Obstetrics & Gynaecology
Protocols and Guidelines

The Association of
Obstetricians
and
Gynaecologists of Malawi

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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 practicethroughout Malawi.

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

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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 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. 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 generally 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.

Abbreviations

+/-	with or without
↑	increased or high
↓	decreased or low
~	approximately
°	degree
>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
%	sat percent saturation
ABC	airway, breathing, circulation
AC	abdominal circumference
ACE	angiotensin-converting enzyme
AMTSL	active management of third stage of labour
AFB	acid fast bacillus
AFI	amniotic fluid index
APH	antepartum haemorrhage
aPTT	activated partial thromboplastin time
ALT	alanine transaminase
ART	antiretroviral therapy
AST	aspartate transaminase
ßhCG	beta - human chorionic gonadotropin
BD	twice daily
BMI	body mass index
BP	blood pressure
BPD	biparietal diameter
bpm	beats per minute
BPP	biophysical profile
BS	blood sugar
BT	blood transfusion
BUN	blood urea nitrogen
c+s	culture and sensitivities
CCF	congestive cardiac failure
CD4+ antigen	cluster of differentiation
cm	centimetre
CHD	congenital heart disease
CIN	cervical intraepithelial neoplasia
Cr	creatinine
CSF	central spinal fluid
CST	contraction stress test
CT	computerized tomography
CXR	chest x-ray
CV	cardiovascular
D&E	dilation and evacuation
DBP	diastolic blood pressure
DHEA-S sulphate	dehydroisoandrosterone
DIC	disseminated intravascular coagulopathy
dL	decilitre
DNS	5% dextrose normal saline
dpm	drops per minute
DVT	deep vein thrombosis
EBL	estimated blood loss
ECG	electrocardiogram
EDD	estimated date of delivery
EFV	efavirenz
EFW	estimated fetal weight
EGA	estimated gestational age
EP	ectopic pregnancy
EUA	exam under anaesthesia
FBC	full blood count
FBS	fasting blood sugar
FDP	fibrinogen degradation products
FeSO4	ferrous sulphate
FEV1	forced expiratory volume in 1 second
FFP	fresh frozen plasma
FH	fundal height
FL	femur length
FLM	fetal lung maturity
FSB	fresh stillbirth
FSH	follicle stimulating hormone
fT3	free triiodothyronine
fT4	free thyroxine
FTA	fluorescent treponemal antibody
FTI	free thyroxine index
FVC	forced vital capacity
g	gram(s)
G	gauge
GA	gestational age
GBS	Group B streptococcus
GC	gonococcus (gonorrhoea)
GCS	Glasgow coma scale
GI	gastrointestinal
GnRH	gonadotropin releasing hormone
Hb	haemoglobin
Hb C	haemoglobin C
Hb S	sickle haemoglobin
HBIG	hepatitis B immunoglobulin
HBeAg	hepatitis B envelope antigen
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HC	head circumference
HC:AC	ratio of head circumference to abdominal circumference
hCG	human chorionic gonadotropin
HELLP	haemolysis, elevated liver function tests, low platelets
Hg	mercury
HIV	human immunodeficiency virus
HPV	human papillomavirus
hr(s)	hour(s)

HSG	hysterosalpingogram
HSV	herpes simplex virus
HTN	hypertension / hypertensive
HVS	high vaginal swab
ICU	intensive care unit
IE	infective endocarditis
IgG	immunoglobulin G
IgM	immunoglobulin M
IM	intramuscular
INR	international normalised ratio
IOL	induction of labour
IRIS	immune reconstitution inflammatory syndrome
IU	international units
IUFD	intrauterine fetal death
IUGR	intrauterine growth restriction
IUP	intrauterine pregnancy
IV	intravenous
IVH	intraventricular haemorrhage
K	potassium
kcal	kilocalorie(s)
KCl	potassium chloride
kg	kilogram(s)
KS	Kaposi's sarcoma
L	litre
LBW	low birth weight (< 2500 g)
LEEP	loop electrosurgical excision procedure
LFT	liver function test
LH	luteinizing hormone
LMP	last menstrual period
LMWH	low molecular weight heparin
LP	lumbar puncture
LPV/r	lopinavir/ritonavir
L:S	lechitin:sphingomyelin ratio
max	maximum
mcg	microgram(s)
MCH	mean corpuscular haemoglobin
MCHC	mean corpuscular haemoglobin concentration
mcs sensitivities	microscopy, culture,
MCV	mean corpuscular volume
MEPI	Medical Education Partnership Initiative
mg	milligram(s)
MgSO4	magnesium sulphate
min	minute(s)
mIU	milli-international units
ml	millilitre
mm	millimetre
mm Hg	millimetres of mercury
mmol	millimoles
mos	months
MPS	malaria parasite smear
MRI	magnetic resonance imaging
MSB	macerated stillbirth
MTCT	mother to child transmission
MTX	methotrexate
mU	milli-units
MU	million units
MVA	manual vacuum aspiration
MVP	mitral valve prolapse
NASG	non-pneumatic anti-shock garment
NEC	necrotizing enterocolitis
NICU	neonatal intensive care unit
NS	normal saline
NSAID	non-steroidal anti-inflammatory drug
NST	non-stress test
NVP	nevirapine
O2	oxygen
O2 sat	oxygen saturation
OA	occiput anterior
OB	obstetric / obstetrics / obstetrical
OB US	obstetric ultrasound
OD	once daily
OGTT	oral glucose tolerance test
OT	operating theatre
ox	oximetry
P2	second pulmonary heart sound
PCR	polymerase chain reaction
PG	prostaglandin
PGE2	prostaglandin E2
pH	power of hydrogen
PID	pelvic inflammatory disease
PIH	pregnancy-induced hypertension
plt	platelet(s)
PMTCT	prevention of mother to child transmission of HIV
PO	per os (oral)
POCs	products of conception
PPH	postpartum haemorrhage
PPROM	preterm premature rupture of membranes
PR	pulse rate
PRBC(s)	packed red blood cells
PRL	prolactin
PROM	premature rupture of membranes
PT	prothrombin time
PTU	propylthiouracil
PTD	preterm delivery
PTE	pulmonary thromboembolism
PTL	preterm labour
PTT	partial thromboplastin time
PUPPP	pruritic urticarial papules and plaques of pregnancy
PV	per vagina

PVB	per vagina bleeding
QID	four times daily
RBS	random blood sugar
RDS	respiratory distress syndrome
RDT	rapid diagnostic test
RDW	red blood cell distribution width
retic	reticulocyte
Rh	Rhesus
RI	reticulocyte index
RL	Ringer's lactate
ROM	rupture of membranes
RNA	ribonucleic acid
RR	respiratory rate
SBP	systolic blood pressure
SC	subcutaneous
sec	second(s)
SL	sublingual
SOU	special observation unit
STAT	immediately (statim in Latin)
STI	sexually transmitted infection
T	temperature
TDF	tenofovir
TDF/FTC	Truvada
TDS	three times daily
TIA	Transient ischemic attack
TIBC	total iron binding capacity
TORCH	toxoplasmosis, other (syphilis, varicella zoster, parvovirus B19), rubella, cytomegalovirus, herpes
TPHA	treponema pallidum hemaglutination assay
TPI	treponema pallidum immobilization
TPR	temperature, pulse, respiratory rate
TSH	thyroid stimulating hormone
TVS	transvaginal scan
TVUS	transvaginal ultrasound
U	units
U&Es	urea and electrolytes
UFH	unfractionated heparin
µmol	micromole(s)
UOP	urine output
UPT	urine pregnancy test
US	ultrasound
UTI	urinary tract infection
VDRL	Venereal Disease Research Laboratory
VE	vaginal exam
VIA	visual inspection with acetic acid
VS	vital signs
VTE	venous thromboembolism
VVF	vesicovaginal fistula
VZV	varicella zoster virus
VZIG	varicella zoster immunoglobulin
X-match	cross match
WB	whole blood
WBC	white blood cell
WHO	World Health Organization
WR	Wassermann reaction
wk(s)	week(s)
yo	year old

EARLY PREGNANCY COMPLICATIONS

PREVENTION AND MANAGEMENT OF ALLOIMMUNISATION

Introduction/Definition

Screening for alloimmunization is important as 4% of Malawians are Rh-negative. The most common type of Rh incompatibility occurs when a Rh-negative pregnant mother is exposed to Rh-positive fetal red blood cells secondary to fetomaternal hemorrhage during the course of pregnancy from miscarriage, trauma, [1] invasive obstetric procedures, or normal delivery. In 90% of cases, sensitization occurs during delivery.

Once produced, maternal Rh Immunoglobulin G (IgG) antibodies persist for life and may cross freely from the placenta to the fetal circulation, where they form antigen-antibody complexes with Rh-positive fetal erythrocytes and eventually are destroyed, resulting in a fetal alloimmune-induced hemolytic anemia. [2] The binding of maternal Rh antibodies produced after sensitization with fetal Rh-positive erythrocytes results in fetal autoimmune hemolysis.

The fetus may have red blood cell antigens (i.e. ABO, Rhesus, Kell, Kid, Duffy) that the mother does not. Although the Rh blood group systems consist of many antigen subtypes (e.g., D, C, c, E, e), the D antigen is the most common; therefore, it most commonly is involved in Rh incompatibility. When ≥ 0.1 ml of fetal blood leaks into the maternal circulation, there is a risk that the maternal immune system will form antibodies against the foreign antigen. This is known as alloimmunisation and can occur in pregnancy > 7 wks gestation (including ectopic pregnancy), chorionic villus sampling, cordocentesis, amniocentesis, APH, external cephalic version, abdominal trauma and delivery. Once sensitized, it takes approximately 1 month for Rh antibodies in the maternal circulation to equilibrate in the fetal circulation.

Therefore, most firstborn infants with Rh-positive blood type are not affected unless immunized during a previous blood transfusion, because the short period from first exposure of Rh-positive fetal erythrocytes to the birth of the infant is insufficient to produce a significant maternal IgG antibody response. A small percentage will follow sensitization very early in the pregnancy. 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, Direct Coombs test, syphilis test and HIV; ultrasound (US) for dating, serial US to diagnose and/or monitor.

- All Rh-negative mothers should be tested for antibodies 3 times during pregnancy: at their 1st antenatal visit, at 28 weeks gestation, and at delivery.
- All potentially-affected infants of Rh-negative mothers should be tested for Rh type and antibodies from the umbilical cord at the time of delivery.

Preventive Management

Prevention of Rh alloimmunisation

- Give Rh immunoglobulin immediately after a sensitizing event* (give 150 µg at <20 weeks)
- Give Rh immunoglobulin 300 µg (1500 IU) at 20 wks gestation **or**
- Give Rh immunoglobulin 300 µg (1500 IU) within 72 hrs of delivery if infant is Rh positive.
    - If the RhIG is not administered during the recommended immediate postpartum period, it should still be given up to 28 days postpartum.

*Sensitizing events include vaginal bleeding early in pregnancy, abortion/miscarriage, ectopic

pregnancy, molar, pregnancy, chorionic villus sampling, amniocentesis, blunt trauma to the abdomen, fetal death**, bleeding from placenta previa, manual removal of placenta, or external cephalic version. Rh Ig should be protective against sensitization for 12 weeks.
** Give Rh Ig at time that fetal death is diagnosed rather than waiting until time of delivery.

Minimization of fetomaternal haemorrhage

- Avoid manual removal of placenta
- Immediate clamping of cord and keep cord of fetus long (for possible transfusion)

Management

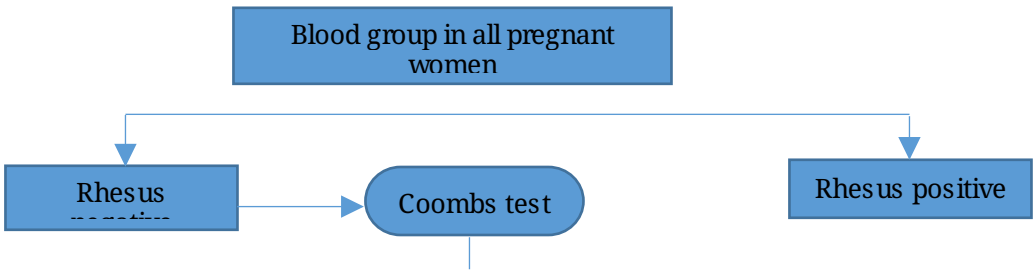
Manifestations of alloimmunization occur after delivery because the bilirubin of in utero haemolysis is cleared by the maternal liver, but after birth this assistance is not available leading to the risk of icterus causing brain damage. A life-threatening condition in infants affected is erythroblastosis fetalis, characterized by severe hemolytic anemia and jaundice. The most severe form of erythroblastosis fetalis is hydrops fetalis, characterized by high output cardiac failure, edema, ascites, pericardial effusion, and extramedullary hematopoiesis. An affected fetus requires referral to the pediatricians.

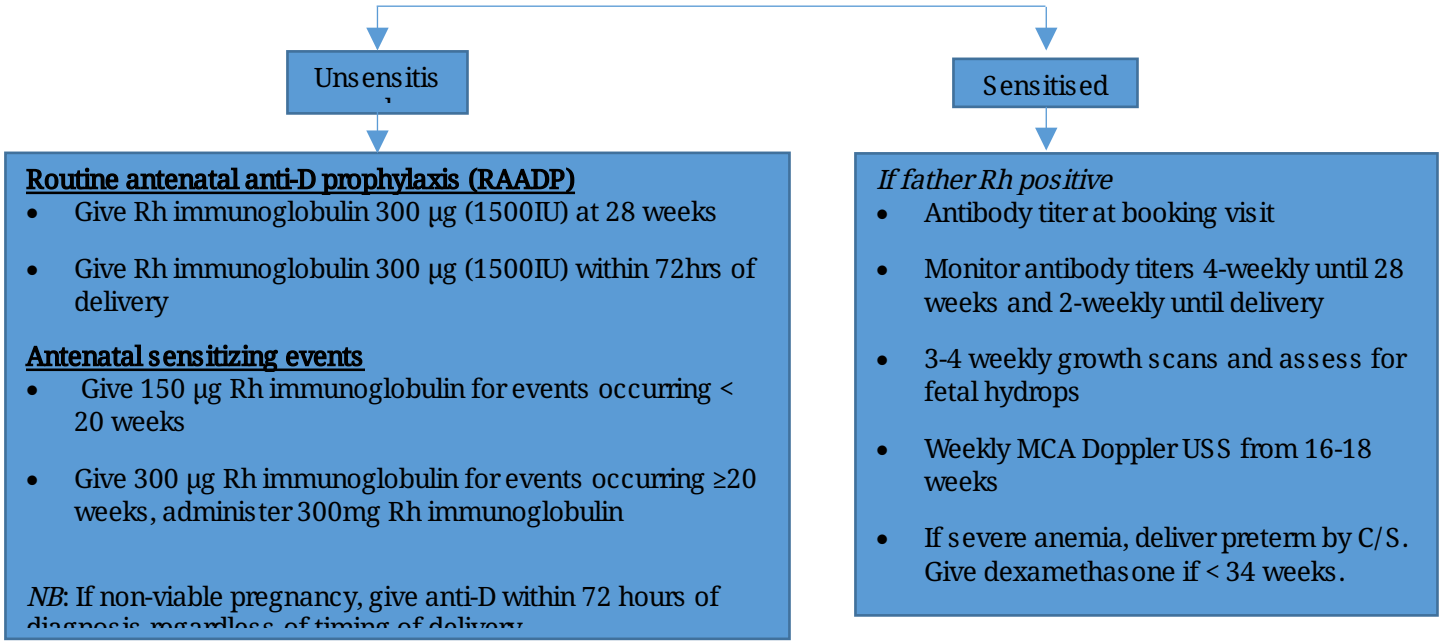
Treatment for sensitized maternal patient (positive Coombs test in Rh negative woman)

- Refer to Specialist for Consultation
- Conservative management: perform monthly US for fetal weight and to look for features of hydrops fetalis (i.e. edema or accumulation of fluid in fetal compartments); if latter are present, then deliver if viable.
- If available, perform US for middle cerebral artery (MCA) Doppler, which can detect fetal anemia, using a threshold value of 1.5 multiples of the median (MoM) to predict moderate-severe fetal hemoglobin. This should begin at 16 to 18 weeks gestation and continue weekly.
    - If severe fetal anemia, consider delivery if viable.
- 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.
- In the 7 to 10 days prior to delivery, oral phenobarbital may be considered to improve hepatic maturity and enhance conjugation of bilirubin.

Intrapartum: timing of delivery is on a case-by-case basis in consultation with a Specialist, but it is reasonable to proceed with induction of labor at 37-38 weeks gestation, or earlier if fetal lung maturity is documented.

Postpartum: women with pregnancies affected by alloimmunization should be counseled that future pregnancies are generally more severely affected.




Unsensitis
Sensitised
Routine antenatal anti-D prophylaxis (RAADP)
Give Rh immunoglobulin 300 µg (1500IU) at 28 weeks
Give Rh immunoglobulin 300 µg (1500IU) within 72hrs of delivery
Antenatal sensitizing events
Give 150 µg Rh immunoglobulin for events occurring < 20 weeks
Give 300 µg Rh immunoglobulin for events occurring ≥20 weeks, administer 300mg Rh immunoglobulin
NB: If non-viable pregnancy, give anti-D within 72 hours of
If father Rh positive
Antibody titer at booking visit
Monitor antibody titers 4-weekly until 28 weeks and 2-weekly until delivery
3-4 weekly growth scans and assess for fetal hydrops
Weekly MCA Doppler USS from 16-18 weeks
If severe anemia, deliver preterm by C/S. Give dexamethasone if < 34 weeks.

CERVICAL INSUFFICIENCY

Introduction/Definition

Cervical insufficiency is a clinical diagnosis characterized by painless cervical dilatation and spontaneous mid trimester pregnancy loss (14 weeks to 24 weeks gestation), in absence of labour and other causes.

Risk factors for cervical insufficiency

- History- past history of recurrent midtrimester losses, cervical surgery (cone biopsy, large loop excision of the transformation zone, D&C
- Structural- congenital uterine abnormalities- septate, bicornuate uterus
- Physical – cervical shortening <25mm before 28 weeks on transvaginal US, cervical tears on physical examination

Indications for cervical cerclage

History-indicated cervical cerclage

- 3 or more spontaneous consecutive midtrimester pregnancy losses that have a typical history of cervical insufficiency
- Placement of history-indicated cerclage is ideally at 13-14weeks gestation

Ultrasound-indicated cervical cerclage

- This is offered to women with previous preterm birth after assessment through cervical length screening
- Cervical length screening- serial transvaginal cervical length assessment between 14-24 weeks gestation. Cervical cerclage is offered before 24 weeks gestation in those women found with a short cervix <25mm.

Physical examination-indicated cervical cerclage

- Physical examination-indicated cerclage is the placement of cervical cerclage in women in the second trimester who present with cervical dilatation in absence of labour or placental abruption.,

Contraindications to cervical cerclage insertion

- Labour, vaginal bleeding, ruptured membranes, chorioamnionitis, placental abruption
- Lethal fetal anomalies, multiple pregnancy
- Cervical dilatation >4cm

Evaluation

History

- Thorough history – obstetric, medical, surgical, social
- Exclude other causes
    - Medical: uncontrolled diabetes, hypertension, thyroid
    - Fetal anomaly, infection, abruption

Exam

- Thorough physical and obstetric evaluation
- Vaginal speculum: scarring, tears, cervical length, infection, cervical dilatation, exclude rupture of membranes
- Wet mount/high vaginal swab: exclude infections
- Urine dipstick

Investigations

- Antenatal screening tests: syphilis, HIV, Rhesus
- Transvaginal US: for cervical length measurement
- Abdominal US: for viability, dating pregnancy, rule out multiple gestation and lethal congenital anomalies

Timing of cervical cerclage insertion

- Between 13-24 weeks

- History-indicated cerclage should be placed as early as possible, starting at 13 weeks

Counselling

- On complications: preterm prelabour rupture of membranes, pregnancy loss, bleeding, infection, hospitalization, procedural risks

Preoperative and postoperative management

- Discuss with Consultant about whether to give Erythromycin 500 mg or Clindamycin 600 mg with Indomethacin 100 mg PO or PR q12 hours for 24 hours post-operative
    - If this regimen is given, patient should be kept in hospital while receiving treatment

Surgical procedure

There are three main techniques used for cervical cerclage insertion described below. The most commonly-used and easiest to learn is the McDonald cerclage.

Procedure	**McDonald cerclage**	**Shirodkar cerclage**	**Abdominal cerclage**
Details	Commonly performed and usually recommended	Reserved for very short cervix	Reserved for women with hypoplastic cervix and where vaginal procedure is not feasible
Technique	• Place circumferential purse-string suture around the cervix at the vesicocervical junction in 4 separate suture bites • Use non-absorbable sutures (i.e. mersilene, nylon, and prolene) • Tie knot anteriorly or posteriorly; *document location* • Avoid vessels at 3 and 9 o'clock	• Similar to McDonald but suture is submucosal • Expect more blood loss • Use mersilene tape • Make 2-3 cm anterior transverse submucosal incision at the vesicocervical junction • Reflect bladder superiorly by 1-2 cm; make similar incision posteriorly and do rectal dissection superiorly • Place suture anterior to posterior or vice versa • Close mucosa	• Requires a lot of expertise Risk of excessive haemorrhage from branches of uterine artery • Laparotomy for access • Done at 13-15 wks • Dissect bladder inferiorly • Place mersilene tape through the tissues of the lateral cervix at the internal os • Caesarean delivery is required

Post-operative management

- Immediate post-operative care includes
    - Analgesia
    - Antibiotic continuation
    - Normal diet unless complication
    - Discharge next day after assessment
    - Bedrest- where clinically indicated but not as a routine for all patients
- Routine ANC unless otherwise indicated with repeated counseling regarding infection, labour, PROM

Antenatal care

- Monthly
- Preterm labour: tocolysis for steroid administration if no contraindications and <34 weeks
    - After 34 weeks, remove cervical cerclage and do not give tocolysis
- PPROM: remove cervical cerclage

Cervical cerclage removal

- If no problems, routine removal at 36-37 weeks gestation
- Other indications:
    - Regular contractions -> then follow preterm labour protocol
    - PPROM ->then follow PPROM protocol
    - Intrauterine fetal death -> then follow IUFD protocol
    - Antepartum hemorrhage
    - Chorioamnionitis

ECTOPIC PREGNANCY

Introduction/Definition
Ectopic pregnancy is a pregnancy that occurs outside of the uterus. The most common location is the fallopian tube, but other possible sites include: cervical, cornual, ovarian, abdominal, or within a hysterotomy scar. The chance of a heterotopic pregnancy (including both a uterine and extrauterine pregnancy) is very rare, but can occur.

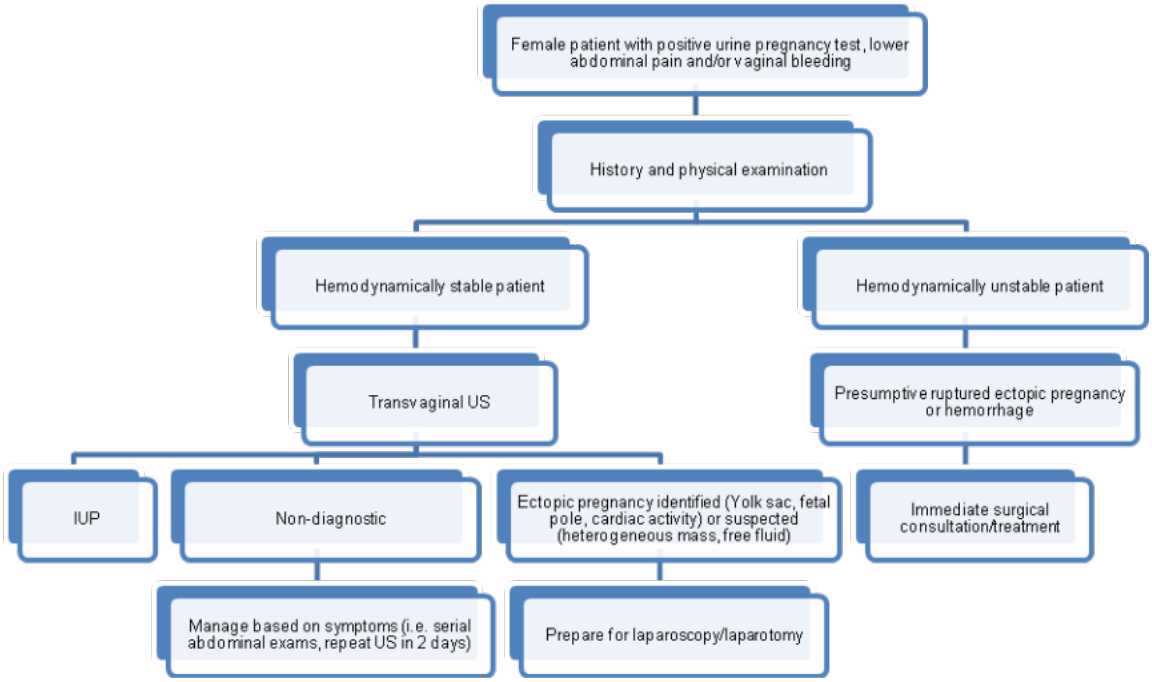
Risk Factors
Prior ectopic pregnancy, prior BTL, current use of IUCD

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

Ultrasound
Findings diagnostic or suggestive of ectopic: extrauterine gestational sac/yolk sac/fetal pole, extraovarian mass, echogenic fluid in the cul-de-sac and/or abdomen

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.
- Send tissue to pathologist for confirmation and consider dilation and curettage (evacuation) if appropriate
- If patient stable, medical management can be considered at the Central Hospitals under Consultant supervision

Follow-up: Counsel patient about family planning options and risk of future ectopic pregnancy prior to discharge.


Female patient with positive urine pregnancy test, lower abdominal pain and/or vaginal bleeding
History and physical examination
Hemodynamically stable patient
Hemodynamically unstable patient
Transvaginal US
Presumptive ruptured ectopic pregnancy or hemorrhage
IUP
Non-diagnostic
Ectopic pregnancy identified (Yolk sac, fetal pole, cardiac activity) or suspected (heterogeneous mass, free fluid)
Immediate surgical consultation/treatment
Manage based on symptoms (i.e. serial abdominal exams, repeat US in 2 days)
Prepare for laparoscopy/laparotomy

GESTATIONAL TROPHOBLASTIC DISEASE

Introduction/Definition

Gestational trophoblastic disease (GTD) are diseases that arise from abnormal proliferation of placental trophoblastic cells. GTD includes hydatidiform mole (complete or partial) andGestational Trophoblastic Neoplasia (GTN), choriocarcinoma, and placental site trophoblastic tumours. Following molars pregnancy about 20% of women will develop malignant disease (GTN). GTN is more common in women with complete molar pregnancies, large theca-luetin cysts (>5cm), extremely enlarged uterus, >40 years old, very high hCG levels and/or prior history of GTD.

Molar Pregnancy:

Diagnosis

Signs/Symptoms: 1st trimester bleeding, uterine size/date discrepancy, sudden increase in uterine size, hyperemesis, passage of vesicles, early gestational hypertension/pre-eclampsia, thyrotoxicosis and greatly elevated hCG.Classically shows "snowstorm" pattern. on ultrasound scan.

History/Exam/Investigations:Patients are at risk of hyperthyroidism/thyroid storm, anemia, coagulopathies, pre-eclampsia/eclampsia. Ask appropriate questions to evaluate for these conditions. Obtain complete vital signs, evaluate uterine size, cervical dilatation and evidence of active bleeding or passage of tissue. Obtain ultrasound scan if not already done. Very high hCG can cause a urine pregnancy test can be falsely negative in molar pregnancies- consider dilution of the urine and re-testing if clinically suspicion is high.

Management

- Order: group and cross-match, FBC, clotting tests, chest x-ray (to rule out lung metastasis) and quantitative hCG if available.
- Ideally, management should take place in a facility where blood transfusion and ICU care are available as hemorrhage and respiratory distress are possible complications.
- If asymptomatic, then schedule suction D&C under ultrasound-guidance (if available) with anesthesia with oxytocin infusion and misoprostol ready due tohigh risk of haemorrhage.
- If actively aborting, send patient to theatre immediately and do D&C under ultrasound-guidance (if available), with oxytocin and misoprostol ready.
- Suction D&C under ultrasound-guidance with the largest suction canula possible is the preferred method of evacuation. Sharp curettage ALONE should NOT be performed.
    - Risk of hemorrhage and uterine perforation are high.
    - Oxytocin infusion should be started after dilation of cervix and continued for several hours postoperatively.
- Hysterectomy can be considered in cases where childbearing is complete, but does not negate the need for close follow-up.
- Give Antibiotics (Doxycycline 100 mg BD x 3 days or Metronidazole 400 mg BD x 5 days) for prophylaxis
- Send tissue for pathologic examination.

Follow up

- Follow up all cases for serial evaluation.
    - Stress importance of avoiding pregnancy until follow-up is complete and encourage use of a highly effective form of birth control (avoid IUCD until hCG is undetectable).
    - Review histology with patient at 1st follow-up visit.
    - At each visit:
        - Send urine for pregnancy test (should be negative by 60-100 days post evacuation)
            - Follow-up serum Hcg instead of UPT if available.
        - Conduct bimanual pelvic exam to assess uterine size
        - Conduct speculum exam of vagina and suburethral area for metastases. If noted, *do not biopsy* as this can lead to hemorrhage.

        - Conduct ultrasound scan to evaluate for intrauterine and extrauterine signs of disease.
    - Monthly follow-up until 1 year after evacuation.
    - Presumed diagnosis of persistent gestational trophoblastic neoplasm if UPT or Hcg remains positive 4 months after evaluation or if there is evidence of molar re-occurrence or metastatic lesions on imaging. (Make sure to rule out new pregnancy before initiation of treatment).
    - In subsequent pregnancies, counsel on the importance of early antenatal care, order early US to look for recurrent mole (10 times more common in patients with prior molar pregnancy).

Persistant Gestational Trophoblastic Neoplasm: The vast majority of women with persistent GTN can be cured with chemotherapy +/- surgery and radiation therapy. Timely diagnosis and appropriate treatment is key.

Remember, although GTN is most common following a molar pregnancy, it can follow any pregnancy event. Suspect GTN in any woman who has bleeding >6 weeks after pregnancy or who has metastatic disease with no known primary and a positive UPT with no intrauterine pregnancy.

Initial Investigations: vaginal ultrasound, chest X-ray, vaginal examination.
If metastatic lesions are found on Pelvic USS, CXR or vaginal exam, perform liver and brain imaging if possible.

Management:

- All patients with persistent disease should be referred to medical oncology for initiation of chemotherapy. The chemotherapy regimen should be based on risk assessment using the FIGO Prognostic Score Index. Score of ≤6 is deemed low-risk and needs single-agent chemotherapy (typically methotrexate). A score >6 is high-risk and should have initial multiple drug chemotherapy.
- Hysterectomy can be considered in women who have completed child bearing and have disease confined to the uterus. It is required in patients with Placental Site Trophoblastic Tumor which is less responsive to chemotherapy. Hysterectomy is not effective against metastatic disease.
- Radiation therapy may be necessary for patients with brain metastasis.

Table: FIGO Gestational Trophoblastic Neoplasia Staging and Prognostic Score Index.

STAGING				
Stage I	Disease confined to the uterus			
Stage II	GTN extends outside the uterus, but is limited to the genital structures (adnexa, vagina, broad ligament)			
Stage III	GTN extends to the lungs, with or without known genital tract involvement			
Stage IV	All other metastatic sites			
SCORING				
	Score			
	0	**1**	**2**	**4**
Age (years)	<40	>40		
Antecedent pregnancy	H. Mole	Abortion	Term	
Interval months from index pregnancy	<4	4<7	7<13	>13
Pre-treatment serum hCG (IU/L) (not pre-evacuation)	<1,000	<10,000	<100,000	>100,000
Largest tumour size (cm) including uterus	<3	3-5	>5	
Site of metastases	Lung	Spleen Kidney	GIT	Liver Brain
No of metastases		1-4	5-8	>8
Previous failed chemotherapy			1 drug	> 2drugs

To stage and allocate a risk factor score a patients diagnosis is allocated to a stage as represented by Roman numeral I, II, III and IV and then separated by a colon from the sum of all the actual risk factors expressed in Arabic numerals eg stage II: 4 or stage IV: 9

A score of <6 is considered low risk and >6 high risk.

Against FIGO staging principles, recurrent GTN can be restaged and hence the risk factor of previous chemotherapy included. Low Risk Recurrent Patients: (Score 06) while High Risk Patients (Score > 7)

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 Input and Output
    - 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.
    - Ultrasound to assess fetal condition
    - Ultrasound to rule-out placenta praevia and/or evaluate placenta for possible abruption where present, noting that abruption is a clinical diagnosis using the grading criteria below. Further management depends on the aetiology of APH
    - If Rh negative, refer to section on Alloimmunization in Pregnancy

No digital vaginal examination until placenta praevia is excluded

Sher Grading of Placental Abruption	
GRADE	DESCRIPTION
0	Asymptomatic patient with a small retroplacental clot
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 (3a) • coagulopathy present (3b)

Grading of Placenta Praevia	
GRADE	DESCRIPTION
I	Low-lying placenta. Placenta lies in the lower uterine segment but its lower edge does notreach the internal os.
II	Marginal praevia. Placental tissue reaches the margin of the internal cervical os but does not cover it.
III	Partial praevia. Placenta partially covers the internal cervical os.
IV	Complete praevia. Placenta completely covers internal cervical os.

*Grade 1 and 2 are Placenta Praevia Minor, whereas Grade 3 and 4 are Placenta Praevia Major.

Diagnosis	History/Exam	Management (including Investigations)
Abruptio placentae	• Vaginal bleeding • Tense/tender uterus • Decreased/absent fetal movements • Fetal distress or absent fetal heart sounds • Possible shock from hypovolemia/APH	• Check fetal heart and cervical exam: o If fetal heart present, viable fetus (EGA ≥28 wks or EFW ≥ 1000 g), then deliver immediately. o If absent fetal heart, then consider vaginal delivery (see Induction of Labour if applicable). o If heavy bleeding and remote from vaginal delivery or high risk of maternal mortality then caesarean delivery regardless of fetal status. • Be prepared for PPH (have oxytocin and misoprostol ready) and anticipate need for condom balloon tamponade • If concomitant hypertension, then manage fluid balance with care (risk of pulmonaryoedema with increased intravascular volume) • If heavy bleeding, organize at least 2 each of PRBC, FFP, platelets or whole blood.
Uterine rupture	• Vaginal bleeding • Abdominal pain or free fluid • Abnormal contour • Tender abdomen • Easily palpable fetal parts • +/- Absent fetal movements • +/- Absent fetal heart sounds • Possible shock from hypovolemia/APH	• Emergency laparotomy. Repair the rupture if possible. If not possible, then hysterectomy. • In cases of uterine repair, counsel the patient that all subsequent deliveries are to be caesarean deliveries. Counsel the patient to seek early antenatal care at Central Hospital. • Document operative findings in health passport.
Placenta praevia	• Painless PVB • Relaxed uterus • Abnormal lie or high presenting part	Depends on gestational age (GA), severity of APH and the type of placenta praevia: • If heavy APH and confirmed praevia o Prepare for caesarean

	• Fetal heart sounds usually present • +/- Shock •	delivery, especially if GA ≥ 28 wks. • If minimal/ moderate APH and preterm o Admit to Antenatal Ward o Transfuse as needed pending Hb o Maintain IV access with large bore cannulae o OB ultrasound o Steroids if GA is <34 weeks • • If no APH and placenta praevia found on routine US, then admit to antenatal ward at GA ≥ 28 wks and give course of dexamethasone. Plan for elective Cesarean delivery btwn36-37 wga. • Be prepared for PPH and placenta accreta/increta if previous uterine scar. Prepare blood products and counsel about possible hysterectomy.

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 ill and needs to be delivered sooner)
- Abnormal lie and presentation (see Malpresentation, Abnormal Position, and Transverse Lie)
- Umbilical cord prolapse
- Obstructed labour
- Features suggestive of a compromised baby (i.e., non-reassuring fetal heart tracing)
- Placenta praevia
- Limb deformities with contracted pelvis
- Previous VVF repair
- Previous transfundal uterine surgery
- Active genital herpes infection

Diagnosis
History/Exam/Investigations Clearly document the indication for the induction and verify the gestational age as accurately as possible (earliest available US in agreement with LMP). Do not rely on fundal height.

Confirmation of a term gestation:

- US measurement at less than 20 wks supporting GA of 39 wks or greater
- Fetal heart tones documented as present by Doppler for 30 wks
- It has been 36 weeks since a positive pregnancy test

Management

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

Cervix	Score			
	0	1	2	3
Position	Posterior	Midposition	Anterior	-
Consistency	Firm	Medium	Soft	-
Effacement	> 4 cm	3-4 cm	1-2 cm	0 cm
Dilation	Closed	1-2 cm	3-4 cm	≥ 5 cm
Station of fetal head	-3	-2	-1	+1, +2

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
    - 25 mcg PV every 4 hrs, max of 6 doses.
    - 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, or try an alternative agent such as a foley bulb.
- If CTG or Moyo available, perform a NST before initiating any method of induction to confirm there is a reassuring pattern and no sign of fetal distress.
- Monitor all patients for uterine tachysystole throughout the induction. (> 5 contractions within a 10-minute period averaged over 30 minutes.)
    - In the event of tachysystole, perform a NST to assess fetal wellbeing and place IV.
- 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
- Oxytocin alone
- Amniotomy and oxytocin if no contraindications
- Avoid prolonged duration of ruptured membranes in HIV-infected patients.
- If membranes have already ruptured, oxytocin is as effective in labor induction as cervical ripening.

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

Methods of induction of labour in pre-eclampsia with severe features, signs of IUGR, or any other concern for the fetus that still allows for IOL and does not require cesarean delivery:

- Consider foley bulb induction rather than misoprostol

AUGMENTATION OF LABOUR

Introduction/ Definition

Augmentation of labour is accomplished with a variety of interventions that stimulate contractions and 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)
- Limb deformities with contracted pelvis
- Previous cesarean section
- Any other contraindications for vaginal delivery

Diagnosis

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

- Confirm and document fetal wellbeing, presentation, current uterine activity, and EFW prior to beginning augmentation.

Management

Characteristic	Management*
No previous uterine surgery Nulliparous or Multiparous (P4 and below)	• Amniotomy • Oxytocin o Oxytocin 2.5 IU in 1 L NS or RL,starting at 7.5 dpm, then increase to 15 dpm after 30 minutes if tolerated and still no strong contractions, and then titrating up to by 15 dpm every 30 minutes until 3 strong contractions every 10 minutes, to maximum dose of 60 dpm (see section on Oxytocin Infusion Rate) o Monitor woman and fetus closely
Grandmultiparous (P5 and above)	• Amniotomy • Oxytocin only if Consultant agrees
HIV-infected	• No difference in management of augmentation if obstetrically indicated • Delay amniotomy

*Use oxytocin with caution due to risk of uterine rupture; see section on 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 consider amniotomy if not already performed or 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.

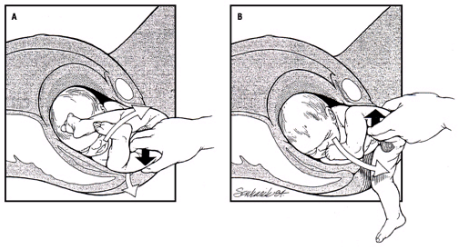
Diagnosis
History Check for a possible cause of the breech presentation, i.e. placenta praevia, congenital fetal abnormalities, uterine masses and intrauterine abnormalities
Exam Ballotable mass consistent with fetal head in the fundus, broad irregular mass in the lower pole
Investigations Confirm breech 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.
    - ECV should be undertaken with informed consent.
    - The procedure is made easier using a tocolytic, such as salbutamol 250 micrograms IV, shortly before the procedure.
    - A CTG should be performed before and after the procedure and a portable ultrasound machine is useful to confirm successful version.
    - Absolute contraindications include:Rh negative status, uterine scar,abnormal placentation, and suspected fetal compromise.
    - Relative contraindications include: oligohydramnios, anterior placenta, HIV-infected
    - For women at 39 weeks or more, an option is to offer ECV just prior to elective CS, then either cancelling the procedure if successful or proceeding to surgery if unsuccessful.
- 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

- Pipers 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 knee and delivery of each leg (B)
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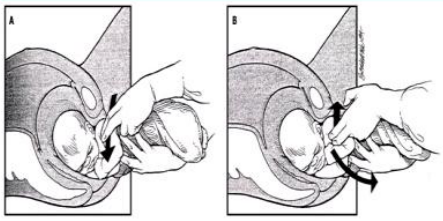
Delivery of the upper limbs



A towel is wrapped around the fetus for better traction. When the scapulae appears under the symphysis, the operator reaches over the left shoulder, sweeps the arm across the chest (A), and delivers the arm (B).
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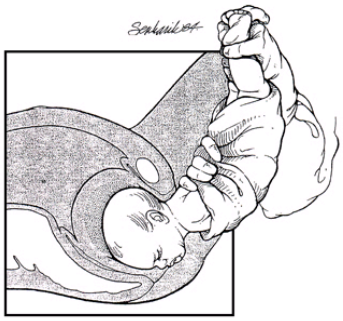
Beginning delivery of the head



Following delivery of the arms, the fetus is slightly elevated. The fetal face and airway may be visible over the perineum. Excessive elevation of the trunk is avoided.
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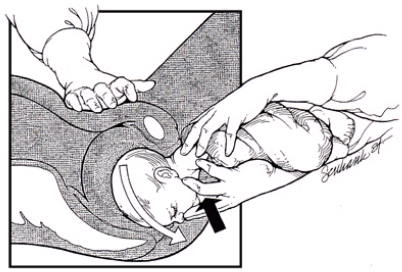
Delivery of the head



Often, delivery of the head is easily accomplished with continued expulsive forces from above, suprapubic pressure, and gentle traction. Cephalic flexion is maintained by pressure (heavy arrow) on the fetal maxilla (not mandible!)
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CAESAREAN DELIVERY

Introduction/Definition
Caesarean delivery is delivery of the infant through a uterine incision.

Indications include:
- obstructed labour
- cephalopelvic disproportion
- abnormal lie
- malposition or 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/obstructive vulvovaginal warts
- primary active HSV
- cervical dystocia
- failed IOL where urgent delivery is indicated, e.g., severe pre-eclamspsia or eclampsia, multiple pregnancy with malpresentation of the leading fetus.

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 in theatre at time of induction of anesthesia. Options include:
    - Cefazolin 1-2g IV x 1
    - Ampicillin 2 g IV x 1
    - X-Penicillin IV 3 million units x 1
    - Ceftriaxone 1 g IV (use only if other antibiotics above are unavailable)

Procedure
- Transverse skin incision (i.e., Cohen, Pfannenstiel) preferred
- Low transverse incision (i.e., Kerr) preferred for uterine incision
- Classical incision (vertical incision above the insertion of the round ligaments) indicated for poorly formed lower segment (i.e., extreme prematurity), transverse lie with fetal back down, 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
  - Light meal once fully awake and when they feel hungry, for uncomplicated caesarean sections OR when fully recovered from regional anaesthesia
  - If surgery was complicated, eat or drink as per instruction from the clinician.
  -
- Continue antibiotics:
  - If preoperative antibiotics were not given, or patient hadchorioamnionitis, contaminated cesarean section, immunocompromised status, prolonged or obstructed labor, or prolonged ROM (>18 hours), intrapartum fever of unknown origin
    - First 24 hrs:
      - First line: Ampicillin 1 g q6h plus Gentamicin 160 mg x 1
      - Second line: Ceftriaxone 1gram IV plus Flagyl 400 mg TDS PO
    - Following 4 days: Amoxicillin 1 g 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), Gastrointestinal 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, intrauterine balloon, laparotomy (B-lynch, O'Leary's, TAH)
        - Cervical/vaginal tears: Examination Under Anesthesia (EUA) in theatre and repair
        - Retained Tissue: manual removal of the placenta, evacuation with placental forceps
        - Thrombin disorder (DIC): give FFP and other blood products as noted above
    - Other causes: macerated stillbirth, infection/sepsis
- Consider heparin if thrombosis is dominant

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ANTENATAL 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).

Method	Indication/ Procedure	Interpretation and Management
Non Stress Test (NST)	**Indications:** all pregnant women at risk for intrauterine fetal compromise • Prolonged pregnancy • Maternal hypertensive disorders • IUGR • Diabetes mellitus • RH sensitization • Maternal hemoglbinopathies • Renal disease • Fetal anomalies • Poor prior obstetric history • Reported decrease in perceived fetal movements **Procedure:** • Place CTG on abdomen for ≥ 20 min • Observe up to 40 min if non-reactive (may be due to fetal sleep cycle or normal period of fetal inactivity)	• 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 • Non-reactive test requires BPP
Biophysical Profile (BPP)	Use NST and real-time U/S to evaluate: • Fetal breathing (1 breathing cycle ≥ 30 sec during 30 min period) • Gross body movements (3 discrete body or limb movements) • Fetal tone (1 episode of extension or flexion of limbs or trunk, or opening or closing of hand) • Amniotic fluid volume (1 pocket ≥ 2 cm in 2 perpendicular planes)	• Assign 2 points if present and 0 points if absent for US components • Assign 2 points if reactive NST and 0 points if non-reactive NST • Score ≤ 6 (out of 10) is suspicious for fetal hypoxemia •

Modified BPP	BPP is labour intensive; therefore, modified BPP may be used: • Amniotic Fluid Index (AFI) with NST	• Normal if AFI > 5 cm and reactive NST
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	• Requires CTG/Moyo • 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
Cardiotocogram (CTG)/Moyo monitoring	**Indications:** • Augmentation with Oxytocin • Induction of labour with Misoprostol after each administration of Misoprostol and at onset of contractions • Pprolonged labour • Suspicion of fetal distress on FHR auscultation • Oligohydramnios • IUGR • Preterm delivery • Previous caesarean in active phase of labour awaiting theatre (or VBAC) • Meconium stained liquor **Procedure** • 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 o Consider Caesarean or operative vaginal delivery

Fetal surveillance in the absence of CTG/Moyo monitoring:

For all pregnancies:

- Determine gestational age and SFH at every visit; if discrepancy ultrasound scan for fetal growth, AFI if possible
- Refer if abnormal fetal growth or abnormal liquor
- Auscultate FHR at every antenatal visit
- Ask patient about perceived fetal movements

For high risk pregnancies:

- Refer to tertiary hospital

If Gestational age is 40 weeks and above, please see protocol for Post-Term Pregnancy.

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. Perform an early US for dating because management sometimes depends on GA.

Disease	**Definition/Diagnosis** *History/Exam/Investigations*
Chronic hypertension (HTN)	• HTN before pregnancy; or • BP ≥ 140/90 mm Hg at ≤ 20 wks gestation; or • Persistence of BP ≥ 140/90 after 12 wks postnatal • Baseline proteinuria may or may not exist
Preeclampsia superimposed on Chronic Hypertension	• Chronic hypertension with the development of any maternal organ dysfunction consistent with preeclampsia.
Gestational HTN	• BP ≥ 140/90 mm Hg at > 20 wks gestation; and • HTN resolves by 12 wks postnatal; and • No proteinuria
Preeclampsia	Gestational hypertension accompanied by **1 or more** of the following new-onset conditions at or after 20 weeks' gestation: 1. Proteinuria (≥ 1+, 30 mg/dL) or urine protein/Cr ratio ≥ 0.3 mg/mg 2. Other maternal organ dysfunction, including: • Acute kidney injury (Creatinine ≥ 90 umol/L; 1 mg/dL) • Liver involvement (ALT or AST ≥ 40 IU/L) with or without RUQ pain or epigastric abdominal pain • Neurological complications (e.g., eclampsia, altered mental status, blindness, stroke, clonus, severe headaches, persistent visual scotomata • Haematological complications (platelets <150,000/uL, DIC, hemolysis) 3. Uteroplacental dysfunction (e.g., IUGR, abnormal umbilical artery Doppler wave form analysis, or stillbirth) Note: Proteinuria is **NOT mandatory** for a diagnosis of preeclampsia, but is present in about 75% of cases. • Rather, this is diagnosed by the presence of de novo hypertension, accompanied by proteinuria **and/or** evidence of maternal acute kidney injury, liver dysfunction, neurological features, hemolysis or thrombocytopenia, **and/or** fetal

	growth restriction Note: There is no longer a distinction between Mild Preeclampsia and Severe preeclampsia
Eclampsia	Tonic-clonic seizures that cannot be attributed to any other causes and no past history of seizure disorder

I. Management of Chronic Hypertension in Pregnancy

1. Stop contraindicated antihypertensive medications (i.e., diuretics, ACE inhibitors (monitor for fetal anomalies)
2. Order US to confirm gestational age
3. Baseline labs: FBC, LFTs, Cr and BUN
4. Urine dipstick for protein; Protein/Creatinine ratio or 24 hr urine protein collection if proteinuria is present
5. Consider fundoscopic exam and ECG
6. Use antihypertensives to maintain blood pressure in the range 110-140/80- 85 mmHg
7. Acceptable initial anti-hypertensives include methyldopa and nifedipine.
8. Hydralazine should be used as a second line agent.
9. Monitor for developing pre-eclampsia using urine dipstick at each visit along with clinical assessment, and blood tests (Hb, platelet count, liver transaminases, uric acid and creatinine) at 28 and 34 weeks as a minimum.
10. Assess fetal well-being with ultrasound from 26 weeks gestation and thereafter at 2-4 weekly intervals if fetal biometry is normal and more frequently in the presence of suspected fetal growth restriction. Measure AFI with each ultrasound exam
    - FOR WOMEN WITH SUPERIMPOSED PRE-ECLAMPSIA: Superimposed pre-eclampsia is an indication for delivery. Administer corticosteroids and MgSo4 as indicated.
    - FOR WOMEN WITH CHRONIC HYPERTENSION AND NO ADDITIONAL MATERNAL OR FETAL COMPLICATIONS, deliver at 39 weeks (ISSHP) gestation

II. Management of Gestational Hypertension

1. Control blood pressure with methyldopa or nifedipine to levels of 110-140/85 mmHg, as above
2. Monitor for the development of pre-eclampsia
3. Monitor fetal growth
4. Delivery can be delayed until 39+6 weeks provided blood pressure can be controlled, fetal monitoring is reassuring and pre-eclampsia has not developed.

III. Management of Pre-eclampsia

1. All women with pre-eclampsia should be hospitalized and placed in Labor Ward or HDU for evaluation.
    a. If early onset (<34 weeks), refer to Central Hospital for management.
2. Blood pressure requires urgent treatment in a monitored setting when ≥ 160/110 mmHg; acceptable agents for this include oral nifedipine or intravenous hydralazine
3. Blood pressures should be consistently maintained below 160 systolic and below 85 mmHg diastolic.

4. Women with pre-eclampsia who have severe hypertension, or hypertension with neurological signs or symptoms should receive MgSO4 for convulsion prophylaxis.
5. Where available, fetal monitoring in pre-eclampsia should include assessment of fetal biometry, amniotic fluid and **umbilical artery Doppler** with ultrasound at first diagnosis and thereafter at 2 weekly intervals if the initial assessment was normal and more frequently in the presence of fetal growth restriction.
    a. If there is absent end-diastolic flow in the umbilical artery (AEDF) prior to 34 weeks' gestation, the patient should be delivered.
6. Maternal monitoring in pre-eclampsia should include: BP monitoring, repeated assessments for proteinuria if not already present, clinical assessment including reflexes & clonus, FBC, LFTs and Creatinine at least twice weekly
7. There should be no attempt to diagnose 'mild' vs. 'severe' pre-eclampsia clinically as all cases may become severe, often rapidly.
8. Women with pre-eclampsia should be **deliveredif they have reached 34 weeks gestation,** or **sooner if they develop any of the following severe features:**
    a. Repeated episodes of severe hypertension despite maintenance treatment;
    b. Progressive thrombocytopenia;
    c. Progressively abnormal renal or liver enzyme tests;
    d. Pulmonary oedema;
    e. Abnormal neurological features such as severe intractable headache,
    f. Repeated visual scotomata, or convulsions; or
    g. Non-reassuring fetal status.
9. Prenatal corticosteroids for fetal lung maturation should be given between 24+0 and 34+0 weeks gestation, but may be given up until 37+0 weeks in cases of elective delivery by Caesarean section; multiple steroid courses are not recommended.
    a. ***Note:The use of corticosteroids beyond 34 weeks gestation has not been validated in low resource settings.***
10. Postpartum hypertension and pre-eclampsia can lead to eclampsia.
    a. Patients should be counseled on prodromal warning signs at the time of discharge.

IV. Management of Eclampsia

Initial management

- Check circulation, airway, breathing (CAB). Correct hypoxia with oxygen as needed.
- Protect patient from injury (left lateral position in bed with rails or on floor)
- Admit to LW or HDU
- Place IV and control BP: hydralazine 5 mg IV every 15 minutes, with titration up to 10 mg as needed to a total dose of 40 mg in an hour, until BP < 160/110 mmHg.
    - If BP still not controlled after reaching max dose of hydralazine, refer to Central Hospital.
    - For those units with infusion pump and intensive monitoring, if BP >160/110 mm Hg, consider 20 mg hydralazine in 200 ml infusion to run at 20, 40, 60 ml/hr until targeted BP of < 160/110.
- If fully conscious, give Methyldopa 500 mg 8 hourly or Nifedipine (short-acting/immediate release) 10-20 mg q8 hourly concurrently with hydralazine regimen if BP > 160/110 mm Hg.
- Prevent more seizures: $MgSO_4$ 4 g (20 ml of 20% solution) IV in 500 mL NS over 10 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 after 15 minutes, then give another $MgSO_4$ 2 g (10 ml of 20% solution) IV over 5 min.
- If seizures continue or $MgSO_4$ not available, consider Diazepam 10 mg IM or IV over 2 min.
    - Maintenance dose of Diazepam is 40 mg in 500 mL of NS or LR.
- 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 1 g 10% IV over 10 min and stop magnesium
- 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
    - Decision to delivery must be made to deliver the pregnant woman within 12 hours. Consider caesarean if unlikely to deliver in 6-12 hours regardless of gestational age.
    - For vaginal delivery, assist with second stage (i.e. vacuum or forceps)
    - Give Oxytocin 10 IU by IV push in 3rd stage
    - Do NOT use ergometrine in hypertensive women
- Control BP (goal BP < 160/110):
    - Hydralazine IV and/or Nifedipine PO
        - Starting dose of Nifedipine SR 10 mg TDS; max 40 mg TDS
- After delivery:
    - Continue $MgSO_4$ until 24 hours after delivery or the last seizure
    - For blood pressure management, refer to section on Hypertensive Disorders.

V. The Use of IM Magnesium Sulfate for Pre-Eclampsia

- In low resource settings, all women with pre-eclampsia should receive magnesium sulphate injections for convulsion prophylaxis.
- CHECK PLATELET COUNT OR BEDSIDE CLOTTING TEST PRIOR TO IM INJECTIONS TO AVOID THE DEVELOPMENT OF SUBCUTANEOUS HEMATOMAS AT THE INJECTION SITE.
    - IF AVAILABLE, CONSIDER THE USE OF AN IV INFUSION PUMP.
- Loading dose: 4 gm is administered as an intravenous dose Then 5 gm in one buttock and another 5 gm in the other buttock. These together constitute the loading dose (14 gm).
- Maintenance dose: Thereafter, 5 gm is administered in alternate buttocks every 4 hours for 24 hr

Signs of MgSO4 toxicity

- Respiratory rate <10/min
- SaO2 < 92%
- Muscle Paralysis
- Reflexes absent

IF TOXICITY SUSPECTED, CEASE THE INFUSION IMMEDIATELY AND ADMINISTER CALCIUM GLUCONATE 10%, 10ML IN 100 ML NS IV OVER 10-20 MINUTES

VI. Prevention of Pre-Eclampsia in High Risk Patients

1. Use low dose aspirin (100-150 mg/d) preferably started before 16 weeks of pregnancy for women at increased risk for pre-eclampsia, particularly if any of the following conditions exist:

- Previous pre-eclampsia,
- Pre-existing medical conditions (including chronic hypertension,
- Underlying renal disease, or pre-gestational diabetes mellitus),

- Antiphospholipid antibody syndrome,
- Multiple pregnancy;
- Obesity
- Assisted reproduction pregnancy

2. In the face of low calcium intake (<600mg/day), use calcium 1.2 to 2.5g per day in women at increased risk.

Table for Management of Hypertensive Disorders in Pregnancy

Management	Chronic HTN	Gestational HTN	Preeclampsia	Eclampsia
Antenatal care: • Stop contraindicated antihypertensive medications (i.e. diuretics, ACE inhibitor) and switch to Nifedipine or Methyldopa(see section on treatment with antihypertensive medications below) • 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				
Send urinalysis and blood for LFT, Cr and FBC at every visit for possible progression to severe disease				
Check BP daily and monitor daily for severe features of 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 20 min until BP < 160/110; repeat hourly as needed • Nifedipine SR 10 mg if persistent BP ≥ 160/110 mm Hg (despite hydralazine) • For maintenance: Methyldopa 500-1,000 mg q8h (up to 3,000 mg/day) and/or Nifedipine SR 10 mg q8h (up to 120 mg/day) • Postnatal: treat with Nifedipine, Methyldopa, HCTZ				

and/or Propanolol PO if BP ≥ 160/110				
Treat with $MgSO_4$ 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 O_2 sat • Monitor UOP (stop $MgSO_4$ if < 30 ml/hr) • Calcium gluconate 1 g over 10 min if loss of DTRs or ↓ RR • Diazepam or thiopental for refractory seizures				

INTRAUTERINE FETAL DEMISE (IUFD)

Introduction/Definition
Intrauterine fetal demise (IUFD) is death of the fetus ≥ 24 wks gestation or > 500 grams 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, overlapping sutures, abnormal curvature of the fetal spine; 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 - 26 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)
- If failed induction after 24 hours, rule out ruptured uterus or extrauterine pregnancy.
- If signs of infection or macerated stillbirth:
    - First 24 hrs:
        - First line: Ampicillin 1 g q6h plus Gentamicin 160 mg x 1
        - Second line: Ceftriaxone 1 gram IV plus Flagyl 400 mg TDS PO
    - Following 4 days: Amoxicillin 1 g TDS PO, plus Flagyl 400 mg TDS PO

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

History Ascertain 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

Exam Complete examination, including BP, signs of extreme malnutrition, BMI, and stigmata of alcohol, tobacco, and drug use; fundal height (FH) ≥ 3cm 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, Doppler studies 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
- NB: always alert Neonatal care unit team at delivery

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.

Malpresentation	**Characteristics**	**Diagnosis** *History/Exam/Investigations*	**Management**
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 o Skilled clinician at delivery o Adequate analgesia o No labour augmentation o 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	• Antenatal diagnosis is inaccurate; 75% of cases with occiput posterior	• Monitor progress of labour closely • Adequate analgesia • IV access with NS at maintenance rate to prevent dehydration and decrease risk of distress

	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	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	• Fetal surveillance *Mode of delivery* • Spontaneous delivery may occur as face to pubis • 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	• Intrapartum diagnosis by VE: supraorbital ridges and anterior fontanelle are palpable	• 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	• Vaginal delivery for anterior mentum • Caesarean delivery for posterior mentum

	vaginal delivery	palpable	
Compound	• Simultaneous presentation of extremity next o 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	• 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

		and arm are palpable	

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, Doppler if discordant growth
- For growth discordance > 20%, refer to Central Hospital.
    - Weekly NST with AFI (see IUGR) or BPP.
- 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 (mono-mono) pregnancy, refer to Central Hospital
    - Treat with steroids at 28 wks gestation, admit to inpatient ward for daily CTG, and caesarean delivery between 32-34 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
- Regular fetal heart rate monitoring for both fetuses, consider use of CTG/Moyo
- Prepare two delivery sets and prophylactic oxytocin IV
- Obstetrics and paediatrics registrars at delivery
- Low threshold for caesarean delivery, especially if primigravida, the woman should be participating in decision making process
- For cephalic presentation of first twin and no complications, vaginal deliveryno 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

	Oligohydramnios	**Polyhydramnios**
Introduction/ Definition	Single deepest pocket < 2 cm or amniotic fluid index (AFI)* ≤5 cm (Borderline if AFI = 5.1-8 cm)	Single deepest pocket > 8 cm; or AFI*> 24cm
Diagnosis		
History	May be associated with draining (ROM), maternal hypertension, and fetal renal anomalies	May be associated with maternal diabetes, substance abuse, TORCH infections, multiple gestation, and fetal anomalies. Ask about dyspnea and abdominal pain. Monitor for hydrops
Exam	• FH is smaller than expected by dates by ≥ 3 cm • Easily palpable fetal parts • Subjectively reduced liquor volume • Sterile speculum exam if draining suspected	• FH is larger than expected by dates by ≥ 3 cm • Stigmata for TORCH infections
Investigations	• US (AFI, anomaly, growth)	
	• Screen for hypertension (HTN), systemic lupus erythematous, antiphospholipid syndrome if available, and placental insufficiency (i.e. HC:AC ratio and umbilical artery Doppler) • Anomaly scan if early onset	• Screen for DM, Rh alloimmunisation, TORCH infections, and substance abuse • Anomaly scan
Management	*At term* • Continuous CTG or Moyo monitoring if vaginal delivery *For borderline oligohydramnios and< 37 wks gestation* • Outpatient: recheck fluid in next 1-2 days • If remains borderline then twice weekly biophysical profile (BPP) and umbilical artery Dopplers • Steroids if < 34 wks gestation • Fetal kick counts • Induce labour at 37 wks gestation	*For treatable aetiologies:* • Management is specific to aetiology *For congenital anomalies or idiopathic* • Outpatient: USS for growth and AFI every 2 wks • Monitor for preterm labour (PTL) or maternal symptoms of dyspnea and abdominal pain • Steroids if < 34 wks • Deliver at term unless significant fetal or maternal compromise • High risk for cord prolapse with AROM

	o Continuous CTG/Moyo monitoring *For unexplained oligohydramnios and< 37 wks gestation* • Admit to hospital • Recheck fluid level in 1-2 days • Steroids if < 34 wks gestation • Weekly CTG/BPP, monitor daily fetal kick counts, dopplers • Deliver if fetal distress • Caesarean delivery if anhydramnios	• High risk for PPH (see *Postpartum Haemorrhage)* • Consider amnioreduction for symptomatic relief of the mother • Consider Indomethacin to reduce fluid level

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.

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

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:

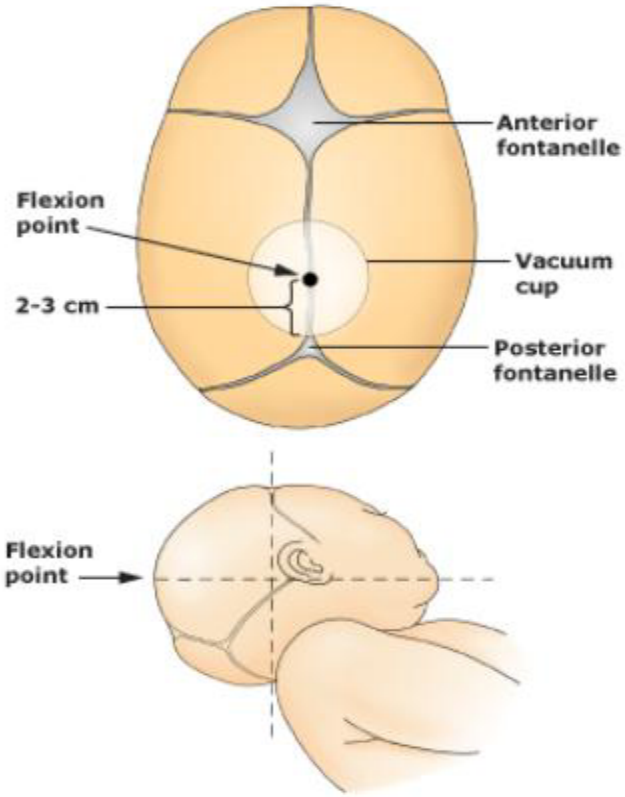
Criteria	Forceps	Vacuum
Maternal	• Fully dilated cervix • Ruptured membranes • No signs or symptoms of cephalopelvic disproportion • Empty bladder • Adequate analgesia • Adequate contractions • +/- Episiotomy for forceps	
Fetal	• Scalp visible at introitus; descent at 0/5 or head at ≥ +2 station • Sagittal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

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



MNEMONIC FOR VACUUM DELIVERY

A Address the patient
Ask for help
Anesthesia adequate?
B Bladder empty
C Cervix must be completely dilated
D Determine position of head
Think of Dystocia
E Equipment ready
F Place cap in proper position to posterior Fontanelle
Feel for maternal tissue before and after suction
G Gentle traction following the pelvic curve
H Halt traction between contractions
Halt procedures if pop-off 3 times
Halt procedure if no progress in 3 pulls
Halt procedure after 20 minutes of use
crowning
I Incision: evaluate for episiotomy when crowning
(episiotomy not usually recommended)
J Remove cup when Jaw is reachable

MNEMONIC FOR FORCEPS DELIVERY

A Address the patient
Ask for help
Anesthesia adequate?
B Bladder empty
C Cervix must be completely dilated
D Determine position of head
Think of Dystocia
E Equipment ready
F Forceps ready
Posterior fontanelle midway between shanks,
1 cm above plane of shanks
Fenestrations admit no more than 1 fingertip
G Gentle traction
H Handle elevated to follow the pelvic curve
I Incision: evaluate for episiotomy when

(episiotomy not usuallyrecommended)

J Remove forceps when Jaw is reachable

OXYTOCIN INFUSION RATE

Oxytocin flow rates are generally started at 1-2 mU/min and are safe up to 15 mU/min with close monitoring of the woman and fetus.

Flow rates beyond 15 mU/min may be considered after discussion with the Consultant and warrant internal monitoring.

Do not keep increasing oxytocin dose if patient has reached 3 strong contractions within 10 minutes.

After reaching the maximum dose, if no cervical change within 4 hours, stop oxytocin and proceed with Cesarean.

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

Oxytocin amount in 1000 ml of NS	Oxytocin amount in 500 ml of NS	Drops per min	Dose in mIU/min
5 IU	2.5 IU	7.5	1.875
5 IU	2.5 IU	15	3.75
5 IU	2.5 IU	30	7.5
5 IU	2.5 IU	45	11.25
5 IU	2.5 IU	60	15

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. Perineal muscles remain intact.
- Second degree (2°) - extends into the perineal body muscles but does not involve 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 Assess extent of bleeding and injury to perineum, vagina, and anorectum by visually and digitally inspecting the injury.If exam at bedside is difficult, then do EUA in OT

Management (3°/4° laceration)

- Prophylactic Ceftriaxone 1 g IV and Metronidazole 500 mg IV 30 min before the procedure if 3°/4° laceration
- Lithotomy position, adequate lighting, assistance with retraction
- Clean perineum with antiseptic solution
- Pain control: regional or sedation/GA
- Procedure for 3°/4° laceration repair (note: sutures listed are suggestions)
    - Close rectal and anal mucosa (4°) with continuous (nonlocking) or interrupted sutures of 3-0 or 4-0 Vicryl (braided polyglactin) if available on round body needle, starting from apex
    - Repair IAS muscle as a separate layer with fine suture size such as 3-0 PDS or 3-0 Vicryl
    - Reconstruct torn ends of EAS with interrupted stitches of 2-0 Vicryl. Use Allis clamps to grasp the two severed ends. May use an end-to-end or overlapping technique.
    - Repair perineal muscles with 2-0 Vicryl
    - Repair vaginal epithelium and perineal skin

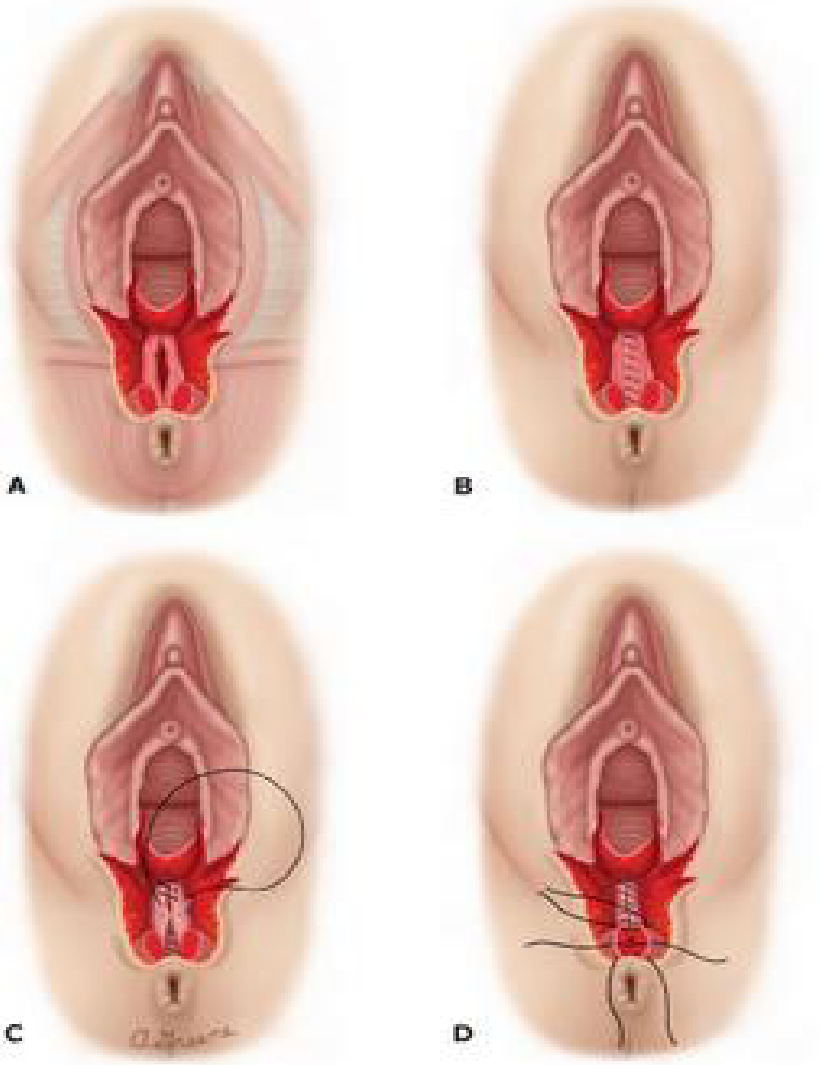
Post-procedure care

- Sitzbaths up to TDS
- Metronidazole 400 mg PO TDS for 5-7 days (4^{th} degree)
- Soft diet and stool softeners for 3-4 weeks
- Pelvic floor exercises

Episiotomy Breakdown/Dehiscence
Signs: Fever, wound tenderness, purulent discharge, typically occurring 6-8 days following delivery

Management: Aggressive wound care including debridement and irrigation, Sitz baths. Once wound is free of exudate and is covered with pink granulation tissue, with no signs of infection, early secondary repair can be attempted.

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

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. Usually from retained products.

Causes of PPH

- Uterine atony (most common), retained placenta/products, vaginal/cervical lacerations, uterine rupture, uterine inversion, and coagulation disorders (i.e. DIC).
- All patients should be screened for risk factors on admission.

Risk factors for PPH:

- Grand multiparity, multiple gestation, severe pre-eclampsia, abruptio placenta, obesity, large uterine myomas, macrosomia, fetal macrosomia, polyhydramnios and prolonged labor.
- Patients at risk should have an IV inserted on admission and uterotonic medications should be readily available. Blood samples should be obtained for group and crossmatch if indicated.

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

- Oxytocin 10 IU IM immediately after all deliveries, including caesarean deliveries
- 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
- Misoprostol 600 µg administered orally can be used for the prevention of PPH if oxytocin is not available[1]

Diagnosis *History/Exam/Investigations* PVB, +/- shock. Quantification of blood loss is preferred over visual estimation.

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 and start IV fluids. If blood loss is greater than 1000 ml, insert 2 large-bore cannulae (i.e. 16G or 18G).
- 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 40 IU IV in 1 liter NS @ 125cc/hr
- Misoprostol 800 mcg sublingual or PR or 600 mcg PO.
  Note: misoprostol is not as effective as oxytocin and may not further increase uterine tone when used in combination with oxytocin[1].
- The use of tranexamic acid 1 g IV STAT (PO if no IV) is recommended for the treatment of PPH if oxytocin and other uterotonics fail to stop the bleeding.[2, 3].

- If bleeding persists, arrange for EUA. Check for cervical lacerations or any missed vaginal lacerations, or possible retained products

- Consider intrauterine balloon tamponade using a condom catheter (300-500 mL 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
- A single dose of antibiotics (ampicillin or first-generation cephalosporin) is recommended if manual removal of the placenta is practised[2].

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. A clotting time greater than six minutes is considered abnormal.
- 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

REFERENCES

[1]FIGO Guidelines: Prevention and treatment of postpartum hemorrhage in low-resource settings· Int J Gynecol Obstet. 117 (2012) 108–118

[2]WHO recommendations for the prevention and treatment of postpartum haemorrhage, 2012

[3]Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage. Lancet 2017; 389: 2105–16.

POST-TERM 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.

It is also associated with risk of induction of labour and caesarean delivery.

Accurate pregnancy dating is critical so that interventions can be done - or avoided - as indicated.

Diagnosis

History/Exam/Investigations: see section on Pregnancy Dating Criteria

Management

- If GA 40 wks, then conservative management until delivery is indicated for other reasons (i.e. preeclampsia) or GA ≥ 42 wks
    - Do cervical stretch and strip membranes at 40+ weeks if no contraindications
    - 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 US to monitor AFI and BPP- if normal return at 41+3 wks gestation for IOL
- If GA ≥ 42 wks, then deliver via IOL or cesarean as indicated.

PREGNANCY DATING CRITERIA

Introduction/Definition

Dating the pregnancy accurately is of critical importance since management of risks during pregnancy and labour often depend on the gestational age (GA) (i.e., when and if to give steroids, conservative management versus early delivery, identifying intrauterine growth restriction, and induction of labour).

Ultrasound measurement of the embryo or fetus in the first trimester (up to 13 6/7 wks) is the most accurate method to determine GA.

Fundal height is not an accurate measurement for gestational age and should not be relied upon independent from LMP and US measurement.

Diagnosis

History Ask the date of the first day of the woman's last menstrual period (LMP).

- A careful history must be taken from the patient to determine the first day of her last period and that her periods are regular (appear every month while not on contraception).
- 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

If < 14 wks: The average of three separate crown-rump length (CRL) measurements in a midsagittal plane should be used to determine GA.

- If the GA determined by the US differs from the GA from the LMP by more than 7 days, the GA and EDD should be changed to what is determined by the US.
    - If the dating agrees within 7 days, the LMP dating should be used.
- If the US is done at less than 9 0/7 wks, and there is a discrepancy of more than 5 days from LMP dating, the dates should be based on the US.

If ≥ 14 wks: Measure fetal biometry (head circumference, biparietal diameter, abdominal circumference, and femur length).

- If the GA determined by the US differs from that of the LMP by more than 14 days, the GA and EDD should be changed to what is determined by the US.
    - If the dating agrees within 14 days, the LMP dating should be used.

Amount of discrepancy from LMP that would suggest using the US dating:

- >16 wks: More than 10 days
- >22 wks: More than 14 days
- >28 wks More than 21 days

If the patient is unsure of her LMP, dating should be determined by the earliest possible US.

If an earlier US was done before your present evaluation, GA should not be changed.

The earlier the US, the more accurate the dating. Instead, consider whether there is a growth disturbance.

If the US you are using does not calculate GA for you, use this website: perinatology.com

Management

Document clearly what the correct gestational age and estimated date of delivery is in the health passport. Tell the patient if this is the first US for dating she has had and let her know that **her EDD does not change from this**.

- If only one measurement can be taken:
    - Head circumference best predicts GA if GA 14-24 wks, but can have a margin of error of 2 weeks
    - Femur length best predicts GA in third trimester, but can have a margin of error of 3-4 weeks

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

Topic or GA	Plan
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	• Start Benzyl Penicillin 2 MU q6h IV if PROM ≥ 18 hours • FBC, group & save • Induce/augment labour by 24 hours after PROM if term • Caesarean delivery if previous cesarean section
PPROM ≥ 34 wks 28 - 34 wks 26-28 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 • 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 cesarean • Deliver by cesarean section if previous cesarean section • Expectant management • Minimise mobility; encourage leg exercises and/or anti-embolic measures • Treat with Steroids and oral antibiotics for latency: Erythromycin 250 mg QID 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 o Conservative management: close monitoring for infection, labour or placental abruption; pelvic rest, modified bed rest with bathroom

<26 weeks	privileges, serial US, and oral antibiotics for latency. o Give corticosteroids at 27 wks if patient reaches that gestation. • 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 forinfection, labour or placental abruption, strict pelvic rest, modified bed rest with bathroom privileges, serial US, and oral antibiotics for latency.
Chorio-amnionitis**	• Ampicillin 1 g OR Benzyl Penicillin 2 MU IV q6h, plus Gentamicin 240 mg 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 AND BIRTH

Introduction/Definition
Preterm labour is defined as onset of contractions that cause progressive cervical dilation at < 37 wks gestation.

It complicates 10-12% of all pregnancies and is associated with significant neonatal morbidity and mortality, especially between 24-34 wks gestation.

Diagnosis
History Risk factors include:
- multiple gestation
- polyhydramnios
- acute local or systemic inflammation (eg. appendicitis, STIs, UTI and/or pyelonephritis)
- antepartum haemorrhage
- placental abruption
- uterine anomalies
- cervical insufficiency
- previous preterm delivery
- tobacco and illegal drug use
- lower socioeconomic status
- extremes of age
- poor nutrition
- poor or lack of antenatal care

*Exam*Presence of contractions with cervical dilation and effacement on VE

Investigations Transvaginal Ultrasound for cervical length (short cervix ≤ 2.5 cm)
- Not for patients with pre-labour rupture of membranes!

Management
Prevention
- Screen and treat asymptomatic bacteriuria/urine microscopy (previous preterm birth)
- If previous preterm birth and current singleton gestation, then treat with hydroxyprogesterone acetate 250mg (Romero R, Nicolaides KH, et al 2016) IM every week at 16-36 weeks if available
- Interventions with inconsistent evidence – treatment of asymptomatic bacterial vaginosis, cervical cerclage
- Offer a choice of either prophylactic vaginal progesterone or prophylactic cervical cerclage to women with:
    - A history of spontaneous preterm birth or mid trimester loss between 16^{+0} and 34^{+0} weeks of

pregnancy **and**
    - in whom a transvaginal ultrasound scan has been carried out between 16^{+0} and 24^{+0} weeks of pregnancy that reveals a cervical length of < 25 mm.
- Discuss the benefits and risks of prophylactic progesterone and cervical cerclage with the woman and take her preferences into account.
- Consider prophylactic cervical cerclage for women in whom a transvaginal ultrasound scan has been carried out between 16^{+0} and 24^{+0} weeks of pregnancy that reveals a cervical length of < 25 mm and who have either:
    - Had PPROM in a previous pregnancy
      or
    - A history of cervical trauma

Established preterm labor

- Monitor fetal heart rate and contractions
- IV line with NS at maintenance rate
- Send investigations if available: FBC, urinalysis / urine dipsticks, speculum exam to check for abnormal discharge,
- Do a wet prep/mount fortrichomonas 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 of Tocolytic medications

Tocolytic medication	Contraindications	Maternal side effects	Fetal/neonatal side effects
Nifedipine (immediate-release) 20 mg load then 10 mg PO if still contracting after 30 mins and 10mg q2h (hold if maternal BP < 90/50 mm Hg)	Cardiac disease, use caution with renal disease, do not use with magnesium	Flushing, headache, dizziness, nausea, transient hypotension, transient tachycardia, palpitations	Sudden fetal death, fetal distress
Indomethacin 50-100 mg load then 25- 50mg PO every 6 hrs × 48 hrs (Only if <32 weeks)	Significant renal or hepatic impairment	Nausea, heartburn	Constriction of ductus arteriosus, pulmonary HTN, reversible renal dysfunction with oligohydramnios, IVH, NEC, hyperbilirubinemia
Salbutamol 250 ug IV slow push over 5 minutes	Cardiac disease, renal disease	Heart palpitations	Transient fetal/neonatal tachycardia

- 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 transferneonate to NICU as soon as possible
- Consider Caesarean delivery if breech presentation
- Consider using Magnesium sulfate for neuroprotection if viable, EGA <32 weeks, and concern for imminent preterm birth (dosage as per preeclampsia protocol; or if IV infusion available, give 4g IV loading dose over 30 minutes, followed by 1 g/hr maintenance)[1].
    - If antenatal magnesium sulfate has been started for fetal neuroprotection, tocolysis should be discontinued.
    - For planned preterm birth for fetal of maternal indications, magnesium sulfate should be started ideally within 4 hours before birth.
    - Magnesium sulfate should be discontinued at delivery, if delivery is no longer imminent, or when a maximum of 24 hours of therapy has been administered.

[1]Society of Obstetricians and Gynaecologists of Canada. Clinical Practice Guideline #258. Magnesium Sulfate for Fetal Neuroprotection. May 2011.

PREVIOUS CAESAREAN DELIVERY

Introduction/Definition
Pregnancies with previous cesarean delivery are at increased risk of uterine rupture, hemorrhage, abnormal placentation, 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. Success rates vary between 70-75%.

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, outcome, 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 caesarean 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 caesarean delivery that was not uncomplicated with low transverse uterine incision
  - Previous diagnosis of CPD led to caesarean or instrumental delivery

VBAC candidates	Repeat caesarean delivery candidates
Uncomplicated previous caesarean delivery with a nonrecurring indication, e.g., fetal distress	Classical caesarean delivery Contraindications to vaginal delivery Obstetric fistula (current or repaired)

VBAC

- Send blood for FBC and X-match so that blood transfusion 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 descent of the anterior shoulder is obstructed by the symphysis pubis and thus the shoulders and body of the infant fail to deliver after the head has delivered.

Previous history of shoulder dystocia, macrosomia, maternal diabetes, maternal obesity, operative vaginal delivery, and protracted second stage are risk factors. However, the majority of cases of shoulder dystocia occur in low risk deliveries.

Shoulder dystocia is not accurately predictable or preventable. 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 use fundal pressure (this worsens impaction of the fetal shoulder and increases the risk of uterine rupture)
- 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.
    - This rotates the symphysis pubis and flattens the lumbar lordosis, often freeing the impacted shoulder.
- 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.
- Apply constant moderate downward traction on the fetal head in alignment with the fetal cervico-thoracic spine at a vector 25-45 degrees below the horizontal plane when the woman is in a lithotomy position.
    - Avoid excessive traction or lateral traction on the fetal head.
- If this fails, attempt other methods:
    - Delivery of the posterior shoulder – flex the posterior arm over the fetal chest using two fingers (to avoid fracture of the humerus) to allow delivery of the posterior arm.
    - 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

Mnemonic for shoulder dystocia:

Complications:

- Maternal:
  - Postpartum hemorrhage (11%)
  - High degree lacerations (4th degree laceration in ~4% cases)
  - Vaginal lacerations
  - Uterine rupture
  - Pubic symphysis separation

- Fetal:
  - ~5% permanent injury rate
  - Up to 40% of cases have initial brachial plexus injury but 80-90% recover
  - Clavical fracture
  - Humerus fracture
  - Increased risk of hypoxemic ischemic encephalopathy and death

MEDICAL CONDITIONS IN PREGNANCY

ADNEXAL MASSES IN PREGNANCY

Introduction/Definition

Adnexal masses are not uncommon in pregnancy. During the first trimester, thecorpus 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*Ultrasound

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 hasmalignant characteristics on US, then consider staging laparotomy
- If mass > 10 cm without symptoms
    - If first trimester, then observe closely with US every 2 wks for growth orcomplications
    - 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 forsuspected 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, thenreplace progesterone with appropriate dose. (Hormorin 200mg od)
- NB: There is no role of tumor markers (CA-125) in pregnancy

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, dizziness, 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

Prevention
- Provide all antenatal women with FeFol 325 mg po BD
- Advise on diet rich in green leafy vegetables, liver, fish, eggs
- Give Albendazole 400 mg to prevent hookworm
- Give at least 3 doses SP (3 tablets, each tablet 500mg/25mg SP) 4 weeks apart, starting at13 weeks gestation
- Advise to keep interval between pregnancy >2 years minimum
- All breastfeeding mothers should take iron supplements

Management
- Check FBC and treat according to the result
    - 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 ofcongestive cardiac failure due to sudden circulatory overload)
        - Treat with folate and FeFol 325 mg PO BD and recheckHb in 2-4 wks
    - If MCV < 80, then send blood for iron studies (ferritin, TIBC and %saturation) if available.
    - If MCV 80-93, then send blood for peripheral smear and consult haematologist as needed
    - If MCV ≥ 94, then treat for folate or vitamin B12 deficiency
- Treat with Albendazole 400mg once on empty stomach
- 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 upto reduce side effects and encourage compliance.
    - Take iron on emptystomach with vitamin C and without antacids.
- If Folate deficiency, then treat with folate 1-4 mg PO OD.
- If Vitamin B12 deficiency, then treat with vitamin B12 1000 mcg IM qweek x 4 weeks, then 1,000mcg IM monthly or until deficiency is corrected.
- If haemolytic anaemia, then send blood for direct and indirect Coombs tests.
    - Treat with corticosteroids.
    - Drug-induced (i.e. methyldopa,penicillin, cephalosporin) haemolytic anaemia is typically milder and istreated by stopping the offending medication.

ASPIRIN USE IN PREGNANCY

Introduction/Definition
Aspirin therapy is used for thromboprophylaxis in the reproductive-aged woman andfor preeclampsia prophylaxis in the obstetric patient.

With regard to obstetrics, 2meta-analyses found 13-15% reduction in preeclampsia especially for high riskwomen, 8% reduction in preterm delivery (PTD), and 14% reduction in fetal orneonatal death.

Diagnosis *History/ Exam/Investigations*

Evaluate for indications

- As thromboprophylaxis in the reproductive-aged woman:
    - Prior myocardial infarction
    - Well documented prior cerebral thrombosis
    - History of Pulmonary Embolism or DVT after completion of anti-coagulation
- As preeclampsia prophylaxis in the pregnant woman:
    - History of preeclampsia or gestational hypertension
    - Prior delivery of severe IUGR infant
    - Chronic hypertension
    - Renal disease
    - Autoimmune Disease
    - Insulin-requiring diabetes
    - History of IUFD
    - Multiple gestation
    - Unexplained recurrent pregnancy losses

Management
- Aspirin 75-150 mg PO OD, to be started between 11-14 weeks of gestation until 36 weeks of gestation.

ASTHMA IN PREGNANCY

Introduction/Definition
Asthma occurs when there is reversible bronchoconstriction and affects 4-12% of pregnancies.

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.

Classification	Intermittent	Persistent		
		Mild	Moderate	Severe
Symptoms	≤ 2 days/wk	> 2 days/wk but not daily	Daily	Throughout the day
Night time awakenings	≤ 2 times/month	3-4 times/month	>1 time/week but not nightly	Often 7 times/week
Short acting beta 2 agonist use for symptom control	≤ 2 days/wk	> 2 days/wk but not daily and not > 1 time on any day	Daily	Several times/day
Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
Lung function	• Normal FEV1 between exacerbations • FEV1 > 80% predicted • FEV1/FVC normal	• FEV1 > 80% predicted • FEV1/FVC normal	• FEV1 60-79% predicted • FEV1/FVC reduced by ≤ 5%	• FEV1 < 60% predicted • FEV1/FVC reduced by >5%

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
- Avoid GERD in 3rd trimester by using PPI or H2 blocker

- For mild - moderate persistent asthma: salbutamol inhaler 1-2 puffs TDS or corticosteroid inhaler (i.e. beclomethasone)
- For acute and/or severe exacerbations:
    - Admit to HDU
    - O2 therapy to keep SaO2 >95%
    - inhaled bronchodilator (salbutamol, ipromium bromide and normal saline)through a nebulizer or spacer every 10-20 min until improvement seen
    - IV fluids
    - IV Aminophylline 250 mg over 10 min or MGSo4 2g stat
    - Sit up
    - 4-hourly fetal monitoring
    - Systemic steroids (i.e. hydrocortisone or prednisone IV) for up to 5-7 days
    - Continuously assess response to treatment, complete response is resolution of symptoms and PEFR>80%
        - Incomplete response is continuation of symptoms PEFR<80% personal best
        - Urgent intervention required when PEFR <50% personal best
- Indication for intubation and ventilation: inability to maintain respiratory drive, worsening hypercapnia, respiratory acidosis, confusion and inability to maintain SpO2> 95% despite high flow oxygen
- Intrapartum management: continue regular inhaler prn
    - Use of IV hydrocortisone if patient has been on oral steroids >7.5mg/day for >2 weeks
- Misoprostol if indication for labour induction
- Oxytocin if PPH
- Avoid use of PGF_2 and ergometrine

CARDIAC DISEASES IN PREGNANCY

Introduction/Definition

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

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

Maternal complications in pregnancy	**Fetal complications**
Congestive heart failure	IUGR
Arrhythmias	Prematurity
Stroke	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, increasingdyspnoea on exertion, and haemoptysis 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

- All pregnant patients with cardiac disease should be referred to Central Hospital for management.
- Preconception counseling for known cardiac disease in order to assess riskand 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
- Use the New York Heart Association (NYHA) 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

- Assess risk of CHF, arrhythmia, stroke, cardiac arrest, death by evaluating for these 4 risk factors (CAPREG):

    - NYHA III, IV, or cyanosis

    - Left heart valvular or outflow tract obstruction:

        - AVA <1.5 cm2, MVA <2 cm2

        - **or**

        - Peak LVOTO gradient >30mm Hg
    - Previous history of arrhythmia, TIA, stroke, or CHF
    - Ejection fraction<40%
        - 5% risk if 0 factors
        - 27% risk if 1 factor
        - 75% if 2 or more factors
- Offer termination of pregnancy if high-risk or with other high-risk condition (pulmonary hypertension, Marfan's syndrome, NYHA III/IV, previous peripartum cardiomyopathy with residual ventricular dysfunction, coarctation of aorta with hypertension)
- Assess functional capacity at each visit
- 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
- AHA 2007 indications for antibiotic use:
    - Prosthetic valve,
    - Previous IE,
    - Transplanted heart with valvulopathy,
    - CHD- unrepaired cyanotic CHD or with palliative shunt, repair in past 6 months, repaired but with defect of no epithelial tissue
- 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 obstetricindications only)
- Consult anaesthesiologist immediately so that he/she is aware of high-riskpatient
- 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 fetalsurveillance
    - 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, no need for antibiotic in labor
- 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 deliveryor 12-24hrs after caesarean delivery
- Inform paediatrician of maternal history of cardiac disease so that newbornis evaluated for congenital heart disease (i.e. examination, echocardiogram)
- Contraception: consider surgical sterilization for life-threatening cardiacdisease 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:

Class	Age of onset	Duration	Vascular disease
B	>20 yo	<10 yrs	None
C	10-19 yo	10-19 yrs	None
D	<10 yo	>20 yrs	Benign retinopathy
F	Any	Any	Diabetic retinopathy
R	Any	Any	Proliferative retinopathy
H	Any	Any	Ischemic heart disease
T	Any	Any	Renal transplant

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 (> 4,000g) 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 24-30 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
    - Patient should self-record daily blood glucose levels before each meal and before going

to bed
    - Treat with oral hypoglycaemic for FBS > 8 mmol/L x 2 or more
    - Goal is to maintain FBS at 6-8 mmol/L
- Medication-based management
    - Metformin (500 mg BID, increase weekly as needed to maximum of 3,000 mg/day) and/or Glibeclamide (2.5 mg PO BD, increase weekly as needed to maximum of 20mg/day)
    - Send blood for FBS or check FBS with glucometer twice weekly
    - Switch to Insulin for persistent FBS > 8 mmol/L despite maximum dose of Metformin & Glibeclamide
- 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 sugaris controlled.
- For women who never used a glucometer before, consider inpatientadmission for diabetic education and glucose control.
- Antenatal care visits: every 2 wks until 30 wks gestation, then weekly untildelivery
- American Diabetic Association diet at 30-35 kcal/kg/day; increase caloriesfor 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 units
    - In second trimester, total daily dose = weight x 0.8 units
    - In third trimester, total daily dose = weight x 0.9-1.0 units
    - Given as 2/3 of total daily dose in the morning at breakfast: 1/3 assoluble Insulin and 2/3 as long-acting Insulin
    - Given as 1/3 of total daily dose in the evening at dinner (17hrs): 1/2 assoluble Insulin and 1/2 as long-acting Insulin
    - For example, for weight of 72 kg in third trimester, give 16 units solubleInsulin and 32 units long-acting Insulin at breakfast and 12 units solubleInsulin 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 coexistenthypertension (HTN)
- Hospitalization at 34-36 weeks
- Intrapartum management
    - No specific treatment if labour progresses normally and quickly
    - For induction or prolonged labour: add 1/3 of her daily insulin as solubleInsulin 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 andno vascular disease
    - At earlier gestation (37-38wks) for Class D and higher, polyhydramnios,macrosomia, poor blood glucose control, chronic HTN on medication orIUGR

- 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 resumepre-pregnancy regimen
- Treat with DNS at 3L daily post Caesarean delivery until tolerating PO andthen 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 toavoid morbidity and mortality
- Presents with nausea and vomiting, thirst, polyuria, polydipsia, alteredmental status, either known history of diabetes or not
- Exam is significant for tachycardia, tachypnoea, fruity breath (due toketones)
- 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 mcs
- Management based on reducing blood glucose in controlled manner
  - On admission: NS 1L over 30 min Soluble insulin 20units IV STATfollowed by soluble insulin 12-20 units IM every 2hours
    - Add 20 mmol KCl to first litre of NS
    - Monitor K and anion gap every1-2 hours until stable if available
  - Next 2 hours NS 1L over 1 hourx 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.

The main focus should be on etiology, both pregnancy related (e.g., pre-eclampsia) and non-pregnancy related(e.g., migraine, cerebrovascular causes) before giving medication.

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.

Prevention
- Testing for HBsAg should be performed at the first prenatal visit if available.

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

For HBsAg-positive women
- Send blood for expanded hepatitis B serology and ALT to evaluate for activeHBV infection.
- No specific antiviral treatment available for acute HBV infection**;** 90-95% of adults will recover spontaneously and develop immunity.
- Consult physician regarding lamivudine 100mg OD for chronic HBV infection.
    - Decision to initiate therapy is dependent on presence of cirrhosis, HBeAg, Hepatitis B e antibody (anti-HBe), ALT >2x the upper limit.
- During pregnancy, ALT should be monitored every 3 months
- Prevent neonatal infection (85-95% effective)**:** give HBIG and vaccine (1st inseries of 3 injections) to newborn within 12 hrs of birth; alert paediatricians.
- Breastfeeding is permissible but not when the mother has cracked nipples.

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 the third trimester
(2) In the labour ward if their last test was over 6 weeks ago
(3) At the 6 week postnatal visit.

Antepartum Management
- All HIV-infected pregnant and breastfeeding women should be on ART.
- Start ART (for lifetime) regardless of WHO clinical stage and at any CD4 cell count, ideally on same day as diagnosis.
- TDF/3TC/EFV is currently first-line therapy(regimen 5A).
- Start PrEP for serodiscordant couples (WHO 2012 guidelines)
- Screen for STIs, such as Hep B and syphilis, nutritional support, and family planning guidance
- TB symptom screening
- Start cotrimoxazole in all HIV-infectesd pregnant women, regardless of CD4count, WHO stage or gestational age.
    - Do not give SP to women on cotrimoxazole.
- Laboratory tests at the following time points
    - At baseline: Cr, FBC, LFT, syphilis test, CD4 count, urinalysis

Intrapartum Management
- Vaginal delivery unless obstetric indication for caesarean delivery
- Continue ART during labour
- Instrument delivery should be avoided unless essential

Postpartum Managment
- Exclusive breastfeeding is encouraged up to 6 months and may continue breastfeeding up to 2 years of age
- Daily NVP syrup for infant for 6 wks (dose based on infant weight)
- Cotrimoxazole syrup for infant starting at 6 wks until final HIV testing resultsreturn as negative

HERPES SIMPLEX AND PREGNANCY

Introduction/Definition
Although its incidence is 1 in 3,000 to 10,000 live births, neonatal herpes simplex virus (HSV) infection is associated with a case fatality rate as high as 50-60%, with 60-70% 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%).

Primary HSV infection is the first occurrence of a genital HSV lesion without pre-existing HSV-1 or HSV-2 antibodies.

Primary infections are associated with a higher risk of vertical transmission at 40-44%, with a higher risk if infection was acquired near time of delivery.

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)
  - First clinical episode: 200 mg 5x daily for 7-14 days or 400 mg TDS for 7-14 days
  - Recurrent episode(s): 200 mg 5x daily for 5 days or 400 mg TDS for 5 days
  - History of HSV (daily suppressive therapy): 400 mg TDS 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 ofprematurity often outweigh the risks of neonatal HSV infection; treat withoral acyclovir.
- Disseminated HSV or HSV-related pneumonitis, hepatitis, and/orencephalitis: treat with acyclovir IV.
- Mode of delivery
  - Vaginal delivery if there are no active genital lesions or prodromalsymptoms.
  - Caesarean delivery if there are active genital lesions or prodromalsymptoms even if membranes are ruptured.
  - Cesarean delivery if women presents with first episode of HSV in the 3rd trimester
  - Vaginal delivery with lesions covered if there are non-genital lesions(i.e. on the thighs).
  - Continue Acyclovir antiviral therapy during intrapartum period
- Infant and infected mother can be together.
- Counsel on hand washing and hygiene techniques to prevent postnataltransmission.
- Breastfeeding is contraindicated only for breast lesion(s).

KAPOSI'S SARCOMA

Introduction/Definition
Kaposi's sarcoma (KS) is a vascular tumour associated with human herpesvirus 8 (HHV-8).

It is the most common tumor in HIV-infected individuals in Africa and is a WHO Stage IV AIDS illness.

The tumor may arise in multiple locations: most commonly skin, but any organ (excluding the brain) may be involved.

Four forms exist: classic, equatorial Africa endemic, secondary to iatrogenic immunosuppression, and HIV/AIDS related.

Diagnosis
History/Exam

- Erythematous violaceous cutaneous lesions, macular, patch, plaque, nodular, or exophytic; solitary, localized, or disseminated
- Lymphoedema

Investigations HIV test with CD4+ cell count and FBC, Cr,liver function tests and coagulation assays; skin biopsy of lesion may be done to confirm diagnosis, although clinical diagnosis in setting of HIV infection is generally sufficient.

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 startchemotherapy vs. start chemotherapy while still pregnant. Regimens include:
    - Paclitaxel alone
    - Doxorubicin, bleomycin, and vinblastine or vincristine (ABV)
    - Gemcitabine monotherapy may be used after previous treatment with ABV

KS and Pregnancy
- Case reports in the literature show that KS may improve or worsen during pregnancy, with a low-risk of HHV-8 vertical transmission
- Given potential fetal toxicity of chemotherapy, non-threatening skin lesions without visceral involvement should be monitored and managed conservatively

References:

KAPOSI'S SARCOMA Union for International Cancer Control, 2014 Review of Cancer Medicines on the WHO List of Essential Medicines:http://www.who.int/selection_medicines/committees/expert/20/applications/KaposisSarcoma.pdf?ua=1. Accessed 20 Oct 2017.

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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 and Fetal complications
- Severe anaemia
- Preterm birth (<37 weeks gestation)
- Low Birth Weight (<2500g at birth)
- Abortions
- IUGR
- Perinatal Death
- Placental abruption
- Hypoglycaemiawhen taking quinine
- Pulmonary oedema
- Cerebral malaria

Diagnosis:
Signs/Symptoms: Fever, chills, headache, myalgia, loss of appetite, nausea/vomiting, abdominal pains, uterine contractions, malaise, reduced fetal movements.

Signs/Symptoms of severe malaria: Dark colored urine, drowsiness/coma, mental confusion, seizures, jaundice, inability to stand, persistent vomiting, temperature >39 degrees C, anemia, poor urine output, difficulty breathing, fetal demise.

*Investigations*Malaria parasite smear, Malaria RDT, FBC, Blood Sugar

Prevention
- Insecticide-treated mosquito nets
- Intermittent Presumptive Treatment of Malaria in pregnancy (IPTp):
    - Pregnant women should receive Sulfadoxine-Pyrimethamine SP1500mg/75mg SP (3 tablets of 500mg/25mg SP) after 13 weeks (second trimester). and every 4 weeks until time of delivery
    - A minimum of 3 doses is required during pregnancy.
    - Doses should be administered at least 4 weeks apart and given as directly observed therapy.
    - Last dose of SP can be delivered safely up until the time of delivery.
    - SP can be given either on an empty stomach or with food.
    - HIV positive women receiving Cotrimoxazole prophylaxis should not receive SP.

Management
- Manage complication as for any adult; consider blood transfusion if severely anemic and close to delivery.
- The risk of death due to severe malaria is greatest in the first 24 hours after clinical presentation.
- For 1st Trimester:
    - Give Quinine 600 mg TDS plus Clindamycin 300 mg TDS or 20mg/kg/day divided three times daily, both for 7 days.
    - Give Panadol 1g TDS as needed
    - If Severe Malaria, give IM/IV Artesunate 2.4 mg/kg, repeat dose at 12 and 24 hours, then 3 days of LA when able to take oral medications.
        - Give IV Quinine if IM/IV Artesunate unavailable (see IV Quinine regimen below).

    - If confirmed treatment failure to Quinine plus Clindamycin, treat with LA.

- For 2nd & 3rd trimesters:
    - Give LA (Lumefrantrine 120 mg/Artemether 20 mg) 4 tabs STAT, then again in 8 hours, then BD for 2 days.
    - If Severe Malaria, give IM/IV Artesunate 2.4 mg/kg, repeat dose at 12 and 24 hours, then 3 days of LA when able to take oral medications. Give IV Quinine if IM/IV Artesunate unavailable (see IV Quinine regimen below).

- Alternative IV Quinine Therapy
    - Give **Quinine** 20mg/kg loading dose, followed by 10mg/kg 12-hourly for at least 24 hours, as follows:
        - Start with IV Quinine in 10% dextrose infusion or 5% dextrose in normal saline over 4 hours.
        - If Quinine can't be given by infusion: give 10mg/kg dosage by IM injection and refer. Make sure you give 10% dextrose concentration or one bottle of 5% glucose before administration of quinine.
        - If patient can't be weighed, give 900 mg Quinine in 1 L of 5% dextrose, followed by 600 mg in 1L of 5% dextrose every 12 hours until at least 24 hours IV Quinine is given.
        - If patient has received at least 24 hours of IV Quinine and can take oral medications, can switch to Quinine 600 mg TDS plus Clindamycin 300 mg TDS, both for 7 days.
        - Beware of hypoglycaemia: random blood sugar should be done before and after quinine administration.
        - Monitor for signs of pulmonary oedema! Give diuretic and stop fluids if overhydration.

- Side effects may include nausea, vomiting, weakness and dizziness

From the WHO Guidelines for the Treatment of Malaria, 3rd Edition, 2015.

MATERNAL SEPSIS/SEPTIC SHOCK

Introduction/Definition

Maternal sepsis is "a life-threatening condition defined as organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion, or postpartum period." [a,b]

Sepsis occurs when the body's response to infection causes injury to its own tissues and organs.[b]

Definitive evidence of organ dysfunction can be difficult to determine with limited resources, but critical features that mark when infection has progressed to sepsis and which should prompt immediate action are:

1) a fast heart rate (greater than 120)
2) low blood pressure (systolic blood pressure less than 90)
3) respiratory distress (reduced oxygen saturations < 94% or respiratory rate greater than 25)
4) jaundice
5) reduced urine output (less than 0.5ml/kg//hour)
6) reduced level of consciousness

There is a spectrum of disease, ranging from sepsis to septic shock. Septic shock is a subset of sepsis in which underlying circulatory and cellular metabolism abnormalities are profound enough to substantially increase mortality.

Diagnosis

History Identify the source of infection, i.e., dysuria, cough, recent abortion or delivery. Identify important risk factors such as severe anemia and HIV status. Identify antibiotic allergies.

Exam
Measure vital signs to determine if sepsis is suspected using features listed above.
Careful physical examination for source of infection.

Investigations FBC, blood mcs, urine mcs, malaria, and HIV testing. Consider further microbiology investigations such as lumbar puncture or other swabs for microscopy e.g. high vaginal swab as appropriate. Consider if additional imaging is required, e.g. ultrasound, CXR

Management

- Airway, breathing, circulation (ABC)
    - O2 (can be discontinued if normal oxygen saturations)
    - Correct hypotension with IV crystalloid fluids (up to 30 ml per kg over first 3 hours, given as 500 ml rapid boluses). Caution and senior advice are required in women with pre-eclampsia or severe anaemia.
    - If persistent hypotension, then consult anesthesia to give norepinephrine or phenylephrine
    - If myocardial dysfunction suspected, consult Medicine and Anesthesia
- Broad spectrum intravenous antibiotics should be commenced urgently (Ceftriaxone + Flagyl or X-Penicillin + Gentamicin + Flagyl for 7 days if source is not known). As soon as source is identified, antibiotics should be selected according to Malawi Standard Treatment Guideline recommendations.
- Remove the source. E.g. Incision and drainage, delivery, laparotomy, evacuation of retained products, as directed by infectious source.
- Monitor response to treatment by charting the vital signs. Consider monitoring of the fetus or neonate if appropriate.
- If not responding to initial treatment or septic shock, then transfer to HDU or ICU for intensive monitoring

[a]WHO statement on maternal sepsis. http://apps.who.int/iris/bitstream/10665/254608/1/WHO-RHR-17.02-eng.pdf.
[b]Singer M, Deutschman CS, Seymour CW, Shankar-Hari M, Annane D, Bauer M et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). J AMA. 2016 Feb 23;315(8):801-10,
[c]Rhodes et al. Surviving Sepsis Campaign: International Guidelines for management of Sepsis and Septic Shock: 2016. Critical Care Medicine. 2017.

SYPHILIS IN PREGNANCY

Introduction/Definition

Syphilis is a STI caused by spirochete *Treponema pallidum*that can be transmitted from mother to fetus.

Clinical Manifestation of Syphilis

- Primary Syphilis: Single painless ulcer (chancre)
- Secondary Syphilis: Rash involving the palms and soles, fever, malaise, arthritis, condyloma lata, glomerulonephritis
- Tertiary (late) Syphilis: neurosyphilis, granulomatous disease of skin and subcutaneous tissues (gummatous disease)

Potential Adverse Pregnancy Outcomes

- Miscarriage
- Preterm birth
- Still birth
- Congenital infection
- Perinatal Death

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 3doses (for latent syphilis, only 1 dose for primary syphilis)
    - If allergic to penicillin, thenerythromycin 500 mg PO QID x 14 days for early syphilis or erythromycin 500mg QID for 30 days
- After sexual contact with a known or possibly infected individual, presumptive treatment with single dose of penicillin G benzathine 2.4 MU IM x 1.
- Monitor for Jarisch-Herxheimer reaction, an acute febrile reaction with headache, myalgia, rash and hypotension.
    - It may also cause preterm labor.
- Partner notification and treatment.
- Fetal US to identify severely infected fetus(placentomegaly, IUGR, microcephaly, hepatosplenomegaly,hydrops, ascites, polyhydramnios).
- 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
- Personal history of other autoimmune disorders

Diagnosis/Management
All cases of suspected thyroid disease should be referred to the Central Hospital for 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 usuallyincreases in pregnancy.
- Send blood for fT4 and TSHevery trimester so that dose canbe 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 TSHevery 4 wks until goals oftherapy are attained and thenevery 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 TDSuntil fT4 is at upper limit of normal.
- Maintain with PTU 50-150mg PO OD.
- Stop PTU for jaundice, fever, chills,sore throat, petechiae or bleedinggums; switch to methimazole 5-10mgPO TDS.
- Send blood for fT4 or FTI every 4 wksthroughout 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 withbeta-mimetics and use magnesiumsulphate with caution due to possiblevolume overload andcardiomyopathy.

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.

The general main focus is to prevent hypothyroidism, with the possible serious consequences for the baby.

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 bloodproducts
    - 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 for Rh negative women

Safety for the mother is the main focus in an emergency situation, with general ABC-procedures, then the baby.

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.
- Streptomycin is associated with ototoxicity and 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 (via Gene Expert if available)
- CXR
- HIV testing (if unknown status)

Management
- 2 months of RHZE daily followed by 4months of RH daily, also known as 2HRZE/4HR per WHO
    - There are no safety studies on Pyrazinamide in pregnancy, but routine use is permissible
    - Streptomycin should not be used as it has been shown to have harmful effects on the fetus, such as hearing loss, vestibular dysfunction
- Dosage is dependent on the weight of the patient
- Isolation if admitted to facility and if suspected or confirmed TB (for first 2 weeks for treatment)

2) Pulmonary TB: relapse or treatment failure

History/Exam
- Same as above with history of TB treatment

Investigations
- Sputum AFB (via Gene Expert if available)
- Sputum c+s
- CXR
- HIV testing (if unknown status)

Management
- Consult TB Officer for management recommendations

*In pregnancy, treat as new case, avoid streptomycin, and consult physicians.
**Postpartum, 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.

Pyelonephritis in pregnancy can lead to acute respiratory distress syndrome (ARDS) and preterm labour.

Therefore, treating UTI to prevent progression to pyelonephritis is imperative.

Diagnosis

History/ Exam Dysuria, increased frequency and urgency,retropubic/suprapubic pain, abdominal pain.

Often, in pregnancy there are no symptoms. Therefore, urine dipstick should prompt investigation and treatment.

For acute pyelonephritis: spiking fevers or chills, flank/costo-vertebralangle pain or tenderness, anorexia, nausea and vomiting.

Investigations Urinalysis, urine microscopy (clean-catch, midstream sample) should be collected at least once in the pregnancy, preferably at the first antenatal visit.

Urine culture should also be performed if available. If only a urine dipstick is available for evaluation, presence of nitrates and leukocytes is often indicative of an infection, however, in pregnancy there should be a low threshold for treatment.

Management

Acute cystitis or Asymptomatic bacteriuria (infection limited to the bladder)

- Cephalexin 500mg QID for 5 days, Amoxicillin 500 mg PO TID for 5 days, Nitrofurantoin 100mg BID for 5days.
- Check urine culture and sensitivities if available. Adjust antibiotics asindicated, 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
    - PO or IV hydration
    - Monitor urine output
    - Ceftriaxone 1g od continue until afebrile for 24hrs, then give oral amoxicillin for total 14 days
    - Check urine culture and sensitivities if available prior to starting antibiotic
    - Paracetamol 500 mg tds PO for pain and fever

Prophylaxis to prevent future UTIs: After the 3rd UTI or any incidence of pyelonephritis during the pregnancy, prophylaxis should be instituted.

- Prophylactic antibiotics (i.e. nitrofurantoin 50-100mg OD or cephalexin 250-500mg mg OD).Both trimethroprim/sulfamethoxazole and nitrofurantoin should be avoided in the 3rd trimester of pregnancy

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 48hours before rash appears until vesicles have crusted over which is 5-7 days after onset of rash.

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

Fetal risks
Congenital varicella syndrome, if maternal infection between 8 and 20 weeks (neurological abnormalities, ocular abnormalities, limb abnormalities, cutaneous scars, low birth weight)
Neonatal varicella (born to mothers who are infected within 2weeks of delivery

Diagnosis

History/ Exam Fever, malaise, pruritic and appears in successive crops of vesicles on the face, trunk and extremities. The lesions begin as macules that become papules followed by vesicles, then it forms the crusted papules

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 (treatment is most effective if within the first 24 hours); give intravenous acyclovir at 10mg/kg every 8 hours 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.

GYNAECOLOGY

ABNORMAL UTERINE BLEEDING (AUB)

Introduction/Definition
Menstrual flow outside of normal volume, duration, regularity, or frequency is considered AUB.

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
Metrorrhagia: bleeding between periods
Menometrorrhagia: 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:

PALM: Structural Causes
Polyp
Adenomyosis
Leiomyoma
Malignancy & hyperplasia

COEIN: Nonstructural Causes
Coagulopathy (Von Willebrand's, warfarin use, etc.)
Ovulatory dysfunction (PCOS, thyroid disease, etc.)
Endometrial (endometritis, AVMs.)
Iatrogenic (medications)
Not yet classified

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 (easybruising/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 or has elevated risk for endometrial cancer (i.e. elevated BMI)
- Has postmenopausal bleeding
- Has history of unopposed estrogen exposure (including PCOS).

Management
Treatment is dependent on the aetiology of AUB. 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 persistent, complex mass noted on ultrasound, refer to Central Hospital, where they will consider cystectomy/oophorectomy for possible endometrioma

- Consider hysterectomy if done with childbearing if failed medical management

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. Consider GnRH agonist if available.
- 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)

Stage	Description
I[a]	Tumor confined to the corpus uteri
IA[a]	Less than half myometrial invasion
IB[a]	Invasion equal to or more than half of the myometrium
II[a]	Tumor invades cervical stroma, but does not extend beyond the uterus[b]
III[a]	Local and/or regional spread of the tumor
IIIA[a]	Tumor invades the serosa of the corpus uteri and/or adnexae[c]
IIIB[a]	Vaginal involvement and/ or parametrial involvement[c]
IIIC[a]	Metastases to pelvic and/or para-aortic lymph nodes[c]
IIIC1[a]	Positive pelvic nodes
IIIC2[a]	Positive para-aortic nodes with or without positive pelvic lymph nodes
IV[a]	Tumor invades bladder and/or bowel mucosa, and/or distant metastases
IVA[a]	

IVB[a]	Tumor invasion of bladder and/or bowel mucosa Distant metastasis, including intra-abdominal metastases and/or inguinal nodes

[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.
- *Hypothalamic Amenorrhea:* 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.

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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, family history

Exam Examine lymph nodes, lungs, abdomen and pelvis (visual, bimanual and +/- rectovaginal exam). Concerning findings include firm, irregular, fixed, nodular, and/or bilateral masses. Ascites is also concerning for malignancy).

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: FBC if infection suspected. CA-125 (a serum tumor marker for epithelial ovarian cancer) 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 (dermoid)
        vii. Serous cystadenoma
        viii. Mucinous cystadenoma
        ix. Hydrosalpinx
        x. Ectopic pregnancy
    b. Malignant
        i. Germ cell tumour
        ii. Sex-cord or stromal tumour
        iii. Epithelial carcinoma
        iv. Metastatic cancer
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 any concern for malignancy, such as a solid or complex mass of any size, refer to Central Hospital.
- 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.

I	**Tumour confined to ovaries or fallopian tube(s)**	**T1**
IA	Tumour limited to one ovary (capsule intact) or fallopian tube. No tumour on ovarian or fallopian tube surface. No malignant cells in the ascites or peritoneal washings.	T1a
IB	Tumour limited to both ovaries (capsules intact) or fallopian tubes. No tumour on ovarian or fallopian tube surface. No malignant cells in the ascites or peritoneal washings	T1b
IC IC1 IC2 IC3	Tumour limited to one or both ovaries or fallopian tubes, with any of the following: Surgical spill intraoperatively Capsule ruptured before surgery or tumour on ovarian or fallopian tube surface Malignant cells present in the ascites or peritoneal washings	T1c
II	**Tumour involves one or both ovaries or fallopian tubes with pelvic extension (below pelvic brim) or peritoneal cancer (Tp)**	**T2**
IIA IIB	Extension and/or implants on the uterus and/or fallopian tubes/and/or ovaries Extension to other pelvic intraperitoneal tissues	T2a T2b
III	**Tumour involves one or both ovaries, or fallopian tubes, or primary peritoneal cancer, with cytologically or histologically confirmed spread to the peritoneum outside the pelvis and/or metastasis to the retroperitoneal lymph nodes**	**T3**
IIIA IIIA1 IIIA1(i) IIIA1(ii) IIIA 2 IIIB III C	Metastasis to the retroperitoneal lymph nodes with or without microscopic peritoneal involvement beyond the pelvis Positive retroperitoneal lymph nodes only (cytologically or histologically proven) Metastasis ≤ 10 mm in greatest dimension (note this is tumour dimension and not lymph node dimension) Metastasis *N* 10 mm in greatest dimension Microscopic extrapelvic (above the pelvic brim) peritoneal involvement with or without positive retroperitoneal lymph nodes Macroscopic peritoneal metastases beyond the pelvic brim ≤ 2 cm in greatest dimension, with or without metastasis to the retroperitoneal lymph nodes Macroscopic peritoneal metastases beyond the pelvic brim *N* 2 cm in greatest dimension, with or without metastases to the retroperitoneal nodes (Note 1)	T1, T2, T3aN1 T3a/T3aN1 T3a/T3aN1 T3b/T3bN1 T3c/T3cN1
IV	**Distant metastasis excluding peritoneal metastases**	**Any T, Any *N*, M1**
Stage IV A Stage IV B	Pleural effusion with positive cytology Metastases to extra-abdominal organs (including inguinal lymph nodes and lymph nodes outside of abdominal cavity) (Note 2)	Any T, Any *N*, M1

Based on 'DG Mutch and J Prat. 2014 FIGO staging for ovarian, fallopian tube and peritoneal cancer. Gynecologic Oncology 2014;133:401-04'

Notes:

1. Includes extension of tumour to the capsule of liver and spleen without parenchymal involvement of either organ.
2. Parenchymal metastases are Stage IV B.

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, sexual activity, and current medications, including contraceptive method

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, presence of galactorrhea, neck webbing suggestive of Turner's syndrome, bimanual exam to evaluate for presence of uterus, speculum examto 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. Evaluate ovaries for presence of >25 follicles on each ovary to support diagnosis of PCOS
         ii. Perform CT scan to evaluate for adrenal tumour.
         iii. Check serum testosterone if available to evaluate for PCOS or tumours.
         iv. 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, primary ovarian insufficiency, or autoimmune oophoritis -> can check karyotype or for autoimmune antibodies (anti-ovarian, anti-adrenal, 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.

*Progesterone withdrawal test: give Medroxyprogesterone or Norethindrone10mg 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. Overall goals include correcting the underlying pathology, helping to achieve fertility if desired, and preventing complication of the disease.

*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-ProducingTumours: 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. Counseling on bone density risks should also be discussed.

Hypothyroidism: start on Levothyroxine1.6 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, "shield" chest, webbed neck, low hairline, short 4^{th} or 5^{th} 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. If not requiring surgery, can treat with bromocriptine or cabergoline.

Polycystic Ovarian Syndrome:perform fasting blood sugar to evaluate for diabetes mellitus, 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 management of oligomenorrhea, acne, and prevention of endometrial hyperplasia. Can consider spironolactone 50 mg BD for treatment of hirsutism if available. May experience infertility or sub-infertility.

Primary ovarian insufficiency (premature ovarian failure): Begin on estrogen therapy to prevent bone loss. Oral contraceptive pill, or replacement estrogen and progestin are options.

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.

ANTIBIOTIC PROPHYLAXIS FOR GYNAECOLOGIC PROCEDURES

Introduction/Definition
Antibiotic prophylaxis is antibiotic use for the purpose of preventing, not treating, infection.

For abdominal or vaginal procedures in which prophylaxis is indicated, pre-operative antibiotics should be given 30-60 minutes prior to skin incision to decrease bacterial load of gram-positive skin flora or vaginal flora.

Post-operatively, only selectpatients at high risk (bowel injury, uncontrolled diabetic etc) or in whom there was evidence of pre-existing infection should be given broad spectrum antibiotics.

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 as needed.

Management

Scenario	Pre-operative (give 30-60 minutes before skin incision)	Post-operative
Surgical management of miscarriage(Dilation and sharp curettage, or Manual Vacuum Aspiration)	None[a,b,c]	None unless concern for Induced Abortion (see Miscarriage section)
Hysterosalpingogram or chromotubation	None	Doxycycline 100 mg PO BD x 5 days(only if patient has history of PID or dilated fallopian tubes on HSG; otherwise, prophylaxis is not needed)[a,b]
Laparoscopy	None	None
Vaginal hysterectomy and/or Urogynaecology procedures	1) Metronidazole 500 mg IV x 1 plus Gentamicin 1.5 mg/kg IV	None, unless evidence of infection during surgery (see below)
Abdominal hysterectomy (elective)	For Gram Positive skin flora: 1) Cefazolin 1-2 g IV, or 2) Ampicillin 2 g IV x 1 plus Gentamicin 1.5 mg/kg IV, or 3) X-Penicillin 3 MU IV x 1 plus Gentamicin 1.5 mg/kg IV	None, unless evidence of infection during surgery (see below)
Other Laparotomy	None, unless suspicion for intra-abdominal infection:	None, unless evidence of infection during surgery: 1) For Gram-Negative pelvic

	1) Cefazolin 1-2 g IV, or 2) Ampicillin 2 g IV x 1, or 3) X-Penicillin 3 MU IV x 1	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 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 to complete a 5-day course.

References

[a]American College of Obstetricians & Gynecologists. Antibiotic prophylaxis for gynecologic procedures. ACOG Practice Bulletin #104. Obstetrics & Gynecology 2009;113:1180-9.

[h]**Pittaway** DE, Winfield AC, Maxson W, Daniell J , Herbert C, **Wentz** AC. Prevention of acute pelvic inflammatory disease after hysterosalpingography: efficacy of doxycycline prophylaxis. Am J Obstet Gynecol. 1983 Nov 15;147(6):623-6.

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 1 year until age 65.
    a. 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 exceeds the normal upper age limit.

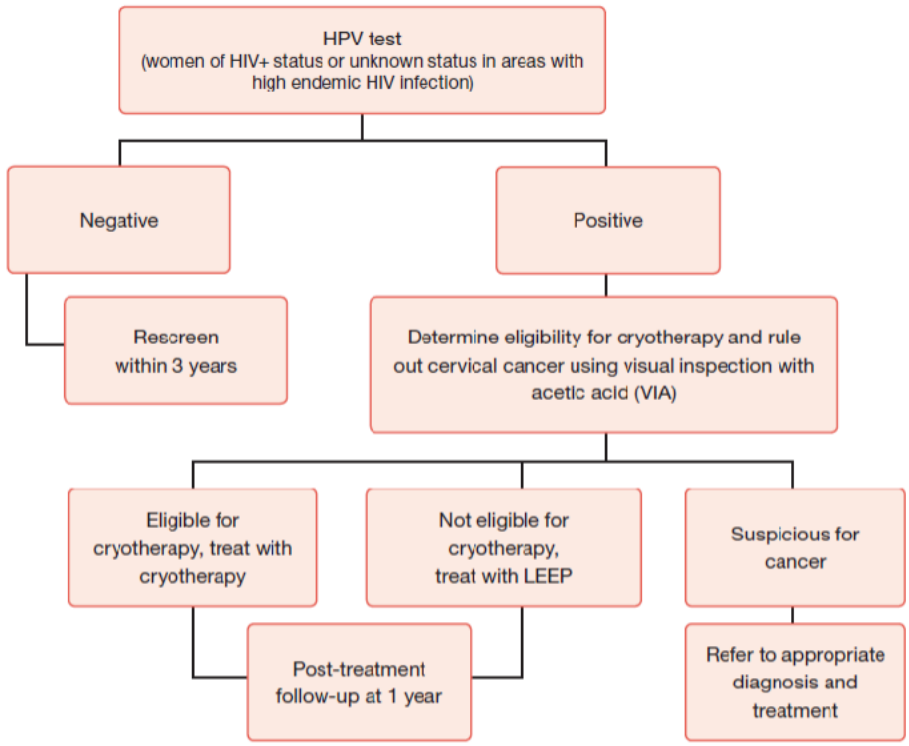
Prevention
1) Vaccination with HPV vaccine in girls between 9 years to 14 years.

Management
Screening methods

1) Speculum exam before any antibiotic course for women presenting with abnormal vaginal bleeding or foul-smelling discharge.
2) 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.
3) Papanicolaou (Pap) smear: cytology-based cervical smear with speculum, light, cervical spatula and cytobrush, microscopic slide, and a trained laboratory and cytopathologist.
4) HPV DNA testing: if available, done by cervical swab and requires PCR capabilities to detect active infection of the most common HPV subtypes (see chart below for WHO 2013 screening algorithm when HPV testing is available).

Screen with an HPV test and treat with cryotherapy, or LEEP when not eligible for cryotherapy

When an HPV test is positive, treatment is provided. With this strategy, visual inspection with acetic acid (VIA) is used to determine **eligibility** for cryotherapy.



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 (1 year if HIV-infected).
    - 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 at1 year
- 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)

Stage	Description
I	The carcinoma is strictly confined to the cervix (extension to the uterine corpus should be disregarded).
IA	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.
IA1	Measured invasion of stroma ≤ 3 mm in depth and ≤ 7 mm width.
IA2	Measured invasion of stroma > 3 mm and < 5 mm in depth and ≤ 7 mm width.
IB	Clinical lesions confined to the cervix, or preclinical lesions greater than stage IA.
IB1	Clinical lesions no greater than 4 cm in size.
IB2	Clinical lesions > 4 cm in size.
II	The carcinoma extends beyond the uterus, but has not extended onto the pelvic wall or to the lower third of vagina.
IIA	Involvement of up to the upper 2/3 of the vagina. No obvious parametrial involvement.
IIA1	Clinically visible lesion ≤ 4 cm.
IIA2	Clinically visible lesion > 4 cm
IIB	Obvious parametrial involvement but not onto the pelvic sidewall.
III	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.
IIIA	Involvement of the lower vagina but no extension onto pelvic sidewall.
IIIB	

	Extension onto the pelvic sidewall, or hydronephrosis/non-functioning kidney.
IV IVA IVB	The carcinoma has extended beyond the true pelvis or has clinically involved the mucosa of the bladder and/or rectum. Spread to adjacent pelvic organs. Spread to distant organs.

References

FIGO staging for carcinoma of the vulva, cervix, and corpus uteri, *International Journal of Gynecology and Obstetrics* (2014), doi:10.1016/j.ijgo.2014.02.003.

Malawi Standard Treatment Guidelines 5th Edition, 2015.

World Health Organization. *WHO guidelines for screening and treatment of precancerous lesions for cervical cancer prevention.* World Health Organization 2013; Geneva, Switzerland.

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, dyschechsia, 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.
- Performbimanual 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 Section onGynaecological 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, monitor urine output, and check UPT
- 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)

	1	2	3	4	5	6
Eye	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to voice	Opens eyes spontaneously	N/A	N/A
Verbal	Makes no sounds	Incomprehensible sounds	Utters inappropriate	Confused, disoriented	Oriented, converses	N/A

			words		normally	
Motor	Makes no movements	Extension to painful stimuli (decerebrate response)	Abnormal flexion to painful stimuli (decorticate response)	Flexion / Withdrawal to painful stimuli	Localizes painful stimuli	Obeys commands

CONTRACEPTION

Introduction
Contraception helps couples to avoid unwanted pregnancy and short interpregnancy intervals (<2 years between births).

Pertinent History for Contraceptive Counseling
- *Obstetric history:* any past pregnancies/deliveries
- *Gynaecological history:* Characteristics of her menses (regularity, how heavy, how long), last menstrual period, any history of STIs or abnormal vaginal discharge, past contraceptive use (if any), current condom use
- *Medical history:* HIV, hypertension, stroke, VTE, breast cancer, liver disease, etc.
- *Medication history:* any ART or TB medication, allergies
- *Social/sexual history:* how many lifetime sexual partners, how many current partners, future fertility intentions

Counseling about available methods
Counsel about most effective methods first. Also counsel about dual method use (using condoms with another contraceptive) since condoms are the only contraceptive that also protect against HIV and STIs.

- Sterilization:
    - Typical use 1st year failure rate for vasectomy: 0.15%
    - Typical use 1st year failure rate for bilateral tubal ligation: 0.5%
        - Irreversible; counsel about increased risk of ectopic if she does become pregnant

- Intrauterine contraceptive device (IUCD, also known as IUD)
    - Typical use 1st year failure rate for ParaGard (copper T): 0.8%
        - Lasts 10-12 years
    - Typical use 1st year failure rate for levonorgestrel IUCD: 0.2%
        - Lasts 5-7 years
    - Both can be inserted in HIV-infected women or women with h/o gonorrhea or chlamydia if treated more than 3 months ago
    - Both can be inserted in adolescents and nulliparous women

- Implant

- Implanon/Nexplanon® contains the progestin etonorgestrel and lasts up to 3 years.
    - Typical use 1st year failure rate: 0.05%
- Jadelle® contains the progestin levonorgestrel and lasts up to 5 years.
    - Typical use 1st year failure rate: 0.05%
- Both implants may have reduced contraceptive effectiveness when among women taking Rifampicin or Efavirenz-based ART; such women should be counseled to use condoms along with the implant.

- Injectable, also known as Depo Provera® or depot medroxyprogesterone acetate (DMPA)
    - Typical use 1st year failure rate: 6%
    - Needs to be given every 13 weeks (2-week grace period before and after)

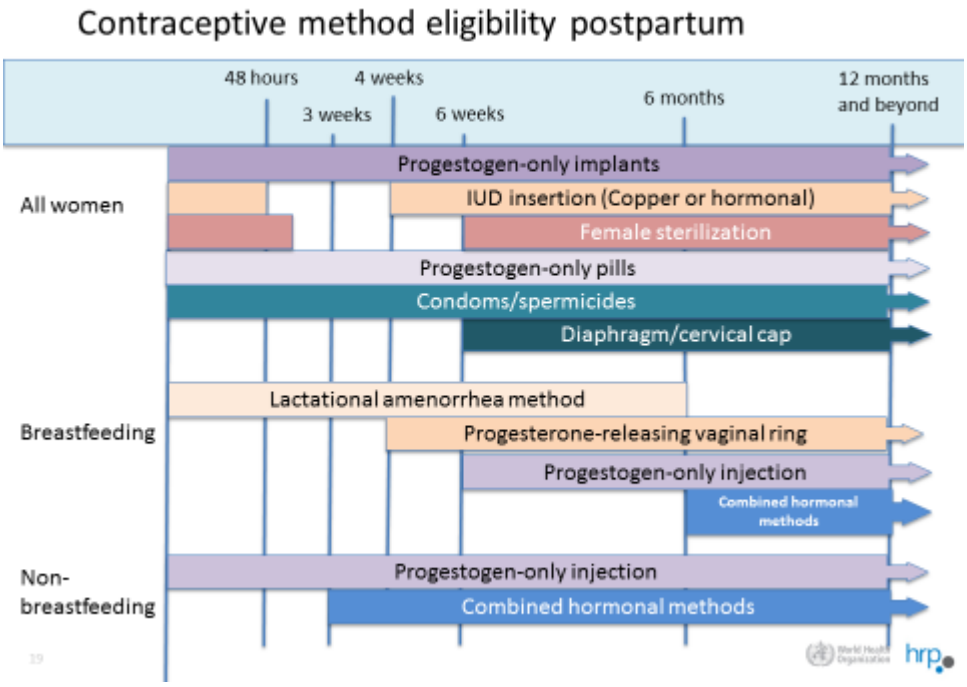
- Oral contraceptives (OC):
    - Typical use 1st year failure rate: 9%
    - Must be taken every day
    - Combined oral contraceptives (COC): containboth ethinyl estradiol and a progestin, e.g., Microgynon
        - Avoid in women with hypertension; smokers ≥ 35 years;history of or multiple risk factors for stroke, cardiovascular disease or VTE; lupus, migraines with aura, diabetes with evidence of microvascular disease; breast or liver cancer, severe cirrhosis, acute hepatitis
    - Progestin-only pills (POP): contain only a progestin, e.g., Microlut (levonorgestrel)
        - Must be taken within 3 hours of when next dose is due, or decreased effectiveness
    - Both types of pills may have reduced contraceptive effectiveness when among women taking Rifampicin or Efavirenz-based ART; such women should be counseled to use condoms along with the pills.

- Condoms:
    - Male condom typical use 1st year failure rate: 18%
    - Female condom typical use 1st year failure rate: 21%

- Withdrawal:
    - Typical use 1st year failure rate: 22%

- Fertility awareness-based methods ("natural family planning methods" such as cycle beads)
    - Typical use 1st year failure rate: 24%

WHO Postpartum Family Planning Guidelines, 2015



*Note: In the chart above, IUD refers to "intrauterine device" (or intrauterine contraceptive device, IUCD), not "intrauterine death".
**Note: Progestin-only pills and implants can be given immediately postpartum anytime after delivery of the placenta.

GYNAECOLOGIC INFECTIONS AND PELVIC INFLAMMATORY DISEASE

The following guidelines are taken from the **Malawi Guidelines for Syndromic Management of Sexually Transmitted Infections, Malawi Ministry of Health, *2017***.
*Note: all patients who present with STI symptoms should be offered HIV Testing and Counseling and VIA.

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.

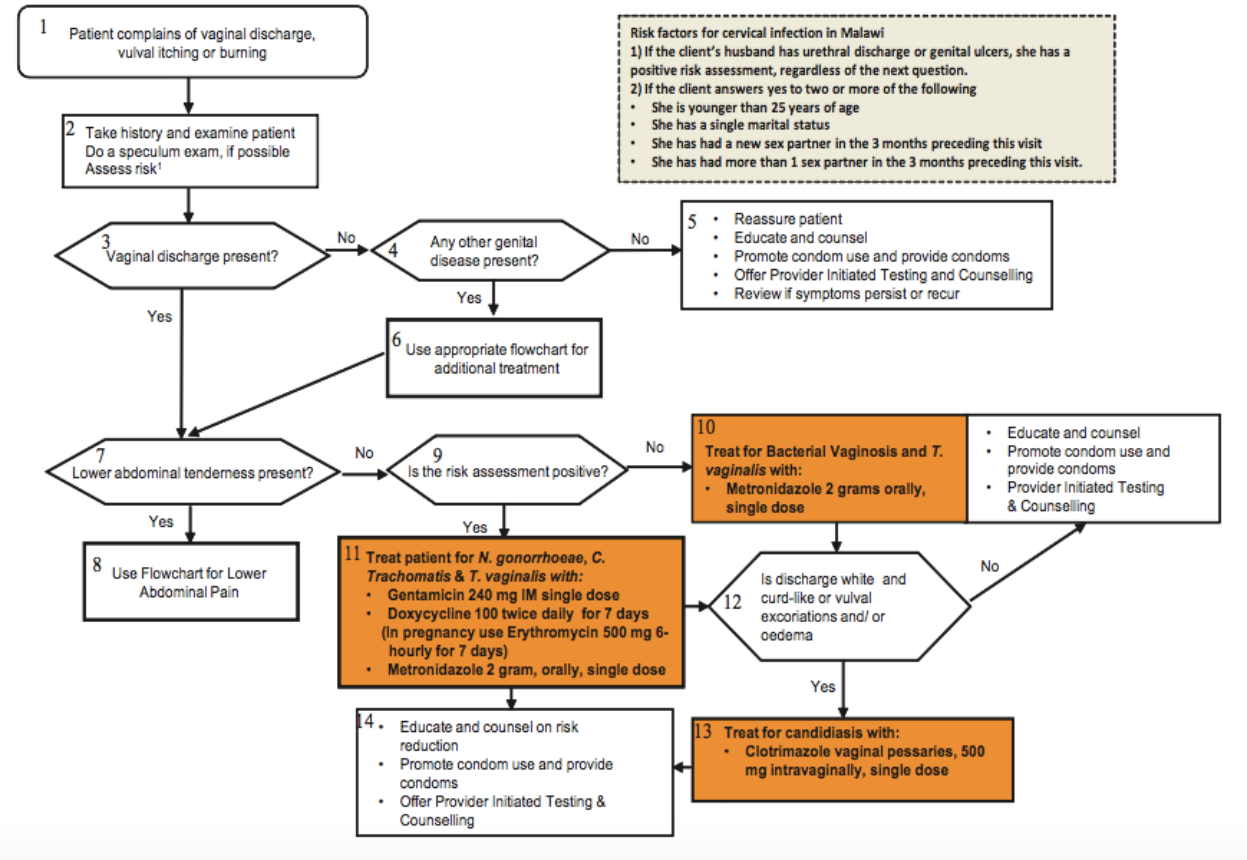
General Management

- **Must perform speculum exam on all women who complain of abnormal vaginal discharge to evaluate for cervical cancer.**
- 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:*
  - **Gentamicin** 240mg IM stat plus
  - **Doxycycline** 100mg orally every 12 hours for 7 days (in pregnancy use Erythromycin 500mg 6-hourly for 7 days), *plus*
  - **Metronidazole** 2g orally single dose
- *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 PV x 1 OR **Miconazole** 200 mg PV x 3 days OR **Fluconazole** 150 mg PO x 1 (not in pregnancy)
- *If no discharge is found and risk assessment is positive:*
  - **Gentamicin** 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

Abnormal Vaginal Discharge Treatment Flowchart



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
- Treat sexual partner(s)

Treatment

- **Ciprofloxacin** 500mg orally stat twice daily for 3 days, and
- **Benzathine penicillin** 2.4 MU i/m stat
- **Acyclovir 800mg** 3 times per day for 2 days (unless primary infection, then 400mg orally 3 times per day for 10 days)
- Tell patient to return for follow-up care in 7-10 days, s*ee 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, consider treatment for granuloma inguinale and lymphogranuloma venereum:
    - Give **Doxycycline 100mg orally twice per day for 14 days**
    - 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 completed 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.
- Cutting warts with scissors or razors in the outpatient setting is contraindicated and can result in excessive bleeding.

Treatment

- Apply **Compound Podophyllin Paint** to the lesions at weekly intervals (contraindicated in pregnancy and lactation)
- Apply **Yellow Soft Paraffin or Vaseline** 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 (acceptable alternative during pregnancy and lactation)

If pregnant:

- Podophyllin, 5 fluorouracil, and interferons are contraindicated in pregnancy.
- Lesions often improve or regress following delivery, so eradication of wards during pregnancy may not be necessary.
- Vaginal delivery can be allowed unless genital warts are obstructing the outlet or will lead to

excessive bleeding.
- There is a low risk of juvenile onset recurrent respiratory papillomatosis in neonates exposed to warts, but risk of transmission is not associated with mode of delivery and therefore, cesarean delivery is not recommended solely to prevent HPV transmission.

4) Herpes Simplex Virus

Causes: Type 1 (*affects lips*), Type 2 (*affects genitals but can interchange dueto 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

Definition: Infection of the female genital tract above the internal cervical os, including: endometritis, salpingitis, tubo-ovarian abscess and pelvic peritonitis.
Causes: most commonly from *Gonorrheal or Chlamydial* or anaerobic bacterialinfection but may also be caused by other intra-abdominal/pelvic bacteria.
Diagnosis: any 1 of the following 3 symptoms: cervical motion tenderness, uterine tenderness, adnexal tenderness. May also have abnormal discharge, fever, of elevated WBC.
Treatment:
- **Gentamicin** 240mg IM x 1
- **Doxycycline** 100 mg q12 hours x 14 days
- **Metronidazole** 400 mg q8 hours x 14 days
- Treat partner with Gentamicin and Doxycycline
- If not improved within 72 hours, not tolerating oral intake, signs of sepsis, or pelvic mass, admit for inpatient treatment:
    - **Gentamicin** 1.5 mg/kg IV or IM q8 hours
    - **Clindamycin 900 mg IV q 8 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 q18 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 2years; syphilis of indeterminate duration
- Congenital syphilis in children
- Treat as late syphilis all patients with a positive RPR or VDRL and nodocumented 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 with Erythromycin 500mg q6 hours for 15 days

Treatment for late syphilis:

- **Benzathine Penicillin** 1 dose of 2.4 MU i/m at weekly intervals for 3 weeks (total of 3 doses)
- 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 with Erythromycin 500mg q6 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, frequency of intercourse
- 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)

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 lengthand 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 50 mg) 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).

MISCARRIAGE

Introduction/Definition

A miscarriage is any pregnancy loss before 28 weeks gestation, the age of viability in Malawi, or with a fetus < 1,000 g. A Miscarriage is a pregnancy loss that occurs spontaneously, whereas an Induced Abortion results from an intervention purposely used to terminate the pregnancy and is higher risk for infection.

Consider miscarriage 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.

Types of Miscarriage

Diagnosis/Definition	Signs and symptoms	Investigations	Management
Threatened miscarriage (pregnancy still viable and may continue)	• Minimal bleeding/spotting • Minimal/no abdominal pain • Closed cervix • Uterine size = GA • Viable fetus	• Ultrasound for viability • Group & save*	• No specific treatment (self-limiting condition) • Heavy lifting/work discouraged • Pelvic rest/avoid coitus
Inevitable miscarriage (pregnancy may still be viable but will inevitably proceed to incomplete or complete abortion)	• Heavy bleeding, but no passage of POCs • Abdominal pain/cramping • Open cervix • Uterine size = GA	• Group & save* • Hb as needed • Crossmatch as needed • Check vital signs: if signs of infection or Induced Miscarriage, treat with Doxycyline 100 mg BD x 7 days plus Metronidazole 800 mg STAT	Three options for management: 1) Expectant management (in hospital) • For up to 2 days[a] 2) Medical management (in hospital)[b,c,d] • For < 13 weeks: misoprostol 400 mcg SL (or) 600 mcg PO • For >13 weeks**: no good evidence but can consider misoprostol 400 mcg PV/SL q3hrs x 5 doses 3) Surgical management[d,e] • MVA preferred if < 9 weeks GA as reduced complications and infections; Dilation & Curettage (D&C) if MVA not available • Bereavement counseling • Syphilis testing, offer HIV testing

			• Iron supplementation if needed • Family Planning: can start immediately
Incomplete miscarriage (POCs are partially expelled)	• Heavy bleeding with passage of POCs • Abdominal pain/cramping • Open cervix • Uterine size < GA	• Group & save* • Hb as needed • Crossmatch as needed	• Same as inevitable miscarriage,[d] unless patient is in shock • If in shock, resuscitate with IV fluids and/or blood transfusion and proceed with surgical management
Complete miscarriage (POCs are completely expelled)	• Minimal bleeding • History of passage of POCs • Minimal abdominal pain • Closed cervix • Small uterus	• Group & save* • Hb as needed • Ultrasound to confirm empty uterus (no gestational sac)	• Evacuation not necessary • Bereavement counseling • Syphilis testing, offer HIV testing • Iron supplementation if needed • Family planning: can start immediately if passage of POCs within past 2 weeks
Missed miscarriage (pregnancy is no longer viable but no POCs have been expelled)	• No history of bleeding • No abdominal pain • Closed cervix • Loss of pregnancy symptoms (nausea/vomiting, breast enlargement, fatigue, urinary disturbances, etc.)	• Group & save* • Hb as needed • Ultrasound to confirm non-viability:[f] - Crown rump length ≥ 7 mm without cardiac activity - Mean sac diameter ≥ 25 mm without embryo - Absence of cardiac activity ≥ 2 wk after U/S showed gestational sac without yolk sac - Absence of cardiac activity ≥ 11 days after U/S showed gestational sac with yolk sac - If any uncertainty over pregnancy viability then seek a senior opinion or perform a second scan 14 days after the first before making a	Three options for management 1) Expectant management (in hospital) • For up to 2 weeks[a] 2) Medical management (Requires rapid access to hospital, else must stay in hospital) • For <12 weeks: misoprostol 800 mcg PV or 600 mcg SL, may be repeated every 3 hours, up to 2 additional doses[g] • For 12-24 weeks**: misoprostol 400 mcg PV every 6 hours until delivery[h] • For 24-28 weeks**: misoprostol 200 mcg PV every 4 hours until delivery[i] Surgical management[d] • 1st TM: MVA preferred; dilation & curettage if MVA not available - Consider cervical ripening with

		diagnosis of miscarriage • Check vital signs: if signs of infection or Induced abortion, treat with Doxycyline 100 mg BD x 7 days plus Metronidazole 800 mg STAT	misoprostol 400 mcg PV or SL 2-3 hrs prior to procedure • 2nd TM: dilation & evacuation with osmotic dilator cervical preparation[j,k] • Bereavement counseling • Syphilis testing, offer HIV testing • Iron supplementation if needed • Family Planning: can start immediately • Doxycycline 400mg STAT, Metronidazole 400mg STAT – only for full course of doxycycline and metronidazole if any evidence of infection
Septic miscarriage (any of the above with clinical infection of the uterus and its contents)	• T ≥ 38° C • Maternal PR > 100 bpm • Purulent vaginal discharge/POCs • Pelvic pain/tenderness • Possible pregnancy interference	• FBC with differential • Group & save* • Crossmatch as needed • Bedside clotting time	• See Maternal Sepsis section for additional details on management of maternal sepsis/septic shock • Resuscitation: IVF +/- blood transfusion • Monitor VS and urine output • Benzyl PCN 2 MU IV Q6h, Gentamicin 320 mg IV x 1, Metronidazole 500 mg IV q8h • Switch to Doxycycline 100 mg BD plus Metronidazole 400 mg TDS x 7 days when able to take po drugs • Evacuation by experienced doctor under GA (high risk for perforation) • Watch out for coagulopathy

*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.[l,m]

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www.misoprostol.org

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, cystocoele, rectocoele 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 or urge type 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, but can continue as long as patient prefers

- 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 childbearing 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 (uterosacral suspension or sacrocolpopexy for apical, paravaginal repair for anterior, enterocele repair) vs
- Vaginal approach: TVH, Uterosacral suspension vs sacrospinous ligament fixation for apical, anterior and posterior colporrhaphy,
- Reconstructive vs. obliterative procedure (colpocleisis if no longer sexually active)
- +/- Concomitant hysterectomy
- Consider evaluation of ureteral patency with cystoscopy or direct visualization via cystotomy

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)
- Always consider alternatives to surgery including medical management or more conservative surgical options
- Explain operation in detail, including risks of additional procedures (i.e. myomectomy may lead to hysterectomy), and then obtain written consent from patient, which should include a detailed summary of risks, benefits, indications and alternatives explained to the 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 (Xmatch for 2U if heavy blood loss anticipated)
    - Renal function tests: only if age >50 years or pre-existing medical conditions (i.e. hypertension) and high-risk surgery
    - U&Es: only if on diuretics or known kidney disease
    - ECG: if CVD history or BMI >40 and at least 1 risk factor for coronary heart disease (HTN, DM, smoking)
    - Chest X-ray only if history of pulmonary disease or current symptoms refractory to medical management
- Prior to surgery, give antibiotics as indicated (see Antibiotic Prophylaxis for Gynaecologic Surgery section)

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 (preferably with D5-mix-mix D50 in NS or RL to proper dilution) or Dextrose in NS 2L/24 hrs. May need much more if large blood loss before or during surgery.
    - Caution in hypertensive patients.
    - Remember 3:1 crystalloid to blood loss and consider transfusion based on pre-op Hb, EBL, risk factors.
- Pain control
    - Paracetamol 1,000 mg po q6h and NSAIDS (i.e. ibuprofen, diclofenac) for minor operations
    - Pethidine 100 mg IM every 6 hrs for at least 24 hrs for major operations plus Diclofenac and/or Paracetamol and/or Tramadol.
    - Can combine analgesics but do not duplicate drugs in same class (i.e. do not give Brufen and Diclofenac or Pethidine and Morphine)
- Encourage early ambulation and incentive spirometery to prevent deep venous thrombosis and atelectasis.

- Use compression stockings when available.
- Keep head elevated at 30° to prevent atelectasis and aspiration.

Patients with cardiac disease

- Consult Medicineand Anesthesia for pre-operative assessment and post-operative follow-up.

SEXUAL ASSAULT

Introduction/Definition
Sexual assault is defined as a 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 – includingantibiotics 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 andpresents within 5 days post-assault
    - **Postinor-2**: take 2 pills in a single dose, or 1 pill followed by the second pill after 12 hours
    - **Microgynon:**take 4 pills, 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; 25-35 kg, then 1,200,000 IU STAT; adult: 2.4 MU IM STAT
    - **Gentamicin** 6mg/kg or 240 mg IMSTAT
    - **Doxycycline** 100 mg BD x 7 days unless breastfeeding, pregnant, or if <8 years or <45 kg
        - Instead, use **Erythromycin:**<8 years 12.5mg/kgq6h for 7 days; >8 years: 24 mg/kg q6h x 7 days
    - **Metronidazole** 2 g STAT or 5mg/kgq8h 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, provide PEP treatment with TDF/3TC 300 mg/300mgQD x 30 days or AZT/3TC 1 pill BD.
    - For children, give weight-based AZT/3TC with alternative of ABC/3TC.

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 thePolice

Step 7:

- Advise on dates for follow-up visits
- Record Findings and treatment in "Examination Record" and provide copyto 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, seroma, excessive intra-abdominal pressure (i.e. coughing or vomiting), DM, malignancies, anaemia, infection, immunosuppression, poor technique and inappropriate suture. Haematomas and seromas predispose to infection as they can cause the incision to separate and allow bacteria to gain access to deeper layers.

Steps to prevent surgical wound complications

- Maintain haemostasis
- Handle tissues gently
- Remove devitalized tissue
- Use monofilament suture, taking bites with at least 1 cm of tissue
- If subcutaneous tissue ≥ 2 cm depth, then close dead space with subcutaneous suture in Camper's fascia

Diagnosis	History/Exam/Investigations	Management
Superficial wound dehiscence	• Separation of skin and SC tissue • Intact fascia • Serosanguineous fluid from closed wound	• Wound infections associated with cellulitis alone (no fluctuance) can be treated with antibiotics alone for 7 days (amoxicillin or cephalexin 500 mg BD; TID if severe infection). • Small haematoma/seromas can be managed expectantly. • Large or symptomatic haematomas/seromas should be evacuated; can be done at bedside using sterile irrigation/gauze and sterile scissors/tweezers to remove/open overlying suture • If sufficient healthy granulation and no evidence of infection, then consider superficial vertical mattress closure. • If evidence of underlying infection, treat with antibiotics and do debridement/irrigation and then wet-to-dry wound packing BD until healthy granulation tissue is present. Can then do delayed closure or allow healing by secondary intention.
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 consider placing abdominal binder

		until patient can tolerate definitive treatment • Procedure: mass fascial closure under general anaesthesia after debridement of necrotic or infected tissue and abdominal exploration/wash out with warm normal saline

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 External examination often demonstrates urine dermatitis. Speculum exam to identify fistula. Normal vaginal discharge usually suggests NO 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 while bladder filled with dye 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 and usually not available
- Check for stone---often urine is more malodorous and discolored or with particulates.

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 6-12 wks of delivery when the surrounding tissues are healthy.
  - Small fistulae may heal spontaneously with prolonged catheterization.
- If a stone is present: remove stone and delay repair unless extensive dissection already done, then can attempt to close.
  - All patients with stones are infected, so post-operative antibiotics are indicated, especially if extensive dissection was done.

Types of repair depending on fistula location (general management scheme)
- Small midvaginal, Suburethral or juxtaurethral VVF: simple vaginal tissue mobilization with layered closure +/- anterior bladder wall mobilization
- Circumferential or massive VVF: wide tissue mobilization into the paravaginal spaces bilaterally to facilitate closure of the bladder and reapproximation to urethra.
  - Consider anti-incontinence procedure with Pubococcygeal sling or other procedure.
  - 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.
  - Consider suprapubic, extraperioneal approach.
- Vesico-uterine 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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