure between 90-100 mmHg (do not reduce DBF below 90mmHg)
2. Use of infusion syringe pump is preferred (to avoid fluid overload)

Maternal and fetal monitoring:
1. PR/BP (manual) every 15 minutes
2. Hourly after BP has been stabilized
3. Continuous CTG till BP is stabilized (provided POA is above 28 weeks)

Investigations:
1. FBC
2. PT/APTT
3. Renal profile (+ serum uric acid)
4. LFT
5. GSH/GXM blood (KIV LSCS)
6. Urine FEME and C&S

2.3.2.1 ANTIHYPERTENSIVE THERAPY - PARENTERAL HYDRAZALINE

1. NEPRESSOL

1 ampoule = 25mg/2ml

Rapid Control
1. Dilute 1 ampoule of nepressol with 8 ml of water, so 1ml = 2.5mg.
2. Give 2ml/ 5mg slow bolus.
3. Can repeat every 20 minutes up to a maximum of 2 doses, if DBP ≥ 110mmHg, to start infusion.

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**Maintenance**

a. **Via infusion syringe pump**
   1. Nepressol 50mg (2 amp = 4ml) + 46ml Normal saline = 1ml/1mg
   2. Start at 1ml/hour (1mg/hour)
   3. Increase every 20 minutes by 1 ml up to a maximum of 10ml/hour

b. **Via IV drip infusion**
   1. Nepressol 50mg (2 amp = 4ml) + 500ml Normal saline = 10ml/1mg
   2. Start at 15ml/hour (1.5mg/hour)
   3. Increase every 20 minutes by 10 ml up to a maximum of 100ml/hour

**2. APRESOLINE**

1 ampoule = 20 mg

**Rapid Control**

1. Dilute 1 ampoule with 8 ml of water, so 1ml = 2mg.
2. Give 2.5ml/5mg slow bolus.
3. C an repeat every 20 minutes up to a maximum of 2 doses, if DBP ≥ 110mmHg, to start infusion.

**Maintenance**

a. **Via infusion syringe pump**
   1. Apressol 50mg (2 1/2 amp = 5ml) + 45ml Normal saline = 1ml/1mg
   2. Start at 1ml/hour (1mg/hour)
   3. Increase every 20 minutes by 1 ml up to a maximum of 10ml/hour

b. **Via IV drip infusion**
   1. Apressol 50mg (2 1/2 amp = 5ml) + 500ml Normal saline = 10ml/1mg
   2. Start at 15ml/hour (1.5mg/hour)
   3. Increase every 20 minutes by 10 ml up to a maximum of 100ml/hour

**2.3.2.2 ANTIHYPERTENSIVE THERAPY – PARENTERAL LABETOLOL**

1 ampoule = 25mg/5ml

**Rapid Control**

1. Give 1 ampoule slow bolus.
2. C an repeat every 20 minutes up to a maximum of 2 doses, if DBP ≥ 110mmHg, to
Maintenance

a. **Via infusion syringe pump**
   1. 50mg (2 amp = 10ml) + 40ml Normal saline = 1ml/1mg
   2. Start at 20ml/hour (20mg/hour)
   3. Increase every 30 minutes by 20 ml up to a maximum of 160ml/hour

b. **Via IV drip infusion**
   1. 200mg (8 amp = 40ml) + 160ml Normal saline = 1ml/1mg
   2. Start at 20ml/hour (20mg/hour)
   3. Increase every 30 minutes by 20 ml up to a maximum of 160ml/hour

**Contraindications to Labetolol:**

1. Bronchial asthma
2. Congestive heart failure (CCF)
3. AV heart block
2.3.3 ECLAMPSIA

1. Call for help!
2. ABC
3. Secure IV at least 2 IV lines.
4. Abort seizure with loading dose of IV/IM MgSO4 then to start on maintenance dose (repeated bolus dose may be necessary).
5. Monitoring in HDU labour ward/ICU
6. Start parenteral anti-hypertensive if DBP ≥ 110mmHg or MAP > 125 mmHg
7. Monitoring according to protocol.
8. Total fluid 2L/24 hours (83ml/hour)
9. Monitor fetus
10. Plan for delivery after patient is stabilised – timing and mode
11. If repeated eclampsia, to refer to anaesthetist for intubation and cerebral resuscitation in ICU

2.3.3.1 MAGNESIUM SULPHATE REGIME

1 ampoule = 2.47gm/5ml

LOADING DOSE

Intravenous
1. 4gm (8ml) MgSO4 + 12ml Normal Saline or H2O given over 15 minutes
2. Further convulsion after 15 minutes:
3. 2gm (4ml) + 8ml Normal Saline given over 15 minutes

Intramuscular
1. 10gm with 5gm(10ml) given at each buttock

MAINTENANCE DOSE

Intravenous
1. 24.7gm (10 ampoules) + 500ml Normal Saline to run at 21ml/hour = 1gm/hour

Intramuscular
1. 5gm (10ml) deep im in alternate buttock every 4 hours
2. Maintenance dose to continue up till 24 hours post-delivery or 24 hours from the last convulsions (whichever occurs later)
Monitoring of patient on MgSO4

1. BP/PR every 15 minutes – 30 minutes
2. Respiratory rate hourly, must be > 16/min
3. Patellar reflex/knee jerk hourly (record as Absent, Normal or Brisk)
4. Urine output hourly more than 100mls/4 hour
5. Pulse oxymeter

Management of potential magnesium sulphate toxicity:

1. Urine output < 100ml/4 hour:
   a) Check reflexes and respiratory rate (ensure no signs of toxicity)
   b) Send BUSE, S. creatinine and serum magnesium level stat and trace results.
      i. If serum creatinine is normal and magnesium level is within therapeutic range then continue same maintenance dose
      ii. If serum creatinine is normal and magnesium level is raised above therapeutic range, reduce the dose by half to 0.5mg/hour
      iii. If serum creatinine is raised or serum magnesium level is above the therapeutic range then STOP the infusion
   c) If unable to do serum magnesium levels, send BUSE and serum creatinine but reduce the maintenance dose to 0.5mg/hour
   d) Listen to lungs & review fluid balance: KIV fluid challenge of 500mls N/S over 1 hour and monitor urine output
   e) Once urine output improves, the maintenance dose should be resumed at 1mg/Hr

2. Absent patellar reflex:
   a) Stop infusion till reflexes return
   b) May consider restarting infusion at lower dose when reflexes return
   c) Send blood for BUSE, S Creatinine and if available check serum magnesium level

3. Respiratory depression:
   a) Stop infusion
   b) Maintain airway, nurse patient in recovery position
   c) Slow IV bolus of 1gm calcium gluconate
4. Respiratory arrest:
   a) Stop infusion
   b) Intubate and ventilate (till return of spontaneous respiration)
   c) Slow IV bolus of 1gm calcium gluconate

*Serum magnesium levels should be checked routinely in patients at very high risk of eclampsia or had eclamptic fit to ensure that the levels are within therapeutic range*

<table>
<thead>
<tr>
<th>Mg Conc (mmol/L)</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8 to 1.0</td>
<td>Normal plasma level</td>
</tr>
<tr>
<td>1.7 to 3.5</td>
<td>Therapeutic range</td>
</tr>
<tr>
<td>2.5 to 5.0</td>
<td>ECG changes (P-Q interval prolonged, widen QRS complex)</td>
</tr>
<tr>
<td>4.0 to 5.0</td>
<td>Reduction in deep tendon reflexes</td>
</tr>
<tr>
<td>&gt; 5.0</td>
<td>Loss of deep tendon reflexes</td>
</tr>
<tr>
<td>&gt; 7.5</td>
<td>Sinoatrial and atrioventricular blockade, respiratory paralysis and CNS depression</td>
</tr>
<tr>
<td>&gt; 12</td>
<td>Cardiac arrest</td>
</tr>
</tbody>
</table>

2.3.3.2 DIAZEPAM REGIME

1. Diazepam is no longer the drug of choice for the management of eclampsia
2. It can still be used if magnesium sulphate is not available
3. Give slow bolus of IV diazepam 10 mg over 5 minutes
4. Repeat 10mg diazepam by low bolus if convulsions still persists (refer to appendix 3.4)
### 2.3.4 HELLP SYNDROME

**HELLP Syndrome is a subset of patient with pre-eclampsia/eclampsia with biochemical evidence of hemolysis, elevated liver enzyme and low platelet counts**

It is a potentially lethal condition which will improve following the delivery of the fetus. However beware that the disease process reaches its nadir 24 to 48 hours after delivery. This condition needs to be differentiated for thrombotic thrombocytopenic purpura.

#### Diagnosis of HELLP Syndrome

Patient presents with:
1. Severe pre-eclampsia or eclampsia
2. Hemolysis
3. Hepatic dysfunction.
   Elevation of:
   3.1 Lactate dehydrogenase (LDH)
   3.2 Indirect bilirubin
   3.3 Aspartate amiotransferase (AST)
4. Thrombocytopenia

Severity of HELLP is based on platelet count

<table>
<thead>
<tr>
<th>Class</th>
<th>Platelet Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>&lt;50,000/uL</td>
</tr>
<tr>
<td>Class 2</td>
<td>&lt;100,000/uL</td>
</tr>
<tr>
<td>Class 3</td>
<td>&lt;150,000/uL</td>
</tr>
</tbody>
</table>

Patient with HELLP syndrome has a wide pulse pressure: systolic hypertension > 140 mmHg and diastolic pressure < 90 mmHg. Clinical findings of pre-eclampsia such as diastolic hypertension, proteinuria and non-dependant oedema may not be present. Diagnosis at times is made after delivery (20%).

#### Management of HELLP Syndrome

1. Assessment and evaluation of patient
   1.1 Full blood count
   1.2 Coagulation profile
   1.3 Peripheral blood film
   1.4 Electrolyte
   1.5 Uric acid
   1.6 Renal profile
1.7 Liver function test, indirect & total bilirubin
1.8 Urine

2. Assessment of fetus
3. Plan for delivery - timing and mode
4. Control of blood pressure
5. Prevention of seizure - use of MgSO4

**2.3.5 CARDIAC DISEASES IN PREGNANCY**

Introduction

Cardiovascular diseases are encountered in 0.5 - 4.0% of pregnant women. The common disorders are rheumatic valvular disease, congenital heart disease and cardiomyopathy.

Cardiac disease remains the commonest non-obstetric cause of maternal mortality in Malaysia, accounting for 10% of all maternal deaths in 1996. Early detection, adequate counseling and appropriate management are important to improve maternal and fetal outcomes. Pre-pregnancy assessment is an important tool in reducing maternal mortality due to heart diseases.

Management Principles

1. Pre-conceptual counseling
2. Assessment and stratification of maternal and fetal risks.
   2.1 General health assessment
   2.2 Determine functional class
   2.3 Confirm clinical diagnosis
   2.4 Establish baseline haemodynamics
   2.5 Minimize aggravating factors of cardiac condition, including correction of anaemia if any.
3. Management of the pregnancy and complications of cardiac disease.
4. Determine the timing, mode and place of delivery.
5. Antibiotic prophylaxis during procedures / labour.

Risk assessment and stratification:

Maternal and fetal risk assessment is based on the following:

1. NYHA Functional Class. The maternal prognosis is strongly related to NYHA functional class prior to pregnancy, with maternal mortality varying from <1% in
NYHA 1 or II to around 7% in those with NYHA III or IV.

The classification is as below:

CLASS I  No limitation. Ordinary physical activity does not cause undue fatigue. dyspnoea or palpitation.

CLASS II  Slight limitation of physical activity. Such patients are comfortable at rest. Ordinary physical activity results in fatigue, dyspnoea or angina.

CLASS III  Marked limitation of physical activity. Although patients are comfortable at rest, less than ordinary activity will lead to symptoms.

CLASS IV  Inability to perform any physical activity without discomfort. Symptoms of congestive failure are present at rest. Increased discomfort is experienced with any physical activity.

2. Presence of cyanosis.
3. Left ventricular and right ventricular function.
4. Severity of pulmonary hypertension.
5. Presence of valve / conduit stenosis (left heart obstruction)
7. Presence of arrhythmias
8. Smoking.
9. Multiple gestations.

Mortality risk associated with pregnancy:

**GROUP I / LOW RISK** (Mortality < 1 %)

1. Atrial septal defect
2. Ventricular septal defect
3. Patent ductus arteriosus
4. Pulmonic / tricuspid disease
5. Aortic and mitral regurgitation
6. Mitral stenosis, NYHA class I and II.
7. Corrected Tetralogy of Fallot
8. Acyanotic Ebstein's anomaly
9. Hypertrophic cardiomyopathy
10. Porcine valve
GROUP II / MODERATE RISK  (Mortality 5-15%)
1. Mitral stenosis with atrial fibrillation.
2. Artificial valve on anticoagulation
3. Mitral stenosis, NYHA class III and IV.
4. Aortic stenosis
5. Coarctation of aorta, uncomplicated.
6. Uncorrected tetralogy of Fallot
7. Previous myocardial infarction
8. Marfan's syndrome with normal aorta.
9. Uni-ventricular circulation after Fontan operation

GROUP III / HIGH RISK  (Mortality 25-50%)
1. Pulmonary hypertension (pulmonary pressure >75% of systemic pressure)
2. Eisenmenger's syndrome
3. Coarctation of aorta, complicated
4. Severe aortic stenosis (peak gradient >64mmHg)
5. Severe mitral stenosis
6. Poor left ventricular function (LVEF <40%) irrespective of etiology
7. Marfan's syndrome with aortic involvement (aortic root diameter >40mm)

Impaired maternal functional class, smoking and the presence of cyanosis are associated with poor fetal outcomes.

Note:

A. The experience in Sarawak of women with mechanical valves is rather poor, resulting in several maternal deaths or stroke. The recommendation for the management of such patients should include appropriate counseling with regards to risks and offer termination of pregnancy to patients who do not want to continue with the pregnancy.

B. The teratogenic risk of warfarin on the fetus is small at less than 2% but even smaller if the dose of warfarin is less than 5mg/day. Clexane/Tinzaparin (LMWH) is not recommended to be used in women with mechanical valves as the
actual dose required cannot be monitored in SGH currently. If the patient is not keen to continue on warfarin then she should be given heparin (perhaps by subcutaneous injections) until 12-13 weeks then revert back to warfarin. A planned LSCS at 38 weeks should be planned.

C. All women with heart diseases should be counseled and assessed appropriately in early pregnancy. Decision should be made with regards to the option for termination of pregnancy and if to continue with the pregnancy then an appropriate plan of management with combine care is compulsory

**Labour and Delivery:**
Favourable outcome is associated with a multidisciplinary team approach involving the cardiologist, obstetrician, anaesthetist and pediatrician. Complications are best avoided by active intervention starting early in the third trimester.

All antenatal mothers with heart disease should be managed in specialist hospitals and seen at the combine clinic.

**All should deliver in specialist hospitals!**

**Timing and mode of delivery:**
1. Routine elective admission to SGH at 34 weeks for Eisenmenger’s patient
2. The timing and mode of delivery should be individualized after discussion with the specialist physician and obstetrician. High risk patients should be delivered at a tertiary center.
   1. Spontaneous labour is preferred to induction.
   2. The second stage of labour should not be allowed to be prolonged.
   3. Although vaginal delivery is generally advocated in these patients, good arguments can be made for planned Caesarean section in high risk situations.
4. All patients should be given supplemental oxygen and encouraged to lie in the lateral position to avoid caval compression.
5. Patients with mechanical valves on anticoagulation with warfarin should ideally have elective caesarean sections at 38 weeks

**Monitoring:**

**Mother**
Careful haemodynamic monitoring throughout labour and for several days postpartum is required. This includes:
   1. Continuous ECG monitoring to detect arrhythmias.
   2. Arterial saturation by pulse oximetry.
   3. Blood pressure (intra-arterial in selected cases).
   4. Occasionally, central venous pressure measurements may be required.

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5. The use of Swan-Ganz catheter is not routinely recommended.

**Fetal CTG Monitoring**

**Analgesia:**
Pain causes sympathetic stimulation resulting in undesirable haemodynamic changes. Thus, effective analgesia is of prime importance. Available techniques include:

1. Epidural analgesia - technique of choice. Systemic hypotension should be avoided.
2. Parenteral opioids, eg. IV PC A fentanyl or intermittent EM Pethidine.
3. Inhalational analgesia (entonox).
4. Local infiltration or pudendal nerve block for assisted delivery during second stage.
5. Newer techniques such as combined spinal epidural (CSE).

**Antibiotic prophylaxis:**
Following uncomplicated vaginal deliveries, routine antibiotic prophylaxis is only recommended for patients with prosthetic heart valves and surgically constructed systemic to pulmonary shunts.

| Standard | IV or IM Ampicillin 2.0gm + IV or IM Gentamicin 1.5mg/kg body weight (not to exceed 80mg) 30 minutes before procedure, followed |
| Penicillin Allergic Patient | IV Vancomycin 1.0 gm over 1 hour + IV or IM Gentamicin 1.5mg/kg body weight (not to exceed 80mg) 1 hour before procedure and |
| Alternative Low Risk Regime | Amoxicillin 3gm orally 1 hour before procedure, then 1.5gm 6 hours later |

**Postpartum:**
Most patients with cardiac disease have an uncomplicated delivery and puerperium. However, the increase in venous return following delivery may result in worsening cardiac failure in patients with stenotic valves and impaired LV function. In addition, patients with Eisenmenger's Syndrome and pulmonary hypertension usually decompensate in the early postpartum period. Thus, careful haemodynamic monitoring is important in these patients for about 48 - 72 hours. These patients should ideally remain in hospital for at least a week.
Breast Feeding:
Patients with cardiac disease and an uncomplicated course should be encouraged to breast feed.

SAFETY PROFILE OF CARDIOVASCULAR DRUGS DURING LACTATION:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Recommendation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digoxin</td>
<td>Safe</td>
<td>Amount ingested is far below the paediatric recommended dose</td>
</tr>
<tr>
<td>Quinidine</td>
<td>Safe</td>
<td>Amount ingested is far below the paediatric recommended dose</td>
</tr>
<tr>
<td>Procainamide</td>
<td>Safe</td>
<td>Amount ingested is far below the paediatric recommended dose</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>Not Safe</td>
<td>Excreted in significant amount in breast milk</td>
</tr>
<tr>
<td>Verapamil</td>
<td>Safe</td>
<td>Amount ingested is far below the paediatric recommended dose</td>
</tr>
<tr>
<td>Propanolol</td>
<td>Safe</td>
<td>No adverse effects seen</td>
</tr>
<tr>
<td>Metoprolol</td>
<td>Safe</td>
<td>Amount ingested is far below the paediatric recommended dose</td>
</tr>
<tr>
<td>Atenolol</td>
<td>Safe</td>
<td>No adverse effects seen</td>
</tr>
<tr>
<td>ACE-I</td>
<td>Not Safe</td>
<td></td>
</tr>
</tbody>
</table>
Anticoagulation in Pregnancy:

Indications:
1. Mechanical heart valves.
2. Deep venous thrombosis & thromboembolism - the risk of DVT is 5 times greater in the pregnant state.
3. AF associated with structural heart disease.
4. Miscellaneous conditions eg. Peripartum Cardiomyopathy, Primary Pulmonary Hypertension, Eisenmenger's Syndrome, Complex Congenital Heart Disease.

AVAILABLE ANTICOAGULANTS:

1. Oral anticoagulants:
   1.1 Warfarin during pregnancy is associated with warfarin embryopathy in 2 - 4% of newborn.
   1.2 The likelihood of fetal complications appears to be significantly higher if the warfarin dose is more than 5 mg daily.

2. Unfractionated heparin
   2.1 Heparin does not cross the placenta.
   2.2 Use Activated Partial Thromboplastin Time (APTT) to monitor
   2.3 Can be given subcutaneously or intravenously twice a day
   2.4 Adjust dose to achieve APTT ratio of 1.5 - 2.5
   2.5 Check APTT 4-6 hours after injection
   2.6 Complications related to long term heparin use include abscesses, hematomas, thrombocytopenia and osteoporosis.

3. Low molecular weight heparin (LMWH)
   3.1.1 While LMWH does not require APTT monitoring because of superior bioavailability and have fewer complications of thrombocytopenia or osteoporosis, the effectiveness in women with mechanical valves is questionable.

   3.1.2 The use of LMWH in patients who are on life-long warfarin is controversial as the levels cannot be monitored. Subcutaneous heparin for the period of organogenesis (<13 weeks) and just prior to delivery should be used instead of LMWH.
Choice of anticoagulants

During pregnancy, there are 3 options for anticoagulation. The choice of which should be decided in consultation with patient and her family.

**Option I:** Combined heparin & oral anticoagulants

**Option II:** Full dose heparin throughout pregnancy

**Option III:** Continuous Warfarin therapy

There is no completely safe method of anticoagulation during pregnancy. In patients with high risk of thromboembolism such as mechanical heart valves and mitral stenosis with atrial fibrillation, Option III is advocated. Should the patient choose to use heparin during first trimester, she should be made aware of the higher risk of valve thrombosis and thromboembolism.

*If planned for caesarean section at 38 weeks then change from warfarin to heparin from 37 weeks and revert back to warfarin 1 or 2 days after LCS*
2.3.6 **BRONCHIAL ASTHMA IN LABOUR**

Bronchial asthma is one of the most common severe pulmonary disorders complicating pregnancy. The effect of pregnancy on the severity of asthma and the effect of asthma on pregnancy are uncertain. However it has been observed that patients with well-controlled pre-pregnancy asthma tend to tolerate pregnancy well. Pregnancy is associated with worsening of symptoms in one third of women.

**Antenatal Assessment:**

All patients with bronchial asthma should be booked for delivery in a hospital. A detailed clinical history should elicit the following information:

1. Frequency of attack
2. Interval between attacks
3. Type and regularity of medication
4. Last attack

Patient with chronic asthma should have:

1. A review by physician in the combined clinic for assessment of:
   1.1 The respiratory system (RR/Cyanosis/ PEF)
   1.2 Response to drug treatment (to continue/ optimize medication)
2. An obstetrics plan drawn by O&G specialist in the combined clinic.
3. Serial ultrasound scans to assess fetal growth pattern (in order to detect IUGR).

**Management in Labour:**

1. Reassess status of respiratory system
   
   1.1 Refer to Physician
   1.2 The presence of bronchitis should be treated with antibiotics
   1.1 The presence of bronchospasm should be treated with bronchodilators (use corticosteroids in the absence of adequate response).
   Intravenous hydrocortisone 2mg/kg body weight every 4 hours.

2. Labour monitor in the usual manner.
3. Continue anti asthmatic medication.
4. Patient should be well hydrated.
5. Patient should be well oxygenated
6. Pulse oxymeter.
7. Provide adequate analgesia.

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8. Administer intravenous hydrocortisone (100mg) if patient is or has been on corticosteroids.

9. CTG monitoring of fetus.
10. In the event of postpartum hemorrhage, use oxytocin.
11. Use oxytocin for induction and augmentation of labour.
12. Avoid carboprost

Post-partum:

1. Encourage breast-feeding among asthmatic mother.
1. Anti-asthmatic drugs are minimally excreted in breast milk and patient may continue medication while breast feeding.
INTRAPARTUM CARE

Delivery should ideally be a planned event. A spontaneous vaginal delivery is generally aimed for. The timing of the delivery depends on certain factors:

If elective preterm delivery is contemplated, steroid therapy to enhance fetal lung maturation has to be considered. Since this antagonizes insulin activity, it is recommended to be done in the hospital with 2 hourly blood glucose determinations, in diabetic, patients with poorly controlled diabetes. Insulin infusion may be required.

**Monitoring**

1. Biochemical monitoring is required when in established labour:
   - Capillary glucose estimation: 2 hourly
   - Random blood glucose: 4 hourly
   - Serum electrolytes: 4 hourly
   - Urine acetone: 4 hourly

2. Glucose levels should be maintained between 4-6 mmol/L to prevent neonatal hypoglycemia.

**Insulin therapy**

1. Insulin infusion should be commenced when the capillary glucose level exceeds 7.0mmol/l. Insulin should be administered via a syringe pump.

**Solution**

1. 20 units of soluble insulin / Actrapid (0.2ml of 100 units/ml solution) +
19.8 ml of normal saline in a 20 ml syringe. This gives a concentration of Insulin 1 unit/ml.

**Insulin infusion requirement**

Insulin infusion requirement should be based on the sliding scale regime:

<table>
<thead>
<tr>
<th>Blood glucose (mmol/l)</th>
<th>Rate of insulin via syringe pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0-10.0</td>
<td>2 units/hour</td>
</tr>
<tr>
<td>10.1-15.0</td>
<td>3 units/hour</td>
</tr>
<tr>
<td>15.1-20.0</td>
<td>4 units/hour</td>
</tr>
</tbody>
</table>

1. All diabetic mothers in labour should have a maintenance drip Dextrose 5%, 1 pint every 4 hours.

2. Any electrolytes imbalance should be corrected accordingly based on serial monitoring of blood investigations.

**Elective Caesarean Section**

1. She should be fasted from 12 midnight.
2. Antacid (oral ranitidine 150 mg) is given at 6.00 am on the day of operation.
3. Subcutaneous insulin is omitted.
4. Plasma glucose estimation is done at 6.00 am. Insulin infusion is required as per sliding scale.
5. 5% dextrose infusion is started at 6.00 am at a rate of 125 ml/hour.
6. 30 ml sodium citrate is given orally when called to the operating theatre.
7. Prophylactic antibiotic is given at induction of anaesthesia for both elective and emergency procedures.
8. Thromboprophylaxis in the form of subcutaneous unfractionated heparin or LMWH, thromboembolic deterrent (TED) stockings and early ambulation is recommended postoperatively for all caesarean sections for 7 days or till discharge.
from ward.

9. Patients at high risk of DVT/PE should be given LMWH for a total of 7 days even after they are discharged

POSTPARTUM CARE

Glucose monitoring

Capillary glucose monitoring is required in the immediate postpartum period (initial 24 hours).

1* GDM requiring insulin therapy antenatally - 4 hourly
2* Pregestational diabetes mellitus - 4 hourly
3* GDM on diet modification alone - not required

Insulin therapy

In the postpartum period endogenous insulin activity should rapidly return to normal.

- GDM on insulin therapy antenatally - discontinue insulin
- IDDM - resume pre-pregnant insulin regime
- NIDDM - resume pre-pregnant oral hypoglycemic regime

Breast feeding

1. Breast feeding should be encouraged in all women. An additional 40-50 g carbohydrate is advised during lactation.
2. In breast feeding, those who require > 2.5 mg Glibenclamide or its equivalent before conception should remain on insulin.
3. Metformin may be passed into the breast milk in small amounts. While the manufacturer recommends that it is not used during breast feeding. If the mother is a type 2 diabetic on metformin then it is considered safe to continue while breast feeding. It is the recommendation from the 2008 NICE guideline.

Contraception

1. To avoid unplanned pregnancies, it is important to practice contraception.
2. IUCDs are suitable in diabetic women and the same contraindications apply as for the general population.
3. Combined Oral Contraceptive pills have only a slight effect on glucose tolerance and can be used. However in those who wish to permanently limit their family size, sterilization may be appropriate.

Neonatal care
1. A pediatrician should be available at delivery
2. Neonatal hypoglycemia should be looked for especially if maternal glycemic control has not been ideal antenatally
3. Neonatal glucose concentration should be assessed
   - At birth
   - 2-4 hourly for 24-48 hours thereafter
4. Early feeding is ensured

Indications for admission into the neonatal care unit
1. Fetal macrosomia (birth weight > 4.0 kg)
2. Persistent neonatal hypoglycemia (< 2.6 mmol/l)

1.3.8 RHESUS NEGATIVE MOTHER

GENERAL CONSIDERATIONS:
1. Advice antenatal follow up in hospital.
2. Advise hospital delivery.
3. Routine antenatal RhoGAM at 28 and 34 weeks in non-sensitized patient
   4.1 Further Coomb’s test is not indicated after antenatal RhoGAM
   4.2 Specialist follow up is necessary for sensitized patient.
4. Antenatal RhoGAM also indicated if:
   5.1 antepartum hemorrhage
   5.2 external cephalic version
   5.3 trauma to abdomen
   5.4 Invasive procedure such as amniocentesis or chorionic villous sampling
5. Details of past medical/obstetric history:
   5.1 history blood transfusions
   5.2 history of induced/spontaneous abortion
   5.3 history of RhoGAM injection during previous pregnancy
   5.4 history of invasive procedures such as amniocentesis or CVS
   5.5 history of threatened miscarriage >12 weeks
   5.6 history of ectopic pregnancy
   5.7 history of surgical intervention >12 weeks
7. Husband’s / Spouse’s blood group

INDUCTION OF LABOUR:
Confirm 2 units of whole blood before starting induction of labour.
LSCS:
1. Confirm 2 units of whole blood.
2. Intra-operative:
   2.1 Pack pelvic gutters to reduce risk of feto-maternal transfusion
   2.2 Deliver the placenta by CCT. Avoid manual removal of placenta.

IN LABOUR:
1. Check antenatal history
2. Confirm 2 units of whole blood
3. Vaginal delivery if no contraindication
4. Fetal monitoring/augmentation of labour as in normal cases
5. At delivery, take cord blood for
   5.1 Hemoglobin, ABO and Rhesus grouping
   5.3 Coomb's test
   5.4 Serum bilirubin
   5.5 G6PD status - as for all newborn babies

POSTPARTUM PERIOD
1. RhoGAM to be given within 72 hours (the earlier the better) if baby is Rhesus positive and mother is Coomb's negative
   KIV Kleihauer test to adjust dose of RhoGAM in case of:
   2.1 LSCS
   2.2 MRP
3. Document if RhoGAM is given in the case records and patient home based card (PINK BOOK)
4. Inform mother regarding the baby’s Rhesus status and document in mother’s home based card (Pink Book)

➢ Antenatal: Do Coomb's test at monthly intervals

➢ Do not give RhoGAM to a patient who's positive for antibodies

➢ Any Rhesus negative woman who suffered miscarriage (even if only threatened miscarriage) warrant administration of RhoGAM to minimize risk of isoimmunisation.
1.3.9 HIV IN PREGNANCY

APPROACH
1. Prenatal care.
2. Access to HIV counseling and testing.
3. Adherence to a recommended prevention strategy.
4. Availability of antiretroviral medications.

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5. Availability of trained healthcare staff to counsel, prescribe and administer Zidovudine (ZDV) during pregnancy and labour.

ANTEPARTUM:

Screening
"Test unless refused" or "routine screening with the option to opt out" policy

Counseling of pregnant women with HIV:
1. Personal prognosis based on lymphocyte subset and viral load, if available.
2. Illicit drug use (where relevant).
3. Counseling and HIV testing for the spouse / partner.
4. Risk of Mother-to-child-transmission (MCTC).
6. Benefits of ZDV therapy for mother and baby - reduction in MTCT.
7. Possible ZDV side-effects to mother and baby.
8. No method of prenatal diagnosis as MCTC risk is highest during intrapartum.
9. Breast feeding is contraindicated as the substitute formula feed is available.

Notification
Notification of case to health department using designated form, if it is not already been done by the referring health clinic.

GOALS OF ANTIRETROVIRAL THERAPY FOR THE BABY OF INFECTED WOMEN:
1. To preserve the current and future health of the mother.
2. To prevent perinatal transmission / MTCT.
3. To ensure the health of the fetus and neonate.

ANTI RETROVIRAL THERAPY: ACTG 076 PROTOCOL

Antepartum
1. T. ZDV 2COmg TDS starting after 14 weeks gestation till delivery.

Intrapartum
1. IV ZDV 2mg/kg in first hour
2. 1 mg/kg/hr until delivery (clamping of cord)

If IV ZDV not available:
1. T. ZDV 300 mg Q3H until delivery.

Induction of Labour
1. Begin ZDV at the time of induction
Elective Caesarean Section
1. Begin ZDV 4 hours before surgery

Postpartum
.i.1.a) Mother to continue T. ZDV 200mg TDS for 6 weeks.
.i.1.b) Baby to be started on Syrup. ZDV 2mg/kg Q6H within 12 hours of life, for a total of 6 weeks.
.i.1.c) Baby should be attended by pediatrics team for further assessment.

- For HIV-infected woman who is already on therapy becomes pregnant, the risks and benefits of continuing antiretroviral treatment need to be discussed.
- If the pregnancy is detected during the first trimester, the woman needs to be counseled regarding the limited data on the safety of the drugs on the fetus and newborn.
- If discontinuation of treatment is considered, all drugs should be stopped simultaneously and restarted after the second trimester.
- If the current drug regimen does not contain ZDV, this needs to be incorporated into the drug regimen in line with the ACTG 076 protocol at the second trimester.

Highly Active Antiretroviral Therapy (HAART)

Consult Physician regarding commencement on HAART.

1. For selected cases, HAART should be considered for:
   1.1 AIDS by CDC definition 1993
   1.2 High viral load/CD4 cell count <350 cells/mm$^3$
   1.3 Patients with potentially good compliance with the HAART.

2. HAART may be complicated by the following issues:
   2.1 More side effects;
   2.2 Adherence to therapy;
   2.3 Development of resistance which will restrict future options of therapy.

ANTEPARTUM:

Clinical examination

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To look for HIV / AIDS related complex:
   1. Skin: dermatitis, folliculitis, Kaposi sarcoma.
   2. Chest infection.
   3. Hepato-splenomegaly.
   4. Haematologically
   5. Genital lesion and infection: herpes simplex, carcinoma of cervix.

**Laboratory monitoring**
   1. Full blood counts
   2. Liver function test
   3. Renal profile
   4. ESR
   5. Creatine kinase (if on ZDV)
   6. Toxoplasma serology
   7. STD screening eg. VDRL/TPHA, Hepatitis B, Hepatitis C (including for spouse / partner)
   8. CD4 measurements: 3-6 monthly
   9. Viral load (if available)
   10. OGTT

**Follow up**
   1. Clinical assessment of side-effects eg. anaemia, nausea, vomiting, myalgia, headaches, etc.
   2. FBC2-weekly
   3. CD4 measurements 3-monthly
   4. Check drug compliance

**Prenatal Care**
   1. Combined care with the involvement of Physician and Pediatrician.
   2. Frequency of antenatal follow up should be as for high risk pregnancies.
   3. Avoid any invasive procedures such as CVS & amniocentesis.

**INTRAPARTUM:**
   1. Minimize the number of medical personnel handling the case
   2. Universal precaution, disposable laundry and equipment, double gloving, elbow-length latex gloves, goggles (when performing vaginal deliveries or MRP), Plastic apron should also be worn beneath the sterile surgical gown.
   3. Use blunt needles eg. blunt taper point and tissue-handling forceps.
   4. ZDV regimen as stated earlier.
   5. **Blood spillage** should be dealt with as soon as possible. Refer to 'Standard Precaution' published by AIDS / STI Section, MOH for details.
      5.1 Freshly prepared Sodium Hypochlorite (Chlorox) 1:10 or sprinkle
chloride granules to cover the spillage and left for 5-10 minutes. If it is a large spillage, it may be covered with suitable absorbent material.

5.2 The spillage should be wiped up using paper towels or suitable absorbent material. Avoid direct contact between gloved hands and the spillage.

5.3 The area should be mopped with Sodium Hypochlorite (Cholorox) 1:100.

5.4 For a large spill, a mop can be used to wipe instead, but the mop needs to be disinfected with Sodium Hypochlorite and rinsed thoroughly.

5.5 Equipment used for management of spillage should be decontaminated.

6. **Placenta** to be handled as below before disposal. Refer to 'Standard Precaution' published by AIDS / STI Section, MOH for details.

6.1 For health care workers:
   6.1.1 Wear plastic apron and double gloves when examining placenta.
   6.1.2 Avoid splashes.

6.2 For Muslims:
   6.2.1 Immerse placenta in Sodium Hypochlorite 1:10 for 10 minutes.
   6.2.2 Drain out and carefully seal in double plastic bags before handing over to relatives.
   6.2.3 Provide relatives with 2 pairs of disposable latex / rubber gloves.
   6.2.3 Educate them on safe handling of the placenta at home.
   6.2.3 If the Muslim relatives do not wish to take the placenta home, discard as clinical wastes.

6.3 For Non-Muslims:
   6.3.1 Discard as clinical wastes.

**Mode of delivery:**

.i.1. Caesarean section should be offered at 38 weeks for woman in the following situations:
   1.1 Women who have not received antiretroviral mono-therapy. Such therapy should be commenced as soon as HIV is recognized.
   1.2 Women receiving antiretroviral mono-therapy (instead of combined antiretroviral agent regimens) regardless of the viral load.
   1.3 Women receiving less than 4 months of HAART.
   1.4 Patients with detectable viral load regardless of the received therapy. Recommended viral load threshold is <50 RNA copies/ml.
   1.5 Women in whom the viral load determination is not available or has not been done.
   1.6 Women with unknown prenatal care.

.i.2. If patient refuses Caesarean section, the following should be observed:
   2.1 Avoid invasive procedures such as scalp electrodes and fetal scalp sampling.
   2.2 Selective episiotomy and not routine.
2.3 ARM should be undertaken only if labour progress is adequate.
2.4 If assisted delivery is required, forceps may be preferable to vacuum extraction given the risk of micro-lacerations of the scalp from the vacuum cup.
2.5 Cord should be clamped early.
2.6 Prophylactic antibiotics should be instituted especially in operative delivery.

POSTPARTUM:
1. Both mother and baby are to continue with oral ZDV for 6 weeks.
2. Baby to be seen and followed up by Paediatrician for further assessment.
3. Mother to be followed up by the Medical team.
4. Breastfeeding is contraindicated.

FOLLOW UP:
1. Permanent sterilization (bilateral tubal ligation) should be offered or considered.
2. Barrier contraceptive methods should be advised including the use of spermicide this should continue to be practiced even after a bilateral tubal ligation, to prevent transfer of virus from one partner to another.
3. Annual Pap smear.
4. Couple to be followed up by the Medical team.

1.3.10 BREECH/ECV

Breech presentation is encountered in 3 - 4% of term deliveries. The frequency of 63 Department of O&G Sarawak General Hospital
encountering an 'undiagnosed' breech has reduced since the increased use of ultrasound.

**Management options**

**Breech at term:**
1. Confirm presentation
2. Confirm gestation
3. Gross fetal anomalies eg. hydrocephalus
4. Placenta praevia
5. Pelvic tumours e.g. cervical fibroid

**Option one: Offer external cephalic version (ECV)**

1. ECV: Trans-abdominal manipulation of a breech-presenting fetus into a cephalic presentation
2. Safe procedure when patient is carefully selected.
3. Timing: Done at 37 weeks gestation to reduce the risk of spontaneous version and reduce risk of prematurity if the need arises to deliver baby in the event of fetal distress (while attempting ECV).
4. Rule out contraindications:
   - 4.1 Independent indication requiring LSCS (eg. Placenta praevia)
   - 4.2 Independent indication for vaginal delivery (eg. IUD)
   - 4.3 In labour
   - 4.4 PROM
   - 4.5 Oligohydramnios
   - 4.6 Uterine scar
   - 4.7 IUGR
   - 4.8 Fetal abnormality
   - 4.9 Uterine abnormality/ pathology
   - 4.10 Hypertensive disorders or other medical disorders
   - 4.11 Non-reactive CTG
5. Preparation and procedure:
   - 5.1 IV line, Consent
   - 5.2 Ultrasound: to document presentation prior to procedure
   - 5.3 Empty bladder
   - 5.4 Baseline CTG
   - 5.5 Intravenous infusion of tocolytic for 30 min prior to procedure (routinely of selectively are both acceptable practice)
   - 5.6 Perform ECV
   - 5.7 Post procedure CTG for 40 min
   - 5.8 IM RhoGAM in non-sensitized Rhesus negative patient

**EXTERNAL CEPHALIC VERSION (ECV)**

1. Place patient in a supine position.
2. Talc is sprinkled over the maternal abdomen.
3. The initial step is to displace the breech / from the pelvic brim.
4. With a pelvic grip, the breech is displaced to one iliac fossa; towards the side of the fetal back (forward somersault).
5. The other hand is placed, over fetal head and is pushed towards the patient's flank and then towards her pelvis.
6. Both hands work in unison to keep the fetus in a flexed position.
7. The version force is applied to both the fetal poles.
8. The pressure should be gentle and intermittent while the pressure is applied, the fetus as a whole should be gently 'rocked' from side to side of the mother's abdomen.

*If ECV is successful: Rest of the pregnancy to be managed as in a normal patient. If ECV is unsuccessful: Proceed to option two*

**OPTION 2: Elective Caesarean Section**

1. Independent indications requiring LSCS.
2. When patient is not suitable for option one.
3. When patient requests for a caesarean section.
5. IUGR.
6. Bad obstetric history.
7. Subfertility.
8. Preterm breech with estimated birth weight less than 2500gm.

Option two is being opted for more frequently after the publication of *Term Breech Trial.*

**OPTION 3: Vaginal breech delivery**

1. Currently SGH guidelines states that this option is only reserved for those who strongly refused both ECV and LSCS after intense counseling by a specialist.
2. In certain circumstances, vaginal breech delivery may be a better and safer option than an emergency caesarean section:
   2.1.1 Impending delivery of breech (os full and the breech can be seen at the introitus)
   2.1.2 Os if full or almost full and the presenting part is well descended in the vagina before the patient is given regional anaesthesia.
   2.1.3 There is no OT available and delivery is expected at anytime
   2.1.4 IUD
   Rule out contraindications:
   3.1 Independent indication requiring LSCS (eg. Placenta praevia, pelvic mass)
   3.2 Flexed / footling breech
   3.3 Hyperextended head
   3.4 Estimated fetal weight < 2500gm

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3.5 Estimated fetal weight > 3500gm
3.6 Previous uterine scar
3.7 Fetal abnormality which may cause dystocia
3.8 Fetal compromise
3.9 IUGR

4. Confirm favourable features:
   4.1 Extended breech
   4.2 Suitable attitude
   4.3 Estimated fetal weight between 2500gm to 3500gm
   4.4 Adequate bony pelvis
   4.5 Spontaneous onset labour
   4.6 Non primigravida

5. Patient husband should be informed of risks to both mother and fetus in vaginal breech delivery.

6. When in active labour:
   6.1 Progress of labour should be similar to cephalic presentation.
   6.2 Augmentation should consult specialist
       CTG tracing should be continuous

7. Rule out cord prolapsed when membranes rupture.

Role of ultrasound in the management of a fetus in breech presentation

1. Confirm gestation
2. Rule out multiple pregnancy
3. Type of breech
4. Attitude
5. Estimated fetal weight
6. Amniotic fluid index
7. Placenta site
8. Uterine anomaly
9. Uterine / pelvic pathology

3.3.11 TWINS IN LABOUR

Twin pregnancy is a high risk pregnancy
<table>
<thead>
<tr>
<th>Maternal risks</th>
<th>Fetal risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaemia</td>
<td>IUGR</td>
</tr>
<tr>
<td>Preterm delivery</td>
<td>Congenital anomalies</td>
</tr>
<tr>
<td>Hypertension</td>
<td>TTTS</td>
</tr>
<tr>
<td>APH</td>
<td>Polyhydramnios</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>Cord accident</td>
</tr>
<tr>
<td>Increase operative delivery</td>
<td>Increase operative delivery</td>
</tr>
<tr>
<td>PPH</td>
<td></td>
</tr>
</tbody>
</table>

**Antenatal**

1. 1st trimester scan to determine chorionicity (separating membranes does not determine chorionicity)
2. Book/Follow-up in hospital
3. Advise on the important of hospital delivery
4. Serial growth scan, interval depend on chorionicity (2 weekly for MCDA & 4 weekly for DCDA)
5. Timing of delivery
   5.1 Uncomplicated
   5.2 DCDA: 37-38/52
   5.3 MCDA: 36-37/52
   5.4 MCMA: After 32-34 weeks (After discussion with pediatrics team, corticosteroid cover and availability of the ventilator).
6. If complicated assess case by case basis after careful review by specialist/consultant

**Mode of delivery:**

**Caesarean section is recommended in:**

a.1. Non-cephalic first twin
a.2. Patient with previous LSCS
a.3. MCMA Twin

**Caesarean section also may be considered in the following circumstances:**

a.1. Death of one fetus especially the leading twin
a.2. MCDA twin
a.3. Any other complicated twin pregnancy.

**When vaginal delivery is planned:**

1. Continuous fetal monitoring of both fetuses.
2. Provide adequate pain relief (preferably epidural).
3. GSH/GXM 2 units of blood
4. Counsel patient regarding second stage.

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Second stage of labour:

1. Medical staff in attendance:
   1.1 Two O&G doctors
   1.2 Two pediatrics doctors
   1.3 Two nursing staff
2. Standby operating theatre.
3. Episiotomy.
4. Delivery of first twin as a singleton.

After delivery of the first twin:

1. Determine lie of second twin (preferably with ultrasound scan).
2. If non-longitudinal lie: Turn fetus to longitudinal lie by ECV (Preferable) or Internal podalic version.
4. Consider starting oxytocin drip if uterine contractions are weak (Increment every 5 minutes).
5. If membranes intact - allow spontaneous rupture/ARM.
6. Deliver fetus.
7. Following placenta delivery to start on 40 units of oxytocin infusion drip.
8. Placenta to be inspected for chorionicity and document in case notes.

3.3.12 TRIAL OF SCAR

A patient with a previous uterine scar (Caesarean section, myomectomy) may be allowed to deliver vaginally following a risk assessment. The patient must be counseled regarding the associated risk of such an attempt and a management plan outlined in the antenatal
Antenatal Assessment

1) Book for hospital delivery.
2) Obtain information regarding previous surgery - review the operation notes, communication with previous obstetrician / hospital; to exclude any contraindications for trial of scar.
3) Ultrasound assessment of fetus especially placenta localization at or beyond 30 weeks gestation
4) Risk assessment.
5) Consider informed choice
6) Assessment by specialist by 36-37 weeks gestation.

Risk assessment should determine the following:

1) Factors regarding previous surgery.
2) Indication for the previous Caesarean section/ uterine surgery.
3) Type uterine incision.
4) Intra-operative findings/ difficulty.
5) Significant events in postoperative period (secondary PPH/ febrile episodes/ wound breakdown).

Factors associated with current pregnancy

1) Presentation.
2) Lie of fetus.
3) Number of fetus.
4) Placental site
5) Pregnancy interval <18 months

Management

1. Trial of labour in selected cases based on risk assessment, for 6 to 8 hours.
2. When patient is admitted in labour:
   2.1 Review by medical officer / specialist;
   2.2 Set IV cannula;
   2.3 Full blood count;
   2.4 GSH/GXM 2 (two) units of whole blood;

Department of O&G, Sarawak General Hospital
2.5 Continuous CTG monitoring
2.6 Partogram. Monitor for slow progress - evaluate causes for disproportion;
2.7 Monitor for signs of impending uterine rupture:
   2.7.1. Abnormal CTG
   2.7.2. Rapid maternal pulse > 100/min;
   2.7.3. Persistent suprapubic tenderness and pain;
   2.7.4. Persistent abdominal tenderness and pain, especially if present in between contractions;
   2.7.5. Haematuria.

Induction of labour (IOL) in women with previous single scar
1. IOL with prostaglandins may increase the risk of uterine rupture by 2.4x
2. The use of prostaglandins is still acceptable but requires specialist approval
   1. Selection of cases to be decided only by specialist/Consultant.
   2. Usual precautions/ monitoring to accompany the use of prostaglandins.
   3. In Sarawak General Hospital only 1 prostin 1.5mg insertion is allowed
   4. Mechanical methods - Foley’s catheter or Cervical Ripening Balloon (CRB)

Augmentation of labour with oxytocin
1. Case selection to be decided by specialist.
2. Use infusion pump to regulate oxytocin is preferable.
3. Usual precaution/ monitoring to accompany the use of oxytocin.

Use of Epidural analgesia
No contraindication

Manual exploration of the uterus
1. No benefit to perform routine manual exploration following the delivery of placenta.
2. Internal palpation of the lower segment should be reserved for patients with abnormal bleeding.

Elective LSCS at 38 weeks Gestation
   1. Independent in current pregnancy (eg. placenta praevia, malpresentation)
   2. Previous LSCS for recurrent causes (eg. Contracted pelvis)
      Previous vertical scar (classical scar)
   4. Breech or twin pregnancy
   5. Mothers who refuse a ‘trial of scar’ despite being counseled appropriately
   6. Past history of myomectomy where uterine cavity was entered.

1.3.13 INTRAUTERINE DEATH
Ultrasound features in intrauterine death
1. Absent fetal heart activity
2. Non-pulsatile aorta
3. Spalding sign - irregular overlapping of skull bones
4. Robert's sign - appearance of gas shadow in heart chambers and great vessels
5. Absence of fetal movement

Labour management
1. Mode of delivery - aim for vaginal delivery.
2. DIVC screening prior to induction of labour.
3. Induction of labour as for viable pregnancy (refer to chapter on IOL).
4. Investigation to determine cause
5. 3rd stage-Watch for PPH.
6. KIV prophylactic antibiotic e.g. maternal pyrexia
7. Record fetal appearance - note abnormalities by medical officer or registrar.
8. Offer patient the option of isolation room after delivery.
9. To provide bereavement counseling prior to discharge.
10. Give appointment date at the postnatal clinic to review results and progress of patients (preferable to be seen by the doctor who has managed the patient during antenatal/Intra-partum period).
11. Suppression of lactation with cabergoline, 1mg on first day after delivery.

Caesarean section for IUD
1. Decision to be made by a specialist.
2. Patient needs to be counseled regarding the decision.
3. Indications:
   3.1 Cephalo - pelvic disproportion
   3.2 Abnormal lie
   3.3 Placenta praevia
   3.4 Two previous LSCS
   3.5 Previous classical caesarean section
   3.6 Fetal anomaly (which may cause dystocia)

Establishing the cause of fetal death
1. Document the events related to an IUD.
2. Investigate to determine the cause of death.
3. Offer a postmortem examination of fetus
   3.1 As this a sensitive issue in our community, counseling about postmortem is only to be given by registrar/specialist/consultant
   3.2 Document if postmortem is declined

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4. Photograph all fetuses with **dysmorphism**.
5. Mandatory "babygram" **only** in the presence of structural / skeletal deformities.
6. Karyotype when indicated.
7. Placental swab for C&S / placental tissue for histopathological examination. Minimal placental tissue for HPE includes 1/8 of placenta (full thickness) from the center till the margin. Both maternal and fetal surfaces as well as membrane must be included. Site of cord insertion is not necessary, but a minimum 2cm long umbilical cord, 5cm away from the site of insertion should be obtained along for HPE. In cases of PPROM / PROM, section of the membranes at the site of rupture should be taken for HPE.
8. Bereavement counseling is a major component of management.
9. Maternal investigations:
   9.1 FBC
   9.2 Blood/Rhesus group
   9.3 VDRL
   9.4 TORCH
   9.5 Lupus anticoagulant and anti-cardiolipin (6/52 after delivery)
   9.6 MOGTT at the time of IUD
   9.7 In hydropic baby
      9.7.1 Send maternal blood for Hb electrophoresis and DNA study for alfa-thalassemia if the maternal MCV is low.
      9.7.2 If maternal MCV is low, screen also the partner
      9.7.3 Kleiheur- test
      9.7.4 Indirect Coomb’s test

**2.4.1 Induction of labour**
2.4.2 Augmentation of labour
2.4.3 Management of the first stage of labour
2.4.4 Management of the second stage of labour
2.4.5 Fetal monitoring in labour
2.4.6 Pain relief in labour

2.4.1 INDUCTION OF LABOUR (IOL)

Prerequisites:
1. Gestation period checked and confirmed by registrar / specialist.
2. Reactive CTG.

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4. Absence of contraindications.

**Indications for IOL:**
Decision for induction must be on individual basis

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>PERIOD OF GESTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post dates</td>
<td>40 weeks and 7 days</td>
</tr>
<tr>
<td>GDM on diet control</td>
<td>38 - 40 weeks (preferably deliver at 39 weeks)</td>
</tr>
<tr>
<td>GDM / DM requiring insulin</td>
<td>38 weeks, or earlier</td>
</tr>
<tr>
<td>PIH on medication</td>
<td>38 to 40 weeks, NOT later than 40 weeks.</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td>37 weeks or earlier if indicated</td>
</tr>
<tr>
<td>Eclampsia</td>
<td>Immediate delivery after stabilization</td>
</tr>
<tr>
<td>Intrauterine growth restriction</td>
<td>Depending on condition and POA</td>
</tr>
<tr>
<td>Reduced fetal movement</td>
<td>Beyond 38 weeks (after discussion with specialist and patient counseling)</td>
</tr>
<tr>
<td>Twins</td>
<td>Refer to twin management</td>
</tr>
<tr>
<td>Bad obstetric history</td>
<td>38 weeks or earlier (after discussion with specialist)</td>
</tr>
<tr>
<td>Intrauterine death</td>
<td>To discuss with specialist and also depend patient wish.</td>
</tr>
</tbody>
</table>

**CERVICAL SCORING SYSTEMS**

**BISHOP'S SCORE**

<table>
<thead>
<tr>
<th>Cervical</th>
<th>Pelvic score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Dilatation (cm)</td>
<td>0</td>
</tr>
<tr>
<td>Effacement (%)</td>
<td>0-30</td>
</tr>
<tr>
<td>Station (cm)</td>
<td>-3</td>
</tr>
<tr>
<td>Consistency</td>
<td>Firm</td>
</tr>
<tr>
<td>Position</td>
<td>Posterior</td>
</tr>
</tbody>
</table>

**MODIFIED BISHOP'S SCORE (CALDER SCORE)**

<table>
<thead>
<tr>
<th>Cervical</th>
<th>Pelvic score</th>
</tr>
</thead>
</table>
The cervical score is used to assist in making a decision regarding induction of labour.

**Documentation:**
The following information must be recorded when a decision is made for IOL
1. Indication
2. Timing of IOL
3. Mode of IOL:
   3.1 Amniotomy
   3.2 Vaginal Dinoprostone (Prostin)
   3.3 Vaginal Gemeprost (Cervegem)
   3.4 Others (state)
4. Decision by:

**IOL with prostaglandin:**
When induction of labour is undertaken with prostaglandins in an unfavourable cervix
1. Planned induction should be started early with prostin inserted at 7 am
2. Pre-existing short acting insulin dosage should be continued
3. Snacks are allowed
4. Capillary glucose estimation should be done 4 hourly until labour is established

**IOL with oxytocin:**
1. Planned Induction should be started as early as possible in labour ward
2. Subcutaneous insulin is withheld
3. An intravenous infusion of 5% dextrose is commenced at a rate of 125 ml/hour
4. Biochemical monitoring include:
   4.1 Capillary glucose estimation - 2 hourly
   4.2 Serum electrolytes, blood glucose & urine ketone - 4 hourly
5. Insulin therapy: as per sliding scale for diabetic mother in labour
   5.1 Patients on pre-existing insulin therapy, the insulin infusion are started at a rate of
1 unit/hour.

5.2 For patients on diet modification, insulin infusion is only started when the capillary glucose level exceeds 7 mmol/l.

5.3 Insulin infusion requirement should be based on capillary glucose estimation.

6. Adequate analgesia is important. (Epidural analgesia would be ideal)

7. Continuous fetal heart rate monitoring is required

8. Normal progress of labour is anticipated.

9. Labour should not be prolonged.

10. A partogram must be started.

11. Should any additional intravenous fluids be necessary during labour such as oxytocin infusion or for rehydration, isotonic saline or Hartmann's solution should be used.

**Choice of Prostaglandin:**

<table>
<thead>
<tr>
<th>Uterine height/Parity</th>
<th>Prostaglandin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine height &lt; 22 weeks</td>
<td>Gameprost ( cervagem) 1 mg 3-4 hourly, maximum 5 doses/day</td>
</tr>
<tr>
<td>Uterine height &gt; 22 weeks</td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>Dinoprotone (prostin), 3 mg , 6 hourly, maximum 2 doses/day</td>
</tr>
<tr>
<td>Uterine height &gt; 22 weeks</td>
<td></td>
</tr>
<tr>
<td>Para1-4 without scar</td>
<td>Dinoprostone (prostin) 1.5 mg, 6 hourly, maximum 2 doses/day</td>
</tr>
<tr>
<td>Uterine height&gt; 22 weeks</td>
<td></td>
</tr>
<tr>
<td>One previous scar</td>
<td>Dinoprostone (prostin) 1.5 mg, need permission from specialist if need more than 1 prostin</td>
</tr>
<tr>
<td>Uterine height &gt; 22 weeks</td>
<td></td>
</tr>
<tr>
<td>grandmultipara</td>
<td>To discuss with specialist before embarking on IOL with prostaglandin or oxytocin</td>
</tr>
</tbody>
</table>

**Suggested induction regime using Dinoprostone PGE2 (Prostin E2) is as follows:**

**Day 1:** maximum 2 prostin in a day, 6 hours apart.

If cervix remains unfavourable, to rest for the night and continue coming morning. IOL should be started in the morning and should not be inserted beyond 5 pm.

**Day 2:** To insert 3rd prostin in the morning.

If cervix is still unfavourable after 3 prostins, discuss with specialist regarding the further management plan.

**Day 3:** 4th prostin to be inserted if decided by specialist. Patient view also needs considered when the 4th prostin is required. Keep patient NBM at the time of insertion in anticipation of Emergency LSCS for failed induction.

- In summary, a maximum of 4 prostins would be used over a span of 3 days for low risk cases. High risk cases would be managed accordingly.
If uterine hyperstimulation is suspected, to administer IV/SC with Salbutamol (Ventolin) or Terbutaline (Bricanyl) STAT to reduce the intensity and frequency of contraction. A CTG must be performed to rule out any fetal distress.

MATERNAL AND FETAL MONITORING

1. CTG before initiation of induction of labour (Pre-induction CTG)
2. Monitor uterine contraction, maternal pulse rate and fetal heart rate in the first 2 hours at 15 min intervals.
3. Repeat CTG in the first hour of initiation of induction of labour (Post induction CTG)

2.4.2 AUGMENTATION OF LABOUR
Consider augmentation in:
1. Poor progress due to inadequate uterine contraction
2. Absence of contraindications.
3. Contraindications:
   3.1 Fetal compromise
   3.2 Malpresentation e.g. breech
   3.3 Membranes intact, unless instructed by specialist

Aim:
To achieve adequate contraction (3-5 contraction per 10 minutes; each lasting up to 35 to 45 secs).

Decision by:
1. Decision by registrar in normal risk cases
2. Decision by specialist in high risk cases

Regime:
Refer to Oxytocin augmentation / induction regime

Documentation on Partogram:
1. Commencement of augmentation
2. Effect upon contraction
3. The increase of dosage against time

Augmentation to be stopped immediately when:
1. Uterine hyperstimulation (more than 5 contractions in 10 minutes)
2. Fetal distress
3. Maternal hypotension / tachycardia (Signs of uterine rupture)

LABEL DRIP BOTTLE CLEARLY STATING STRENGTH OF OXYTOCIN USED

CAUTION: OXYTOCIN SHOULD NOT BE USED SOONER THAN 6 HOURS AFTER USE OF VAGINAL DINOPROSTONE (PROSTIN).

OXYTOCIN AUGMENTATION / INDUCTION REGIME

Aim: To achieve good contraction, ie. 4 contractions in 10 minutes, with
duration of contractions lasting up to 45 seconds.

**Dilution:** 10 units (1ml) Oxytocin + 500ml Normal Saline

**Preparation:** 1 ampoule = 10 units /1ml

**Regime:**
1. To use either infusion syringe pump or IV drip infusion pump
2. Start at 2miu/min.
3. Increase every 30 minutes.
4. Maximum 32miu/min (32dpm or 96ml/hr).
   
   [20miu/min= recommended maximum dose by manufacturer]
5. 12 miu/min usually establishes adequate contractions.

*Note: 1 ml = 20 drops, 1 dpm = 3 ml/hr*

**DOUBLING REGIME:**

<table>
<thead>
<tr>
<th>DOSE</th>
<th>DROPMAT</th>
<th>INFUSION SYRINGE PUMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 miu/min</td>
<td>2 dpm</td>
<td>6 ml/hr</td>
</tr>
<tr>
<td>4 miu/min</td>
<td>4 dpm</td>
<td>12 ml/hr</td>
</tr>
<tr>
<td>8 miu/min</td>
<td>8 dpm</td>
<td>24 ml/hr</td>
</tr>
<tr>
<td>16miu/min</td>
<td>16 dpm</td>
<td>48 ml/hr</td>
</tr>
<tr>
<td>32miu/min</td>
<td>32 dpm</td>
<td>96 ml/hr</td>
</tr>
</tbody>
</table>

**INCREMENTAL REGIME:**

<table>
<thead>
<tr>
<th>DOSE</th>
<th>DROPMAT</th>
<th>INFUSION SYRINGE PUMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 miu/min</td>
<td>2 dpm</td>
<td>6 ml/hr</td>
</tr>
<tr>
<td>4 miu/min</td>
<td>4 dpm</td>
<td>12 ml/hr</td>
</tr>
<tr>
<td>6 miu/min</td>
<td>6 dpm</td>
<td>18 ml/hr</td>
</tr>
<tr>
<td>8 miu/min</td>
<td>8 dpm</td>
<td>24 ml/hr</td>
</tr>
<tr>
<td>10 miu/min</td>
<td>10 dpm</td>
<td>30 ml/hr</td>
</tr>
<tr>
<td>12miu/min</td>
<td>12 dpm</td>
<td>36 ml/hr</td>
</tr>
</tbody>
</table>

For high risk patients such as grandmultipara, one previous scar, heart disease in pregnancy, usage of a lower dose regime ie. (INCREMENTAL REGIME) is acceptable. The dose is titrated upwards in a slower and smaller incremental increase. The maximum dose of oxytocin is also lower.
2.4.3 MANAGEMENT OF THE FIRST STAGE OF LABOUR

1. Record the date and time of admission.
2. Do a complete examination of patient following admission.
3. Commence patient on a partogram to monitor progress of labour, once she is in active labour (>\(\leq\) 4 cm, or earlier whenever necessary such as an IOL cases.
4. Ensure accurate and complete recording of information in the partogram.
5. Fetal monitoring:
   5.1 Normal / low risk patients: Intermittent auscultation, intermittent CTG
   5.2 High risk patients: Electronic fetal monitoring (CTG) - continuous
6. Ensure patient passes urine / Bladder is catheterized when bladder is palpable.
7. Urine to be tested for ketone, protein and sugar.
8. Ensure the patient is adequately hydrated.

Intermittent auscultation (where CTG is not available):
1. Listen to the fetal heart with a fetal stethoscope or hand held Doppler ultrasound monitor.
2. First stage: Performed for 1 min every 15 min between contractions.
3. Second stage: More frequently than during first stage (as required).

Set up intravenous cannula in the following patients:
1. Grand multipara.
2. Multiple pregnancy.
3. Previous LSCS.
5. Intrauterine fetal death.
6. Patient having higher risk factors for operative delivery.
7. Patient who is at risk of PPH.

Intravenous maintenance fluid: (monitor input / output of fluid)
1. P1H / PET (Do not overload).
2. Diabetic (on DIK regime).
3. Requiring augmentation of labour.
4. Planned for epidural pain relief (ensure adequate hydration).

Augmentation of labour:
1. Decision by registrar in normal or moderate risk cases.
2. Decision by specialist in high risk cases.
**Group and save blood (GSH):**
1. IOL
2. Previous LSCS
3. Breech
4. Bad obstetrics history
5. PIH/PET
6. Diabetic
7. IUD
8. History of retained placenta
9. Grand multipara
10. History of PPH

**Continuous bladder catheterization:**
1. Severe PET / Impending eclampsia / Eclampsia
2. Abruptio placenta
3. Cases that require close monitoring of urine output / renal function

**Accompanying person:**
1. Encourage a relative to be with the patient (with the nurse monitoring labour). This is providing if the labour room is equipped and conducive to be husband friendly.

**Findings suggestive of satisfactory progress:**
1. Regular, good contractions.
2. Progressively increasing in frequency and duration.
3. Rate of cervical dilatation, at least 1 cm per hour during active phase.
4. Presenting part remains well applied to cervix.

**Hyperstimulation:**
1. Prolonged contractions (> 2 mins)
2. Frequent contractions (<1:2)
3. Tetanic contractions (continuous)
ANAGEMENT OF THE SECOND STAGE OF LABOUR

.i.1. House officer must review and document on case note:
1.1 Time of Os at full dilatation.
1.2 Time of delivery of baby.
1.3 Time of delivery of placenta.

2. Duration of 2nd stage depends on antenatal history (eg. cardiac disease) and parity.

3. Generally allow:
3.1 One hour for primigravida
3.2 Half an hour for multiparous woman.
3.3 Patients on epidural analgesia can be allowed up to 3 hours, providing there is no maternal or fetal distress. The descent of the presenting part is delayed in patients on epidural.

4. Remember to use information from the partogram to assist in decision to expedite delivery.

5. CTG monitoring during the second stage of labour can be difficult to interpret due to loss of contact, even more so when the mother is bearing down. In high risk cases where monitoring is required, it may be necessary to use internal CTG electrodes.

6. Ensure all CTG traces are interpreted, signed and dated. Time must be correctly stated.

7. High risk patients should have IV access.

8. Check that suction apparatus is functioning while preparing to conduct delivery.

9. Appropriate gowning is necessary to conduct delivery.

10. Clean and drape patient prior to delivery.

11. Use local anaesthesia if episiotomy is required.

12. Intramuscular Syntometrine / Syntocinon when anterior shoulder of fetus is delivered.

13. Paediatric doctor should be on standby for high risk cases and instrumental deliveries.
14. Practice active management of 3rd stage of labour (prophylactic oxytocics administration, controlled cord traction with or without early cord clamping).

15. Be familiar with all equipment and availability / location of drugs in the labour room.

3.4.5

ETAL MONITORING IN LABOUR

MODALITIES OF MONITORING IN SGH:

1. Intermittent auscultation
2. Electronic fetal heart monitor (daptone)
3. Cardiotocograph (CTG):
   a. External
   b. Internal
4. Fetal scalp blood pH testing

MONITORING IN LABOUR WARD:

On admission to labour ward:

1. All antenatal patients will have a baseline CTG trace for at least 20 minutes

A.

OR LOW RISK CASES:

1. Intermittent fetal auscultation or using fetal daptone (approximately at 30 minutes)
1. Record fetal heart rate on the partogram

2. Intermittent 20 minute CTG trace (2 – 4 hourly)

3. Record patient’s name, NRIC, interpretation, the name of the doctor who reviewed and state the time on every CTG trace.

4. Continuous CTG monitoring is absolutely unnecessary

B. OR MODERATE RISK CASES:

1. Intermittent fetal heart monitoring with daptone (between CTG monitoring)

2. Intermittent 20 minute CTG trace with frequency to be decided by the registrar or specialist on duty.

3. Frequency and length of CTG trace dependent on individual case and the interpretation of the previous trace

4. All fetal heart recording have to be documented as above

C. FOR HIGH RISK CASES:

1. Intermittent CTG tracing with the frequency to be decided by the registrar or specialist on duty

2. The CTG can also be left to continuously monitor the fetal heart rate but only need to print traces on intermittent basis if needed

3. Continuous CTG tracing in exceptional cases may be needed where there are some interval)
REVIEWING CTG TRACE:
1. Normal CTG trace to be reviewed by a doctor or the attending midwife and tracing endorsed with date, time and name of doctor.
2. Report on tracing by HO / MO / Doctors. Comment on all components of the CTG
3. Abnormal CTG trace have to be reviewed and endorsed by the medical officer or the specialist on duty

ABNORMAL CTG TRACE:
1. Medical officer/ registrar or specialist on duty be informed immediately
2. The informed medical officer or specialist have to attend to the patient and review the CTG trace
3. If the CTG is suspicious or abnormal;
   a) Put patient in the left lateral position
   b) Stop oxytocin drip
   c) Give nasal oxygen 5L/min or give oxygen through ventimask
   d) Inform the medical officer or registrar/specialist as soon as the suspicious trace is detected

WHEN TO USE INTERNAL CTG:
1. When the trace from the external CTG monitoring is difficult to interpret due to intermittent loss of tracing. This could occur if the patient is agitated or in pain and they move constantly causing the loss of trace or in obese patients and in the second stage of labour.
2. Twin or multiple pregnancy
 Interpretation of CTG

.i.1.a.8.A.

*Normal CTG trace:*

1* baseline heart rate : 110- 160 bpm
2* baseline variability : 10-25 bpm
3* accelerations: 2 or more in 20 minutes. Increase \( \geq 15 \) bpm lasting at least 15 sec
4* accelerations : Absent

.i.1.a.8.B.

*Suspicious CTG trace:*

1* accelerations: absent for > 40 minutes and any of the following:
1* baseline heart rate : bradycardia <110 bpm
tachycardia >160 bpm
2* baseline variability : <10 bpm lasting for > 40 minutes, greater significance if <5 bpm.
2* accelerations : variable decelerations without ominous features

.i.1.a.8.C.

*Abnormal CTG trace:*

3* accelerations absent for > 40 minutes; and any of the following:
4* abnormal baseline rate
5* poor baseline variability of less than 5 bpm lasting over 90 minutes
3* repetitive decelerations: late or variable
4* the features of decelerations which may indicate a poorer outcome includes; prolonged decelerations longer than 60 seconds, how low the FHR goes down and the delay in recovery.
Other specific traces categorized as abnormal are:
1. Sinusoidal pattern
2. Prolonged bradycardia (<100 bpm) for > 3 minutes
3. Shallow decelerations in the presence of markedly reduced baseline variability (< 5 bpm) in a non-reactive trace.

**FETAL SCALP BLOOD SAMPLING:**

*Fetal scalp pH testing is essentially an invasive vaginal procedure performed when a woman is in active labour to determine if the baby is getting enough oxygen.*

**How the Test is Performed**

1. Make sure it is technically possible before offering the test (Os ≥ 4 cm dilated)
2. Membrane should be absent (SROM or ARM)
3. Make sure there is someone skilled in performing the procedure
4. Make sure the blood gas machine is functioning
5. Make sure the various instruments are available
6. Counsel the mother regarding the test:
   a) Why it needs to be done
   b) How it is going to be done
   c) How long it is going to take (5 to 10 minutes)
   d) Who is going to do it
   e) What the results would mean
   f) The risks to the baby
   g) Inform her that there is a possibility of failure (which invariably means revert to caesarean section)
7. The mother lies on her back in the lithotomy position
8. Her legs/feet should be in stirrups
9. Insert an appropriate sized metal or plastic cone into the vagina
10. The cone should fit snugly against the scalp of the fetus
11. The scalp of the fetus is cleaned, wiped dry and pierced with a 2mm scalp blade at the end of a long blade holder.
12. A small amount of blood is then withdrawn using a special heparinised thin tube.
13. Make sure that you obtain enough blood at least half the length of the tube.
14. The blood is then analyzed by the blood gas machine in the labour ward
15. The result would be available within a few minutes.

**Normal fetal blood sample results:**
- **Normal pH:** 7.25 - 7.35
- **Borderline pH:** 7.20 - 7.25
- **Abnormal pH:** < 7.20

**What the results mean:**
1. An abnormal pH of less than 7 means that delivery have to be expedited either by instrumental delivery if all prerequisites are fulfilled or by caesarean section.
2. A borderline result may necessitate a repeat test or several repeat tests if a decision is made to allow the labour to continue. This should be undertaken after the patient is counseled by the registrar/specialist and is agreeable with this plan of management. This should be recorded clearly in the notes. The test is usually repeated every 30 minutes until delivery.
3. Decision to continue with labour when the result is borderline should be undertaken only if vaginal delivery is expected soon.
4. Normal result means the abnormality noted on the CTG is probably not significant. Repeat test is usually not required unless there are further adverse changes on the CTG.
5. The test results is a guide, the decision as in abnormal CTG should be undertaken with all associated factors taken into account.

**Risks of this procedure include the following:**
1. Continued bleeding from the puncture site (more likely if the fetus has a pH imbalance)
2. Infection
3. Bruising of the baby's scalp
Considerations:
This test is not recommended for mothers with:
   a. Infections, such as HIV or hepatitis C.
   b. Thrombocytopenia
   c. Non cephalic presentation

1.4.5
PAIN RELIEF IN LABOUR

1. Ensure adequate pain relief for patients in labour.
2. Discuss choice of analgesia to identify the patient’s preference.
3. Ideally, the choice of analgesia during labour should be discussed with the patient during antenatal period.

OPTIONS
1. Parenteral analgesia (Intramuscular pethidine)
2. Inhalation analgesia
3. Epidural analgesia

PARENTERAL ANALGESIA
1. Pre-requisite:
   1.1 Normal BP
   1.2 Reactive CTG
2. Intramuscular pethidine:
   2.1 Normal dose 75-100 mg
   2.2 1 mg per kg body weight 6 hourly
3. Combined (for anti-emetic effect) with Metoclopramide (Maxolon) 10mg or promethazine HCL (phenergan) 25mg.
4. Imminent delivery should not be regarded as an indication to withhold IM Pethidine
(provided CTG is reactive).
5. If pethidine is given to the mother, the newborn may suffer from respiratory depression.

NOTE:

INHALATION ANALGESIA
1. Safe for mother and fetus.
2. Mixture of Oxygen (50%) and Nitrous Oxide (50%) - **ENTONOX**
3. Effective only when used correctly.
4. Mask must be placed over patients face correctly.
5. Clean mask for each patient.
6. Instruct patient to start breathing the gas (normal rate but deep breath) as the patient feels tightening of the uterus (because Entonox has a latent period of 15 seconds).
7. To continue breathing in Entonox till pain ceases.
8. Not effective if patient starts inhalation at the point when the pain starts.

EPIDURAL ANALGESIA
1. To liaise with anaesthetist if a patient request / requires epidural analgesia.
2. Consider this when effective analgesia is required in patients with heart disease, multiple pregnancy.
3. Choice of analgesia offered should be discussed with mothers during antenatal period.
4. Refer to the chapter on 'Guidelines for Epidural Anaesthesia in Women on Thromboprophylaxis'.
2.5.10 Episiotomy
2.5.11 Repair of cervical tears
2.5.12 Repair of vaginal and perineal tears
2.5.13 Instrumental delivery
2.5.14 Management of retained placenta
2.5.15 Preterm prelabour rupture of membranes (PPROM)
2.5.16 Prelabour rupture of membranes (PROM)
2.5.17 Perinatal Group B Streptococcus Infection Prevention
2.5.18 Preterm labour

2.5.9.4 Tocolytic for preterm labour
2.5.9.5 Tocolytic regime: Nifedipine
2.5.9.6 Tocolytic regime: Salbutamol

2.5.10 Antepartum haemorrhage
2.5.10.3 APH: Abruptio placenta
2.5.10.4 APH: Placenta praevia
2.5.13 Postpartum haemorrhage
2.5.14 Guidelines for transfusion in massive blood loss
2.5.13 Disseminated intravascular coagulation (DIVC)
   2.5.13.1 Use of factor 7 (Novo 7)
2.5.14 Uterine inversion
2.5.15 Cord prolapse
2.5.16 Shoulder dystocia

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**2.5.1 EPISIOTOMY**

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Indications to consider episiotomy:
1. Complicated vaginal deliveries such as breech, shoulder dystocia, instrumental deliveries.
2. Scarring resulting from female genital cutting / mutilation or poorly healed third or fourth degree tears.
3. Fetal distress.

Procedures:
1. Apply general aseptic precautions.
2. Adequate analgesic in the form "of local infiltration with lignocaine or pudendal block unless epidural analgesic in situ.
2. Infiltrate 10 ml 0.5% lignocaine solution beneath the vaginal mucosa, beneath the perineal skin and deeply into the perineal muscle.
2. Anaesthetize early to provide sufficient time for effect.
5. Perform episiotomy when:
   5.1 The perineum is thinned out;
   5.2 3-4 cm of the baby's head is visible during contraction.
6. Place two fingers between the baby's head and the perineum and cut the perineum with scissors, about 3-4 cm in the mediolateral direction.
7. After delivery, examine for any extension and other tears.

REPAIR OF EPISIOTOMY

1. Material preferred is absorbable synthetic material polyglycolic acid, over chromic catgut as the former is associated with less perineal pain, analgesic use, dehiscence and re-suturing.
2. Vaginal mucosa is closed with continuous 2/0 suture:
   2.1 Start about 1 cm above the apex, continue the suture to the level of the vaginal opening.
   2.2 At the opening of the vagina, bring together the cut edges of the vagina.
3. Close the perineal muscle using interrupted 2/0 sutures.
4. Close the skin using interrupted or subcuticular 2/0 sutures. Continuous subcuticular technique is associated with less short term pain.

COMPLICATIONS OF EPISIOTOMY

1. Vulval/vaginal haematoma management depends on size and if it is increasing in size. Small haematomas should be managed conservatively. Bigger haematoma needs to be drained, bleeders secured and a drain should inserted at the end of the procedure.

2. In perineal wound breakdown, assess the wound:
   2.1 If there are signs of infection, do regular dressing until it is clean then perform secondary suturing if necessary
   2.2 If clean, secondary suturing can be performed

3. For mild infection, antibiotics are not required
4. In severe infection a combination of oral antibiotics is required for 7 days:
   4.1 Tab cefuroxime 250 mg, 12 hourly
   4.2 Plus Tab Metronidazole 400 mg, 8 hourly
5. In deep infection involving muscles and is causing necrosis (necrotizing fasciitis), combined parenteral antibiotics is used until necrotic tissue has been removed and the patient remains afebrile for 48 hours:

5.1 IV Penicillin G 2 million units 6 hourly
5.2 Plus FV Gentamicin 5 mg/kg body weight, daily.
5.3 Plus IV Metronidazole 400 mg, 8 hourly.

6. Once the patient is afebrile for 48 hours, switch to combined oral antibiotics for 7 days:

6.1 Tab cefuroxime 250 mg, 12 hourly
6.2 Plus Tab Metronidazole 400 mg, 8 hourly

7. Necrotizing fasciitis requires wide debridement and secondary closure is performed in 2 - 4 weeks, pending resolution of the infection.

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2.5.2 REPAIR OF CERVICAL TEARS

1. Apply general aseptic precautions.

2. Adequate analgesic is required. Repair in OT under regional or general anesthesia is required and extensive tears.

3. The assistant should apply fundal pressure to give better exposure of the cervical tears.

4. Gently grasp the cervix with ring or sponge forceps on both sides of the tear and gently pull to expose the tear and to inspect the entire cervix.

5. Start suturing from the apex with 0 chromic catgut or polyglycolic suture.

6. Apply interrupted sutures along the entire length of the laceration about 1 cm
apart, taking the whole thickness of each lip of the cervix.

7. If the apex is difficult to reach and ligate, grasp the apex with artery or ring forceps and leave it in place for 4 hours:
   7.1 Open the forcep partially after 4 hours but do not remove
   7.2 Remove the forceps completely after another 4 hours

8. Laparotomy may be required to repair a cervical tear that has extended deep beyond the vaginal vault.

2.5.3 REPAIR OF VAGINAL AND PERINEAL TEARS

1. The different ‘degrees’ of tears are:
   1.1 First degree involving skin only;
   1.2 Second degree involving perineal muscles;
   1.3 Third degree involving partial or complete disruption of the anal sphincter
   1.4 Fourth degree involving complete disruption of the external and internal sphincter and rectal mucosa.

2. Absorbable synthetic material polyglycolic acid is preferred over chromic catgut for their tensile strength, non-allergic properties and lower probability of infectious complications. The former is associated with less perineal pain, analgesic use, dehiscence and re-suturing.
REPAIR OF FIRST AND SECOND DEGREE TEARS

1. Most first degree tears close spontaneously without sutures.
2. The general aseptic precautions apply.
3. Carefully examine the vagina, perineum and cervix.
4. Exclude third or fourth degree tear by:
   4.1 Place a gloved finger in the anus;
   4.2 Gently lift the finger and identify the sphincter;
   4.3 Feel for the tone or tightness of the sphincter.
5. Change to clean gloves.
6. If the sphincter is not injured, proceed with repair.
5. Adequate analgesic by infiltrating beneath vaginal mucosa, beneath the skin of the perineum and deeply into the perineal muscle using about 10 ml 0.5% lignocaine solution. Anaesthetize early to provide sufficient time for effect.
8. Repair the vaginal mucosa using a continuous 2/0 suture:
   8.1 Start the repair about 1 cm above the apex of the vaginal tear, continue the suture to the level of the vaginal opening;
   8.2 At the opening of the vagina, bring together the cut edges of the vaginal opening.
   8.3 Bring the needle under the vaginal opening and out through the perineal tear and tie.
6. Repair the perineal muscles using interrupted 2/0 suture. A second layer of stitch may be required to close the space in a deep tear.
10. Skin is closed using sub-cuticular or interrupted 2/0 sutures starting at the vaginal opening. The former is associated with less short term pain.
11. If the tear was deep, rectal examination is performed after the completion of the repair to ensure there are no stitches involving the rectal mucosa.

REPAIR OF THIRD AND FOURTH DEGREE PERINEAL TEARS

1. Repair the tear in the operating room.
2. Prophylactic antibiotics (ampicillin and metronidazole) is required and continued orally for 1 week.
3. The general aseptic precautions apply.
4. Carefully examine the vagina, perineum and cervix.
5. Exclude third or fourth degree tear by:
   5.1 Place a gloved finger in the anus.
   5.2 Gently lift the finger and identify the sphincter or the lack of it.
   5.3 Feel the surface of the rectum and look carefully for a tear.

6. Change to clean gloves.
   Pudendal block or ketamine may be used. If all edges of the tear can be seen, the repair can be done using local infiltration with lignocaine and pethidine and diazepam IV slowly.
8. Adequate analgesic by infiltrating beneath vaginal mucosa, beneath the skin of the perineum and deeply into the perineal muscle using about 10 ml 0.5% lignocaine solution. Anaesthetize early to provide sufficient time for effect.
9. Repair the rectum using interrupted 2/0 or 3/0 PDS suture 0.5 cm apart to bring together the mucosa. The sutures are placed through the muscularis and not all the way through the mucosa:
   9.1 Cover the muscularis layer by bringing together the fascia! layer with interrupted sutures.
   9.2 Apply antiseptic solution to the area frequently.

10. If the sphincter is torn:
   10.1 Grasp each end of the sphincter with an Allis clamp
   10.2 Repair the sphincter with 2 or 3 interrupted stitches of 2/0 suture.

11. Apply antiseptic solution to the area again and re-examine the anus with a gloved finger to ensure the correct repair of the rectum and sphincter.
12. Change to clean gloves.
13. Continue repairing the vaginal mucosa, perineal muscles and skin.

**POST-PROCEDURE CARE**

1. Patient should be followed up closely for signs of infection.
2. Avoid giving enemas or rectal examinations for 2 weeks.
3. Give stool softener by mouth for 2 week.
4. Give oral antibiotics for 1 week, e.g. Augmentin 625 mg 12 hourly
5. Review in clinic in 2-4 weeks to examine wound
6. Ask if she has fecal incontinence, rectal pain and urgency

**MANAGEMENT OF NEGLECTED CASES OF 3RD & 4TH DEGREE TEARS**
If closure is delayed for more than 12 hours, infection is inevitable as a perineal tear is always contaminated with faecal material. As such, delayed primary closure is indicated:

1. For first and second degree tears, leave the wound open.
2. For third and fourth degree tears, close the rectal mucosa with some supporting tissue and approximate the fascia of the anal sphincter with 2 or 3 sutures. Close the muscle and vaginal mucosa and the perineal skin 6 days later.

2.5.4 INSTRUMENTAL DELIVERY

PRE-REQUISITE:

1. Head should not be palpable per abdomen 'active uterus' - presence of uterine contractions.
2. 'Empty bladder' - catheterize bladder if patient has not passed urine correctly.
3. 'No membrane' (Amniotic membranes must have been ruptured)
4. 'Full OS': Cervical OS must be fully dilated.
5. Cephalic with no excessive caput or moulding.
6. Position must be determined and favorable for instrumental delivery.
7. An adequate bony pelvis.
8. Adequate analgesia.
9. Paediatric doctor to standby for delivery (before instrument is applied).
10. Doctor must be experienced in performing the instrumental delivery (logged experience required). Otherwise have to be supervised.
11. CPD ruled out.
12. Operator must know his limitation and be prepared to abandon the procedure in case of difficulty.
13. The use force is the worst of the available option.
14. Instrumental deliveries should NOT be attempted because of non-availability of OT - inform specialist to request for second OT.
15. A negative attempt should be swiftly converted to abdominal delivery.
16. The specialist must be informed about a failed instrumental delivery

**DO NOT ATTEMPT INSTRUMENTAL DELIVERY IF:**

1. HEAD PALPABLE PER ABDOMEN
2. UNABLE TO DEFINE POSITION
3. ESTIMATED FETAL WEIGHT > 3.8 KG
4. INEXPERIENCED

**REMEMBER:**

- **IT SHOULD NOT BE A VAGINAL DELIVERY AT ALL COST!**
- **ATTEMPT INSTRUMENTAL DELIVERY ONLY IF ALL PRE-REQUISITES ARE FULFILLED**
- **ATTEMPT INSTRUMENTAL DELIVERY ONLY IF YOU KNOW HOW, UNLESS SUPERVISED.**

**POST PROCEDURE:**

1. Proper documentation in the case note
2. All post-instrumental babies should not be discharged within the first 24 hours.
3. Urinary and anal sphincter dysfunction must be excluded before patient is discharged
4. If PPH, do FBC before discharge.
5. It is encouraged that the registrar who performs the instrumental delivery must review the patient in post natal ward.
6. It is preferable that these patients are reviewed in our post-natal clinic at 6 weeks. This is to ensure that these patients do not suffer from urinary/bowel problems.
2.5.5 MANAGEMENT OF RETAINED PLACENTA

Diagnosis:
1. Not able to deliver placenta by CCT within 30 minutes of delivery of fetus.
2. Ensure that before making a diagnosis of retained placenta:
   2.1 Bladder is catheterized
   2.2 Syntometrine has been given
   2.3 Sufficient time is allowed
3. Snapping of the cord during CCT is not equivalent to retained placenta.

Pre-requisite:
1. Inform registrar.
3. Set IV line.
4. Group and cross match 2 units of whole blood (do not have to wait for blood before carrying out the procedure).
5. BP/PR.-Baseline, and then continue monitoring during procedure and thereafter.
6. Resuscitate patient if she is in shock.

PROCEDURE:
1. Aseptic technique.
2. Sterile gown.
3. Long gloves.
4. PROPHYLACTIC ANTIBIOTIC- Stat dose of IV ampicillin 1 gm and IV metronidazole 500mg.
5. Left hand should grasp the uterus- per abdomen.
6. Right hand introduced through the vagina into the uterus.
7. If OS is closed- use fingers to dilate (be patient).
8. If cord is intact- use it as a guide to the placenta
9. Identify the edge of the placenta.
10. Introduce the edge of your palm between the placenta and the uterine wall.
11. Side to side motion to separate the placenta.
12. Fingers always pointing into the uterine cavity- away from the uterine wall.
13. Do not remove your hand until the placenta is entirely detached.
14. Check the placenta for complete removal-if not re-explore.
15. Give IV ergometrine O.5mg or IV syntocinon 10 units.
16. External uterine massage - ensure uterus is well contracted.
17. IV syntocinon (40 units in 500mls of Ringers lactate) over 6 hours.
18. Inspect vagina after procedure to identify vaginal wall tears or episiotomy wound if tears are extensive, the registrar must carry out the repair.
19. Observe patient for a minimum of 1 hour, till patient is stable before transfer to postnatal ward.

POST PROCEDURE
1. Document the procedure, should include the following information:
   1.1 Placenta/membranes: complete/incomplete/ragged edges;
   1.2 Estimated blood loss.
2. Monitor patient in labour room till sedation has worn off or at least 1 hour.
3. Palpate uterus during observation to ensure that it remains contracted.
4. Maintain infusion of IV fluids.
5. KIV blood transfusion.
6. If PPH, check FBC and coagulation profile
7. Give broad spectrum oral antibiotics for 7 days

2.5.6 PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

*Defined as the spontaneous rupture of membranes before the onset of regular uterine contractions which occurs prior to completed 37 weeks POA.*

**DEFINITION**

1. Less than 37 completed weeks of gestation.
2. Spontaneous rupture of membranes.
3. No uterine contraction / not in labour.

**OFTEN ASSOCIATED WITH:**
1. Infection.
2. Polyhydramnios.
3. Unstable lie.
4. Multiple pregnancy.

**CLINICAL EXAMINATION:** (Determine period of gestation)
2. Diagnostic sterile speculum examination:
   2.1 Confirm diagnosis
   2.2 Assessment of the cervix
   2.3 Low vaginal swab for C&S
3. Rule out cord prolapse.
4. Vaginal examination to note status of cervix (not recommended).

**Unnecessary VE increases risk of infection!**

Speculum examination may demonstrate fluid coming from cervix or forming a pool in the posterior fornix. Encourage patient to cough in order to demonstrate a 'gush of fluid'. Red litmus pH paper would turn blue if there is presence of amniotic fluid (alkaline).

**CHORIOAMNIONITIS:**
1. Fever >37.5°C
2. And 2 other criteria:
   - Maternal tachycardia
   - Uterine tenderness
   - Fetal tachycardia
   - Foul smelling amniotic fluid
   - Leukocytosis

**IF DIAGNOSIS OF PPROM IS CONFIRMED:**
1. Admit patient

**MONITORING:**
1. Temperature and vital signs monitoring charts (4 hourly).
2. Uterine contraction/tenderness.
4. High vaginal swab for C&S during admission: trace result early.
5. Twice weekly WBC.
6. Fortnightly growth scans.

**MANAGEMENT:**

**A. LESS THAN 34 WEEKS POA**
1. Start T. EES 400mg BD for 10 days.
2. Antenatal steroids
3. Give tocolytics if patient is in labour for dexamethasone to work provided no evidence of chorioamnionitis.
5. Allow labour if steroid therapy has been completed.
6. Expectant management up to 34 weeks if patient does not go into labour.
7. If infection develops, start on parenteral antibiotics and deliver fetus (choice of antibiotic to be discussed with the specialist).
8. Attempt vaginal delivery if patient in established labour.
9. If caesarean section is performed, pack pelvic gutters to contain spread of infection.
10. Presence of chorioamnionitis:
   10.1 Delivery is the best option irrespective of maturity of the fetus.
   10.2 Must be treated with:
       10.2.1 IV cefuroxime 750mg 8 hourly.
       10.2.2 IV metronidazole 500 mg 8 hourly.
       10.2.3 All antimicrobials are continued till afebrile for 24-48 hours; then switch to oral antimicrobials.
   10.3 Newborn baby to be reviewed by the paediatric team.

B. 34 WEEKS POA ONWARDS
1. Deliver after completion of dexamethasone providing there is no suspicion of chorioamnionitis
2. NICE Guidelines recommend delivery as the risk of managing such cases conservatively is higher than delivery
3. However, there should be a good neonatal care support in the hospital
4. In the district hospitals of Sarawak, cases of PPROM have to be referred to the nearest specialist hospital for further management

2.5.7 PRELABOUR RUPTURE OF MEMBRANES AT TERM (PROM)

*Spontaneous rupture of membranes before the onset of regular uterine contractions which occurring after 37 completed weeks of gestation.*

**DEFINITION**

1. Completed 37 weeks gestation and beyond.
2. Spontaneous rupture of membranes.
3. No uterine contraction, not in labour.

**EXAMINATION**

1. Uterine fundal height.
2. Speculum examination: demonstration of liquor, to rule out cord prolapse.
3. High vaginal swab for C&S during admission.
4. Vaginal examination to note status of cervix (cervical scores).

**UPON ADMISSION**

1. CTG.
2. WBC - if for conservative management (see below).
3. Pad chart.
4. Temperature and vital signs monitoring charts.
MANAGEMENT OPTIONS
1. Active management: IOL upon admission and assessment
2. Conservative management: Allow 12-24 hours for spontaneous onset of labour; failing which for IOL (after 12 hours in SGH).
   2.1 Bishop score favourable: ARM/Oxytocin induction
   2.2 Bishop score not favourable: Cervical ripening with Prostin follow by ARM / Oxytocin 6 hours later. (1 prostin insertion only in SGH)
3. Malpresentation / Abnormal lie: Emergency LSCS

2.5.8 PERINATAL GROUP B STREPTOCOCCUS INFECTION PREVENTION

Maternal GBS colonization is associated with an increased risk of PPROM and preterm labour. However the diagnosis and treatment of the infection has not shown to reduce this risk. GBS is a vaginal commensal, the carrier rate has been cited to be between 10 - 25%.

Detection

1. All patients who are admitted for preterm prelabour rupture of membranes (PPROM) / prelabour rupture of membranes (PROM) must have a low vaginal swab culture to detect GBS.

2. Culture swabs of the lower vagina and rectum has been shown to yield higher colonization rates in comparison to those taken from the cervix or higher vagina.

Antepartum Prophylaxis:
There are only a few indications for antepartum antibiotic prophylaxis:

1. Proven carrier planned for any procedure eg. cervical cerclage
2. Symptomatic pregnant women
3. Heavy colonization as evidenced by positive urine culture for GBS.

Routine antepartum prophylaxis is not recommended as:

1. This may cause antibiotic resistance
2. This intervention has not proven to eradicate GBS totally at term / when the woman is in labour.

Intrapartum Prophylaxis

1. Intravenous antibiotics to be given when patient is in labour (intrapartum antimicrobial prophylaxis).
2. Antibiotics: IV ampicillin 2 gm stat then 1 gm 4 hourly, unless culture results indicate otherwise. In the presence of allergy to penicillin: use Clindamycin 900 mg, 8 hourly.

Antibiotics should be given to a patient with:

1. PPROM with positive culture.
2. PPROM that has been managed actively (planned for delivery).
3. PROM exceeding 18 hours (> 12 hours in SGH), and PPROM > 12 hours
4. In labour with positive antenatal culture.
5. Presence of signs and symptoms of chorioamnionitis.
6. History of previous baby been affected by GBS.

Suspect chorioamnionitis in women with:

1. Fever
2. Uterine tenderness or uterine irritability
3. Foul smelling vaginal discharge
4. Leukocytosis
5. Maternal tachycardia
6. Fetal tachycardia
7. Meconium stained liquor
2.5.9 PRETERM LABOUR

DIAGNOSIS
1. Uterine contraction:
   1.1 Occurring once every 10 minutes.
   1.2 Lasting at least 30 seconds.
2. Gestation before 37 completed weeks
3. Vaginal examination finding: with or without cervical changes.

INITIAL ASSESSMENT
1. General condition of patient including her cardiovascular and thyroid status.
   Identity predisposing factor or causes:
   2.1 PPROM
   2.2 Infection
   2.3 Abruption
   2.4 Multiple pregnancy
      Fetal anomaly
3. Abdominal examination: SFH/Lie of fetus.
4. Ultrasound scan:
   4.1 Fetal condition (anomaly/viability)
   4.2 Placental site
   4.3 Amniotic fluid index
5. Vaginal examination
6. Transvaginal scan to assess cervical length (SGH).
PLAN OF MANAGEMENT
1. To ensure best fetal outcome:
   Tocolysis to suppress labour in order to give antenatal steroid (IM Dexamethasone
   12mg 12hrly x 2 doses) if less than 36 weeks
2. Consider delivery:
   2.1 In the presence of infection
   2.2 Interuterine death
   2.3 Fetal abnormality
   2.4 Steroid therapy completed
      Unsuccessful tocolysis
3. Counsel patient regarding her condition and plan of management.
4. Paediatrics team to be informed if delivery is imminent, especially when ventilator
   may be required.

DELIVERY
1. Allow vaginal delivery if cephalic presentation.
2. Breech more than 1 kg- for Caesarean Section (Less than 1 kg need specialist input)
3. To be conducted by doctor
4. Episiotomy.
5. Paediatric medical officer to stand by for delivery.
6. Instrumental delivery - for obstetric indication only.
7. Ventouse delivery not recommended for POA less than 36 weeks

ANTENATAL STEROID THERAPY

1) Repeated doses of dexamethasone are not recommended. Consult Obstetrician
   should the patient require repeated doses

2) Each completed dose of dexamethasone should be effective for 7 days

3) Allow 12 hours following 2nd dose if planned for delivery.
4) There is benefit of steroid if it has been administered for a minimum of 4
   hours from the first dose.

5) Dexamethasone may cause transient poor glycaemic control
6) Dexamethasone should be given before delivery between 24 weeks to 36 weeks
   unless the risk to the mother or fetus outweighs the benefit (e.g. chorioamnionitis,
   acute fetal distress, acute massive APH)
7) Consider giving insulin on a sliding scale for patients in insulin

1.5.9. 1 TOCOLYSIS FOR PRETERM LABOUR
AIM
The aim of suppressing preterm labour is to allow time for:
1. completion of antenatal steroid therapy (24hr from 1st dose);
2. in-utero transfer to a another hospital for the benefit of baby if no contraindication for delay in delivery.
3. To allow the pregnancy to continue and reduce the risk of prematurity

PREREQUISITE BEFORE INITIATION OF TOCOLYTIC REGIME
1. Normal viable fetus
2. No maternal medical contraindication for labour suppression
3. Normal maternal ECG
4. Baseline random blood sugar level (RBS)
5. Baseline serum electrolytes (BUSE)

CONTRAINDICATIONS
1. Fetal compromise
2. Antepartum haemorrhage (APH) –absolute contraindication in abruption placenta
3. Intrauterine infections (chorioamnionitis)
4. Maternal cardiac disease
5. Hyperthyroidism
6. Intrauterine disease
7. Advanced labour
8. Severe hypertension
9. Multiple pregnancy (relative contraindication)
10. Poorly controlled diabetes

TOCOLYTIC AGENTS:
- **Nifedepine (preferred).**
- Consider beta agonist if Nifedepine failed or not available.

MONITOR FOR:
- Fetal tachycardia
- Maternal tachycardia
- Maternal pulmonary edema
- Maternal hypotension
- Palpitation
- Headache
- Hypokalemia
- Hyperglycemia
TOCOLYTIC REGIME:

2.5.9.2 NIFEDIPINE SUPRESSION

Loading dose:
T.Nifedipine 15 mg stat then 15 mg every 15 minutes for 4 doses

Maintenance dose:
T.Nifedipine 20 mg tds for 48 hours

Monitoring of patient on Nifedipine suppression:
1. Continuous monitoring of the fetal heart rate is recommended as long as the patient has contractions
2. Monitor blood pressure and pulse every 15 minutes for the first hour, then every 30 minutes for the 2nd hour then hourly during the first 24 hours.

Side effects of Nifedipine:
1. Tachycardia
2. Palpitations
3. Flushing
4. Headaches
5. Dizziness
6. Nausea
7. Hypotension is minimal if patient is normotensive

Contraindication to Nifedipine suppression:
1. Allergy to nifedipine
2. Hypotension
3. Hepatic dysfunction
4. Concurrent use of beta-mimetics, transdermal nitrates or other antihypertensive medication

Based on available evidence nifedipine is superior to salbutamol as it is more tolerable and have a safer profile. The investigators found a reduced risk of delivery within 7 days and at less than 34 weeks' gestation. Cessation of treatment due to adverse reaction occurred in 1 of 419 patients, versus 29 of 414 with other tocolytics. The nifedipine-treated neonates also had decreased risk of respiratory distress syndrome, necrotizing enterocolitis, and intraventricular hemorrhage.

2.5.9.3 SALBUTAMOL SULFATE (VENTOLIN)

1. 1 ampule = 0.5 mg/1 ml
2. Dilute according to table below
3. Increasing at 15 minutes interval
4. Maximum 45 μg/min
5. Preferably to use infusion syringe pump instead of dropper to avoid volume overload.

Note: 1 ml = 20 drops, 1 dpm = 3 ml/hr

MATERNAL AND FETAL MONITORING:
1. Maternal pulse (every 15 minutes)
2. Blood pressure
3. RBS (6 hourly) or glucometer 4-6 hrly
4. BUSE (potassium levels-daily)
5. Auscultation of lungs field 4hrly
6. Maternal temperature 4hrly
7. Contraction / labour progress chart 1/2hrly
8. Continuous cardiac monitoring
9. FHR (not more than 180/minute)
10. Input/output charting

| Dosage in 45μg/min | Infusion syringe pump | Dropmat
| 5 mg (10 ampule) + 40 ml Dextrose 5% or Normal Saline | 5 mg + 500 ml Dextrose 5% or Normal Saline |
| ml/hr | dpm | ml/hr |
|---|---|---|---|---|
| 5 μg/min | 1dpm | 3ml/hr | 10dpm | 30ml/hr |
| 10 μg/min | 2dpm | 6ml/hr | 20dpm | 60ml/hr |
| 15 μg/min | 3dpm | 9ml/hr | 30dpm | 90ml/hr |
| 20 μg/min | 4dpm | 12ml/hr | 40dpm | 120ml/hr |
| 25 μg/min | 5dpm | 15ml/hr | 50dpm | 150ml/hr |
| 30 μg/min | 6dpm | 18ml/hr | 60dpm | 180ml/hr |
| 35 μg/min | 7dpm | 21ml/hr | 70dpm | 210ml/hr |
| 40 μg/min | 8dpm | 24ml/hr | 80dpm | 240ml/hr |
| 45 μg/min | 9dpm | 27ml/hr | 90dpm | 270ml/hr |

CESSATION OF TOCOLYSIS:
1. Symptoms of intolerance to (3-agonist tocolytic agents - palpitation, severe tremor, chest
pain, vomiting, severe headache and restlessness
1. Sign & symptom of pulmonary oedema
2. Maternal heart rate > 120 bpm
3. FHR>180bpm
4. Maternal DBF < 60mmHg

Maintain infusion to complete administration of antenatal steroid or to achieve in-utero transfer; before attempting to taper down the dose. Gradually wean every 30 minutes. Maximum duration of infusion: 24 hours

2.5.10 ANTEPARTUM HAEMORRHAGE

TWO GROUPS OF PATIENTS WILL BE SEEN IN THE LABOUR ROOM:
1. Direct admission (booked or unbooked)
2. Booked patient (in-patient, with placenta praevia)

RESUSCITATE PATIENT
Do a quick assessment of her vital signs first and if required resuscitate the patient (See below)

ASSESS PREGNANCY
1. Period of amenorrhoea
2. Uterine size & activity
3. Viability of fetus, lie and presentation
4. Placental localization if not previously done.
5. No digital examination till placenta praevia is ruled out by ultrasound scan
6. Further management after discussing with specialist
7. Proceed to perform digital examination after ruling out placenta praevia.

Causes of APH (bleeding > 22 weeks gestation)
1. Abruptio placenta
2. Placenta praevia
3. Indeterminate APH
4. Local causes
2.5.10.1 APH: ABRUPTIO PLACENTA

'THE PREMATURE SEPARATION OF A NORMALLY LOCATED PLACENTA FROM THE UTERUS PRIOR TO THE DELIVERY OF THE FETUS'

Principle of management
1. Assess maternal status:
   1.1 Evaluate amount of blood loss
   1.2 Coagulation status
2. Analgesia
3. Assess fetal status
   3.1 Gestational age
   3.2 Viability
   3.3 Lie / presentation
4. Plan for delivery

ASSESS PATIENT
1. Blood pressure
2. Pulse rate
3. Blood Loss (beware of concealed bleed)
4. Fetal condition
5. Check coagulation profile

INVESTIGATION
1. FBC
2. Coagulation profile
3. Renal profile
4. Group and cross match

RESUSCITATE PATIENT
1. Call for 'Red Alert Team' if necessary.
2. Site 2(two) large bore (14G/16G) intravenous access lines for fluid resuscitation.
3. Transfuse fresh blood/blood components.
4. Correct coagulopathy if any.
5. Oxygen therapy (5L/min through ventimask).
“The mother is the most precious possessions of the nation, so precious that society advances its highest well being when it protects the functions of the mother”

by Ellen Key