Maternity
Clinical Guidelines

AIC Kijabe Hospital

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Please email meddir.kh@gmail.com
with any corrections or revisions

OBJECTIVES FOR CLINICAL PROTOCOLS AT KIJABE HOSPITAL

VISION: To effectively use our limited resources to provide the best holistic and compassionate maternal and neonatal care for God's glory.

OBJECTIVES: Protocols will be:

1. Cost-effective for most financially vulnerable patients: Prioritize the largest clinical outcome improvements for the lowest possible cost.
    a. i.e. address the question: *if you only had XXX shillings to send on your condition, how would you spend it?*
    b. *i.e. use most cost-effective diagnostic and therapeutic interventions first*
    c. *i.e. use evidence based practices adapted to low resource settings*
2. Tailored for more financially viable patients: Enable clinicians to tailor secondary (i.e. less cost-effective) interventions for patients willing to pay more for less incremental benefit. Patients who have enough financial resources should be given appropriate available options available including private health services.
3. Efficient: Improve use of clinician's time.
4. Simple: Be easy to implement
5. User friendly and standardization

Implementation and monitoring of protocols (i.e. ongoing teaching, modification) is critical if protocols are to improve outcomes and cost-effectiveness of care.

These guidelines are compiled primarily from WHO guidelines, supplemented by evidence from the North America and UK with reference to the Handbook of Medicine for Developing Countries, Fifth edition by Dennis Palmer. They have been adapted in order to fit our local context. Their purpose is to provide a rapid reference for accepted management particularly during an emergency and to set forth the general attitude of our department for new staff and visitors. They are not designed to replace basic knowledge, textbooks, national or international guidelines, or critical thought. However, all staff should understand the standards, and deviations should be justified. They are as current as at the date of publication and new information can be added in consultation with the head of department and medical director. This document will be reviewed every two years.

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General Guidelines by Service Delivery Units

Labor and Delivery:

There should be clear documentation that

1. All patients admitted to the Obstetrical service are presented to the consultant physician at the time of admission
2. Periodic reviews and updates provided to the consultant physician as clinical circumstances dictate
3. All patients in labor ward and admitted overnight are handed over at the change of shift.
4. All high–risk deliveries including operative vaginal and cesarean deliveries are supervised by the consultant physician who should be given adequate lead time to be present at the delivery.
5. No patient is admitted or discharged from the obstetrical inpatient service without approval of the consultant physician.
6. No patient is informed about decision for surgical procedure without discussion with the consultant physician of the day/shift

Gynecology Inpatients:

There should be clear documentation that

1. All patients admitted to the Gynecology inpatient services are presented to the consultant physician at the time of admission
2. Periodic reviews and updates provided to the consultant physician as clinical circumstances dictate
3. All patients admitted overnight are handed over at the change of shift.
4. All surgical procedures have a consultant present during all major portions of the procedure.
5. No patients should be admitted or discharged from the Gynecology inpatient service without prior approval of the consultant physician.

Inpatient Consultations:

There should be clear documentation that

1. All patients consulted on by the Obstetrical or Gynecology services are presented to the responsible consultant physician at the time of the initial assessment by the team.
2. Periodic updates provided to the consultant thereafter as clinical circumstances dictate, but at minimum every shift.

Emergency Department Consultations:

There should be clear documentation that

1. The intern-resident team in Obstetrics was consulted including time and name of the team
2. After initial assessment by the intern-resident team, each patient consulted on in the Emergency Department should be presented to the consultant physician in the Emergency Department or on the appropriate obstetrical or gynecology service for further assessment and management
3. Urgent consultation requests on unstable patients should be communicated immediately by the covering emergency department clinician to the consultant on service for expeditious evaluation
4. Stable chronic patients do not take more than 60 minutes before evaluation by the ObGyn team
5. Unstable acute patients should take no more than 30 minutes before evaluation by the ObGyn team

MCH/Gynecology Outpatient Clinics:

To achieve efficient and timely delivery of services which are essential in these areas

1. All clinics are to have resident/medical/clinical officer and consultant physician supervision at all times
2. All trainees allocated to MCH must report by latest 11am every working day
3. The consultant physician is responsible for starting the Gyn clinic by latest 9am and all interns/residents must report by 11am.
4. Interns must present all patients to qualified medical officer/resident/consultant before the patient is admitted or discharged home

Being on-call in Ob/Gyn

The expectation of the Obstetrics and Gynaecology Department is that ***the role of midwives and nurses is to take primary responsibility for uncomplicated antenatal, post-natal, and intrapartum patients***. If women develop complications or are admitted with risk factors, the responsibility of the nurse is to seek review and advice from the on-duty physician; usually this will be the medical officer intern on-call, though in serious emergencies the intern and on-duty consultant should be contacted simultaneously. ***Once notified of a high-risk patient, it is the responsibility of the medical team to ensure that prompt and thorough review is carried out and an assessment and management plan clearly documented in the notes***. If any nursing staff is concerned about a patient, it is never acceptable for the medical staff to decline to attend. When available the clinical officers can be assigned tasks by the medical officer intern, medical officer or consultant physician. However the clinical officer will not have primary responsibility over the patient and must present all patients to the medical officer intern, medical officer or consultant physician.

It is expected that interns on-call for obstetrics will be available and responsive to calls from midwives and nurses. When called, the intern should ask the urgency of review that is required. Due to the potential for rapid deterioration in obstetric patients, it is expected that when informed of an emergency, the intern will be present within five minutes of being called. Non-emergency calls should be responded to within one hour. If the intern is already engaged in an emergency and the nurse informs them that the clinical situation cannot wait, the intern should request that the nurse call the second on-call physician. For cases that the midwife perceive as low risk the clinical officer intern will review and present to the medical officer intern and/or consultant, whoever is readily available. It is the nurses' responsibility to determine the level of consultations required. In all cases the medical officer intern must review all the patients seen by the clinical officer intern.

If a nursing staff calls an intern to question an order it is expected that the intern will come and document clarification in the notes. If there is disagreement between nursing staff and an intern about the safety of an order, the nursing staff is expected to contact the consultant on-call to explain their concerns.
If nurses express concern about a patient, it is the responsibility of the intern to review the patient in person and document their assessment and management plan in the notes and call the consultant.
If the intern discusses the patient with a consultant, they must document the results of the discussion in the notes.

Interns are not permitted to issue verbal orders in maternity under any circumstances. This includes verbal orders initiated by the intern and those that were initiated by a consultant or any other physician. This includes all orders for patient care without exception.
Failure to attend will result in disciplinary action – which may include verbal warning, written warning, probation, or failing the entire module.

Documentation Standards

The purpose of patient records is to aid communication between health care professionals over time. Good quality documentation makes it easier to make a diagnosis, track patient progress, and evaluate the efficacy of therapy. Remember that your notes are not only for your own benefit, but must be legible and understandable by other clinicians and nursing staff.

Handwriting must be LEGIBLE and use only common acronyms/abbreviations (see page 83-88)
Every entry in the notes must include date (day/month/year), time, and a LEGIBLE name.
Every page must have the patient's name and hospital number

Examples of notes used in different situations:

Admission Note
Date Time and Name of Clinician
Name, Age, Parity, Gestation (by LMP & by US if pregnant)
History of Presenting Complaint
Associated symptoms
LMP, menstrual cycle (including irregular bleeding)
Past obstetric history
Past gynecologic history
Past medical and surgical history
Drug history (including allergies)
Social/Family history
Examination findings
Any investigation results known already (***Every*** woman should have a pregnancy test recorded unless you can feel a baby in the uterus or she has had a hysterectomy, all pregnant patients need PMCT & blood group).
Assessment
Differential diagnosis
Plan—orders, including further investigations and therapy
Sign your notes (LEGIBLY WRITE YOUR NAME) and document which consultant you discussed the patient with.

Operative Note
Date and time of procedure
Name of procedure
Indication
Post-op Diagnosis
Operative findings
Description of procedure—including site of incision, key operative steps
Complications
Estimated blood loss
Relevent medications or transfusions given intraop (uterotonics, antibiotics, etc)
Lap/sponge count
Post-operative amount and color of urine

Ward Round Note

S—Subjective: how is the patient feeling, do they have any complaints?
O—Objective: vital signs, examination findings, and Investigation results
A—Assessment: your diagnosis and evaluation of progress
P—Plan: orders for today and any long-range plans
(Acceptable options including presenting complaint, examination, impression and plan.)

Review of women in labour

Age, Parity, Gestational age
Risk factors
Progress of labor
    Contractions—started when? Now: frequency/duration/strength
    Dilation and descent
Fetal condition
    Liquor—clear/meconium/bloody/malodorous
    Fetal Heart Rate (comment on CST)
Maternal condition
    V/S, Investigation results
Examination
    Abdominal palpation, Vaginal exam
Assessment: Normal labor or dysfunctional
Plan: (e.g. time of next VE, frequency of monitoring, any drugs needed, C/S etc.

OBSTETRICS

Antepartum

Reduced Fetal Movements

Reduced fetal movements (RFM) or absent fetal movements may be a warning sign of impending fetal death. About 55% of women experiencing stillbirths perceived RFM prior to the diagnosis.

***Definition*:** Diagnosis is based upon qualitative maternal perception of a reduction of fetal movement.

***Counting fetal movements*:** Relevant after 28 weeks, women should be advised to lie on their left side and focus on fetal movements for 2 hours. If they do not feel ≥ 10 discrete movements they should come in for review. Other protocols include Cardiff count to ten (10 movements in 12 hours)

Factors associated with RFM

1) Position- most movements are felt in the supine position and fewest on standing
2) Busy daily lifestyle
3) Maternal obesity
4) Drugs: smoking, alcohol, corticosteroids, benzodiazepines, barbiturates, narcotics, methadone
5) Maternal conditions: metabolic disorders, autoimmune disorders, hypertensive disorders
6) Primigravidas
7) Oligohydramnios / polyhydramnios
8) Placental position: anteriorly lying placenta
9) Fetal sleep cycles
10) Placental insufficiency causing IUGR, SGA etc.
11) Abnormalities in CNS, muscular dysfunction or skeletal abnormalities
12) Fetal spines that lie anteriorly

Management

- Detailed history to elicit factors associated with an increased risk of stillbirth e.g. multiple consultations for RFM, known IUGR, hypertension, diabetes, extremes of maternal age, primiparity, smoking, placental insufficiency, congenital malformation, obesity, racial/ethnic factors, poor past obstetric history (e.g. IUGR and stillbirth), genetic factors and issues with access to care
- ***RFM before 26 weeks*** : Confirm fetal viability with handheld Doppler device by two independent medical staff, history to rule out risk factors for still birth and placental insufficiency as above. There is NO evidence for CTG/CST below the age of viability typically <26 weeks or US to assess for IUGR, AC, EFW, Fluid volume (AFI), BPP, umbilical artery velocimetry (RI).
- ***RFM between 26-34 weeks***: Confirm viability with handheld Doppler device by two independent medical staff, History to rule out risk factors for still birth and placental insufficiency. IMMEDIATE CST then U/S to assess EFW, Fluid volume (AFI), BPP, umbilical artery velocimetry (RI). If CST abnormal, fetal compromise is likely, ALL cases and management discussed with a consultant. Consider admission for antenatal steroids.
- ***RFM between 34-37 weeks.*** IMMEDIATE CST. If reassuring, then U/S to assess EFW, AFI, RI. Initiate antenatal steroids. Kick counts. Mode and timing of delivery dependent on results of above testing and discussion with consultant.

- ***Delivery is indicated for RFM at term***. Mode and timing of delivery is determined by antepartum fetal testing results and discussion with consultant.
- ***Recurrent RFM***: Exclude predisposing factors, U/S, CTG, All cases are discussed with a consultant
- ***Normal investigations in pre-term RFM***: Women with normal investigations after one presentation of RFM should come for review in 1 week with kick counts documented. Counsel extensively on the danger signs. All cases are discussed with a consultant.

Prognosis, 70% of women with 1 episode of RFM will have a normal outcome, 3 – 5 % will have a recurrence of RFM that should be taken seriously due to associated poor outcome, An individual case by case review regarding decisions on IOL / surgical delivery or to continue with the pregnancy should be made and discussed with a consultant

Miscarriage (Spontaneous Abortion)

Definition: Expulsion /extraction of an embryo or fetus weighing <500g or gestational age < 26wks

Diagnosis	Bleeding	Cervix	Uterine size	Other signs
Threatened abortion	Slight to moderate	Not dilated	Equal to dates	+ve PDT/viable intrauterine pregnancy, cramping, uterus soft
Inevitable abortion	Moderate to heavy	Dilated	Less than or equal to dates	Cramping, uterus tender/ firm
Incomplete abortion	Slight to heavy	Dilated	Less than or equal to dates	Partial expulsion of POCs
Complete abortion	Slight to moderate	Dilated or Closed	Less than dates	Complete expulsion of POCs
Missed abortion	Little or none	Closed	Less than nor equal to dates	No FHTs; delayed expulsion, Decrease in pregnancy signs

Incomplete or Inevitable Miscarriage

Definition: Pregnancy loss < 26 weeks gestation; intrauterine pregnancy, may or may not have fetal heart beat; not all of the products of conception have been expelled, cervix dilated.

***Risks*:** May lead to very significant hemorrhage and possibly maternal compromise.

***Diagnosis**:* Amenorrhea, PV bleeding +/- pain, cervix open, POC may be visible in vagina.

Investigations: CBC, blood group, consider GXM, Pregnancy test & US only if stable (not useful if POC are visible)

Management

- Resuscitate (if patient unstable)
  - Oxygen
  - 2 large bore cannula with rapid IV fluids until blood available
  - Keep warm
- If unstable (P > 120, BP <80/50) or bleeding significant, **needs urgent evacuation via MVA (preferred) or D&C**
  (If POC visible they may be removed at time of initial examination in casualty or maternity and MVA performed)
- If stable, consider **misoprostol. See FIGO guidelines for route/dose based on gestational age.**
- If unsuccessful—needs D&C or MVA
- Give antibiotics at time of MVA or D&C
  - Ceftriaxone 2g IV
- Continue antibiotics if evidence of infection (e.g. pyrexia, malodorous vaginal discharge or POC, ↑WBC)
  - Ampicillin 2g IV q 6 hrs
  - Gentamycin 5mg/kg IV q 24 hrs.

    - Metronidazole 500 mg/kg IV q 8 hrs
- Discharge home if stable on doxycycline 100mg q 12 hours and metronidazole 400 mg q 8 hours (3days if no evidence of infection, complete 10-14days if there was evidence of infection)
- **If Rh negative—Anti-D is necessary**

Threatened Miscarriage

Definition: PV bleeding < 26 weeks gestation; intrauterine pregnancy WITH fetal heart beat; products of conception have NOT been expelled

***Risks*:** May lead to infection or significant hemorrhage and possibly maternal demise.

Diagnosis: Amenorrhea, PV bleeding +/- pain, cervix closed; viable, intrauterine pregnancy

Investigations*:* CBC, blood group, pregnancy test & US

Management

- Expectant
- As long as patient is stable, bleeding is minimal and there is no evidence of infection, the patient may be discharged
- Repeat U/S in 2 weeks.

- Consider IOL or D&C if patient septic
- **If Rh negative—Anti-D is necessary**
- Do NOT give medications such as hormones (e.g. estrogens or progesterone) or tocolytics (e.g. salbutamol, indomethacin) as they will NOT prevent miscarriage and instead cause harm from their adverse effects

Complete Miscarriage

Definition: PV bleeding < 26 weeks gestation; products of conception have completely passed

***Risks*:** May lead to infection or significant hemorrhage and possibly maternal demise.

Diagnosis: Amenorrhea, PV bleeding +/- pain, cervix closed; Uterus empty on US

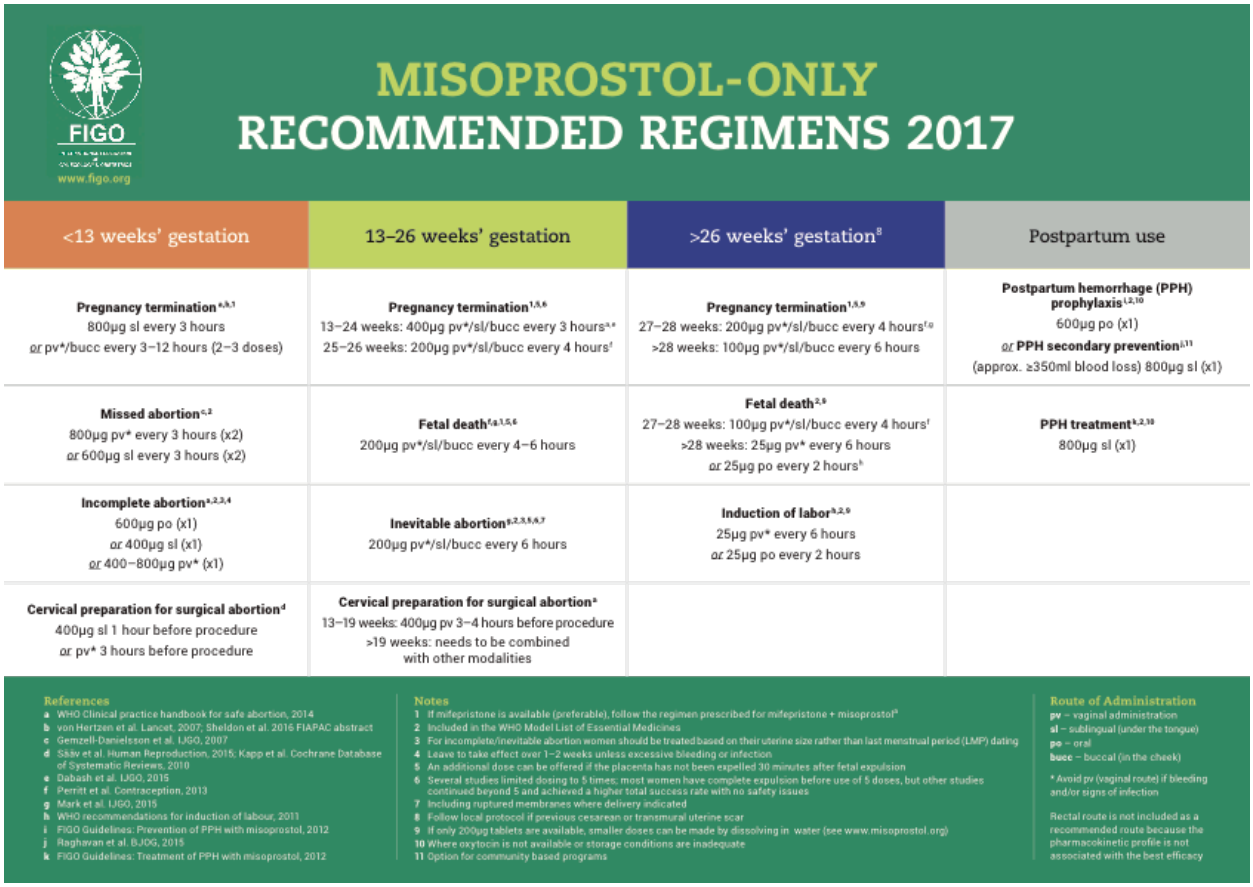
Investigations*:* CBC, US , blood group

Management

- Expectant
- As long as patient is stable, bleeding is minimal and there is no evidence of infection, the patient may be discharged

- **If Rh negative—Anti-D is necessary**

See FIGO Recommended Regimens 2017 for misoprostol use


FIGO
www.figo.org
MISOPROSTOL-ONLY
RECOMMENDED REGIMENS 2017
<13 weeks' gestation
13–26 weeks' gestation
>26 weeks' gestation[8]
Postpartum use
Pregnancy termination[a,b,1]
800µg sl every 3 hours
or pv*/bucc every 3–12 hours (2–3 doses)
Pregnancy termination[1,5,6]
13–24 weeks: 400µg pv*/sl/bucc every 3 hours[a,e]
25–26 weeks: 200µg pv*/sl/bucc every 4 hours[f]
Pregnancy termination[1,5,9]
27–28 weeks: 200µg pv*/sl/bucc every 4 hours[f,g]
>28 weeks: 100µg pv*/sl/bucc every 6 hours
Postpartum hemorrhage (PPH) prophylaxis[i,2,10]
600µg po (x1)
or PPH secondary prevention[j,11]
(approx. ≥350ml blood loss) 800µg sl (x1)
Missed abortion[c,2]
800µg pv* every 3 hours (x2)
or 600µg sl every 3 hours (x2)
Fetal death[f,g,1,5,6]
200µg pv*/sl/bucc every 4–6 hours
Fetal death[2,9]
27–28 weeks: 100µg pv*/sl/bucc every 4 hours[f]
>28 weeks: 25µg pv* every 6 hours
or 25µg po every 2 hours[h]
PPH treatment[k,2,10]
800µg sl (x1)
Incomplete abortion[a,2,3,4]
600µg po (x1)
or 400µg sl (x1)
or 400–800µg pv* (x1)
Inevitable abortion[a,2,3,5,6,7]
200µg pv*/sl/bucc every 6 hours
Induction of labor[h,2,9]
25µg pv* every 6 hours
or 25µg po every 2 hours
Cervical preparation for surgical abortion[d]
400µg sl 1 hour before procedure
or pv* 3 hours before procedure
Cervical preparation for surgical abortion[2]
13–19 weeks: 400µg pv 3–4 hours before procedure
>19 weeks: needs to be combined with other modalities
References
a WHO Clinical practice handbook for safe abortion, 2014
b von Hertzen et al. Lancet, 2007; Sheldon et al. 2016 FIAPAC abstract
c Gemzell-Danielsson et al. IJGO, 2007
d Sääv et al. Human Reproduction, 2015; Kapp et al. Cochrane Database of Systematic Reviews, 2010
e Dabash et al. IJGO, 2015
f Perritt et al. Contraception, 2013
g Mark et al. IJGO, 2015
h WHO recommendations for induction of labour, 2011
i FIGO Guidelines: Prevention of PPH with misoprostol, 2012
j Raghavan et al. BJOG, 2015
k FIGO Guidelines: Treatment of PPH with misoprostol, 2012
Notes
1 If mifepristone is available (preferable), follow the regimen prescribed for mifepristone + misoprostol[a]
2 Included in the WHO Model List of Essential Medicines
3 For incomplete/inevitable abortion women should be treated based on their uterine size rather than last menstrual period (LMP) dating
4 Leave to take effect over 1–2 weeks unless excessive bleeding or infection
5 An additional dose can be offered if the placenta has not been expelled 30 minutes after fetal expulsion
6 Several studies limited dosing to 5 times; most women have complete expulsion before use of 5 doses, but other studies continued beyond 5 and achieved a higher total success rate with no safety issues
7 Including ruptured membranes where delivery indicated
8 Follow local protocol if previous cesarean or transmural uterine scar
9 If only 200µg tablets are available, smaller doses can be made by dissolving in water (see www.misoprostol.org)
10 Where oxytocin is not available or storage conditions are inadequate
11 Option for community based programs
Route of Administration
pv – vaginal administration
sl – sublingual (under the tongue)
po – oral
bucc – buccal (in the cheek)
* Avoid pv (vaginal route) if bleeding and/or signs of infection
Rectal route is not included as a recommended route because the pharmacokinetic profile is not associated with the best efficacy

Ectopic Pregnancy

Definition: Any pregnancy growing outside the uterus due to implantation of a fertilized egg in a location outside the uterine cavity.

Sites for ectopic include

- Tubal: 97.7% (ampulla 80%, Isthmic 12%, fimbria 5%, Cornual 2%, Interstitial 2-3%),
- Non Tubal: 2% of. Cervix 0.2%, Ovary 0.2%, abdominal cavity 1.4%;
- Heterotopic: This is rare. Occurs when there are 2 fertilized eggs, one outside the uterus and the other inside
- Persistent ectopic pregnancies: refers to a continuation of trophoblastic growth after surgical intervention to remove an ectopic pregnancy

Risk factors:

1. Tubal damage: History of PID, Salpingitis, abdominal surgery, tubal ligation, maternal in utero exposure to diethylstilbestrol, tubal surgery, previous induced abortion.
2. Altered tubal motility: Hormonal contraceptives (progesterone only and progesterone IUDs), smoking,
3. History of multiple sexual partners
4. History of previous ectopic pregnancy: 7- 13 fold increase in the likelihood of another ectopic pregnancy
5. History of >2 years of infertility
6. Increasing maternal age
7. Use of fertility drugs or assisted reproductive technology

Signs and symptoms*:*

- <u>The classic triad:</u> Abdominal pain, Amenorrhea, Vaginal bleeding may not be present
- Others, shoulder-tip pain, collapse, tachycardia, pallor
- Dizziness or weakness, syncope, fever, vomiting, abdominal rigidity, involuntary guarding, severe tenderness, slightly enlarged uterus, uterine or cervical motion tenderness, adnexal mass.

<u>Remember!</u>
ALL women are pregnant until proven otherwise.
ALL pregnancies are ectopic until proven otherwise.

Investigations

- Urine PDT, CBC, Electrolytes, Cr, LFTs in case of medical management, Blood group and GXM
- The diagnosis is clinical, not radiological, but use US to confirm if patient stable.
- If stable for possible methotrexate management, beta HCG is a “send out” lab.

Management

- ***Ruptured ectopic***
    - Resuscitate if patient unstable
        - Oxygen
        - 2 large bore cannula with rapid IV fluids until blood available
        - Keep warm

- CBC, GXM 2-4 units
- V/S q 15 min—if stable may have time to arrange US, if unstable (P >120, BP < 80-50 or collapsed) transfer directly to theatre
- Exploratory laparotomy +/- salpingectomy—(Stopping the bleeding is part of the resuscitation. Do not delay surgery to wait for blood to be available or for vital signs to improve.)
- Blood transfusion PRN

- ***Expectant Management***
  - This is an option for the management of a pregnancy of unknown location i.e. a case where there is a +ve PDT, no visible pregnancy (intra- or- extra uterine) on transvaginal sonography, stable pt and serum ß-HCG levels that are below the discriminatory zone (i.e. <6000 IU/l)
    - *The discriminatory zone is the serum HCG concentration above which an intrauterine pregnancy should be visible using a transvaginal ultrasound.*
    - The discriminatory zone is between 1500- 2000 IU/l with transvaginal sonography and 6000- 6500 iu/l with abdominal ultrasound.
  - 44 – 69% of pregnancies of unknown location resolve spontaneously with expectant management while in 14 – 28% ectopic pregnancy is subsequently diagnosed.
  - These women should be followed up in 48 – 72 hours with repeat ß-HCG levels, and active intervention should be considered if symptoms of ectopic pregnancy occur, serum HCG levels rise above the discriminatory level or HCG levels start to plateau.
  - If none of the above occur, then women managed expectantly should have serial serum HCG until levels are <20 iu/l
  - Expectant management is also an option for clinically stable asymptomatic women with a U/S diagnosis of ectopic pregnancy and a decreasing serum HCG initially less than 1000iu/l, or an adnexal mass <4cm.
  - These women should have weekly serial HCG measurements and weekly transvaginal U/S examinations, until the HCG level falls <50% of its initial level within 7days and there is a reduction in size of the adnexal mass by 7days. Thereafter weekly HCG levels until it falls <20 iu/l.
  - ****Note: women should be counseled adequately about the importance of compliance with follow-up and should be within easy access to the hospital. This management requires consultant approval.*
- ***Medical management for unruptured ectopic pregnancy***
  - **Prerequisite:**
    - Ability to follow up multiple times and perform necessary tests
    - Hemodynamic stability
    - No severe or persisting abdominal pain
    - Normal baseline liver and renal function tests
    - Size of the gestation should not exceed 4cm (or 3.5cm with a cardiac activity)
    - No evidence of tubal rupture
    - Serum ß-hCG level <5000 iu/l
  - **Relative Contraindications:**
    - ß-hCG levels >5000 iu/l
    - Fetal cardiac activity
  - **Absolute Contraindications:**
    - Heterotopic pregnancy
    - Immunodeficiency
    - Blood dyscrasias: anemia, thrombocytopenia

- Sensitivity to methotrexate
- Active pulmonary or peptic ulcer disease
- Hepatic or renal dysfunction
- Breastfeeding
- Evidence of tubal rupture
- Alcoholism, alcoholic liver disease, chronic liver disease
- Possible side effects: Nausea, vomiting, stomatitis, diarrhea, gastric distress, dizziness

- ***Other medical management guidelines***
  - Discuss with family medical management and obtain informed consent.
  - Must have written approval by a consultant.
  - Family must commit to multiple serum HCG and follow-up.
  - 15-20% of patients will need a 2nd dose

Treatment day	**Labs**	**Intervention**
Pretreatment	bhCG, CBC, SGOT, SGPT, CREAT, BLOOD GROUP	Rule out spontaneous abortion Rhogam/Anti-D if Rh negative
1		MTX 50 mg/m2 IM
4	ß-hCG	Usually < than initial ß-hCG
7	ß-hCG	If >15% b-hCG decline between days 4 and 7, weekly b-hCG until undetectable. If <15% b-hCG decline between days 4 and 7, give additional dose of MTX 50mg/m2 IM
Weekly	ß-hCG	Continue until <5mIU/mL

Labor and Delivery

Management of Routine Labor

Definition: *Labor is painful and regular uterine contractions leading to cervical change (dilatation and effacement)*

Once a diagnosis of labor is made, maternal and intermittent intrapartum fetal monitoring is initiated in low risk pregnancies and continuous fetal monitoring in high-risk pregnancies.

First stage of labor

- **Latent phase**: Onset difficult to define. Characterized by uterine contractions resulting in progressive effacement and dilation of the cervix up to 6 cm.
- **Active phase**: Contractions leading to cervical dilation from 6 cm until full dilatation. Patients in active labor are monitored using the partograph.

Second stage of labor

- **Passive**: From full cervical dilatation until an urge to push
- **Active**: From the onset of the urge to push until delivery.

Normal parameters of labor

NORMAL PARAMETERS OF LABOR		
Stage	**Nullipara**	**Multipara**
First stage		
Latent phase	< 20 hours	< 14 hours
Active phase		
Onset	6 cm	6 cm
Dilatation	1.2 cm/hr	1.4 cm/hr
Duration	< 12 hours	< 5 hours
Second stage	< 3 hours	< 2 hour

Principles of normal labor management

- Use sterile gloves for vaginal exams. Minimize vaginal exams after membranes ruptured to decrease risk of chorioamnionitis
- Chart findings every 4hours, or use partograph to follow labor.
- Analgesias (even morphine) safe to use in labor. Peds can be notified and have naloxone available if necessary

Group B Strep Prophylaxis

GBS is a gram-positive coccus that frequently colonizes the genital and GI tract. It is a frequent cause of asymptomatic bacteriuria, UTI, intra-amniotic infection, chorioamniotis, endometritis and neonatal sepsis/meningitis.

- We use a **risk factor** based approach, which is based on the presence of certain characteristics to identify women whose infants are at increased risk of developing early-onset disease.
    - Intrapartum fever ≥100.4°F [≥38°C]
    - Delivery before $37^{0/7ths}$ weeks of gestation
    - Rupture of membranes ≥18 hours
    - Previous delivery of an infant affected by GBS meningitis/sepsis
    - Previous neonatal death/IUFD if sepsis sounds like a possible cause
    - GBS bacteriuria ($\geq 10^4$ cfu/mL) in the current pregnancy

- Treatment
    - Penicillin G 5million units IV loading dose, then 2.5million units IV Q4
    - Or Ampicillin 2gm IV loading dose, then 1gm IV Q4
    - If penicillin allergic: Vancomycin 1gm IV Q12 (document normal renal function)

Chorioamnionitis/Intraamniotic infection (IAI)

Definition: Infection of the amniotic fluid, membranes, placenta or decidua

DIagnosis: Maternal fever (>38 deg C) with at least 2 of the following

- Maternal tachycardia (>100bpm)
- Fetal tachycardia (>160bpm)
- Uterine tenderness
- Malodorous amniotic fluid
- Maternal leukocytosis (>15,000)

Complications

- Labor abnormalities
- Cesarean delivery
- Uterine atony and subsequent PPH
- Endometritis
- Septic pelvic thrombophlebitis
- Neonatal sepsis/pneumonia/meningitis

Evaluation

- Physical exam – vitals, lungs, evaluate for fundal tenderness, CVA tenderness and character of amniotic fluid
- CST – assess for fetal tachycardia, decelerations
- CBC with differential, urinalysis, blood cultures

Treatment

- Paracetamol 1g IV q8 hrs
- Ampicillin 2gm IV q6 hrs PLUS Gentamicin 5mg/kg IV OD
- OR Ampicillin 2gm IV q6 hrs PLUS Gentamicin 1.5mg/kg q8 hrs
- OR Ampicillin-sulbactam 3gm IV q6 hrs
- OR Piperacillin-tazobactam 3.375gm IV q6hrs

Stop antibiotics after vaginal delivery.

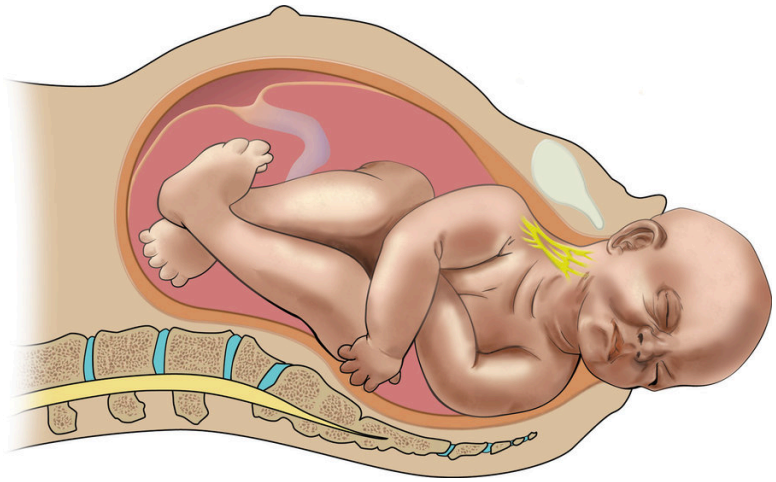
Chorioamnionitis is not a reason for cesarean section, however, if a patient undergoes cesarean section, **continue antibiotics postpartum** to decrease risk of endometritis:

- Ampicillin 2gm q6 hrs PLUS Gentamicin 5.0mg/kg IV QD PLUS Flagyl 500mg q8 hrs
- Complete 48hrs AND afebrile/asymptomatic

Shoulder Dystocia

***Definition**: the need for additional obstetric maneuvers to effect delivery of fetal shoulders at the time of vaginal delivery*

Pathophysiology: impaction of anterior fetal shoulder on pubic bone causing delay in delivery of the shoulder after head has been delivered



Incidence: 0.15-1.70% of all vaginal deliveries

Shoulder dystocia risk increases with birth weight:

Birth Weight	Maternal DM	No maternal DM
<4000gm	0.1 - 1.1%	0.6 – 3.7%
4000 – 4500gm	1.1 – 10.0%	4.9 – 23.1%
>4500gm	2.7 – 22.6%	20.0 – 50.0%

Risk Factors: most occur with no known risk factors and all relate to increased fetal birth weight

- *Maternal*: High BMI, Multiparity, Advanced Maternal Age, Diabetes, Postterm Pregnancy, Previous macrosomic infant, previous delivery complicated with shoulder dystocia, excessive weight gain in pregnancy, Maternal birth weight over 4000 g.
- *Fetal*: Male infant

Warning Signs:

- prolonged second stage
- "turtle sign" (head retracts into perineum after delivery)

Complications:

- Maternal – PPH, cervical/vaginal lacerations
- Fetal: clavicle/humerus fractures, brachial plexus injuries, birth asphyxia, death

Management: KEY iS ANTICIPATION

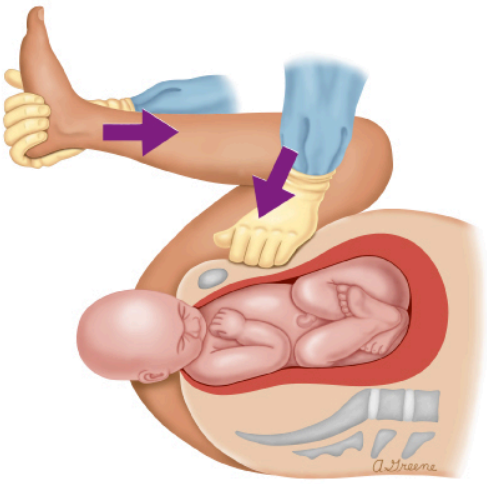
- goal → release anterior shoulder from entrapment
- Prevent fetal asphyxia and permanent Erb's palsy
- Avoid physical injury (eg, bone fractures, maternal trauma).
- HELPERR (mnemonic):
    - Call for **H**ELP-minimum of two midwives, intern, consultant and pediatric team
    - Evaluate for **E**PISOTOMY only if posterior space needed for maneuvers
    - **L**EGS – McRoberts Manuver –knee chest position
    - External **P**RESSURE (suprapubic)-to dislodge the anterior shoulder
    - **E**NTER – Rotational maneuvers
        - Rubin: push on posterior aspect/back of anterior shoulder and on anterior aspect of posterior shoulder and try to rotate shoulders to oblique
        - Woods screw: push on anterior/clavicular aspect of posterior shoulder and try to rotate shoulders to oblique
        - Reverse Woods screw: push on posterior aspect/back of posterior shoulder
    - **R**EMOVE Posterior arm – grasp fetal elbow, not shoulder
    - **R**OLL the patient to her hands and knees

Documentation:

- Delivery complicated with shoulder dystocia is not complete without documentation. Supervised and cosigned by the consultant physician. Clear and complete documentation in the medical record is critically important after deliveries complicated by shoulder dystocia
- **<u>No longer than 30 sec. should be spent on one procedure. If unsuccessful move on to another procedure.</u>**

Other possible maneuvers:

- Deliberately fracture clavicles
- Symphysiotomy
- Zavanelli's maneuver: (attempt to replace head into abdomen and deliver by cesarean section—NOT an acceptable option if no FHT or >10 min since delivery of head)

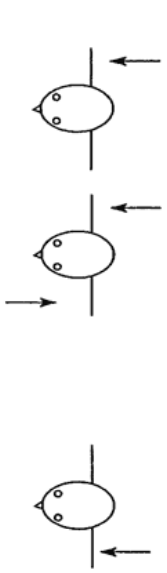


Suprapubic Pressure

PLUS

McRobert's Maneuver
(flexion of hips)

Rotational Maneuvers



Rubin II
At vaginal examination apply pressure as indicated. If shoulders move into the oblique diameter, attempt delivery.

- Pressure on rear of anterior shoulder

Rubin II + Woods corkscrew maneuver
If unsuccessful, add the Woods corkscrew maneuver and continue rotation in the same direction. Use both hands and apply pressure as indicated. If shoulders now move into the oblique, attempt delivery. If this is unsuccessful, continue rotation 180 degrees and deliver.

- Add pressure on front of posterior shoulder

Reverse Woods corkscrew maneuver
If the last maneuver is unsuccessful, change to reverse Woods corkscrew maneuver. Slide fingers down to back of posterior shoulder and attempt 180-degree rotation in the opposite direction.

- Last maneuver – pressure on rear of posterior shoulder

NOTE: *Rubin I = suprapubic pressure.*

Gaskin Maneuver

Mother on all fours

Fetal Heart Rate Assessment

Interpreting Cardiotocographs

Cardiotocograph (CTG): graphical recording of fetal heart rate and maternal contractions over time

Used for antepartum/intrapartum fetal monitoring. *Always* place *both* ultrasound probe for fetal heart monitoring AND tocometer to trace contractions with straps.

Goal: Improve perinatal outcome, specifically by decreasing stillbirth and fetal CNS injury.

Definitions

Baseline FHR	Mean FHR rounded to increments of 5 beats/min during a 10-min window
	Must be for a minimum of 2 minutes in any 10-min segment
	Normal: 110–160 bpm

	Tachycardia: > 160 bpm
	Bradycardia: < 110 bpm
Variability	Fluctuations assessed by looking at the amplitude of peak-to-trough in beats per minute
	Determined over a 10-minute window
	Absent: no detectable amplitude change
	Minimal: ≤ 5 bpm
	Moderate (normal): 6–25 bpm
	Marked: > 25 bpm
Acceleration	Abrupt increase in FHR (onset to peak < 30 sec)
	Peak of 15 beats/min or more above baseline, lasting ≥ 15 sec but < 2 min ("15x15") (< 32 wks "10x10")
	Prolonged acceleration: lasts ≥ 2 min but < 10 min
	If lasting ≥10 minutes, it is a baseline change
Early deceleration	Happens in relation to contractions
	Symmetrical gradual decrease and return of the FHR associated with a uterine contraction
	Gradual >30 sec onset to nadir
	Onset, nadir, and recovery coincides with beginning, peak, and end of contraction (think "mirror")
	Not associated with fetal acidosis (benign)
	Due to *compression of fetal head* (vagal reflex), often during active stage or when pushing
Late deceleration	Happens in relation to contractions
	Occurs during/after the contraction; due to placental insufficiency
	Nadir after the peak of the contraction; FHR is not returned to baseline at the end of the contraction
	If persistent and repetitive, usually indicative of fetal hypoxia from *uteroplacental insufficiency*
	Considered ominous if not correctable and if associated with decreased variability and tachycardia
Variable deceleration	May occur with or without contractions
	Abrupt decrease and return to baseline FHR; "v-shaped".
	Time from onset to nadir is ≤ 30 sec.
	Due to *umbilical cord compression*.
	Can be benign, or can be more ominous if repetitive, nadir to < 80bpm, lasts > 30sec
Prolonged deceleration	Decrease ≥15 bpm below baseline, lasting >2 minutes but < 10 min
	Deceleration ≥10 min is a baseline change
Sinusoidal	Smooth, sine wave-like undulating pattern, a cycle frequency of 3–5 per minute persists for ≥ 20 minutes

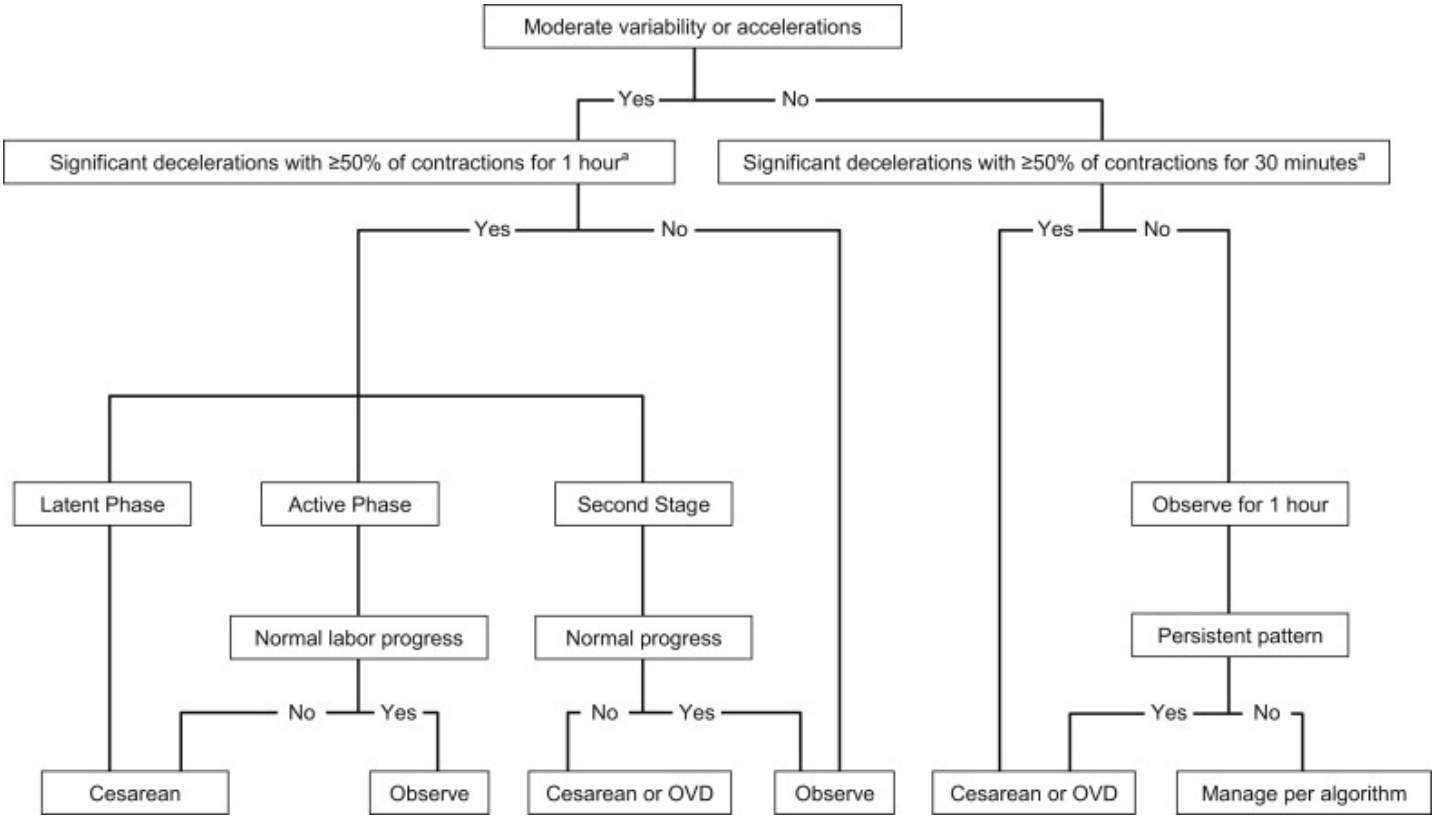
Intrapartum FHR monitoring

Three-Tiered Intrapartum FHR Interpretation System

TABLE 2. Category Definitions

Category I: Normal or "Good"	*Present:* – Baseline FHR 110 to 160 bpm – Moderate baseline variability (6-25 bpm)
	Absent: – Variable decelerations – Late decelerations
	Present or Absent: – Accelerations – Early decelerations
Category II: Indeterminate or "Atypical"	FHR patterns that are not category I or III
	Absence of induced accelerations after fetal stimulation
Category III: Abnormal or "Bad"	*Present (either):* – Sinusoidal FHR pattern **OR** – Absent baseline FHR variability **AND ANY**: – Recurrent late decelerations – Bradycardia – Recurrent variable decelerations

Algorithm for Management of a Category II Strip:



Some Potential Causes of Abnormal FHR Patterns

Bradycardia

-Maternal: supine position, hypotension, beta blocker, SLE, prolonged maternal hypoglycemia, acute cardiopulmonary compromise.

- Fetal: Mature parasympathetic nervous system, umbilical cord occlusion, acute hypoxemia, congenital heart block, cardiac structural defect, excessive PSNS stim r/t chronic head compression, serious fetal compromise (placental abruption, severe APH, maternal hypothermia).

Tachycardia

-Maternal: fever (esp. from chorioamnionitis which can occur before overt maternal fever is diagnosed), infection, dehydration, hyperthyroidism, maternal administration of parasympathetic (atropine) or sympathomimetic (terbutaline) drugs. *Fetal tachycardia from maternal causes is NOT associated with fetal compromise unless there are associated periodic heart rate changes or fetal sepsis.

-Fetal: cardiac arrhythmias (SVT), infection, activity, cardiac anomalies/failure, anemia. *Fetal compromise in association with tachycardia has concomitant decelerations.

Wandering Baseline

- Unsteady and “wanders” between 120 and 160 bpm, suggests a neurologically abnormal fetus; may be a preterminal event.

Decreased Variability

- **Most often caused by normal sleep cycles**.

-Maternal: Transient diminished beat-to-beat variability from drugs that depress CNS e.g. magnesium sulfate, narcotics, barbiturates, phenothiazines, tranquilizers, and general anesthetics.

- Loss of variability in combination with decelerations is associated with fetal acidemia or severe maternal acidosis. Reduced variability is the single most reliable sign of fetal compromise.

-Sinusoidal

- Seen in fetal intracranial hemorrhage, severe fetal asphyxia, and severe fetal anemia from Rh isoimmunization, fetomaternal hemorrhage, twin-twin transfusion syndrome, or vasa previa with bleeding.

-Late deceleration

- Consequence of uteroplacental insufficiency; associated with maternal hypotension, excessive uterine activity e.g. from oxytocin stimulation, or placental dysfunction, hypotension from epidural analgesia, chronic placental dysfunction from maternal diseases such as hypertension, diabetes, and collagen-vascular disorders. Placental abruption can cause acute late decelerations.

Induction of Labor

Definition: Use of mechanical or chemical methods in an attempt to start labor prior to the onset of spontaneous labor

- **Indications:** Maternal medical problems (e.g. hypertension, diabetes), IUGR, pre-labor rupture of membranes, decreased fetal movements at term, late/postterm (defined as >41 weeks gestation)
- **Risks**: Iatrogenic pre-maturity, hyper-stimulation of uterus which can result in fetal heart rate abnormalities, fetal hypoxia, placental abruption or uterine rupture, PPH
- **Prerequisites**:
  1. Assess the cervix (Bishop's Score)
  2. Confirm fetal gestational age (scan, date, quickening, antenatal records, h/o contraceptive use etc)

All women should be discussed with the consultant before choosing to begin IOL.

Methods of Induction:

- Mechanical
  - 'Cervical Sweep' — Performed at full term 39-41 weeks, decreases the risk of pregnancy persisting >41 weeks. Should be offered to all women.
  - Foley balloon — used in an unfavorable cervix when prostaglandins have high risk of hyperstimulation (e.g. grand multipara, previous cesarean section or myomectomy) or no available bed in labor and delivery for chemical induction
- Pharmacological
  - Prostaglandins — Used for cervical 'ripening' an unfavorable cervix (Modified Bishop's score < 6) with contractions < 4:20.
  - Misoprostol (Cytotec). Follow FIGO 2017 guidelines for dosage/route/frequency of administration. (25mcg PV Q6 or 25mcg PO Q2)
    In setting of prelabor rupture of membranes the PO route is preferred.
  - Oxytocin — To initiate contractions if cervix is favorable (Bishop's score ≥6), usually started after artificial rupture of membranes if contractions present. When used in setting of prelabor rupture of membranes with poor Bishops score the outcomes are similar to misoprostol.

Documentation for all patients undergoing IOL

- Parity, Gestation (and any US confirming dates)
- Indication for IOL
- Examination findings
- Reassuring 20 min CST filed in the notes
- Standard orders signed
- Until a patient's cervical dilation is ≥4 cm, complete the monitoring form for IOL—fetal heart rate and contractions must be documented q15 minutes, and maternal V/S q1 hour
- After cervical dilation is ≥4 cm a partograph must be completed
- All patients on induction must have IV access.

Tachysystole

- Contracting >5:10, or incomplete relaxation of uterus between contractions averaged over a 30-minute window, Tachysystole should always be qualified as to the presence or absence of associated FHR decelerations.
- Tachysystole itself is NOT a reason for cesarean section. Intervene to resolve tachysystole.
    - If on oxytocin, the dose must be decreased by 50%, and reassessed in 15 minutes. If the fetal heart is abnormal, stop oxytocin completely. Start IV NS 1 litre bolus and maintain at 125 cc/hour. Start supplemental oxygen and place patient in left lateral position.
    - If after misoprostol, management depends on fetal heart rate. If fetal heart rate tracing is reassuring, expectantly manage. If there is a non-reassuring fetal heart rate, consider maternal position change, IV bolus, maternal oxygen admistration. Tocolysis can be considered with nifedipine 20mg PO.
- Cesarean section if non-reassuring fetal status persists.

'Failed' induction of labor

- Failure to get a woman into active labor after appropriate intervention
- **1 cycle of misoprostol consists of <u>SIX doses</u> of PV/PO**.
- After failure of one cycle, the options are:
    - Rest the patient for 24 hours and repeat a second cycle only if the maternal and fetal condition permit
    - Foley balloon
    - Upon discussion with a consultant can give 50 mcg of misoprostol for a maximum of two doses
- The decision regarding further management after failure of one cycle of misoprostol will be made by the consultant on an individual basis depending on the condition of the mother and fetus.

Augmentation of Labor

Definition: Stimulation of uterine contractions with oxytocin

Contraindications include, but are not limited to:

- Placenta previa or vasa previa
- Abnormal fetal lie
- Cord presentation
- Presenting part above the pelvic inlet
- Prior classical uterine incision
- Active genital herpes infection
- Pelvic structural deformities
- Invasive cervical carcinoma

Prerequisites

- Sign the augmentation order sheet
- The nurse to complete the augmentation order sheet and complete the induction-monitoring sheet
- The nurse should chart the appropriate components of the partograph

Dosage

- Premixed solution of oxytocin 10 units in 1000 mL of Dextrose Normal Saline
- Infuse at 5 drops per minute increase every half hour until 3 in 10 contractions to a maximum of 60 drops per minute. If inadequate contractions increase the dose to 20 units per 1000 mls and start at 30 drops per minute maximum 60 drops per minute
- Best administration is through infusion pumps which is not currently available at AIC Kijabe hospital

Complications

- Tachysystole
- Non-reassuring fetal status – Management:
    - Discontinue or decrease oxytocin infusion as indicated by fetal and maternal response
    - Maternal repositioning (left or right lateral position)
    - IV bolus of at least 500mL of Normal Saline solution
    - Oxygen at 10L/min via non-rebreather facemask (discontinue as soon as possible)
    - Consider cervical examination to assess progress of labor
- Other complications: uterine rupture, and fluid overload

LABOR ABNORMALITIES

Prolonged latent phase

Definition: >24hrs without progress at term gestation

- Cervix unfavorable
  - Sedate – this will stop contractions if in false labor. Meperidine 50-100mg IM or morphine 5-10mg IM are recommended, and may have less toxicity
  - PO hydrate, IV if not able to tolerate PO
  - If contractions continue without progress, consider amniotomy and/or induction/augmentation. Then, if still no progress, consider C/S, but in general want to avoid doing C/S solely for latent phase labor dystocia.
- Cervix favorable
  - Amniotomy (may shorten 1st stage but does not affect C/S rates)
  - Oxytocin augmentation.
  - If still no progress with regular contractions, consider C/S, but in general want to avoid doing C/S solely for latent phase labor dystocia**.**

Arrest of active phase

Definition: no change in cervical dilatation >6hrs despite adequate contractions and ruptured membranes

- This diagnosis requires that the patient is in active labor (>6cm) with ruptured membranes. Be sure the patient is not in the latent phase of labor and that the head is engaged.
- Complications of obstructed labor include:
  - Fetal death
  - Uterine rupture
  - Infection
  - Obstetrical fistula formation
- If arrest of dilatation is felt to be present, do C/S.

Protracted active phase

Definition: low slope of active phase labor

Possible causes:

- Occiput posterior position – attempt to correct by position changes of mother (i.e. ambulate, hands/knees)
- Oversedation – expectant management.
- Hypotonic uterine contractions – hydrate, amniotomy, oxytocin augmentation.
- Cephalo-pelvic disproportion or malposition.
- Defined as < 1.2 cm/hr for nullipara or < 1.5 cm/hr for multipara.
- If mother and baby are stable, observe with adequate contractions for at least 4-6 hours before performing C/S.

Prolonged or arrest of descent phase/2nd stage

Definition: > 3hrs after complete dilatation in primipara or >2hrs in multipara

- If slow progress is being made and the baby is stable, continued observation is warranted.
- Exhaustion – apply vacuum or forceps if at least +2 station.
- Occiput posterior position- if slow progression, consider manual rotation or maternal position change.
- If malposition or frank disproportion suspected – perform C/S.

Meconium

- May indicate non-reassuring fetal status, though meconium passage has now been shown to be a normal event.
- The greatest danger with meconium is the risk of meconium aspiration syndrome (a cesarean section does not decrease this risk)
- Monitor fetal heart tones continuosly. CS if non-reassuring tracing not improved with interventions (maternal oxygen, position changes)
- Suction nose and mouth prior to routine neonatal stimulation.
- Perform intubation and deep tracheal suction only if the infant is in need of resuscitation.

3rd or 4th degree laceration

- Risk of 3rd or 4th degree laceration is increased with midline episiotomy, operative vaginal delivery and fetal macrosomia
- Have low threshold to perform digital rectal exam after any difficult delivery
- Diagnosis – complete laceration through perineum and into anal sphincter (3rd) or to rectum (4th).
- Evaluation – visualize entire extent of laceration; it is important to repair the entire laceration to avoid fistula formation.
- Repair is a layered repair beginning with rectal mucosa
    - Approximate rectal mucosa with fine absorbable suture (4-0 chromic or 3-0 Vicryl) using continuous submucosal suture.
    - Reinforce mucosal closure with second layer of 3-0 absorbable suture.
    - Repair anal sphincter with interrupted sutures of 2-0 long-term absorbable suture (Vicryl). Place sutures in the capsule of the sphincter for increased strength.
    - Complete laceration/episiotomy repair with standard technique, using 2-0 or 3-0 absorbable suture (chromic or vicryl)
- Postpartum care
    - Ice packs x 12-24 hr to decrease edema.
    - Frequent Sitz baths, or warm perineal lavage, to keep perineum clean and decrease pain.
    - Encourage high fiber diet to promote soft stools, or stool softener
    - We recommend:
        - Cefazolin 1-2gm IV at the time of repair
        - Augmentin 625mg PO TDS and Flagyl 500mg PO TDS x 7d post repair

Operative Vaginal Delivery

Definition:
Use of vacuum or forceps to expedite vaginal delivery. We do not routinely use forceps at AIC Kijabe Hospital.

Performing the delivery:
Operator must have sufficient knowledge, experience and skills to manage delivery and any complications. Experience must be achieved in SVD prior to instrumental delivery.

Indications:
- Prolonged 2nd stage of labor (>3hrs in primip and 2hrs in multip)
- Nonreassuring fetal status
- Maternal cardiac or neurologic disease
- Maternal exhaustion

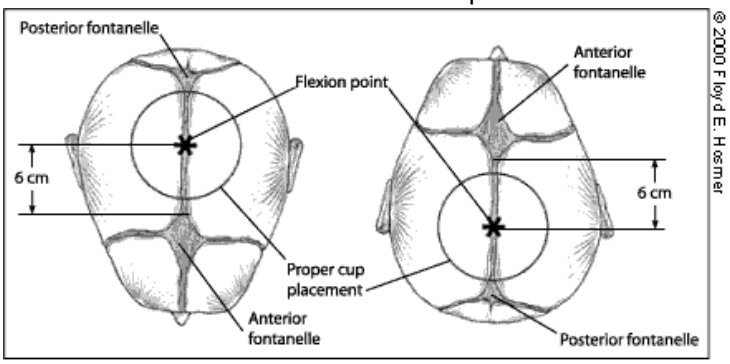
Prerequisites:
- Consultant in attendance
- Cephalic
- Cervix fully dilated
- Membranes ruptured
- Head engaged
- Fetal presentation, position, lie and asyncliticism are known
- EFW known
- Clinical pelvimetry shows adequate dimensions
- Maternal bladder empty
- Anesthesia/analgesia adequate
- Pediatric team present

Contraindications:
- Fetal prematurity (eg, EGA<34 weeks)

Risks:
- Fetal: intraventricular/subdural hemorrhage, cephalohematoma, retinal hemorrhage, hyperbilirubinemia
- Maternal: Vaginal/cervical lacerations

PROCEDURE
1. Empty maternal bladder
2. Confirm full cervical dilatation
3. Fetal presentation confirmed
4. Place the cup – centre of cup 2 cm anterior to the posterior fontanel/flexion point on the sagittal suture ensuring no maternal tissues are trapped; also not over either fontanelle.
5. Create vacuum of 0.2kg/sq.cm (yellow)
6. Apply suction: 500-600 mmHg=0.8kg/cm2=23.6 inchesHg=11.6 lb/in
7. Exert traction (perpendicular to plane of cup; continuous, non-jerking; gently downward; non-twisting; gradually extending traction upwards 45 degrees as head emerges from pelvis).

8. Documentation: Clear and complete documentation in the medical record is critically important



Compared to forceps, vacuum delivery is:

- More likely: to fail (OR 1.79), to be associated with cephalohematoma (OR 2.4) and retinal hemorrhage (OR 2.0)
- Less likely: to be associated with significant perineal trauma (OR 0.45)
- Have the same: 5 min APGAR and neonatal jaundice.

The key factor in success and safety is the experience of the operator.

There is no evidence to support the routine use of episiotomy with instrumental delivery

When to stop:

- Delivery not imminent after three pulls of a correctly placed instrument by an experienced operator.
- Fetal head does not advance with each pull
- Cup slips off the head 3 times at proper direction of pull with maximum negative pressure
- Duration 15-30 minutes

Caution: Sequential instrumentation (i.e. vacuum followed by forceps) is associated with increased fetal trauma. However, this must be balanced against the greatly increased risks of maternal trauma with cesarean section. It is not advised to attempt another instrumentation.

Breech Delivery

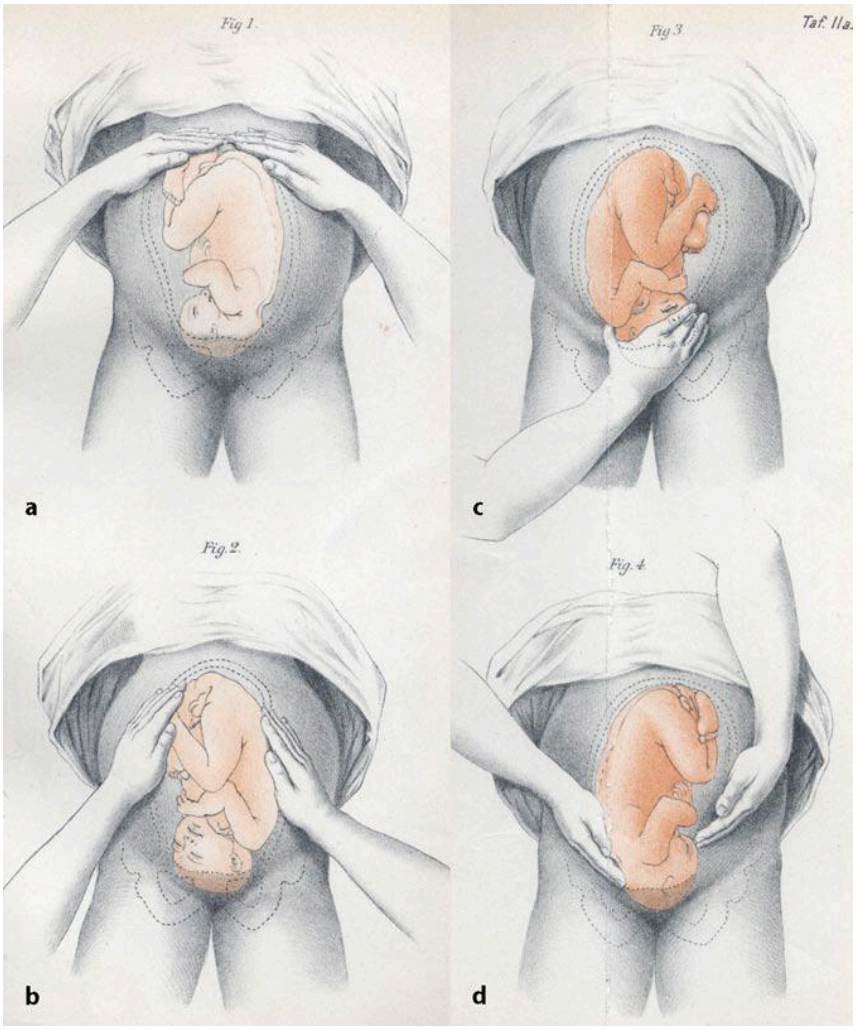
This guideline refers to singleton breech presentation at term with no other complications or contraindications to breech vaginal delivery.

Antenatal:

Basic skills in physical examination are essential to diagnose the breech fetus in the antenatal period. The Leopold maneuvers are the backbone of the physical exam of the pregnant mother.

Leopold maneuvers

A. Identify fetal pole in the fundus. Breech gives sensation of large nodular mass.
B. Palms on the sides of abdomen. Identify (hard, smooth) back on one side and irregular mobile parts on the other side
C. Using thumb and fingers grasp presenting part (diagnose whether engagement has occurred)
D. Facing mother's feet, use fingertips to palpate presenting parts.

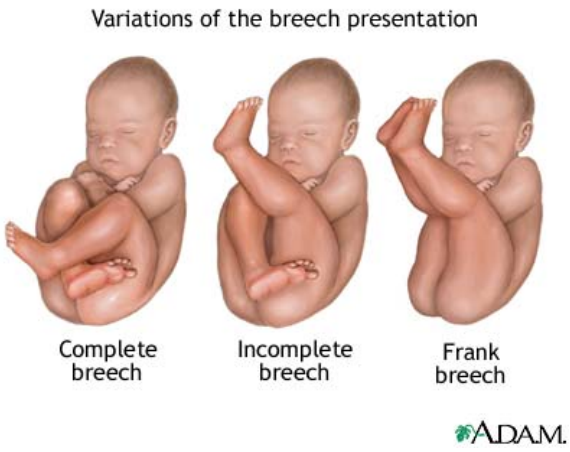


Breech configurations:

- Complete: 5-10%
- Incomplete: 10-40%
- Frank: 50-70%

Prevalence of breech presentation:

- <28 weeks: 20-25%
- 32 weeks: 7-16%
- Term: 3-4%



Risk Factors:

- Preterm gestation
- Altered intrauterine contour or volume: extremes of AFI, myomas, placental abnormalities, bicornuate uterus
- Fetal anomolies: anencephaly, hydrocephaly, gastroschisis, omphalocele
- Impaired fetal mobility: crowding from multiple gestation

Mode of Delivery:

- ***External Cephalic Version (ECV)*** is possible to convert a breech to cephalic presentation which will allow SVD
- ***Preterm Breech (<34wks)***: because of the higher fetal HC/AC ratio than the term baby, the preterm breech head is more likely to be caught in a partially dilated cervix. Therefore, if a preterm breech needs delivery, CS is recommended.
- ***Term Breech***: the TERM BREECH TRIAL (Lancet, 2000) presented some evidence that planned CS is associated with improved neonatal outcomes compared to planned vaginal birth (poor neonatal outcomes of 1.6% -v- .5.0%)

At Kijabe Hospital, we recommend for breech fetuses to be delivered by CS. However, one must be prepared and skilled to do a breech vaginal delivery because of the occurrence of an undiagnosed breech presenting in active labor

- The WHO Reproductive Health Library has several excellent videos including one on Breech Delivery Techniques
  http://apps.who.int/rhl/videos/en/
- Higher risk of cord prolapse in breech, so ARM should be avoided.
- Oxytocin augmentation should also be avoided.
- 2nd stage longer than 30-60 minutes should prompt strong consideration for CS.
- Ideally all breech presentations should be diagnosed through abdominal palpation and confirmed by US.
- **Babies remaining breech at 38 weeks should be offered assessment for external cephalic version.**

Intrapartum: Women who are admitted in labor with a breech presentation must be discussed with the consultant on call. In most women with frank or flexed (***not*** footling) breech and uncomplicated labors vaginal delivery could be attempted with the following guidance:

A consultant comfortable with breech delivery *must* be present. Call as soon as second stage is diagnosed. A pediatrician must also be present at delivery.

Breech Delivery Method:

1. Call Consultant experienced in breech delivery
2. Maternal effort (the active second stage, i.e. pushing) should begin when the breech is near the perineum.
3. Assisted breech delivery is '**hands off'** – do not assist in the delivery of the baby until maternal efforts have resulted in expulsion of the fetus at least to the scapula.
4. Pull down a small loop of cord to prevent traction on the cord.
5. Wrap body in a towel to allow for support and grip
6. Legs may be delivered by flexing the knees.
7. Support the baby by holding the femurs with thumbs on the sacrum. Do ***not*** grasp the baby's abdomen
8. When the scapula are visible, gentle rotation will usually allow delivery of arms - Rotate to sacrum anterior if needed
9. Lovsett's manouevre may be used to deliver the arms. Follow humerus down and each arm rotated across the chest and out.
10. When the occiput is visible the head should be delivered in a controlled fashion, ensuring continued flexion of the neck.
    The aftercoming head may deliver spontaneously. If not, use the modified *Mariceau-smellie-veit maneuver* (see diagram below). The trunk of the baby lies on the operator's right forearm. The head is flexed by applying pressure to the cheek bones and upper lip while the gentle traction applied on the shoulders with the left hand.

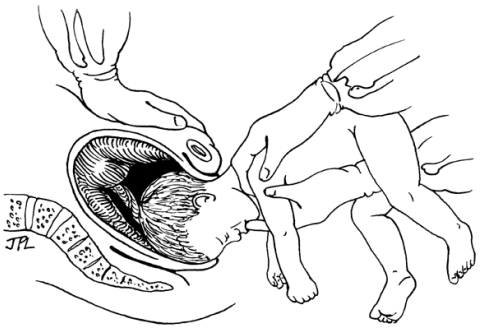


Image shows *Mariceau-smellie-veit maneuver, but should use "MODIFIED" technique – fingers on cheekbone and upper lip, not in mouth*

11. If the head is entrapped, uterine relaxation in theatre with GA (halothane) may allow delivery.
12. Induction or augmentation of labor should be avoided.
13. Poor progress of labor or fetal heart rate abnormalities should prompt consideration of cesarean section.

Twin Delivery

Multiple pregnancies do not automatically require delivery by cesarean section. Vaginal delivery should be preferred if twin 1 is cephalic and there are no absolute contraindications. The presentation of twin 2 is not relevant in determining mode of delivery.

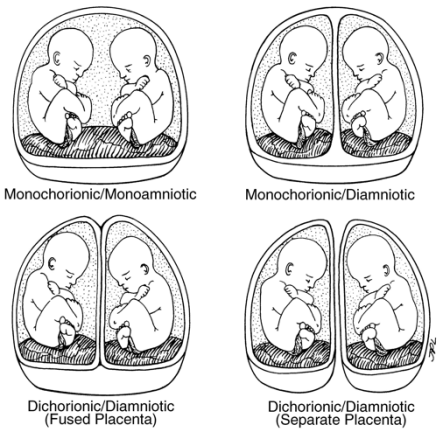
Antenatal: Ideally women should have a diagnosis of twins through a 1st or 2nd trimester ultrasound scan and the need for good antenatal and intrapartum care due to the increased risks should be clearly explained.

Zygosity / Chorionicity

- important to understand as it can aid obstetric risk assessment; best determined in 1st or 2nd trimester
- Dizygotic: 80% of twins; fertilization of two oocytes; results in dichorionic placentation, two placentas.
- Monozygotic: 20% of twins; fertilization of single oocyte; multiple possible placental configurations

14%

<1%



Risks of Monochorionicity

- Twin-twin Transfusion Syndrome (TTTS) – 10% of MC twins
- Twin anemia-polycythemia sequence (TAPS) – variant of TTTS

- Monoamniotic twins are at high risk of cord entanglement/accidents
- Higher risk of still birth (RR 3.6), neonatal mortality (RR 1.5), selective IUGR and discordance

Twin Gestations at higher risk of Preterm birth

- A major cause of morbidity and mortality in twins
- Cervical length screening between 20-24 weeks
    - Length < 25mm suggests increased risk of preterm birth

Antepartum:

- Timing of delivery:
    - Dichorionic/Diamniotic – 38+0 – 38+6 wks; SVD if concordantly grown and presenting twin is cephalic
    - Monochorionic/Diamniotic – 36+0 – 37+0 wks; SVD if concordantly grown and presenting twin is cephalic
    - Monochorionic/Monoamniotic – 34wks after steroids given; cesarean section recommended
- Presentation and Mode of Delivery:
    - *Vertex/Vertex*: 42% of twins (goal of vaginal delivery appropriate at any gestation age)
    - *NonVertex Presenting twin*: 20% of twins, elective CS recommended in this situation
    - *Vertex/non-vertex*: 38% of twins; probably safe to attempt breech extraction of second twin and proceeding to CS if unsuccessful;
- Relative contraindications to breech extraction of second twin
    - EFW of 2nd twin >20% more than presenting twin
    - Delivery of presenting twin suggests pelvis may not be adequate breech extraction (prolonged 2ndstage;marked molding of head)
    - EGA <28wks or EFW of 2nd twin<1500g

Intrapartum care

- A partograph must be completed with *both* fetal hearts recorded.
- The mother must have IV access, CBC and 2 units GXM
- Twins are not a contraindication for IOL or augmentation.
- Poor progress (despite oxytocin) or fetal heart rate abnormalities should prompt consideration of cesarean section.
- **A consultant comfortable with twin delivery *must* be present. Call as soon as second stage is diagnosed.**
- Minimum staff required: consultant, intern, 2 midwives, pediatrician
- Equipment prepared: Fetal Doppler, 1 L N/S with 10u oxytocin, Medications for anticipated PPH: another 40u oxytocin, cytotec, tranexamic acid, ergometrine (if not hypertensive), vacuum, 2 delivery packs
- Delivery of twin 1—as any other SVD.
- Immediately after twin 1 is born: plan delivery of Twin B
    - Continue with continuous fetal heart monitoring
- Assess lie with portable ultrasound
- Gentle VE to determine station/presentation.
- Avoid ARM until presenting part is engaged in the pelvis
- Stabilize the lie of twin 2, start oxytocin infusion (10 u in 1 L N/S) at 60 drops/min,
- Aim to deliver twin 2 within 30 min. of twin 1, breech extraction (+/- internal podalic version) or high vacuum may be required.

- Immediately after twin 2 is born: Give 10u oxytocin IM. Add 30IU oxytocin to 1L NS. Infuse at 125mL/hour, deliver placenta by CCT and massage uterus until well contracted. Suture perineum as required.
- Monitor PV bleeding and V/S q1 hour for 6 hours, then QID for 24 hours

TOLAC (Trial of labor after cesarean section)

Provides women with an opportunity to have VBAC-*Vaginal Birth After Caesarean Section.*
In selected appropriate cases VBAC rates range from 60-80%

Maternal Risks

- Attempted VBAC carries an increased risk of uterine rupture (<1%), blood transfusion, and endometritis. Morbidity almost always occurs in a failed VBAC attempt. (The risk of uterine rupture is increased to ~2% with induction of labour (especially with prostaglandins). The risk of rupture is similar with one or two previous cesarean sections but rises considerably after three cesareans. The risk following myomectomy is uncertain.
- ERCS (Elective Repeat Cesarean Section) carries an increased risk of hysterectomy, thromboembolism, and maternal death.

Fetal Risks

- Attempted VBAC carries the same perinatal mortality rate as for a primigravid mother. It also has a higher risk of hypoxic ischemic encephalopathy.
- ERCS carries a higher risk of respiratory problems in the neonate.

The majority of women should be offered a trial of labor.

Absolute Contraindications: same as those for any other attempt at vaginal delivery

Relative Contraindications – two previous cesarean sections, myomectomy, multiple factors that decrease the chance of success

Management

- Once admitted to labor ward: IV access, Hb, Type and Hold, continuous electronic FHR monitoring, sign consent for emergency CS
- Any decision to induce or augment must be made by consultant. Prostaglandin induction of labor will not be used (except possibly in the event of premature delivery or dead foetus). Augmentation with oxytocin is rarely appropriate
- *Latent phase of labour:* Women should be encouraged to attend hospital as soon as they experience regular contractions or rupture of membranes, An NST must be performed on admission, FHR hourly
- *Active phase of labour:* A partograph must be scrupulously completed. If any signs of rupture are noted the intern, consultant obstetrician, and theatre team must be paged simultaneously.

Signs and Symptoms of Uterine Rupture*
Abnormal fetal heart rate
Severe abdominal pain (especially between contractions)
Chest or shoulder tip pain, sudden SOB
Acute onset of scar tenderness
Abnormal vaginal bleeding or hematuria
Cessation of previously efficient uterine activity
Maternal tachycardia, hypotension or shock
Loss of station of the presenting part

*Note: Not all women will experience all of these signs and symptoms

Puerperium

Puerperal Sepsis

Definition: Sepsis following delivery up to 6 weeks postpartum

Risk factors*:* cesarean section, prolonged labor or ROM, multiple Ves, manual removal of placenta

Etiology*:* usually polymicrobial endometritis

Signs and symptoms*:* temp ≥38^{o}C, tachycardia, lower abdominal pain, uterine tenderness, foul smelling lochia suggestive of anaerobes, malaise, persistent spiking temperature suggests abscess, diarrhea or vomiting – may indicate exotoxin production (early toxic shock), breast engorgement / redness, rash (generalized maculopapular rash), abdominal / pelvic pain and tenderness, wound infection – spreading cellulitis or discharge, serosanguineous vaginal discharge suggestive of streptococcal infection, productive cough, urinary symptoms, delay in uterine involution, heavy lochia, general – non-specific signs such as lethargy, reduced appetite.

Remember!
The key factors for survival of sepsis are aggressive fluids and immediate antibiotics

Management

- Resuscitate—**Rapid** IV fluid
  - **Minimum** 2L N/S in the first hour and further 2L in the next 2 hours.
  - V/S q15 min until stable then hourly for 4 hours then 6hourly
  - Titrate continued fluids to maintain P ≤110bpm, BP ≥ 80/40, U/O ≥ 20mL/hr
- Antibiotics—give 1st dose **within1 hr** of presentation
  - Ampicillin 2g IV q 6 hrs
  - Gentamycin 5mg/kg IV q 24 hrs or 1.5mg/kg IV q 8hrs
  - Metronidazole 500mg IV q 8 hrs
- **Investigations:** CBC, renal function, U/S
- **Reassess**—if patient is not improving within 48 hours of commencing antibiotics re-consider differential diagnosis:
  - RPOC—requiring uterine evacuation
  - Pelvic abscess—may require laparotomy and drainage
  - Another source of infection—e.g. pneumonia, UTI, breast abscess, malaria, typhoid, meningitis, thrombophlebitis

Breastfeeding

The establishment and maintenance of exclusive breastfeeding is one of the major goals of good postpartum care.

The ten steps to successful breastfeeding for a baby friendly facility

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
7. Practice rooming-in – allow mothers and infants to remain together – 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic

How to help a mother to position and attach her baby

- Help the mother to get into a comfortable and relaxed position, sitting or lying down.
- The helper should sit in a comfortable, convenient position.
- Explain to the mother how to hold her baby, according to the **four key points**:
    - with the head and body straight
    - facing the breast, and starting with his/her nose opposite the nipple
    - with his/her body close to her body
    - supporting the whole body
- **Show her how to support her breast:**
    - with her fingers flat against her chest wall under her breast
    - with her thumb above the breast
    - her fingers should not be on the areola or near the nipple, because this can interfere with attachment.
- **Explain or show the mother how to help her baby to attach by:**
    - touching the baby's lips with her nipple
    - waiting until the baby's mouth is open wide
    - moving the baby quickly onto her breast
    - aiming her nipple up towards the roof of the baby's mouth
    - aiming his/her lower lip behind her nipple, so his/her chin touches the breast.
- **Notice how the baby responds and ask her how the suckling feels.**
  Look for (4) signs of correct attachment.
    - more of the areola is visible above the baby's top lip than below the lower lip
    - the baby's mouth is wide open
    - the baby's lower lip is curled outwards
    - the baby's chin is touching or almost touching the breast.

  If attachment is not good, or if the mother is uncomfortable, ask her to try again.
  Show her how to take the baby off the breast by slipping her little finger into the baby's mouth to release the suction

The various breastfeeding positions include:


Cradle hold


Football hold


Cross-cradle hold


Side-lying

Contraindications to breastfeeding:

- Active pulmonary tuberculosis *not absolute refer to guidelines
- Herpes lesions on mothers breast
- Infants with inborn errors of metabolism, galactosemia, phenylketonuria
- Maternal medications e.g chemotherapy, radioactive isotopes

Breastfeeding Basics

- Early suckling – skin-to-skin contact and initiation of breastfeeding within 1 hour of delivery.
- Nursing supervision of breastfeeding to ensure correct technique and 'latching on' the nipple.
- Encourage the mother that colostrum is good for neonatal health, and that it is normal for milk production not to begin for the first 2-3 days post-natal. As long as the fontanelle is not sunken and neurological behavior is normal, is the baby is fine.
- The baby should be encouraged to suckle even if the mother reports 'no milk' – as suckling itself encourages the milk let-down reflex.
- Avoid supplementary feeds (including formula or other fluids) unless specifically prescribed by the consultant pediatrician.
- The baby should be encouraged to suckle until each breast is emptied. The total length of breastfeeding should be approximately 20 min in one feed.
- Mothers should be encouraged to feed their babies on-demand. Healthy neonates should feed every 2-4 hours.
- If mothers complain of breast pain—they should be assessed for appropriate technique and examined for evidence of engorgement. If breasts are engorged they should be encouraged to feed more from the affected side to decrease milk stasis. They may also use NSAIDs and warm compresses.
- Mastitis is treated with cloxacillin 500mg PO QID x 14days. Baby should continue to breast feed on affected side. Milk should only be expressed and discarded if it is contaminated by purulent discharge.
- Breast abscesses may require incision and drainage.

Signs of effective breastfeeding

- Frequent feedings 8-12 feeds/day
- Intermittent episodes of rhythmic suckling with available swallows should be heard while the infant is nursing
- Infant should have about 6-8 wet diapers in a 24hr period once breastfeeding is established.

- Infants should have minimum of 3-4 bowel movements/24hrs
- Stools should be about I tablespoon or larger & should be soft & yellow after day 3
- Average daily wt gain of 15-30gm
- Infant has regained birth weight by day 10 of life

Obstetric Complications

Hypertensive disorders of pregnancy

- **Chronic (pre-existing) hypertension** – HTN that precedes pregnancy, usually present before the 20th wk gestation or persists longer than 12wks postpartum
- **Gestational hypertension** – HTN first detected after 20wks gestation in the ABSENCE of proteinuria or other features of preeclampsia
- **Preeclampsia/eclampsia** – new onset HTN in the PRESENCE of proteinuria after 20wks gestation
- **Preeclampsia-eclampsia superimposed on chronic or gestational hypertension** – worsening hypertension with new onset proteinuria or end organ damage in a patient that with previously diagnosed chronic or gestational HTN

Definitions:	
Hypertension	BP ≥ 130/80
Chronic hypertension	BP ≥ 130/80 before 20wks gestation or >12wks postpartum
Gestational hypertension	BP ≥ 140/90 without end organ damage at >20wks gestation or < 12 wks postpartum
Pre-eclampsia	BP ≥ 140/90 after 20wks gestation with proteinuria
- Severe features/HELLP	BP ≥ 160/110, evidence of end organ damage or symptoms (headache, photophobia, epigastric pain, renal insufficiency, pulmonary edema, thrombocytopenia, IUGR)

Outpatient Management

- The aim of treatment is to stabilize the maternal condition and prolong the pregnancy in order to achieve fetal maturity. Pregnancy can be prolonged for an average of 15 days after the initiation of antihypertensives. Therefore, initiation of antihypertensive treatment after 36 weeks gestation is rarely appropriate—planning delivery is preferable.

CHRONIC/GESTATIONAL HYPERTENSION (NO proteinuria)

Degree of HTN	Mild HTN <150/100	Moderate HTN 150-160 to 160/110	Severe HTN >160/110
Admit to hospital?	No	No but close surveillance until BPs controlled	Yes until BPs controlled
Treat?	No	Yes - oral medication	Yes - IV for emergency Then oral to maintain
Test for proteinuria?	Yes	Yes	Yes
Blood tests?	Baseline CBC, LFTs, creatir	Baseline CBC, LFTs, creatini	CBC, LFTs, creatinine WEEKLY

Ultrasound	3rd trimester for fetal growth, AFI, RI	3rd trimester Q4wks for fetal growth, AFI, and RI	3rd trimester Q3-4wks for fetal growth, AFI and RI
Follow-up	Q1-2wks	Weekly	Weekly

** ANY NEW ONSET PROTEINURIA CHANGES DIAGNOSIS TO SUPERIMPOSED PRE-ECLAMPSIA and requires admission**

Pre-eclampsia and Eclampisa are more common if:

● <20 and >35 years old	● Diabetes mellitus or renal disease
● Primigravida	● Pre-existing connective tissue or vascular disease (APS, SLE)
● Multiple gestations	● Fetal growth restriction (baby palpates small for gestational age)
● Molar pregnancy	● Prior history or family history of pre-eclampsia or eclampsia
● Chronic hypertension	● BMI >30

If history of preeclampsia/HELLP/eclampsia in previous pregnancy:

Check baseline urinalysis for protein, creatinine, SGOT/SGPT at first antenatal visit

Aspirin 150mg PO OD and Calcium supplement from 12wks to 36wks

Antihypertensive agents safe in pregnancy

- Methyldopa – start 250mg PO BD; increase every 2days to desired BP. Maximum dose 3000mg/24hrs
- PO Labetalol (can be found in Nairobi AKH outpatient clinic) start 100mg PO BD, increase by 100mg BID every 2-3days to desired BP. Maximum dose 2400mg/24hrs
- Nifedipine 20mg PO BD, increase every 7-14 days, maximum dose 120mg/24hrs
- If patient with chronic hypertension is on HCTZ, may continue in pregnancy

Timing of delivery

Chronic hypertension on medications – 37+0 - 39+0 wks

Chronic hypertension on medications, difficult to control – 36+0 – 37+0wks

Gestational hypertension – 37+0 – 38+0wks

Preeclampsia without severe features – 37+0 wks, MgSO4 not indicated

Preeclampsia with severe features
- if >37wks, give MgSO4, deliver
- if < 37wks, give MgSO4, attempt to finish antenatal steroids and then deliver

Inpatient Management

Prongs of management:

- **BP control**
- **Seizure prophylaxis**
- **Fetal surveillance**
- **Fluid management**

Hypertension management:

- The aim of treatment is to drop BP enough to decrease risk of stroke and seizure without compromising placental perfusion. Target BP should be 140-160/90-110.
- Institute fetal surveillance if undelivered and fetus is viable. Do not control the pressure at the expense of fetal survival.
- BP should be monitored q 30 min for at least 2 hours—if stable may decrease to hourly.
- **Hydralazine** 5-10mg IV PRN—Hydralazine may be needed every 15 min (it has a short half-life), but if >20mg/hr are needed a longer acting antihypertensive should be added.
- **Nifedipine** 20mg PO BD
- **Labetalol** - ***__this is the antihypertensive of choice__*** It can be given PO or IV and there is a very wide range to titrate, starting dose of 20 mg IV over 2 minutes and titrate as follows:
    - Repeat and record BP measurement in 10 minutes,
    - If BP is below threshold, continue to monitor BP closely.
    - If either BP threshold of SBP 160 or DBP 110 is still exceeded, administer labetalol 40 mg IV over 2 minutes.
    - Repeat BP measurement in 10 minutes and record results.
    - If either BP threshold is still exceeded, administer labetalol (80 mg IV over 2 minutes). If BP is below threshold, continue to monitor BP closely.
    - Repeat BP measurement in 10 minutes and record results.
    - If either BP threshold is still exceeded, administer hydralazine (10 mg IV over 2 minutes). If BP is below threshold, continue to monitor BPclosel
    - Repeat BP measurement in 20 minutes and record results.
    - If either BP threshold is still exceeded, obtain emergency consultation from internal medicine, anesthesia, or ICU.

Seizure prophylaxis:

- **MgSO4**—if pre-eclampsia with severe features, prophylactic MgSO4 should be commenced following the same protocol as for eclampsia:
    a. 4gm IV loading dose over 20minutes
    b. 1-2gm/hour IV maintenance until 24hrs post delivery

Fetal Surveillance

- CST
- Ultrasound to assess AFI, RI and fetal growth abnormalities

Fluid Management

- Restrict maternal fluids. Limit IVF to 80-90cc/hours

Complications

HELLP Syndrome: Hemolysis, Elevated Liver enzymes, Low Platelets. A variation of severe pre-eclampsia. Can be complete having all features of HELLP or partial with only some components.

Eclampsia: One or more convulsions occurring pregnancy after 20 weeks gestation or within the first week after delivery as a complication of pre-eclampsia. (Though the hypertension and proteinuria are not always detected prior to the first convulsion). These convulsions look the same as epileptic tonic-clonic seizures, and involve jerking movements of eyes, jaw, neck and limbs. The mother becomes unconscious and may stop breathing if the convulsions persist.

Status epilepticus*:* One continuous unremitting seizure lasting longer than 5-10 minutes, or recurrent seizures without regaining consciousness for greater than 30 minutes.

Remember: All seizures in pregnancy are eclampsia until proven otherwise!

Complications of eclampsia

- Maternal death (up to 1/3 of women die if poorly managed)
- Fetal death (~1/3 of babies die)
- Placental abruption and massive antepartum and/or post-partum hemorrhage
- Hypoxic brain injury or CVA
- Pulmonary edema
- Hepatic or renal failure

Warning signs that may precede a convulsion include:

Symptoms	Signs
● Severe headache	● BP > 180/110
● Visual disturbance	● Tenderness over the liver
● Epigastric pain	● Brisk reflexes (including clonus)
● Vomiting	● Papillo-edema

Seizures can occur without any warning at all.

Women are also vulnerable to seizures post-partum.

Key to management is stabilization of the mother prior to delivery. Do not rush the mother to theatre before control of convulsions using management below.

Management of ECLAMPSIA

- Stabilize patient – ABC (airway, breathing, circulation)
    - Place in "recovery position"
    - Check HR and BP
    - Insert IV
    - Start CST
- Administer **Magnesium sulfate**
    - **4gm IV** over 20minutes (preferred)
    - If unable to obtain IV access, give **5gm IM** in each buttock
    - After 15 minutes, if patient still seizing, give additional 2gm IV over 20minutes.
    - **Continue 1-2gm/hour IV** until 24hrs after delivery or last seizure.
- Administer antihypertensives if BP > 160/110
    - Take care not to drop BP precipitously as it will adversely affect placental perfusion. Goal is around 140-160/80-100
    - See
- Plan delivery
    - If reassuring heart rate tracing and patient stabilized, consider IOL.

Antepartum Hemorrhage

Definitions:
Antepartum hemorrhage (APH): Any bleeding from the vagina in the third trimester (after 24 weeks gestation) before delivery of the baby. This can occur before or during labor. Any blood loss > 500ml is considered 'severe'.
Major hemorrhage: blood loss > 1000ml. This carries a very high risk of maternal and fetal death.

Causes of vaginal bleeding

- **Hemorrhage** from placental site or uterine cavity
- **Placenta previa**: A placenta that has implanted in the lower part of the uterus. Complete placenta completely covers the cervix, Partial previa covers part of the os while marginal or low-lying placenta is proximate to the margin of the internal but doesn't cover it.
- **Placental abruption** (or 'abruptio placenta'): Separation of the placenta from the uterus prior to delivery of the baby.
- **Uterine rupture**: The uterus splits apart following obstructed labor and part of the baby and/or placenta are expelled into the abdomen.
- **Lesions of vagina or cervix**
- **Cervical cancer**
- **Tears (or lacerations)** – may occur following rape or domestic violence
- **Infection**s –trichomoniasis, candidiasis, 53hlamydia. Infections should not cause large amounts of vaginal bleeding.

Management

- Admit and put patient on bedrest.
- Monitor the degree of bleeding.
- Place fetus on continuous fetal monitoring
- If patient and fetus stable, then send for ultrasound – estimate gestational age, presentation, amount of amniotic fluid present, placental location, retroplacental clot.
- VS q hour on patient.
- CBC, Group and crossmatch 2-3 units of blood.
- IV with large bore needle (RL or NS).
- No non-labor vaginal or rectal exams until previa is ruled out (no digital exam if confirmed previa). GENTLE sterile speculum exam to assess dilatation (may be a heavy bloody show). R/O cervical lesion, carcinoma

Placenta previa

Definitions: Placenta partially or completely covers internal os

- ***Diagnosis***
  - Sudden painless bleeding in the third trimester (first bleed is usually mild, self-limited; second bleed more ominous and unexpected).
  - Risk factors: multiparity, previous C/S, advancing age.
  - Confirm by ultrasound

- ***Management***
  - If previa is present and bleeding stops, there is no labor and fetus is stable, and <37wks then give antenatal steroids and expectantly management. If >37wks, proceed to C/S
  - If bleeding severe, patient in labor, or fetal distress present – perform immediate C/S. General anesthesia is preferred over spinal, to avoid hypotension.
  - CAUTION: placenta previa in patient with prior C/S has a high risk of placenta accreta. Be prepared for cesarean hysterectomy.

Abruptio placenta

Definitions: Separation of placenta from uterine wall prior to delivery of baby

- ***Predisposing factors***
  - Multiparity, preeclampsia/eclampsia, overdistended uterus, sudden loss of copious amniotic fluid.
  - HTN, renal disease, advanced age, malnutrition, diabetes, abdominal trauma, preterm PROM.
- ***Diagnosis***
  - May have external, or internal (concealed) hemorrhage.
  - Internal (concealed) hemorrhage may be more hazardous.
  - Pain can be severe if rapidly separating; mild if not.
  - Uterus is tender, firm and fails to relax. Backache or pelvic pain may be present if posterior abruption. Fundal height may rise.
  - Fetal distress/death.
  - Watch for anemia/DIC.
- ***Management***
  - Transfuse earlier than normal.
  - If near term, rupture membranes and closely monitor the fetus.
  - If no fetal distress and delivery anticipated in <6h, deliver vaginally even if oxytocin has to be used. Especially try to deliver vaginally if coagulation abnormalities are present.
  - If fetal heart tones absent, deliver vaginally if it can be done in <6h.
  - If fetal distress is present, do a C/S if mother's coagulation status permits.
  - If transfusion is necessary for DIC, consider fresh whole blood or fresh frozen plasma if available.

If placenta previa and abruption are excluded and patient is bleeding:

- *Admit for observation, bedrest.*
- *Check CBC, group and crossmatch.*
- *Do a speculum exam to check cervical dilatation and to evaluate for a cervical lesion or infection.*
- *The patient may be discharged when she has remained stable for several days with no bleeding and the following conditions are met:*
  - <37 week gestation.

- Estimated fetal weight <5# (2200 gm).
- Bleeding minimal and decreasing.
- Not in labor.
- Reassuring fetal heart tracings

Home care includes reduced activity and pelvic rest (no tampons, no intercourse

Cervical and vaginal lesions

- Cervical cancer cannot be treated while the woman is pregnant and will require careful discussion between the patient, her relatives and the medical team to form the best plan.
- Any vaginal or cervical tears should be sutured if they are still bleeding.
- If there is any offensive smelling discharge in the vagina, the woman should be treated for sexually transmitted infection.

Post Partum Hemorrhage

Definitions:
Postpartum hemorrhage (PPH): Blood loss >1000ml regardless of route of delivery or if hemodynamic instability
***Primary PPH*:** PPH within first 24 hours of delivery. Most common cause is uterine atony

Secondary PPH: after 24 hours of delivery. Most common cause is infection

Diagnose PPH if:

- Pad or cloth soaked in <5 minutes
- Constant trickling of blood
- Delivered outside hospital and still bleeding
- Accompanying 10% loss in hematocrit
- Associated hemodynamic instability

Major hemorrhage – blood loss > 1000ml. This carries a very high risk of maternal death.

Etiology (the 4Ts):

- Tone – uterine atony – the most common cause
- Tissue – retained placental tissue, membrane or clots inside the uterus
- Trauma – to uterus, cervix or vagina
- Thrombin – disseminated intravascular coagulation

Complications of PPH

- Maternal death, Hemorrhagic shock, hypoxic brain injury, renal failure

Prevention of PPH

- All women undergoing vaginal delivery should have active management of the third stage. They should receive Oxytocin 10 units IM as soon as the baby is delivered and the placenta should be delivered by controlled cord traction (CCT).
- Women undergoing cesarean section should receive dilute oxytocin 40IU in 1000 mL of normal saline, maximum 80IU in 24hrs.

Evaluation

- Palpate the fundus of the uterus. If soft or boggy, bleeding is likely due to uterine atony.
- If the fundus is firm, bleeding is likely due to genital trauma.
    - Inspect vulva and vagina for lacerations.
    - Inspect the cervix carefully using ring forceps (use adequate retraction and light)
    - Provide adequate analgesia during the exam.

Treatment

- Obtain help.
- Start large bore IV.
- Use bimanual uterine massage.
- Uterotonics
    - Oxytocin is 40u in 1L of NS IV
    - Methergine or Ergometrine 0.2mg IM q2-4 hours, maximum of 5 doses (**Contraindicated with hypertension**)
    - Hemabate (Carboprost) 250 mcg IM can be used q 15-90 minutes, maximum of 12 doses (Contraindicated with asthma; not available at Kijabe)
    - Misoprostol (Cytotec) Low grade fever is a common side effect
        - 2017 FIGO recommendation: 800mcg SL x 1
        - ACOG 2017 recommendation 600-1000mcg PO or PR x 1
    - Transexamic acid 1gm IV push over 20min, repeat 1hr, maximum 2 doses
- Repair episiotomy, vaginal or cervical tears, if present.
- Replace blood.
- If no tears found, perform postpartum uterine curettage.
- If bleeding continues, consider placing a tamponade balloon (Bakri balloon, if available) or either a Blakemore tube, or a #24 Foley catheter placed in a sterile condom/glove and secured, then inflated with 300-500 mL saline.
- If uncontrolled bleeding, consider laparotomy with B-lynch or O'Leary stitches or hypogastric artery ligation, or hysterectomy, if needed

Preterm Labor

Definition: Onset of regular contractions between 26-37wks gestation resulting in cervical dilatation and effacement

Assessment

- Document clear history, especially gestational age.
- Sterile Speculum examination—if no blood or liquor, then may perform digital examination.
- CST for fetal well being.
- Arrange investigations: Send to ultrasound suite when confirmed stable for transport. U/S – to confirm dates, presentation & liquor vol.,
- CBC with differential, urinalysis.
- Monitor fetal well being (CST) and labor progress every 4hrs
- HR, BP, temp q. 4 hours

Management

- Give Dexamethasone 6mg IM 12 hourly x4 doses
- Tocolysis must be discussed with consultant—typically it will be discontinued after 48 hours when all steroids have been administered.
    - MgSO4 4gm IV over 20 minutes, then 1-2 gm/hr infusion. Caution in patients with renal dysfunction.
        - Observe patellar reflexes at least hourly; if absent, decrease or discontinue infusion.
        - Observe respirations to make sure >12/min.
        - Monitor urine output; if <100 mL every 4 hrs, D/C MgSO4
    - Nifedipine 30mg PO loading dose then 10-20mg PO every 4-6hrs. Maximum dose 180mg/day. Observe for hypotension. Headache is a common side effect
    - Indomethacin 50mg PO loading dose then 25mg PO every 6hrs. Contraindicated if ulcerative disease, significant bleeding risk or >32wks gestation
    - Beta agonist (terbutaline, ritodrine, albuterol, salbutamol) can be used if available. No longer first-line treatment
- Consider progesterone if successful tocolysis, history of prior preterm delivery and acute phase over with Primulut 10mg IM weekly until 34 weeks
- If in active labor administer ampicillin 2gm IV loading dose followed by 1gm IV Q4hrs or Vancomycin if PCN allergy
- Inform pediatric team
- Inform parents of possible need of surfactant
- Patient must remain in hospital until contractions stopped for >48 hours or delivery.
- Magnesium sulphate is recommended for neonatal neuroprotection if ≤ 32 weeks gestation. 4gm IV loading dose then 1gm IV/hr infusion; ideally started 3-4hrs prior to delivery.
- *A cesarean section is generally inappropriate for babies with EFW <800g or gestation age <26wk. We have nearly a 100% mortality rate for babies delivered at this gestational age. In those situations discuss with the consultant whether intrapartum FHR monitoring should be offered. However, even with no FHR monitoring, a pediatrician should be present at delivery in the event that the child is born vigorous or larger than anticipated.*

Preterm Pre-labor Rupture of Membranes (PPROM)

Definition: *rupture of membranes prior to onset of labor in a preterm pregnancy 26-34 weeks*

- Incidence: ~3% of all pregnancies
- **Risk Factors**
  - Previous PPROM
  - Genital Tract Infection
  - APH
  - Cigarette smoking
- **Diagnosis:**
  - History: "gush of fluid"
  - PE: sterile speculum exam which reveals pooling of amniotic fluid in vagina and/or amniotic fluid draining from cervix (demonstrated with Valsalva, cough, or suprapubic palpation); NO Digital exam unless pt in labor.
  - Amniotic Fluid pH=~7.0; vaginal fluids pH=~4.0 ; Nitrazine paper turns blue
  - Amniotic Fluid which dries on a glass microscope slide shows a "fern pattern"
  - Ultrasound: 50-70% have reduced amniotic fluid index
- **Clinical Course:**
  - Time to delivery after PPROM: varies inversely with gestational age.
  - About 27% deliver within 48 hours; 56% within 7d; 76% within 14d
  - One-third of women develop serious infection
  - Placental abruption occurs in 2-5%; 8x higher risk of placental abruption in those with intrauterine infection or oligohydramnios.
  - Higher risk of cord prolapse
  - Early severe oligohydramnios associated with fetal malformations
- **Assessment**
  - Admit for observation and monitoring.
  - Document clear history, especially gestational age
  - Sterile speculum examination to look for pooling of liquor. NO digital vaginal exam unless patient in labor. Can collect fluid for ferning if not certain of diagnosis.
  - Arrange investigations: U/S – to confirm dates and amniotic fluid index
  - CBC with differential, CST, U/A (If patient does not labor, investigations must be repeated twice weekly).
- **Starting monitoring** for women not in active labor. FH and contractions every 1 hour if not contracting, vital signs (including P, BP, temp) q4 hours
- **Management**
  - Key question: *Expeditious Delivery or Expectant Management until 34 weeks*
  - Expeditious delivery (induction or CS) for the following indications:
    - Signs of intrauterine infection (initiate treatment and deliver)
    - Signs of placental abruption
    - Signs of cord prolapse
    - Nonreassuring fetal status
  - Antenatal Corticosteroids
    - Dexamethasone 6mg IM q 12 hr x4 doses or
    - Betamethasone 12mg q 24 hr x 2 doses

- Antibiotics:
    - Prolong latency; reduce the risk of early onset neonatal group B streptococcal (GBS) infection, and treatment of overt intraamniotic infection. .
    - Erythromycin 500 mg q 6 hr for 10/7 OR Azithromycin 1gram on day 0 and day 5 (targets genital mycoplasmas and Chlamydia trachomatis)
    - Ampicillin 2g IV bolus followed by Ampicillin 1g IV q 6 hr for 7/7 OR Ampicillin 2g IV q6h x 48h; then amoxicillin 500 TDS x 5d (targets GBS, aerobic gram negatives, and some anaerobes)
    - Penicillin allergy with high risk of anaphylaxis: clindamycin 900 mg IV every 8 hours or Vancomycin 1 g IV every 12 hours
- Patient must remain inpatient until delivery.
- If undelivered by 34-36 weeks (and no contraindication to vaginal delivery) – to induce labor. Management of PROM 34-36 weeks will be decided on an individual basis by the consultant.
- Pre-labour rupture of membranes >36 weeks should prompt induction of labour within 18 hours.
- With any evidence of infection (temp >38°C, maternal or fetal tachycardia) fetus should be delivered – mode and timing of delivery to be discussed with the attending physician
- Tocolysis in the setting of PPROM is to delay delivery for 48 hours to allow administration of corticosteroids and should not be administered for more than 48 hours, in advanced labor (>4 cm dilation) or when expectant management is contraindicated.
- NOTE: ***Inform the pediatrician of all neonates born following PPROM***

PROM at term

Definition: rupture prior to onset of labor in a term pregnancy with duration ≥18 hours

- Use antibiotics for GBS prophylaxis.
- Induction of Labor, not expectant management
- Antibiotic options
    - Ampicillin 2 g IV then 1 g every 4 hours until delivery
    - Penicillin allergy low risk of anaphylaxis:
      cefazolin 2 g IV then 1 g every 8 hours until delivery
    - Penicillin allergy high risk of anaphylaxis:
      clindamycin 900 mg IV every 8 hours until delivery
      or Vancomycin 1 g IV every 12 hours until delivery
- NOTE: ***Inform the pediatrician of all neonates born following PPROM or PROM***

GYNECOLOGY

CONTRACEPTION

CONTRACEPTION			
Method	**Duration of use**	**Contraindications**	**Side-effects**
Natural methods	Use until menopause	None	Difficult in women with irregular menses
Combined oral contraceptive or transdermal patch (found in Nairobi) Progestin only pills	Use until menopause	Thromboembolic disease, CVA, coronary artery disease, breast cancer, pregnancy, liver disease, caution in HTN, smoker >35, immobility, migraine with aura Risks associated with COC's do not apply.	Thromboembolic disease, HTN, hepatic adenoma, GB disease depression, headache, weight gain, nausea, fluid retention, breast tenderness, menstrual irregularities Irregular bleeding. More effective if taken at same time daily.
Depo-Provera	Maximum of 5yrs		Heavy or irregular bleeding, amenorrhea Osteroporosis
Progestin releasing impants	Implanon – 1rod/3yrs Jadelle - 2rod/5yrs Norplant-6rods/5yrs		Irregular bleeding
IUD	Mirena-progestin releasing-5yrs	Current PID, pregnancy, caution with previous ectopic pregnancy	Perforation, spotting and bleeding, amenorrhea

	Copper-T-10yrs		
Diaphragm	Use until menopause	Allergy to latex or spermicide, recurrent UTI, toxic shock syndrome, pelvic pain	Irritation, vaginal discharge, allergic reaction, pelvic discomfort, toxic shock syndrome
Spermicides and contraceptive sponge	Use until menopause	None	Irritation, allergic reaction
Male condom	Use until menopause	None	None

VAGINITIS

- Vulvovaginitis is a common outpatient gynecologic complaint. Vulvar hygiene is often key. Avoid douching, chemical products, and frequent washing, keep dry, use white cotton underwear,
- Symptoms include discharge, pruritus and odor.
- Physical examination and wet prep (with saline and KOH) usually give the diagnosis.
- Characteristics of vaginal discharges:

	Candidiasis	Trichomonas	Bacterial Vaginosis
Character	Thick, cheesy, white	Copious, thin, foamy, green/yellow	Watery, grey
Symptoms	Pruritus	Pruritus	Fishy odor
pH	4.5	5-7	5-6
Wet prep	Hyphae	Trichomonads	Clue cells
KOH prep	Positive for hyphae	Negative	Negative

Candidiasis

- Commonly seen in association with pregnancy, antibiotic usage, diabetes and HIV infection.
  - On exam, there is usually erythema with white patches on the vaginal wall.
  - "Yeast infections" are a very common complaint.- examine! Vulvar hygeine.
  - Antifungal vaginal suppositories or cream (nystatin, clotrimazole, miconazole, butoconazole or terconazole).
  - Fluconazole 150mg PO as a single dose may be used, not preferred in pregnancy; For complicated infections use oral and topical. If recurrent infection, fluconazole 150mg PO q72hr x 2, then weekly for 6 months.

Trichomoniasis

- Sexually transmitted, can be asymptomatic for years.
- Symptoms range from asymptomatic to acute inflammatory disease.
- Treatment
  - Metronidazole 2gm PO x 1 dose or 500mg PO bid x7d. Contraindicated in 1st trimester but otherwise safe in pregnancy.
  - Tinidazole 2gm PO x 1 (50mg/kg once). Do not use in pregnancy and lactation.
  - Treat the sexual partner(s), avoid intercourse until 7 days after both partners' treatments are completed. There are often concurrent STI's.

Bacterial vaginosis (*Gardnerella vaginalis*)

- Diagnosis is suspected on wet prep with the finding of "clue cells".
- Untreated disease can progress to cause premature labor, postpartum endometritis, postabortal infection, and post-hysterectomy cuff cellulitis.
- Treatment
  - Metronidazole 500 mg PO bid x7d or metronidazole vaginal cream 5 gm bid x 5d.

- Clindamycin 300 mg PO bid x 7d or clindamycin vaginal cream 5gm qd x7d may be used in pregnancy.

Atrophic vaginitis

- Thin watery discharge or dryness +/- spotting.
- Seen in postmenopausal women.
- Exam shows dryness and thinning of the vaginal mucosa.
- Treatment
  - Topical estrogen cream using a low dose regimen such as 0.5gm conjugated estrogen vaginal cream daily for 3 weeks and then twice a week thereafter.

Pelvic Inflammatory Disease

Definition: Ascending usually sexually transmitted infection from the cervix into the upper genital tract.

Etiology: common organisms are Chlamydia trachomatis, N. Gonorrhoea, mycoplasma hominis, anaerobes

Risk Factors*:* multiple sexual partners, IUCD use, high risk sexual practices, gynecological procedures (e.g. HSG, endometrial biopsy, MVA/D&C)

Presentation: pelvic pain, dyspareunia, dysuria, mucopurulent PV discharge, irregular bleeding, cervical motion or adnexal tenderness

Assessment*:* Antibiotics must never be given simply on a history of PV discharge—a speculum examination must *always* be carried out to evaluate for the possibility of malignancy (cancer of the cervix and endometrium may also create PV discharge) or candida (which will be made worse by antibiotic therapy).

Management: The woman and her sexual partner must be treated simultaneously and advised to avoid intercourse until they both completed treatment.

- **Outpatient management**—for patients that are stable
    - Ceftriaxone 250mg IM stat
    - Doxycycline 100mg BD for 14/7
    - Metronidazole 500mg BD for 14/7
- **Inpatient management**—for patients with pregnancy, hemodynamic instability, fever, severe pain, signs of tubo-ovarian abscess
    - Rapid IV fluids (2 L in 1st hour, then titrate to maintain P<110 and BP>80/40)
    - Clindamycin 900 mg IV TDS with Gentamycin 1.5mg/kg IV TDS
    - Or Cefotaxime 1gm IV TDS with Doxycyline 100mg po q 12 hrs
    - Add Metronidazole 400 mg or 500mg IV q 8 hrs (Oral preferred unless not tolerated)
- Other management guidelines
    - Remove the IUCD and treat
    - Screen and treat sexual partners

Complications

- Tubal-infertility—10-12% after 1 episode, 20-30% after 2 episodes, 50-60% after ≥3 episodes
- Ectopic pregnancy—risk increased 6-10x
- Chronic pelvic pain—18%
- Recurrent infection—30%
- Perihepatitis (Fitz-Hugh-Curtis syndrome) - 5-15%

INFERTILITY

Definition: Inability to conceive despite one year of unprotected intercourse for females under the age of 35 or 6 months if over the age of 35.

- Prevalence - approximately 13% of all married women will not conceive within 12 months of unprotected intercourse.
- Spectrum and frequency of abnormalities found in one study:
  - Male factor
  - Ovulatory dysfunction
  - Tubal factor (most common)
  - Endometriosis
  - Coital factor
  - Cervical factor
  - Unexplained infertility – 28%
- **Female evaluation**
  - History - fertility, overall health status, menstrual history, sexual history, gynecologic history, drugs and medications.
  - Physical examination including pelvic exam.
  - Ovulation detection
    - History of regular menstruation is highly suggestive of ovulation. Cycles <24 days or >35 days suggest ovulatory dysfunction.
    - Ovulation symptoms - mittelschmerz, premenstrual syndrome.
    - Basal body temperature (BBT) - should see a 0.5 - 1°F. rise in temperature with ovulation. There should be 11 or more days between the temperature rise and onset of menses with a normal luteal phase.
    - Ovulation detection kit
    - If serum progesterone is available, a level of > 5 ng/ml during the luteal phase (day 21 of cycle) confirms ovulation.
  - Ovarian reserve
    - Day 3 FSH (nl <10) and estradiol to assess ovarian reserve if > 35 (nl >80).
    - antral follicle count, anti-mullerian factor
  - Patency of the female reproductive tract
    - Hysterosalpingography demonstrates abnormalities within the uterus and tubes. If available, it should be performed between the cessation of menses and ovulation.
  - Laparoscopy or laparotomy is done when tubal or intraperitoneal pathology is suspected.
  - Tests of limited clinical value.
    - Postcoital test - poor diagnostic potential and predictive value.
    - Endometrial biopsy - invasive, uncomfortable, expensive, unnecessary for the evaluation of ovulation, and ineffective for the evaluation of endometrial receptivity.
- **Male evaluation**
  - Semen analysis
    - Obtain semen following 2-3 days of abstinence.
    - Analysis should be performed within 1 hour of obtaining the specimen.

- New normal WHO values
  - Sperm concentration > 15 million/mL
  - Volume 1.5mL
  - Total sperm number >39 million
    - 58% vitality
    - 4% normal strict morphology
  - Total progressive motility >40%
- If semen analysis is abnormal, repeat in 4-6 weeks and refer to a urologist or treat as below if abnormal.

- **Management**
  - Anovulation
    - Clomiphene citrate (Clomid) 50mg PO daily days 5-9 of the cycle. Ovulation should occur 3-10 days after the last tablet is taken. May increase the dose by 50 mg increments each cycle to a maximum of 150 mg. Intercourse on alternate days beginning 3 days after the last tablet, until ovulation has occurred (BBT rise, mid-luteal progesterone levels). Most pregnancies will occur within six ovulatory cycles.
    - Other options: letrozole 2.5mg PO daily days 3-7 of the cycle. Increase by 2.5mg every cycle until maximum dose 7.5mg.
  - Damaged fallopian tubes
    - Surgical repair
    - In vitro fertilization, if available.
    - Watch for increased risk of ectopic pregnancy after tubal repair.
  - Endometriosis - surgical therapy (medical therapy not effective for increasing pregnancy rates)
  - Male infertility (low sperm counts, abnormal postcoital tests) - artificial insemination, if available. May treat oligospermia with Ciprofloxacin 500mg PO x 1 and Doxycycline 100mg PO BID x 14 days to empirically treat for an infectious etiology.

ABNORMAL UTERINE BLEEDING

Definition: Abnormal volume, duration, frequency or unpredictability of menstrual cycle for at least 3 months.

Normal menstruation

- Normal volume of blood loss: 20-80 mL (average 30 mL).
- Normal interval between cycles: 28-30 days (range 21 - 35 days).
- Duration of flow: 3-5 days (range 2-7days).

Abnormal menstruation

- FIGO (The International Federation of Gynecology and Obstetrics) classifies abnormal uterine bleeding using PALM-COEIN. Each is denoted AUB-O, for example.
- PALM refers to structural entities seen on imaging
    - **P**olyp- endometrial or endocervical
    - **A**denomyosis
    - **L**eiomyoma- submucosal or other
    - **M**alignancy and hyperplasia

- COEIN includes nonstructural entities
    - **C**oagulopathy - von Willebrand's disease, platelet disorders, factor deficiencies
    - **O**vulatory dysfunction- physiologic (perimenarcheal, perimenopausal anovulation), hypothalamic (stress, exercise, weight loss), hyperprolactinemia, premature ovarian failure, androgen excess (PCOS or late-onset 21-hydroxylase def), thyroid dysfunction, chronic anovulation causing endometrial hyperplasia or cancer
    - **E**ndometrium- essential menorrhagia or hypo/hyperthyroidism
    - **I**atrogenic- steroid contraceptives, IUD, anticoagulants, chemotherapy
    - **N**ot yet classified- AV malformations

Evaluation

- Careful history and physical examination, including pelvic examination.
- RULE OUT PREGNANCY!

- Possible testing
    - CBC, platelet count with heavy bleeding.
    - PT, PTT, factor VIII, von Willebrand's factor-heavy bleeding especially in adolescents.
    - ALWAYS check urine pregnancy test if premenopausal
    - Prolactin, TSH and FSH if amenorrheic.
    - GC and Chlamydia cultures if cervicitis, purulent discharge or pelvic tenderness.
    - Cervical cytology or biopsy
    - Transvaginal ultrasound to measure endometrial stripe if peri/postmenopausal. Can avoid endometrial biopsy if <5mm as this is normal and rarely associated with cancer.
    - Endometrial biopsy or D&C in women >35 or younger women with a history of anovulation.

CAUSES OF UTERINE BLEEDING

AGE GROUP	**ETIOLOGY**	**TREATMENT**
Peri-menarcheal	Anovulatory R/O pregnancy	COCs* for several cycles Provera 5-10mg/d x 10d/month (start on day 16 or 21 after LMP)
Reproductive	Ovulatory : Mid cycle bleeding Short cycles	Premarin 1.25 mg/d from 3d before to 2d after ovulation or COCs* Clomiphene or COCs*
	Anovulatory: >35 years old	
		Endometrial biopsy
	Pregnancy desired	Clomiphene
	Pregnancy not desired	Provera 5-10 mg/d x 10d/month or COCs*
	Menorrhagia or intermenstrual bleeding	R/O anatomic abnormalities COCs*
Peri-menopausal	Anovulatory	Provera 5-10mg/d x 10d/month (start on day 16 or 21 after LMP)
Postmenopausal	Atrophic changes in vagina	Estrogen cream
	Endometrial hyperplasia if no atypia	Provera 5-10mg/d x 14d/month Mirena IUCD

* Ensure no contraindications to COCs (hypertension, hypercoagulable state)

MENOPAUSE

Definition: Cessation of spontaneous menstruation for 1yr without other obvious cause; premature if age <40

- **Symptoms**
  - Menstrual irregularities leading to complete cessation of menses.
  - Vasomotor instability (may precede menopause by months to years) - hot flashes, night sweats.
  - GU atrophy (usually late after cessation of menses) - vaginal dryness, pruritus, irritation, dyspareunia.
  - Emotional symptoms - depression, lability, irritability, insomnia.
  - Cardiovascular disease (increased LDL, decreased HDL).
  - Osteoporosis - 50% bone loss in the first 7 years.
  - Other- joint pain, difficulty concentrating, memory loss, difficulty sleeping.
- **Diagnosis**
  - History of 12 months of amenorrhea without other demonstrable cause after age 40.
  - Normal physical exam, including pelvic exam.
  - Negative pregnancy test.
  - FSH levels are unnecessary in this group.
- **Hormone Replacement Therapy**
  - Recommendations regarding hormone replacement therapy have changed recently due to further evaluation of the WHI and HERS trials and USPSTF meta analysis.
    - Patients with premature ovarian failure or who are post hysterectomy and bilateral oophorectomy should continue on estrogen until age 50.
    - Hormone replacement therapy after age 50 should ideally be short term (2-3 years) for women who have clear indications for therapy. The lowest effective dose should be used. When started within 10 yrs of menopause or < age 60, estrogen only therapy decreases risk of CAD and breast cancer. Estrogen-progestin has an equivocal effect on CAD, may prevent if >3-5yrs, with a modest increase in breast cancer similar to mod alcohol consumption and longterm increase risk in death from breast cancer. Transdermal estrogen has a safer VTE risk profile than oral systemic estrogen. Progesterone should be added to estrogen in women who have an intact uterus.
  - Women with a history of breast cancer, coronary heart disease, previous stroke, venous thromboembolic event, or have high risk of these conditions are not candidates for postmenopausal hormone therapy.
  - Indications for postmenopausal hormone therapy:
    - Symptomatic hot flashes
    - Genitourinary atrophy
  - Postmenopausal hormone therapy is no longer indicated for prevention of coronary heart disease or osteoporosis.
  - Dosage equivalents
    - Estrogen - available as pill, transdermal, ring, spray, cream, gel
      - 0.625 mg conjugated estrogen
      - 1 mg. micronized estrogen

        - 0.05 mg transdermal 17β estradiol
    - Progesterone - pill, transdermal, vaginal, cream, IUD
        - Medroxyprogesterone acetate 2.5mg- most available, cheapest, more side effects
        - Norethindrone (acetate)
        - Bioidentical hormones - there is no evidence for its safety, efficacy or effectiveness
- Treatment regimens
    - Intact uterus (use lowest possible dose)
        - Cyclic - continuous estrogen with progestin 10 days of the cycle- often get withdrawal bleeding.
        - Continuous - both estrogen and smaller dose progesterone - usually amenorrhea.
    - Absent uterus - unopposed estrogen (use lowest possible dose)
- Special considerations
    - GU atrophy- vaginal creams are absorbed systemically, especially with early vaginal atrophy. Have the patient use 0.5mg conjugated estrogen cream (1/8 applicator) daily for 3 weeks, and then twice a week as needed.
    - Alternatively, if available, the Estring delivers a small daily dose of estrogen to the vagina (6-9 mcg) for 3 months at a time with less systemic absorption.

Pap Recommendations

Recommendations discussed are for resource-developed countries. At Kijabe, we have resources for affordable Pap and reliable pathology team. HPV co-testing is currently only available as a send out lab and is not cost-effective. (When it becomes more affordable, the below recommendations will change)

- Initiate at 21yrs, regardless of age of initiation of sexual activity, even if she has reported abstinence
- Pap every 3yrs
- Discontinue after age 65yrs
    - Continue longer if patient has risk factors (h/o CIN 2 or greater, immunocompromised with life span >10yrs.
    - Perform pap if patient with inadequate prior screening or never been screened
    - May discontinue screening if TAH done for benign indications (fibroids, AUB, PPH) and no risk factors (h/o CIN). If subtotal hysterectomy done, continue screening recommendations
- Special populations
    - Immunocompromised women (HIV or on immunosuppression)
        - Initiate at age 21
        - Annual pap
    - TAH done with h/o CIN 2, 3
        - Continue vaginal cytology q3yrs until 20yrs after TAH
    - TAH in women with HIV
        - If TAH done for benign indications, may discontinue screening
        - If h/o CIN 2, 3 then continue vaginal cytology annually until 20yrs after TAH

INTERPRETATION/RESULT with RECOMMENDED FOLLOW-UP in red**.**

Bethesda classification of cytology (JAMA 2002; 287:2114)

- Specimen type – conventional, liquid based or other
- Specimen adequacy
    - Satisfactory – endocervical/transformation zone visualized
    - Unsatisfactory – specify reason (obscuring blood, inflammation, no TZ, etc)
- General categorization/Interpretation/Result
    - NILM – if no risk factors, repeat pap in 3yrs
    - Other non-neoplastic findings (Infection, reactive cellular changes, glandular cells, atrophy, etc)
    - Epithelial cell abnormality
        - Squamous cell intraepithelial lesion
            - Atypical squamous cells (ASC)

        - Of undetermined significance (ASC-US)
            - If HR-HPV positive then colposcopy/biopsy
            - If HR-HPV negative then repeat pap in 3yrs
            - If unable to test HPV then repeat pap in 6mos
        - Cannot exclude high grade (HSIL, ASC-H) – colposcopy/biopsy
    - Low-grade (LSIL)
        - Risk of progression to invasive cervical cancer is <5%
            - If HR-HPV positive then colposcopy/biopsy
            - If HR-HPV negative then repeat pap in 1yr
            - If unable to test HPV then colposcopy/biopsy
    - HSIL moderate/severe dysplasia – CIN 2, 3, CIS
        - Indicate if there are features suspicious for invasion
            - Colposcopy/biopsy or diagnostic LEEP
    - Squamous cell carcinoma
            - Diagnostic biopsy
- Glandular cell – All following would recommend cervical and endometrial biopsy
    - Atypical
        - Endocervical cells
        - Endometrial cells
        - Not otherwise specified
    - Atypical, favor neoplastic
        - Endocervical cells
        - Not otherwise specified
    - Endocervical adenocarcinoma in situ (AIS)
    - Adenocarcinoma

Cervical Cancer Staging

Stage	Tumor criteria
I	Confined to cervix/uterus
IA	Diagnosed only by microscopy
IA1	Stromal invasion depth < 3.0mm Horizontal spread < 7.0mm
IA2	Stromal invasion depth 3.0 – 5.0mm Horizontal spread < 7.0mm
IB	Clinically visible lesion
IB1	Clinically visible lesion < 4.0cm
IB2	Clinically visible lesion > 4.0cm
II	Tumor invading beyond uterus, but not to pelvic wall or lower 1/3 of vagina
IIA	Without parametrial invasion
IIA1	Clinically visible lesion < 4.0cm
IIA2	Clinically visible lesion > 4.0cm
IIB	With parametrial involvement
III	Tumor extending to pelvic sidewall, lower 1/3 of vagina, and/or causing hydronephrosis
IIIA	Involves lower 1/3 of vagina but not pelvic sidewall
IIIB	Extends to pelvic sidewall and/or hydronephrosis
IV	Tumor invades bladder, rectum or extends beyond true pelvis

- Biopsy any suspicious lesion
- Assess tumor size, vaginal and parametrial involvement
- CT or MRI (preferred) to exclude obvious LN or distant metastasis
- Recommendations:
    - Modified radical hysterectomy for tumors IA2-IB1 (ACOG recommendations)
        - GYN ONCOLOGIST @ Kijabe currently will perform radical hyst for patients up to stage IIA.
        - Prior to scheduling surgery
            - MRI of abdomen/pelvis to assess for parametrial invasion
            - Medical clearance – CBC, creatinine, GXM, (EKG if indicated)
    - Chemoradiation if > Stage IIA
        - Call palliative team for referral to KNH or Texas Cancer Center

Endometrial hyperplasia

Definition: proliferation of endometrial glands, includes non-neoplastic entities (disordered proliferation, simple and complex hyperplasia without atypia) and precancerous neoplasms (atypical complex hyperplasia)

- **Risk factors**
  - Obesity
  - Chronic anovulation (PCOS)
  - Increased genetic risk (Lynch syndrome)
  - Unopposed estrogen use
- **Indications for endometrial biopsy**
  - Postmenopausal – ANY uterine bleeding regardless of volume (includes spotting/staining)
  - Age 45 yrs to menopause – any bleeding that is frequent (<21days between episodes), heavy or prolonged (>5days)
  - Younger than 45 yrs – any abnormal uterine bleeding in women with BMI >30; in non-obese women, any AUB that is persistant or associated with chronic anovulation, unopposed estrogen use, Lynch syndrome
  - Pap results with AGC (atypical glandular cells)
- **Treatment**
  - Cessation of any source of unopposed estrogen (HRT, correcting ovulatory dysfunction, weight loss, removing estrogen-producing tumor)
  - Progestin agent
    - Provera 5-10mg po OD for 5-10days/month (10mg x 10days is most common)
    - Depo-Provera 150mg IM every 3 months
    - Levonorgestrel (Mirena) IUCD **now considered first line treatment**
  - Total hysterectomy – definitive treatment, but consider fertility and surgical risks; treatment of choice for endometrial hyperplasia with atypia
- **Follow-up**
  - Endometrial biopsy every 3-6months for 1yr
    - Biopsy can be performed with IUCD in place
    - If persistent pathology after 12 months of therapy, consider surgical intervention
  - Therapy should be continued until normal biopsy AND:
    - Fertility desired
    - Inciting risk factor is no longer present
    - If postmenopausal and risk factors unable to be removed, consider treatment indefinitely

Uterine Cancer Staging

Stage	Tumor criteria
I	Confined to uterus
IA	Tumor limited to endometrium or invades < ½ myometrium
IB	Tumor invades > ½ myometrium
II	Invades cervix but does not extend beyond uterus
IIIA	Invades uterine serosa and/or adnexa
IIIB	Vaginal or parametrial involvement
IVA	Invades bladder or bowel

- Surgical resection with TAH/BSO +/- pelvic and paraortic LN sampling is treatment of choice even with advanced tumors
- Post surgical treatment and surveillance depends on pathology

Ovarian, Fallopian tube and primary peritoneal cancer staging

Stage	Tumor criteria
I	Confined ovaries or fallopian tube
IA	Tumor limited to one ovary or tube with capsule intact, no ascites
IB	Limited to one or both ovaries/tubes with capsule intact, no ascites
IC	Limited to one or both ovaries/tubes
IC1	Surgical spill
IC2	Capsule ruptured before surgery
IC3	Malignant cells in ascites
II	Tumor with pelvic extension below pelvic brim
IIA	Extension and/or implants on the uterus, ovaries or tubes
IIB	Extension or implants on other pelvic tissues
III	Microscopically confirmed metastasis outside of pelvis and/or to lymph nodes
IIIA2	Microscopic extrapelvic metastasis +/- LN involvement
IIIB	Macroscopic metastasis beyond pelvis <2cm in size +/- LN involvement
IIIC	Macroscopic metastasis beyond pelvis >2cm in size +/- LN involvement Extension to capsule of liver/spleen
IV	Metastasis involving liver/spleen parenchyma, lungs, brain

- Surgical resection with TAH/BSO +/- pelvic and paraortic LN sampling is treatment of choice even with advanced tumors
- Post surgical treatment and surveillance depends on pathology

Pre-op OB/GYN Admissions

- Elective preoperative work up begins at the outpatient clinic. Its is the responsibility of the medical intern, resident and attending to ensure that patients are fully fit for surgery before they are booked for elective surgery. This may require consulting other disciplines.
- All patients admitted for elective surgery must be evaluated by the intern on the OB/Gyn service (before 5pm) or by the intern on-call (after 5pm). Ensure that outpatient notes are available and carefully read them to look for any additional instructions from the booking consultant.
- Pre-op work up begins in the Gyn Outpatient clinic. Patients should be scheduled after they have been cleared of medical complications including anemia, Diabetes, Hypertension, Thyroid disease, Evaluation for cervical dysplasia, and Pregnancy
- **Document:**
    - Planned operation (including indication).
    - Confirmation that symptoms have not changed.
    - Past medical and history, including drug history
    - Examination: cardiovascular, endocrine, respiratory and abdomen
- **Investigations required for *all* patients:**
    - CBC, HIV spot, pregnancy test (PDT unless admitted for C/S or had previous hysterectomy)
    - GXM 2 units (minimum) for major operations: e.g. exploratory laparotomy, hysterectomy, myomectomy
- **Critical evaluation of suitability for surgery:**
    - If the patient's symptoms have changed or they have had another illness since reviews in clinic consider: *Is the operation still appropriate?*
    - Have any of your examinations or investigations raised questions about suitability for surgery? (e.g. hypertension, anaemia, HIV +ve, pregnancy test +ve)
    - Are other investigations necessary? e.g.
        - Hypertension or heart disease—ECG/renal function
        - Dysuria/urgency—U/A
        - **Imaging studies**
            - Cough or chest crepitations—CXR
            - US, CT Scan, and/or MRI used in the evaluation at the special clinic.
            - Pre-op CXR for patients >60 and those with suspected cardiac or pulmonary disease.
- **Medical consultation/clearance**
    - In patients with a medical condition and has been recently unstable. E.g. Diabetes mellitus &hypertension disease. Such must be multidisciplinary with input from anesthesiologists/critical care, ICU/HDU physicians etc
    - If there are concerns regarding suitability for surgery, document them in the notes and inform the nursing staff.
- **Informed Consent**
    - Must be signed by the admitting clinician
    - Ensure patient understands the operation (including risks) and that a consent form has been completed.
    - Very crucial with the increased number of litigations preferably done by the admitting/resident surgeon during scheduling & only countersign if 2wks elapse
    - A thorough and well-documented consent form helps to ensure that the patient's expectations for her surgery, recovery, and final outcome are realistic and appropriate.

- The informed consent discussion should include: the indications for surgery, expected benefits of the procedure, alternatives, expected course of the problem without therapy, possible complications, possible need for consultation with other surgical specialists.
- Consider drawing a diagram showing the relationship of the ureters, bladder, and bowel to the uterus and adnexae, and include this in the records.
- Mention injury to the bladder and ureter, and the potential for fistula formation or reoperation. Also discuss injury to the bowel and the rare need for colostomy, prolonged catheterization, and unanticipated removal of organs.
- Complications can also develop postoperatively, such as delayed hemorrhage, infection, breakdown of a repair, and bowel obstruction from adhesions.
- Review the possibility of unexpected findings at surgery and intraoperative modifications of the procedure. Consider adding at the end of the procedure "... and any unanticipated or indicated procedures required, in the judgment of the surgeon."

- **Other Considerations**
  - **Correct anemia**
    - GnRH analogue Lupron if available.
    - Autologous blood donation if Hb level >14gm/dl
    - Intraoperative blood salvage if available
  - **Bowel preparation**
    - It improves visualization in laparoscopic cases
  - **Thromboembolic disease: patients receive prophylaxis based on risk as either** low, moderate, high, and highest risk categories*(see admission guidelines).
  - **Diabetes mellitus: better control to address** wound healing and infection after surgery. Once controlled measure blood glucose q 1h during surgery and for several hours postoperatively using a sliding scale
  - **Hypertension: elective surgery** postponed in patients with blood pressures above 170/110 mmHg. Urgent surgery should be treated with a parenteral drug acutely in consultation with anesthetic and medical teams.
- **Preventing Surgical Site Infection**
  - Antibiotic prophylaxis is recommended prior to:
    - Hysterectomy (any route)
    - Hysterosalpingogram/Chromopertubation
    - D&C
  - Choices: Cephalosporins (Cefazolin 1-2 g, Cefoxitin 1-2g, Cefotetan 1-2g) 30 minutes prior to the incision. Consider prescribing on the treatment sheet and instruct the nurse to administer when the patient leaves for OR.
  - Repeated if the procedure extends beyond three hours or if blood loss is greater than 1500 mls
  - In cases of anaphylaxis options include Clindamycin or Vancomycin

Drugs in OB/Gyn

Before any drug is prescribed the possible effect on pregnancy and lactation must be evaluated. ***If in doubt, check!*** *Here are comments on a few common drugs.*

Drug	**Comments**
<u>Analgesics</u>	
Codeine	You may use opiates in pregnancy and breastfeeding, but if used in labor watch the neonate for respiratory depression. When used after a general anesthetic, morphine should be scheduled q 4 hours.
Morphine	
*NSAIDs**	**NSAIDs* may cause oligohydramnios and premature closure of ductus arteriosus if used antenatally.
Paracetamol	
Pethidine	
<u>Antibiotics</u>	
Amoxycillin	
Ampicillin	
Cefazolin	
Ceftriaxone	
*Ciprofloxacin**	**Ciprofloxacin*—fetal arthropathy
*Cloxacillin**	**Cloxacillin*–expressed in breast milk
*Doxycycline**	**Doxycycline* and other tetracyclines—fetal bone and dental anomalies.
*Erythromycin**	**Erythromycin*—can treat Chlamydia in pregnancy
*Gentamycin**	**Gentamycin*—nephrotoxic if used for a long time or in a patient with renal compromise.
*Metronidazole**	**Metronidazole*—safe in pregnancy, may give bad taste to breast milk.
Nitrofurantoin	
Penicillins	
*Tetracycline**	**Trimethoprim*—avoid in first trimester (folate antagonist, theoretical risk of neural tube defect)
*Trimethoprim**	

Drug	Comments
Anticoagulants	Choice of anticoagulation is difficult in our context.
Heparin	
*Warfarin**	**Warfarin* is highly teratogenic and must not be used in the first trimester. It requires INR monitoring and has risks of maternal and fetal hemorrhage. Heparin requires self-injection, safe disposal of sharps, and risks osteoporosis and thrombocytopenia.
Enoxaparin	Enoxaparin is the preferred anticoagulant in pregnancy, requires self-injection and safe disposal of sharps. It is very costly.
Anticonvulsants	$MgSO_4$ is the anticonvulsant of choice.
*Diazepam**	**Diazepam* should only be used if $MgSO_4$ not available (high risk of respira
$MgSO_4$	anticonvulsants are associated with neural tube defects and require suppl folic acid if used for epilepsy.
Phenytoin	
Sodium Valproate	
Antiemetics	These are safe in pregnancy. Should be used regularly (i.e. scheduled) when used for hyperemesis gravidarum.
Metaclopramide	
Promethazine	
Ondansetron	
Antifungals	May be used in pregnancy.
Clotrimazole	
Fluconazole	

Drug	Comments
Antihypertensives	
*ACE inhibitors**	**ACE inhibitors, Beta-blockers and diuretics* are avoided in pregnancy and the puerpurium except in specific situations.
*Beta-blockers**	
*Diuretics**	**IV hydralazine* is used for management of acute hypertension, it must be given frequently due to the short half-life.
*Hydralazine**	Labetalol is the antihypertensive of choice in pregnancy, but PO form often not available in our hospital.
Labetalol	
*Methyldopa**	**Methyldopa* is not useful in the acute situation, and should generally be changed to something more effective post-natally.
*Nifedipine**	**Nifedipine* must be used carefully to avoid hypotension and fetal compromise.
Antimalarials	
Artesunate	Artesunate is preferred for treatment of severe malaria.
Coartem	Coartem is preferred for treatment of uncomplicated malaria.
Fansidar	Fansidar is used for intermittent preventive therapy in endemic areas.
Quinine	Quinine may be necessary in complicated malaria.
Steroids	Multiple courses of steroids are associated with developmental delay.
Dexamethasone	
Hydrocortisone	
Tocolytics	
$MgSO_4$	
Nifedipine	
Indomethicin	
*Salbutamol**	Oral and inhaled B-agonists (**salbutamol/terbutaline* etc…) are ineffective for tocolysis (though they are safe for treatment of asthma), they must be used IV for tocolysis.
*Terbutaline**	
Uterotonics/PPH	
*Ergometrine**	**Ergometrine* must not be used in hypertensive patients.
Oxytocin	

Drug	Comments
*Misoprostol**	**Misoprostol*—IOL of live babies at term 25mcg is max. dose, higher doses are needed for fetal demise, pre-term IOL and control of hemorrhage—see specific guidelines for dose.
Transexamic Acid	
Vitamins/Minerals	
Ferrous sulfate	Folic acid should be used in the first trimester for prevention of neural tube defects. It can be used in combination with FeSO4 to treat anemia.
Folic Acid	
*Vit A**	**Vit A* is teratogenic.
Vit B	Vit B should be given in hyperemesis gravidarum.
Vit K	Vit K is given to the neonate to prevent hemorrhagic disease of the newborn.

Approved Acronyms

In general acronyms and abbreviations are discouraged as they can easily confuse communication, especially in a multi-cultural context such as Kijabe where health care workers have been trained in several different countries. Please do not use 'o' to refer to a negative result—write 'no' or 'neg'. The following are approved for use in clinical notes:

ABD—Assisted breech delivery

APH—Antepartum hemorrhage

ARM (AROM)—artificial rupture of membranes

AXR/CXR—abdominal x-ray / chest x-ray

BP—blood pressure

BSO (LSO/RSO)—bilateral salpingo-oophorectomy (left/right)

BTL—bilateral tubal ligation

CBC—complete blood count

C/O—Chief complaint of (Complains of)

C/S—Cesarean section

CST—contraction stress test

CTG—cardiotocograph

CVA—cerebral vascular accident

D&C—dilation and curettage

DIC—disseminated intravascular coagulation

ECV—External cephalic version

EDD—estimated date of delivery

FHR—fetal heart rate

G_P_ — Gravida _ Para _

Gyn—gynecology

GDM—gestational diabetes mellitus

GTN/GTD —Gestational trophobastic neoplasia/disease

GXM—Group and cross match

HTN—Hypertension

IMB—Intermenstrual Bleeding

Inc:Cl/D/I—Incision: Clean, Dry, and Intact

I&D— incision and drainage

IOL—induction of labor

IUCD—Intrauterine contraceptive device

IUFD–Intrauterine fetal Demise (Death)

IUGR—Intrauterine Growth Restriction

IV—intravenous

LAP—lower abdominal pain

LTCS—Low (uterine) Transverse Cesarean section

LMP—last menstrual period

$MgSO_4$—Magnesium Sulphate

NSAID—non-steroidal anti-inflammatory drug

NST—non-stress test

OA/OP/OT—occiput anterior/posterior/transverse

OB—opened bowels

Obs—obstetrics

OE—on examination

P—pulse

PA/PR/PV—per abdomen/rectum/vagina

PC—Presenting Complaint

PCB—post-coital bleeding

PDT—pregnancy detection test

PID—pelvic inflammatory disease

PIH—Pregnancy induced hypertension

PMB—post-menopausal bleeding

PMCT—prevention of maternal to child transmission (of HIV)

PPD—post-partum day ___

PPH—post-partum hemorrhage

POC—products of conception

POD—post-op day ____

ROM—rupture of membranes (PROM—prelabor ROM, PPROM—pre-labour, premature ROM, SROM—spontaneous ROM)

RPOC - retained products of conception

RR - respiratory rate

RVF - recto-vaginal fistula

SQ - sub-cutaneous

SL - sub lingual

SOB—shortness of breath

SVD—spontaneous vaginal delivery

TAH—total abdominal hysterectomy

TOA—tubo-ovarian abscess

TVH—total vaginal hysterectomy

U/A—urine analysis

U/O—urine output

USS—ultrasound scan

UTI—urinary tract infection

VBAC—vaginal birth after caesarean section

VE - vaginal exam

V/S - vital signs (P, BP, temp)

VSSAF—vital signs stable, afebrile

VVF—vesicovaginal fistula

Vx—vertex