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Foreword

Protocols and guidelines have been shown to improve patient safety, communication, and outcomes. Thus, the Association of Obstetricians & Gynaecologists of Malawi sought to develop and formally adopt a comprehensive set of clinical protocols and guidelines, which was completed with the assistance of the Department of Obstetrics and Gynaecology at the University of Malawi College of Medicine. This booklet highlights common obstetric and gynaecologic conditions in Malawi and management that are pertinent to our setting. We believe the Obstetrics & Gynaecology Protocols and Guidelines will promote good medical decision-making, particularly for trainees, and advance standardized clinical practice throughout Malawi.

Dr. Frank Taulo  
President  
The Association of Obstetricians & Gynaecologists of Malawi

Dr. Ronald Mataya  
Head of Department  
Dept of Obstetrics & Gynaecology  
Queen Elizabeth Central Hospital  
Blantyre, Malawi

Dr. Grace Chiudzu  
Head of Department  
Dept of Obstetrics & Gynaecology  
Kamuzu Central Hospital  
Lilongwe, Malawi

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This endeavour was completed with assistance through the Medical Education Partnership Initiative (MEPI) Linked Award from the Fogarty International Center at the U.S. National Institutes of Health (NIH). Many of the Protocols and Guidelines were adapted with permission from Obstetrics & Gynaecology Protocols and Guidelines from the Department of Obstetrics & Gynaecology of the University Teaching Hospital (UTH) in Lusaka, Zambia, which were developed under the leadership of Dr. Bellington Vwalika (Head, UTH Department of Obstetrics & Gynaecology) and Dr. Benjamin Chi (Scientific Director, Centre for Infectious Disease Research in Zambia/University of North Carolina). In addition, appreciation is extended to the following individuals and institutions who participated in and/or supported the development of these protocols and guidelines:

- Dr. Phylos Bonongwe (Department of Obstetrics & Gynaecology, Queen Elizabeth Central Hospital)
- Dr. Francis Kamwendo (Department of Obstetrics & Gynaecology, Queen Elizabeth Central Hospital)
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- Dr. Jeffrey Wilkinson (Department of Obstetrics & Gynecology, University of North Carolina at Chapel Hill)
- Dr. Gregory Petro (Department of Obstetrics & Gynaecology, University of Cape Town)
- Dr. Susan Raine (Department of Obstetrics & Gynecology, Baylor College of Medicine)
- Loma Linda University
- U.S. Centers for Disease Control and Prevention, Malawi
- The Bill & Melinda Gates Foundation
- The Norwegian Government
How to Use the Protocols and Guidelines

The primary aim of the *Obstetrics & Gynaecology Protocols and Guidelines* is to improve the health of our women and their newborns by standardizing the clinical care they receive in Malawi. The development of these protocols and guidelines was the product of numerous hours dedicated by many Specialists from the Department of Obstetrics and Gynaecology at the Malawi College of Medicine, the Medical Education Partnership Initiative at the University of Zambia (Zambia), the Division of Global Women’s Health at the University of North Carolina at Chapel Hill (U.S.A.), the U.S. Peace Corps (U.S.A.), the University of St. Andrews (Scotland), and the University of Cape Town (South Africa). We expect no different for implementation of the same to be a success; many people will need to be involved.

The purpose of the protocols and guidelines is not to replace specialty textbooks or medical journals. They emphasize those clinical practices that are evidence-based and available in Malawi. Many of the protocols are based on the Fourth Edition of the *Malawi Standard Treatment Guidelines (MSTG)*, published by the Malawi Ministry of Health in 2009. Pocket-sized, this booklet is best used at the bedside, on hospital rounds, and in admission. We acknowledge that patients are individuals and do not always fit into premade boxes. Therefore, individual cases may require different approaches for management and complex decisions should always be discussed with a Consultant.

Topics are divided into four sections: 1) Early pregnancy complications, 2) Labour ward, 3) Medical conditions in pregnancy, and 4) Gynaecology. With regard to format, we hope the protocols and guidelines are self-explanatory. Each topic is divided into sections: Introduction, Definition, Diagnosis (History, Exam, Investigations), and Management.

We appreciate your support and usage of the *Obstetrics & Gynaecology Protocols and Guidelines* as we strive together to improve the health of our women and their newborns. Any feedback on how to improve this booklet is welcome and should be directed to the President of the Association of Obstetricians & Gynaecologists of Malawi.
### Abbreviation

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tr>
<td>+/-</td>
<td>with or without</td>
</tr>
<tr>
<td>↑ ↓</td>
<td>increased or high / decreased or low</td>
</tr>
<tr>
<td>~</td>
<td>approximately</td>
</tr>
<tr>
<td>˚</td>
<td>degree</td>
</tr>
<tr>
<td>&gt; ≥</td>
<td>greater than or equal to</td>
</tr>
<tr>
<td>&lt; ≤</td>
<td>less than or equal to</td>
</tr>
<tr>
<td>%</td>
<td>sat percent saturation</td>
</tr>
<tr>
<td>ABC</td>
<td>airway, breathing, circulation</td>
</tr>
<tr>
<td>AC</td>
<td>abdominal circumference</td>
</tr>
<tr>
<td>ACE</td>
<td>angiotensin-converting enzyme</td>
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<td>AMTSL</td>
<td>active management of third stage of labour</td>
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<tr>
<td>AFB</td>
<td>acid fast bacillus</td>
</tr>
<tr>
<td>AFI</td>
<td>amniotic fluid index</td>
</tr>
<tr>
<td>APH</td>
<td>antepartum haemorrhage</td>
</tr>
<tr>
<td>aPTT</td>
<td>activated partial thromboplastin time</td>
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<td>ALT</td>
<td>alanine transaminase</td>
</tr>
<tr>
<td>ART</td>
<td>antiretroviral therapy</td>
</tr>
<tr>
<td>AST</td>
<td>aspartate transaminase</td>
</tr>
<tr>
<td>βhCG</td>
<td>beta - human chorionic gonadotropin</td>
</tr>
<tr>
<td>BD</td>
<td>twice daily</td>
</tr>
<tr>
<td>BMI</td>
<td>body mass index</td>
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<tr>
<td>BP</td>
<td>blood pressure</td>
</tr>
<tr>
<td>BPD</td>
<td>biparietal diameter</td>
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<tr>
<td>bpm</td>
<td>beats per minute</td>
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<tr>
<td>BPP</td>
<td>biophysical profile</td>
</tr>
<tr>
<td>BS</td>
<td>blood sugar</td>
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<tr>
<td>BT</td>
<td>blood transfusion</td>
</tr>
<tr>
<td>BUN</td>
<td>blood urea nitrogen</td>
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<tr>
<td>c+s</td>
<td>culture and sensitivities</td>
</tr>
<tr>
<td>CCF</td>
<td>congestive cardiac failure</td>
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<tr>
<td>CD4+</td>
<td>cluster of differentiation antigen</td>
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<tr>
<td>cm</td>
<td>centimetre</td>
</tr>
<tr>
<td>CIN</td>
<td>cervical intraepithelial neoplasia</td>
</tr>
<tr>
<td>Cr</td>
<td>creatinine</td>
</tr>
<tr>
<td>CSF</td>
<td>central spinal fluid</td>
</tr>
<tr>
<td>CST</td>
<td>contraction stress test</td>
</tr>
<tr>
<td>CT</td>
<td>computerized tomography</td>
</tr>
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<td>chest x-ray</td>
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<tr>
<td>CV</td>
<td>cardiovascular</td>
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<td>D&amp;E</td>
<td>dilation and evacuation</td>
</tr>
<tr>
<td>DBP</td>
<td>diastolic blood pressure</td>
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<td>DHEA-S</td>
<td>dehydroisoandrosterone sulphate</td>
</tr>
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<td>DIC</td>
<td>disseminated intravascular coagulopathy</td>
</tr>
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<td>dL</td>
<td>decilitre</td>
</tr>
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<td>DNS</td>
<td>5% dextrose normal saline</td>
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<td>dpm</td>
<td>drops per minute</td>
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<td>deep vein thrombosis</td>
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<td>EBL</td>
<td>estimated blood loss</td>
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<td>ECG</td>
<td>electrocardiogram</td>
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<td>EDD</td>
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<tr>
<td>EFV</td>
<td>efavirenz</td>
</tr>
<tr>
<td>EFW</td>
<td>estimated fetal weight</td>
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<tr>
<td>EGA</td>
<td>estimated gestational age</td>
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<tr>
<td>EP</td>
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<tr>
<td>EUA</td>
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<td>FBC</td>
<td>full blood count</td>
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<td>FDP</td>
<td>fibrinogen degradation products</td>
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<td>FeSO₄</td>
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<td>FEV₁</td>
<td>forced expiratory volume in 1 second</td>
</tr>
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<td>FFP</td>
<td>fresh frozen plasma</td>
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<td>fundal height</td>
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<td>FLM</td>
<td>fetal lung maturity</td>
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<td>FSB</td>
<td>fresh stillbirth</td>
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<td>fT3</td>
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<td>fluorescent treponemal antibody</td>
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<td>free thyroxine index</td>
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<td>forced vital capacity</td>
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<td>Group B streptococcus</td>
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<td>GC</td>
<td>gonococcus (gonorrhoea)</td>
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<td>GCS</td>
<td>Glasgow coma scale</td>
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<td>hepatitis B immunoglobulin</td>
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<td>HBeAg</td>
<td>hepatitis B envelope antigen</td>
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<td>hepatitis B surface antigen</td>
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<tr>
<td>HC</td>
<td>head circumference</td>
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<tr>
<td>HC:AC</td>
<td>ratio of head circumference to abdominal circumference</td>
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<td>hCG</td>
<td>human chorionic gonadotropin</td>
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<td>HELLP</td>
<td>haemolysis, elevated liver function tests, low platelets</td>
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<td>mercury</td>
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<td>human immunodeficiency virus</td>
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<td>hour(s)</td>
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<td>hysterosalpingogram</td>
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<td>herpes simplex virus</td>
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<td>HVS</td>
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<td>intensive care unit</td>
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<td>IgG</td>
<td>immunoglobulin G</td>
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<td>Abbreviation</td>
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<td>RR</td>
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<td>SBP</td>
<td>systolic blood pressure</td>
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<tr>
<td>SC</td>
<td>subcutaneous</td>
</tr>
<tr>
<td>sec</td>
<td>second(s)</td>
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<tr>
<td>SL</td>
<td>sublingual</td>
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<tr>
<td>SOU</td>
<td>special observation unit</td>
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<tr>
<td>STAT</td>
<td>immediately (statim in Latin)</td>
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<td>STI</td>
<td>sexually transmitted infection</td>
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<tr>
<td>T</td>
<td>temperature</td>
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<td>TDF</td>
<td>tenofovir</td>
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<tr>
<td>TDF/FTC</td>
<td>Truvada</td>
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<td>TDS</td>
<td>three times daily</td>
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<tr>
<td>TIBC</td>
<td>total iron binding capacity</td>
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<td>TORCH</td>
<td>toxoplasmosis, other (syphilis, varicella zoster, parvovirus B19), rubella, cytomegalovirus, herpes</td>
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<td>TPHA</td>
<td>treponema pallidum hemaglutination assay</td>
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<td>TPI</td>
<td>treponema pallidum immobilization</td>
</tr>
<tr>
<td>TPR</td>
<td>temperature, pulse, respiratory rate</td>
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<td>TSH</td>
<td>thyroid stimulating hormone</td>
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<td>TVS</td>
<td>transvaginal scan</td>
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<td>transvaginal ultrasound</td>
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<tr>
<td>U</td>
<td>units</td>
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<td>U&amp;Es</td>
<td>urea and electrolytes</td>
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<td>unfractionated heparin</td>
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<td>μmol</td>
<td>micromole(s)</td>
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<td>urine output</td>
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<td>urine pregnancy test</td>
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<td>ultrasound</td>
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<td>UTI</td>
<td>urinary tract infection</td>
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<td>VDRL</td>
<td>Venereal Disease Research Laboratory</td>
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<td>VE</td>
<td>vaginal exam</td>
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<td>VIA</td>
<td>visual inspection with acetic acid</td>
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<td>VS</td>
<td>vital signs</td>
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<td>VTE</td>
<td>venous thromboembolism</td>
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<td>VVF</td>
<td>vesicovaginal fistula</td>
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<td>VZV</td>
<td>varicella zoster virus</td>
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<td>VZIG</td>
<td>varicella zoster immunoglobulin</td>
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<td>X-match</td>
<td>cross match</td>
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<td>WB</td>
<td>whole blood</td>
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<td>WBC</td>
<td>white blood cell</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WR</td>
<td>Wassermann reaction</td>
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<td>wk(s)</td>
<td>week(s)</td>
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<td>yo</td>
<td>year old</td>
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EARLY PREGNANCY COMPLICATIONS
PREVENTION AND MANAGEMENT OF ALLOIMMUNISATION

Introduction/Definition
The fetus may have red blood cell antigens (i.e. ABO, Rhesus, Kell, Kid, Duffy) that the mother does not. When ≥ 0.1 ml of fetal blood enters the maternal circulation, the maternal immune system is more likely to form antibodies against the foreign antigen. This is known as alloimmunisation and can occur in pregnancy > 7 wks gestation (including induced abortion and ectopic pregnancy), chorionic villus sampling, cordocentesis, amniocentesis, APH, external cephalic version, abdominal trauma and delivery. The initial pregnancy is generally unaffected. However, maternal antibodies cross the placenta and form antigen-antibody complexes in subsequent pregnancies. Manifestations of alloimmunisation include hydrops fetalis, icterus gravis neonatorum and congenital anaemia.

Diagnosis
History  Ask about gravidity, parity, previous abortions and/or miscarriages, history of transfusions and blood group of pregnant woman and her partner
Exam/Investigations  Send blood for Hb, blood group, Coombs test, syphilis test and HIV; ultrasound (US) for dating, serial US to diagnose and/or monitor

Preventive Management
Prevention of Rh alloimmunisation
- Give Rh immunoglobulin immediately after a sensitizing event (give 50 μg in the first trimester)
- Give Rh immunoglobulin 300 μg (1500 IU) at 28 wks gestation
- And/or
- Give Rh immunoglobulin 300 μg (1500 IU) within 72 hrs of delivery if infant is Rh positive; can be given up to one month after delivery if not given on time

Minimization of fetomaternal haemorrhage
- Pack abdomen during caesarean delivery to prevent spilling of blood into peritoneum
- Avoid manual removal of placenta
- Immediate clamping of cord and keep cord of fetus long (for possible transfusion)

Management
Treatment for sensitized maternal patient (positive Coombs test in Rh negative woman; clinically affected pregnancy)
- Conservative management: perform US for fetal weight and to look for features of hydrops fetalis (i.e. edema or accumulation of fluid in fetal compartments); if features of hydrops fetalis are present, then deliver.
- If available, perform US for middle cerebral artery Doppler to assess for fetal anemia.
- Perform caesarean delivery for severely affected and/or preterm fetus. If < 34 weeks EGA, give antenatal corticosteroids (i.e. dexamethasone) prior to delivery if possible.
  - Transfuse newborn with Hb ≤ 12 g/dL and/or positive direct Coombs and/or bilirubin ≥ 5 mg
Blood group in all pregnant women

Rhesus negative  Rhesus positive

Coombs test

Unsensitised
- Give Rh immunoglobulin 300 µg (1500 IU) at 28 wks gestation
- Give Rh immunoglobulin 300 µg (1500 IU) within 72 hrs of delivery

Sensitised
- Antibody titre during ANC
- US for fetal weight and to look for hydrops fetalis
- Caesarean delivery for severely affected and/or preterm fetus
CERVICAL INCOMPETANCE

Introduction/Definition
Cervical incompetence is a clinical diagnosis characterized by painless cervical dilatation and spontaneous mid trimester pregnancy loss.

Diagnosis
History
- Prior history of recurrent mid trimester pregnancy losses, D&E in second trimester, cervical surgery (i.e. cone biopsy, cauterization, amputation) or cervical cerclage
- Current history of vaginal fullness or pressure, vaginal spotting, increased volume of brown watery discharge and vague low back/abdominal pains

Exam/Investigations
- Transvaginal ultrasound (TVUS) showing open internal os (i.e. funneling) or cervical length < 25 mm
- Index pregnancy: sterile speculum exam to assess for vaginitis, dilatation of cervix and bulging membranes and to exclude rupture of membranes

Management
Women with suspected cervical incompetence need to be thoroughly evaluated in the first trimester. Conservative management is always an option, while surgical intervention is done by cerclage (elective or emergency). A cerclage is ideally placed at 14-16 wks, but can be done up to 24 wks. See table for the types of cerclage.

Pre-operative assessment
- Ultrasound (US): confirm pregnancy viability and gestational age (GA), exclude major fetal anomalies, assess for uterine anomalies (i.e. bicornuate uterus, leiomyomatas)
- Speculum exam to assess for abnormal vaginal discharge and infection (gonorrhea and Chlamydia), treat any infection and advise the patient to abstain from intercourse for one week while her partner is treated
- Review risks with patient: PROM, chorioamnionitis, fibrous scarring of cervix

<table>
<thead>
<tr>
<th>Gestational age</th>
<th>14 wks</th>
<th>28 wks</th>
<th>37 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirm viability and no fetal anomalies by US</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimal timing for cervical cerclage placement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish history of cervical incompetence as early as possible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove cerclage; await spontaneous labour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td>McDonald cerclage</td>
<td>Shirodkar cerclage</td>
<td>Abdominal cerclage</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
<td>--------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Details</td>
<td>Commonly performed and usually recommended</td>
<td>Reserved for very short cervix</td>
<td>Reserved for women with hypoplastic cervix and where vaginal procedure is not feasible</td>
</tr>
<tr>
<td>Technique</td>
<td>Place circumferential purse-string suture around the cervix at the vesicocervical junction in 4 separate suture bites</td>
<td>Similar to McDonald but suture is submucosal</td>
<td>Requires a lot of expertise</td>
</tr>
<tr>
<td></td>
<td>Use non-absorbable sutures (i.e. mersilene, nylon, and prolene)</td>
<td>Expect more blood loss</td>
<td>Risk of excessive haemorrhage from branches of uterine artery</td>
</tr>
<tr>
<td></td>
<td>Tie knot anteriorly or posteriorly; document location</td>
<td>Use mersilene tape</td>
<td>Laparotomy for access</td>
</tr>
<tr>
<td></td>
<td>Avoid vessels at 3 and 9 o’clock</td>
<td>Make 2-3 cm anterior transverse submucosal incision at the vesicocervical junction</td>
<td>Done at 13-15 wks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reflect bladder superiorly by 1-2 cm; make similar incision posteriorly and do rectal dissection superiorly</td>
<td>Dissect bladder inferiorly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Place suture anterior to posterior or vice versa</td>
<td>Place mersilene tape through the tissues of the lateral cervix at the internal os</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Close mucosa</td>
<td>Caesarean delivery is required</td>
</tr>
</tbody>
</table>

**Post-operative management**
- Immediate post-operative care includes
  - Analgesia
  - Antibiotics: Erythromycin 500 mg QID x 5 days and Flagyl 400 mg TDS x 5 days
  - Indomethacin
- Routine ANC unless otherwise indicated with repeated counseling regarding infection, labour, PROM
- If no antenatal problems, then remove cerclage as outpatient procedure at 36 completed wks
- If labour, severe or persistent APH, ROM or chorioamnionitis, then remove cerclage immediately
**ECTOPIC PREGNANCY**

**Introduction/Definition**
Ectopic pregnancy is a pregnancy that occurs outside of the uterus. The most common location is the fallopian tube.

**Diagnosis**
*History* Classic triad of abdominal pain, amenorrhea and vaginal bleeding
*Exam +/- Tenderness, +/- adnexal mass, +/- shock if ruptured*
*Investigations* Urine pregnancy test, US (transvaginal is preferred), send blood for X-match

**Management**
- Obtain IV access with 2 large-bore cannulae (i.e., 16G or 18G).
- If shock, then resuscitate with IV fluids and/or BT while organizing emergency laparotomy.
- If not in shock and:
  - If ruptured, then perform emergency laparotomy with possible blood transfusion.
  - If not ruptured, then consider urgent laparoscopy or laparotomy.
    - If conservative management is desired, monitor as inpatient with serial abdominal exams and repeat ultrasound in 2 days if surgery not yet performed.

**Follow up:** Counsel patient about family planning options and risk of future ectopic pregnancy prior to discharge.
GESTATIONAL TROPHOBLASTIC DISEASE

Introduction/Definition
Gestational trophoblastic disease (GTD) includes hydatidiform mole (complete or partial), persistent or invasive gestational trophoblastic neoplasia, choriocarcinoma, and placental site tumours. Following molar pregnancy, the following characteristics are high risk for choriocarcinoma: age < 20 or > 40 years old, high initial hCG, persistent high hCG after 6 wks, and plateau/rise in hCG during follow up.

Diagnosis
History/Exam/Investigations Send blood for group and cross and FBC, "snowstorm" on ultrasound (US), order chest x-ray, obtain vital signs and ask patient questions related to thyroid function to rule out thyroid storm.

Management
- If asymptomatic, then schedule D&E under anesthesia with oxytocin infusion and misoprostol ready due to high risk of haemorrhage.
- If actively aborting, send patient to theatre immediately and do D&E, with oxytocin and misoprostol ready.
- Give Antibiotics (Doxycycline 100 mg BD x 3 days or Metronidazole 400 mg BD x 5 days) for prophylaxis
- If at high risk for choriocarcinoma, consult medical oncology

Follow up of molar pregnancy
- Follow up all cases for 2 years
  - Monthly follow up until urine pregnancy test is negative
  - Then follow up every 3 months in 1st year and every 6 months in 2nd year
  - Conduct speculum exam of vagina and suburethral area for metastases
  - Conduct bimanual pelvic exam
- Send urine for serial pregnancy tests (should disappear by 6 wks post D&E)
- If pregnancy test remains positive at 3 months
  - Order US to monitor ovarian cyst and residual/invasive mole
  - CXR for metastasis
- Prescribe family planning, i.e. implants, depo-provera injections, combined oral contraceptives and condoms
- In subsequent pregnancy, counsel the patient on importance of early antenatal care, order early US to look for recurrent mole

Management of choriocarcinoma
- Chemotherapy is first choice, especially in women who want to bear children (family planning for at least one year post chemotherapy). Refer to medical oncology
- If older and multiparous woman, placental site choriocarcinoma, uterine perforation or failed chemotherapy, then refer to medical oncology and perform hysterectomy.
  - Preoperative chemotherapy for 5 days prevents dissemination
  - Postoperative chemotherapy treats residual and disseminated tissue
LABOUR WARD
ANTEPARTUM HAEMORRHAGE

Introduction/Definition
APH refers to vaginal bleeding that occurs at ≥ 28 wks gestation at any time prior to delivery.

Management (initial actions)
- Immediately call for help, urgently mobilize available staff and initiate resuscitation
  - Evaluate patient’s general condition quickly, including vital signs (VS)
  - Obtain IV access with 2 large-bore cannulae (i.e. 16G)
  - Place foley catheter to monitor In’s and Out’s
  - Maintain SBP > 100 mm Hg and urine output (UOP) > 30 ml/hr (give minimum of 0.9% NS 1 L rapid infusion while awaiting blood products)
  - Send blood for FBC, U&Es, Cr, clotting time and X-match
  - If heavy bleeding, order at least 2 units each of PRBC, FFP and platelets or 2 units of whole blood.
- No vaginal examination until placenta praevia is excluded.
- Ultrasound to rule out placenta praevia and placental abruption (i.e. retroplacental clot) and to assess fetal condition.
- Further management depends on the aetiology of APH

<table>
<thead>
<tr>
<th>Grading of Placental Abruption</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADE</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>0</td>
<td>Asymptomatic patient with a small retroplacental clot</td>
</tr>
</tbody>
</table>
| 1  | Vaginal bleeding; +/- uterine tetany and tenderness
  |  - no signs of maternal shock |
  |  - no fetal distress |
| 2  | External vaginal bleeding possible
  |  - no signs of maternal shock |
  |  + signs of fetal distress |
| 3  | External bleeding possible; marked uterine tetany and persistent abdominal pain
  |  + maternal shock |
  |  + fetal demise |
  |  coagulopathy may be present |

<table>
<thead>
<tr>
<th>Grading of Placenta Praevia</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADE</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>I</td>
<td>Low-lying placenta. Placenta lies in the lower uterine segment but its lower edge does not reach the internal os.</td>
</tr>
<tr>
<td>II</td>
<td>Marginal praevia. Placental tissue reaches the margin of the internal cervical os but does not cover it.</td>
</tr>
<tr>
<td>III</td>
<td>Partial praevia. Placenta partially covers the internal cervical os.</td>
</tr>
<tr>
<td>IV</td>
<td>Complete praevia. Placenta completely covers internal cervical os.</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>History/Exam</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Abruptio placenta</td>
<td>• Shock&lt;br&gt;• Tense/tender uterus&lt;br&gt;• Decreased/absent fetal movements&lt;br&gt;• Fetal distress or absent fetal heart sounds</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>• Shock&lt;br&gt;• Abdominal pain or free fluid&lt;br&gt;• Abnormal contour&lt;br&gt;• Tender abdomen&lt;br&gt;• Easily palpable fetal parts&lt;br&gt;• Absent fetal movements&lt;br&gt;• Absent fetal heart sounds</td>
</tr>
<tr>
<td>Placenta praevia</td>
<td>• +/− Shock&lt;br&gt;• Painless PVB&lt;br&gt;• Relaxed uterus&lt;br&gt;• Abnormal lie or high presenting part&lt;br&gt;• Fetal heart sounds usually present</td>
</tr>
</tbody>
</table>
AUGMENTATION OF LABOUR

Introduction/ Definition
Augmentation of labour is accomplished with a variety of interventions that accelerate labour. Indications include prolonged labour and arrest disorders. Contraindications include:

- Abnormal lie and presentation (see Malpresentation)
- Obstructed labour
- Features suggestive of a compromised baby (i.e. fetal distress, IUGR, unexplained oligohydramnios)
- Placenta praevia
- Limb deformities with contracted pelvis
- Previous VVF repair
- Previous cesarean section
- Previous transfundal uterine surgery

Diagnosis

History/Exam/Investigations  Protraction or arrest disorders should be well documented on the partograph and/or in the notes prior to labour augmentation

Management

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Management*</th>
</tr>
</thead>
<tbody>
<tr>
<td>No previous uterine surgery</td>
<td>• Amniotomy</td>
</tr>
<tr>
<td>Nulliparous or Multiparous (P4 and below)</td>
<td>• Oxytocin</td>
</tr>
<tr>
<td></td>
<td>o Oxytocin 2.5 IU or 5 IU in 1 L NS or RL, starting at 15 dpm and titrating up by 15 dpm every 30 minutes until 3 strong contractions every 10 minutes, to maximum dose of 60 dpm</td>
</tr>
<tr>
<td></td>
<td>o Monitor woman and fetus closely</td>
</tr>
<tr>
<td>Grandmultiparous (P5 and above)</td>
<td>• Amniotomy</td>
</tr>
<tr>
<td></td>
<td>• Oxytocin only if Consultant agrees</td>
</tr>
<tr>
<td>HIV-infected</td>
<td>• No difference in management of augmentation if obstetrically indicated</td>
</tr>
<tr>
<td></td>
<td>• Delay amniotomy</td>
</tr>
</tbody>
</table>

*Use oxytocin with caution due to risk of uterine rupture; see Oxytocin Infusion Rate

Reassess the cervical dilation after 4 hrs of at least 3 strong contractions every 10 minutes to see if labour has progressed satisfactorily. If labour has not progressed, then caesarean delivery. Consider continuing oxytocin while awaiting OT if there are no signs of fetal distress.
BREECH PRESENTATION AND DELIVERY

Introduction/Definition
The fetus that presents in (complete or frank) breech presentation may be delivered vaginally if investigated and/or conditions are favourable.

Diagnosis
History Check for a possible cause of the breech presentation, i.e. placenta praevia, congenital fetal abnormalities, uterine masses and intrauterine abnormalities
Exam Ballotable mass consistent with fetal head in the fundus, broad irregular mass in the lower pole
Investigations Confirm breech presentation and rule out fetal abnormalities with US at ≥ 36 wks gestation and prior to caesarean delivery

Management
- After discussion with consultant and patient, can attempt external cephalic version at ≥ 36 wks gestation if there are no contraindications to vaginal delivery and emergency caesarean section is possible.
- Counsel (with patient and senior colleagues) on mode of delivery (vaginal breech delivery vs. caesarean section. Recommend caesarean section especially if:
  - Large baby with EFW ≥ 3.5 kg
  - BPD > 9.5 cm
  - Footling breech
  - Extended head
  - Clinically small pelvis
  - Nulliparous (primigravida)
  - Concomitant soft indications for caesarean delivery (i.e. preeclampsia)
- Book caesarean section for 39 – 40 weeks EGA
- If assisted breech vaginal delivery to be attempted, then steps include:
  - First stage – preferably spontaneous onset and progress of labour
    - Open partograph
    - IV access
    - Hb, group and save
    - Consider caesarean delivery for any delay in labour
  - Second stage
    - Delivery to be conducted by the most experienced person (i.e. registrar or senior midwife)
    - Consider episiotomy
    - Lovset manoeuvre (if necessary) for extended arms
    - Delivery of the after-coming head by any of the following methods:
      - Mauriceau-Smellie-Veit manoeuvre: the middle finger of one hand is placed in the mouth, and the second and fourth fingers are placed on the malar eminences to promote flexion and descent while counter-pressure is applied to the occiput with the middle finger of the other hand
      - Piper's forceps: fully dilated cervix, ruptured membranes, +/- episiotomy, empty bladder, adequate analgesia and adequate contractions. There should be no concern for cephalopelvic disproportion.
Delivery of the lower limbs

After spontaneous expulsion to the scalpulae, external rotation of each thigh (A) combined with opposite rotation of the fetal pelvis results in flexion of the knees and delivery of each leg (B).


Reference: UpToDate, date of access, need permission
CAESAREAN DELIVERY

Introduction/Definition
Caesarean delivery is delivery of the infant through a uterine incision. Indications include: obstructed labour, cephalopelvic disproportion, abnormal lie, malposition and malpresentation, placenta praevia, fetal distress, cord prolapse with pulsating cord, abruptio placenta with fetal distress, previous myomectomy, two or more previous caesarean deliveries, high HIV viral load (> 1000 copies), extensive vulvovaginal warts, active HSV and cervical dystocia.

Diagnosis
History/Exam/Investigations Indication for caesarean delivery should be clearly documented in the file

Management

Pre-operative care
- Elective caesarean deliveries should be done during the weekday whenever possible
- Informed consent must be signed by patient
- IV access
- Send blood for Hb, group and save and X-match if indicated (i.e. previous scar, APH)
- Catheterize patient
- Medications:
  - Prophylactic antibiotics 30-60 minutes prior to skin incision. Options include:
    - Cefazolin 1-2 g IV x 1
    - Ampicillin 2 g IV x 1
    - X-Penicillin IV 3 million units x 1

Procedure
- Transverse skin incision (i.e. Cohen, Pfannenstiel) preferred
- Low transverse incision (i.e. Kerr) preferred for uterine incision
  - Classical incision (vertical uterine incision in the upper segment even up to fundus) indicated for poorly formed lower segment (i.e. extreme prematurity), transverse lie with fetal back down, anterior classical incision, conjoined twins, inaccessible lower segment (i.e. dense adhesions, large leiomyoma) or cancer of cervix

Post-operative care
- Monitor vitals (BP, TPR) and check for bleeding every 30 min for 2 hrs, every 1 hr for 4 hrs, then every 4-6 hrs until discharge. See Perioperative Management and other recovery room protocols.
- First 24 hrs post caesarean delivery
  - Adequate IV fluids: [5% dextrose 1 L + RL 1 L + NS 1 L] or [NS 2 L + RL 1L] over 24 hrs
  - Adequate analgesia: pethidine 50-100 mg IM every 6 hrs for 4 doses; diclofenac 100 mg PR BD, Paracetamol 1000 mg every 6 hours PO
  - Early ambulation
  - Consider thromboprophylaxis if at high risk for DVT
  - If catheterized, then remove catheter within 24 hrs unless otherwise indicated
- Diet
  - Fluids PO when fully awake
  - Normal diet after 24 hrs or when fully recovered from regional anaesthesia
- Continue antibiotics:
  - If preoperative antibiotics were not given, or patient had chorioamnionitis, contaminated cesarean section, immunocompromised state, prolonged or obstructed labor, or prolonged ROM (>18 hours)
    - First 24 hrs: Ceftriaxone 1 gram IV OD or Gentamicin 240 mg IV/IM x 1; plus Flagyl 400 mg TDS PO
    - Following 4 days: Amoxicillin 500 mg TDS PO, plus Flagyl 400 mg TDS PO
- Post-op day 3: consider discharge if in stable condition and ambulatory
- Permanent suture removal: transverse skin incision on post-op day 5 or midline skin incision on post-op day 7
DISSEMINATED INTRAVASCULAR COAGULOPATHY (DIC)

Introduction/Definition
Disseminated intravascular coagulopathy (DIC) is a bleeding and clotting disorder, secondary to underlying systemic process resulting in thrombin or plasmin dominance.

Diagnosis
History/Exam Evaluate for active vaginal bleeding (blood appears thin, without clots), GI bleeding, epistaxis, oozing from puncture and surgical wounds, purpura, oliguria, pulmonary oedema, reduced consciousness.

Investigations Check FBC (Hb, Platelets), clotting time (in red top tube blood should clot within 8 minutes), PT/PTT/fibrinogen (if available), abdominal ultrasound to evaluate for intraabdominal/pelvic bleeding

Management
Initial management
- Admit to HDU or ICU
- CAB (Circulation, Airway, Breathing), Oxygen
- Place 2 large bore (16 or 18 gauge) IV lines
- Place urinary catheter and monitor urine output every hour
- Contact blood bank immediately for blood products
  - Give 2-6 units of whole blood if different components not available
  - If components available, give 2-6 units PRBCs first to improve oxygenation
  - Give 2-6 units FFP at 1:1 ratio with PRBCs
  - Give platelets at 1-2 units/10 kg of actual body weight
  - Give Cryoprecipitate at 10-20 ml/kg (4-6 units total) if FFP not available
- Initiate volume resuscitation immediately with 2L NS or RL until blood products arrive
- Evaluate and treat cause of bleeding
  - If postpartum think of the “4 Ts” (Tone, Trauma, Tissue, Thrombin):
    - Uterine Atony: Oxytocin 40 IU IV, Misoprostol 800-1,000 mcg PR, uterine massage, bimanual compression, intruterine balloon, laparotomy (B-lynch, O’Leary’s, TAH)
    - Cervical/vaginal tears: Exam Under Anesthesia in theatre and repair
    - Retained Tissue: manual removal of the placenta, evacuation with placental forceps
    - Thrombin disorder (DIC): give FFP as noted above
  - Other causes: macerated stillbirth, infection/sepsis
- Consider heparin if thrombosis is dominant
**ECLAMPSIA**

**Introduction/Definition**
Eclampsia is a disease characterized by tonic clonic seizures, attributable to no other aetiology, that occur during the antenatal, intrapartum or postnatal period.

**Diagnosis**
*History/Exam* Generalized tonic-clonic convulsions (observed or by history) +/- ↑BP
*Investigations* Check urine for proteinuria, send blood for FBC, Cr and LFT

**Management**

*Initial management*
- Check airway, breathing, circulation (ABC). Correct hypoxia.
- Protect patient from injury (left lateral position in bed with rails or on floor)
- Admit to LW or HDU
- Control BP: hydralazine 10 mg IV every hour until BP < 160/110 mmHg
- Prevent more seizures: MgSO\(_4\) 4 g (20 ml of 20% solution) IV over 5-20 min AND 5 g (10 ml of 50% solution) IM in each buttock with 1 ml of 2% lignocaine loading dose in same syringe. If no IV, then IM only. If convulsions recur, then give another MgSO\(_4\) 2 g (10 ml of 20% solution) IV over 5-20 min. If seizures continue, consider giving diazepam IM injection.
- Assess for mode of delivery (assisted vaginal delivery or caesarean delivery)

*Labour & delivery, postnatal management*
- Maintain airway, stop seizures, inform senior obstetrician and anaesthetist and exclude other causes
- Monitor BP, PR, RR, urine output (UOP), deep tendon reflexes and level of consciousness
  - If UOP < 30 ml/hr, then withhold MgSO\(_4\)
  - If absent knee jerk reflex or RR < 16/min, then magnesium toxicity; give calcium gluconate 10% IV 1 g/10 min
- Give IV fluids cautiously: NS ≤ 1.5-2 L over 24 hrs or ≤ 80 mL/hr
- MgSO\(_4\) 5 g (with 1 ml of 2% lignocaine) IM every 4 hours in alternate buttock for 24 hrs after last seizure or delivery, whichever is later
  - If seizures still recur, then
    - Call for help, senior obstetrician, senior anaesthetist and experienced midwives
    - Repeat MgSO\(_4\) load; give diazepam or thiopental x 1 if persistent
    - Intubate to maintain airway and ventilate
- Once seizures are controlled, start delivery process
  - For vaginal delivery, assist with second stage (i.e. vacuum or forceps)
- Control BP (goal BP < 160/110):
  - Hydralazine IV and/or nifedipine PO
    - Starting dose of nifedipine 10 mg TDS; max 40 mg TDS
  - Postnatal: continue nifedipine, add HCTZ and propranolol if needed.
**FETAL SURVEILLANCE**

**Introduction/Definition**
Fetal surveillance aims to evaluate fetal well-being. During antenatal care, the fetal heart is assessed using a fetoscope (≥ 20 wks gestation) or Doppler (≥ 12 wks gestation). For abnormalities or complicated pregnancies, use cardiotocogram (CTG), non stress test (NST) or biophysical profile (BPP).

**Diagnosis History/Exam/Investigations**

<table>
<thead>
<tr>
<th>Method</th>
<th>Procedure</th>
<th>Interpretation and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Stress Test (NST)</td>
<td>• Place CTG on abdomen for ≥ 20 min&lt;br&gt;• Observe up to 40 min if non-reactive (may be due to fetal sleep cycle or normal period of fetal inactivity)</td>
<td>• Reactive test has ≥ 2 accelerations (15 bpm above baseline x 15 sec) in 20 minutes with moderate variability and baseline range from 110 - 160 bpm&lt;br&gt;• Non-reactive test requires CST or BPP</td>
</tr>
<tr>
<td>Contraction Stress Test (CST)</td>
<td>• Adequate test if ≥ 3 contractions (each lasting 40-60 sec) in 10 min&lt;br&gt;• Patient can massage her nipple for 10 min with 5 min breaks or treat with oxytocin until adequate contractions</td>
<td>• Negative test has no decelerations with adequate contractions&lt;br&gt;• Positive test has late decelerations with &gt; 50% of adequate contractions&lt;br&gt;• Suspicious test has inconsistent late decelerations&lt;br&gt;• Unsatisfactory test does not have adequate contractions</td>
</tr>
<tr>
<td>Biophysical Profile (BPP)</td>
<td>Use NST and real-time US for:&lt;br&gt;• Fetal breathing (1 breathing cycle ≥ 30 sec during 30 min period)&lt;br&gt;• Gross body movements (3 discrete body or limb movements)&lt;br&gt;• Fetal tone (1 episode of extension or flexion of limbs or trunk, or opening or closing of hand)&lt;br&gt;• Amniotic fluid volume (1 pocket ≥ 2 cm in 2 perpendicular planes)</td>
<td>• Assign 2 points if present and 0 points if absent for US components&lt;br&gt;• Assign 2 points if reactive NST and 0 points if non-reactive NST&lt;br&gt;• Score ≤ 6 (out of 10) is suspicious for fetal hypoxemia&lt;br&gt;• Normal if AFI &gt; 5 cm and reactive NST</td>
</tr>
<tr>
<td>Modified BPP</td>
<td>• Amniotic fluid index (AFI) with NST</td>
<td>• Normal if AFI &gt; 5 cm and reactive NST</td>
</tr>
<tr>
<td>Method</td>
<td>Procedure</td>
<td>Interpretation and Management</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Intrapartum fetal heart monitoring | • Evaluate fetal heart rate for ≥ 1 min for all women in admission with fetoscope or Doppler  
• Evaluate fetal heart rate before, during, and after a contraction every 30 min of active phase of labour  
• Record fetal heart rate in active phase on partograph | • Normal includes fetal heart rate that increases or decreases with contraction but recovers to baseline after contraction  
• Abnormal includes bradycardia, tachycardia, and decelerations in the absence of a contraction or persisting after a contraction  
  o Evaluate for maternal fever, hypotension, and medications  
  o Evaluate for placental abruption and chorioamnionitis  
• Requires CTG |
| Cardiotocogram (CTG)          | • Place fetal heart monitor on abdomen so that heart beat is detected easily  
• Place monitor for detection of contractions at top of the fundus | • Normal includes  
  o Baseline rate of 110-160 bpm with variability of 5-25 bpm  
  o Accelerations  
  o Early decelerations (often due to fetal head compression)  
• Abnormal includes  
  o Late decelerations (suspicious for fetal hypoxia and acidosis due to placental insufficiency)  
  o Sinusoidal if fetal anaemia  
  o Variable decelerations (often due to cord compression and may not require intervention)  
• Management of abnormal CTG  
  o Evaluate for possible aetiology  
  o Place woman in left lateral position  
  o Stop oxytocin if applicable  
  o Treat with tocolytic (i.e. nifedipine) if hyperstimulation (> 5 contractions in 10 min)  
  o Treat with NS 500 ml IV bolus if hypotension  
  o Treat with oxygen by mask if available  
  o Elevate the presenting part if cord prolapse  
• Consider Caesarean or operative vaginal delivery |
HYPERTENSIVE DISORDERS IN PREGNANCY

Introduction
Hypertensive disorders in pregnancy are associated with increased perinatal morbidity and mortality (i.e. IUFD, IUGR, preterm delivery (PTD)). Take BP with an appropriately sized cuff size (falsely ↑BP if small cuff) when the woman is at rest. Urinalysis is critical to distinguish the specific disease. Perform an early US for dating because management sometimes depends on GA.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Definition/Diagnosis</th>
<th>History/Exam/Investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic hypertension (HTN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• HTN before pregnancy; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• BP ≥ 140/90 mm Hg at ≤ 20 wks gestation; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Persistence of BP ≥ 140/90 after 12 wks postnatal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Baseline proteinuria may or may not exist</td>
<td></td>
</tr>
<tr>
<td>Gestational HTN (previously known as PIH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• BP ≥ 140/90 mm Hg at ≥ 20 wks gestation; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• HTN resolves by 12 wks postnatal; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No proteinuria</td>
<td></td>
</tr>
<tr>
<td>Mild preeclampsia</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• BP 140-159/90-109 mm Hg at &gt; 20 wks gestation on two or more occasions 6 hours apart; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• HTN resolves by 12 wks postnatal; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Proteinuria (300 mg/L or 1+ on dipstick)</td>
<td></td>
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<tr>
<td>Severe preeclampsia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• BP ≥ 160/110 mm Hg at &gt; 20 wks gestation* on two or more occasions 6 hours apart; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• HTN resolves by 12 wks postnatal; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With proteinuria: 5 g/L or ≥ 3+ on dipstick;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Other diagnostic signs of severe preeclampsia include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Severe headache</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Visual disturbance (i.e. scotomata, blurriness)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Epigastric and/or right upper quadrant pain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Vomiting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Liver tenderness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Low platelets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Abnormal LFT’s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o HELLP syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Intrauterine growth restriction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*18 wks gestation in multiple gestation or molar pregnancy</td>
<td></td>
</tr>
<tr>
<td>Eclampsia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tonic-clonic seizures that cannot be attributed to any other causes and no past history of seizure disorder</td>
<td></td>
</tr>
<tr>
<td>Other hypertensive disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Include stroke, malignant HTN, aneurysm, coarctation of the aorta, renal artery stenosis, renal disease, hyperthyroidism and adrenal disorders</td>
<td></td>
</tr>
</tbody>
</table>
### Management

#### Antenatal care:
- Stop contraindicated antihypertensive medications (i.e. diuretics, ACE inhibitor)
- Order US for major fetal anomalies
- Involve physicians for secondary causes
- Baseline labs: send blood for LFT, Cr and FBC; 24 hr urine protein collection
- Consider fundoscopic or eye exam, ECG

#### Antenatal care visits:
- Every 2 wks until 28 wks gestation and weekly thereafter
- Weekly until delivered
- Send urinalysis and blood for LFT, Cr and FBC at every visit for possible progression to severe disease
- Check BP and urinalysis daily for possible severe preeclampsia

#### Involve senior doctors in OB, anaesthesiology +/- internal medicine, as well as experienced midwives

#### Admit to LW or HDU

#### Stabilize patient (intubate and ventilate if needed)

#### Treat with antihypertensive medications:
- Hydralazine 5-10 mg IV every 15 min until BP < 160/110; repeat hourly as needed
- Nifedipine 10 mg SL if persistent BP ≥ 160/110 mm Hg (despite hydralazine)
- Methyldopa and/or nifedipine PO for maintenance (goal DBP 90)
- Postnatal: treat with nifedipine, HCTZ and/or propanolol PO if BP ≥ 160/110

#### Treat with MgSO₄ until 24 hrs after delivery or last seizure, whichever is longer
- Repeat loading dose for persistent or recurrent seizure; give diazepam or thiopental x1 if needed
- Monitor RR, DTRs and O₂ sat
- Monitor UOP (stop MgSO₄ if < 30 ml/hr)
- Calcium gluconate 1 g over 10 min if loss of DTRs or ↓ RR
- Diazepam or thiopental for refractory seizures

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<table>
<thead>
<tr>
<th>Management</th>
<th>Chronic HTN</th>
<th>Gestational HTN</th>
<th>Mild preeclampsia</th>
<th>Severe preeclampsia</th>
<th>Eclampsia</th>
<th>Other HTN disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal care:</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>Antenatal care visits: every 2 wks until 28 wks gestation and weekly thereafter</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>Antenatal care visits: weekly until delivered</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Send urinalysis and blood for LFT, Cr and FBC at every visit for possible progression to severe disease</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Check BP and urinalysis daily for possible severe preeclampsia</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Involve senior doctors in OB, anaesthesiology +/- internal medicine, as well as experienced midwives</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>Admit to LW or HDU</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stabilize patient (intubate and ventilate if needed)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Treat with antihypertensive medications</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Treat with MgSO₄ until 24 hrs after delivery or last seizure, whichever is longer</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Management</td>
<td>Chronic HTN</td>
<td>Gestational HTN</td>
<td>Mild preeclampsia</td>
<td>Severe preeclampsia</td>
<td>Eclampsia</td>
<td>Other HTN disorders</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Send blood for LFT, Cr and FBC</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Restrict fluid intake to 80 ml/hr or 1 ml/kg/hr</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Treat with furosemide for pulmonary oedema</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Deliver at 39 wks gestation if stable BPs and asymptomatic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Induce labour if no contraindications to vaginal delivery</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Deliver at 37 wks gestation if stable BPs and asymptomatic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Induce labour if no contraindications to vaginal delivery</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Delivery is treatment irrespective of GA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Induce/augment labour if ≥ 34 wks gestation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Steroids and deliver after 48 hrs if &lt; 34 wks gestation and stable</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Discuss delivery plan with consultant</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Induce labour for 12 - 24 hours if reassuring fetal status (i.e. no</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>oligohydramnios or IUGR and normal NST/CTG)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Caesarean delivery if contraindications to vaginal delivery or if</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>induction of labor does not progress</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>AMTSL with oxytocin (not ergometrine)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>If &lt; 37 wks gestation, then US for growth, consider early delivery and</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>see every 1-2 wks. If ≥ 37 wks gestation and:</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• If stable BP, then await spontaneous labour until 40 wks gestation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• If unstable BP, then admit to LW or HDU and induce labour or proceed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>to caesarean delivery</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Postnatal management per physicians with nifedipine, HCTZ +/- propranolol</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>as needed for blood pressures</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
INDUCTION OF LABOUR

Introduction/Definition
Induction of labour is accomplished with a variety of interventions that ripen the cervix and initiate labour. Indications include unfavourable Bishop score < 6 with any of the following: post-term, eclampsia, severe preeclampsia, mild preeclampsia at term, PROM > 24 hrs at term or PPROM > 34 weeks EGA, and IUFD.

Contraindications include:
- Poor condition of the mother (very sick)
- Abnormal lie and presentation (see Malpresentation, Abnormal Position, and Transverse Lie)
- Obstructed labour
- Features suggestive of a compromised baby (i.e. unexplained oligohydramnios, non-reassuring fetal heart tracing)
- Placenta praevia
- Limb deformities with contracted pelvis
- Previous VVF repair
- Previous transfundal uterine surgery
- Use caution with grand multiparity (parity of 5 and higher) – use foley bulb, amniotomy +/- oxytocin

Diagnosis
History/Exam/Investigations  Clearly document the indication for the induction

Management
Calculate the Bishop score to determine if cervix needs ripening or not

<table>
<thead>
<tr>
<th>Cervix</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td></td>
<td>Posterior</td>
<td>Midposition</td>
<td>Anterior</td>
<td>-</td>
</tr>
<tr>
<td>Consistency</td>
<td></td>
<td>Firm</td>
<td>Medium</td>
<td>Soft</td>
<td>-</td>
</tr>
<tr>
<td>Effacement</td>
<td></td>
<td>0-30%</td>
<td>40-50%</td>
<td>60-70%</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>Dilation</td>
<td></td>
<td>Closed</td>
<td>1-2 cm</td>
<td>3-4 cm</td>
<td>≥ 5 cm</td>
</tr>
<tr>
<td>Station of fetal head</td>
<td></td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>+1, +2</td>
</tr>
</tbody>
</table>

Methods to ripen the cervix for unfavourable cervix (Bishop Score <6)
Misoprostol (see below) and/or Foley catheter inflated with 40-60 ml of water
*DO NOT GIVE MISOPROSTOL IF ≥ 28 WKS + PREVIOUS CESAREAN DELIVERY
- If second trimester gestation (<28 weeks), then see Abortion protocol
- If third trimester gestation (including IUFD), then misoprostol:
  - Dissolve misoprostol 200 mcg tablet into 20 mL of water. Give 2.5 mL (25 mcg) of solution PO every 2 hours.
  - OR
  - 50 mcg PV every 6 hrs, max of 4 doses, for induction of labour. If not in active labor after 4 doses and if fetal status is reassuring, rest patient for 24 hours and restart induction.
- Monitor all patients for uterine tachysystole
- Consider foley bulb with oxytocin. Review plan with Consultant.
- Once cervix is ripened, continue with augmentation of labour or with methods of induction for favourable cervix (see below).

Methods of induction for favourable cervix (Bishop score ≥ 6)
- Amniotomy alone (for grandmultiparous mothers)
- Oxytocin alone
- Amniotomy and oxytocin if no contraindications
- Avoid prolonged duration of ruptured membranes in HIV-infected patients.
Methods of induction of labour in previous cesarean delivery

- Start induction only with approval of Consultant
- DO NOT USE misoprostol if ≥ 28 wks GA
- Consider amniotomy
- Consider foley catheter +/- oxytocin for cervical ripening
INTRAUTERINE FETAL DEMISE (IUFD)

Introduction/Definition
Intrauterine fetal demise (IUFD) is death of the fetus ≥ 28 wks gestation in utero. 80-90% of women experience labour within 2-3 wks. IUFD retained for ≥ 4-5 wks is associated with a 25% risk of DIC.

Diagnosis
History Decreased or absent fetal movement
Exam No fetal heart heard. Fundal height may be less than expected
Investigations US with no fetal cardiac activity (verified by 2 health care providers), may also note oligohydramnios or overlapping sutures; Check FBC, RBS, grouping, VDRL

Management
- If IUFD and no chorioamnionitis or preeclampsia, then may allow up to 3 wks for spontaneous labour to occur (draw platelets every wk)
- If induction of labour, then:
  - If GA 24 - 27 wks, then misoprostol 200 mcg PV every 4 hrs until delivery (see Abortion Protocol).
  - If GA 28 - 40 wks, then misoprostol 25 mcg orally every 2 hours or 50 mcg PV every 6 hrs until delivery (see Induction of Labour Protocol).
  - If 1 prior low transverse caesarean delivery and ≤ 28 wks gestation, then use misoprostol 50 mcg every 4 hours until delivery (see Abortion Protocol).
  - If more than 1 prior low transverse caesarean delivery and ≤ 28 wks gestation, then discuss plan with Consultant. Consider foley bulb followed by oxytocin at same rate as labour augmentation.
  - If 1 or more prior low transverse caesarean deliveries and > 28 wks gestation, then NO misoprostol.
  - If prior classical caesarean delivery discuss with Consultant. If ≤ 28 wks, may consider use of misoprostol as above. If > 28 wks then discuss and document > 1% risk of uterine rupture and advise repeat caesarean delivery.
- If augmentation of labour, then manage similar to live birth
- Ensure privacy to the extent possible
- Provide adequate analgesia
- Provide bereavement counseling
- Placental evaluation and perinatal autopsy recommended
- Counsel regarding risk of recurrence (depends on aetiology)
INTRAUTERINE GROWTH RESTRICTION

Introduction/ Definition
Intrauterine growth restriction (IUGR) presents a complex management problem with increased risk of perinatal morbidity and mortality. IUGR describes a fetus whose estimated fetal weight (EFW) is < 10%ile for gestational age. Determination of growth by gestational age (GA) requires standardized ultrasound (US) reporting that includes locally relevant nomograms. IUGR represents 30% of all small for gestational age infants. When possible, constitutionally small fetuses should be excluded.

Diagnosis
HistoryAscertain reliability of pregnancy dating; hypertension, vascular disorders, tobacco use, recreational drug use, medications (i.e. anticonvulsants), previous IUGR, previous abruption, placenta praevia in current pregnancy, multiple gestation in current pregnancy

ExamComplete examination, including BP, signs of extreme malnutrition, and stigmata of alcohol, tobacco, and drug use; fundal height (FH) ≥ 3 cm smaller than what is expected for GA

Investigations
- US for anatomy: EFW, liquor volume, anomalies
- US for growth every 2-4 wks (frequency depends on precision of measurements)
- Doppler velocimetry of the umbilical artery if available
- Send VDRL
- Screen for thrombophilias if early onset IUGR, early onset severe preeclampsia, thrombosis, or IUFD
- Consider fetal karyotype if structural anomalies, IUGR < 32 wks gestation, IUGR < 3%ile or polyhydramnios (suggestive of trisomy 18)

Management
Because treatment is individualized, review management with the Consultant. The plan depends on the GA, severity of IUGR, maternal condition and fetal condition.
- Mild or moderate IUGR: daily fetal kick counts, weekly antenatal care visits, weekly non-stress test (NST) or biophysical profile (BPP) if indicated, and serial US for growth and liquor volume
- Severe IUGR: admit to KCH/QECH, twice weekly NST or BPP
- IUGR < 34 wks gestation: corticosteroids, regular fetal surveillance and deliver at 34 wks gestation
- IUGR > 34 wks gestation: immediate delivery

Mode of delivery
- Vaginal delivery with continuous CTG if fetal surveillance is normal and immediate caesarean delivery is possible if needed
- Caesarean delivery if antenatal and/or intrapartum fetal surveillance is abnormal
### MALPRESENTATION, ABNORMAL POSITION AND TRANSVERSE LIE

#### Introduction/Definition
Malpresentation refers to any abnormalities of the fetal presenting part, normal being cephalic presentation. Abnormal fetal position includes non-occiput anterior positioning of the fetal head during labour. With transverse lie, there is no presenting part.

<table>
<thead>
<tr>
<th>Malpresentation</th>
<th>Characteristics</th>
<th>Diagnosis/Exam/Investigations</th>
<th>Management</th>
</tr>
</thead>
</table>
| Breech          | • Incidence: 2-3% of term pregnancies  
• Types: frank (65%), complete (10%), footling (25%)  
• Predisposing factors include: uterine anomaly, abnormal amniotic fluid volume, anencephaly, hydrocephaly, reduced fetal tone and multiple gestation | • Ultrasound (US) for major fetal anomalies  
• US for BPD, fetal weight, placental location, type of breech | Antenatal management  
• Perform fetal surveillance to check well being  
• Look for possible causes of breech presentation  
• Caesarean delivery at 39 wks gestation for primigravida  
• Caesarean delivery for footling breech in labour  
• Low threshold for Caesarean delivery (i.e. prolonged labour, complications, abnormal fetal assessment)  
• Discuss mode of delivery with patient and offer cesarean section. If the patient desires vaginal delivery, term pregnancy, EFW 2.5-3.5 kg and normal pelvic dimensions  
  - Skilled clinician at delivery  
  - Adequate analgesia  
  - No labour augmentation  
  - Assist delivery of the legs, arms (Lovset manoeuvre), and head (Burn-Marshall manoeuvre, Mauriceau-Smellie-Veit manoeuvre or forceps) |
| Occiput posterior | • Membranes rupture easily although head is not well opposed to cervix  
• Premature maternal desire to push due to back pain  
• Increased risk of prolonged second stage  
• Predisposing factors include: slightly smaller pelvic inlet and large fetus | • Antenatal diagnosis is inaccurate; 75% of cases with occiput posterior position rotate into occiput anterior position  
• Intrapartum diagnosis by VE: both fontanelles are palpable  
• If moulding or caput present, then feel the ear to determine position | • Monitor progress of labour closely  
• Adequate analgesia  
• IV access with NS at maintenance rate to prevent dehydration and decrease risk of distress  
• Fetal surveillance  

*Mode of delivery*
- Spontaneous delivery may occur as face to pubis  
- Consider Kielland forceps for assisted delivery only by experienced obstetrician or midwife  
- Low threshold for Caesarean delivery (i.e. relative CPD)
| Occiput transverse (persistent) | • Usually a transitory position with spontaneous anterior rotation | • Intrapartum diagnosis by VE | • Consider oxytocin augmentation if weak contractions without CPD  
• Rotate head manually into occiput anterior position  
• Consider outlet forceps delivery with instrumental rotation or vacuum assisted vaginal delivery  
• Low threshold for Caesarean delivery |
|--------------------------------|-------------------------------------------------|----------------|-------------------------------------------------|
| Brow                           | • May be due to fetal neck oedema (i.e. goiter, cystic hygroma)  
• Suspect if prolonged first stage of labour despite strong contractions and history of vaginal delivery | • Intrapartum diagnosis by VE: supraorbital ridges and anterior fontanelle are palpable  
• Confirm by ultrasound if available | • May convert to vertex or face presentation in early labour with subsequent vaginal delivery  
• Caesarean delivery for persistent brow presentation |
| Face                           | • Intrapartum diagnosis by VE: supraorbital ridges and alveolar margins are palpable | • Vaginal delivery for anterior mentum  
• Caesarean delivery for posterior mentum |
| Compound                       | • Simultaneous presentation of extremity next to the presenting part  
• Increased risk of perinatal loss due to preterm delivery, prolapsed cord and traumatic obstetrical procedures | • Intrapartum diagnosis by VE: prolapsed extremity is palpable with presenting part  
• Monitor closely  
• In general, leave the prolapsed extremity alone because it usually does not interfere with labour  
• For prolapsed arm, monitor closely to see if arm retracts out of the way. If it does not, then gently push it upwards while pushing the head downwards by fundal pressure. If this fails, then caesarean delivery. |
| Transverse                     | • Risk factors include: high parity, preterm labour, multiple gestation  
• Uterine anomalies, placenta praevia, severe pelvic contracture | • US to confirm fetal lie and absence of presenting part. Document position of head and back.  
• Inspection reveals wide abdomen with top of fundus only slightly above umbilicus  
• Head and buttocks are palpable in the iliac fossae  
• Intrapartum diagnosis by VE: ribs, scapula and clavicle or should and arm are palpable | • Can perform external cephalic version at 36 weeks with consultant  
• Caesarean delivery at 39 weeks gestation for persistent transverse lie  
• Caesarean delivery for transverse lie in labour  
• Low vertical/classical uterine incision for transverse back down lie |
MULTIPLE GESTATION

Introduction/Definition
Multiple gestation refers to any pregnancy with more than one fetus and is a high risk pregnancy. Maternal complications include: anaemia, hyperemesis gravidarum, hypertensive disorders of pregnancy, APH, thromboembolism, preterm labour (PTL), prolonged labour, caesarean delivery and PPH. Fetal/neonatal complications include: twin-twin transfusion syndrome, twin reverse arterial perfusion sequence, miscarriage, IUGR, IUFD, hydrops fetalis, conjoined twins, polyhydramnios/oligohydramnios, cord entanglement, malpresentation, prematurity and death.

Diagnosis
History Increased symptoms of early pregnancy (i.e. nausea, vomiting), history of ovulation stimulation drug use, family history of multiple gestation
Exam FH ≥ 3 cm than expected by dates, multiple fetal parts and/or > 2 fetal poles palpable, multiple fetal heart tones (difference ≥ 10 bpm)
Investigations US with multiple fetal hearts or heads

Management
Antenatal management
- Order US for dating and chorionicity as early as possible
- Order US for anatomy and/or anomalies at 18-20 wks gestation
- Order US every 2-3 weeks after 28 wks gestation for growth
- For growth discordance > 20%, weekly NST (see IUGR) or BPP. Check AFI
- Antenatal care visits: monthly up to 28 wks gestation, every 2 wks up to 36 wks gestation and then weekly until delivery at 38 weeks (mono-di, di-di)
- Nutrition: extra daily caloric needs of 600 kcal (for twin gestation) more than a non-pregnant woman; eat normal balanced diet
- No specific intervention to prevent preterm labour
- Plan delivery around 38 weeks gestational age unless earlier delivery is indicated or labor occurs.
- For monoamniotic pregnancy, treat with steroids at 28 wks gestation, admit to inpatient ward at 34 wks gestation and caesarean delivery by 36 wks gestation. Consider salvage course of steroids prior to delivery if ≥ 14 days has passed since initial course of steroids.

Intrapartum management
- Partograph to monitor labour progress
- Prepare two delivery sets and prophylactic oxytocin IV
- Obstetrics and paediatrics registrars at delivery
- Low threshold for caesarean delivery
- For cephalic presentation of first twin and no complications, vaginal delivery no later than at 39 wks gestation; plan for caesarean delivery if earlier delivery is indicated (i.e. oligohydramnios, IUGR, maternal hypertension or other indications)
- For delay > 30 min between delivery of twins, assess lie and presentation and proceed accordingly
  - For transverse lie of second twin, perform internal podalic version then breech extraction in OT
  - For cephalic presentation of second twin, start oxytocin augmentation
- After delivery of second twin, perform AMTSL followed by oxytocin 20 IU/1L of NS IV at 30 dpm

Triplet gestation and beyond
- Treat with steroids at 28 wks gestation
- Caesarean delivery at 34 wks gestation or earlier if in labour

One antenatal fetal death in multiple gestation
- Admit to inpatient ward for expectant management
- Monitor for maternal complications of IUFD including infection or DIC (see Intrauterine Fetal Demise)
- Monitor fetal well being of surviving twin
## Oligohydramnios and Polyhydramnios

<table>
<thead>
<tr>
<th>Introduction/Definition</th>
<th>Oligohydramnios</th>
<th>Polyhydramnios</th>
</tr>
</thead>
<tbody>
<tr>
<td><em><em>Single deepest pocket &lt; 2 cm or amniotic fluid index (AFI)</em> ≤ 5 cm</em>* (Borderline if AFI = 5.1-8 cm)</td>
<td></td>
<td>Single deepest pocket &gt; 8 cm; or AFI* &gt; 24 cm</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>May be associated with draining (ROM), maternal hypertension, and fetal renal anomalies</td>
<td>May be associated with maternal diabetes, substance abuse, TORCH infections, multiple gestation, and fetal anomalies. Ask about dyspnea and abdominal pain. Monitor for hydrops</td>
</tr>
<tr>
<td><strong>Exam</strong></td>
<td>FH is smaller than expected by dates by ≥ 3 cm, Easily palpable fetal parts, Subjectively reduced liquor volume, Sterile speculum exam if draining suspected</td>
<td>FH is larger than expected by dates by ≥ 3 cm, Stigmata for TORCH infections</td>
</tr>
<tr>
<td><strong>Investigations</strong></td>
<td>US (AFI, anomaly, growth), Screen for hypertension (HTN), systemic lupus erythematosus, antiphospholipid syndrome if available, and placental insufficiency (i.e. HC:AC ratio and umbilical artery Doppler)</td>
<td>Screen for DM, Rh alloimmunisation, TORCH infections, and substance abuse</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td><strong>At term</strong> Continuous CTG if vaginal delivery, <strong>For borderline oligohydramnios and &lt; 37 wks gestation</strong> Outpatient: oral hydration 2L daily and recheck fluid in next 1-2 days, If remains borderline then twice weekly biophysical profile (BPP) and umbilical artery Dopplers, Steroids if &lt; 34 wks gestation, Induce labour at 37 wks gestation o Continuous CTG, <strong>For unexplained oligohydramnios and &lt; 37 wks gestation</strong> Inpatient: oral hydration 2 L daily, Recheck fluid level in 1-2 days, Steroids if &lt; 34 wks gestation, Weekly CTG/BPP, monitor daily fetal kick counts, dopplers, Deliver if fetal distress o Caesarean delivery if IUGR</td>
<td>For treatable aetiologies, Management is specific to aetiology, <strong>For congenital anomalies or idiopathic</strong> Outpatient: USS for growth and AFI every 2 wks, Monitor for preterm labour (PTL) or maternal symptoms of dyspnea and abdominal pain, Steroids if &lt; 34 wks, Deliver at term unless significant fetal or maternal compromise, High risk for cord prolapse with AROM, High risk for PPH (see Postpartum Haemorrhage), Consider amnioreduction for symptomatic relief of the mother, Consider Indomethacin to reduce fluid level</td>
</tr>
</tbody>
</table>

Consider performing AFI three times and taking the average
OPERATIVE VAGINAL DELIVERY: FORCEPS AND VACUUM

Introduction/Definition
Operative vaginal delivery (or assisted vaginal delivery) may be performed via forceps or vacuum.

<table>
<thead>
<tr>
<th>Indications</th>
<th>Forceps</th>
<th>Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maternal exhaustion</td>
<td>• Fetal distress</td>
</tr>
<tr>
<td></td>
<td>• Conditions in which expulsive efforts should be avoided (i.e. cardiac disease, h/o stroke) (VBAC is not indication for assisted delivery)</td>
<td>• Delay in descent of the fetal head, especially second twin</td>
</tr>
<tr>
<td></td>
<td>• Delivery of head in breech delivery</td>
<td>• Other indications</td>
</tr>
<tr>
<td></td>
<td>• Fetal distress</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Prematurity</td>
<td></td>
</tr>
</tbody>
</table>

Diagnosis

History/Exam/Investigations Document indication(s) for operative vaginal delivery clearly in the file

Management

Check that following conditions are fulfilled prior to operative vaginal delivery:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Forceps</th>
<th>Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fully dilated cervix</td>
<td>• Term or late preterm (GA &gt; 34 wks) fetus</td>
</tr>
<tr>
<td></td>
<td>• Ruptured membranes</td>
<td>• Vertex presentation</td>
</tr>
<tr>
<td></td>
<td>• No signs or symptoms of cephalopelvic disproportion</td>
<td>• Head at ≥ 0 station or ≤ 2/5 above symphysis pubis</td>
</tr>
<tr>
<td></td>
<td>• Empty bladder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adequate analgesia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adequate contractions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• +/- Episiotomy for forceps</td>
<td></td>
</tr>
<tr>
<td>Fetal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Scalp visible at introitus; descent at 0/5 or head at ≥ +2 station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sagittal suture in direct AP position with occiput anterior</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If face presentation, then anterior chin</td>
<td></td>
</tr>
</tbody>
</table>

Procedure

- Make sure theater space is available when attempting an operative vaginal delivery
- Use aseptic technique
- Performed by obstetrician or experienced/trained midwife
- Explain procedure and provide emotional support and encouragement to mother (who should continue to push if not contraindicated)
- For forceps application
  - Test the locking mechanism
  - Lubricate the blades with sterile lubricant
  - Insert left blade first +/- episiotomy
  - If difficulty with locking, then recheck position of fetal head and re-apply blades as indicated
- For vacuum application
  - Identify the posterior fontanelle
  - Place cup ~2-3 cm anterior to posterior fontanelle
  - Check that there is no maternal tissue trapped within cup
  - Create vacuum seal slowly from 0.2 kg/cm² to 0.8 kg/cm²
- Pull in direction of birth canal axis (initially, downward and forward) with each contraction; expect descent with each combination of pulling and maternal pushing
- Proceed to Caesarean delivery if there is no descent after 2 pulls or after 30 min or 2 pop-offs occur
Flexion point in relation to fetal skull landmarks
OXYTOCIN INFUSION RATE

Oxytocin flow rates are generally started at 1-2 mU/min and are safe up to 12 mU/min with close monitoring of the woman and fetus. Flow rates beyond 20 mU/min may be considered after discussion with the Consultant and warrant internal monitoring.

Conversion

- 1 drop per min = 3 ml/hr
  - 15 dpm = 45 ml/hr
  - 30 dpm = 90 ml/hr
  - 45 dpm = 135 ml/hr
  - 60 dpm = 180 ml/hr
- If 30 units in 500 ml, then 1 mU/min = 1 ml/hr
- If 20 units in 1000 ml, then 2 mU/min = 6 ml/hr
- If 2.5 IU in 500 ml (equivalent to 5 IU in 1000 ml), then
  - 15 dpm = 1.25 mIU/min
  - 30 dpm = 2.5 mIU/min
  - 45 dpm = 3.75 mIU/min
  - 60 dpm = 5 mIU/min

<table>
<thead>
<tr>
<th>Oxytocin amount in 1000 ml of NS</th>
<th>Oxytocin amount in 500 ml of NS</th>
<th>Drops per min</th>
<th>Dose in mIU/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 IU</td>
<td>1.25 IU</td>
<td>15</td>
<td>0.625</td>
</tr>
<tr>
<td>2.5 IU</td>
<td>1.25 IU</td>
<td>30</td>
<td>1.25</td>
</tr>
<tr>
<td>2.5 IU</td>
<td>1.25 IU</td>
<td>45</td>
<td>1.875</td>
</tr>
<tr>
<td>2.5 IU</td>
<td>1.25 IU</td>
<td>60</td>
<td>2.5</td>
</tr>
<tr>
<td>5 IU</td>
<td>2.5 IU</td>
<td>15</td>
<td>1.25</td>
</tr>
<tr>
<td>5 IU</td>
<td>2.5 IU</td>
<td>30</td>
<td>2.5</td>
</tr>
<tr>
<td>5 IU</td>
<td>2.5 IU</td>
<td>45</td>
<td>3.75</td>
</tr>
<tr>
<td>5 IU</td>
<td>2.5 IU</td>
<td>60</td>
<td>5</td>
</tr>
<tr>
<td>10 IU</td>
<td>5 IU</td>
<td>15</td>
<td>2.5</td>
</tr>
<tr>
<td>10 IU</td>
<td>5 IU</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>10 IU</td>
<td>5 IU</td>
<td>45</td>
<td>7.5</td>
</tr>
<tr>
<td>10 IU</td>
<td>5 IU</td>
<td>60</td>
<td>10</td>
</tr>
</tbody>
</table>
PERINEAL LACERATIONS

Introduction/Definition
Perineal lacerations may be sustained during vaginal delivery and should be repaired immediately, usually following delivery of the placenta. If repair is delayed > 24hrs, then wet to dry dressing/sitzbaths with weekly followup to check for infection, repair as an outpatient procedure 6 week postpartum.

The degree of the laceration is defined by its depth and involvement of the anal sphincter.
- First degree (1°) - limited to superficial perineal skin or vaginal mucosa.
- Second degree (2°) - extends to the perineal muscles but does not involving the anal sphincter.
- Third degree (3°) - involves anal sphincter but does not compromise the rectal mucosa
  - 3a: Less than 50% of external anal sphincter (EAS) thickness torn.
  - 3b: More than 50% of EAS thickness torn.
  - 3c: Both EAS and internal anal sphincter (IAS) torn.
- Fourth degree (4°) - interrupts the rectal mucosa.

Diagnosis
History/Exam/Investigations If exam at bedside is difficult, then do EUA in OT

Management (4° laceration)
- Prophylactic metronidazole 500 mg IV 30 min before the procedure if 4° laceration
- Lithotomy position
- Clean perineum with antiseptic solution
- Pain control: regional or GA
- Procedure for 3/4° laceration repair
  - Close rectal and anal mucosa (4°) with interrupted sutures of vicryl if available on round body needle, starting from apex
  - Repair IAS muscle with fine suture size such as 3-0 PDS or 2-0 Vicryl
  - Reconstruct torn ends of external anal sphincter with interrupted stitches of same suture
  - Repair perineal muscles with vicryl
  - Repair vaginal walls and perineal skin

Post-procedure care
Sitzbaths up to TDS
Metronidazole 400 mg PO TDS for 5-7 days (4th degree)
Soft diet and stool softeners for 3-4 weeks
Pelvic floor exercises
Repair of a fourth-degree obstetric laceration

A. 4th degree laceration B. The torn anal mucosa is repaired using a running stitch, but interrupted stitches are also acceptable. C. The internal anal sphincter should be properly identified and repaired as a separate layer. D. The external sphincter is then identified and repaired. The repair consists of either end-to-end or overlapping plication of the disrupted external anal sphincter and capsule using interrupted or figure-of-eight sutures.

Reference: UpToDate, date of access, need permission
POSTPARTUM HAEMORRHAGE (PPH)

Introduction/Definition

Primary PPH is defined as blood loss ≥ 500 ml within 24 hrs of vaginal delivery, or blood loss ≥ 1,000 ml within 24 hrs of Caesarean delivery, or any amount of blood loss that disturbs maternal hemodynamic status.

Secondary PPH is defined as abnormal bleeding at 24 hrs to 6-12 wks postnatal.

Causes of PPH include: atony (most common), retained placenta/products, vaginal/cervical lacerations, uterine rupture, uterine inversion, infection, and coagulation disorders (i.e. DIC).

Prevention of PPH is done via routine active management of the third stage of labour (AMTSL) and routine prophylactic oxytocin 20 IU in 1L NS at 30 drops/min for multiple gestation, polyhydramnios, macrosomia, and prolonged labour. AMTSL includes the following:

- Oxytocin 10 IU IM immediately after all deliveries, including caesarean deliveries
- Delayed cord clamping at 1-3 min after delivery
- Controlled cord traction for delivery of placenta, including caesarean delivery
- Uterine massage
- Regular and frequent assessment of uterine tone by palpation of fundus after delivery of placenta

Diagnosis History/Exam/Investigations PVB, +/- shock

Management Initial management

- STOP BLEEDING AS YOU CALL FOR HELP (i.e. Bimanual compression, aortic compression)
- Call for help and check circulation, airway, breathing (CAB)
- Obtain IV access with 2 large-bore cannulae (i.e. 16G or 18G) and start IV fluids
- Oxygen 10-15 L/min if available
- Insert foley catheter
- Draw blood:
  - X-match ≥ 4-6 units PRBC and 4-6 units FFP (at a 1:1 ratio with PRBC)
  - Bedside clotting time
  - FBC (if unavailable, then Hb)
- Uterine massage to induce contractions
- Place woman in supine position and keep warm

For uterine atony

- Vigorous uterine massage
- Repeat oxytocin 20 IU IV in 1 liter NS @ 125cc/hr
- If bleeding persists, then add another 20 IU oxytocin to the liter (total 40 units)
- If bleeding persists, then misoprostol 800 mcg sublingual or PR
- If bleeding persists, arrange for EUA. Check for cervical lacerations or any missed vaginal lacerations, or possible retained products
- Consider intruterine balloon tamponade using inflated Foley catheter or condom (60-80cc saline)
- If above steps fail, then consider laparotomy for B-Lynch suture, bilateral uterine artery ligation (O’Leary sutures), or hysterectomy. While awaiting OT, perform bimanual uterine or aortic compression.

For retained products/placenta

- If able to tolerate, give Pethidine 100 mg IM and perform manual removal of placenta at bedside
- If unable to tolerate, then manual removal and/or evacuation with banjo curette in OT under anesthesia
- If morbidly adherent or retained, then consult senior doctor immediately
For vaginal/cervical lacerations
- Identify apex before initiation of repair
- Consider repair in OT if difficult to visualize apex at bedside

For coagulopathy
- Evaluate for coagulation abnormality via bedside clotting time
- Draw blood for platelet count, PT and PTT, and fibrinogen (if available)
  - If deranged, then transfuse PRBC, FFP, +/- platelets, +/- whole blood

For uterine inversion
- Consult anesthesia
- Suspect if on bimanual examination, the finding of a firm mass below or near the cervix, coupled with the absence of identification of the uterine corpus on abdominal examination
- If the inversion occurs before placental separation, detachment or removal of the placenta should not be undertaken
- Place palm of the hand against the fundus as if holding a tennis ball, with the fingertips exerting upward pressure circumferentially
- Uterine relaxant may be necessary- terbutaline, magnesium sulfate, halogenated general anesthetics, and nitroglycerin have been used
- If not successful, then laparotomy
  - Huntington procedure - progressive upward traction on the inverted corpus using Babcock or Allis forceps
  - Haultain procedure - incising the cervical ring posteriorly, allowing for digital repositioning of the inverted corpus, with subsequent repair of the incision
POSTTERM PREGNANCY

Introduction/Definition
Post-term pregnancy is defined as a pregnancy ≥ 42 wks gestation. It is associated with increased risk of meconium aspiration, IUFD, oligohydramnios and fetal distress. Accurate pregnancy dating is critical so that interventions can be done - or avoided - as indicated.

Diagnosis
History/Exam/Investigations see Pregnancy Dating Criteria

Management
• If GA 40-42 wks, then conservative management until delivery is indicated for other reasons (i.e. preeclampsia) or GA ≥ 42 wks
  o Strip membranes if no contraindications
  o Assess amniotic fluid volume with US
    ▪ If oligohydramnios, then admit for induction of labour (IOL)
    ▪ If absent fetal movement (on US or maternal perception?), then admit for IOL regardless of fetal cardiac activity
    ▪ If normal amniotic fluid volume, then instruct patient to monitor fetal kick count, weekly USS to monitor AFI and BPP- if normal return at 41+5 wks gestation for IOL
• If GA ≥ 42 wks, then deliver via IOL or cesarean as indicated.
PREGNANCY DATING CRITERIA

A careful history must be taken from the patient verifying that the date given is the first day of the period, as well as whether the period was normal, heavy, or light. The date of the previous menstrual period will help ascertain the length of the cycle. History should also be taken about previous use of oral contraceptives, which might influence ovulation.

Introduction/Definition
Dating the pregnancy accurately is of critical importance since management often depends on the gestational age (GA) (i.e. steroids, conservative management versus early delivery, post-term induction of labour).

Diagnosis
History Ask the date of the first day of the woman's last menstrual period (LMP). Clarify whether the LMP was normal or not, such as a post-hormonal contraception period. Find out if an early pregnancy test was performed.
Exam Measure FH from pubic symphysis to upper edge of uterus; a discrepancy ≥ 3 cm merits further investigation, usually done with US
Investigations Urine pregnancy test may be useful in the first trimester, ultrasound (US) for dating, try correlating gestational age with antenatal visits

Management
FH discrepancy will alert the doctor that GA by dates, that is LMP, may be incorrect. Order US for dating and adjust GA accordingly:

- GA by LMP and GA by US should agree by
  - +/- 1 week (7 days) in 1st trimester
  - +/- 2 weeks (14 days) in 2nd trimester
  - +/- 3 weeks (21 days) in 3rd trimester

- If there is agreement, then use LMP for EDD
- If there is discrepancy, then use US estimates for EDD
- If only one measurement can be taken:
  - Head circumference best predicts GA if GA 14-22 wks
  - Femur length best predicts GA in third trimester
PREMATURe RUPTURE OF MEMBRANES (PROM)

**Introduction/Definition**
Premature rupture of membranes (PROM) refers to draining of amniotic fluid before the onset of labour. Preterm PROM (PPROM) is associated with significant maternal and neonatal morbidity and mortality. Spontaneous rupture of membranes > 24 wks gestation complicates 2-3% of pregnancies.

**Diagnosis**
*History* Continuous draining of fluid
*Exam* Sterile speculum reveals fluid in the vaginal vault and/or fluid passing per os
  - Avoid a digital examination, especially if PPROM

*Investigations* USS may show low liquor volume

**Management**

<table>
<thead>
<tr>
<th>Topic or GA</th>
<th>Plan</th>
</tr>
</thead>
</table>
| **General care** | • Admit patient to antenatal ward or labour ward  
• Monitor uterine activity and fetal heart  
• Check maternal PR and temperature every 4 hrs  
• Assess for labour, chorioamnionitis and placental abruption at least daily  
• US for presentation, anatomy and liquor volume |
| **PROM > 24 hrs at term** | • Penicillin 2.4 MU q6h IV  
• FBC, group & save  
• Induce/augment labour as indicated  
• Caesarean delivery if previous cesarean section |
| **PPROM ≥ 34 wks** | • Send investigations: urine dipstick, urine culture if available, FBC*  
• If in labor administer Penicillin as above  
• Steroids: dexamethasone 6 mg IM BD x 4 doses  
• If not in labor can send to ANW |
| **28 - 34 wks** | • If HIV negative, induce/augment if no spontaneous labour in 24 hrs ROM  
• If HIV positive start immediate induction, if not in labor within 24 hours consider delivery via cesarean section  
• Deliver by cesarean section if previous cesarean section |
| **26-28 wks** | • Expectant management  
• Minimise mobility; encourage leg exercises and/or anti-embolic measures  
• Treat with Steroids and oral antibiotics for latency: erythromycin 250 mg QID +/- amoxicillin 250 mg TDS for 7 days and deliver at 34 wks gestation unless there are signs of chorioamnionitis  
• Admission FBC, Repeat FBC weekly or if otherwise indicated |
| **Consultant input strongly recommended** |  
• US for estimated fetal weight.  
• Decision to continue with pregnancy discussed with patient  
  - Conservative management: close monitoring for infection, labour or placental abruption, strict pelvic rest, modified bed rest with bathroom privileges, serial US, and oral antibiotics for latency. Give corticosteroids at 27 wks if patient reaches that gestation. |
| <26 weeks | • Determine GA to provide a realistic appraisal of outcomes  
• Options to be discussed with patient:  
  o Labour induction with IV oxytocin and/or oral or intravaginal misoprostol  
  o Conservative management: close monitoring for infection, labour or placental abruption, strict pelvic rest, modified bed rest with bathroom privileges, serial US, and oral antibiotics for latency. |
|-----------|---------------------------------------------------------------|
| Chorioamnionitis** | • Penicillin and Gentamicin daily IV until 48 hrs afebrile  
• If still spiking fevers add metronidazole 500 mg IV every 8 hrs until 48 hrs afebrile, |

*WBC is elevated in pregnancy and up to 7 days after antenatal corticosteroids **Signs of chorioamnionitis include: maternal tachycardia, maternal fever, abdominal tenderness, foul vaginal discharge, and WBC > 16,000
PRETERM LABOR

Introduction/Definition
Preterm labour is defined as contractions that cause cervical dilation at < 37 wks gestation. It complicates 10-12% of all pregnancies and is associated with significant neonatal morbidity and mortality, especially at 24-34 wks gestation.

Diagnosis
History Risk factors include multiple gestation, polyhydramnions; acute local or systemic inflammation (i.e. appendicitis), UTI and/or pyelonephritis, STIs; vaginal bleeding, placental abruption; uterine anomalies, incompetent cervix; previous preterm delivery; tobacco and illegal drug use, lower socioeconomic status, extremes of age, poor nutrition and poor antenatal care
Exam Cervical dilation with effacement on VE
Investigations TVUS for cervical length (short cervix ≤ 2.5 cm)

Management
Prevention
- Screen and treat symptomatic bacteriuria/ urine microscopy (previous PTD)
- If previous preterm delivery and current singleton gestation, then treat with Hormorin 200mg IM every week at 16-36 weeks if available
- Interventions with inconsistent evidence – treatment of asymptomatic bacterial vaginosis, cervical cerclage

Established preterm labor
- Monitor fetal heart rate and contractions
- IV line with NS at maintenance rate
- Send investigations if available: FBC, urinalysis, speculum exam to check for abnormal discharge, wet prep for trichomonas and bacterial vaginosis
- US for presentation, AFI, placental location, EFW, EGA and anatomy
- Group B streptococcus prophylaxis
  - Treat with penicillin IV (erythromycin if allergy to penicillin)
- Steroids for decreased risk of respiratory distress syndrome (RDS), necrotizing enterocolitis (NEC) and intraventricular haemorrhage (IVH)
  - Treat at 28-34 wks gestation unless fetal lung maturity is confirmed
  - Betamethasone 12 mg IM every 24 hrs x 2 doses; or
  - Dexamethasone 6 mg IM every 12 hrs x 4 doses
- Tocolytic medications to delay delivery for 48 hrs (for steroids) if contractions are present: see table below

<table>
<thead>
<tr>
<th>Tocolytic medication</th>
<th>Contraindications</th>
<th>Maternal side effects</th>
<th>Fetal/neonatal side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terbutaline 0.25 mg SC every 20-180 min (hold for maternal PR &gt; 120 bpm)</td>
<td>Arrhythmias</td>
<td>Arrhythmias, pulmonary oedema, myocardial ischemia, hypotension, tachycardia</td>
<td>Tachycardia, hyperinsulinemia, hyperglycemia, myocardial and septal hypertrophy, myocardial ischemia</td>
</tr>
<tr>
<td>Magnesium sulphate Same regimen as with preeclampsia</td>
<td>Myasthenia gravis</td>
<td>Flushing, lethargy, headache, muscle weakness, diplopia, dry mouth, pulmonary oedema, cardiac arrest</td>
<td>Lethargy, hypotonia, respiratory depression, demineralization with prolonged use</td>
</tr>
<tr>
<td>Nifedipine (immediate-release) 20 mg load then 10 mg PO if still contracting after 30 mins and 10mg q2h (hold if maternal BP &lt; 90/50 mm Hg)</td>
<td>Cardiac disease, use caution with renal disease, do not use with magnesium</td>
<td>Flushing, headache, dizziness, nausea, transient hypotension, transient tachycardia, palpitations</td>
<td>Sudden fetal death, fetal distress</td>
</tr>
<tr>
<td>Indomethacin 50-100 mg load then 25-50 mg PO every 6 hrs × 48 hrs (Only if &lt;32 weeks)</td>
<td>Significant renal or hepatic impairment</td>
<td>Nausea, heartburn</td>
<td>Constriction of ductus arteriosus, pulmonary HTN, reversible renal dysfunction with oligohydramnios, IVH, NEC, hyperbilirubinemia</td>
</tr>
</tbody>
</table>

- Delivery and neonatal care
  - Inform NICU so that neonatologist or paediatrician may attend delivery
  - Deliver with intact membranes if possible
  - Minimize trauma by easing out the head in second stage of labour
  - Forceps may be used to assist delivery; avoid vacuum extraction
  - Suction neonatal airway immediately, avoid hypothermia and transfer neonate to NICU as soon as possible
- Consider Caesarean delivery if breech presentation
- Consider using Magnesium sulfate for neuroprotection if EGA <32 weeks (dosage as per preeclampsia protocol)
PREVIOUS CAESAREAN DELIVERY

Introduction/Definition
Pregnancies with previous cesarean delivery are at increased risk of uterine rupture, hemorrhage, and perinatal morbidity and mortality. Adverse outcomes coupled with anticipated litigation have led to routine preference of elective repeat cesarean deliveries. However, planned VBACs in women with one previous cesarean delivery can be successful.

Several large studies of women with one prior low transverse uterine incision reported a uterine rupture rate of approximately 0.5–0.9% with VBAC.*

Diagnosis
Documentation of the previous cesarean delivery, especially indication and complications and any subsequent vaginal delivery should be reviewed prior to deciding on vaginal birth after cesarean or elective repeat cesarean delivery.

Management
Mode of delivery
- Counsel patient on mode of delivery during antenatal visits. Decision to be made jointly by patient and obstetrician.
- Document decision clearly in file
- If repeat cesarean delivery is chosen, then discuss and document the plan for the situation when labour starts prior to the scheduled date of surgery
- Consultant review (with details of previous surgery) is needed if:
  - VBAC is desired with previous cesarean delivery that was not uncomplicated with low transverse uterine incision
  - Previous diagnosis of CPD led to cesarean or instrumental delivery

<table>
<thead>
<tr>
<th>VBAC candidates</th>
<th>Repeat cesarean delivery candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncomplicated previous caesarean delivery with a nonrecurring indication</td>
<td>Transfundal caesarean delivery</td>
</tr>
<tr>
<td></td>
<td>Contraindications to vaginal delivery</td>
</tr>
<tr>
<td></td>
<td>Obstetric fistula (current or repaired)</td>
</tr>
</tbody>
</table>

VBAC
- Send blood for FBC and X-match so that BT is readily available if needed.
- Place IV line and Foley catheter
- Serial cervical assessments by the same person is preferred
- Monitoring with continuous CTG during labor
- Delivery by obstetrician or experienced midwife
- Inform anaesthetist and neonatologist of possible emergencies
- Induction or augmentation of labor is not recommended given the current setting. Patients who opt for a trial of labor should come in in spontaneous labor. At most an amniotomy can be performed if possible.

Elective repeat caesarean delivery
- Delivery by senior house officer if scheduled; if emergent, then delivery by registrar or above
- Send blood for X-match so that BT is readily available if needed
- If previous classical cesarean section, schedule for elective repeat at 37 weeks gestation
SHOULDER DYSTOCIA

Introduction/Definition
Shoulder dystocia is an obstetric emergency in which the anterior shoulder is impacted against the symphysis pubis and thus the shoulders and body of the infant fail to deliver after the head has delivered. Although previous history of shoulder dystocia, macrosomia, large fetus in diabetic mother, postdates pregnancy and failure to progress in late first stage or in second stage are risk factors, shoulder dystocia cannot be predicted. Thus, the clinician should be prepared for shoulder dystocia at all deliveries.

Diagnosis
Birth attendants should routinely look for the signs of shoulder dystocia:
- Difficulty with delivery of the face and chin
- Retraction of fetal head against the maternal perineum (turtle sign)
- Failure of restitution of the fetal head
- Failure of the shoulders to descend

After 6-minute head-to-body interval there is increased risk of neonatal depression, acidosis, asphyxia, central nervous system damage, and death.

Management
- Start timing from when shoulder dystocia is diagnosed
- Call for help – registrar should be present along with interns and midwives
  - Notify consultant on call
  - Notify pediatricians, ideally they should come to the delivery
  - Notify anesthetist
- Do not exert excess traction on the head
- Do not use fundal pressure
- Tell patient to stop pushing and to push only when you instruct them
- Consider episiotomy only if it will make internal maneuvers easier
- Catheterization
- Start with McRobert’s position- flexion and abduction of the maternal hips, positioning the maternal thighs on her abdomen.
- Suprapubic pressure can be employed together with the McRoberts’ manoeuvre - using palm or fist superior to pubic symphysis to push anterior shoulder down towards fetal chest
- If this fails, attempt other methods:
  - Rubin’s maneuver - insert one hand in the vagina posteriorly or anteriorly along the dorsal aspect of the fetal shoulder and rotate the shoulder inward (adduction) about 30° until the shoulders lie in the oblique diameter of the pelvis
  - Wood’s screw maneuver - the posterior shoulder may be rotated forward, through a 180-degree arc, and passed under the pubic ramus as in turning a screw
  - Barnum’s maneuver - Slide the hand along the dorsal aspect of the humerus and press it against the fetal chest, the clinician then palpates the elbow. If the elbow is already flexed, the operator grasps the fetal forearm and wrist and sweeps the forearm over the chest and across the infant’s face, extending the arm at the elbow and shoulder to deliver it first.
  - Gaskin maneuver- turn patient on all fours with back arched
- Other more traumatic methods - a last resort:
  - Zavanelli’s maneuver, which involves pushing the fetal head back in with performing a cesarean section. or internal cephalic replacement followed by Cesarean section
  - Intentional fetal clavicular fracture - reduces the diameter of the shoulder girdle that requires to pass through the birth canal.
  - Maternal symphysiotomy, which makes the opening of the birth canal laxer by breaking the connective tissue between the two pubes bones facilitating the passage of the shoulders.
  - Abdominal rescue, described by O’Shaughnessy, where a hysterotomy facilitates vaginal delivery of the impacted shoulder
PNEUMONIC for shoulder dystocia:

**H** Call for HELP
**E** Evaluate for Episiotomy
**L** Legs: McRoberts Maneuver
**P** Suprapubic Pressure
**E** Enter Rotational Maneuvers
**R** Remove the posterior arm
**R** Roll the patient to her hands and knees
MEDICAL CONDITIONS IN PREGNANCY
ADNEXAL MASSES IN PREGNANCY

Introduction/Definition
Adnexal masses are not uncommon in pregnancy. During the first trimester, the corpus luteum of pregnancy may be palpated or detected on US; it is too frequently removed because of pain. The differential diagnosis also includes ectopic pregnancy, acute salpingitis or PID, ovarian tumour, uterine leiomyoma, and acute appendicitis.

Complications usually occur during the first trimester and range from rupture, torsion, and infarction to malignancy.

Diagnosis

History  Abdominal pain, nausea/vomiting, abdominal swelling, +/- light PVB
Exam  May be difficult to palpate on pelvic exam and/or abdominal exam
Investigations  US

Management

- If mass < 5 cm, then most resolve without intervention. Treat symptoms.
- If mass 5-10 cm, then manage based on patient’s age, US findings, etc.
  - Consider close observation with US every 2 wks.
  - If mass increases in size, persists into the second trimester, and/or has malignant characteristics on US, then consider exploratory laparotomy
- If mass > 10 cm without symptoms
  - If first trimester, then observe closely with US every 2 wks for growth or complications
  - If second trimester, then perform exploratory laparotomy with removal
  - Discuss risks and benefits with patient
- If severe pain at any size, then perform emergency laparotomy for suspected torsion or rupture
- The optimal timing for exploratory laparotomy is 16-18 wks gestation. At >20 wks gestation closely observe mass to avoid precipitating preterm labour (PTL).
- Send all surgical specimens for histopathology
  - If corpus luteum on histopathology and ≤ 7-12 wks gestation, then replace progesterone with appropriate dose. (Hormorin 200 mg od)
ANAEMIA IN PREGNANCY

Introduction/Definition
Anaemia in pregnancy is defined as Hb < 11 g/dL (severe anaemia as Hb < 7 g/dL) at any gestational age. Iron deficiency and acute blood loss are the most common causes of anaemia in pregnancy, but other causes should be considered with severe anaemia.

Diagnosis
History Easy fatigability, headache, palpitations, PV bleeding

Exam Pallor, tachycardia, +/- jaundice, +/- splenomegaly, +/- petechiae

Investigations Point-of-care Hb to determine severity immediately; malaria RDT (or peripheral smear), stool for ova and parasites, FBC if Hb < 8 g/dL, HIV

Management
- If Hb < 7 g/dL, especially if symptomatic, then blood transfusion
  - Transfuse rapidly if anaemia due to acute blood loss
  - Transfuse slowly if chronic anaemia (Consider use of diuretics as necessary to reduce risk of congestive cardiac failure due to sudden circulatory overload)
- If Hb < 8 g/dL, then send blood for FBC and treat per FBC results
  - If MCV < 80, then send blood for iron studies (ferritin, TIBC and % saturation (% sat) if available.
  - If MCV 80-93, then send blood for peripheral smear and consult haematologist
  - If MCV ≥ 94, then treat for folate or vitamin B12 deficiency
- If Hb > 8 g/dL, then treat with folate and FeSO4 325 mg PO BD and recheck Hb in 2-4 wks
- Treat with Albendazole
- Treat for malaria or schistosomiasis if indicated
- Mixed anaemia may occur and complicate laboratory findings
- If iron deficiency, then treat with elemental iron 200 mg PO OD. Titrate up to reduce side effects and encourage compliance. Take iron on empty stomach with vitamin C and without antacids.
- If folate deficiency, then treat with folate 1 mg PO OD.
- If vitamin B12 deficiency, then treat with vitamin B12 1000 mg IM monthly.
- If haemolytic anaemia, then send blood for direct and indirect Coombs tests.
- Treat with corticosteroids. Of note, drug-induced (i.e. methyldopa, penicillin, cephalosporin) haemolytic anaemia is typically milder and is treated by stopping the offending medication.
ASPIRIN USE IN PREGNANCY

Introduction/Definition
Aspirin therapy is used for thromboprophylaxis in the reproductive-aged woman and for preeclampsia prophylaxis in the obstetric patient. With regard to obstetrics, 2 meta-analyses found 13-15% reduction in preeclampsia especially for high risk women, 8% reduction in preterm delivery (PTD), and 14% reduction in fetal or neonatal death.

Diagnosis History/Exam/Investigations
Evaluate for indications
- As thromboprophylaxis in the reproductive-aged woman:
  - Prior myocardial infarction
  - Well documented prior cerebral thrombosis
  - DVT
- As preeclampsia prophylaxis in the pregnant woman
  - History of preeclampsia
  - Prior delivery of severe IUGR infant
  - Chronic hypertension
  - Renal disease
  - Connective tissue disease
  - Insulin-requiring diabetes
  - History of IUFD
  - Multiple gestation
  - Unexplained recurrent pregnancy losses

Management
- Aspirin 75 mg PO OD - BD (up to 150 mg/day is safe for mother and fetus)
ASTHMA IN PREGNANCY

Introduction/Definition
Asthma occurs when there is reversible bronchoconstriction. It is associated with increased risk of mortality, preeclampsia, preterm delivery (PTD) and low birth weight. Asthma is unpredictable in pregnancy: 1/3 of women report improvement, 1/3 remain the same, and 1/3 worsen.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Intermittent</th>
<th>Persistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>≤ 2 days/wk</td>
<td>&gt; 2 days/wk but not daily</td>
</tr>
<tr>
<td>Night time awakenings</td>
<td>≤ 2 times/month</td>
<td>3-4 times/month</td>
</tr>
<tr>
<td>Short acting beta 2 agonist use for symptom control</td>
<td>≤ 2 days/wk</td>
<td>&gt; 2 days/wk but not daily and not &gt; 1 time on any day</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Minor limitation</td>
</tr>
<tr>
<td>Lung function</td>
<td>Normal FEV1 between exacerbations</td>
<td>FEV1 &gt; 80% predicted</td>
</tr>
<tr>
<td></td>
<td>FEV1 &gt; 80% predicted</td>
<td>FEV1/FVC normal</td>
</tr>
</tbody>
</table>

Diagnosis

History/Exam  Trigger (often viral), chest tightness, shortness of breath; cough, wheezing, decreased pulse ox

Investigations  Peak flow meter or spirometry, pulse oximetry

Management

Avoid triggers and use inhaled corticosteroids to decrease underlying inflammation
- Antenatal clinic visit monthly if on regular meds
- Peak flow meter BD (first thing in the morning and 12 hrs later) if available
- Avoid allergens and tobacco
- For mild - moderate persistent asthma: salbutamol inhaler 1-2 puffs TDS or corticosteroid inhaler (i.e. beclomethasone)
- For acute and/or severe exacerbations:
  o Admit to HDU
  o O2 therapy to keep SaO2 >95%
  o inhaled bronchodilator (salbutamol, ipromium bromide and normal saline)through a nebulizer or spacer every 10 – 20 min until improvement seen
  o IV fluids
  o IV Aminophylline 250 mg over 10 min or MGSo4 2g stat
  o Sit up
  o 4-hourly fetal monitoring
  o Systemic steroids (i.e. hydrocortisone or prednisone IV) for up to 5-7 days
- Misoprostol if induction of labour induction
- Oxytocin if PPH
- Avoid use of PG F2 and ergometrine
CARDIAC DISEASES IN PREGNANCY

Introduction/Definition
Women with cardiac disease (1% prevalence) are at increased risk of maternal morbidity and mortality. However satisfactory outcome can be expected with careful antenatal, intrapartum and postpartum care.

In our setting mostly we see acquired lesions and seen for the first time in pregnancy due to physiologic stresses of pregnancy.

Maternal complications in pregnancy
- Congestive heart failure
- Arrhythmias
- Stroke

Fetal complications
- IUGR
- Prematurity
- Risk of congenital heart defect

History
Severe progressive dyspnea, orthopnoea, paroxysmal nocturnal dyspnoea, haemoptysis, syncope with exertion, chest pain, palpitations, nocturnal cough, sudden reduction in ability to perform ordinary physical activity, increasing dyspnoea on exertion, and haemoptyis are associated with CCF.

Exam
Cyanosis, finger clubbing, systolic murmur > grade 3 of 6, diastolic murmur, cardiomegaly, sustained arrhythmias, loud P2; CCF: persistent basilar rales, oedema, tachycardia, increase in RR to > 24 breaths per minute

Investigations
CXR (shielded) with minimal cardiomegaly, ECG, echocardiogram for accurate diagnosis, ABG for cyanosis if available.

Management
- Preconception counseling for known cardiac disease in order to assess risk and optimize treatment (i.e. preconception surgery, family planning)
- Explain the cardiac anomaly to the patient and its impact on pregnancy, including up to 4% risk of infant with congenital heart disease

Antenatal management
- Antenatal care visits: regular visits with obstetrician and with cardiologist
- Offer termination of pregnancy if high risk condition. (pulmonary hypertension, Marfan’s syndrome, NYHA III/IV, previous peripartum cardiomyopathy with residual ventricular dysfunction)
- Assess functional capacity at each visit
- Use the New York Heart Association Classification to determine the patient's functional capacity
  - Class I: no limit to physical activity
  - Class II: comfortable at rest, ordinary physical activity leads to discomfort
  - Class III: comfortable at rest, less than ordinary activity causes discomfort
  - Class IV: unable to perform any physical activity without discomfort
- Screen for and prevent anaemia
- Exclude complications (i.e. CCF, thrombosis)
- Admit to antenatal ward for any complications
- Behavioural modifications: adequate rest, no smoking
- US for fetal anatomy (congenital heart disease) at 18-20 wks gestation
- Document clear labour plan in medical records
- Treat respiratory infections promptly
- Treat with antibiotics for any dental procedures
- Treat with warfarin and/or heparin if already on anticoagulation
- Treat with anticoagulation if valve replacement
  - Switch to heparin in the first trimester due to teratogenicity of warfarin
  - Treat with warfarin at 16-36 wks gestation
  - Switch to heparin at > 36 wks gestation
  - Treat with warfarin during puerperium period
Intrapartum management

- Admit for vaginal delivery (Caesarean delivery for obstetric indications only)
- Consult anaesthesiologist immediately so that he/she is aware of high-risk patient
- Induce labour with misoprostol for obstetric indications only
- First stage of labour
  - Evaluation by doctor every ≤ 2 hours
  - Open partograph, monitor vitals every 30 min, and record fetal surveillance
  - Semi-recumbent position with lateral tilt
  - Minimize IV fluids- strict monitoring of fluid intake and urine output
  - Treat with oxygen at 4-6 L/min as needed
  - Adequate analgesia with Pethidine 100 mg IV or epidural if available
  - Treat with X-Penicillin 2.4 MU IV every 6 hrs and gentamicin 240mg IV stat
- Second stage of labour: assist delivery with vacuum or forceps
- Third stage of labour
  - AMTSL with oxytocin 10 IU IM (no ergometrine)

Postnatal management

- Avoid PPH, anaemia, sepsis, VTE, development of CCF
- Keep in HDU until > 24hrs after delivery if no complications
- Keep in postnatal ward at least 48 hrs to monitor for complications
- For patients on anticoagulation, start heparin 6-12 hrs after vaginal delivery or 12-24hrs after Caesarean delivery
- Inform paediatrician of maternal history of cardiac disease so that newborn is evaluated for congenital heart disease (i.e. examination, echocardiogram)
- Contraception: consider surgical sterilization for life-threatening cardiac disease or intrauterine contraceptive devices, may need to avoid oestrogen
- Review mother and infant at 6-week postnatal visit
DIABETES IN PREGNANCY

Introduction/Definition
Diabetes mellitus is a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, action or both. It can be gestational or preexisting. A1 refers to gestational diabetes that is controlled with diet and exercise, while A2 requires either oral medication or insulin. If a pregnant woman is diagnosed with overt diabetes requiring treatment at < 20 wks gestation, she has pre-gestational diabetes (class B). White’s classification of pre- gestational diabetes is shown in the following table:

<table>
<thead>
<tr>
<th>Class</th>
<th>Age of onset</th>
<th>Duration</th>
<th>Vascular disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>&gt; 20 yo</td>
<td>&lt;10 yrs</td>
<td>None</td>
</tr>
<tr>
<td>C</td>
<td>10-19 yo</td>
<td>10-19 yrs</td>
<td>None</td>
</tr>
<tr>
<td>D</td>
<td>&lt; 10 yo</td>
<td>&gt;20 yrs</td>
<td>Benign retinopathy</td>
</tr>
<tr>
<td>F</td>
<td>Any</td>
<td>Any</td>
<td>Diabetic retinopathy</td>
</tr>
<tr>
<td>R</td>
<td>Any</td>
<td>Any</td>
<td>Proliferative retinopathy</td>
</tr>
<tr>
<td>H</td>
<td>Any</td>
<td>Any</td>
<td>Ischemic heart disease</td>
</tr>
<tr>
<td>T</td>
<td>Any</td>
<td>Any</td>
<td>Renal transplant</td>
</tr>
</tbody>
</table>

Maternal risks in preexisting diabetes
- Diabetic ketoacidosis
- Retinopathy
- Nephropathy
- Hypertension
- Infection
- Operative delivery
- Pelvic floor trauma

Fetal risks
- Congenital anomalies
- Early pregnancy losses
- Preterm labor
- Increased perinatal mortality
- Shoulder dystocia and birth trauma

Diagnosis- screening of all high risk patients in pregnancy. Risk factors include family history of diabetes, diabetes in previous pregnancy, previous IUFD, previous macrosomic (> 4000g) infant, BMI > 30 kg/m2.

Exam/ Investigations
- Send blood for fasting blood sugar (FBS) or random blood sugar (RBS)
  - FBS > 7.0 mmol/L is suspicious for diabetes
  - FBS > 7.0 x 2 or FBS > 11.0 mmol/L confirms diabetes; no oral glucose tolerance test (OGTT) needed
  - RBS > 11.1 mmol/L is suspicious for diabetes
- Send blood for OGTT at 24-28 wks gestation
  - Procedure: FBS is drawn, woman drinks 75 g glucose load and serum glucose is drawn 1 hr and 2 hrs later
Abnormal values: FBS > 7 mmol/L (126mg/dl), 2 hour blood sugar (BS) >7.8 mmol/L (140mg/dl)

MANAGEMENT
Gestational diabetes
- Initial management: trial of diet and exercise for 2-4 wks
  - Nutrition counseling
  - Send blood for FBS or check FBS with glucometer twice weekly
  - Treat with oral hypoglycaemic for FBS > 8 mmol/L x 2 or more
- Medication-based management
  - Glibeclamide 5 mg PO BD, increase weekly to maximum 20mg daily; consider glibenclamide per RCOG
  - Send blood for FBS or check FBS with glucometer twice weekly
  - Switch to insulin for persistent FBS > 8 mmol/L
- Refer to medicine clinic at 12 wks postnatal due to increased risk of long-term diabetes
**Insulin-requiring diabetes (gestational and pre-gestational)**

- For pre-gestational diabetics, continue pre-pregnancy regimen if blood sugar is controlled.
- For women who never used a glucometer before, consider inpatient admission for diabetic education and glucose control.
- Antenatal care visits: every 2 wks until 30 wks gestation, then weekly until delivered
- American Diabetic Association diet at 30-35 kcal/kg/day; increase calories for normoglycemic ketonuria
- Patient logbook to self-record daily insulin dosages and daily blood glucose levels at 7hrs, 11hrs, 16hrs and 21hrs
- Initial insulin is calculated based on maternal weight
  - In first trimester, total daily dose = weight x 0.7 unit
  - In second trimester, total daily dose = weight x 0.8 unit
  - In third trimester, total daily dose = weight x 0.9 - 1.0 unit
  - Given as 2/3 of total daily dose in the morning at breakfast: 1/3 as soluble insulin and 2/3 as long-acting insulin
  - Given as 1/3 of total daily dose in the evening at dinner (17hrs): 1/2 as soluble insulin and 1/2 as long-acting insulin
  - For example, for weight of 72 kg in third trimester, give 16 units soluble insulin and 32 units long-acting insulin at breakfast and 12 units soluble insulin and 12 units long-acting insulin at dinner
- Goal blood glucose levels: FBS < 6 mmol/L, other BS 6-8 mmol/L

**Pregestational Diabetes**

- Comprehensive US at 18-20 wks gestation for fetal structural defects
- Baseline maternal ophthalmology exam for diabetic retinopathy
- Baseline serum creatinine for diabetic nephropathy renal disease
- Send urine mcs every trimester
- Fetal surveillance (kick counts and/or biophysical profile (BPP) weekly) at 34wks gestation until delivery
  - Start at 28 wks gestation for Class D and higher, IUGR or coexistent hypertension (HTN)
- Intrapartum management
  - No specific treatment if labour progresses normally and quickly
  - For induction or prolonged labour: add 1/3 of her daily insulin as soluble insulin to 1 L of DNS and treat at 40 dpm
  - For Caesarean: skip AM insulin, start DNS
  - Place oxytocin in separate bag of NS fluid using separate IV access
- Delivery
  - At 39 wks gestation for women with well-controlled blood sugars and no vascular disease
  - At earlier gestation (37-38wks) for Class D and higher, polyhydramnios, macrosomia, poor blood glucose control, chronic HTN on medication or IUGR
  - Caesarean delivery for EFW > 4500g on US

**Postnatal period (insulin needs drop rapidly)**

- Breastfeed infant early and notify paediatricians of maternal diabetes
- Use insulin sliding scale for 5 days post vaginal delivery and then resume pre-pregnancy regimen
- Treat with DNS at 3L daily post Caesarean delivery until tolerating PO and then use insulin sliding scale
- Insulin sliding scale based on blood glucose drawn 1 hr after meals
- Blood Glucose: Insulin dose
  - 0-5 mmol/L: None
  - 5-8 mmol/L: 4 units soluble
  - 8-12 mmol/L: 8 units soluble
  - 12-16 mmol/L: 12 units soluble
  - 16-20 mmol/L: 16 units soluble
Diabetic ketoacidosis

- Often triggered by an infection
- Very severe condition that requires prompt diagnosis and treatment to avoid morbidity and mortality
- Presents with nausea and vomiting, thirst, polyuria, polydipsia, altered mental status, either known history of diabetes or not
- Exam is significant for tachycardia, tachypnoea, fruity breath (due to ketones)
- Do point-of-care urinalysis for ketones and/or leukocytes
- Check RBS every 1-2 hours if possible
- Send blood for FBC with differential
- Send urine mcg
- Management based on reducing blood glucose in controlled manner
  - On admission: NS 1L over 30 min Soluble insulin 20units IV STAT followed by soluble insulin 12-20 units IM every 2 hours
    - Add 20 mmol KCl to first litre of NS
    - Monitor K and anion gap every 1-2 hours until stable if available
  - Next 2 hours NS 1L over 1 hour x 2 L
  - Next 4 hours NS ½ L over hour x2 L
  - RBS < 12 mmol/L DNS Insulin sliding scale
HEADACHE IN PREGNANCY

Introduction/Definition
Headaches are common in reproductive-age women and thus are common in pregnancy. More than 90% of headaches are migraine headaches or tension-type headaches, but more serious aetiologies should be considered, such as preeclampsia, cerebrovascular haemorrhage or thrombosis, intracranial mass and meningitis.

Diagnosis
*History* Gestational age (consider preeclampsia/eclampsia if gestational age > 20 wks and high BP), triggers, alleviating factors, location, chronic headaches (prior to pregnancy) vs. new onset vs. increased severity, any underlying depression.

*Exam* Fever (infectious aetiologies), focal vs. generalized neurologic signs

*Investigations* CT or MRI of head if focal neurologic signs, LP

Management (depends on aetiology) if no obvious cause,
- Reassurance and bed rest if mild.
- Paracetamol 1000 mg PO 6hourly
- Short course of NSAIDS (< 48 hours)
- Phenergan 25 mg or Metoclopramide 10 mg
- Narcotics if severe (tramadol, codeine or morphine) or not responding to other medications.
HEPATITIS B INFECTION IN PREGNANCY

Introduction/Definition
Pregnant women who are actively infected with hepatitis B virus (HBV) may transmit HBV to their offspring (10-20% of HBsAg-positive women and 90% of HBsAg/HBeAg-positive women). Vertically acquired HBV can result in a chronic carrier state in up to 90% of infected infants with progression to cirrhosis and/or hepatic carcinoma.

Diagnosis
*For known HBV exposure in susceptible patient*
If known HBV exposure, then immunoprophylaxis with hepatitis B immunoglobulin (HBIG) if available and vaccine.

*For HBsAg-positive women*
- Send blood for expanded hepatitis B serology and ALT to evaluate for active HBV infection.
- No specific antiviral treatment available for acute HBV infection; 90-95% of adults will recover spontaneously and develop immunity.
- Consult physician regarding lamivudine for chronic HBV infection.
- Prevent neonatal infection (85-95% effective): give HBIG and vaccine (1st in series of 3 injections) to newborn within 12 hrs of birth; alert paediatricians.
HIV IN PREGNANCY

Introduction/Definition
HIV affects up to 15% of pregnancies in Malawi. Without any intervention, MTCT is as high as 45%. With efficacious combination antiretroviral therapy (ART), this risk decreases to 1-5%.

Diagnosis
History/Exam Regardless of risk factors, all pregnant and breastfeeding women should be offered HIV testing in an opt-out approach.

Investigations Point-of-care HIV testing should be offered to all HIV-negative women at 3-month intervals during the antenatal and breastfeeding periods. In addition, HIV testing should be repeated in HIV-negative women: (1) in labour ward if their last test was over 6 weeks ago and (2) at the 6 week postnatal visit.

Management
- All HIV-infected pregnant and breastfeeding women should be on ART.
- Start ART (for lifetime) when ready, ideally on same day as diagnosis.
- TDF/XTC/EFV is first line therapy (regimen 5A).
- Start cotrimoxazole in all HIV-infected pregnant women, regardless of CD4 count, WHO stage or gestational age. Do not give sulfadoxine pyrimethamine (e.g. Fansidar).
- Laboratory tests at the following time points
  - At baseline: Cr, FBC, LFT, syphilis test, CD4 count, urinalysis
- Vaginal delivery unless obstetric indication for caesarean delivery.
- Breastfeeding is encouraged
- Continue ART during labour and delivery and for life
- NVP syrup for infant for 6 wks (dose based on infant weight)
- Cotrimoxazole syrup for infant starting at 6 wks until final HIV testing results return as negative
HERPES SIMPLEX AND PREGNANCY

Introduction/Definition
Although its incidence is 1 in 2500 to 1 in 20,000 live births, neonatal herpes simplex virus (HSV) infection is associated with a case fatality rate as high as 50-60%, with 50% of survivors suffering severe neurologic sequelae. Neonatal HSV infection results from in utero transmission (5% of cases); contact with infected maternal genital secretions at delivery (85%); and postnatal transmission (10%).

Diagnosis
History/Exam Classic presentation of small, very painful vesicular lesions, but suspect for any vesicular or ulcerative genital lesions with or without pain; prior history of HSV is not always elicited

Management
• Indication: Acyclovir dose (oral tablets)
  o First clinical episode: 200 mg 5x daily for 7-14 days or 400 mg TDS for 7-14 days
  o Recurrent episode(s): 200 mg 5x daily for 5 days or 400 mg TDS for 5 days
  o History of HSV (daily suppressive therapy): 400 mg BD at ≥ 36 wks gestation until delivery
• Active lesions: treat with oral acyclovir, topical lidocaine and sitz baths.
• Active lesions and PPROM: expectant management because the risks of prematurity often outweigh the risks of neonatal HSV infection; treat with oral acyclovir.
• Disseminated HSV or HSV-related pneumonitis, hepatitis, and/or encephalitis: treat with acyclovir IV.
• Mode of delivery
  o Vaginal delivery if there are no active genital lesions or prodromal symptoms.
  o Caesarean delivery if there are active genital lesions or prodromal symptoms even if membranes are ruptured.
  o Vaginal delivery with lesions covered if there are non-genital lesions (i.e. on the thighs).
• Infant and infected mother can be together.
• Counsel on hand washing and hygiene techniques to prevent postnatal transmission.
• Breastfeeding is contraindicated only for breast lesion(s).
KAPOSI’S SARCOMA

Introduction/Definition
Kaposi’s sarcoma is a low-grade vascular tumour associated with human herpes virus 8 (HHV-8). KS is a WHO Stage IV illness.

Diagnosis
History/Exam Papular lesions found on lower extremities, face, oral mucosa or soles of feet; assorted colours due to vascularity; lymphoedema (clinical diagnosis).

Investigations HIV test with CD4+ cell count and FBC, Cr, AST for antiretroviral therapy (ART) initiation; skin biopsy can be done if needed.

Management
- All patients with KS are eligible for ART regardless of CD4+ cell count:
  - ART prevents new KS lesions.
  - ART may induce immune reconstitution inflammatory syndrome (IRIS).
- Chemotherapy is indicated in patients with:
  - KS lesions > 25 in number
  - Extensive oedema
  - Symptomatic visceral involvement
  - IRIS
  - Need to weigh risks and benefits to decide whether to deliver and start chemotherapy vs. start chemotherapy while still pregnant
MALARIA IN PREGNANCY

Introduction/Definition
Febrile illness caused by species of plasmodium, mostly plasmodium falciparum in our setting. Increased risk of malaria infection compared to non-pregnant women, especially in primigravidas.

Maternal complications
- Severe anaemia
- Preterm birth
- IUGR
- Placental abruption
- Hypoglycaemia when taking quinine
- Pulmonary oedema
- Cerebral malaria

Diagnosis:
History/Exam  Fever, chills, headache, myalgia and malaise.
Investigations  Malaria parasite smear

Prevention
- Insecticide-treated mosquito nets
- Intermittent Presumptive Treatment of Malaria in pregnancy (IPTp)
  - Give at least 2 doses of Sulphadoxine Pyrimethamine (SP) 525 mg 3 tablets for each dose, after the 1st trimester.
  - The 2 doses should be given at least 4 weeks apart, under direct observation by health personnel.

Management
- Manage complication as for any adult
- Give Quinine 20mg/kg body weight loading dose, followed by 10mg/kg 12-hourly for 7 days, as follows:
  - Start with IV quinine in 10% glucose infusion or 5% glucose in normal saline.
  - If for some reason quinine cannot be given by infusion: give 10mg/kg dosage by IM injection and refer immediately. Make sure you give 10% glucose concentration or one bottle of 5% glucose before administration of quinine; be careful not to induce pulmonary oedema.
  - Random blood sugar should be done before and after quinine administration.
- Shift to oral quinine (during 1st trimester) and LA (in 2nd and 3rd trimester) as soon as the patient can take medicines orally.
SYMPHILIS IN PREGNANCY

Introduction/Definition
Syphilis is a STI caused by spirochete *Treponema pallidum* that can be transmitted from mother to fetus. 75% of infants born to mothers with active syphilis will become infected in utero leading to miscarriages, stillbirth, neonatal death, neonatal disease or latent infection.

Diagnosis. All pregnant women should be screened for syphilis at their first contact with medical personnel using VDRL or RPR.

Management
- Benzathine penicillin G 2.4 MU IM once weekly for 3 doses
  - If allergic to penicillin, then erythromycin 500 mg PO QID x 15 days
- Partner notification and treatment.
- Fetal US to identify severely infected fetus (enlarged placenta, IUGR, microcephaly, hepatosplenomegaly, hydrops).
- Alert paediatricians so that they can evaluate the neonate for congenital syphilis.
THYROID DISEASE IN PREGNANCY

Introduction/Definition
Although thyroid disease in pregnancy is not common, it is associated with perinatal morbidity and mortality. Hyperthyroidism, when untreated or uncontrolled, is associated with spontaneous abortion, stillbirth, IUGR, preterm labour, preeclampsia and cardiomyopathy.

Hyperthyroidism is usually due to Graves disease (thyroid-stimulating antibodies). Thyroid storm is a life-threatening emergency that is typically triggered by infection, surgery or labour.

The most common aetiologies of hypothyroidism are Hashimoto thyroiditis, postablation or thyroidectomy, primary atrophic hypothyroidism and iodine deficiency. Because maternal subclinical hypothyroidism has been associated with neuropsychological decrements in children, consider screening pregnant women with the following for thyroid disease: personal or family history of thyroid disease, signs/symptoms suggestive of goitre or hypothyroidism, type 1 diabetes and personal history of other autoimmune disorders.

Diagnosis/Management

Hypothyroidism

History/Exam:
Fatigue, muscle cramps, hair loss, inability to concentrate, constipation and dyspnea.

Investigations:
Increased TSH, Decreased free T4 (fT4), Decreased FTI

Management:
Goals of therapy:
• TSH at or slightly below normal
• fT4 at the upper limit of normal

Pre-established hypothyroidism:
• Levothyroxine daily dose usually increases in pregnancy.
• Send blood for fT4 and TSH every trimester so that dose can be changed to maintain goals of therapy.
• Send blood more frequently (but≥ 4 wks apart) if indicated.

New diagnosis of hypothyroidism:
• Start with levothyroxine 50-100mcg PO OD and increase every 4wks to achieve goals of therapy (most require 150-300 mcg PO OD).
• Send blood for fT4 and TSH every 4 wks until goals of therapy are attained and then every 8-12 wks.

Hyperthyroidism

History/Exam:
Tachycardia, thyromegaly, failure to gain weight, heat intolerance, fatigue, palpitations and warm moist skin.

Investigations: Decreased TSH, Increased fT4

Management:
• Start with PTU 100-150mg PO TDS until fT4 is at upper limit of normal.
• Maintain with PTU 50-150mg PO OD.
• Stop PTU for jaundice, fever, chills, sore throat, petechiae or bleeding gums; switch to methimazole 5-10mg PO TDS.
• Send blood for fT4 or FTI every 4 wks throughout pregnancy.
• Follow every 1-2 wks; keep pulse <100 and monitor weight gain.
• If indicated, then propranolol 10-40mg PO every 6-12 hours.
• For preterm labour, do not treat with beta-mimetics and use magnesium sulphate with caution due to possible volume overload and cardiomyopathy.

Thyroid storm

History/ Exam:
Tachycardia >150 bpm, fever, altered mental status, hypertension, diarrhoea, nausea, vomiting, severe dehydration, and fetal tachycardia +/- high output cardiac failure and arrhythmia.

Investigations
Leukocytosis, electrolyte abnormalities (i.e. hypercalcaemia), elevated LFTs, increased fT4 and fT3.

Management
• Manage in SOU or ICU.
TRAUMA IN PREGNANCY

Introduction/Definition
Trauma is a leading cause of morbidity and mortality in reproductive-age women; pregnant women are not excluded.

Diagnosis
History/Exam/Investigations If trauma is reported, regardless of visible signs of injury, the patient and her fetus should be thoroughly evaluated.

Management
- Ensure safety of the woman first
- Check airway, breathing, circulation (ABC)
  - If airway is blocked, then foreign body removal
  - If upper airway is inflamed and cannot be relieved, then tracheotomy
  - If airway is patent, then check breathing
  - If breathing is compromised, then look for cause and treat accordingly
  - Involve general surgeons if operative management may be needed (i.e. ICD)
  - If breathing is compromised due to weakness of respiratory muscles, then intubation
  - Once breathing addressed, check circulation via BP and pulse rate (quality and rate)
  - Insert 2 large bore cannulae (i.e. 16G) for possible resuscitation
  - If shock, then give IV fluids to keep BP ≥100/60 while waiting for blood products
  - Take blood for Hb and X-match for whole blood
- Catheterise a patient in haemorrhagic shock to monitor urine output
- Start fluid chart (strict ins and outs)
- Raised foot of bed to ensure adequate circulation to vital organs
- Look for other deformities and treat accordingly
- Confirm viability of fetus with US
- Monitor for signs of abruption
- Give Rhogam if available
TUBERCULOSIS IN PREGNANCY

Introduction/Definition
Caused by Mycobacterium tuberculosis, tuberculosis (TB) is an infection that typically attacks lungs (pulmonary TB, or PTB) but can affect any organ system.

Maternal risks
- Hepatotoxicity of isoniazid is increased in pregnancy, therefore requires increased monitoring.

Fetal risks
- Postnatally acquired infection if mother has active disease.
- Teratogenicity of drugs, streptomycin associated with ototoxicity, should be avoided in pregnancy

Diagnosis
1) Pulmonary TB: new case, confirmed AFB positive
History/Exam
- Productive cough
- Pleuritic chest pains
- Haemoptysis
- Bronchial breath sounds

Investigations
- Sputum AFB
- CXR
- HIV testing (if unknown status)

Management
- 2 months of RHZE daily followed by 4 months of RH daily
- Dosage is dependent on the weight of the patient

2) Pulmonary TB: relapse or treatment failure
History/Exam
- Same as above with history of TB treatment

Investigations
- Sputum AFB
- Sputum c+s
- CXR
- HIV testing (if unknown status)

Management
- SRHZ for 2 months, RHZE for 1 month, RHE for 5 months
- Dosage is dependent on the weight of the patient

*In pregnancy, treat as new case, avoid streptomycin, and consult physicians.
**Post partum, neonates born to mother with active disease should be given isoniazid prophylaxis.

Isoniazid = H
Rifampin = R
Pyrazinamide = Z
Ethambutol = E
Streptomycin = S
URINARY TRACT INFECTION IN PREGNANCY

Introduction/Definition
Urinary tract infection (UTI) and progression to pyelonephritis is a common complication in pregnancy due to untreated asymptomatic bacteriuria. UTI is defined as ≥ 100,000 organisms/ml if asymptomatic or >100 orgs/ml with pyuria (>7 WBCs/ml) if symptomatic.

Diagnosis
History/Exam Dysuria, increased frequency and urgency, retropubic/suprapubic pain, abdominal pain. For acute pyelonephritis: spiking fevers or chills, loin pain or tenderness, rib cage tenderness, anorexia, nausea and vomiting.

Investigations Urinalysis, urine microscopy (clean-catch, midstream sample)

Management

Acute cystitis (infection limited to the bladder)
- Amoxicillin 500 mg PO BID for 5 days or nitrofurantoin 100mg BID for 3 days.
- Check urine culture and sensitivities if available. Adjust antibiotics as indicated, especially if first-line treatment fails.
- If UTI recurs, then check urine culture and sensitivities. Adjust antibiotics.

Acute pyelonephritis (infection of upper tract, mainly of renal pelvis +/- parenchyma)
- Mostly in 2nd and 3rd trimester.
- Signs and symptoms
  - Backache, fever, rigors and renal angle tenderness
- Increased risk of preterm labor
- Management
  - Admit
  - FBC, creatinine, urea and electrolytes and urine culture
  - Monitor urine output
  - Ceftriaxone 1g od continue until afebrile for 24hrs, then give oral amoxyl for total 14 days
  - Check urine culture and sensitivities if available prior to starting antibiotic
  - PO or IV hydration
  - Paracetamol 500 mg tds PO for pain and fever

Prophylaxis to prevent future UTIs
- Prophylactic antibiotics (i.e. trimethoprim/sulfamethoxazole DS one tablet PO OD or amoxicillin 250mg PO OD or nitrofurantoin 100 mg OD) until 2 wks postnatal.
- Indications: acute cystitis, pyelonephritis, recurrent or persistent asymptomatic bacteriuria.
VARICELLA INFECTION IN PREGNANCY

Introduction/Definition
Highly contagious, varicella zoster virus (VZV) is transmitted by infected secretions from the nasopharynx, by direct contact with vesicular fluids or by air borne spread. The most infectious period spans from 48 hours before rash appears until vesicles have crusted over which is 5-7 days after onset of rash.

Maternal complications
- Bacterial superinfection
- Pneumonia
- Arthritis
- Glomerulonephritis
- Myocarditis
- Ocular disease
- Adrenal insufficiency
- Encephalitis

Fetal risks
- Congenital varicella syndrome, if maternal infection between 8 and 20 weeks.
- Neonatal varicella (born to mothers who are infected within 2 weeks of delivery)

Diagnosis
History/Exam Fever, malaise, pruritic maculopapular rash (clinical diagnosis)
Investigations Send VZV IgG only if needed.
US findings suggestive of fetal varicella syndrome include: hydrops, hyperechogenic foci in the liver and bowel, cardiac malformations, limb deformities, microcephaly, and/or IUGR.

Management
For pregnant women with VZV infection:
- Any suspicious rash should be seen immediately.
- Avoid contact with susceptible individuals for 5-7 days after onset of rash.
- Treat symptoms and practice clean hygiene.
- Treat with acyclovir 800 mg oral 5x daily for 7 days if ≥ 20 wks gestation and rash < 24 hrs (intravenous acyclovir in cases of pneumonia and CNS involvement)
- Postpone delivery until 5-7 days after onset of rash, even at term.
- For the infant born to a woman with VZV:
  - Notify pediatricians of maternal infection - Neonatal ophthalmic exam soon after birth
  - Treat with varicella zoster immunoglobulin (VZIG) if birth and onset of maternal rash occur within 7 days of each other + intravenous acyclovir.
  - Monitor for infection until 28 days after the onset of maternal rash; treat neonatal infection with acyclovir.

For susceptible pregnant women with known exposure:
- Send blood for VZV IgG.
- If significant exposure and seronegative for VZV IgG, treat with VZIG within 10 days of contact and manage as infectious for 8-28 days after.
ABNORMAL UTERINE BLEEDING

Introduction/Definition
Menstrual flow outside of normal volume, duration, regularity, or frequency is considered abnormal uterine bleeding. The duration of normal menstrual flow is generally 5 days and the normal menstrual cycle typically lasts between 21 and 35 days.

Menorrhagia: heavy menstrual bleeding, typically defined as menstrual blood loss > 80 mL
Menometrorrhagia: bleeding between periods
Menorrhagia: heavy menstrual bleeding and bleeding between periods
Oligomenorrhea: bleeding that occurs less frequently than every 35 days
Polymenorrhea: bleeding that occurs more often that every 21 days

PALM-COEIN classification system introduced in 2011 by FIGO and classified uterine bleeding abnormalities by bleeding pattern as well as by etiology:

<table>
<thead>
<tr>
<th>PALM: Structural Causes</th>
<th>COEIN: Nonstructural Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyp</td>
<td>Coagulopathy (Von Willebrand’s, warfarin use, etc.)</td>
</tr>
<tr>
<td>Adenomyosis</td>
<td>Ovulatory dysfunction (PCOS, thyroid disease, etc.)</td>
</tr>
<tr>
<td>Leiomyoma</td>
<td>Endometrial (endometritis, AVMs.)</td>
</tr>
<tr>
<td>Malignancy &amp; hyperplasia</td>
<td>Iatrogenic (medications)</td>
</tr>
<tr>
<td></td>
<td>Not yet classified</td>
</tr>
</tbody>
</table>

Diagnosis

History/Exam Age of menarche/menopause, menstrual bleeding pattern, severity of bleeding (clots or flooding), pain (severity and treatment), medical conditions, surgical history, use of medications (coumadin, NSAIDs, hormonal contraception, etc.), symptoms of possible hemostatic disorder (easy bruising/bleeding). On exam, check BMI, look for signs for PCOS (hirsutism, acne) and insulin resistance (acanthosis nigricans on neck), and perform bimanual and speculum exams.

Investigations UPT, FBC (check Hb and Plt), targeted screening for bleeding disorders (if available), TSH and PRL (if available), and pelvic ultrasound. Endometrial biopsy or dilation and curettage for any women who:
  - Is age 45 years or older
  - Has postmenopausal bleeding
  - Has history of unopposed estrogen exposure (including PCOS).

Management

Treatment is dependent on the aetiology of amenorrhea. Iron supplementation for symptomatic anaemia.

1. Structural causes (PALM)

   Polyp: polypectomy in operating theatre.

   Adenomyosis: dysmenorrhea, menorrhagia, bulky uterus on exam or ultrasound
   - Hormonal treatment with either oral contraceptive pills, Provera, or Depo-provera injection
   - Panadol and Bufren as needed
   - If adnexal mass noted on exam or ultrasound, consider cystectomy/oophorectomy for possible endometrioma
   - Consider hysterectomy if done with childbearing

   Leiomyoma: menorrhagia; may feel pressure on bladder, rectum or spine; large bulky uterus on exam; fibroids noted on ultrasound
   - Hormonal treatment with either oral contraceptive pills, Provera or Depo-provera injection
   - Panadol and Bufren as needed
   - Consider hysterectomy if done with childbearing
**Malignancy & hyperplasia:**
WHO divides hyperplasia into 3 classifications, which have different incidence rates for endometrial cancer:

1) Simple without atypia (1%)
2) Complex without atypia (3%)
3) Simple with atypia (8%)
4) Complex with atypia (29%)

For hyperplasia with atypia, a hysterectomy +/- BSO should be done if childbearing is complete. If hyperplasia without atypia or if fertility is desired, can start on Depo-Provera injection or Provera 10-20 mg PO daily with endometrial sampling every 3 months until hyperplasia is resolved, and then yearly thereafter.

For malignancy, patient will need to be taken for exploratory laparotomy, TAH/BSO, staging, and possible pelvic and periaortic lymph node dissection.

**FIGO Staging for Cancer of the Corpus Uteri (2014)**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>Tumor confined to the corpus uteri</td>
</tr>
<tr>
<td>IAa</td>
<td>Less than half myometrial invasion</td>
</tr>
<tr>
<td>IBa</td>
<td>Invasion equal to or more than half of the myometrium</td>
</tr>
<tr>
<td>IIa</td>
<td>Tumor invades cervical stroma, but does not extend beyond the uterus b</td>
</tr>
<tr>
<td>IIIa</td>
<td>Local and/or regional spread of the tumor</td>
</tr>
<tr>
<td>IIIAa</td>
<td>Tumor invades the serosa of the corpus uteri and/or adnexae c</td>
</tr>
<tr>
<td>IIIBa</td>
<td>Vaginal involvement and/or parametrial involvement c</td>
</tr>
<tr>
<td>IIICa</td>
<td>Metastases to pelvic and/or para-aortic lymph nodes c</td>
</tr>
<tr>
<td>IIIC1a</td>
<td>Positive pelvic nodes</td>
</tr>
<tr>
<td>IIIC2a</td>
<td>Positive para-aortic nodes with or without positive pelvic lymph nodes</td>
</tr>
<tr>
<td>IVa</td>
<td>Tumor invades bladder and/or bowel mucosa, and/or distant metastases</td>
</tr>
<tr>
<td>IVAa</td>
<td>Tumor invasion of bladder and/or bowel mucosa</td>
</tr>
<tr>
<td>IVB a</td>
<td>Distant metastasis, including intra-abdominal metastases and/or inguinal nodes</td>
</tr>
</tbody>
</table>

a Either G1, G2, or G3.
b Endocervical glandular involvement only should be considered as Stage I and no longer as Stage II.
c Positive cytology has to be reported separately without changing the stage.
2. Nonstructural causes (COEIN)

*Coagulopathy:* Refer to Haematology.

**Ovulatory dysfunction:**
- *Adolescence:* combined hormonal contraceptive pills.
- *Androgen-Producing Tumours:* Ovarian tumours should be removed via salpingo-oophorectomy and sent to Pathology for histologic evaluation. Adrenal tumours should be referred to Surgery for management.
- *Congenital Adrenal Hyperplasia:* refer to Pediatrics/Endocrinology.
- *CNS Tumours:* refer to Surgery/Neurosurgery.
- *Congenital Adrenal Hyperplasia:* Usually associated with anorexia, poor nutritional status or excessive stress or exercise, so lifestyle changes and counseling to correct these causes should be performed.
- *Hypothyroidism:* start on Levothyroxine 1.6 mcg/kg/day. Recheck TSH in 6 weeks and titrate dose by 12-25 mcg/day as needed, rechecking TSH every 6 weeks until normal TSH level.
- *Perimenopause:* can start on oral contraceptive pills (progestin-only pills if history of hypertension or other risk factors for thromboembolic disease), Depo-Provera injections, or Provera pills as needed.
- *Pituitary Insufficiency:* Refer to Medicine/Endocrinology.
- *Pituitary Lesion (Prolactinoma, Craniopharyngioma, etc.):* Refer to Surgery/Neurosurgery.
- *Polycystic Ovarian Syndrome:* encourage weight loss if overweight or obese as it will reduce their risks for diabetes, infertility, and endometrial cancer. Treat with combined hormonal contraceptive pills for both management of oligomenorrhea and acne and prevention of endometrial hyperplasia. Can consider spironolactone 50 mg BD for treatment of hirsutism if available.
- *Premature Ovarian Failure:* Estrogen therapy (combined hormonal contraceptive pills) should be given for bone protection and treatment of menopausal symptoms. Estrogen patches with cyclic progestin can also be given if available.
- *Thyroid Disease:* management per etiology of disease. Consider referral to Medicine. If hypothyroid, can start on Levothyroxine 1.6 mcg/kg/day. Recheck TSH in 6 weeks and titrate dose by 12-25 mcg/day as needed, rechecking TSH every 6 weeks until normal TSH level.

*Endometrial:* may be secondary to endometritis/PID or uterine arteriovenous malformations (AVMs). Management as per etiology of disease.

*Iatrogenic:* secondary to medications such as hormonal contraceptives, intrauterine devices, or tricyclic antidepressants.

*Not yet classified:* for causes of AUB that do not fit into other categories.

**References**


ABORTION

**Introduction/Definition**
An abortion is any pregnancy loss before 28 weeks gestation, the age of viability in Malawi.
Consider abortion in any woman of reproductive age with a history of amenorrhea and one or more of the following: bleeding, abdominal pain, partial expulsion of products of conception (POCs), dilated cervix or smaller uterus than expected.

<table>
<thead>
<tr>
<th>Types of Abortion</th>
<th>Diagnosis/Definition</th>
<th>Signs and symptoms</th>
<th>Investigations</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Threatened abortion</strong> (pregnancy still viable and may continue)</td>
<td>• Minimal bleeding/spotting</td>
<td>• Ultrasound for viability</td>
<td>• No specific treatment (self-limiting condition)</td>
<td>• Heavy lifting/work discouraged</td>
</tr>
<tr>
<td></td>
<td>• Minimal/no abdominal pain</td>
<td>• Group &amp; save*</td>
<td>• Pelvic rest/avoid coitus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Closed cervix</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Uterine size = GA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Viable fetus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Incomplete abortion</strong> (POCs are partially expelled)</td>
<td>• Heavy bleeding with passage of POCs</td>
<td>• Group &amp; save*</td>
<td>Three options for management:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Abdominal pain/cramping</td>
<td>• Hb as needed</td>
<td>1) Expectant management (in hospital)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Open cervix</td>
<td>• Crossmatch as needed</td>
<td>• For up to 2 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Uterine size &lt; GA</td>
<td></td>
<td>2) Medical management (in hospital)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• For &lt; 13 weeks: misoprostol 400 mcg SL (or) 600 mcg PO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• For &gt;13 weeks**: no good evidence but can consider misoprostol 400 mcg</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>PV/SL q3hrs x 5 doses</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>3) Surgical management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• MVA preferred if &lt; 9 weeks GA; D&amp;C if MVA not available</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Bereavement counseling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Family Planning: can start immediately</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Doxycycline 100 mg BD x 3 days or Metronidazole 400 mg BD x 5 days</td>
<td></td>
</tr>
</tbody>
</table>

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*Note: Management options may vary based on local protocols and resources.*
<table>
<thead>
<tr>
<th>Complete abortion (POCs are completely expelled)</th>
<th>Missed abortion (pregnancy is no longer viable but no POCs have been expelled)</th>
<th>Surgical management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Minimal bleeding</td>
<td>• History of passage of POCs</td>
<td>1) Expectant management (in hospital)</td>
</tr>
<tr>
<td>• History of passage of POCs</td>
<td>• Minimal abdominal pain</td>
<td>For up to 2 weeks</td>
</tr>
<tr>
<td>• Minimal abdominal pain</td>
<td>• Closed cervix</td>
<td>2) Medical management (in hospital)</td>
</tr>
</tbody>
</table>
| • Closed cervix                                                                                                     | • Small uterus                                                                                                                       | For <12 weeks: misoprostol 800 mcg PV or 600 mcg SL, may be repeated every 3 hours, up to 2 additional doses  
|                                                                                                                     |                                                                             | For 12-24 weeks*: misoprostol 400 mcg PV every 6 hours until delivery  
|                                                                                                                     |                                                                             | For 24-28 weeks**: misoprostol 200 mcg PV every 4 hours until delivery |
| • Group & save*                                                                                                     | • Hb as needed                                                                                                                       | Surgical management                                            |
| • Ultrasound to confirm empty uterus (no gestational sac)                                                           | • Ultrasound to confirm non-viability:*                                           | 1) MVA preferred: dilation & curettage if MVA not available  
|                                                                                                                     | - Crown rump length ≥ 7 mm without cardiac activity                                                                                   | Consider cervical ripening with misoprostol 400 mcg PV or SL 2-3 hrs prior to procedure  
|                                                                                                                     | - Mean sac diameter ≥ 25 mm without embryo                                                                                           | 2) TM: dilation & evacuation with osmotic dilator cervical preparation |
|                                                                                                                     | - Absence of cardiac activity ≥ 2 wk after U/S showed gestational sac without yolk sac                                                | Bereavement counseling                                         |
|                                                                                                                     | - Absence of cardiac activity ≥ 11 days after U/S showed gestational sac with yolk sac                                               | Family Planning: can start immediately                         |
| • Evacuation not necessary                                                                                        | Three options for management                                                                                                         | Doxycycline 100 mg BD x 3 days or Metronidazole 400 mg BD x 5 days |
|                                                                                                                     | 1) Expectant management (in hospital)                                                                                                 | Resuscitation: IVF +/- blood transfusion                       |
|                                                                                                                     | • For up to 2 weeks*                                                               | Monitor VS and urine output                                    |
|                                                                                                                     | 2) Medical management (in hospital)                                                                                                   | X-Pen 2.4 MU IV q6h, Gentamicin 80 mg IV q8h, Metronidazole 500 mg IV q8h, starting immediately upon |
|                                                                                                                     | • For <12 weeks: misoprostol 800 mcg PV or 600 mcg SL, may be repeated every 3 hours, up to 2 additional doses  
|                                                                                                                     | • For 12-24 weeks*: misoprostol 400 mcg PV every 6 hours until delivery  
|                                                                                                                     | • For 24-28 weeks**: misoprostol 200 mcg PV every 4 hours until delivery |
|                                                                                                                     | Surgical management                                            | 1) MVA preferred: dilation & curettage if MVA not available  
|                                                                                                                     | • Consider cervical ripening with misoprostol 400 mcg PV or SL 2-3 hrs prior to procedure  
|                                                                                                                     | 2) TM: dilation & evacuation with osmotic dilator cervical preparation |
|                                                                                                                     | Bereavement counseling                                         | Family Planning: can start immediately                         |
|                                                                                                                     | Doxycycline 100 mg BD x 3 days or Metronidazole 400 mg BD x 5 days |

**Septic abortion (any of the above with clinical infection of the uterus and its contents)**

<table>
<thead>
<tr>
<th>Septic abortion (any of the above with clinical infection of the uterus and its contents)</th>
<th>Septic abortion (any of the above with clinical infection of the uterus and its contents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• T ≥ 38°C</td>
<td>• T ≥ 38°C</td>
</tr>
<tr>
<td>• Maternal PR &gt; 100 bpm</td>
<td>• Maternal PR &gt; 100 bpm</td>
</tr>
<tr>
<td>• Purulent vaginal discharge/POCs</td>
<td>• Purulent vaginal discharge/POCs</td>
</tr>
<tr>
<td>• Pelvic pain/tenderness</td>
<td>• Pelvic pain/tenderness</td>
</tr>
<tr>
<td>• Possible pregnancy interference</td>
<td>• Possible pregnancy interference</td>
</tr>
<tr>
<td>• FBC with differential</td>
<td>• FBC with differential</td>
</tr>
<tr>
<td>• Group &amp; save*</td>
<td>• Group &amp; save*</td>
</tr>
<tr>
<td>• Crossmatch as needed</td>
<td>• Crossmatch as needed</td>
</tr>
<tr>
<td>• Bedside clotting time</td>
<td>• Bedside clotting time</td>
</tr>
<tr>
<td>• Resuscitation: IVF +/- blood transfusion</td>
<td>• Resuscitation: IVF +/- blood transfusion</td>
</tr>
<tr>
<td>• Monitor VS and urine output</td>
<td>• Monitor VS and urine output</td>
</tr>
<tr>
<td>• X-Pen 2.4 MU IV q6h, Gentamicin 80 mg IV q8h, Metronidazole 500 mg IV q8h, starting immediately upon</td>
<td>• X-Pen 2.4 MU IV q6h, Gentamicin 80 mg IV q8h, Metronidazole 500 mg IV q8h, starting immediately upon</td>
</tr>
</tbody>
</table>
### References

11. **Society of Family Planning Cervical preparation for second-trimester surgical abortion prior to 20 weeks’ gestation.** Contraception 2014;89:75-84.

---

**Table:**

<table>
<thead>
<tr>
<th>Diagnosis, prior to evacuation, for a total of 14 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evacuation by experienced doctor under GA (high risk for perforation)</td>
</tr>
<tr>
<td>Watch out for coagulopathy</td>
</tr>
</tbody>
</table>

---

**Notes:**

*Group and save determines ABO blood group plus Rhesus. Give anti-D 250 IU IM x 1 if Rhesus negative and sensitized.

**Misoprostol may be used with caution up until 28 weeks GA in women with 1 prior scar; consider using half the recommended dose instead. If more than one prior low transverse caesarean delivery or history of Classical incision, then discuss use of misoprostol of oxytocin with Consultant. Misoprostol should not be given to any woman with a prior scar and gestational age > 28 weeks."
ADNEXAL MASSES

Introduction/Definition
Adnexal masses are a common reason for gynecologic referral. Although most adnexal masses are benign, the goal of the diagnostic evaluation is to exclude malignancy. Management decisions often are influenced by the age and family history of the patient; older age and family history of breast or ovarian cancers raise the index of suspicion for malignancy.

Diagnosis

History Abdominal pain, nausea/vomiting, abdominal swelling, +/- light PVB

Exam May be difficult to palpate on pelvic exam and/or abdominal exam

Investigations
UPT: rule out pregnancy/ectopic pregnancy.
Pelvic US: note size, simple versus solid and/or cystic, cystic wall structure (smooth versus papillary projections), and presence/absence of ascites.
Laboratory: CA-125 may be considered in postmenopausal women with high index of suspicion for cancer.

Differential diagnosis:
1) Gynecologic
   a. Benign
      i. Functional cyst
      ii. Leiomyomata
      iii. Endometrioma
      iv. Tuboovarian abscess
      v. Ectopic pregnancy
      vi. Mature teratoma
      vii. Serous cystadenoma
      viii. Mucinous cystadenoma
      ix. Hydrosalpinx
   b. Malignant
      i. Germ cell tumour
      ii. Sex-cord or stromal tumour
      iii. Epithelial carcinoma (papillary serous,
2) Nongynecologic
   a. Benign
      i. Diverticular abscess
      ii. Appendiceal abscess or mucocele
      iii. Nerve sheath tumours
      iv. Ureteral diverticulum
      v. Pelvic kidney
      vi. Paratubal cysts
      vii. Bladder diverticulum
   b. Malignant
      i. Gastrointestinal cancers
      ii. Retroperitoneal sarcoma
      iii. Metastases

Management
- If asymptomatic simple cyst up to 10 cm, may be managed with observation and serial pelvic ultrasounds as needed.
- If asymptomatic cyst noted during the luteal phase, may be a corpus luteal cyst. Repeat pelvic ultrasound in 6 weeks during follicular phase of cycle to assess for resolution of cyst.
- If severe pain with cyst > 2 cm, consider emergency laparotomy for suspected torsion. Torsion may also present with nausea, vomiting, fever, and elevated WBC.
• If symptomatic cyst > 4 cm, can consider exploratory laparotomy and cystectomy versus oophorectomy depending on surgical findings.
• If symptomatic with fever, consider tubo-ovarian abscess and treat with inpatient antibiotics. Plan for exploratory laparotomy if no improvement within 48 hours.
• Send all surgical specimens for histopathology. Consider frozen section if any features concerning for malignancy noted (papillary excresances, ascites, metastases).
• Perform staging if pathology positive for malignancy.

**FIGO Staging for ovarian and peritoneal carcinoma**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Tumor limited to ovaries (one or both)</td>
</tr>
<tr>
<td>IA</td>
<td>Tumor limited to one ovary; capsule intact, no tumor on ovarian surface. No malignant cells in ascites or peritoneal washings.</td>
</tr>
<tr>
<td>IB</td>
<td>Tumor limited to both ovaries; capsules intact, no tumor on ovarian surface. No malignant cells in ascites or peritoneal washings.</td>
</tr>
<tr>
<td>IC</td>
<td>Tumor limited to one or both ovaries with any of the following: capsule ruptured, tumor on ovarian surface, malignant cells in ascites or peritoneal washings.</td>
</tr>
<tr>
<td>II</td>
<td>Tumor involves one or both ovaries with pelvic extension</td>
</tr>
<tr>
<td>IIA</td>
<td>Extension and/or implants on uterus and/or tube(s). No malignant cells in ascites or peritoneal washings.</td>
</tr>
<tr>
<td>IIB</td>
<td>Extension to and/or implants on other pelvic tissues. No malignant cells in ascites or peritoneal washings.</td>
</tr>
<tr>
<td>IIIC</td>
<td>Pelvic extension and/or implants (T2a or T2b) with malignant cells in ascites or peritoneal washings.</td>
</tr>
<tr>
<td>III</td>
<td>Tumor involves one or both ovaries with microscopically confirmed peritoneal metastasis outside the pelvis</td>
</tr>
<tr>
<td>IIIA</td>
<td>Microscopic peritoneal metastasis beyond pelvis (no macroscopic tumor)</td>
</tr>
<tr>
<td>IIIB</td>
<td>Macroscopic peritoneal metastasis beyond pelvis 2 cm or less in greatest dimension</td>
</tr>
<tr>
<td>IIIC</td>
<td>Peritoneal metastasis beyond pelvis more than 2 cm in greatest dimension and/or regional lymph node metastasis</td>
</tr>
<tr>
<td>IV</td>
<td>Distant metastasis (excludes peritoneal metastasis)</td>
</tr>
</tbody>
</table>
AMENORRHEA

Introduction/Definition
1) Primary amenorrhea:
- No menses by age 14 years in absence of growth/development of secondary sexual characteristics
- No menarche by age 16 years old with normal growth and secondary sexual characteristics.

2) Secondary amenorrhea:
- Cessation of menses for 6 months after menarche if regular periods
- Cessation of menses for 3 cycles if irregular periods

Diagnosis
1) Primary amenorrhea
History Ask about pubertal development, family history (including mental retardation), neonatal/child health (for congenital adrenal hyperplasia), galactorrhea, headaches, visual field defects, polyuria/polydipsia stress/weight change/exercise, current medications

Exam Check height/weight/BMI, look for signs of androgen excess (clitoral enlargement, hirsutism, acne, deepening voice), Tanner staging of breasts and pubic hair growth, bimanual exam to evaluate for presence of uterus, speculum exam to evaluate for cervicovaginal anomalies.

Investigations: Pelvic ultrasound to determine if uterus is present or absent and to evaluate ovaries.

A. If Uterus Absent:
1. Evaluate breast/pubic hair growth and check serum testosterone level +/- karyotype if available
   a. If elevated female testosterone level, look for signs of virilisation:
      i. If signs of virilisation absent, patient likely has Complete Androgen Insensitivity (46, XY) and usually has breast development, sparse/absent pubic and axillary hair, and a blind vaginal pouch.
      ii. If signs of virilisation present, patient likely has 5α-reductase deficiency or Partial Androgen Insensitivity (both are 46, XY) and usually does not have breast development, but may have a blind vaginal pouch.
   b. If normal female testosterone level, patient likely has Uterine Agenesis (46, XX) and will have normal breast and pubic hair development and a blind vaginal pouch.

B. If Uterus Present:
1. Check UPT to rule out Pregnancy
2. Check for signs of androgen excess:
   a. If signs of androgen excess present, patient likely has Polycystic Ovarian Syndrome (PCOS), Late-Onset Congenital Adrenal Hyperplasia (CAH), or an Androgen-Producing Tumour (ovarian or adrenal tumours).
      i. Perform CT scan to evaluate for adrenal tumour.
      ii. Check serum testosterone if available to evaluate for PCOS or tumours.
      iii. Check morning 17OH-progesterone level if available to evaluate for CAH.
   b. If signs of androgen excess absent, do progesterone withdrawal test* (see below) and check FSH, TSH, and Prolactin if available:
      i. If no withdrawal flow to progesterone, patient may have Gonadal Dysgenesis, Hypothalamic Amenorrhea, Pituitary Lesion, Chronic Disease, or CNS Tumour.
         a. Do trial of combined hormonal contraceptive pill for 1-3 months to evaluate for withdrawal flow with hypothalamic amenorrhea, anorexia nervosa, and chronic disease.
         b. Neurologic assessment (including evaluation of sense of smell) +/- CT scan or MRI brain (if available) to evaluate for CNS or pituitary tumour.
         c. TSH and PRL to evaluate for hypothyroidism and hyperprolactinemia.
            i. Elevated TSH: Hypothyroidism
ii. Elevated PRL: Pregnancy/Postpartum/Postabortion, Drugs**, Hypothyroidism, Chest Wall Stimulation, Prolactinoma, CNS Tumours, Bronchogenic/Renal Carcinoma -> do fasting PRL and consider MRI brain (if available)
d. FSH if available
   i. If FSH elevated, likely gonadal dysgenesis or autoimmune oophoritis -> can check karyotype or for autoimmune antibodies (antiovarian, antiadrenal, anti thyroid) if available.
   ii. If FSH normal, likely PCOS or sometimes hypothalamic amenorrhea or chronic disease.
   iii. If FSH low, likely hypothalamic amenorrhea, anorexia, or chronic disease.
   ii. If has withdrawal flow to progesterone, likely hypothalamic amenorrhea, chronic disease, or PCOS.

*Progestrone withdrawal test: give Medroxyprogesterone or Norethindrone 10mg orally once a day for 5 or 10 days. If the patient has an estrogen-primed endometrium and is not pregnant, she will have a period 3 to 10 days after the last progesterone tablet if her estradiol level was > 50 pg/ml.

**Drugs which cause hyperprolactinemia: Benzodiazapines, Haldol, Risperdone, Metoclopramide, Amitryptyline, Phenothiazines, Reserpine, Methyldopa, Prostaglandins, Cimetidine, Cocaine.

2) Secondary amenorrhea: evaluation is the same as women with Primary Amenorrhea with a Uterus Present. However, also consider Asherman’s Syndrome or Pituitary Insufficiency due to Sheehan’s Syndrome if patient has had prior uterine surgery or delivery. Patients with either condition will no withdrawal flow to progesterone, but patients with Asherman’s Syndrome will have normal FSH, whereas patients with Pituitary Insufficiency will have low FSH. Hysteroscopy can also be done to evaluate for Asherman’s Syndrome.

Management
Treatment is dependent on the aetiology of amenorrhea:

5α-Reductase Deficiency: Refer to a Specialist. Treatment will depend on whether patient prefers to have a female or male social role.

Androgen Insensitivity (Complete or Partial): Gonads should be prophylactically removed after patient has attained full height and breast development because they have a high rate of malignant degeneration with formation of dysgerminoma. Until then, serial pelvic ultrasounds can be performed to assess for development of a pelvic mass. After gonadectomy, patients should receive estrogen replacement.

Androgen-Producing Tumours: Ovarian tumours should be removed via salpingo-oophorectomy and sent to Pathology for histologic evaluation. Adrenal tumours should be referred to Surgery for management.

Asherman’s Syndrome: hysteroscopic lysis of adhesions, followed by estrogen treatment to stimulate regrowth of endometrial tissue.

Cervicovaginal Anomalies: Diagnoses include imperforate hymen, transverse vaginal septum, agenesis of the cervix or vagina. Women often present with cyclic abdominal pain and hematocolpos or hematometra on ultrasound. Treatment is with surgery +/- postoperative use of dilators to prevent scarring.

Congenital Adrenal Hyperplasia: refer to Pediatrics/Endocrinology.

CNS Tumours: refer to Surgery/Neurosurgery.

Hypothalamic Amenorrhea: Is usually associated with anorexia, poor nutritional status or excessive stress or exercise, so lifestyle changes and counseling to correct these causes should be performed.
**Hypothyroidism:** start on Levothyroxine 1.6 mcg/kg/day. Recheck TSH in 6 weeks and titrate dose by 12-25 mcg/day as needed, rechecking TSH every 6 weeks until normal TSH level.

**Gonadal Dysgenesis (Turner’s Syndrome or 45, X0):** These women may have short stature, broad chest, webbed neck, low hairline, short 4th or 5th metacarpals, ptosis, low-set ears, narrow high-arched palate, micrognathia, lymphedema, or multiple pigmented nevi. They are at higher risk for hearing impairment, hypertension, diabetes, Hashimoto’s thyroiditis, celiac disease, cardiac anomalies (bicuspid aortic valve, coarctation of the aorta, mitral valve prolapse, dissecting aneurysms), and renal anomalies (horseshoe kidneys, unilateral pelvic kidney, hydronephrosis, etc.). Renal ultrasound and echocardiogram are often done at time of diagnosis. If diagnosed prior to age 15 years, they should be started on synthetic growth hormone if available. Otherwise, they should be started on estradiol 5 ug/kg per day for bone protection, which can be given via the combined hormonal contraceptive pill if estrogen alone is not available. Rarely, these women may achieve pregnancy.

**Pituitary Insufficiency:** Refer to Medicine/Endocrinology.

**Pituitary Lesion (Prolactinoma, Craniopharyngioma, etc.):** Refer to Surgery/Neurosurgery.

**Polycystic Ovarian Syndrome:** encourage weight loss if overweight or obese as it will reduce their risks for diabetes, infertility, and endometrial cancer. Treat with combined hormonal contraceptive pills for both management of oligomenorrhea and acne and prevention of endometrial hyperplasia. Can consider spironolactone 50 mg BD for treatment of hirsutism if available.

**Uterine Agenesis:** Renal ultrasound to evaluate for renal anomalies. Can consider use of vaginal dilators to create vaginal pouch when she is an adolescent. Dilators should be applied the same time every day for at least 2 months.

**References**
ANTIBIOTIC PROPHYLAXIS FOR GYNAECOLOGIC PROCEDURES

Introduction/Definition
Antibiotic prophylaxis is antibiotic use for the purpose of preventing, not treating, infection. For abdominal procedures, pre-operative antibiotics should be given 30-60 minutes prior to skin incision to decrease bacterial load of gram-positive skin flora. Post-operatively, patients should be given antibiotics to cover both gram-negative and anaerobic bacteria that may have contaminated the pelvic during the procedure for at least 5 days.

Diagnosis
History/Exam/Investigations Document need for pre-operative antibiotics clearly in pre-operative orders. After surgery, document in operative note whether or not antibiotic prophylaxis was given and write for post-operative antibiotic regimen.

Management

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Pre-operative (give 30-60 minutes before skin incision)</th>
<th>Post-operative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilation and curettage/evacuation</td>
<td>None</td>
<td>1) Doxycycline 100 mg PO BD x 3 days, or 2) Metronidazole 400 mg po BD x 5 days</td>
</tr>
<tr>
<td>Hysterosalpingogram or chromotubation</td>
<td>None</td>
<td>Doxycycline 100 mg PO BD x 5 days</td>
</tr>
<tr>
<td>Laparoscopy</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Vaginal hysterectomy and/or Urogynaecology procedures</td>
<td>1) Metronidazole 500 mg IV x 1 or Clindamycin 600 mg IV x 1, plus Gentamicin 1.5 mg/kg IV x 1 or Levofloxacin 400 mg IV x 1</td>
<td>None, unless evidence of infection during surgery (see below)</td>
</tr>
<tr>
<td>Abdominal hysterectomy (elective)</td>
<td>For Gram Positive skin flora: 1) Cefazolin 1-2 g IV, or 2) Ampicillin 2 g IV x 1, or 3) X-Penicillin 3 MU IV x 1</td>
<td>None, unless evidence of infection during surgery (see below)</td>
</tr>
<tr>
<td>Other Laparotomy</td>
<td>None, unless suspicion for intraabdominal infection: 1) Cefazolin 1-2 g IV, or 2) Ampicillin 2 g IV x 1, or 3) X-Penicillin 3 MU IV x 1</td>
<td>None, unless evidence of infection during surgery: 1) For Gram-Negative pelvic flora: Ceftriaxone 2g IV (or) Gentamicin 240 mg IV x 1 day (or until patient is tolerating po, then Amoxicillin 500 mg PO TDS x 4 days (or to complete a 5-day course) 2) For Anaerobic pelvic flora: Metronidazole 500 mg IV TDS or Clindamycin 600 mg IV q6h x 1 day (or until patient is tolerating po), then Metronidazole 400 mg PO TDS x 4 days (or to complete a 5-day course)</td>
</tr>
</tbody>
</table>

Reference
CERVICAL CANCER SCREENING

Introduction/Definition
Cervical cancer is caused by human papillomavirus (HPV). Precancerous lesions (cervical intraepithelial neoplasia = CIN) begin in the transformation zone and may take 6 months to several years to develop into cancer. Alternatively, CIN may persist for life. The objective of cervical cancer screening, most commonly performed here as visual inspection with acetic acid (VIA), is to detect precancerous lesions and treat them before they progress to cancer. CIN1 reflects mild dysplasia, CIN2 moderate dysplasia, and CIN3 severe dysplasia.

Diagnosis

History/Exam/Investigations

1) HIV-negative women: women aged 25 years should be screened for cervical cancer at least once every 3-5 years until age 50.
2) HIV-positive women: women should start screening at the time of HIV diagnosis and then continue every 3 years until age 65. For women who were born with HIV, screening should be initiated by age 21 years.
3) For all women: if a woman has never been screened before, screening should be offered even if she exceed the normal upper age limit.

Management

Screening methods

1) Visual Inspection with Acetic Acid (VIA): based on clinical examination with speculum, light, 3-5% acetic acid applied to the cervix x 1 minute, and visual determination of disease by trained health care worker.
2) Visual Inspection with Lugol’s Iodine (VILI): based on clinical examination with speculum, light, potassium iodine applied to the cervix x 1 minute, and visual determination of disease by trained health care worker.
3) Papanicolaou (Pap) smear: cytology-based cervical smear with speculum, light, cervical cytobrushes, microscopic slide, and a trained laboratory and pathologist.
4) HPV DNA testing: based on cervical swab and requires PCR capabilities to detect active infection of the most common HPV subtypes.

Management of VIA Positive:
- Patient is eligible for cryotherapy if:
  - Entire squamocolumnar junction is visible
  - Entire lesion is visible and does not extend into the endocervical canal or beyond the cryoprobe
  - Lesion covers <75% of ectocervix
    - After cryotherapy, patient should follow-up after 1 year.
- If patient is not eligible for cryotherapy, loop electrosurgical excision procedure (LEEP) should be done.
  - After LEEP, patient should follow-up after 6 weeks to review pathology results.
    - If result shows CIN1 or less, rescreen within 3 years.
    - If result shows CIN2 or CIN3, rescreen after 1 year.

Management of abnormal pap smear (ASCUS, LSIL, HSIL, malignant cells)
- Colposcopy with directed biopsies +/- endocervical curettage (if no lesions) should be performed

Management of abnormal cervical biopsy results (CIN1, CIN2, CIN3, invasive cancer)
- CIN1: rescreen within 3 years if HIV-positive, 5 years if HIV-negative
- CIN2: offer cryotherapy or LEEP
- CIN3: offer cryotherapy or LEEP; if HIV-positive, can also offer hysterectomy (preferably vaginal)
- Invasive cancer: complete FIGO staging

*Note: If patient is pregnant and found to be VIA+, she can have a pap smear done (without endocervical sampling), but should not have cryotherapy, cervical biopsy, or LEEP performed. If she needs to have any of these procedures performed, she should follow-up 6 week postpartum to have them done.
**FIGO Cervical Cancer Staging (2014)**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>The carcinoma is strictly confined to the cervix (extension to the uterine corpus should be disregarded).</td>
</tr>
<tr>
<td>IA</td>
<td>Invasive cancer identified only microscopically. (All gross lesions even with superficial invasion are Stage IB cancers.) Invasion is limited to measured stromal invasion with a maximum depth of 5 mm and no wider than 7 mm.</td>
</tr>
<tr>
<td>IA1</td>
<td>Measured invasion of stroma ≤ 3 mm in depth and ≤ 7 mm width.</td>
</tr>
<tr>
<td>IA2</td>
<td>Measured invasion of stroma &gt; 3 mm and &lt; 5 mm in depth and ≤ 7 mm width.</td>
</tr>
<tr>
<td>IB</td>
<td>Clinical lesions confined to the cervix, or preclinical lesions greater than stage IA.</td>
</tr>
<tr>
<td>IB1</td>
<td>Clinical lesions no greater than 4 cm in size.</td>
</tr>
<tr>
<td>IB2</td>
<td>Clinical lesions &gt; 4 cm in size.</td>
</tr>
<tr>
<td>II</td>
<td>The carcinoma extends beyond the uterus, but has not extended onto the pelvic wall or to the lower third of vagina.</td>
</tr>
<tr>
<td>IIA</td>
<td>Involvement of up to the upper 2/3 of the vagina. No obvious parametrial involvement.</td>
</tr>
<tr>
<td>IIA1</td>
<td>Clinically visible lesion ≤ 4 cm.</td>
</tr>
<tr>
<td>IIA2</td>
<td>Clinically visible lesion &gt; 4 cm</td>
</tr>
<tr>
<td>IIB</td>
<td>Obvious parametrial involvement but not onto the pelvic sidewall.</td>
</tr>
<tr>
<td>III</td>
<td>The carcinoma has extended onto the pelvic sidewall. On rectal examination, there is no cancer free space between the tumor and pelvic sidewall. The tumor involves the lower third of the vagina. All cases of hydronephrosis or non-functioning kidney should be included unless they are known to be due to other causes.</td>
</tr>
<tr>
<td>IIIA</td>
<td>Involvement of the lower vagina but no extension onto pelvic sidewall.</td>
</tr>
<tr>
<td>IIIB</td>
<td>Extension onto the pelvic sidewall, or hydronephrosis/non-functioning kidney.</td>
</tr>
<tr>
<td>IV</td>
<td>The carcinoma has extended beyond the true pelvis or has clinically involved the mucosa of the bladder and/or rectum.</td>
</tr>
<tr>
<td>IVA</td>
<td>Spread to adjacent pelvic organs.</td>
</tr>
<tr>
<td>IVB</td>
<td>Spread to distant organs.</td>
</tr>
</tbody>
</table>

**References**


CHRONIC PELVIC PAIN

Introduction/Definition
Chronic pelvic pain is defined as intermittent or constant pain that occurs in the lower abdomen or pelvis for at least six months. It may be associated with menses or intercourse; it is not associated with pregnancy. Organ systems of aetiology include: gynaecologic (20% of cases; adenomyosis, adhesive disease, endometriosis, leiomyoma, PID), gastrointestinal (inflammatory bowel disease, irritable bowel syndrome, diverticulitis), urologic (interstitial cystitis), psychological, musculoskeletal (pelvic floor pain), or neurological (diabetic neuropathy, spinal cord injury).

Diagnosis
History Ascertain possible causes, covering every possible organ system of aetiology. Ask about frequency/timing of pain, location of pain, precipitating factors, prior surgeries, prior diagnoses/treatments, abnormal vaginal discharge, menorrhagia, dysmenorrhea, dyspareunia, dysuria, hematuria, dyschezia, tenesmus, association with food intake, diarrhea, constipation.

Exam
- Examine abdomen for evidence of scars from prior surgeries and palpate all 4 quadrants with superficial and deep palpation.
- Perform bimanual exam to assess for cervical motion tenderness (CMT), uterine tenderness or enlargement, and adnexal tenderness/masses.
- Examine vulva for signs of irritation or lesions
- Perform speculum exam to assess for abnormal discharge and vaginal/cervical lesions.

Investigations UPT, urinalysis, gonorrhea/chlamydia screening if available, pelvic US for pelvic masses.

Management
Depends on possible aetiologies:
- **Adenomyosis**: dysmenorrhea, menorrhagia, bulky uterus on exam or ultrasound
  - Hormonal treatment with either oral contraceptive pills, Provera, or Depo-provera injection
  - Panadol and Bufren as needed
  - If adnexal mass noted on exam or ultrasound, consider cystectomy/oophorectomy for possible endometrioma
  - Consider hysterectomy if done with childbearing
- **Adhesive disease**: history of prior surgeries, possibly with infection afterwards. Tenderness upon palpation of scar.
  - Panadol and Bufren as needed
  - Consider injections with local anesthetic (Lidocaine, Marcaine, etc.) for trigger points.
- **Endometriosis**: dysmenorrhea; can also have dyspareunia, dysuria, dyschezia
  - Hormonal treatment with either oral contraceptive pills, Provera, or Depo-provera injection
  - Panadol and Bufren as needed
  - If adnexal mass noted on exam or ultrasound, consider cystectomy/oophorectomy for possible endometrioma
  - Consider hysterectomy if done with childbearing
- **Leiomyoma**: menorrhagia; may feel pressure on bladder, rectum or spine; large bulky uterus on exam; fibroids noted on ultrasound
  - Hormonal treatment with either oral contraceptive pills, Provera or Depo-provera injection
  - Panadol and Bufren as needed
  - Consider hysterectomy if done with childbearing
- **Pelvic inflammatory disease (PID)**: CMT and/or uterine/adnexal tenderness, possibly with abnormal discharge or fever -> see Guideline for Gynaecological Infections and Pelvic Inflammatory Disease
COMATOSE PATIENT

Introduction/Definition
The comatose patient requires prompt attention. Coma is a state of deep unconsciousness for a prolonged or indefinite period of time.

Diagnosis
History Elicited from relatives or the ambulance workers: onset of coma, condition in which patient was found, fever, convulsions, any pertinent chronic medical illnesses (i.e. diabetes or asthma), alcohol and/or substance abuse, poisoning, suicide note, etc. Minimal OB history includes parity, GA, and history of PVB.

Exam/Investigations Temperature, vitals/O2 saturation, pallor, jaundice, cyanosis, neck stiffness, Glasgow Coma Scale* (GCS), neurological exam (pupillary reaction, deep tendon reflexes), abdominal exam for peritonitis and/or haemoperitoneum (to assess for uterine rupture or abruptio placentae), check breath for alcohol and/or ketones

Management
- Call for help
- Airway: ventilate if patient is cyanotic
- Breathing: intubate if no spontaneous breathing
- Circulation (check pulse and BP): resuscitate if signs of shock
- Insert urinary catheter and monitor urine output
- Send blood for glucose, FBC, U&Es, and Malaria
- Send blood and urine for culture
- Start IV line
- Treat with 50 ml of 50% dextrose unless glucose is confirmed as normal
- If organophosphate poisoning suspected, then treat with atropine 0.6-2.4 mg IV every 15 min until normal PR, dilatation of pupils, etc. Obtain physician consultation.
- Admit patient to HDU (high dependency unit)
  - Monitor VS, GCS, and pupillary reaction
    - If poisoning, then monitor every 30 min until normal
  - Perform LP if no contraindication
  - Consider Head CT if not improvement within 24 hours or neurological exam suggests possible stroke
  - Take full history when possible
- Nursing care
  - Feeding via nasogastric tube
  - 2 hourly turnings

*Glasgow Coma Scale (range: 3-15)

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<tr>
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<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye</strong></td>
<td>Does not open eyes</td>
<td>Opens eyes in response to painful stimuli</td>
<td>Opens eyes in response to voice</td>
<td>Opens eyes spontaneously</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Verbal</strong></td>
<td>Makes no sounds</td>
<td>Incomprehensible sounds</td>
<td>Utters inappropriate words</td>
<td>Confused, disoriented</td>
<td>Oriented, converses normally</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Motor</strong></td>
<td>Makes no movements</td>
<td>Extension to painful stimuli (decerebrate response)</td>
<td>Abnormal flexion to painful stimuli (decorticate response)</td>
<td>Flexion / Withdrawal to painful stimuli</td>
<td>Localizes painful stimuli</td>
<td>Obeys commands</td>
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Malawi Obstetrics & Gynaecology Protocols
GYNAECOLOGIC INFECTIONS AND PELVIC INFLAMMATORY DISEASE


*Note: all patients who present with STI symptoms should be offered HIV Testing and Counseling.

1) Abnormal Vaginal Discharge

**Causes:** vaginal infection, cervical infection, endometrial infection/pelvic inflammatory disease (PID)

- Common causes of vaginal infections: trichomonas vaginalis, candida albicans and bacterial vaginosis.
- Common Causes of cervical infections: neisseria gonorrheae and chlamydia trachomatis.

**Note:** Vaginal discharge is normal during and after sexual activity, at various points throughout the menstrual period, and during pregnancy and lactation.

**General Management**

- Do risk assessment to identify women at risk of cervical infection
  - Treat for vaginitis to those with negative risk assessment
  - Treat for cervicitis and vaginal infection to those with positive risk assessment.

- Treat all women with vaginal discharge and a positive risk assessment for gonococcus and Chlamydia infection, plus trichomoniasis and bacterial vaginosis:
  - If the discharge is white and curd-like also treat for candidiasis.

- Treat all women with vaginal discharge and a negative risk assessment for trichomoniasis and bacterial vaginosis:
  - If the discharge is white and curd-like, also treat for candidiasis.

**Treatment**

- If vaginal discharge is present and the risk assessment is positive:
  - Gentamycin 240mg IM stat plus
  - Doxycycline 100mg orally every 12 hours for 7 days, plus
  - Metronidazole 2g orally single dose

- If the discharge is white or curd-like add 1 Clotrimazole Pessary 500mg inserted intra-vaginally stat

- If vaginal discharge is present and risk assessment is negative:
  - Metronidazole 2g orally single dose stat

- If the discharge is white or curd-like add 1 Clotrimazole Pessary 500mg inserted intra-vaginally stat

- If no discharge is found and risk assessment is positive:
  - Gentamycin 240mg IM stat plus
  - Doxycycline 100mg orally every 12 hours for 7 days

- If no discharge is found and risk assessment is negative:
  - Reassure client, counsel, educate and provide condoms.
  - Advise client to come back if symptoms persist.
  - Offer HIV testing after providing information and counseling

2) Genital Ulcer Disease

**Common Causes:** genital herpes, chancroid and syphilis may be present concurrently.

- Genital herpes is the most prevalent amongst the three.
- Treat patients with GUD for the above three infections

**General Management**

- Aspirate fluctuant lymph nodes (buboes) through adjacent normal (i.e., uninflamed) skin.
- Do not incise.
- Ask patients to return if non-fluctuant nodes become fluctuant

**Treatment**

- Ciprofloxacin 500mg orally stat and
- Benzathine penicilllin 2.4 MU i/m stat
- Acyclovir 800mg every 12 hours orally for 7 days
- Tell patient to return for follow-up care in 7-10 days, see below
- **Note:** Acyclovir is indicated only in symptomatic GUD clients
If patient allergic to penicillin:
- **Erythromycin** 500mg every 6 hours for 15 days plus
- **Acyclovir** 800mg orally every 12 hours for 7 days

If patient allergic to penicillin/Ciprofloxacin and pregnant or lactating:
- **Erythromycin** 500mg every 6 hours for 15 days and acyclovir 800mg every 12 hours for 7 days
- Infants born to mothers treated for GUD with Erythromycin alone:
- **Benzathine Penicillin** 500,000 IU/kg as a single dose

**Follow-up care of GUD**
- Inform the patient to return 7-10 days after starting treatment.
- *If the ulcers have not healed or are getting worse*, repeat GUD treatment if there is evidence of noncompliance.
- If the client complied fully and there is no improvement:
  - Give **Azithromycin** 2g stat.
  - Review in further 7-10 days
  - If no improvement, *refer for specialist opinion*
  - If improved, *follow patient’s progress until completely healed*
  - No further antibiotics are required at this time
- *If the ulcers have improved but not completely healed*:
  - Repeat chancroid treatment **Ciprofloxacin** 500mg single dose
  - Review in further 7-10 days
- *If ulcers have completely healed*:
  - Reinforce counseling and patient education
  - Promote/provide condoms

3) **Genital Warts (Low-Risk Human Papilloma Infection)**

*Common causes: HPV 6 and 11.*
- Should be distinguished from *condyloma* of secondary syphilis and *molluscum contagiosum*.
- Besides local caustic applications, surgical removal or electrocautery may be used for treatment:
  - For more extensive growth
  - When topical applications have failed
  - When topical applications are contraindicated
- Increase in size and number in pregnancy.
- Risk of juvenile onset recurrent respiratory papillomatosis if exposed to warts during delivery.

*Treatment*
- Apply **Compound Podophyllin Paint** to the lesions at weekly intervals
- Apply **Yellow Soft Paraffin** to avoid normal tissue
- Use only for scattered growth
- When applied to vulval mucosa or to meatal warts, allow to dry before coming back into contact with normal epithelium
- Remove the paint by washing off after 1-4 hours
- If no effect after 4-6 weeks, stop treatment and consider alternative methods of removal

*Alternatively to Podophyllin Paint, and for treating vulvar warts:*
- Apply **Silver Nitrate Stick (pencil)** once daily

*If pregnant:*
- Podophyllin, 5 fluorouracil, and interferons are contraindicated in pregnancy.
- Vaginal delivery can be allowed unless genital warts are obstructing the outlet or will lead to excessive bleeding.
4) **Herpes Simplex Virus**
*Causes:* Type 1 (*affects lips*), Type 2 (*affects genitals but can interchange due to oral sex*)
*Treatment*
- Acyclovir Cream or GV Paint or Silver Sulphadiazine Cream Application twice a day
- Aspirin 300mg or Paracetamol
- In severe conditions give Acyclovir 200-400 mg every 8 hours for 5 to 7 days and consider checking HIV

5) **Pelvic Inflammatory Disease**
*Causes:* most commonly from Gonorrheal or Chlamydial infection but may also be caused by other intra-abdominal/pelvic bacteria.
*Diagnosis:* any 1 of the following 3 symptoms: cervical motion tenderness, uterine tenderness, adnexitis tenderness. May also have abnormal discharge, fever, or elevated WBC.
*Treatment:*
- Gentamicin 240mg IM x 1
- Doxycycline 100 mg q12 hours x 10 days
- Metronidazole 400 mg q12 hours x 10 days
- Treat partner with Gentamicin and Doxycycline
- If not improved within 72 hours, signs of sepsis, or pelvic mass, admit for inpatient treatment:
  - Gentamicin 1.5 mg/kg IV or IM q8 hours
  - Chloramphenicol 500 mg IV q6 hours
  - Metronidazole 500 mg IV q8 hours
  - When improved and able to swallow:
    - Add Doxycycline 100 mg PO q12 hours x 10 days
    - Switch from IV to PO Metronidazole 400 mg q12 hours x 10 days

6) **Syphilis**
*Diagnosis:*
- *Early syphilis:* primary (ulcer), secondary (generalized skin rashes, condylomata lata) or latent syphilis of not more than 2 years duration
- *Late syphilis:* benign, cardiovascular and latent syphilis of more than 2 years; syphilis of indeterminate duration
- Congenital syphilis in children
- Treat as late syphilis all patients with a positive RPR or VDRL and no documented syphilis serology in the last 2 years.
*Treatment for early syphilis:*
- Benzathine Penicillin one dose of 2.4 MU IM
- Divide as 1.2 MU into each buttock
*Alternatively, if hypersensitivity to penicillin:*
  - Doxycycline 100mg every 12 hours for 15 days
  - Note: In pregnancy/lactation, substitute Doxycycline with Erythromycin 500mg every 6 hours for 15 days
*Treatment for late syphilis:*
- Benzathine Penicillin 3 doses of 2.4 MU i/m at weekly intervals
- Divide each weekly dose 1.2 MU into each buttock: total (3 doses) is 7.2 MU
*Alternatively, if hypersensitivity to penicillin:*
  - Doxycycline 100mg orally every 12 hours for 30 days
  - Note: In pregnancy/lactation, substitute Doxycycline with Erythromycin 500mg every 6 hours for 30 days
INFERTILITY

Introduction/Definition
Infertility is the inability for a couple to conceive after regular, unprotected sexual intercourse for one year. Aetiologies of infertility may be found in the female partner, male partner, and/or both partners, or may be unexplained.

Diagnosis

History
- Both partners: prior pregnancies, history of STIs, drug history (alcohol, tobacco), occupational history
- Female: age (≥ 35 years old), height/weight/BMI, previous pelvic and/or abdominal surgery, contraceptive use, menstrual history and any menstrual abnormalities
- Male: previous urogenital or hernia surgery, varicocele and/or genital pathology, mumps

Exam/Investigations - as indicated
- Female: menstrual calendar, pelvic US, HSG; if available: basal body temperature graph, TSH, PRL, day 3 FSH and oestrogen, day 21 progesterone or ovulation predictor kits, diagnostic laparoscopy
- Male: semen analysis (2 samples should be submitted), urine mcs

Management
- Pre-conception management includes weight loss if female BMI > 30 and female rubella and syphilis status.
- HIV testing for both partners.
- Couples should be advised to have regular intercourse 2 - 3 times per wk or can be counseled to use timed intercourse around the time of ovulation if the woman has predictable menstrual cycles.
  - To calculate the day of ovulation, calculate the woman’s menstrual cycle length and subtract 14.
  - The couple should start having intercourse every other day for 7 days, beginning 5 days before her anticipated date of ovulation.
- If woman is overweight, counsel about weight loss as a strategy to improve fertility.
- If woman has abnormal TSH or PRL noted, treat underlying etiology.
- If woman has anovulatory cycles, may consider using clomiphene citrate (Clomid) on days 5-9 of cycle if structural and semen abnormalities have been ruled out. Counsel patient about increased risk of multiple gestation and ovarian hyperstimulation syndrome with Clomid.
- If structural or semen abnormalities are noted, patient may need referral for surgery, intrauterine insemination (IUI), or in vitro fertilization (IVF).
PELVIC ORGAN PROLAPSE

Introduction/Definition
Pelvic organ prolapse is herniation of pelvic organs to or beyond the vaginal introitus. Other terms for pelvic organ prolapse include procidentia, anterior or posterior compartment or apical prolapse, cystocele, rectocele and enterocoele.

Diagnosis
History
Vaginal or pelvic pressure, sensation of vaginal bulge or something falling out of the vagina, +/- vaginal discharge, +/- PVB from ulceration, +/- urinary symptoms (ranging from stress urinary incontinence to urinary retention), +/- defecatory symptoms (ranging from constipation to rectal incontinence), +/- sexual dysfunction

Exam/Investigations
Pelvic exam using POPQ or Baden Walker system to classify

Management
Expectant management
If symptoms are tolerable and the patient prefers to avoid treatment, then the prolapse can be observed and evaluated regularly for the development of worsening urinary and/or defecatory symptoms.

Conservative management usually temporary since prolapse is chronic
- Vaginal pessary (multiple types, multiple sizes)
- Pelvic floor muscle exercises (Kegel’s)
- Oestrogen therapy (vaginal cream or pessary) as an adjunct

Surgical treatment
Procedure of choice depends on many factors, including age, risk factors for recurrence and technical expertise. Surgery should only be considered after child-bearing is complete or if highly symptomatic and conservative measures have failed. Prior to reconstructive surgery of apical prolapse, determine whether anatomic correction of the prolapse will result in stress incontinence (occult urinary incontinence) and consider adding a procedure to prevent post-operative incontinence.
- Abdominal vs. vaginal approach
- Reconstructive vs. oblitative procedure (colpocleisis if no longer sexually active)
- +/- Concomitant hysterectomy
PERIOPERATIVE MANAGEMENT

Introduction/Definition
While perioperative management is individualized to the specific patient and condition requiring surgical intervention, certain steps should be performed.

Diagnosis
History/Exam/Investigations Document clearly the indication for surgery in the file.

Management

Pre-operative management
- Ensure patient is identified and well clerked (thorough history and physical, including clear indication for surgery)
- Explain operation in detail, including risks of additional procedures (i.e. myomectomy may lead to hysterectomy), and then obtain written consent from patient
- If major surgery, then anaesthetist to see the patient on the day before
- Starve patient ≥ 6 hrs for elective cases (emergency surgeries are excluded from this rule)
- Consider baseline investigations
  - Urine pregnancy testing
  - FBC or Hb
  - Group and save (crossmatch for 2U if heavy blood loss anticipated)
  - Renal function tests: only if age >50 years and high-risk surgery
  - U&Es: only if on diuretics or known kidney disease
  - ECG: only if BMI >40 and at least 1 risk factor for coronary heart disease (HTN, DM, smoking)

Post operative management
- Keep nil per os (no oral intake) for procedures done under GA until patient is fully awake; consider slowly advancing diet as tolerated vs. allowing regular diet, dependent on surgery
- Maintenance IV fluids: RL or NS or Dextrose in NS 2L/24 hrs. May need much more if large blood loss before or during surgery. Caution in hypertensive patients.
- Post-operative antibiotics for 5 days for laparotomies.
- Pain control
  - Paracetamol 1,000 mg po q6h or NSAIDS (i.e. ibuprofen, diclofenac) for minor operations
  - Pethidine 100 mg IM every 6 hrs for at least 24 hrs for major operations
- Encourage early ambulation and incentive spirometry to prevent deep venous thrombosis and atelectasis.
- Keep head elevated at 30° to prevent atelectasis and aspiration.

Patients with cardiac disease
- Consult Medicine and Anesthesia for pre-operative assessment and post-operative follow up.
SEPSIS

Introduction/Definition
Sepsis is a systemic response to infection associated with high morbidity and mortality. There is a spectrum of
disease, ranging from sepsis to septic shock. Sepsis is the clinical syndrome that results from a dysregulated
inflammatory response to an infection.

Diagnosis
History Identify aetiology, i.e. dysuria, cough or recent abortion or delivery.

Exam Sepsis exists if two or more of the following abnormalities are present, along with either a culture-proven or
visually identified infection:
- T > 38.5 °C or <35 °C
- PR > 90 beats/min
- RR > 20 breaths/min or PaCO2 <32 mmHg
- WBC > 12,000 cells/mm3, <4000 cells/mm3 or > 10% immature (band) form

Investigations FBC, blood mcs, urine mcs,

Management
- Airway, breathing, circulation (ABC)
  - O2
  - Correct hypotension with IV crystalloid fluids (up to 5 litres in first 6 hours given as 500ml rapid
    boluses
  - If persistent hypotension, then give norepinephrine or phenylephrine
  - If myocardial dysfunction suspected, consult Medicine and Anesthesia
- Broad spectrum antibiotics (X-Penicillin + Ceftriaxone/Gentamicin + Flagyl for 7 days) and/or incision and
drainage (directed by infectious source)
- If severe shock or septic shock, then transfer to HDU or ICU for intensive monitoring
SEXUAL ASSAULT

Introduction/Definition
Sexual assault is defined as non-consensual sexual act. The clinician should complete the history, examination and management in a non-judgmental manner. Record the chain of evidence, what was collected and where it went. If the patient is unable to consent to the exam, then the next of kin or 2 doctors may consent.

Diagnosis

History
Record details of the events before and after the assault, drugs taken voluntarily or involuntarily, force and/or weapons used, condom use, timing and sequence of events, specific events of the assault and post assault hygiene. Ask about LMP, current hormonal contraception and previous intercourse.

Exam
Visualize entire body to draw a detailed body map. Mark abnormalities (i.e. contusions, bites, ligature marks, old and new trauma), distinguishing features (i.e. tattoos, piercings, scars) and areas where swabs were obtained. Include pertinent negatives. For the pelvic exam, visualize before using a speculum. Other common areas of injury include head/neck and anus/rectum. Note tenderness, tears, ecchymosis, abrasions, erythema and oedema. Lack of findings does not mean that the exam is inconsistent with history of sexual assault.

Investigations
Time dependent specimens include sperm/semen, foreign material, swabs of body secretions and fingernail scrapings. Blood and hair from the head or pubic area are NOT time dependent. Also do the following:
- HIV test
- UPT

Management

Step 1:
- Assess and treat serious injuries first
- Obtain verbal consent to conduct physical examination
- Take full history and document all findings
- Conduct full physical examination and document all findings
- Document all facts regarding the assault

Step 2:
- Manage physical effects of the assault such as wounds and bruises – including antibiotics to prevent wound infection, tetanus booster if required, medication for pain relief or anxiety

Step 3:
- Provide emergency contraception if the victim has started menarche and presents within 72 hours post-assault
- **Postinor-2** – take 1 tablet orally, to be repeated after 12 hours or
- **Lo-Femenal** 4 tabs to be repeated after 12 hours

Step 4:
- Treat presumptively for STIs (or conduct laboratory investigations if available):
  - **Benzathine Penicillin** < 25 kg: 600,000 IU stat (if >25 kg, then 1,200,000 IU stat)
  - **Gentamycin 6mg/kg** single dose
  - **Erythromycin 12.5mg/kg** every 6 hours for 7 days
  - **Metronidazole 5mg/kg** every 8 hours for 7 days

Step 5:
- Provide HIV Testing and Counseling
- Conduct an HB baseline reading (if available)
- If the victim presents within 72 hours of penetrative assault, and is HIV negative upon initial testing, and consents to PEP treatment, provide PEP treatment with Duovir BD x 30 days.
  - If the victim has HB ≤ 8 g/dl Duovir must be replaced with LamivirS BD x 30 days
Step 6:
- Provide counseling on post-traumatic stress to victim and guardian
- Assess safety of the victim
- Refer to other support services, such as the Victim Support Unit in the Police

Step 7:
- Advise on dates for follow up visits
- Record Findings and treatment in “Examination Record” and provide copy to the victim for submission to the police, if appropriate
- Record all findings and treatment in health passport
### SURGICAL WOUND DEHISCENCE

**Introduction/Definition**
Dehiscence occurs when fascia, subcutaneous tissue and skin separate prior to healing. Risk factors include: haematoma, excessive intra-abdominal pressure (i.e. coughing or vomiting), DM, malignancies, anaemia, infection, immunosuppression, poor technique and inappropriate suture.

**Steps to prevent surgical wound complications**
- Maintain haemostasis
- Handle tissues gently
- Remove devitalized tissue
- Use monofilament suture
- If subcutaneous tissue ≥ 2 cm depth, then close dead space with subcutaneous suture in Camper’s fascia

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>History/Exam/Investigations</th>
<th>Management</th>
</tr>
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</table>
| Superficial wound dehiscence | • Separation of skin and SC tissue  
• Intact fascia  
• Serosanguineous fluid from closed wound | • Evacuate all hematomas and/or seromas  
• Treat underlying infection  
• Wound care  
• Heal via secondary intention  
• Irrigate wound dressings to remove surface bacteria  
• Do wet-to-dry wound dressings BD  
• If sufficient healthy granulation, then consider superficial vertical mattress closure |
| Fascial dehiscence          | • Separation of skin, SC tissue and fascia  
• Early recognition is critical | • Surgical emergency; act quickly to prevent bowel necrosis, perforation and/or peritonitis  
• If evisceration of abdominal contents, then place abdominal binder with sterile, saline-soaked towels (temporary measure) over fascial dehiscence  
• If critically ill, then place abdominal binder until patient can tolerate definitive treatment  
• Procedure: fascial closure under general anaesthesia after debridement of necrotic or infected tissue and abdominal wash out with warm normal saline |

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UROGENITAL FISTULA

Introduction/Definition
Obstructed labour is the most common cause of urogenital fistulas in Malawi. Other aetiologies include surgery, cervical cancer, radiation therapy and traumatic or instrumental vaginal delivery.

Diagnosis
History Continuous leakage of urine from vagina, +/- vulvar irritation, +/- infections, +/- chronic pyelonephritis leading to renal insufficiency

Exam Speculum exam to identify fistula

Investigations
- Dye test
  - Use catheter to retrograde fill bladder with sterile milk or methylene blue (2-3 drops) mixed with NS in 60 ml aliquots
  - Inspect for obvious fistula and describe location
  - Place tampon or large cotton swabs in vagina and check for sterile milk or dye
  - Staining likely indicates vesicovaginal fistula
  - If no leakage, ask patient to cough or bear down (Valsalva manoeuvre)
  - Wetness with clear fluid may indicate ureterovaginal fistula. Consider oral phenazopyridine to turn urine orange (vs. blue for vesicovaginal fistula)
- Intravenous pyelogram may be indicated if complex history or examination
- US to assess upper renal tract dilation (dilated ureter or renal pelvis)
- Cystoscopy in OT can be useful but often not necessary in large obstetric fistula

Management
Timing
- If urogenital injury is noted at time of surgery or within a few days of surgery, then repair immediately
- Excise and repair within 6-8 wks of delivery when the surrounding tissues are healthy. Small fistulae may heal spontaneously with prolonged catheterization.

Types of repair depending on fistula location
- Suburethral or juxtaurethral VVF: simple vaginal tissue mobilization with layered closure +/- anterior bladder wall mobilization
- Midvaginal or massive VVF: wide tissue mobilization into the paravaginal spaces bilaterally to facilitate closure of the bladder. Consider skin graft to augment or preserve vaginal caliber or depth,
- Juxtacervical VVF: Vaginal approach usually possible, but depends on degree of uterine/cervical descent
- Vesico-endometrial vaginal fistulas: examination +/-cystogram confirms diagnosis; Often requires repair via laparotomy with resection of the fistulous tract from both bladder and uterus, closure of the openings, and then interposition of the omentum or peritoneum; alternative is hysterectomy with excision of fistula from bladder
- Vesico-colonic fistulas: excision of fistula from bladder and colon and interposition of omentum or peritoneum
- Fistulas with total urethral loss: create a neourethra from mobilized anterior bladder, vulvar/labial tissue
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