The Safe Motherhood Initiative (SMI)

Guidelines for Antenatal Care and the Management of Obstetric Emergencies and Prevention of Mother To Child Transmission of HIV

First Published in 1994

Revised 2016

Ministry of Health - UNICEF - WHO - UNFPA

Botswana

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ABBREVIATIONS

ANC	-Antenatal clinic/care
APH	-Ante partum haemorrhage
ARM	-Artificial Rupture of Membranes
ARV	-Antiretroviral
BBT	-Basal Body Temperature
BOH	-Bad Obstetric History
BP	-Blood pressure
CPD	-Cephalo pelvic Disproportion
C/S	-Caesarean section
D&C	-Dilatation and curettage
DIC	-Disseminated Intra vascular coagulopathy
DVT	-Deep Venous Thrombosis
ECS	-Elective Caesarean Section
EFW	-Estimated Foetal Weight
E/S	-Endocervical Swab
ESR	-Erythrocytes Sedimentation Rate
EUA	-Examination under Anaesthesia
FP	-Family Planning
FSB	-Fresh Stillbirth
GIT	-Gastro Intestinal Tract
HDP	-Hypertensive Disorders of Pregnancy
HIV	-Human-Immunodeficiency Virus
HVS	-High Vaginal Swab
ICT	-Indirect Coombs Test
IPT	-Isoniazid Tuberculosis Preventative Therapy
IUFD	-Intrauterine Foetal Death
IUGR	-Intrauterine Growth Restriction
IV	-Intravenous
LFT	-Liver Function Tests
MSB	-Macerated Stillbirth
NND	-Neonatal Death
OH	-Obstetric Haemorrhage
PNC	-Postnatal Care
POC	-Products of Conception
POD	-Pouch of Douglas
PPH	-Postpartum Haemorrhage
PRN	-As necessary
PROM	-Premature Rupture of Membranes
PV	-Per Vagina (Per Vaginal)
RDS	-Respiratory Distress Syndrome

Rh Factor	-Rhesus Factor
RFT	-Renal Function Test
SB	-Stillbirth
SFD	-Small for dates
SMI	-Safe Motherhood Initiative
SRHS	-Sexual Reproductive Health Services
SROM	-Spontaneous Rupture of Membranes
STI	- Sexually Transmitted Infection
Temp	-Temperature
TB	-Tuberculosis
TPHA	-Treponema Palladium Haemoaglutination Assay
TV	-TrichomonasVaginalis
U/S	-Ultra Sound
UTI	-Urinary Tract Infection
VCT	-Voluntary Counselling and Testing
VDRL	-Venereal Disease Research Laboratory

FOREWORD

The safe motherhood program was initiated in Botswana in the early nineties with an aim of reducing maternal morbidity and mortality as well as improving the quality of lives of women.

Like the global community, Botswana committed itself to the attainment of the fifth Millennium Development Goal (MDG 5) which aims at improving maternal health and reducing maternal mortality by 75% between 1990 and 2015.Despite on-going efforts to achieve these global commitments, Botswana is not on track for MDG 5 although it is on track to achieve MDG 4.
Every year, an estimated 287,000 maternal deaths occur globally (2010). Almost all of these deaths (99%) occur in developing countries which account for more than 50% of the deaths. Globally four million newborn die in the first month of life annually, 25% in Sub Saharan Africa die within the first month of life. In addition, over three million babies are born dead (WHO 2009 top-date with more recent data).

Over 70% of maternal deaths worldwide are from five main causes: severe bleeding, infections, unsafe abortion, hypertensive disorders (pre-eclampsia and eclampsia) and obstructed labour. In Botswana the main causes of maternal deaths are: Haemorrhage, Pregnancy Induced Hypertension, Abortion, AIDS and Sepsis, in total 75% of maternal deaths are due to direct causes. These direct causes can be avoided if quality of care is availed to women during pregnancy, childbirth and postpartum.

Botswana records good figures in terms of women attending Antenatal care services (94% BFHS 2007) and women delivering in health facilities (95% BFHS 2007) implying that most of the maternal deaths occur in health facilities which may be attributed poor quality of care or delay in providing the required interventions.

The Ministry of Health has identified reduction of maternal and newborn death as a priority hence capacity of health workers to improve and provide quality of care during ANC, Childbirth and Postpartum continues to be strengthened.

The need to provide health workers with guidelines that are updated remains very important whereby review of the guidelines to align them to evidence based information by WHO standards became necessary.

The Ministry believes that health workers shall utilise the guidelines in providing care to women in order to improve quality. These guidelines provide basic obstetric care guide to improve health workers' performance in the care of women and newborns.

ACKNOWLEDMENT

The guidelines were reviewed using basic standards and using evidence based reference from WHO. It is aimed at improving the skill and knowledge of health care workers in management of obstetric care including the newborn. The process of review in 2015 was made possible by the sponsorship of Ministry of Health and technical and financial support from World Health Organisation.

The review of guidelines has been done to address the practical issue in obstetric care in Botswana. The reproductive health problems prevalent in Botswana are not principally different from those encountered elsewhere in the Africa region. However the practical approach in the management of these problems requires some specificity, considering other aspects of life relevant to Botswana. It is in this regard that the experience of local health providers was extensively important and utilized in the production of the guidelines.

The review for 2016 was made possible by tireless work and expertise of the National Maternal Review Committee, namely: Ms Otukile Y, Dr Gaolebale P, Ms Manthe M, Ms Modo S, Dr Siamisang A B, Ms Rapitse G, Dr Pfidze T, Dr Molwantwa O, Ms Lephirimile E, Ms Thipe B, Mr Nkosi O, Dr Sentlabane I, Ms Pono S, Dr Sinvula M, Ms Maribe L.S, Dr Anderson S.S, Dr Mogatle M, Dr Masole L, Ms Mafa-Setswalo J, and Ms Macha N. The team reviewed the guidelines within a short time and their wide experience in maternal and newborn care, as well as literature search made the guidelines practical and thus user friendly for our maternity care.

The work could have not been possible without the support of Acting Chief Health Officer for Sexual Reproductive Health Division.

Special thanks go to the women of Botswana for being able to avail themselves to benefit from our experience and allow us to gain experience in their care. Lastly, we wish to thank all managers from various facilities for releasing their staff members to carry out this important task.

INTRODUCTION

The risks posed by pregnancy to the health of the woman and the baby are not relative in themselves. They are real and absolute. They may only be relative to our knowledge and ability to address them. It is vital that we utilize all the available resources, knowledge and facilities, to the best of our abilities to provide the best care for the pregnant woman to meet the changing demands for quality life. To do this we have to continuously and relentlessly update our knowledge and skills in reproductive health care taking into account the circumstances and clinical events in the environment in which we live and practice. This is the overall spirit in which this manual for basic service standards in maternity care has been developed. The manual should be a useful reference material for update training for health care providers in the management of obstetric emergencies and in life saving skills.

Part one deals with topics that address areas of maternity care that are generally handled at the sexual reproductive health outpatient clinics, i.e. the antenatal and postnatal care.
Part two is designed to provide basic approach to general inpatient care. It deals mainly with labour and delivery. It is divided into 2 sections: section A deals with issues related to management of labour and delivery while section B elaborates on special skills in managing certain complications of delivery. Part three addresses various common and critical complications of pregnancy.

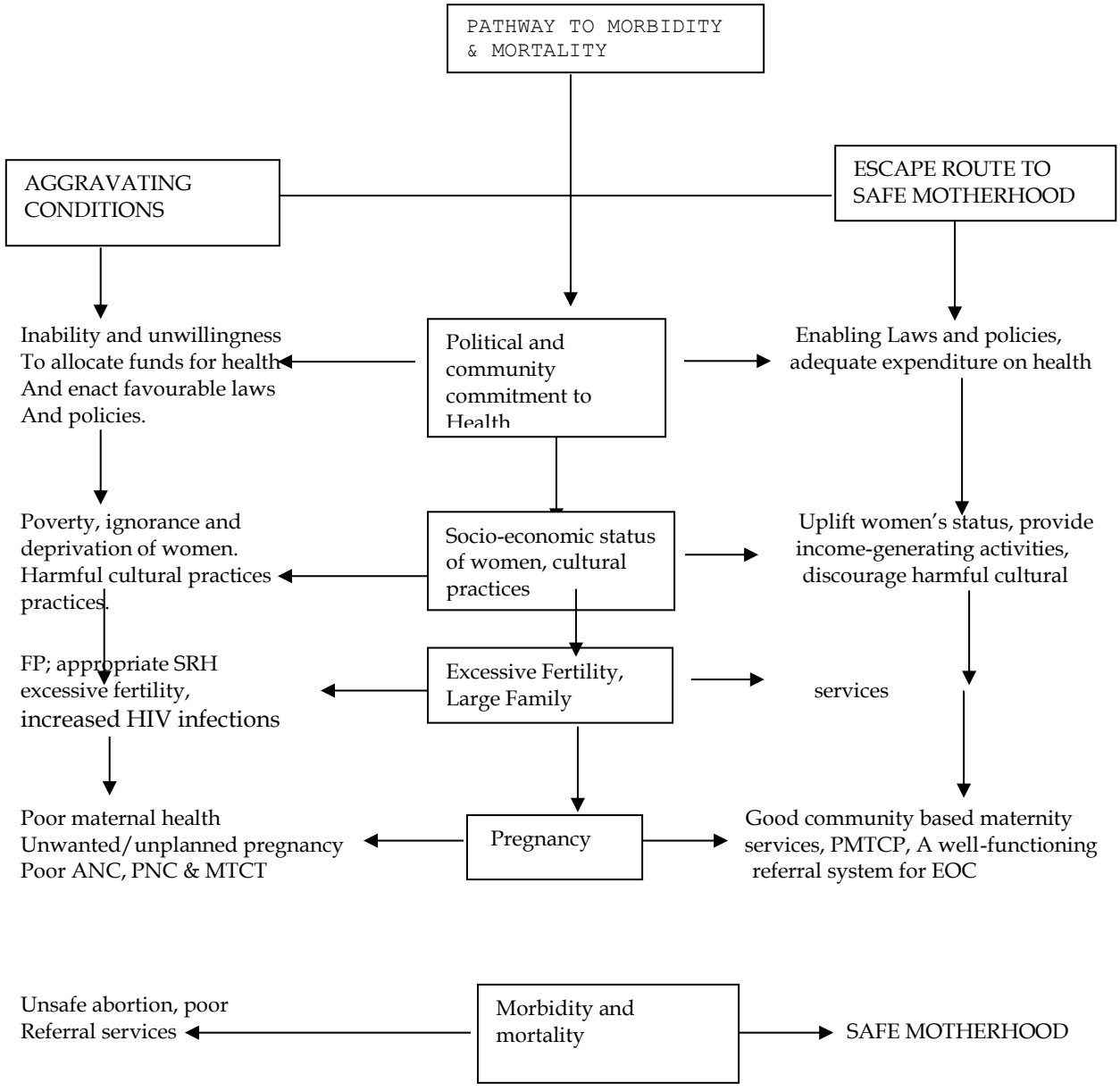
Effort has been made to keep the manual as simple and brief as possible so that it can be used with relative ease by trainers, trainees and practitioners as a quick reference material. For more in-depth information on each subject covered, extra relevant reading will be necessary. The manual is not exhaustive, but a guide to basic principles of maternity care in the context of the objectives and concepts of making pregnancy safer. It provides the basics for uniformity in training and practice in these areas.

The skills which are emphasized in this manual are:

- Evacuation of the uterus
- Manual removal of the placenta
- Vacuum- extraction
- Breech delivery
- Repair of episiotomy and perineal tears
- Caesarean section
- Resuscitation of the new-born

It is therefore, useful and is highly recommended that all those involved in the management of reproductive health care in Botswana be familiar with the content of this manual as it will not only provide a basis for their practice, but also for discussion and possible improvement and expansion of its content in future.

Flow Chart 1.0: SAFE MOTHERHOOD – THE OPTIONS


PATHWAY TO MORBIDITY & MORTALITY
AGGRAVATING CONDITIONS
ESCAPE ROUTE TO SAFE MOTHERHOOD
Inability and unwillingness To allocate funds for health And enact favourable laws And policies.
Political and community commitment to Health
Enabling Laws and policies, adequate expenditure on health
Poverty, ignorance and deprivation of women. Harmful cultural practices practices.
Socio-economic status of women, cultural practices
Uplift women's status, provide income-generating activities, discourage harmful cultural
FP; appropriate SRH excessive fertility, increased HIV infections
Excessive Fertility, Large Family
services
Poor maternal health Unwanted/unplanned pregnancy Poor ANC, PNC & MTCT
Pregnancy
Good community based maternity services, PMTCP, A well-functioning referral system for EOC
Unsafe abortion, poor Referral services
Morbidity and mortality
SAFE MOTHERHOOD

PART ONE

I. ANTENATAL CARE

In many studies on maternal and perinatal morbidities and mortalities, references have been made to the role and significance of antenatal care in reduction of these. In a number of these studies emphasis has been placed on the importance of the number of visits paid by pregnant women to the clinics. **However, of more significance and relevance is the quality of the antenatal care rather than the number of visits per se. For instance, it is not just enough to identify the risk through examination or history taking, but of importance is what you do about the risk factor.**

A. Good Antenatal Care:

This includes the following elements:

1. Creation of pleasant and conducive environment at the health facility
   - Cleanliness in the facility
   - Availability of resources (material and human)

2. Establishment of individualized rapport with patients. This heavily relies on health providers' attitude, patience and ability to listen and be empathetic.

3. Provision of information, education and counselling to patients as well as making available simple self-explanatory visual demonstrative posters.

4. Assessment of vital signs and triaging: Pulse rate, Temperature, Respiratory Rate, Weight, Blood Pressure

5. Comprehensive history-taking

6. Comprehensive physical, obstetrical and gynaecological examination, which must include:
   a) Physical:
      - general physical outlook of the patient including the status of personal hygiene .
      - assessment of nutritional status.
      - assess for signs of anaemia
      - examination of the breasts for abnormal masses, scars, tenderness, flat nipple and abnormal discharge.
      - cardiopulmonary examination
      - abdominal examination
      - assessment of extremities including checking for oedema finger clubbing, varicosities and DVT.
   b) Obstetric examination:

- inspection: abdominal shape, presence of scars, and observe for any foetal movements.
- palpation:
  I. symphysis fundal height (SFH)
  II. Determine ; the lie, presentation and position of the foetus
  III. uterine consistency and points of tenderness.
- auscultation: determine foetal heart rate, volume and regularity.

c) Gynaecological:
- assessment of external genitalia
- speculum examination to assess the status of the vagina and cervix.

7. Laboratory tests. (See Table 1)
8. Identification of risk factors(see table 1.1) reviewed at every visit
9. Determination of mode of delivery.
10. Discuss place of delivery e.g. Clinic with maternity, Primary Hospital, District hospital, or Referral Hospital

B. Critical Issues in Antenatal Care

1. **First Visit**:

The first visit should be at 8 weeks gestation, or after 2 missed periods, or as soon as the woman realises she is pregnant.
All women to be done a dating ultrasound, (first trimester or before 20 weeks gestation).

PMTCT and Routine ante-natal screening tests should be performed at this point.

2. **Regularity and frequency of ANC Visits**

Subsequent visits should be;

I. every 4 weeks until 28weeks of gestation,
II. followed by 2 weekly visits until 36weeks gestation,
III. thereafter weekly until delivery

This pattern, however can be modified according to the risks identified to suit the individual patient.

Early start of antenatal care and regular visits permit better assessment and identification of risk factors and their prompt management. If a woman is undelivered at 40 weeks, refer for consideration of induction.

3. **2nd Trimester**:

This is the period when hormonal and haemodynamic changes and influences are at their peak e.g physiological haemodilution, tendency towards hypotension, etc. Certain routine tests, like Hb, should be repeated and risk factors critically assessed.

4. **3rd Trimester**

During this period there is tendency towards other cardiovascular changes and changes in placental function. Final pre-delivery assessments are made including Hb, VDRL and HIV test. Discussion on the mode and place of delivery is finalised.

C. Basic Necessary laboratory tests in ANC (*CHECK PMTCT PROTOCOL*)

Table 1.0: Mother Baby Care Package during antenatal care

TASK	1ST VISIT (8-12 weeks)	20-24- WEEKS	34-36WEEKS	onset of labour
Testing and counselling	• HIV Pre-test counselling and voluntary testing • Benefits of PMTCT program • Maternal nutrition • family planning counselling • Scheduling of visits	• HIV Pre-test counselling and voluntary testing if not yet done • If tested, post test counselling • Infant feeding counselling • Family planning counselling • Maternal nutrition	• HIV Pre-test counselling and voluntary testing if not yet done • Maternal nutrition • For HIV positive mothers: ○ ARV Counselling ○ Supportive Counselling • For HIV negative mothers: ○ Preventive Counselling • Infant feeding counselling. • Family planning counselling	• HIV Pre-test counselling and voluntary testing if not yet done • Maternal nutrition • For HIV positive mother: ○ ARV counselling ○ Supportive counselling • For HIV negative mothers: ○ Preventive counselling • Infant feeding counselling. • Family planning counselling

SCREENING	• Follow safe motherhood protocols • HIV positive mothers: ○ Check if already on antiretroviral (ARV) drugs, if not; follow PMTCT protocol	• Follow safe motherhood protocols • HIV positive mothers: ○ Check if already on ARV drugs, if not follow PMTCT protocol	• Follow safe motherhood protocols • HIV positive mothers: ○ Check if already on antiretroviral (ARV) drugs, and follow PMTCT protocols	• Follow safe motherhood protocols • HIV-positive mothers: ○ Check if already on antiretroviral (ARV) drugs, if not; follow PMTCT protocol
LABORATORY INTERVENTIONS	• VDRL/RPR • FBC, ABO Grouping, Rh • Urinalysis • HIV test • HVS* • MPS* RBS	• HIV /repeat and also MPS* • HB • Urinalysis • ICT* • RBS	• Urine analysis • HIV/repeattest and FBC at 34 weeks, • VDRL • ICT* • RBS	• Urine analysis • HIV/Repeat test • , FBC • RBS

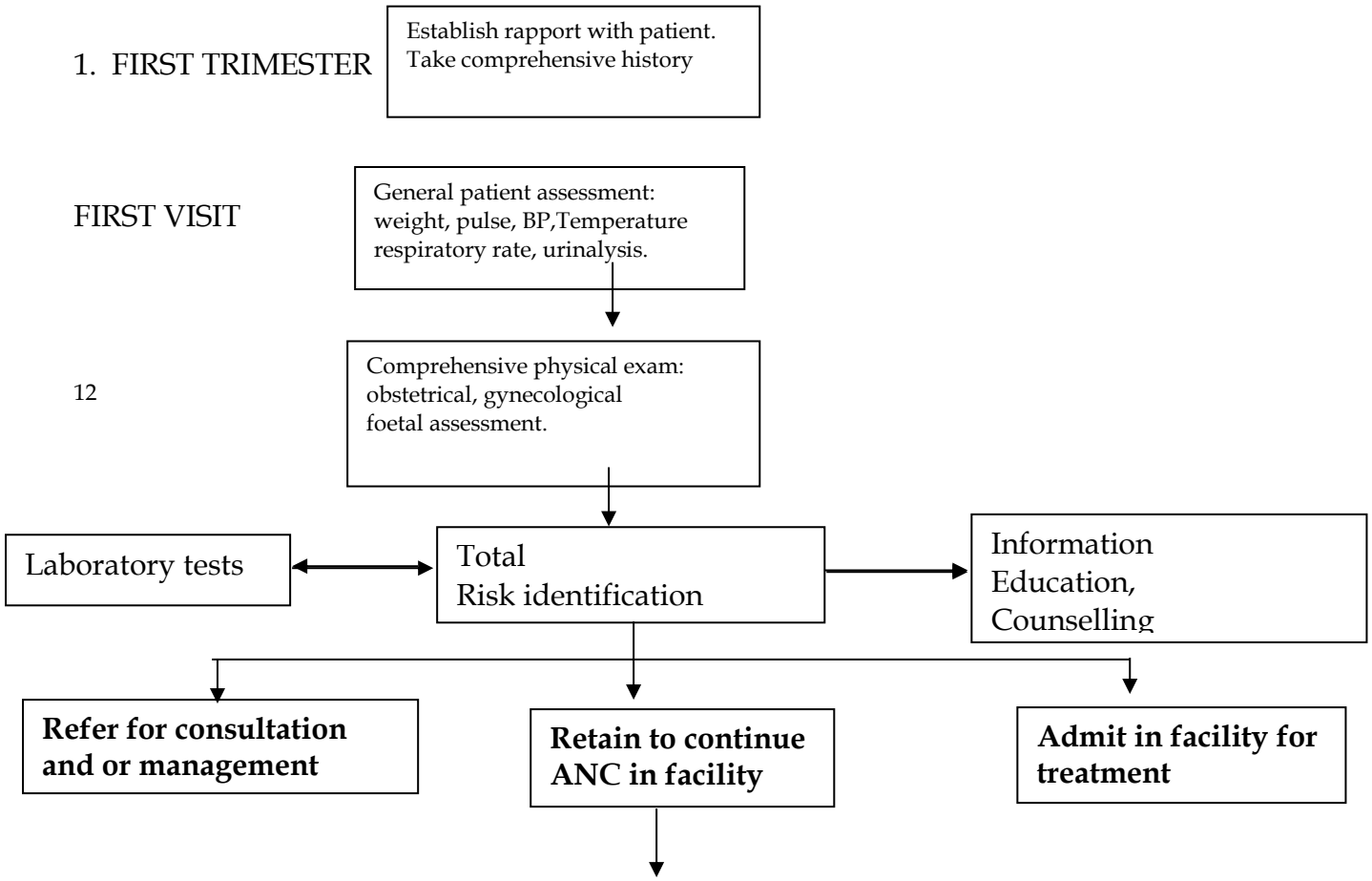
OBSTETRIC INTERVENTIONS	• Follow safe motherhood protocols. Ultra Sound Scan before 20 weeks or at booking.	• Follow safe motherhood protocols. • Anomaly Ultra Sound scan	• Follow safe motherhood protocols ○	• Follow safe motherhood protocols.
TREATMENT	• Iron/Folate • Vitmain C • Multivitamins∗ • STI treatment∗ • Tetanus toxoid • Malaria prophylaxis if in malaria prevalent area • Treatment of opportunistic infections • Food supplements∗ • Start ARV's according to PMTCT protocol	• Iron/Folate • Multivitamins∗ • STI treatment∗ • Tetanus toxoid • Malaria prophylaxis if in malaria prevalent area • Treatment of opportunistic infections • Food supplements∗ • ARV's as per PMTCT protocols if not on treatment	• HIV positive mother: ○ ARV according to PMTCT protocol if not yet on treatment • Iron/Folate • If anaemic (HB<8) **consider** transfusion. • Multivitamins∗ • STI treatment∗ • Tetanus toxoid • Malaria prophylaxis if in malaria prevalent area • Treatment of opportunistic infections • Food supplements. ∗	○ HIV positive mothers: ARV according to PMTCT protocol • Iron/Folate • Multivitamins* • STI treatment* • Malaria prophylaxis if in malaria prevalent area. • Treatment of opportunistic infections • Food supplements*

∗if necessary

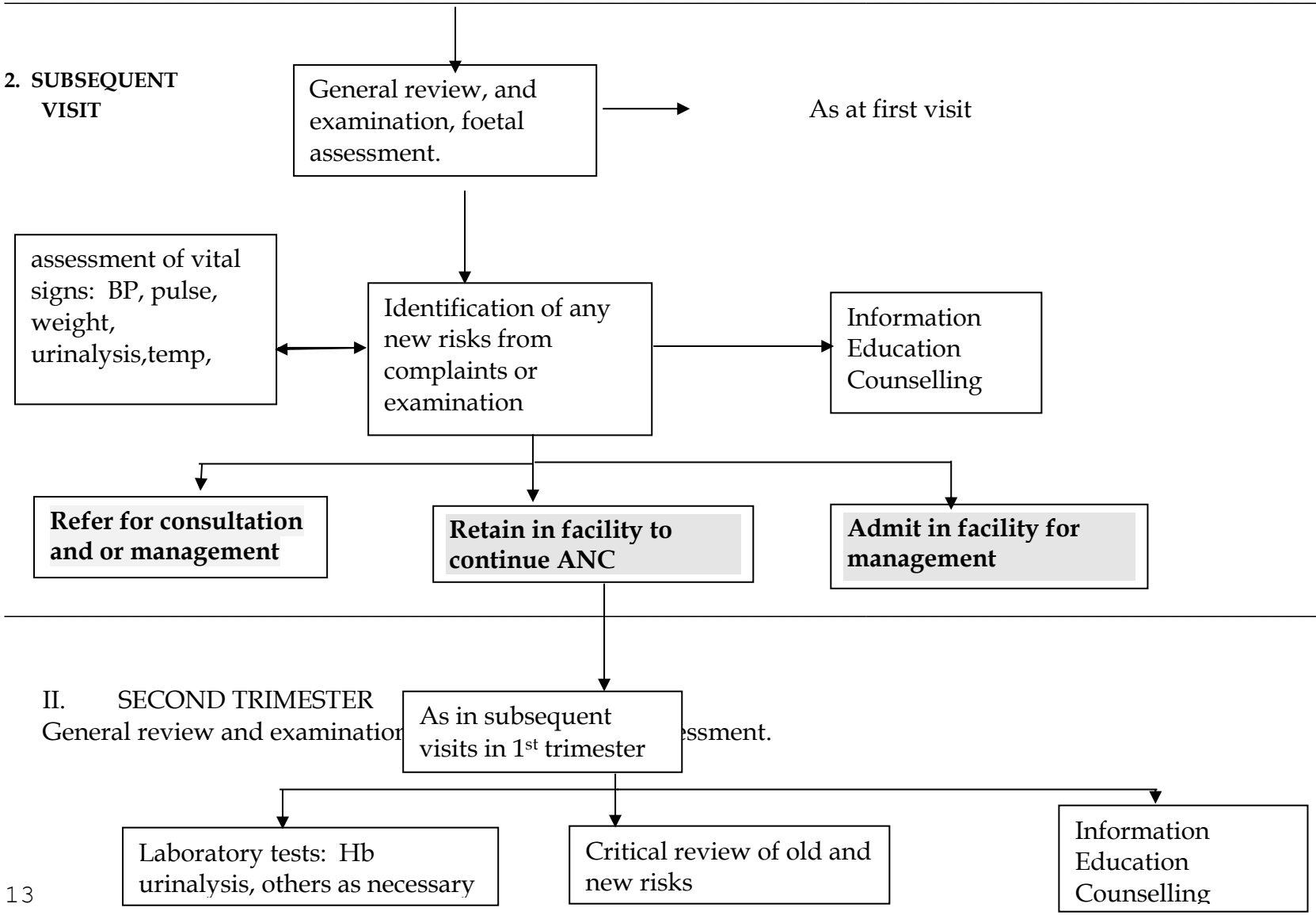
If Rh factor is negative, do antibody screening (indirect Coombs test - ICT).

If ICT is negative, repeat it at 28 weeks and 36 weeks of gestation and give 300micrograms of Rh immune globulin (Anti D)to the mother at 28 weeks

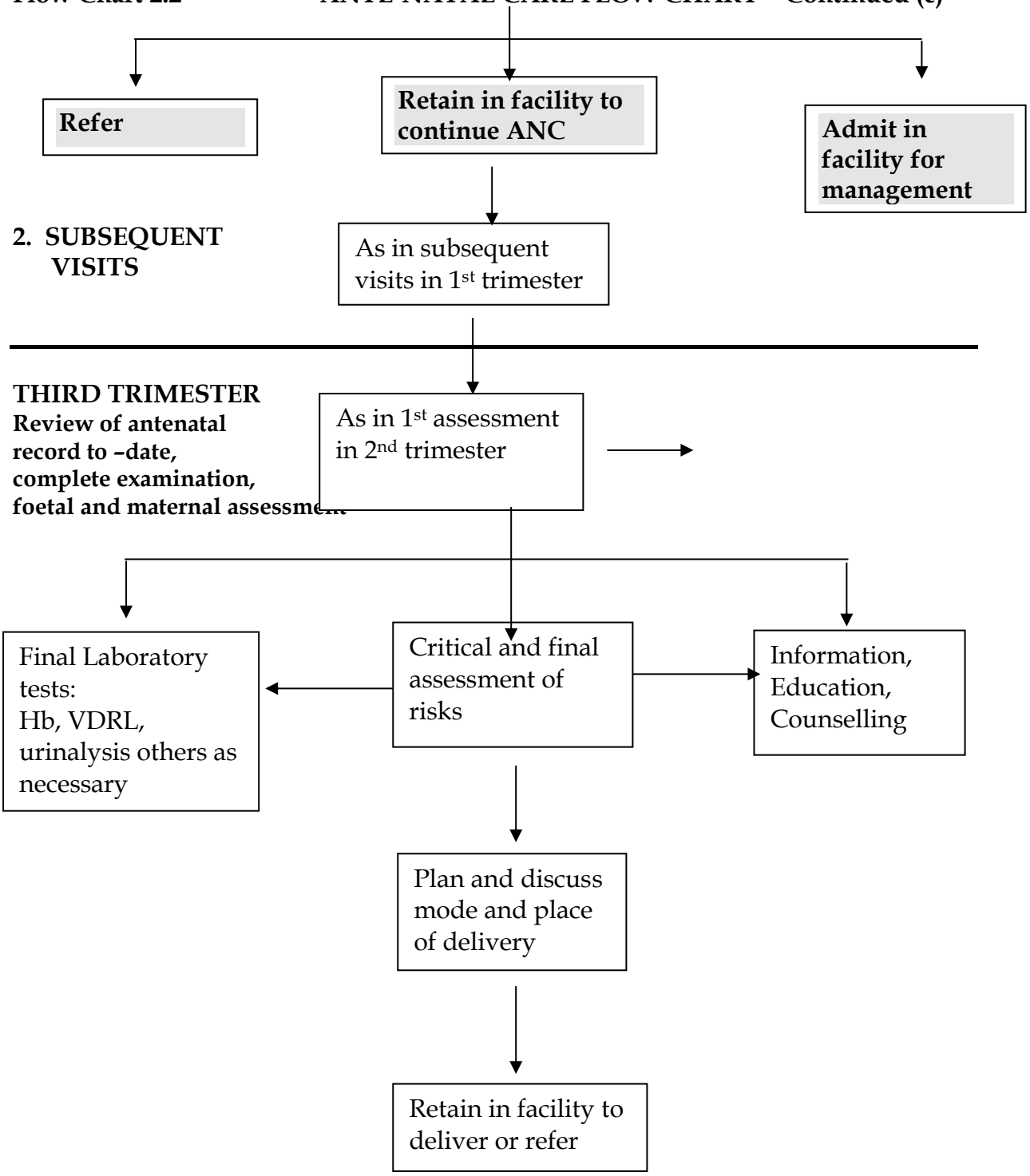
Flow Chart 2.0 **ANTE-NATAL CARE FLOW CHART (A)**



Flow Chart 2.1 **ANTE-NATAL CARE FLOW CHART – Continued (B)**



Flow Chart 2.2 **ANTE-NATAL CARE FLOW CHART – Continued (c)**



D. Table 1.1: Ante-Natal High Risk Indicator

	Obstetric	General Medical/Surgical	Socio-Economic
I **F** **r** **o** **m** **H** **i** **s** **t** **o** **r** **y**	**1. BOH** - NND - SB - IUFD - Prematurity - Abortions **2. Difficult Deliveries:** - C/Section - Instrumental Vaginal delivery - Obstructed labour - Prolonged labour - Induced labour - 3rd /4th degree tear - Impacted shoulder **3. Obstetric complications of pregnancy:** - APH - PPH - RH Isoimmunisation - Hypertensive disorders in pregnancy - Gestational diabetes	**1. Medical Diseases:** - Cardiac disease - Diabetes - Hypertension(chronic) - Anaemia - Renal disease - Liver disease - TB - STI and HIV - Mental Disorder - Epilepsy - D.V. T - Asthma - Endocrine disoderse.gthyroiddisease **2. Surgical:** - Pelvic surgery - previous gynaecological surgeries e.g myomectomy - Heart surgery - Renal surgery - Skeletal deformity - GenitoPerineal Surgery - VVF - RVF	1. Nutrition: -Excessive weight gain -Weight loss 2. Age: - teenage - elderly primi (>30yrs) - advanced maternal age >35 years 3. Residence and Communication: - distance from facility - telephone - mode of transport 4. Occupation: 6. Lack of social support 7. Habits - alcohol - smoking - illicit drugs
II **O** **n** **E** **x** **a** **m**	**1**. Baby: Size (large or small for dates) - abnormal lie - malpresentation **2**. PV bleeding 3. Pelvic tumours 4. Vaginal warts, varicosities 5. Abnormal Vaginal Discharge	1**.** Weight: - obesity - excessive weight gain - or weight loss 2. Height:< 150cm: 3. Pallor 4.Oedema, dyspnoea, abnormal BP 5.Proteinuria Glycosuria Jaundice, Cyanosis 6. Breast lumps, Varicose veins	1. Poor Personal hygiene 2. Negative attitude to pregnancy 3. Inability to communicate and understand information provided.

NB: All obstetric and medical risk factors are important singly or in combination with others.

a. Social risk factors are generally relative. Their significance is in relation to the anticipated obstetric or medical complication.
b. If there is uncertainty regarding the severity of the risk factor consultation and or referral must be undertaken.
c. Risks identified should be marked and entered in red in the "obstetric record"
d. Evaluate indications for any past procedure.

PART TWO: LABOUR, DELIVERY AND DELIVERY PROCEDURES

Pregnancy and labour related definitions:

a. Gravid: Means pregnant

b. Gravidity: Total number of pregnancies (normal or abnormal) a woman has had.

c. Parity: A state of having given birth to viable foetus or foetuses.

d. Labour: Coordinated regular sequence of effective uterine contractions resulting in cervical effacement and dilatation.

e. **False labour** is common in late pregnancy and can be considered as exaggerated **"Braxton-Hicks" contractions** without cervical effacement and dilatation.

f. Delivery: Actual expulsion of the foetus and the placenta after viability stage of pregnancy.

SECTION A.LABOUR AND DELIVERY

1. MANAGEMENT OF NORMAL LABOUR

For labour to progress normally the **four "Ps"** must be within normal range individually and in relation to each other:

Powers: uterine contractions
Passenger: the foetus and dimensions of its various parts
Passage: the birth canal,--bony pelvis and soft tissues
Parturient: hydration, pain threshold, anxiety, nutrition, position, and bladder

The entire mechanism of labour depends on these four and any deviation in them may lead to deviation in the normal conduct of labour.

Labour can either befalse or true labour. True labour is in turn divided into 4 basic stages for easy and effective management.

First Stage: From onset of labour to full cervical dilatation. This is further subdivided into:

Latent phase- From onset of labour i.e. when there are regular uterine contractions

- There is softening and progressive effacement of the cervix
- Cervix is < 4cm dilated
- Last for 8 hours

Active phase – regular uterine contractions, cervix is fully effaced and >/= 4cm dilated. Cervical dilation at a minimum of 1cm per hour.

Second Stage:
From full cervical dilatation to the delivery of the baby, lasting about 1 hour in primiparae and 30 minutes in multiparae.

Third Stage:
From delivery of the baby to the delivery of the placenta and should last 30 minutes or less.

Fourth Stage:
Period of two hours after delivery of the placenta.

The first two hours after the delivery of the placenta is often regarded as the **fourth stage** of labour because of the critical nature of the complications associated with this period ie. Postpartum haemorrhage. It requires therefore, equally critical observation.

A. General Preparation:

When a patient presents with complaints of labour, she should be thoroughly examined and her history evaluated to confirm or exclude true labour. The evaluation includes:

1. Review of her history, ante-natal record.
2. Evaluation of the presenting complaints
3. Physical examination:
   - General physical examination to exclude problems related or unrelated to pregnancy.
   - Specific examination to assess the four"Ps" individually and in relation to each other.
   - Determine the stage of labour through assessment of uterine contractions, cervical dilatation and station of presenting foetal part.
4. Counselling and education of the patient on the birth process.
5. Basic observations and tests:
   - BP, Temperature, Pulse, Respiratory rate, and Weight
   - Urinalysis
   - Cross match and full blood count should be done.
   - HIV test if omitted during ANC, or not done in the preceding 3 months.

6. If true labour is confirmed, the patient is admitted to the labour ward.
7. Intravenous cannulation should be done for every patient in preparation for active management of the third stage.

B. Conduct of Labour

The pattern and frequency of observations and examination during labour must be individualized and related to the prevailing risks. The observations and activities described in table 2.0 mainly relate to a normally progressing labour in a low risk patient. For instance a patient who is for vaginal delivery after caesarean section or one with pre-eclampsia will require more frequent assessment of the progress of her labour than one who has no similar or worse risks.

The baby should be given to the mother soon after the second stage for bonding and/or suckling. Among other things this facilitates uterine contraction and hence reduces the risk of postpartum haemorrhage. It further enhances baby - mother-bonding process.

Close observation must be kept over the patient in the immediate postpartum period during which she may develop postpartum haemorrhage. Genital lacerations and episiotomies must be repaired immediately after the third stage. Delayed repair can lead to bacterial infection which results in poor healing.

Table 2.0: Conduct of labour

STAGE	CHARACTERISTICS	ACTIONS
First (latent)	• Regular uterine contractions • Cervix progressively effacing and dilated <4cm. • Amniotic membranes may or may not be intact.	• Maternal assessment - 2 Hourly observations of maternal BP, and pulse. 4 hourly temp checks • Foetal heart rate every 30 minutes. • Observe whether and when membranes have ruptured. • VE & PP 2 hourly • Psychological and emotional support • Give soft diet • Encourage movement out of bed if head is engaged. • Give ARV as indicated. • PMTCT counselling and testing if status unknown
First (Active)	• Regular uterine contractions • Cervix fully effaced and dilated >/=4cm • Amniotic membranes may or may not be intact .	• Regularly monitor labour progress on the Partogram. • Fetal heart rate ½ hourly • Maternal assessment every hour • Vaginal assessment every 2 – 4 hours • Descent of PP every 2 hours • **ARM should be done only for obstetric reasons.** • Encourage feeding, take fluids and soft diet • Encourage emptying of the bladder • **Give Pethidene 50 - 100mg** (4hourly) for pain as early as possible for cervical dilatation is less or equals to 6cm. • Ensure naloxone is available as an antidote
Second	• Full dilatation of the cervix • Strong uterine contractions • Propulsive maternal effort	• Monitor fetal heart rate after every contraction • Aseptic preparation of the person conducting delivery • Prepare delivery tray • Aseptic preparation of external genitalia • Encourage patient to bear down • Episiotomy if necessary with crowning of the vertex(under local anaesthetic) • Protect the perineum • Gradual delivery of the head

		• Give oxytoxic with the delivery of the anterior shoulder.(or within a minute of delivery of the baby) • Wipe the secretions from baby's mouth and nose as soon as the head is delivered • Maintain the baby in a position of head lower than the rest of the body while clamping and cuttingthe cord.
Third	• The baby is completely delivered • Placenta still in situ	• Close observations of the mother • Oxytocin 10 IU IM or Syntometrine 1ml IM within 1 minute after delivery of baby. • Do not wait for signs of placental separation. • Deliver the placenta by controlled-cord traction during a contraction with concurrent support of the uterus with cephalically directed supra-pubic pressure . • examine placenta and membranes for completeness • Massage the uterus to expel clots • Administer a uterotonic for PPH prevention (IV infusion- 20-40IU in 1l crystalloid, to run for 4 to 6 hrs)
Fourth	Placenta completely delivered	• Monitor vital signs (2hours) every 15minutes in the 1st hour then half hourly in the next hour. • Observe/check uterine consistency and blood loss with vital signs as above. • Exclude cervical and vaginal tears • Repair episiotomy and tears • Check urine output • Examination of baby • Give baby ARV drugs indicated as per PMTCT protocol. Breast feeding/give formula.

Drugs used and average dosages:

- Analgesia: Pethidine: 50-100 mg IM. Not recommended after 6cmof cervical dilatation and if delivery is expected within 4 hours. **Midwives can give pethidine without a doctor's prescription.**
- Oxytocin is the uterotonic of choice (10 IU IM/IV) for PPH prevention. Other injectable uterotonics or misoprostol (Cytotec600 mcgPer-Rectum) can be used where oxytocin is not available.
- Syntometrine may be given instead on IM Oxytocin, after excluding hypertension and cardiac disease.

C. Special Notes:

1. The value of enema in labour has over the years been a subject of controversy. Those who feel that its benefits do not justify the discomfort caused to the patient by its administration mainly object to it. It is definitely useful in patients with a "full" rectum. A full rectum and or bladder may interfere with the progress of labour either mechanically or through the physiology of the enervation system. The attitude and feeling of the patient however should be considered.

2. The vast majority of patients are able to pass urine in the greater part of the first stage of labour. This should be preferred against catheterization.

3. Narcotic analgesics should not, as a principle, be given 4 hours prior to the delivery of the baby. On the other hand there is undisputed evidence that pain relief in labour results in better outcome for the mother and baby.

4. Women in labour use a lot of energy during labour. It is therefore wrong to starve them but they should avoid solid food which takes long to digest.

5. Modern obstetric practice stipulates that normal active labour should last for about 6 -8 hours in multiparas and about 10 - 12 hours in primi gravidas. Latent phase should last about 8 hours for both. The following guidelines regarding average time are suggested.

Table21: Duration of Labour

Stage of Labour	Multipara	Nullipara
• Latent phase	• 8 hours	• 8 hours
• Active First Stage	• 6 - 8 hours	• 8 - 10 hours
• Second Stage	• Average ½ hour	• ½ - 1 hour
• Third Stage	• 5 - 30 minutes	• 5 - 30 minutes
• Fourth Stage	• 2 hours	• 2 hours

6. The use of oxytocin to accelerate labour is justified if inadequate contractions have been identified as the cause of slow progress in absence of mechanical dystocia.
7. Oxytocin for acceleration of labour is contraindicated:

i. if there is CPD/ obstructed labour

ii. if impending or actual rupture of the uterus is suspected

iii. if there is foetal distress or significant intrapartum haemorrhage.

8. Caesarean section should be considered as management of foetal distress in first stage of labour. Vacuum extraction is appropriate when criteria for safe delivery are met. (Refer to Section B for Vacuum delivery).

9. Artificial rupture of membranes should be performed if obstetrically indicated.

10. Massaging of the uterus to expel clots after the third stage of labour **must** not be accompanied with fundal pressure to push the uterus downwards. This may cause uterine inversion.
11. In the course of labour, rupture of the uterus should be highly suspected if:

    i. Active labour suddenly diminishes and even stops.
    ii. Intrapartum uterine bleeding with pathologically distinct retraction ring.
    iii. Foetal parts becoming easily palpable through the abdominal wall with or without irregular foetal heart rate.
    iv. Receding of the presenting part.
    v. Change of lie.
    vi. Signs of shock.

12. Administration of a uterotonic is recommended by the WHO as the most important intervention for the active management of the third stage of labour (AMTSL). Uterotonic can be administered with the delivery of the anterior shoulder, or within a minute of delivery of the baby. AMTSL shortens the third stage and is an important preventive measure for postpartum haemorrhage (PPH). Oxytocin/Syntometrine is recommended as the uterotonic drug of choice. Other injectable uterotonics and misoprostol are recommended as alternatives for the prevention of PPH in settings where oxytocin is unavailable. Ergometrine or Syntometrine should be avoided in patients with cardiac disease and hypertension and instead oxytocin or misoprostol can be given.

13. Other interventions of the 3rd stage of labour include controlled cord traction and concurrent support of the uterus with cephalically directed supra pubic pressure to prevent uterine inversion. Continuous uterine massage is not recommended as an intervention to prevent PPH in women who have received prophylactic Oxytocin, as it may cause maternal discomfort, require a dedicated health professional, and may not lead to a reduction of blood loss. However, surveillance of uterine tonus through

abdominal palpation is recommended in all women for early identification of postpartum uterine atony(WHO 2012)

14. **The application of fundal pressure in the second stage is contraindicated.**
15. Fundal pressure increases the risk for:
    - Severe intrapartum and postpartum haemorrhage due to poor uterine contraction after the delivery of the baby.
    - Retention of the placenta or prolonged third stage of labour due to uterine inertia.
    - The rupture of the uterus
    - Intrapartum shock
    - Predisposition to uterine prolapse
    -
16. The management of delayed second stage of labour is as follows:
    - careful evaluation of the cause of delay.
    - exclude ruptured uterus.
    - establish the station of the presenting part, whether above or below the ischial spines.
    - assess the condition of the foetus.

17. The possible management options will be the following (**see also flow chart 3.0)**
    - C/S - in ruptured uterus, where there is mechanical obstruction and foetal distress with high presenting part.
    - Oxytocin - (poor uterine contraction, with no foetal distress and no mechanical obstruction. Extra care should be taken in multiparous.
    - Vacuum – If criteria met

2. POSTNATAL CARE

Postpartum care is the least utilized maternity service by women. This poor utilization may be due to the fact that after the delivery of the baby everyone concerned becomes complacent.It should be emphasized that postpartum events can totally nullify the efforts made in the antenatal period and during labour and delivery. Some of the postpartum complications of pregnancy are leading causes of maternal morbidity and mortality (haemorrhage and sepsis). This period is therefore as important as any other period of pregnancy and delivery and requires equally serious monitoring.

A. Definitions:

Postpartum: After parturition/Delivery
Post Partum Period: The period extending up to 42 days after delivery.

B. Complications in the puerperium

Important postpartum complications include:

- Postpartum haemorrhage (PPH) – "see obstetric haemorrhage"
- Puerperal infections including infection of birth canal wounds sustained during delivery- **see** "sepsis in obstetrics"
- Puerperal psychosis/depression
- Anaemia
- Postpartum eclampsia
- Defective breastfeeding
- Mastitis **see** "puerperal sepsis" under "sepsis in obstetric".
- Thromboembolic disease
- Urinary Tract Infections (UTI)

C. Postnatal Care (PNC)

Postnatal care should be considered in several aspects:

1. **Postnatal care in the facility**:

This consists of various observations and treatment given to the mother before discharge from the hospital. Healthy women should be retained in hospital for at least 24hours after delivery for observation of primary complications. Those with high risk factors should have their hospital stay extended accordingly.

Areas of focus

Continuous counselling on**:**

- HIV and Testing if not done
- Infant feeding.
- Family Planning.
- Education on Wound care, i.e. perineal wounds and C/S
- Education on umbilical cord care
- Alarm symptoms (eg: fever, headache, increased abdominal pain, offensive lochia, increased vaginal discharge/bleeding)

2. **General care at home:**

Throughout the puerperium mothers require general support and assistance in domestic chores, care of the baby, emotional and psychological support. This is more imperative for women who have had traumatic and/ or operative deliveries. Usually family members or close relatives and friends provide this type of support.

3 **Home visit by health workers: domiciliary**

This should be conducted within the first week after delivery.. During this visit the health care worker (usually a nurse midwife) provides:

a. General physical check-up including vital signs
b. Assess for signs of anaemia.
c. Assess for uterine involution, state of lochia, repaired birth canal wounds, C/Section scar and signs of any infection.
d. Assess breasts and infant feeding.
e. Assess condition of the baby - feeding, passing of stool and urine, state of the cord, descent of testes (male), vaginal orifice (female) and presence of jaundice.
f. Psychological, moral and emotional support particularly for mothers who had difficult deliveries and or lost their babies.
g. Counselling, information and education on individualized personal care.
h. Dietary advice.
i. Check adherence: compliance to ARV and infant feeding for PMTCT.
j. Continue HIV counselling on PMTCT.

4 **Routine postnatal check-up:**

This is the assessment provided to the postnatal mothers at the health facilities at the end of the puerperium for comprehensive evaluation and to establish the return of their systems to pre-pregnancy state. Counselling and discussion are also conducted on breastfeeding, diet,

sexuality and family planning. **Refer to the flowchart 2.3 on postpartum care.**

D Special Notes:

1. Postpartum care should be individualized according to identified and managed risk factors.

2. During postnatal care, risk factors identified during pregnancy and delivery should be reassessed and the mother advised accordingly on her health and reproductive health.

3. Assessment for uterine involution is done through abdominal palpation. Immediately after delivery the uterine size corresponds to about that of 20-week pregnancy after 1 week it is about the size of 12-week gestation. By the sixth week, the uterus has returned to its' pre-pregnancy size.

4. Pain Management: women usually experience after birth pains due to uterine contractions. These pains may be quite severe requiring attention. Although medical treatment is not routinely indicated, pain relieving medication and non-pharmacological (gentle exercise, massage, abdominal support) measures may be helpful.

5. The amount and type of lochia is a manifestation of the changes in the uterus and in particular in the placental site. Its colour changes from lochia rubra (red) for the first 2 to 3 days through lochia serosa (brownish-grey) to lochia alba (yellowish-white) by the end of the second week.

6. Postpartum eclampsia can occur in the post-partum period and should be screened for even if the patients did not have high blood pressure during pregnancy.

7. It is a good and useful practice to perform a Pap smear at the end of the puerperium. (6 weeks post partum) for women that need the cervical cancer screening criteria.

8. The comprehensive counselling on reproductive health is best done during the postnatal visit at the clinic or home because there may be issues relevant to the just ended pregnancy to be referred to. The discussions on family planning that started in the antenatal period or at this time should be finalized and decisions implemented by the client with the assistance of the health care provider.

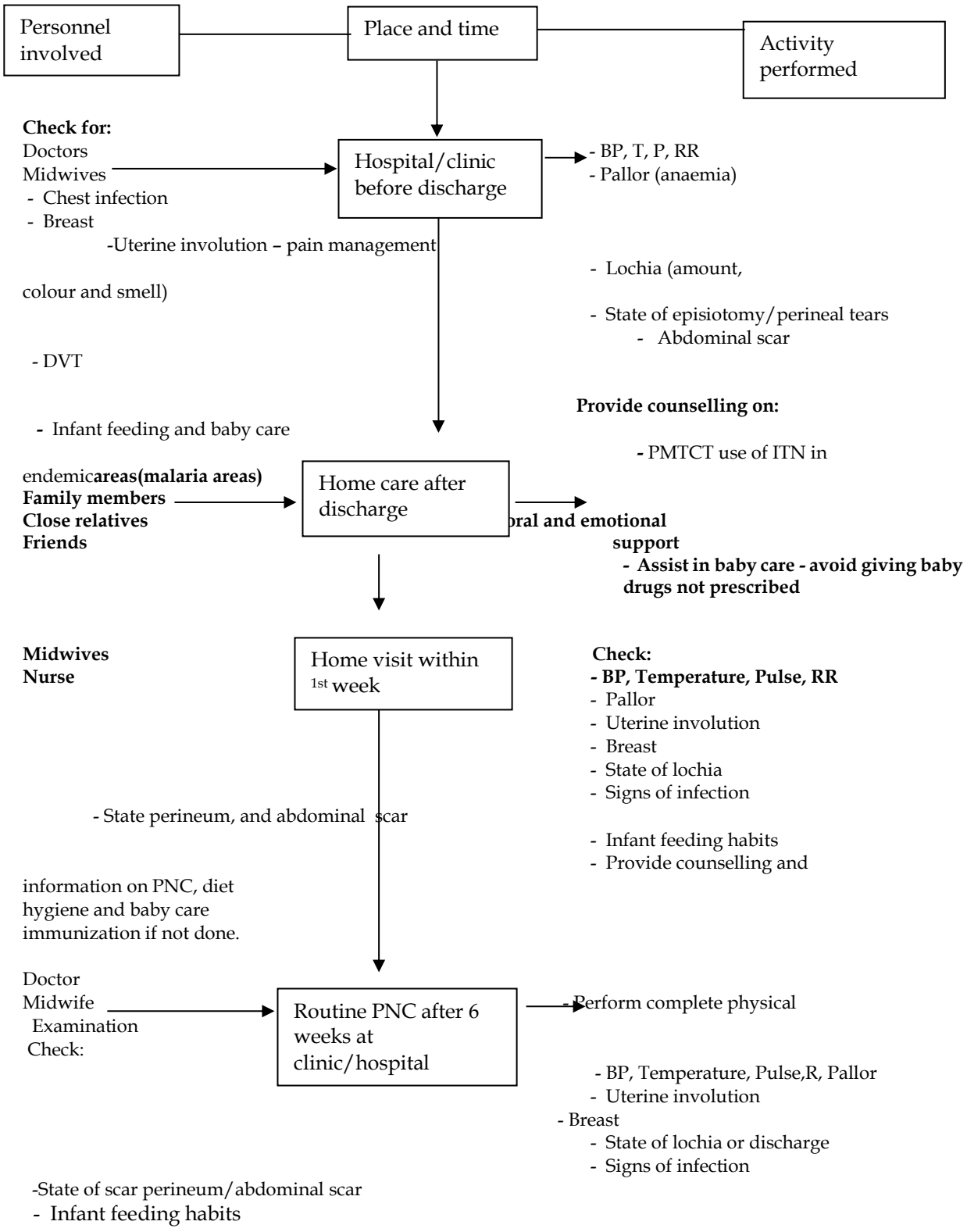
9. The involvement of the partner during the PNC is as important as it is during ANC.

10. HIV& infant feeding counselling, VCT for partners.

11. Babies whose direct coomb's test is positive should be referred to the Paediatrician for further management

12. For infant feeding refer to relevant protocols.

Flow Chart 2.3 POST NATAL CARE



- Counselling on reproductive health -
Baby's weight and umbilical cord
-PMTCT, Pap smear (if needed)

3. PRE-TERM LABOUR

Definitions:

Pre-term labour is labour occurring after 24 weeks but before 37 weeks' gestation**.** It may or may not be accompanied by premature rupture of membranes.

Risk factors predisposing to pre-term labour:

1. **Maternal factors:**

   - Previous history of pre-term delivery
   - UTI e.g. pyelonephritis, asymptomatic bacteriuria (CFU > 100 000)
   - General febrile infections e.g. malaria, pneumonia
   - Previous abortion
   - Pelvic genital infections

2. **Uterine factors:**

   - Incompetent cervix (Idiopathic, iatrogenic- LEEP/Cone biopsy)
   - Uterine abnormalities e.g. bicornuate, didelphys uterus
   - Tumours - uterine fibroids

3. **Socio-economic factors:**
   - Age < 16 or above 35 years
   - Poor nutrition
   - Low maternal weight <50 kg/low BMI<20
   - Smoking
   - Alcohol and drug abuse

4. **Foetal/Placental factors**
   - Multiple pregnancy
   - Premature rupture of membranes
   - Polyhydramnios
   - Placental abnormalities including abnormal placentation
   - Malpresentation
   - Congenital abnormalities

Diagnosis:

Diagnosis of pre-term labour is based on regular uterine contractions with cervical effacement and progressive cervical dilatation between 24 and 37 weeks gestation

Management:

The aim is to delay the delivery until 34 weeks. Delivery should only be delayed after careful assessment of both the mother and the fetus. This includes but not limited to a full physical examination, speculum examination, FBC, Urine MCS and a high vaginal swab.

Timing and mode of delivery is determined by the following:

a. Gestational age and fetal size

Fetal survival is poor at gestational ages less than 28 weeks and fetal weight less than 1000g

b. Maternal conditions

- In the presence of ruptured membranes at gestation more than 34 weeks the patient needs to be delivered
- Chorioamnionitis is an indication for delivery
- Haemorrhage is a contraindication to prolongation of pregnancy (NO TOCOLYSIS)

c. Fetal conditions

- Fetal heart anomalies – below 28 weeks and weight less than 1000g should not trigger immediate delivery
- Fetal size
- Fetal lie/presentation

d. Amniotic Membranes

If pre-term labour occurs with ruptured membranes at gestation more than 34weeks, the patient needs to be delivered. If patient is not in established labour at a gestation<34weeks, suppress labour for 24-48hours during which time glucocorticoids/steroids are administered. If labour is already established tocolytics are futile (cervix >3cm dilated).

Drugs of Choice:

Glucocorticoids (Steroids)

- Should be given between 28-34 weeks gestation orfetal weight more than 1000g.
- Steroids promote fetal lung maturity and reduce neonatal morbidity and mortality
- Either Betamethasone or Dexamethasone to be given as 12mg doses (2 doses, 12 hours apart)
- Do not use in women with chorioamnionitis
- Extra care in women with a diabetic and cardiac condition.

Tocolysis- Does not reduce neonatal morbidity/mortality however, buys time for steroid administration and transfer to a facility with neonatal facilities

- Certain medical conditions are contraindications for the use of tocolytic drugs
    - Cardiac disease

Nifedipine-Nifedipine SR (not LA or XL)

- Drug of choice with the least side effects
- Do not use if BP <90/60
- Give 20 mg orally STAT and then in 30 minutes followed by 20 mg every 4-8 hours
- The maximum dose is 160 mg per day
- To be discontinued once contractions have ceased
- No maintenance treatment beyond 48 hours
- Contraindications: allergy to Nifedipine, hypotension, hepatic dysfunction, underlying cardiac lesions, concurrent use of beta-mimetics
- Side Effects: headache, hypotension, tachycardia, palpitations, flushing, dizziness and nausea
- Monitoring: Maternal pulse and BP every 30 minutes for the first hour, then hourly for the first 24 hours, then every 4 hours

Antibiotics

- A significant proportion of patients with preterm labour have a subclinical infection, hence antibiotics should be given together with tocolytics
- (Erythromycin 250- mg 6 hourly for 10 days with ruptured membranes
- With intact membranes antibiotics should be given for 5 days

- Urine/HVS should be sent for MCS done before antibiotics are started.

Special notes on pre-term labour:

1. Pre-term labour can only be controlled and stopped if the treatment is initiated in the latent phase. Once it is in active phase the efforts to stop it are futile at this stage. Therefore, attention should be concentrated on appropriate management of the labour and subsequent resuscitation of the newborn if the foetus is alive.

2. If pre-term labour is diagnosed in latent phase and with intact amniotic membranes efforts should always be made to stop it. Pre-term labour may recur after the initial successful treatment therefore, it is useful and wise to give dexamethasone to the mother as part of the initial treatment to facilitate foetal lung maturity.

3 Pre-term labour with intact membranes at gestation more than 34 weeks should be allowed to progress. Between 28 and 34 weeks gestation with ruptured membranes conservative management should only be considered after careful patient selection

4. Where there is time, patients with pre-term labours should be referred to facilities with adequate and appropriate skills and capacities to manage them.

5. One of the common causes of pre-term labour is bacterial infections particularly where there is rupture of membranes. In all these cases, therefore, both mother and child should receive prophylactic antibiotics to cover gram positive and negative bacteria.

6. There are two reasons for being conservative in the management of pre-term labour; to give time for foetal lung maturity and to allow for transfer to a facility with neonatal facilities.

7. Tocolysis is contraindicated if active labour (cervix more than 4cm)

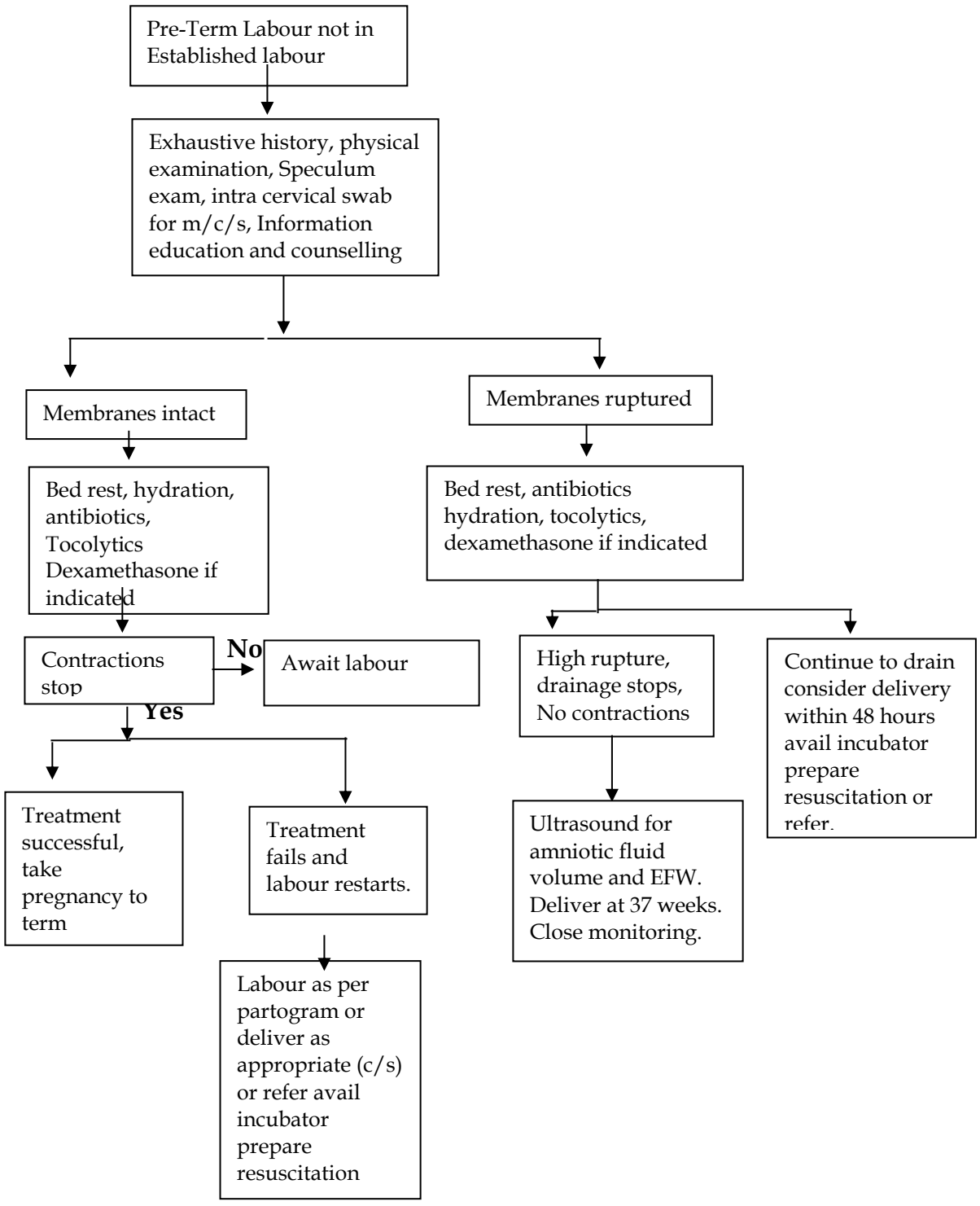
9. In all cases of pre-term labour efforts must be made to exclude associated infections, take HVS and MSU for MCS and give antibiotics in all patients with ruptured membranes.

10. In pre-term labour with intact membranes, the artificial rupture of the membranes should be performed ONLY for obstetric indications. Caution must be taken against cord prolapse.

11. Pre-term labour is best managed in facilities with adequate neonatal care. Referral should therefore be made promptly unless delivery is imminent.

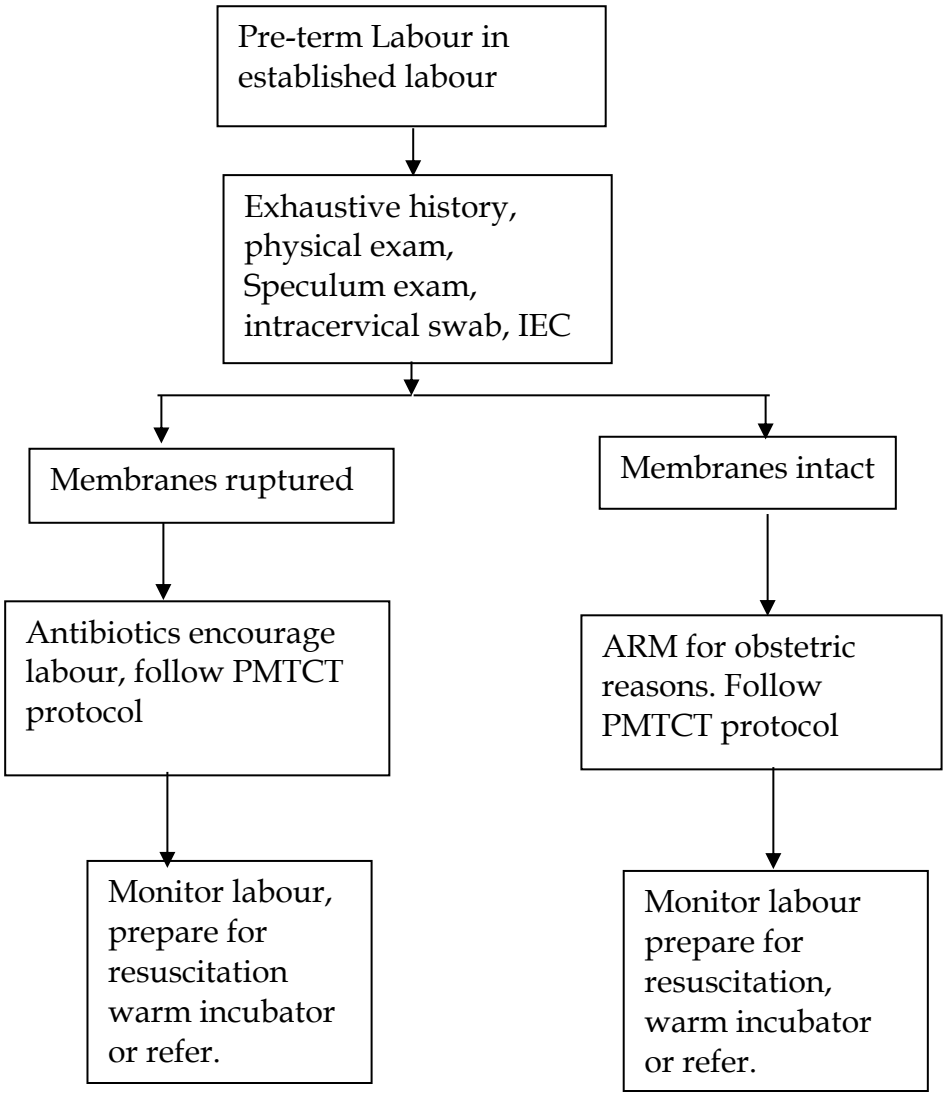
Flow Chart 3.1

D. MANAGEMENT OF PRE-TERM LABOUR: LABOUR NOT ESTABLISHED



Flow Chart 3.2

D. MANAGEMENT OF PRETERM LABOUR : LABOUR ESTABLISHED



4.PRETERM PRE-LABOUR RUPTURE OF MEMBRANES (PPROM)

Definition:

The rupture of amniotic membranes in a preterm pregnancy (24 to 37 weeks) before the onset of labour is referred to as Preterm Pre-labour Rupture of Membranes (PPROM)

Conditions predisposing to or associated with PPROM

- Cervical incompetence.
- Sudden increase in intrauterine pressure through external force on the uterus e.g. trauma.
- Increased intrauterine pressure e.g. in multiple pregnancy, polyhydramnios.
- Malpresentation
- Chorioamnionitis.
- Family history of rupture of membranes. It is reported that if a baby girl is born following premature rupture of membranes she has an increased risk of having premature rupture of membranes when she becomes pregnant.
- Poor maternal nutrition.
- General maternal febrile infections e.g. malaria, UTI.
- STI, HIV.

Clinical presentation and diagnosis:

Diagnosis is based on history and clinical examination.

Symptoms and signs:

- The patient may complain of a sudden gush of warm fluid running down her thighs.
- If it is a small and high rupture she may complain of repeated trickle of warm fluid that wets her underwear.
- There may be noticeable flakes of vernix caseosa on the underwear, pads or on the thighs.
- The patient may complain of reduced uterine size compared to before the rupture.
- She may feel tightening of the uterus and “painful” or “uncomfortable” foetal movements due to the closer foetal contact with the uterine walls.

Examination:

General and pelvic examination may reveal the following:

- Abdominal examination may indicate some degree of reduced uterine size in relation to the LNMP depending on the amount of fluid lost.

- Sterile speculum examination may reveal a pool of clear fluid in the posterior fornix with or without flakes of vernix caseosa. If there is no obvious leakage from the Cervicalos, this may be provoked through the Valsalva Manoeuvre.

- Speculum examination may reveal cervical dilatation, and the presence or absence of cord prolapse will be confirmed.

- If the drainage of liquor is not confirmed at the initial examination, the patient is asked to maintain a vulval pad which is examined at regular intervals.

- Digital examination should not be done as it increases the risk of chorioamnionitis, unless if the patient is in labour.

Laboratory tests:

- Urine for MCS
- FBC ,HVS,RFT

Ultra sound Examinations

- Confirm gestation, fetal weight and liquor volume
- Oligohydramnios with a history suggestive of PPROM supports the diagnosis
- A normal examination does not rule out PPROM
- Does not diagnose PPROM

A. <u>Complications of PPROM</u>

Maternal

- Chorioamnionitis
- Puerperal endometritis, which may lead to, generalized puerperal sepsis.
- Increased risk of caesarean delivery

Neonatal

- Prematurity
- Neonatal sepsis.
- Placental separation, which may lead to IUFD.
- Pathological flexures of the foetus.
- Neonatal lung hypoplasia.

Management

PPROM has the potential of developing into prolonged rupture of membranes, which carries high risk of chorioamnionitis and eventual puerperal sepsis. All women with PPROM should be managed as in-patients.

- Only sterile speculum vaginal examination is permitted for patients whose delivery is not imminent.
- Digital examination in these patients' poses increased risk of infection and should be avoided. It should be done in patients who are being induced or who go into spontaneous labour.

- Patients presenting with premature rupture of membranes at 28-34 weeks may benefit from tocolytic treatment for the first 24 - 48 hours of the management to allow for accelerated foetal lung maturity by dexamethasone.

- If the decision to delay delivery is made, the patient should be monitored by:

    - Observation of the amount and colour of liquor draining every 4 hours (the patient should be provided with pads).
    - Observation of any bleeding per vaginum.
    - Noting any foul smell from the woman's genital area.
    - taking 4 hourly maternal pulse and temperature as well as foetal heart rate
    - checking twice weekly maternal FBC
    - Urine and HVS swab on presentation for culture and sensitivity tests.
    - checking through gentle palpation for any tenderness developing over the uterus (uterine irritability).
    - Noting any complaint of dysuria by the patient.
    - Serial ultra sound scan

The mode of delivery of PPROM is dictated by a number of factors. These include:

a. Gestational age
b. Estimated weight of the foetus
c. The status of the foetus

d. Other obstetrical complications and or unfavourable history e.g. APH, BOH.
e. Medical complications of pregnancy: e.g. diabetes, cardiac disease, HDP, chronic renal disease.
f. Presence of infections e.g.amnionitis, UTI, HIV/AIDS, STD.

The general line of management is as outlined in the **Flow Chart 4.0**. Also refer to the management of pre-term labour.

Special notes on PPROM:

1. Many women may not accurately recall the time of the rupture of the membranes. The time lapse is either understated because the initial trickle of liquor was ignored or it is exaggerated due to anxiety and apprehension. It is therefore, necessary to probe carefully for the time and even date and day.

2. The continued drainage of liquor may lead to descent of the cord in the lower uterine segment and become compressed by the presenting part (if it does not prolapse) leading to foetal asphyxia and eventual IUFD

3. The severely diminished amniotic fluid may lead to placental separation and APH. Amniotic fluid acts as a protective buffer between the foetus and uterine walls. The removal of this buffer often leads to pathological foetal flexions and wrinkling of the skin besides the exposure to ascending infection from the lower maternal genitalia.

4. Women should receive prophylactic antibiotics

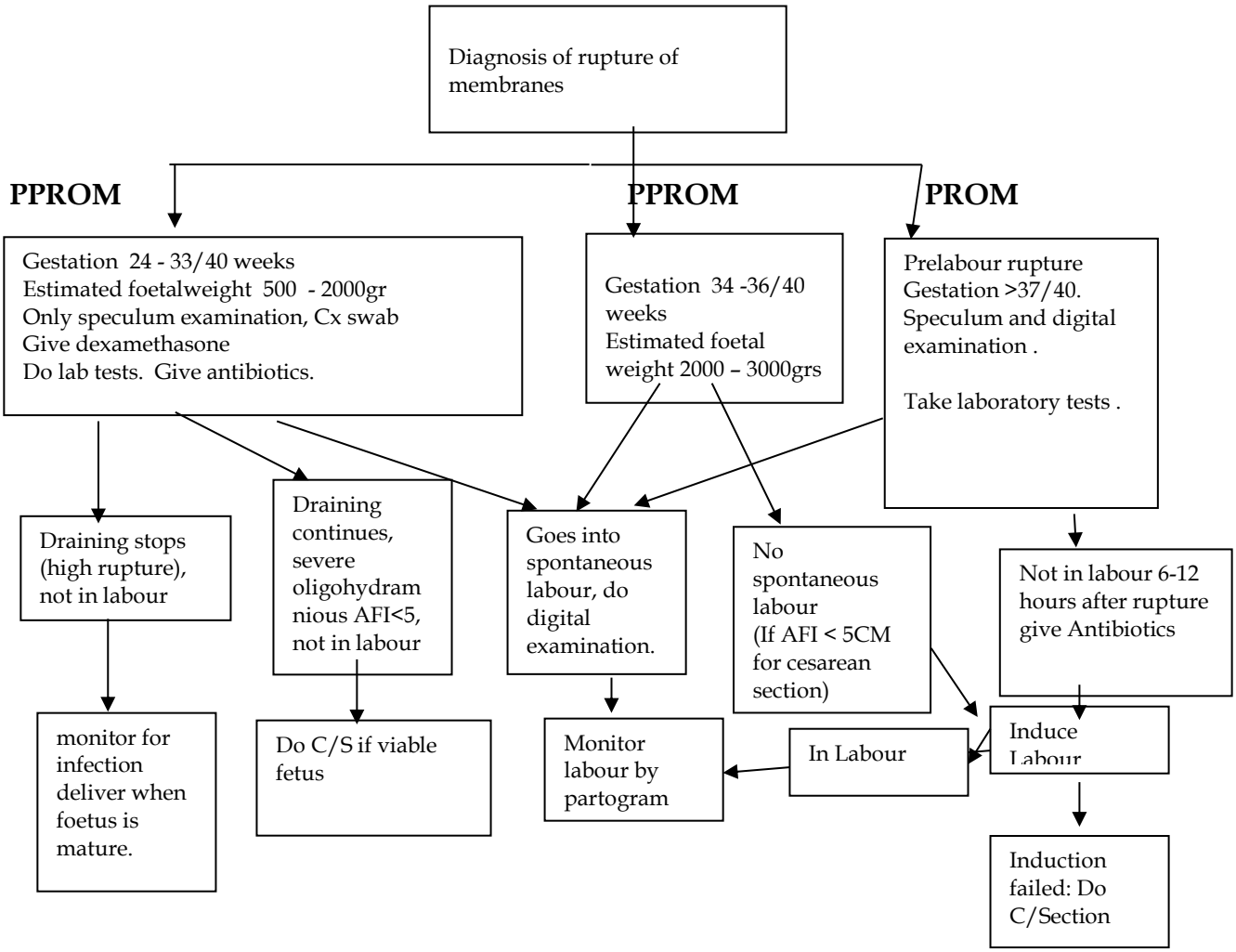
5. If there is any sign of infection in all cases of PPROM urgent delivery should be instituted.

6. The signs and symptoms of infection are:

   - fever - elevated temperature with or without chills.
   - both maternal and foetal tachycardia with maternal pulse rate of >100 beats per minute and foetal heart beat of > 160 per minute.
   - Foul smelling vaginal secretion or liquor itself.
   - maternal leukocytosis of >16,000
   - uterine tenderness
   - dysuria

7.Women presenting with PPROM after 34 weeks should be delivered after counselling

Flow Chart 4.0 MANAGEMENT OF RUPTURED MEMBRANES



NB* HIV positive women presenting with PROM should be induced as per PMTCT guidelines.

5. BREECH DELIVERY

Definitions:

- **Breech**: the caudal pole of the foetus is called breech
- **Breech presentation**: When the foetus presents with the breech over the pelvic inlet or lower in the birth canal. Breech presentation is more frequent in premature infants with the percentage gradually decreasing from about 40% of infants at 20 weeks to about 3% of term infants.
- **Breech delivery:** When the delivery occurs with the foetus in breech presentation.

Types of Breech Presentations:

There are three main types of breech presentations.

- **Frank Breech:** The hips are flexed and the knees are extended over the foetal abdomen.
- **Complete Breech:**Both hip and knee joints are flexed.
- **Footling/Incomplete breech:**One or both hips extended with one or both feet presenting.

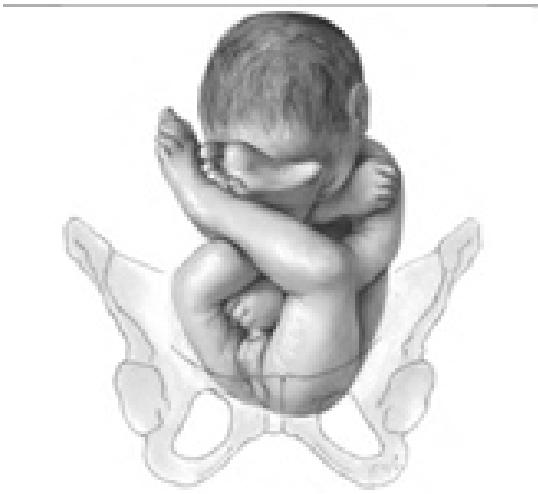
Diagnosis:

The diagnosis of the breech can be made through various clinical and ultra sound scan approaches:

- Palpation and ballottement of the presenting foetal pole at the pelvic brim: Unlike the vertex, the breech is soft with an irregular outline and is non-ballottable. A globular firm ballottable mass (fetal head) can be felt in the fundus of the uterus.
- Auscultation of the foetal heart: Unlike in cephalic presentation the foetal heartbeat is best pronounced at an area on the abdomen above the level of the umbilicus.
- Bimanual pelvic examination: soft mass with an irregular outline can be felt through the fornices in breech presentation.
- Ultrasonography

BREECH PRESENTATIONS

Figure 1.0: Breech Presentations



Frank breech presentation

Complete breech presentation

Footling breech

Differential Diagnosis

- Face presentation
- Foetal abnormalities, e.g. anencephaly
- Other Malpresentation e.g. shoulder presentation
- Compound presentation: hand or foot accompanying the breech or vertex.

Management of Breech Presentation and Delivery

Antenatal Assessment:

- the fetal size
- rule out pelvic contractures
- parity

Assessment and evaluation of the "Risk" factors like:

- Previous obstetric history and performance e.g. Caesarean section, previous scar prolonged difficult vaginal delivery, bad obstetric history (BOH)

- Superimposed medical disease (hypertension, diabetes mellitus, etc.)

Table 3.0: CRITERIA FOR MODE OF DELIVERY IN BREECH PRESENTATION

Vaginal Delivery	Caesarean Section
• Multi-Para • Frank/Flexed breech • Estimated foetal weight less than 3.5 kg • Normal pelvis • No indication for Caesarean section • Confirmed lethal foetal abnormalities • Patient presenting in advanced labour • Premature foetus <28 weeks or <1000grams	• Footling breech • Estimated foetal weight >3.5kgs • Contracted or borderline pelvis • Prolonged rupture of membranes (24 hrs.) • Persistent high breech in labour • All primigravida more than 37 weeks • Previous caesarean section • Pelvic tumours • Any contraindication to vaginal delivery

NB: For 1-1.5 Kg c/s can be done if there are other obstetrical reasons associated

Vaginal Delivery

Basic Rules:

- Avoid artificial rupture of the membranes before the breech is engaged.
- Vaginal examination immediately after spontaneous rupture of membranes is mandatory to exclude cord prolapse.
- There is no VBAC in breech presentation
- Active interference as part of assisted breech delivery is permitted only in the second stage and should be deferred to as late as possible stage.
- ***VACUUM EXTRACTION IS ABSOLUTELY CONTRAINDICATED***

Spontaneous Vaginal Breech Delivery:

Vermelin Method

When vaginal delivery is permitted, labour is allowed to progress under normal routine monitoring until the second stage.
In the late second stage when the breech exerts pressure on the perineum, a mediolateral episiotomy may be made under local anaesthesia. The breech is then let to be delivered spontaneously till the scapulae are visible. Until this stage the breech should not be interfered with except for possible passive support to maintain the habitus (maintain sacro-anterior position).

Bracht's Method:

- Once the scapulae are visible the breech is held with both hands and with thumbs on the sacrum and the rest of the fingers on the thighs and lower back of the foetus. The shoulders are brought in the transverse diameter of the pelvic exit.
- The back of the baby is lifted towards the mother's abdomen without over-extending it to avoid spinal injury.
- The arms are usually delivered spontaneously
- The foetus is then lowered towards the perineum until the occiput comes beneath the symphysis pubic bone.
- The foetus is again lifted towards the abdomen of the mother and the chin, mouth, nose and the brow emerge from the vagina spontaneously.

Advantages of Bracht's Method:

- No intra vaginal manipulation
- No traction on the baby
- No forced rotation of the infant's thorax

It is contra-indicated in:

- Sacro-posterior position
- Extended foetal arms
- Pelvic and soft tissue abnormalities e.gperineal fibrosis
- Uterine inertia (poor contractions)

The success of the method is highly dependent on maternal cooperation.

Complete Breech Extraction (Delivery of retained twin)

- ***CAESAREAN SECTION IS INDICATED IF NO SKILL IN BREECH EXTRACTION FOR SECOND TWIN***

Special Notes

I. During breech delivery there should be no pressure on the foetal abdomen to avoid damage to fetal abdominal viscera.

II. When applying Mauriceaus method to deliver the after coming head, not more than two fingers should be inserted in the mouth of the foetus to avoid damage to buccal structures.

III. Careful examination of the birth canal after the completion of the delivery process is mandatory to exclude tears.

IV. Sometimes during the delivery of the after coming head, it may be necessary to apply suprapubic pressure by an assistant to facilitate the delivery of the head and avoid deflexion.

V. To avoid traction and injury to umbilical cord and its compression, a small loop of the cord should be loosened and drawn down as soon as the umbilicus is exposed.

Possible Complications

Maternal:

- Lacerations of the birth canal
- Haemorrhage due to:
  - Lacerations
  - Uterine atony

- Shock, particularly consequent to injudicious breech extraction
- Puerperal sepsis

Foetal:

- Cord prolapse
- Single or double nuchal arm
- Dystocia of the after coming head (extension and hyperotation)

- Intracranial haemorrhage often consequent to abrupt delivery of the head and excessive supra pubic pressure on the head.
- Fractures
- Damage to nerves due to:

    - spinal traction
    - brachial plexus nerve traction

- Aspiration pneumonia commonly due to delayed delivery of the after coming head.
- Omphalitis and septicaemia usually due to premature rupture of the membranes and repeated vaginal examination during labour.
- Permanent wryneck (torticollis). Sometimes this is caused by haemorrhage into sternocledo mastoid muscles followed by fibrosis and contracture.

Precautions against complications

- It is advisable to conduct breech delivery with an intravenous (IV) line in place to expedite administration of emergency drugs.
- No force throughout breech delivery.
- To avoid the force of negative pressure on the after coming head, it should be delivered gradually but avoiding undue delay.
- Vaginal examinations should be as aseptic as possible and unnecessary repeated examinations should be avoided.
- Avoid unnecessary interference with the delivery of the breech (**HANDS OFF**)
- Use of local anaesthesia including pudendal block should be judicious and properly timed.

6. INDUCTION OF LABOUR

Induction of labour is considered when the continuation of pregnancy is prejudicial to the wellbeing of the mother and or the foetus. It is generally expected that once initiated it should follow the normal pattern of labour process. If it fails Caesarean Section is the mode of delivery. Indications for induction of labour must be seriously considered, judged and justified.

A. Indications for Induction of Labour:

1. Post term gestation/post dates
2. Hypertensive Disorders of Pregnancy
3. IUFD
4. IUGR
5. Abruptio Placenta with IUFD
6. PPROM
7. Congenital anomalies that are not compatible with extra-uterine life
8. Severe Polyhydramnious (relative) at term
9. Any obstetric indication

B. Contraindications:

1. Malpresentation
2. Macrosomia (EFW ≥4KG) Clinical assessment supersedes USS.
3. Contracted pelvis
4. Placenta praevia
5. Previous Caesarean Section delivery/Scared uterus
6. Lower genital infections e.g. (Extensive Genital warts, herpes)
7. Grand multi parity due to risk of uterine rupture (Induction only after assessment by a specialist)
8. Malignancy of the birth canal
9. Maternal Cardiac disease

C. Process of Induction:

General preparation of the patient including counselling and information on the procedure, discussion of indications, advantages and disadvantages of induction of labour versus continuing with the pregnancy.

a. FBC, x-match and urinalysis
b. C/S with failed induction

D. Precautions before induction:

Table 4.0: Bishop's Score:

Examination	Points			
	0	**1**	**2**	**3**
Cervical dilatation in cm	<1	1 - 2	3 - 4	5+
Cervical length in cm	3+	2	1	0
Station of presenting part	-3	-2	-1	0
Consistency of cervix	Firm	Medium	Soft	-
Position of cervix	Posterior	Middle	Anterior	-
TOTAL SCORE				

A Bishop score of >6 has higher chances of SVD

E. **Approaches to Induction of Labour**:

Several methods of inducing labour exist: medical, surgical and a combination of both.

1. Medical Induction of Labour:

The medical methods are more successful in induction of labour at term than in preterm pregnancy

Drugs Used: Prostaglandins and Oxytocin; these are two major modes.

Oxytocin: (Pitocin/syntocinon) intravenous administration through a well-regulated system (IV drip or preferably a pump) is recommended.

Prostaglandins; Prostaglandin analogue (Misoprostol/PG gel) is indicated for pre-labour cervical ripening and induction of labour. Prostaglandins provoke uterine activity during any stage of pregnancy or even outside pregnancy. Prostaglandins are synthesized and released locally in the cervix and the myometrium. **Local administration of these (as vaginal pessaries or gel) causes "ripening" of the cervix and therefore sensitizes the uterus to respond more successfully and efficiently to oxytocin.** Prostaglandins may also induce labour on their own. Oxytocin has to be delayed for at least 6 hours after last dose of misprostol.

Methods for induction of labor:

- Oral misoprostol (25 μg, 2-hourly) is recommended for induction of labour. -25 mcg given 2 hourly by 8 doses followed by a 24 hour rest and repeat the cycle if labour has not started, (maximum of 2 cycles).
- Misoprostol is contraindicated for women with previous caesarean section
- Vaginal prostaglandins 0.5mg every 6hours, maximum dose of 1.5mg in 24hrs.If prostaglandins are not available, intravenous oxytocin alone should be used for induction of labour.
- PG gel and misoprostol should not be used in combination. Either should be followed by oxytocin if labour has not started. i.e.: if induction has started with misoprostol, and labour does not start then PG-Gel should not be used to continue the induction process (or vice versa).

Oxytocin induction

- Depending on parity fix a drip with 5 units for multiparas and 10 units for primiparas) in 1 litre of 5% dextrose. Start induction at 10 drops per minute and increase at the rate of 10 drops per minute every 30 minutes till effective contractions are achieved or to a maximum of 60 drops per minute.
- If there is no response (no contractions after 6hours) patient should be taken for C/S and not returned to ANW.
- **Monitor patient every 30 minutes using the cytotec/oxytocin chart**
- Monitor labour closely

2. Mechanical methods for induction of labour***

Amniotomy followed by oxytocin

3. **Combined Approach:**

Induction of labour is more successful when both surgical and medical methods are used concurrently. The application of prostaglandins helps to ripen the cervix and to sensitize uterine muscles. This makes ARM easier and provides a better base for uterine response to oxytocin stimulation.

G. Possible Complications of Induction of Labour:

1. Foetal distress due to hyper stimulation
2. PPH
3. Discordinated uterine action due to inappropriate regulation of oxytocic drip.
4. Rupture of the uterus due to injudicious usage of oxytocin or misoprostol and poor monitoring.
5. Fluid retention
6. Intra partum haemorrhage - Abruptio Placenta
7. Infection (chorioamnionitis)

H. Special Notes of Induction of Labour

1. In case Preterm delivery is indicated, Induction of labour may be delayed for 24hours for administration of corticosteroids for fetal lung maturation. However, if there is an obstetric indication for delivery, this should override any other reason for delaying labour.
2. Avoid NIGHT time Induction of labour at all cost. Induction of labour except in emergency cases should be started early in the morning for better monitoring and decision-making.
3. Gradual drainage of liquor to prevent cord prolapse and presentation must be emphasized. In the event of Polyhydramnious or a high presenting part, controlled/stabilisingamniotomy can be done.
4. When using prostaglandins in gel for ripening of the cervix (or induction of labour) the first application should be preferably in the morning time. Repeat application can be made six hours later if on assessment the patient is not in labour. In the event of Misoprostol use for Induction of Labour, ONLY the oral route is recommended at 25 micrograms 2hourly, and it should be stopped as soon as the patient starts contracting. If the patient has absorbed 200micrograms and the contractions have not started, she may be rested for 24hours if there is no immediate indication for caesarean section, then restart another cycle.
5. If patient is not in labour then proceed to ARM then oxytocin. Labour should be established within six hours after the start of induction process with oxytocin.
6. If Induction fails Caesarean Section should be the mode of delivery.
7. PG Gel is Contraindicated in the event of Ruptured Membranes
8. **Failed Induction**
    a) Gel: after 24hours (Maximum 3 doses) if ARM is not possible
    b) Misoprostol: Rest for 24hours after the first cycle and repeat the cycle if ARM is not possible proceed with Caesarean Section if the second cycle fails (2cycles).
    c) Oxytocin: Expect established labour in six hours. If it fails proceed with Caesarean Section.
9. Induction of labour should be performed only when there is a clear medical indication for it and the expected benefits outweigh its potential harms.
10. In applying the recommendations, consideration must be given to the actual condition, wishes and preferences of each woman, with emphasis being placed on cervical status, the specific method of induction of labour and associated conditions such as parity and rupture of membranes.
11. Induction of labour should be performed with caution since the procedure carries the risk of uterine hyperstimulation, uterine rupture and fetal distress.
12. Wherever induction of labour is carried out, facilities should be available for assessing maternal and fetal well-being.

13. Women receiving oxytocin, misoprostol or other prostaglandins should never be left unattended.
14. Induction of labour should only be carried out in facilities where caesarean section can be performed.

7. OBSTRUCTED LABOUR

1. Definition:

The term "obstructed labour" refers to labour that has failed to progress in the presence of effective uterine contractions due to mechanical obstruction arising from the birth canal (Passage) or the foetus (Passenger) or both. Frequently the cervical dilatation progresses well but corresponding descent of the presenting foetal part does not occur. Obstructed labour is often confused with prolonged labour and vice versa. While obstructed labour is often prolonged, prolonged labour is often not obstructed and may be caused by factors other than mechanical.

2. Causes of Obstructed Labour

a) Maternal Causes:

i. Contracted pelvis
ii. Pelvic tumours e.g. lower uterine segment fibroids, solid ovarian tumours, bladder tumours etc.
iii. Scarring of pelvic tissues e.g. previous surgery on the cervix.
iv. In-born or acquired pelvic skeletal deformities (eg kyphosis/scoliosis)
v. Pelvic Fractures

b) Foetal Causes:

I. Malpresentation,
II. Malposition
III. Macrosomia
IV. Foetal abnormalities e.g hydrocephalus, conjoined twins
V. Multiple pregnancy

c). Feto-maternal causes

- CPD

3. Clinical Presentation:

a. Labour may be prolonged in the presence of effective uterine contractions
b. Lack of descent of the presenting foetal part with effective uterine contractions.

c. Arrest of cervical dilatation in the presence of good regular coordinated uterine contractions.
d. Oedema of the cervix, and in severe cases, vulval oedema.
e. Varying degrees of caput formation and moulding. These may be absent if the presenting foetal head is not fixed into the pelvic brim.

f. Maternal exhaustion and dehydration generally manifested with urinary ketones, haemo concentration and physical weakness.
g. Haematuria

h. Bandl's ring with ballooning of the abdomen

4. Factors Contributing to Obstructed Labour:

a) **Socio-Economic Factors:**

I. Poor nutrition
II. Grand-multiparity
III. Patient's delay in reaching the hospital.
IV. Teenage pregnancy

b) **Health Worker Factors:**

I. Poor antenatal counselling and advice
II. Inadequate antenatal diagnosis and management
III. Delayed referral
IV. Poor management of labour

5. Complications of Obstructed Labour

a) Maternal complications:

i. Maternal distress
ii. Uterine rupture
iii. Antepartum and postpartum haemorrhage
iv. Renal failure
v. Sepsis
vi. Fistulae formation (VVF/RVF)

b) Foetal complications:

I. Foetal distress
II. Foetal brain damage
III. IUFD
IV. Neonatal sepsis
V. Neonatal death

6. Management of Obstructed Labour:

Consequences of obstructed labour are disastrous to the mother and her baby and all efforts, therefore, must be made to eliminate this diagnosis from our obstetric practice. Some of the contributing factors are difficult to eliminate in the community and may be operational for quite some time, and cases of obstructed labour are bound to occur. Strategies for pragmatic and skilled management of these patients are mandatory.

I. For all patients with obstructed labour:DELIVER BY Caesarean Section

II. Set up intravenous drip with dextrose saline for maternal hydration and improved foetal well being.

III. Catheterization of the urinary bladder

IV. Draw blood for FBC, blood group, U&E, rhesus factor and cross match.

V. Start broad spectrum IVprophylactic antibiotics (ampicillin 1-2g QID and metronidazole 500mg TDS)

These emergency measures must be instituted in all cases irrespective of the status of the foetus. All cases of obstructed labour should be delivered by c/section.

7. Prevention of Obstructed Labour:

a) Good Antenatal Care which involves:

   I. proper examination and identification of risk factors at booking.
   II. adequate monitoring and assessment of:
      a. maternal nutrition
      b. adequacy of the pelvis
   III. identification of the risk factors likely to predispose to obstructed labour
   IV. appropriate advice and counselling

b) Timely referral:
- antenatally

c) Efficient Conduct of Labour:
   I. Proper use of PARTOGRAM
   II. accurate observations and their interpretation
   III. timely intervention

d) Well trained and skilled personnel in reproductive health care.

e) Adequate adolescent care including nutrition and sex education.

F) Education to the community on high risk pregnancies

8. Special Notes on Obstructed Labour

a) Administration of oxytocin in a drip after the delivery of the baby is an important prophylactic measure against postpartum haemorrhage, which often occurs as a result of the uterine inertia caused by the inability of the over-stretched uterine muscles to contract after the delivery of the foetus.

b) Babies born after obstructed labour suffer from varying degrees of asphyxia and require pragmatic resuscitation. Availability of paediatric services is therefore crucial for their survival. Where there is no paediatric team, at least basic equipment, drugs and skills in resuscitation must be made available.

c) Decision to perform Caesarean section with an intra-uterine foetal death must be made in the best interest of maternal health. Though obstruction may be overcome by instrumental vaginal delivery, consequences to maternal tissue could be devastating.

d) If a woman previously underwent a c-section for obstructed labour, it is a repeat indication for c-section. The woman should never have a VBAC (vaginal birth after c-section)

9. VARIATIONS IN THE MANAGEMENT OF LABOUR

Various medical and obstetrical complications of pregnancy require that specific adjustments are made in the conduct of labour as described in previous chapters in order to achieve safe and successful delivery. In this chapter the conditions to be considered are:

- Cardiac disease in pregnancy
- Diabetes mellitus
- Multiplepregnancy

Labour and delivery of above conditions should be managed in hospitals with appropriate back up facilities and skilled manpower in obstetrics and paediatrics.

A. Delivery of Twins:

The general pattern of labour monitoring and management is maintained in principle except for the specific observations and interventions outlined in table 7.0.

All multiple pregnancies should be referred to high risk clinic as soon as they are diagnosed for management of the pregnancy, including the delivery plan. Emphasis should be made on the importance of early booking.

a. All multiple pregnancies of more than two foetuses irrespective of their lies and presentations should be delivered by C/S

b. In twin pregnancy, the presentations of the two foetuses are paramount to successful vaginal delivery. The following possibilities exist:

Table 6.0: Mode of delivery for twin presentation (Multiparas)

Presentation	**1st Twin**	**2nd Twin**	**Possible mode of delivery**
Cephalic /Cephalic	Cephalic	Cephalic	Vaginal Delivery
Cephalic /Breech	Cephalic	Breech	Vaginal Delivery
Breech /Breech	Breech	Breech	C/S
Breech /Cephalic	Breech	Cephalic	Caesarean Section
Other combinations	Various	Various	Caesarean Section

The risk involved in the vaginal delivery of the twins in breech /cephalic presentation is the interlocking of the heads of the two foetuses in the pelvis after partial delivery of the first twin. This often leads to the death of one or both foetuses with traumatic consequences to the mother both physically and psychological.

Table 7.0 Management of labour in special conditions

Complication	**Stage of Labour**	**Management**
1.Cardiac Disease All cardiac patients with pulmonary hypertension should never get pregnant. If pregnancy does occur, termination of pregnancy and BTL should be offered.	First Stage	- Inform Paediatrician & Physician if available - Patient should be in a propped up position - Patient to be nursed close to oxygen source and resuscitation tray - Prophylactic antibiotics to be started - I/V line should be inserted - Ensure close monitoring of the cardio-vascular system - Avoid fluid overload. - Maintain medications as prescribed - Give adequate analgesia

These patients should be referred to facilities with specialists as soon as pregnancy is diagnosed (1st trimester) including cardiologist. Mode of delivery to be determined in consultation with cardiologist.	Second Stage Third Stage	- Assist with vacuum delivery if required. - Maintain propped up position - Avoid lithotomy position - **<u>Ergometrine & syntometrine should not be given</u>** - Give cardiac drugs as prescribed - when giving oxytocin in the fourth stage,**give 20IU oxytocin in 200mls N/S to run for 4-6hours and not 1000mls, to avoid fluid overload**
2. Diabetes mellitus	First stage	Inform and liaise with paediatric team and Physician if available - start 500ml of 5% dextrose with sliding scale insulin - hourly RBS - Monitor and maintain blood glucose level at 6-7 mmol/l - start prophylactic antibiotics
	Second stage	- Prepare 10% dextrose for the baby as part of resuscitation -**The baby should always be admitted and monitored for blood sugar**
	Third stage& Fourth stage	Routine management

Besides the specific measures pointed out in this chapter, the rest of labour management should be as described in previous chapters.

NB: Get resuscitation tray ready once you receive the patients with above conditions.

Table 7.0 (continued)

3. Delivery of twins		
Presentation	**Stage of labour**	**Management**
Cephalic/Cephalic: **(1st twin - cephalic, 2nd twin - cephalic)**	1st stage - Latent phase	- Encourage emptying of the bladder. - Establish intravenous line - Monitor labour as in singleton, cephalic. -Psychological support
	1st stage - Active phase	- Monitor maternal and foetal well- being as in singleton - Give analgesia -ARM should be done for obstetric indications, considering HIV status of mother.

	2nd stage	- Conduct delivery of the first twin as in singleton. - Cut the cord of the first twin quickly after delivery and as close as possible to the first twin and between two clamps. - Do not give oxytocin/ergometrine /syntometrine before the delivery of the 2nd twin.(3rd stage has not occurred until 2nd twin has been delivered) - Do V/E immediately after the delivery of the 1st twin to confirm presentation of the 2nd twin and exclude presence of a cord. - If second twin has separate and unruptured membranes do ARM, taking precaution against cord prolapse. - If contractions are delayed add 5 -10 units of oxytocin to the drip to accelerate uterine contractions. - Deliver the 2nd twin as in 1st twin - Conduct third stage as in singleton deliveries.
	Third stage	- Cord traction should be on both cords. - Examine the placenta thoroughly.
	Fourth stage	- Conduct 4th stage as per singleton delivery. Add 40IU oxytocin instead of 20IU to the IV drip

Cephalic/Breech **1st twin - cephalic** **2nd twin – breech**	First stage - latent phase First stage - Active phase	- Manage as in cephalic/cephalic - Manage as in cephalic/cephalic
	Second stage	- Proceed as in cephalic/cephalic - If strong uterine contractions resume within 5 -10 minutes and breech delivery is anticipated within 30 minutes, allow breech to descend- If there is delay in breech descent, deliver by c-section. If expertise are available do breech extraction. - If no contractions add oxytocin 5 – 10 IU - Proceed as in cephalic/cephalic presentation.

B. Complications of Labour and Delivery in special conditions:

a) Cardiac Disease

1. Cardiac failure due to:
    - circulatory overload from fluid infusion
    - stress of labour
    - inappropriate positioning of the patient during labour and delivery.
    - pre-existing anaemia
2. Postpartum bacterial endocarditis
3. Postpartum thromboembolic disease (e.g following strict bed confinement).
4. Maternal death.

b) **Diabetes**

1. Diabetic Keto-acidosis or hypoglycaemia as a resultant of poor intrapartum serum glucose control.
2. Premature rupture of membranes which predisposes to infection.
3. Prolonged and obstructed labour due to foetal macrosomia.
4. Cord prolapse and abruptio placentae in cases of polyhydramnios.
5. Puerperalsepsis.

6. Foetal hypoxia.
7. Neonatal hypoglycaemia and hypocalcaemia.
8. PPH

c) Twin Delivery

1. Premature labour.
2. PROM and PPROM
3. Cord prolapse and/or compression at SROM or ARM.
4. Cord entanglement.
5. Failure to recognize distress of one of the foetuses which may result in IUFD.
6. Change of presentation of the 2nd twin after the delivery of the first twin especially in cases of polyhydramnios and prematurity. This may lead to obstruction.
7. Prolonged labour due to over distended uterine walls leading to poorly coordinated contractions.
8. Accelerated or early separation of the placenta placing the second twin at increased risk of IUFD (Intrauterine foetal Death).
9. PPH as a result of uterine inertia.
10. Increased incidence of operative delivery.
11. Foetal intra ventricular haemorrhage, particularly of the 2nd twin.
12. Foetal abnormalities e.g. conjoined twins making vaginal delivery impossible.
13. Neonatal Death from prematurity.

C. Special notes

a) Cardiac Disease:

All these patients should have an Echocardiogram and cardiology review done during pregnancy

1. Patients with cardiac disease should be nursed in propped up position to avoid cardio -pulmonary distress. Oxygen source must always be close by.
2. The classification of cardiac disease based on symptoms by the New York Heart Association is a rough guideline and does not accurately assess the severity of the disease.

Any physical or mental stress can precipitate change in the classification. The management of labour must take note of this and consider any of the grades as a volatile state.

Table 7.1: The New York Heart Associations classification

Grade	Symptoms
I	No symptoms. No limitation to ordinary physical activity.
II	Slight dyspnoea on moderate activity e.g. climbing stairs.
III	Severe dyspnoea and or chest pain with mild exertion e.g. taking a walk.
1V	Severe limitation with dyspnoea and or chest pain at rest and or symptoms of heart failure.

In obstetrics cardiac patients remain in the severest grade attained even if they have been treated and re-graded to less severe grade by the physicians. This is because the symptom based grading is unpredictable in the presence of a stressful condition like pregnancy and labour.

3. Pregnant women with heart disease irrespective of the grade should be delivered in a hospital with adequate skills and facilities for resuscitation.

4. During labour, fluid overload should be avoided, though labour and delivery should be conducted with an IV line in place to expedite emergency medication if the need arises.
5. Throughout labour and delivery a resuscitative tray should be prepared and placed within easy reach. The tray should include drugs like; morphine, furosemide, adrenaline, pethidine, and oxytocin.

6. Pain and anxiety relief must be effectively maintained throughout labour and the 2nd stage should be assisted with vacuum extraction to avoid maternal exertion.

7. For similar reasons as in patients with hypertension, ergots should be avoided as they may precipitate sudden circulatory overload and heart failure.

8. The first 4 to 6 hours after delivery are critical in cardiac patients. Vigilant observations of BP, pulse, temp,fluid balance and blood loss must be kept until there is cardio-vascular stabilization.

9. A reasonable degree of activity for cardiac patients is advised in the puerperium. Even those in severe grades physical activity in bed should be encouraged to minimize the risk of thrombo embolic disease.

10. Cardiac patients are most vulnerable to developing puerperal infections. The antibiotics started in the first stage of labour should be continued in the puerperium.

b) Diabetes:

1. Diabetic patients like all patients should never be starved while in labour.

2. Unless in cases of emergency, diabetic patients should be delivered in hospitals with adequate skills and neonatal care.

3. Babies of diabetic mothers are prone to developing hypoglycaemia in the first hours after birth, particularly if maternal glucose level was not well controlled. In facilities without skilled laboratory back up for monitoring neonatal glucose soon after birth, giving 10ml of 10% dextrose to the baby through the umbilical vein could be life saving. The mainstay of the management, however is early feeding of the infant.

4. Diabetic mothers are prone to developing puerperal infections.

c) Twin delivery:

1. Patients with multiple pregnancies should be referred to hospital at less than 16 weeks of gestation; chorionicity should be determined as early as possible. A delivery plan should be advised as early as possible.

2. All patients with multiple pregnancies should have their blood taken for x-match when they go into labour.

3. Twin pregnancies should be monitored in labour with an IV line to expedite the administration of drugs in case of emergency.

4. The delivery of the second twin should be accomplished within 30 minutes after the delivery of the first twin. Further delay could lead to asphyxia and IUFD as a result of placental separation and intrauterine aspiration by the foetus. Oxytocin is given with the delivery of the second twin.

5. During labour the monitoring of foetal well-being must recognize the presence of two foetuses particularly with regard to the foetal heart beats.

SECTION B: SPECIAL PROCEDURES

6. MANUAL REMOVAL OF RETAINED PLACENTA

Definition: The evacuation of a retained placenta from the uterine cavity using a hand rather than instruments. This procedure should preferably be done in the operating theatre.

Diagnosis With the current active management of the third stage of labour, a diagnosis of retained placenta should be made if the placenta is not delivered within 30 minutes after the delivery or expulsion of the foetus.

A. Causes and Predisposing Conditions to Retained Placenta

1. Uterine Inertia: this is when there is poor uterine retraction and contraction after the second stage of labour. The placenta fails to separate completely or only separates partially. The placenta may be separated completely but is not expelled through the cervxidue to lack of propulsive contractions of the uterus.

2. Full bladder: this may cause mechanical obstruction or interfere with nerve impulses to the uterus due to shared innervation.

3. Uterine Fibroids: these may cause poor and uncoordinated contraction of the uterus leading to incomplete separation of the placenta.

4. Uterine abnormalities e.discornuate uterus, septatus uterus. These abnormalities may also cause adherent placentas.

5. Premature closure of the cervix after the delivery of the foetus.

6. Large Placenta: this may interfere with the uterine contractions and subsequent expulsion of the placenta.

7. Injudicious manipulation of the uterus after the second stage of labour may precipitate this complication by causing discordinate uterine contractions.

8. Dichorionic twins: the presence of two separate placentae may lead to expulsion of one and retention of the other. Abnormal placentae e.succenturiate and bipartite placentas: often the accessory cotyledon and the second lobe respectively may be retained after expulsion of the other part of the placenta.

9. Abnormaly adherent placenta

B. **Indications:**
Manual removal of the placenta is indicated if:

1. The placenta remains undelivered for more than 30 minutes after the delivery of the foetus.

2. There is significant haemorrhage after the delivery of the foetus even before 30 minutes are over.

3. There is incomplete delivery of the placenta

C. Required Conditions:
For successful manual removal of the placenta:

1. The urinary bladder should be empty
2. The cervical canal should be open enough to allow the hand into the uterine cavity.
3. The patient should be relaxed and sedated.

Before manual removal of the placenta is performed, an attempt at delivery through controlled cord traction should be made. Often this is achieved after emptying of the bladder and in the absence of significant haemorrhage.

D. Essential Instruments:
1. Speculum (Sims): this is necessary for inspection of the birth canal to exclude tears after removal of the placenta.

2. Urinary catheter

3. Sponge holding forceps: to be used for aseptic preparation of the vulva and the surrounding areas.

4. A large kidney dish to hold the placenta and blood

E. The Procedure:
1. Temporarily stop the oxytocin the was put up for normal 4th stage during the procedure.

2. Give prophylactic antibiotics: Ampicillin2g IV and metronidazole 500mg IV

3. The patient shouldbe sedated with 5-10 mg of diazepam plus 50-100mg of pethedine given separately intravenously slowly for 2 - 3 minutes. Oxygen should be within reach.

4. The person to perform the procedure must scrub the hands and arms up to the elbows and put on sterile gloves. It is advisable to use the long gloves reaching the elbows to avoid contact with the patients' blood. Eye goggles are advised.

5. Using the sponge holding forceps and swabs or cotton soaked in antiseptic solution, the vulva and the surrounding area are aseptically prepared.

6. With the left hand providing pressure on the uterine fundus through the abdominal wall downwards the right hand is made a funnel shape and is gently inserted into the vagina and through the open cervix into the uterine cavity.

7. Using the tip of the fingers the placental margin is located. The separation is achieved through sideway slicing movements of the tip of the fingers starting from the margin.

8. The placenta can be left to slip off past the hand into the vagina or the hand can be removed grasping the whole completely separated placenta.

9. The uterine cavity is explored digitally for:

   - any abnormality
   - any evidence of uterine rupture
   - any remains of the placental tissue and membranes

8. Examination of the placenta for completeness

9. Repair any tears, lacerations and episiotomy if it was done

10. Patient must be monitored closely. The oxytocin drip can then be recommenced as per 4th stage.

F. Caution With Manual Removal of Placenta:

I. Suspected Ruptured uterus: The manual manipulations may worsen the uterine tear and provoke more intra-peritoneal bleeding.

Previous C-section – care should be taken particularly if the placenta is anteriorly located. There is high risk of a morbidly adherent placenta.

2. After attempting the procedure once and it fails one should suspect an abnormally adherent placenta. Call for senior help.

G. Advantages:

Manual removal of the placenta:

1. Prevents prolonged 3rd stage of labour
2. Minimizes blood loss
3. Provides opportunity to explore the uterine cavity. .
4. Reduce the risk of perforations

H. Complications:

1. Separation of the placenta may provoke haemorrhage
2. Puerperal sepsis may occur

NB: To avoid accelerated closure of the cervix leading to retention of the placenta, all kinds of unnecessary manipulation of the uterus after the second stage of labour must be discouraged. Timely diagnosis and management is also important.

I. Precautions

I. An intravenous line should be set up before starting removal of the placenta to expedite administration of oxytocics or ergometrine to facilitate uterine contraction after removal of the placenta.

II. Bimanual uterine massage should follow the removal of the placenta to enhance uterine contractibility and expulsion of blood clots.

III. Prophylaxis with broad-spectrum antibiotics should be provided to the patient.

IV. 4th stage should be done comprehensively

J. Special Notes on Manual Removal of Placenta:

I. A distinction must be made between unseparated and separated retained placentas. The former requires separation and removal while the latter needs only to be removed.

II. If the placenta is adherent and resists gentle separation, force must not be used. The placenta should be removed in theatre under special precautions with preparedness for laparotomy. General anaesthesia and availability of blood for possible transfusion are necessary.

III. If the cervixis not dilated sufficiently enough to allow the hand through into the uterine cavity instrumental removal of the placenta in theatre should be arranged.

IV. Identify and manage haemorrhagic shock.

2. VACUUM EXTRACTION

Definition: The use of a vacuum extractor with a ventouse applied to the presenting head of the foetus to expedite its delivery is referred to as vacuum extraction.

The indications for vacuum extraction are:

1. Delayed second stage of labour
2. Foetal distress in second stage of labour
3. Maternal medical disease requiring minimal maternal effort or exertion in the second stage of labour e.g. cardiac disease, severe pre-eclampsia

B. Necessary Conditions:

For a successful vacuum extraction certain conditions must prevail. These include:

1. The foetus must be presenting with the vertex and should be term.
2. The cervix should be fully dilated.
3. The presenting part of the foetal head should be well below the level of the ischial spines. The station should be at least +1, and the foetal head should not be palpable abdominally. Foetal position should be known.
4. The amniotic membranes must be ruptured.
5. The urinary bladder must be emptied.
6. There must be no clinical cephalopelvic disproportion.
7. Episiotomy may be necessary.
8. Appropriate instruments must be available.
9. The cooperation of the patient is necessary and should be solicited.
10. Operating theatre should be alerted. In the event of failure, a c-section will be required.

C. Instruments:

1. Manual Type: This consists of a bottle connected to a manual pump, a manometer to indicate the level of pressure and a suction cup (ventouse) with its attachments, which is applied to the presenting foetal head.

2. Electric Type: This consists of an electric vacuum extractor with a built-in manometer. It is connected to the mains and by tubing to the suction cup.

The electric type is more convenient and easy to manipulate during use. The manual type is more cumbersome and requires an assistant to operate the manual pump. However, this latter type is handier in areas without electricity or where there is irregular electricity supply. It is advisable to have this equipment as a stand-by option even when the electric model is available. Silicon cups are preferable but metallic cups could be used when silicon cups are not available.

D. The Procedure:

Careful evaluation and assessment of the patient is the key to successful vacuum extraction. Critical review of the indication and accurate assessment are necessary. Verbal consent from the patient should be sought after adequate explanation of the procedure.

1. The patient is placed in lithotomy position and external genitalia and surrounding areas are cleaned with antiseptic solution. The operator must wear sterile gloves.

2. A final vaginal examination before application of the ventouse is mandatory. The bladder should then be emptied.

3. The suction cup is connected to the vacuum extractor with rubber tubing. The connecting tube must be long enough to avoid contamination of the operating area.
4. The ventouse is inserted into the vagina obliquely to avoid bruising the vaginal wall and the urethra. It is then applied onto the vertex. The vertex is approximately 1cm anterior to the posterior fontanelle. The ventouse should not be applied over a fontanelle. The index and middle fingers are passed around the suction cup to ascertain that no soft tissues of the birth canal have been included.

5. If episiotomy is planned, it should be done prior to application of the ventouse. Infiltration of the perineum with Lignocaine is a requirement. An episiotomy is not mandatory.

6. Controlled negative pressure (of up to 0.7 - 0.8kg per sq. cm) is developed gradually.

7. During uterine contraction the parturient is encouraged to bear down and traction in the direction of the delivery axis is applied. Do not apply traction without uterine contraction.
8. Once the head is delivered, the pressure is gradually released and the delivery proceeds in the normal manner.

9. Careful inspection of the birth canal must be done after the delivery of the placenta to exclude trauma to the birth canal.

10. If the ventouse cup detaches (''pops off'') twice during application of traction, or there is no foetal descent after two contractions/pulls the procedure has failed. Caesarean Section is indicated.

N.B: Delivery by vacuum extraction should closely imitate the normal delivery process maintaining the usual mechanism of labour. Never use the cup to actively rotate the baby's head.

E. Complications:

Maternal:
1. Genital trauma/tears(cervical, vaginal, perineal).
2. Haemorrhage from tears and/or uterine inertia.
3. Puerperal sepsis.

Foetal:
1. Cephalic haematoma and scalp ecchymosis.
2. Tentorial tears and intracranial damage.
3. Damage to other foetal organs e.g. eyes, ears.
4. Neonatal sepsis.

F. Precautions:

1. Careful evaluation of the indications for vacuum extraction.

2. Meticulous assessment of the conditions necessary for successful vacuum extraction.

3. Proper application of the ventouse on the vertex without inclusion of the soft tissues of the birth canal.

4. Gradual increase and persistent maintenance of negative pressure at optimum level. Excessive force is not necessary during vacuum extraction if proper assessment has been done.

5. Normal mechanism of labour should be maintained.

6. Extraction time should be as short as possible, preferably not longer than 10 minutes.
7. Intravenous line should be maintained during the procedure to expedite administration of drugs as necessary.

H. Special Notes:

In the context of Safe Motherhood (i.e. preservation of the life and good health of the mother and child):-

1. The practice of high vacuum extraction has been eliminated. It should not be attempted in any circumstance.

2. "Trial vacuum" has no place in modern obstetrics. This refers to attempt of Vacuum extraction in absence of all the required conditions

3. Failure of traction (ventouse coming off) calls for reassessment of the conditions and indications for vaccum extraction and consideration of c-section

4. The use of forceps even in the most experiencedhands carries high risk of morbidity to both the mother and the baby.

3. REPAIR OF EPISIOTOMY AND PERINEAL TEARS

A. Anatomical Considerations

1. **Perineal body:**
This consists of the outer skin, the underlying tissues between the anal orifice and the vaginal entrance (which include adipose tissue and muscles) and vaginal mucosa.

2. **The muscles involved are:**
   - External sphincter ani muscle.
   - Superficial transverse perineal muscle.
   - Bulbo-spongiosus muscle.
   - Pubococcygeal and puborectal parts of levatorani muscle.

ANATOMY OF THE PERINEAL BODY (PELVIC FLOOR)

INSERT PICTURE FROM PAGE 82

DEGREES OF PERINEAL TEARS (INSERT PICTURE FROM PAGE 83**)**

Table 8.0 B. Types of Perineal Tears

Degree of Tear	Tissue Involved
1st degree	Vaginal Mucosa and or the skin
2nd degree	The above + superficial fascia and superficial transverse perineal muscle
3rd degree	All the above + external and internal sphincter ani muscle
4th degree	All the above and involvement into the rectal mucosa

C. Basic Instruments:

- Surgical needles and absorbable sutures like, dexon, vicryl (numbers. 2-0, 0)
- Needle holder.
- Dissecting forceps, toothed and non-toothed.
- Pair of scissors.
- Kidney dish.
- 1% or 2% lignocaine solution or equivalent.
- Tissue forceps: "little woods" or "allis".
- Sponge holding forceps
- Gloves
- Syringes (10ml) and hypodermic needles
- Sims Speculum

D. Repair of Episiotomy, 1st and 2nd Degree Perineal Tears:

Episiotomy is not necessary in all deliveries. Careful and timely assessment is necessary.Episiotomy is doneto avoid irregular tears which may result in inappropriate repair and poor healing. Basic principles of repair are similar to those described for 3rd degree perineal tears.

Steps involved:
1. identify

E. Techniques of Repair of 3rd degree Tear:

1. The patient should be in lithotomy position. It should be repaired in the operating theatre.

2. Aseptic preparation of the surgeon and the external genitalia should be performed as described earlier.

3. Adequate infiltration of the operation area with local or regional anaesthetic is often achieved with 10-20mls of lignocaine or equivalent.

4. Identify the tissues involved:

    - vaginal mucosa
    - the superficial transverse perineal muscle
    - external sphincter anal muscle
    - the skin

5. Repair should strive to restore the anatomy of the perineum as much as possible to its original status:

    - approximate them across.
    - repair the vaginal wall
    - identify the apex of the episiotomy, the first suture should be placed above the apex
    - **repair the vaginal mucosa with a running non-**locking suture. The last suture placed at the hymen ring and the knot placed there.
    - **The perineal muscles are then approximated and repaired using a running non-locking suture.** The same suture can be used.
    - repair the skin using a subcuticular suture.

V.3rd and 4th degree tears should be cared for as in patients. Antibiotics and stool softeners are mandatory. Referral should be made to the physiotherapist.

F. Fourth degree tear: Refer to a skilled health care provider

G. Complications and their management

- If a haematoma is observed, open and drain it. If there are no signs of infection and the bleeding has stopped, the wound can be sutured.

- If there are signs of infection, open and drain the wound. Remove infected sutures and debride the wound.

- Treat infected episiotomy with oral antibiotics – Amoxycillin 500mg PO TDS
-
- If the infection is deep, involves muscles and is causing necrosis (necrotizing fasciitis), give a combination of antibiotics until necrotic tissue has been removed and the woman is fever-free for 48 hours.
- Ampicillin 1-2g every 6 hours
- Plus metronidazole 500mgIVevery 8 hours.
- Once the woman is fever free for 48 hours give:
- Amoxycillin 500mg orally 4 times a day for 5 days (or appropriate alternative).

H. Conditions to improve Outcome of Episiotomy Repair

- Good light
- Lithotomy bed
- Good techniques, especially hemostasis.
- Aseptic techniques
- Supervision of practitioners in training
- Adequate anaesthesia
- Health education

I. Special Notes:

1. Careful anatomical approximation of tissue layers is important.
   Two important landmarks in the restoration of the vagina and vulva are remnants of the hymenal ring and the border between the mucosa of the introitus and the skin.

2. Absorbable sutures only should be used for repair of tissue deeper than the skin.s. If infection is anticipated, then non-absorbable sutures may be used on the skin to be removed after healing.

3. Mass ligatures should not be done.

4. Sutures should not be made tight to avoid obstructing blood circulation, which is necessary for good healing and less fibrosis.

5. Preferably bury the suture knots.

6. In cases of 3rd degree tears, provide prophylaxis with broad spectrum antibiotics.

7. Urinary catheterization may aid in delineating anatomy and aiding in repair – particularly in involvement of peri-urethral lacerations

NB: The described repair of the 3rd degree perineal tear refers to fresh tears. Old tears are technically more difficult and involve excision of fibrous tissues and exposure of the muscles involved. This procedure should be done in theatre under general or regional anaesthesia.

Management of Neglected tears

A perineal tear is always contaminated with faecal material. If closure is delayed more than 12 hours, infection is inevitable. The patient should be referred to a specialist.

Perineal tears not sutured within 24hrs should be treated with antibiotics and arranged for repair after 6 weeks post-partum.

4. CAESAREAN SECTION

Definitions

Caesarean section: Delivery of a viable foetus by making an incision through the anterior abdominal wall and the uterus.

Hysterotomy: Incision through the anterior abdominal wall and the uterus for delivery of a pre-viable foetus.

A. Indications for Caesarean Section:

1. Maternal:

- Scarred uterus - previous Caesarean section/s, myomectomy, scarred cervixcervix.
- Placenta praevia.
- Abruption placentae that threatens the well-being of the foetus and mother.
- Failed induction.
- Impending uterine rupture.

- Pelvic scarring and deformity resulting from pelvic floor surgery (eg VVF/RVF repair)and trauma or congenital malformation.
- Maternal genital infections e.g. genital warts, lympho granuloma venereum (LGV) active Herpes simplex infection
- Carcinoma of the cervix.
- Abnormalities of the bony pelvis
- Maternal medical or obstetric conditions posing a danger to maternal wellbeing eg eclampsia, severe pre-eclampsia

2. Foetal:

- Malpresentation.
- Multiple pregnancy of more than 2 foetuses and certain presentations in twin pregnancy.
- Macrosomia.
- Cord prolapse.
- Foetal distress.
- Hydrocephalus.

3. Feto-maternal: Cephalo-pelvic disproportion (CPD)

4. Emergency Indications

- CPD
- Foetal Distress
- Cord Prolapse
- APCervical dystocia
- Eclampsia
- Impending uterine rupture
- Obstructed labour
- Footling breech
- Hand prolapsed
- Transverse lie

5.Relative Indications

These are factors which individually may not stand as valid indications for Caesarean section, but in combination with other factors do stand. Some of these have been mentioned as indications because frequently are strong enough to stand on their own.

- Bad Obstetric History (BOH)

  - recurrent miscarriage
  - early neonatal deaths
  - labour related foetal damage

- History of infertility
- Elderly primigravida (>35 years)
- Diabetes mellitus
- Prematurity
- Prolonged rupture of membranes
- HIV positive
- Previous vaginoplastic surgeries
- Placenta praevia
- Female genital mutilation

C. Types of Caesarean Sections

Classification of Caesarean section is based on the position of the uterine incision.

1. Lower Segment Caesarean Section (LSCS)

The uterine incision is made transversely in the anatomical border of lower and upper uterine segments. This is the preferred incision.

2. Classical Caesarean Section:

In classical Caesarean section, a vertical incision is made in the anterior uterine wall starting from the border between lower and upper uterine segments and extending upwards towards the fundus. This is done only for special indications.

Indications:

- Inaccessible lower uterine segment due to extensive adhesions and fibrosis
- Tumours (fibroids) in the lower uterine segment.
- Transverse lie with reduced amniotic fluid
- Uterine structural abnormalities (e.g. arcuate uterus with transverse foetal lie).

-when no lower segment has not yet formed – usually in preterm babies

D. Peri-mortem C-Section

. Emergent delivery of a viable foetus in the setting of maternal injury/disease to reduce the haemodynamic burden of the uterus on the mother. Both foetus and mother may or may not survive. Delivery of the foetus should be done within 4 minutes of maternal collapse. It is exceedingly rare. This indication may provoke many ethical issues. Caution is therefore advised.

Table 9.0:Preparation of Patients for Elective C/S

Activity	Issues to Consider
1. Timing of the C/S	1. Indications 2. Gestation 3. Informed consent
2. Assessment of maternal condition	1. Blood investigations and advance correction of anaemia 2. Renal function 3. Liver function 4. Nutritional status 5. Emotional status (Counselling) 6. HIV status & PMTCT enrolment
3. Assessment of the foetus	1. Foetal maturity 2. Placental localization 3. Foetal presentation 4. Multiple pregnancy
4. Anaesthetic review	1. Anaesthetic risks 2. Pre-medication and other prescriptions 3. Feeding regime
5. Assessment on day of operation	1. Review documentation 2. Final review of physical status of mother and foetus 3. Premedication 4. Urinalysis 5. IV line 6. Catheterize the bladder 7. Prophylactic antibiotics before C/section
6. Medications for HIV Positive - PMTCT enrolled clients	As per PMTCT guidelines

Table 9.1:Preparation for Emergency C/S

Activity	Issues to Consider
1. Timing of the C/S	1. Indication 2. Condition of mother and foetus
2. Quick Assessment of mother and foetus and treatment	1. Maternal hydration status 2. Status of amniotic membranes 3. Status of the foetus (live or dead) 4. Condition of the uterus and uterine activity 5. Station of the presenting foetal part 6. insert urine catheter 7. Consent and counselling

F. Necessary Conditions for performing C/S

1. Proper theatre facilities
2. Appropriate and adequate staff
3. Availability of anaesthetic facility
4. Adequate supplies: drugs, fluids, linen, gloves, giving sets etc.
5. Competent postoperative care

G. The Procedure of C/S:

1. Position of the Patient on the Operating Table

This sometimes may vary according to the condition of the patient. In patients with compromised respiratory and cardiac systems slight reverse Trendelenburg position may be preferred. Trendelenburg position could facilitate easy dislodging of a deeply engaged presenting part during extraction of the baby. Prior to induction of anaesthesia and sometimes even after, slight left-lateral tilting of the patient minimizes the pressure of the uterus on the vena cava.

2. Anaesthesia: The choice of anaesthesia is often dictated by:

- availability of anaesthetic facilities
- availability of anaesthetic skills
- the condition of the patient

Regional anaesthesia (spinal) is preferred if not contraindicated.

3. In patients who have been in prolonged and or obstructed labour, a final vaginal examination is useful to assess any change in the progress of labour after previous examination particularly if considerable time has elapsed. In elective C/S, this should not be done. A urinary catheter is inserted to keep the bladder empty throughout the operation.

4. Aseptic preparation of the surgeon and assistants.

It is compulsory for all those directly participating in this operation to wear a cap and mask. They must scrub their arms to the elbows with an antiseptic solution for at least five minutes and then wear sterile gowns and gloves.

5. Treatment of anterior abdominal wall skin.
This can be achieved by use of the appropriate and available antiseptic solution.

6. Abdominal Incision

a) Pfannenstiel Incision:

This is the incision of choice in both elective and emergency Caesarean sections. It is not just aesthetically sound but healing is also better and more effective.

b) Subumbilical Median Incision:

This type of incision is done in someone with a previous mid-line incision.

7. Incision on the uterus:
Low segment transverse incision is recommended in all cases. In special conditions upper segment longitudinal incision may be made (classical incision). An inverted T-incision may be made in certain circumstances.

In suspected chorio amnionitis, before making the uterine incision, para-colic spaces on both sides are packed with wet large abdominal packs to arrest the spread of amniotic fluid and blood in the abdominal cavity. The lower uterine segment is exposed by careful dissection of the peritoneum overlying the lower uterine segment and the bladder and deflexion of the latter downwards.

Opening of the uterus through the transverse incision can be achieved by:

. making a small window incision sharply at the centre. The two index fingers are used to extend the incision laterally through the window. This mode of opening the uterus is recommended because there is

minimum bleeding and the separation of the muscles follows the structural arrangement of uterine muscles in this area and so the healing is with minimum fibrosis.

8. Delivery of the baby:

If membranes are intact, they must be ruptured before proceeding to deliver the baby.

Cephalic Presentation: The surgeon's hand on the caudal side of the patient is inserted through the incision and is slid behind the head of the foetus. The head is then lifted up through the incision and outside. sGentle fundal pressure may be necessary to achieve this.

Breech Presentation: In complete and footling breech the feet are delivered through the incision first. The rest of the delivery of the baby follows the basic rules in breech delivery i.e. avoid undue pressure on the foetal abdomen; and traction pressure should be confined on the thighs and the sacrum. Delivery of the after coming head is generally similar to that described under the vaginal breech delivery.

In frank breech the delivery of the baby is as described under partial breech extraction.

`

Transverse Lie:
Deliver the foetus as a breech.

9. Delivery of the Placenta and Membranes:
Appropriate oxytocic is administered intravenously to the mother as the baby is delivered. This leads to expeditious uterine contraction and placental separation. The placenta and membranes can be delivered with gentle cord tractionAfter the delivery of the placenta the bleeders in the uterine incision must be secured with Green Armitages to avoid excessive blood loss.

If there is abrupt excessive bleeding from the placental site after the delivery of the baby manual removal of the placenta and membranes becomes necessary.

In all situations after the delivery of the placenta, clean the uterine cavity with an abdominal gauze to exclude:

. retained parts of the placenta and membranes
. uterine abnormality

10. Closure of Uterine Incision:

- Close the myometrium in 2 layers using absorbable sutures e.g. vicryl 1. The first layer in either a continuous or interlocking stitch. The latter is preferable if competent assistance to the surgeon is lacking. The second layer using a continuous stitch. The continuous stitch is generally quicker and should be used where there is good assistance to maintain the stitch constantly under tension.

- Explore the abdominal cavity and posterior uterine wall including the adnexae to ascertain intactness of the uterus and the absence of any abdominal and pelvic pathology. Remove the abdominal packs if they were placed.

11. Closure of the abdominal wall:

The scrub nurse checks and accounts for all the instruments as before the operation started.

- Close the rectus sheath in a continuous fashion with appropriate suture material.

- If the subcutaneous fat is excessive (> 3cm) it is generally advisable to approximate the adipose tissue with interrupted stitches using vicryl0. This obliterates the dead spaces in the suture line and prevents formation of haematomas, which often interfere with primary healing of the wound.

Closure of the skin:

Subcutaneous suture: this should be the preferred approach unless the status of the abdominal wall or the incision is unfavourable. Absorbable sutures (dexon, vicryl) are appropriate. If these are unavailable nylon suture can be used and removed on 6th or 7th postoperative day.

Interrupted Suture:

If this has to be made, non-absorbable sutures are used and removed on the 6th or 7th postoperative day. They are painful to remove and leave unsightly skin marks. At this point a swab and instrument count are repeated.

The wound is appropriately dressed with sterile gauze and an adhesive dressing. Pressure dressing is sometimes necessary.

Postoperative Management:

Table 9.2 gives a summary of postoperative management of patients after c-section. Depending on the prevailing condition of the patient, the surgeon may wish to prescribe additional treatments.

-Uterine massage to expel clots

-Vaginal toilet is carried out but never use spirit or iodine.

Table 9.2: Postoperative management of C/S

PERIOD	EVENT ACCOMPLISHED
1. Immediate Post-Op First 2 hours	- Blood Pressure, pulse and temperature every quarterly for first hour and 1/2 hour for second hour - fluid input and output chart - 20IU oxytocin IV in 1L over 4-6 hours - check for haemorrhage - Pethidine 50-100mg IM - antibiotics can be continued if needed - others as necessary - IV fluids: Hartmans solution, normal saline, dextrose, infant feeding
Next 24 hours	- 4 hourly BP, P & Temperature - monitor for haemorrhage - continue input and output chart - Pethidine 50-100mg IM if necessary - diclofenac 75mg IM TDS/PRN - Discontinue IVF - Continue HAART where applicable Oral fluids 6 hours post op - ambulate the patient - Remove urinary catheter - Infant feeding - expose incision
2. Late Post-op.24-48 hours	- 4 hourly BP, P and temperature - daily bowel sounds - passing of flatus - urine output - normal diet - bowel motion if any - general condition including possible anaemia - lochia: amount, colour and smell - breast activity - uterine involution, haemorrhage from the wound - Oral analgesics and other medication can be started. - HAART to be continued
3. 48 - 72 hours	- 12 hourly BP, Pulse and Temp - opening of bowels - passing flatus - general physical condition - check for signs of infection - uterine involution - lochia amount, colour & smell - breast secretion - patient should be up and about - appropriate management if the patient has not passed flatus
After 72 hours	- Check for signs of infection - Normal diet unless otherwise prescribed

H. Complications of caesarean section:

1. Psychological and emotional stress
2. Intraoperational and postoperative haemorrhage

3. Postoperative sepsis
4. Injury to other abdominal viscera - ureter, intestines, bladder
5. Inappropriate repair of the incisions and approximation of tissues resulting in poor healing and possible wound dehiscence.
6. Wound infection/haematoma/seroma

I. Special notes:

1. Caesarean section is a serious obstetrical procedure and demands serious and meticulous evaluation and assessment of the indications.

   In emergency C-Section the baby should be extracted within 30 min of decision to operate.

   In cases of foetal distress or cord prolapsed efforts should be made to extract the baby within 15 minutes of the decision to operate in all hospitals.

2. Adequate skills and competence in the performance of the procedure cannot be over emphasized.

3. Performing caesarean section for the convenience of the patient and or the physician (doctor) for unnecessary fear of litigation must be discouraged. Caesarean section with all its refinement still carries considerable risks of morbidity and mortality.

4. Consideration of "relative contraindications" must be weighed against the risks of not performing the caesarean section.

5. Sometimes delivery of the presenting foetal part may be difficult if it is deeply fixed in the pelvis. It is then necessary for an assistant to push it upwards from below. Efforts to force the delivering hand deep into the pelvis to dislodge the impacted head may cause extension of the uterine incision laterally.

6. Special attention must be paid when delivering babies in transverse lie and complete breech without bringing out the legs first. Lateral extension of the incision and damage to uterine arteries with resultant torrential haemorrhage may occur.

7. Extreme care must be taken when closing the uterus to avoid including the ureters when the angles of the incision are being secured.

8. Early ambulation of the patient is the key to quick general patient recovery and wound healing. This also refers to initiation of oral fluids and feeds as early as possible.

9. Wound inspection on the 1st postoperative day (POD) is important to exclude advent infection and the incision site left open.
10. On discharge the patient must be counselled on personal hygiene, care of the wound in particular and her future pregnancies. She should be reviewed within 6 weeks from delivery.

11. Visceral and parietal peritoneum do not have to be sutured. This is to reduce the likelihood of post - operative adhesions.

5. NEONATAL RESUSCITATION (TO BE REVIEWED BY PEADIATRIC TEAM)

Anticipation and recognition of the Neonate in Distress

A) Recognition and treatment of Primary and Secondary apnea

1) Primary apnea: When asphyxiated, the infants respond with an increased respiratory rate. If the episode continues, the infant becomes apneic, followed by a drop in heart rate and a slight increase in blood pressure. The infant will respond to stimulation and oxygen therapy with spontaneous respirations.

2) Secondary apnea: When asphyxia is allowed to continue after primary apnea, the infant responds with a period of gasping respirations, falling heart rate and blood pressure. The infant takes the last breath and then enters the secondary apnea period. The infant will not respond to stimulation and death will occur unless resuscitation begins immediately.

NB: After delivery of an infant it is impossible to differentiate between primary apnea and secondary apnea, assume the infant is in secondary apnea and begin resuscitation immediately.

B) High risk deliveries: infants at greater risk for distress

1. Thick meconium after membranes ruptured
2. Foetal distress
3. Emergency C-section
4. Premature birth

C) Gather and test appropriate equipment

1) Ambu – bag with appropriate mask size
2) Oxygen source and tube
3) Suction machine
4) Warm bed and blankets
5) Laryngoscope with straight blade (neonatal size)
6) Endo – tracheal tube, different sizes

D) Appropriately trained person to be present at delivery

<u>Initial steps for Neonatal Resuscitation in Delivery Room</u>

A) Warm and dry infant

Place infant under radiant heat warmer bed and dry infant (tactile stimuli)
This helps prevent cold stress.

B) Initiate ABC

A) = Establish airway: position head in neutral position and gently suction mouth and nose.

B)= Breathing: Bag and Mask Ventilation always with 100% Oxygen.

Ensure there is a good seal around mouth and nose.
Adequate Ambu – bagging will be demonstrated by movement of the chest.
Intubate if face mask not adequate**.**

C) = Circulation: Assess heart rate by listening to apical pulse with stethoscope, pulse in umbilicus or brachial pulse.

<u>Bag and Mask Ventilation in the Newborn</u>

1. Indication for bag mask ventilation

a. Apnea or bradycardia
b. Heart rate less than 100 beat per minute

2. Technique for bag and mask ventilation

a. Positioning haed in sniffing position – a towel under the shoulders may help
b. Obtain a good mask seal. Two care givers may be needed to bag eddectively – one to hold the mask seal, the other to sqeeuze the bag.
c. Give each breath gently, and squeeze bag just enough to get good chest rise. Bag at a rate of 40-60 per minute (1 breath every 1-2 seconds)
d. It is often necessary to reposition the airway and mask seal several times to achieve good ventilation with chest rise.
e. Evidence suggests you should start bagging with room aur and turn on oxygen only if HR does not rise to >100 after 90 seconds
f. Place orogastric tube and open cap to decompress stomach. It will become distended during prolonged bag-mask ventilation. A distended abdomen results in increased pressure on the lungs and makes adequate ventilation very difficult

Intubation of the Neonate

NB: bag-mask ventilation is usually the safest and most effective way of resuscitating a newborn. Attempt intubation only if trained and experienced in intubating neonates.

1. Indications for intubation

a. Prolonged bag and mask ventilation

b. Bag and mask is ineffective

c. Tracheal suctioning of meconium in a flat baby (do not unduly delay mask ventilation to intubate and suction meconium. There is no evidence that this prevents meconium aspiration syndrome)

2. ETT sizes and correct suction catheter sizes:

Table 10.0: ETT sizes and correct suction catheter sizes:

Weight of infant	Et tube size	Suction catheter size
< 1000 grams	2.5 Et tube	5-6 French suction catheter
1000-2000grams	3.0 Et tube	6 French suction catheter
2000-3000 grams	3.5 Et tube	8 French suction catheter
>3000 grams	4.0 Et tube	8French suction catheter

Chest Compressions

Indication: Heart rate persistently below 60, despite adequate bag-mask ventilation.

Technique: Circle chest with both hands and use 2 thumbs to compress the chest. Single provider may wish to use two finger technique and use the other hand to maintain mask seal. To be accompanied by ventilation at a ratio of 3 compressions to 1 breath. Compress 1/3 to ½ the AP diameter of the chest at a rate of 120/minute. "Push hard, Push fast".

Medications:

1. Indications for adrenaline: If infant 's heart rate remains below 60 beats per minute despite adequate ventilation with oxygen and chest compressions for a minimum of 30-60 seconds or if there is no heart beat. Drugs are not a substitute for effective bag-mask ventilation

2. Give medications via IV or IO route. IO access is often most easily obtained. IV route includes umbilical vein catheterization. Endotracheal route is an option, but less effective than IV and IO. When giving adrenaline via ET route, use up to ten fold the IV/IO dose.

Adrenaline: Increases the rate and strength of cardiac contractions and causes peripheral vasoconstriction. Indications are asystole or persistent bradycardia, less than 60 Dose can be repeated every 3-5 minutes. Dilute standard 1:1000 ampole with 10mls of NS or sterile water to obtain 1:10 000 concentration.

Volume expanders are for hypovolaemic states especially if associated with antepartum haemorrhage: signs of hypovolamic include pallor despite oxygenation, weak pulse with a good heart rate, poor response to resuscitative efforts, decreased blood pressure (may not be available). Start with isotonic fluid, obtain crossmatch if possible as blood products may be urgently required.

Dextrose: hypoglycaemia (RBS <2.6mmol/l) is common in premature babies, infants of diabetic mothers and in prolonged resuscitation. Check RBS if possible. If child is depressed presumptively treat hypoglycaemia with IV/IO or NG dextrose. Always use 10% dextrose, never give undiluted D50%.

Other drugs: Naloxone Hydochloride (Narcan) is no longer routinely recommended in the depressed baby whose mother received narcotics. The key is to bag and mask the baby if necessary. Sodium bicarbonate had not been shown to improve outcomes and has no place in the delivery room.

Table 10.1: Dosage chart

Drug name	Dosage	Concentration
Adrenaline	0.01-0.03 mg/kg or 0.1 – 0.3 ml / kg (of 1:10000 diluted adrenaline) IV/IO	1: 10,000
Volume Expander	10ml/kg, slowly over 5 to 10 minutes. Rapid infusion can lead to brain haemorrhage	Packed red cells , , Normal saline, Ringers lactate, 5% albumin
Dextrose	2-4mg/kg IV/IO push	D10% (if unavailable add 2mls of D50% to 8mls of sterile water or NS to make 10ml of D10%)
Naloxone Hydrchloride	0.1mg/kg	1.0mg /ml or 0.4mg/ml

NB: if blood loss is acute and severe, consider non cross-matched O-negative blood.

PART THREE

1. ABORTION

LEGAL FRAMEWORK ON ABORTION

The provision of post abortion care need not be affected by whether abortion is legal or not. The medical profession has the responsibility to provide comprehensive post abortion service including family planning to all women who need them, to the full extent of the legal limits. Emergency care for the complications of abortion (post abortion care), both spontaneous and induced, is legal and not punishable by any part of the law. Botswana laws states that:

160. Attempts to procure an abortion

1) Any person who, with intent to procure a miscarriage of a woman, whether she is or is not with child, unlawfully administers to her or causes her to take any poison or other noxious thing, or uses any force of any kind, or uses any other means whatever is guilty of an offence and is liable to imprisonment for a term not exceeding seven years.

2) Notwithstanding the provisions of subsections (1), it shall not be an offence under this section if a pregnancy is terminated or an abortion is caused within the first 16 weeks of pregnancy, in the following circumstances and under the following conditions-

   a) where the medical practitioner carrying out the operation is satisfied, by acceptable evidence, that the pregnancy is the result of rape, defilement or incest, and the termination or abortion is requested by the

victim, or, where the victim lacks the capacity to make such a request, by her next of kin or guardian or the person in *loco parentis*; or

b) where the continuance of the pregnancy would involve risk to the life of the pregnant woman or injury to her physical or mental health, and such two medical officers consent to serious physical or mental abnormality or disease as to be seriously handicapped, and the pregnant woman consents to the termination or abortion, or, if she lacks the capacity to give such consent, it is given on her behalf by the next of kin or guardian or the person in loco parentis; or

c) where established evidence shows that there is a substantial risk that, if the child were born, it would suffer from or later develop such;

Provided that-

1) The termination or abortion is carried out by a registered medical practitioner in a government hospital or a registered private hospital, or a clinic approved for the purpose by the Director of Health Services; and

2) two medical practitioners have given their opinions in good faith, in writing, in the case of paragraph (b) above, that continuation of the pregnancy would involve risk to the life of the pregnant woman or injury to her physical or mental health, or in the case of paragraph (c) above, that there is substantial risk that, if the child was allowed to be born, it would suffer such serious physical or mental abnormality or disease as to be seriously handicapped.

- *Since October 11th1991, the indications for safe abortion in Botswana broadened to embrace the following: Section 160(1) of the penal code as amended by act No.15 of 1991 and section 160(2) of the penal code states when abortion may be carried out. Note in the same legal notice: Section 236 states a person is not criminally responsible for performing in good faith and with reasonable care and surgical skill:*
  - *Safe abortion within the first 16 weeks of pregnancy*
  - *When the pregnancy is as a result of rape, defilement ,or incest*
  - *When the pregnancy would injure the woman's physical or mental health or threaten the woman's life*
  - *When the unborn child would suffer or later develop serious physical or mental abnormality or disease that would handicap the child*
  - *Can be done by a registered medical practitioner in a government hospital ,or a registered private or a clinic approved for abortion by the director of health services and two doctors should confirm in writing that the continuation of the pregnancy would indeed involve the risk to either the mother or child.*

A. Definitions:

1. Abortion: The termination of pregnancy or expulsion of a non-viable foetus weighing 500grams or less before 24 weeks gestation. The more acceptable term for abortion is miscarriage.

2. Spontaneous Abortion: This is abortion occurring without deliberate external intervention.

3. Missed Abortion:The retention in utero of POC's after foetal death before 24 weeks of gestation.

4. Incomplete Abortion: The partial expulsion of the product of conception.

5. Complete Abortion: The expulsion of all the products of conception.

6 Threatened Abortion: This is a clinical diagnosis in which vaginal bleeding occurs, but the cervix remains closed and the pregnancy is still viable.

7. Inevitable Abortion: This is the state in which there is uterine contraction with progressive effacement and dilatation of the uterine cervix with or without uterine bleeding before the stage of foetal viability.

8. Septic Abortion: Abortion associated with localised or generalised infection.

9. Recurrent Abortion: This is defined as three consecutive spontaneous abortions.

10. Induced Abortion: Deliberate termination of pregnancy before the stage of viability. It can either be legal or illegal.

B. Spontaneous abortion

Spontaneous abortion, or miscarriage can be classified according to the clinical stage of development i.e. threatened, inevitable, incomplete, complete or missed. All these stages are characterised by specific clinical signs and symptoms and the management is based on these clinical presentations. Spontaneous abortion can be due to either foetal or maternal factors. Spontaneous abortion is rarely associated with sepsis.

1. Causes of spontaneous abortion

a. Foetal Factors:

First Trimester:
- Abnormality of chromosomal structure
- Poor implantation and inefficient placental development

Second Trimester:
- Congenital infections e.g. syphilis
- Erythroblastosis

b. Maternal Factors:

Systemic Diseases:
- Infections e.g. malaria, chlamydia, herpes simplex, HIV & AIDS.
- Endocrine disorders e.g. diabetes mellitus, hyperthyroidism.
- Hypertension, Immunological disorders

Malnutrition		
Uterine Abnormalities and Defects	.	Cervical incompetence
	.	Congenital abnormalities of the uterus
	.	Repeated or over curettage and other uterine scarring (Asherman syndrome)
Trauma	.	Physical trauma on the gravid uterus
Other disorders	.	
	.	Unfavourable habits (Toxins) e.g. alcoholism, smoking, drug abuse.

Table 11.0 Clinical classification and management of abortion

TYPE OF ABORTION	CLINICAL PRESENTATION	MANAGEMENT
1. Threatened abortion	. mild lower abdominal pains and backache . slight PV bleeding . cervical os is closed	Counselling, strict bed rest, avoid strenuous activities. Investigate and treat the cause. Rule out UTI
2. Inevitable Abortion	. painful cramps or contractions . uterine bleeding . os open . membranes may be ruptured.	Facilitate expulsion by evacuation of the uterus if pregnancy is <12 weeks Oxcytocin drip or prostaglandins for spontaneous expulsion if pregnancy is >12/40
3. Incomplete Abortion	. abdominal cramps may or may not be present . cervical os is generally open . varying degrees of uterine bleeding . uterine size will be considerably less than gestational age.	-treat as emergency IV line with or without a drip depending on amount of blood loss. -emergency evacuation of the uterus can be done with the following methods: a) Treatment with MVA b) Dilatation and Evacuation c) Misoprostol for cervical ripening in a closed os before evacuation -All women to receive broad spectrum antibiotic prophylaxis
4. Complete Abortion	.A diagnosis of exclusion abdominal pain or cramps have subsided . no active uterine bleeding . cervical os is generally closed . uterine size is considerably less than the gestational age or is almost normal size	-All women to receive broad spectrum. Exclude ectopic pregnancy- 5-10% of supposedly complete abortions are ectopic pregnancies
5. Septic Abortion	. pelvic pain of varying degrees . offensive blood stained or brownish vaginal discharge . varying degrees of fever . pelvic tenderness	-IV line(Fluid or blood products) -endocervical swab or HVS for culture and sensitivity test.

	. there may be fluid (pus) collection in the POD. . cervical canal is generally open . POC may be felt through the cervical canal .Patient may be in shock	-start on triple broad spectrum IV antibacterial cover as soon as possible, do evacuation -if there is peritonitis, may require laparotomy for drainage - STABILISE PRIOR TO EVACUATION (SEE NOTES BELOW)
6. Missed Abortion	. signs and symptoms of pregnancy disappear with time . uterine size progressively decreases . pregnancy test maybe negative	-coagulation screen: clotting time, (bedside clot observation test) -x-match blood -Surgical evacuation of the uterus after cervical priming with misoprostol

C. Induced abortion

Induced abortion is probably the most common form of pregnancy termination today in the world. In countries or communities with restrictive laws to free access to abortion services; the majority of induced abortions are done by incompetent and untrained people and in an environment detrimental to the health and life of the woman. Induced abortion is classified as:

a) "legal" when it is performed in conformity to the provisions of the existing law and the norms of medical practice in a specific country.

b) "illegal" when it is performed irrespective of the law.

(i) Induced abortion can present as:

- complete.
- incomplete if parts of POC are left in the uterus .
- inevitable when induction has not resulted in expulsion of the POC
- septic when accompanied with infection.

The clinical presentations and management of these are the same as described under **Table 11**.

D. Septic abortion - infected abortion

Management (see also Flow Chart 6.0)

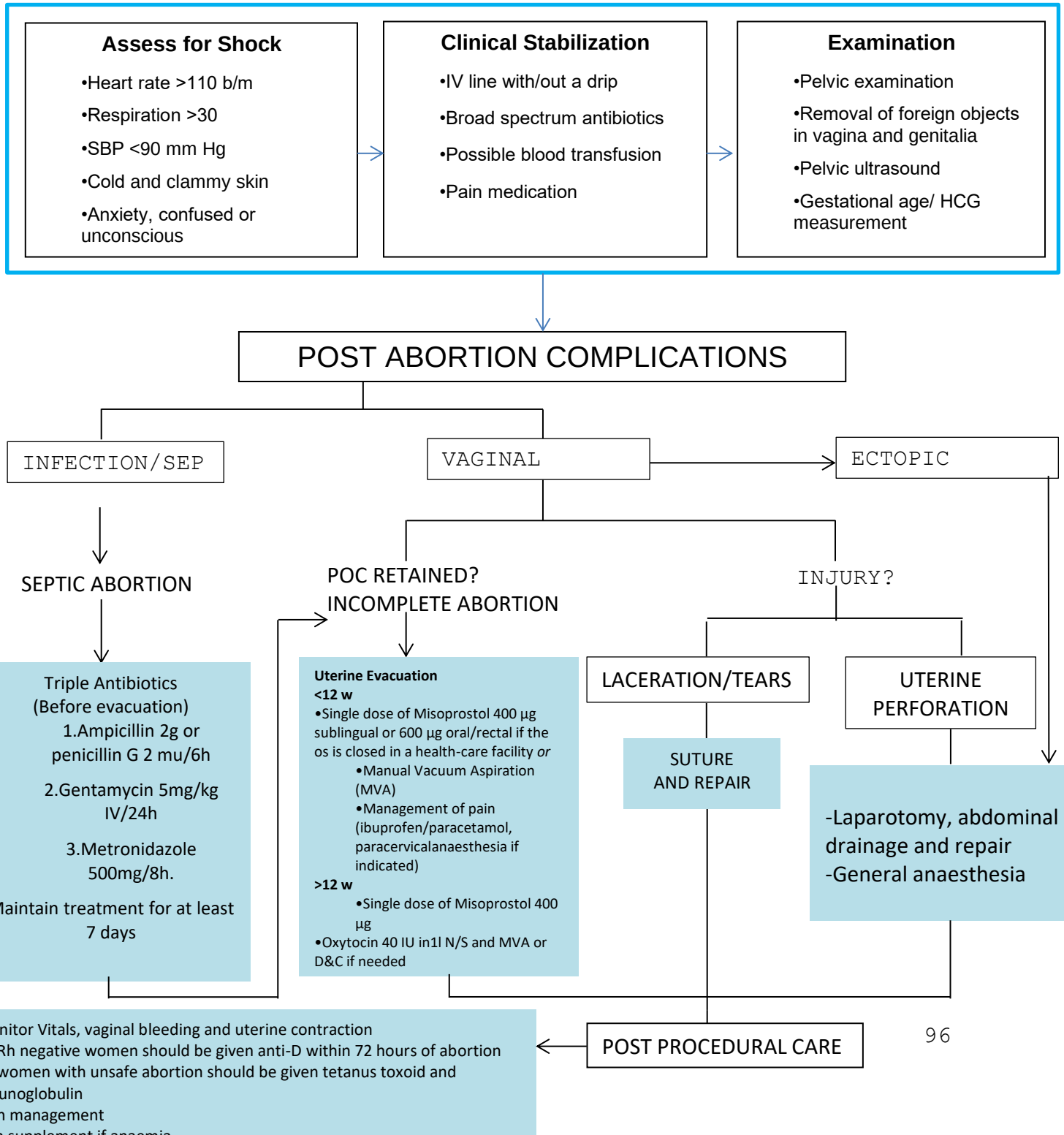
NB: In all cases institute management immediately.

All types of clinical stages of abortion can be septic (infected). Generally the management is as follows:

Flow chart 6.0:GUIDELINE FOR THE MANAGEMENT OF SEPTIC ABORTION

Post Abortion Complications Care

Suspect abortion in woman of reproductive age, delayed menses with vaginal bleeding, cramping or lower abdominal pain. Women who need uterine evacuations should be done within 2 hours of diagnosis.



NB: THE TREATMENT OF CHOICE IN SEPTIC ABORTIONS IS TRIPLE ANTIBIOTIC THERAPY METRONIDAZOLE, AMPICILLIN AND GENTAMYCIN INTRAVENOUSLY.

Other Antibiotics

. Cefotaxime
. Clindamycin

Broad spectrum oral antibiotics in ALL incomplete abortions – Amoxycillin and Metronidazole (or Co amoxyclav)

E. Prevention of abortion and its complications

1. Prevention of Fetal Loss and Abortion:

- Prompt and adequate management of medical disorders that may lead to fetal loss
- Adequate nutrition
- cervical cerclage where appropriate
- institutionalised adolescent reproductive health care
- Effective provision and use of contraception

2. Prevention of Complications of Abortion:

- emergency and appropriate management of all types of abortion efficient post abortion care and counselling.
- reproductive health education
- adequate training of health personnel
- availability of appropriate facilities and equipment
- availability of blood

G. Complications of abortion:

1. Short Term

. Haemorrhage
. Uterine Perforation
. Sepsis
. Injury to other organs e.g. genital tract, intestines, bladder
. Shock
. Emotional trauma
. DIC (Disseminated intravascular coagulopathy)
. Maternal death

2. Long Term

. Infertility due to tubal blockage resulting from sepsis

- Asherman's syndrome.
- Social and psychological consequences due to cultural stigma of having an abortion or miscarriage
- Serious complications leading to prolonged treatment may cause loss of opportunities like education and jobs.

J. SPECIAL NOTES ON ABORTION:

1. Complete abortions are rare in pregnancies between 6 - 12 weeks gestation. This diagnosis is made in cases where the POC can be examined for completeness and in the very early stages of pregnancy. In the absence of POCs comprehensive assessment including a pelvic ultrasound should be carried out to rule out POCs and ectopic pregnancy.

3. Since it is not possible to assess the prevailing environment at the onset of the abortion process, the condition should be regarded as potentially septic and therefore antibiotic prophylaxis should be given.

4. Abortion is an emergency condition and must be treated and managed as such.

5. All patients with Rhesus Negative Blood Groups should receive anti-D treatment within 72 hours post abortion. It is therefore necessary to determine the Rhesus factor of these patients if not known.

6. Facilities that manage women with abortion should have access to haemoglobin estimation.

7. All patients evacuated after abortion should be reviewed after one week. Signs and symptoms of complications should be noted and appropriately managed.

8. Post Abortion Counselling should be done before discharge. It is crucial to include FP & HIV/AIDS in the short and long term management of patients who have been treated for abortion. Family planning should be started prior to discharge in women who consent.

9. Molar pregnancy should be referred to a Specialist.

2. EVACUATION OF THE UTERUS

The evacuation of the uterus refers to the procedure carried out to remove POC to prevent haemorrhage and possible sepsis.
Proper diagnosis is therefore important.

A. Indications

1. Incomplete abortion.
2. Inevitable abortion (less than 12 weeks gestation).
3. Retained products of conception un-recognized at delivery.
4. Molar pregnancy.

B. Methods Used for Uterine Evacuation:

Evacuation of the uterus can be achieved by medical or surgical means

C. Uterine Evacuation with Medical Methods

Medication abortion uses various agents, most commonly misoprostol and mifepristone, to expel the contents of the uterus. Misoprostol is a prostaglandin analogue developed for gastrointestinal indications that also has the effect of softening the cervix and stimulating uterine contractions. It is used increasingly used around the world, often in combination with mifepristone, for medication abortion. Mifepristone blocks progesterone activity in the uterus, leading to detachment of the pregnancy. Mifepristone also causes the cervix to soften and the uterus to contract.

Used in combination, these medications stimulate uterine contractions and cause expulsion of the pregnancy. Misoprostol can be used in isolation to effect cervical softening and uterine contractions. Most women undergoing medication abortion experience some amount of abdominal cramping and bleeding. Other possible side effects, depending on dosage and route of administration, include vomiting, nausea, diarrhea, chills and fever. An ultrasound should be carried out after medical evacuation to ensure complete abortion.

Misoprostol is a prostaglandin-E1 analogue and causes uterine contractions and cervical dilatation. It is a heat-stable tablet with an excellent safety profile. As a safe, affordable, easy to use and heat-stable utero-tonic, misoprostol has several obstetric and gynecologic uses. The following table summarizes the misprostol regimens for uterine evacuation for different conditions.

Table: Misoprostol Recommended Dosages for Uterine Evacuation for Different Conditions(insert MoH misoprostol protocol)

	Misoprosto	Route	Timing

	1 dose		
Incomplete abortion and miscarriage	600 mcg	Oral	Three 200 mcg tablets taken at once (single dose)
	OR 400 mcg	Sublingual	Two 200 mcg tablets under the tongue until they dissolve or for 30 minutes; swallow any remaining fragments. (Single dose)
Missed abortion/ anembryonic gestation	800 mcg	Vaginal	3 hourly (max x2)
	OR 600 mcg	Sublingual	3 hourly (max x2)
Termination of pregnancy up to 12 weeks	800 mcg	Vaginal or Sublingual	Every 3-12 hours, up to 3 doses
Intrauterine foetal death13-17 weeks	200 mcg	Vaginal	Every 6 hours (max x4)
Intrauterine foetal death18-26 weeks	100 mcg	Vaginal	Every 6 hours (max x4)
Intrauterine foetal death above 26 weeks	25 mcg	Orally	Every 4 hours (max x6)

E. Uterine Evacuation with MVA/Curettage

Instruments:

The minimum standard instruments necessary for this procedure include:

1. The speculum: various types of speculums exist but the common ones are:
   - Sims speculum
2. Vulsellum or Tenaculum
3. Ovum forceps
5. Curette: there are various sizes of these
6. Sponge holding forceps
7. Urinary catheter
8. Kidney dish
9. M.V.A. set.

Patient Preparation for /Surgical Evacuation

Unless the patient is unable to communicate for one reason or another, she should be adequately informed about the procedure. The information should

include the benefits of the procedure and possible consequences if the procedure is not carried out. She should then give an informed written consent.

Spontaneous emptying of the bladder should be encouraged and preferred to catheterization.

General anaesthesia is not always necessary for evacuation. Give Pethidine 50-100mg IV slowly and Diazepam 5-10mg IV. Ensure availability of Naloxone as an antidote. Give Oxygen per mask as required.
Cervical block should be given instead of Pethidine/Diazepam in unstable patients

Surgical Evacuation

1. The patient is placed in lithotomy position.

2. The surgeon must wash his/her hands with soap or antiseptic solution and wear sterile gloves. A sterile gown is not a must.

3. Using a sponge holding forceps, the vulva, vagina and the surrounding area are cleaned with gauze or cotton soaked in an antiseptic solution. Various solutions are available on the market and the choice will depend on what is available and recommended by the health institution.

4. A bimanual examination is performed to assess the size and position of the uterus and exclude any pelvic pathology. Empty the bladder prior to the procedure.

5. A speculum is gently inserted. An appropriate size of the speculum should be chosen to fit in the introitus. This should be properly placed to expose the uterine cervix. It is introduced into the introitus obliquely and gradually rotated into the transverse diameter of the vagina.

6. A tenaculum or vulsellum is applied to the cervix anteriorly or posteriorly depending on the position of the uterus to provide firm support.
7. A uterine sound should not be used in a gravid uterus .

8. Large pieces of POC are removed using the ovum forceps

9. Then gently insert an appropriate size curette and systematically scrape the uterine wall. Gritty sensation and sound, cessation of bleeding and emergence of air bubbles is indication that the uterine cavity is empty. Further curetting of the uterine walls may result in complications.

10. Remove instruments in the reverse order of insertion i.e. what was inserted last is removed first and vice versa.

11. Bimanual uterine massage is performed to expel blood clots from the uterus and facilitate uterine contraction.

12. Blood is cleaned off the external genitalia to which a clean pad is placed.

13. Oxytocin or symtometrine to be given at end of procedure
14. Monitor vital signs before, during and after the procedure.

Evacuation of the uterus can be accomplished through other methods if the necessary equipment is available. Some of the methods preferred today are:

a) Suction curettage using an electric suction machine

b) Manual Vacuum Aspiration (MVA) using Karman's syringe and plastic cannula. This is suitable for abortions of pregnancies of up to 12 weeks. (**See the manual on MVA**)

Complications due to procedure

Complications related to this procedure may be short term or long term.

1. Short Term Complications:

- Perforation of the uterus
- Collapse from iv Drugs or pain.
- Haemorrhage due to incomplete evacuation
- Post-evacuation sepsis
- Hysterectomy

2. Long Term Complications:

- Uterine synechia (adhesions) leading to infertility and scanty menstrual flow
- Infertility as a result of tubal blockage due to sepsis.

Precautions Against Complications:

1. Application of proper aseptic techniques during the procedure
2. Bimanual assessment of uterine size and position before the procedure
3. Gentle use of instruments,

4. Experience in the judgement of complete evacuation
5. Judicious scraping of the uterine walls
6. Use of the prophylactic antibiotics.

3. ANAEMIA IN PREGNANCY

A. Definition: In Africa region a haemoglobin level of 10g/dL is generally considered as the cut off point for anaemia.

B. Classification:

Mild	- 8-10g/dl
Moderate	**6**-8g/dl
Severe	- < 6g/dL

C. Common Causes of Anaemia in Pregnancy:

1. Poor diet - nutritional anaemia
2. Physiological haemodilution in pregnancy
3. HIV infection and ARVs
4. Multiparity (short birth intervals)
5. Multiple pregnancy
6. Malaria - Haemolytic anaemia
7. Parasitic infestation e.g. hookworm
8. Haemorrhage: Antepartum or bleeding in early pregnancy
9. Geophagia (eating soil)

D. Clinical signs and symptoms of anaemia:

i) Symptoms: - general body weakness
- dizziness with episodes of fainting
- palpitations

- breathlessness
- sores in the mouth and tongue may occur
-anorexia, vomiting, diarrhoea (common in folic acid deficiency anaemia)

ii) Signs: -pallor of the mucus membranes (conjuctiva and the tongue)
- tachycardia
- tachypnea
- jaundice (then sclera) in haemolytic anaemia of malaria, sickle cell disease
-splenomegally, the so called "tropical spleen" in chronic malaria.
-koilonychia, in chronic iron deficiency anaemia.
-oedema,

E. Management:(See Flow Chart 7.0)

History taking, nutrition, and HIV status
All pregnant mothers with anaemia (i.e. Hb of <10 gm/dl) should be investigated. Correction of anaemia without establishing the cause gives only a temporary solution to the problem.

First line investigations include:

a) FBC with differential and reticulocyte count.
b) blood slide for malaria parasites
c) stool examination for parasitic infestation
d) urine for analysis, microscopy and culture to exclude chronic renal disease.
e) HIV test
d) *Iron studies*

If anaemia persists despite negative results and treatment, the patient must be referred for second line management at a higher-level facility.

G. Complications of anaemia in pregnancy:

Maternal	**Foetal**
1. Obstetric haemorrhage	1.I.U.G.R.
2. Antenatal infections	2.IUFD
3 Cardiac failure (shock).	3.Prematurity
4. Puerperal sepsis	
5. Maternal death	

H. Special notes on anaemia:

1. All pregnant women should have FBC check in the first trimester(first visit). If Hb is less than 10g/dL repeat tests should be performed within 2 weeks to monitor the impact of the treatment. In all cases repeat tests must be performed at 20 - 24 weeks and at 34 -36 weeks of gestation.

2. If routine laboratory investigations reveal no apparent cause of anaemia and nutrition has been excluded as a contributory factor then referral to an appropriate facility should be made.

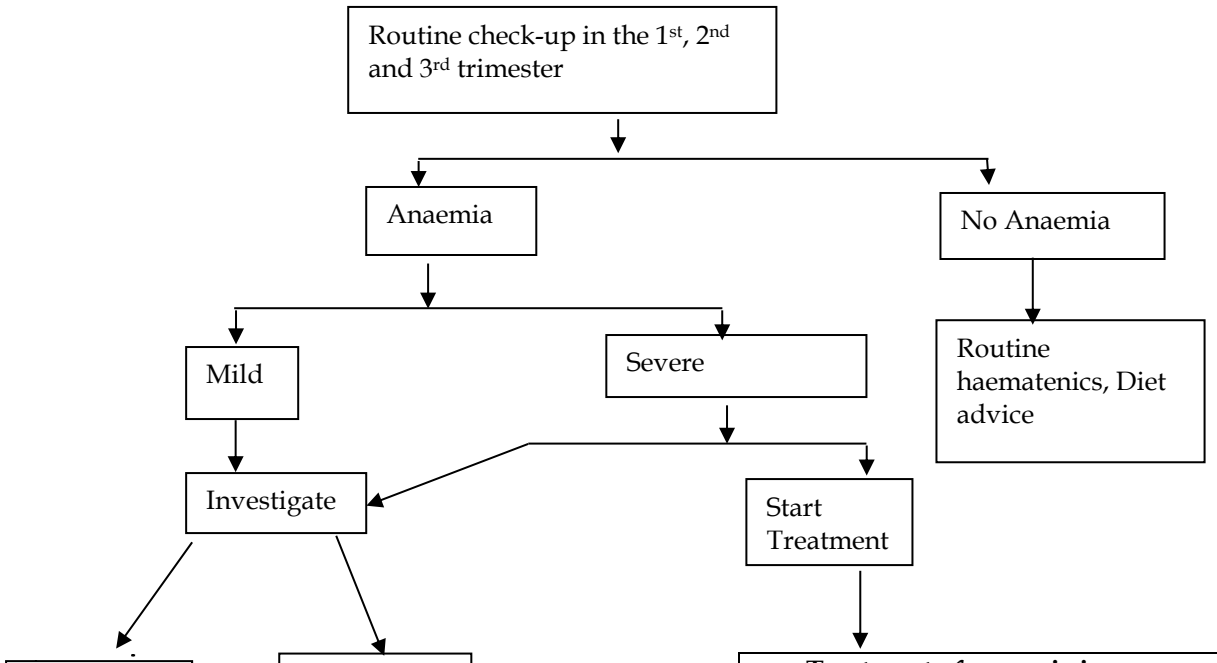
3. The necessity for parenteral iron and transfusion must be critically weighed against the benefits and possible complications that may result from these treatments.

4. Calculation of the dosage of parental iron is based on the level of Hb and the weight of the patient. A test dose is necessary before a complete dose is given.

5. Dietary advice must take note of what the patient generally eats and can afford and not exclusively on what is deemed right by the health provider or advisor.

6. In the treatment of anaemia, oral haematinics should contain both iron and folic acid- give daily dose of 600mg Iron(in divided doses) and Vitamin C.

Flow Chart 7.0: **MANAGEMENT OF ANAEMIA IN PREGNANCY**
Diagnosis, Treatment and Prevention



Treatment of anaemia in pregnancy

Stage of Pregnancy	degree of anaemia & treatment	
	Mild	Severe
Preterm	Oral Haema-Tinics Dietsion Advice	Parenter-al transfu-diet advice
Term	Oral Haema-Tinics Diet, Advice, Parent-Eral Iron Sion	Trans-fusion, Oral Haema-tinics, diet advice

4. HYPERTENSIVE DISORDERS IN PREGNANCY (HDP)

A.DEFINITION OF HYPERTENSION

A diastolic blood pressure (BP) of 90 mmHg or more and systolic blood pressure of 140 mmHg, on 2 occasions at least 4 hours apart, or a BP reading of >160/110 mmHg or an increase of 30mmHg and 15 mmHg in systolic and diastolic BP respectively over the normal or first trimester BP.

B. Classification of HDP:

I. Chronic hypertension:

Hypertension **without** proteinuria, diagnosed **before** 20 weeks of pregnancy, or a history of essential hypertension prior to the pregnancy

II. Gestational hypertension:

Hypertension **without** proteinuria or any features of pre-eclampsia, starting **after** 20 weeks of pregnancy.

III. Pre-eclampsia (gestational proteinuric hypertension)

Hypertension, starting **after** 20 weeks of pregnancy with any of the following:

- Proteinuria – 1+ protein or 300mg in 24 hours
- Renal insufficiency - serum creatinine≥100 µmol/L
- Abnormal LFTS(AST and ALT)
- Neurological problems – severe headache, hyperreflexia, convulsion
- Thrombocytopaenia<100/mm3 or haemolysis (increased LDH)
- Placental insufficiency – asymmetric fetal growth restriction

IV. Superimposed pre-eclampsia:

Pre-eclampsia that develops in a woman with chronic hypertension.

V. **Eclampsia:** generalized tonic-clonic seizures after 20 weeks of pregnancy and within 42 days after delivery, associated with hypertension and proteinuria. New onset of convulsions in pregnancy should be managed as eclampsia until proven otherwise

C. GRADES OF PRE-ECLAMPSIA

I. **Mild pre-eclampsia:** a diastolic BP of 90-109 mmHg, SBP of 140-159 with 1+ or 2+ proteinuria

II. **Severe pre-eclampsia:** a diastolic BP of 110 mmHg or more, or SBP of 160mmHg or more with 2+ proteinuria or symptoms suggestive of imminent eclampsia **or** organ dysfunction irrespective of the level of blood pressure or level of proteinuria, e.g. renal failure, raised liver enzymes or thrombocytopenia.

Imminent eclampsia: symptoms and signs that develop in a pre-eclamptic woman: severe headache, visual disturbances, epigastric/RUQ pain, hyper-reflexia, dizziness, fainting and vomiting.

HELLP syndrome: the presence of haemolysis, elevated liver enzymes and low platelets, almost always in association with hypertension and proteinuria.

NB: Up to 25% of women with eclampsia present with normal BP and no proteinuria.

Headaches, blurred vision, convulsions and loss of consciousness are often associated with hypertension in pregnancy, but are not necessarily specific to it. Other conditions that may cause convulsions or coma include epilepsy, complicated malaria, head injury, meningitis and encephalitis and uncontrolled blood sugars.

D. CONDITIONS PREDISPOSING TO HDP

I. Maternal factors:

- Previous history of pre eclampsia
- extremes of ages: <19 years and >35 years
- prim gravidity
- genetic predisposition - family history of hypertension
- chronic hypertension
- chronic renal disease
- diabetes
- obesity

II. Foetal factors:

- hydatidiform mole
- multiple pregnancy

E. PRE-ECLAMPSIA

Pre-eclampsia is a multi-organ disease affecting predominantly the circulatorysystem, renal system, central nervous system, coagulation and liver. A placental immunological or chemical defect causes a prostaglandin imbalance,which affects the endothelium (lining) of blood vessels, resulting in vascular spasm, platelet aggregation and leakage of plasma from capillaries.

Pre-eclampsia complicates 5-10% of pregnancies in Botswana. There is still no effective method of prevention, and the only known cure is termination of Pregnancy. Early detection, treatment and follow up may help in reducing death and morbidity from complications of pre-eclampsia.(Insert Reference)

I.Classification:

Classifying this condition into mild, moderate and severe is unrealistic and can be dangerous. The transition between the three categories is so small that often it is not noted and can therefore create false complacency in the total management strategy.

Nevertheless pre – eclampsia is often differentiated into mild and severe for practical reasons.

Table 12.1: Classification of Pre-eclampsia by signs and symptoms

Symptoms and signs	Mild	Severe
BP recorded twice, 4 hours apart with patient at bed rest	BP less than 160/110	BP equal to or more than 160/110
Proteinuiria	<3g or (≤2+on dipstick) in 24 hours	>3g in 24 hours >2+ on dipstick
Oliguria	Urinary output of >500ml in 24 hours	<500ml urine output in 24 hours
Cerebral or visual disturbance	No	Yes /no
Epigastric pain	No	Yes /no
Pulmonary oedema or cyanosis	No	Yes /no

II. Clinical Signs

Hypertension: This is the most important sign for the diagnosis of pre-eclampsia.
Proteinuria: Proteinuria is an important indicator of renal deterioration.

Oedema: Oedema is common in pregnancy. Its presence and absence does notpreclude the diagnosis of pre eclampsia. However the finding ofanasarca, pulmonary oedema are ominous signs of Pre eclampsia.

F. PRINCIPLES OF MANAGEMENT

1. Prevent and control fits	**Drugs of choice:** • **1st choice: magnesium sulphate** • **2nd choice: Diazepam (valium)**
2. Control Blood Pressure	Monitor blood pressure closely Drugs of choice: • Hydralazine (especially for unconscious patient) • Nifedipine (Useful for conscious patient) • Methydopa (Aldomet – not useful in emergencies but used for sustained blood pressure control after emergency is over)
3. Expedite Delivery	Assess patients for the quickest and safest route of delivery: vaginal delivery or caesarean section. **If eclampsia**, must be delivered within 12 hours **If severe pre-eclampsia**, must be delivered within 24 hours
4. Monitor for vital organ failures	Kidneys: renal failure is a common complication. Monitor urine output carefully (intake and output chart): urea/creatine/uric acid: urine for albumin/culture and sensitivity. **Blood**: haemoglobin, platelet count **Liver**: liver function tests **Lungs/Heart**: Pulmonary failure **CNS/Eye:** blindness, strokes
5. Prevent infection	Administer prophylactic broad spectrum antibiotic: Ampicillin/flagyl/gentamicin

Fig 1: Five key principles of management of Hypertensive complications in pregnancy (WHO)

F. IMPORTANT LABOROTARY TESTS AND FINDINGS IN HDP

Table 12.2

Laboratory Test	Important Findings

Urinalysis	. Proteinuria . Casts
Blood	. Haemolytic anaemia in severe cases . Thrombocytopaenia . Creatinine in severe cases is raised, and in less severe cases is normal . Uric Acid is raised . LFT: Usually normal except in very severe cases

G.COMPLICATIONS OF PRE-ECLAMPSIA AND ECLAMPSIA

I.Maternal

- Severe hypertension
- Cerebrovascular accident/Stroke
- Eclampsia
- Renal failure
- Liver failure or rupture
- Disseminated intravascular coagulation
- Pulmonary oedema
- Abruption placentae

II.Fetal

- Intrauterine death from placental insufficiency
- Intrauterine death from abruption placentae
- Prematurity
- Intrauterine growth restriction
- Respiratory distress syndrome
- Acute fetal distress related to antihypertensive drug use

A.ANTENATAL VISITS

Chronic and gestational hypertensives should attend 2 weekly up to 30 Weeks and weekly up to delivery. Those newly diagnosed with preeclampsia must be admitted for investigations.

B.PREVENTION OF PRE-ECLAMPSIA

Give aspirin 75 mg orally daily from 12 weeks gestation to mothers who have a history of previous severe pre-eclampsia that resulted in delivery at less than 7 months
of pregnancy (30 weeks)in combination with calcium gluconate (600mg daily) This should be continued until 36 weeks of gestation.

C.HOSPITAL ADMISSION
Admission criteria for hypertensive patients

- Proteinuria +1 on a midstream specimen
- Symptoms of imminent eclampsia
- Organ dysfunction e.g. thrombocytopenia, liver dysfunction, eclampsia
- Diastolic BP >90 mmHg
- Systolic BP >140 mmHg
- Pregnancy at term

D.ADMISSION PROCEDURE

- Take blood for FBC and RFT/LFT and uric acid
- Order 4 hourly BP and daily urinalysis for protein in the ward
- Order ultrasound for fetal well-being
- Prescribe oral antihypertensive medication
- If SBP>160 or DBP110 mmHg, treat as for severe pre-eclampsia
- Systolic BP of more than 160 mmHg should be treated as an emergency regardless of the DBP. A high SBP increases the risk of CVA which happens at a low SBP in pregnant women.

E.CONTROLLING THE BLOOD PRESSURE IN PRE-ECLAMPSIA
EMERGENCY TREATMENT (BP 160/110)

- Admit to a high care area
- Preload with 300 mL crystalloid solution over 20 minutes, to avoid hypotension, which may lead to collapse, celebral herniation and fetal compromise.
- Give Hydralazine 12.5 mg IM (Max 160mg in 24 hours)
- Measure the blood pressure every 30 minutes at first, then hourly
- Repeat Hydralazine every half hourly if necessary (BP still ≥160/110)
- Aim for a diastolic BP of 90 mmHg and systolic BP of 140
- Add maintenance treatment

F.MAINTENANCE TREATMENT

The drugs are usually prescribed in a stepwise fashion, depending on response.
Aim for a diastolic BP 80-90 mmHg and SBP of 130-140 mmHg
Step 1: Methyldopa 500 mg orally tds up to a maximum of 750 mg 3 times daily
Step 2: Add nifedipine XL 30 mg orally once daily up to a maximum of 90 mg once daily (alternative: hydralazine 10-50 mg orally 3 times daily).
Step 3: Consider delivery in uncontrolled hypertension on 2 maximum drugs
For chronic hypertensives, discontinue beta-blockers, diuretics, and ACE inhibitors. Some chronic hypertensives may need no medication at all during pregnancy.

G.INPATIENT MANAGEMENT

- Doctors' daily round - ask for symptoms of imminent eclampsia, fetal
- movements, check BP and urine chart
- Repeat RFT/LFT, FBC and uric acid once to twice weekly
- Treat imminent eclampsia and severe pre-eclampsia as set out below

H.INDICATIONS FOR DELIVERY OF HYPERTENSIVE MOTHERS

- Pregnancy at 37 completed weeks with gestational and essential hypertension
- Pregnancy at 37 completed weeks with mild pre-eclampsia
- Severe pre-eclampsia
- Uncontrolled Hypertension
- Eclampsia
- Cerebral oedema
- HELLP syndrome
- Renal dysfunction
- Thrombocytopaenia (platelet count persistently $<100 \cdot 10^9$/L)
- Fetal distress
- Dead fetus
- Suspected abruptio placentae

I.DISCHARGING HYPERTENSIVE PREGNANT PATIENTS FROM THE ANTENATAL WARD

- The BP must be stable below 140/90 mmHg (stable for at least 24 hours)
- There must be no proteinuria
- Mother and fetus must be well
- There must be no indication for delivery
- A return date to antenatal clinic must be given
- A very brief discharge summary must be written on the antenatal card

J.SEVERE PRE-ECLAMPSIA

Initial management is as follows:

1. Arrange for transfer to a high care area
2. Give MgSO4
3. Insert an indwelling Foley catheter and monitor urine output hourly

4. Take blood for FBC, U&E, uric acid and AST/LDH. Do INR/PTT if there is thrombocytopaenia as caesarean section may need to be done
5. Assess gestational age and fetal weight, by ultrasound if necessary
6. Do CTG if fetus is viable
7. Treat the blood pressure
8. Arrange for delivery if indications exist

K.CONSERVATIVE MANAGEMENT OF SEVERE PRE-ECLAMPSIA (28-34 WEEKS)

To be considered only under direct specialist care

Following stabilisation of blood pressure:

- Oral antihypertensive medication to keep BP at about 140/90 mmHg
- Dexamethasone 12 mg IM stat, repeat after 12 hours
- Twice-weekly FBC, U&E, uric acid, more frequently if necessary
- Weekly ultrasound fetal assessment for liquor volume and umbilical arterydoppler
- 4 hourly BP, daily urinalysis for protein

DELIVER IF SIGNS OR SYMPTOMS OF IMMINENT ECLAMPSIA

L.HELLP syndrome

- Manage as for severe pre-eclampsia
- Arrange for delivery
- If platelet count is $<50 \cdot 10^9$/L and caesarean section is planned, give platelet transfusionperi-delivery as per hematology guidelines
  Platelets have a short half-life and should be given as close to delivery as possible.

M.ECLAMPSIA

Principles of care are control of convulsions, reduction of blood pressure, clinical and laboratory assessment, and delivery

N.IMMEDIATE MANAGEMENT OF ECLAMPSIA

I. Call for help
II. Turn the woman onto her side (left lateral)
III. Clear the airway – ensure that it is open and remove secretions or vomitus
IV. Give oxygen by mask
V. Prevent injuries, e.g. with cot sides, and remove sharp objects, etc.
VI. Insert an oropharyngeal airway if necessary
VII. Start an intravenous drip and give magnesium sulphate
VIII. With persistent convulsions or restlessness, give additional magnesium sulphate 2 g IV
Diazepam5-10 mg IV over 5 minutes if continues to fit after 2g MgSO4 or non-availability of MgSO4
IX. Insert an indwelling urinary catheterq
X. Admit to a high care area

O.MANAGEMENT OF ECLAMPSIA AFTER FITS HAVE BEEN CONTROLLED

- Take blood for FBC, U&E, and liver function tests
- Control the blood pressure if BP more than160/110 mmHg
- Continue intravenous fluids (Ringer-Lactate or normal saline) at 80 mL/hour
- Monitor BP, urine output and level of consciousness hourly
- Assess fetal condition with CTG, and fetal size by ultrasound after patient has been stabilised
- Continue magnesium sulphate until 24 hours

after delivery or 24 hours after the last convulsion, whichever is later

- The baby should be delivered as soon as possible after the first fit:

- By caesarean section if there is fetal distress or the cervix is unfavourable
- Vaginally if the mother is in labourand delivery is expected within 6-8 hours.
-monitor fetal wellbeing with continuous CTG

- cesarean section should only be carried out once the mother is stable. Acute fetal distress post seizure is common and shouldnot lead to a c-section that compromises the mothers' life.

- Vacuum extraction may be necessary in the second stage
- Do not use ergometrine in the third stage (use oxytocin 10 units IM)
- Expect return to full consciousness within two hours of the last fit
- Investigate women with persistent coma or localising signs – call a

neurologist to assess and arrange for a CT scan of the brain

- Take blood for FBC and U&E on the day after delivery
- Keep in hospital for at least 3 days after delivery

P.ADMINISTRATION OF MAGNESIUM SULPHATE*

Dilute magnesium sulphate 4 g (8 mL) in 12 mL normal
saline and give slowly intravenously over 4 minutes or 4g $MgSO_4$ in 200 mls normal saline with 5 g IM in each buttock with 1 mL 1% lignocaine. A total of 14 g is given.
Maintenance dosage is 5 g IM
4 hourly in alternate buttocks, mixed with 1 mL 1% lignocaine

Q.PRECAUTIONS DURING MAGNESIUM SULPHATE THERAPY

Maintenance doses should only be continued if the following hourly observations are made and confirmed:

- Presence of patellar reflexes,
- The respiratory rate is more than 16 breaths/minute
- Urine output ismore than 100 mL in the last 4 hours (about 30ml per hour)

R.TREATMENT OF SUSPECTED OVERDOSE

- The symptoms and signs of overdose are a feeling of extreme weakness,decreased respiratory rate, and absent tendon reflexes
- Take blood for magnesium level
- Give 10% calcium gluconate 10 mL IV slowly

S.BLOOD MAGNESIUM LEVELS:

Normal range 0.7-1.0 mmol/L, therapeutic at 1.25-3.25, absent reflexes at 4-5, respiratory depression at 6-8, cardiac arrest at >15 mmol/L

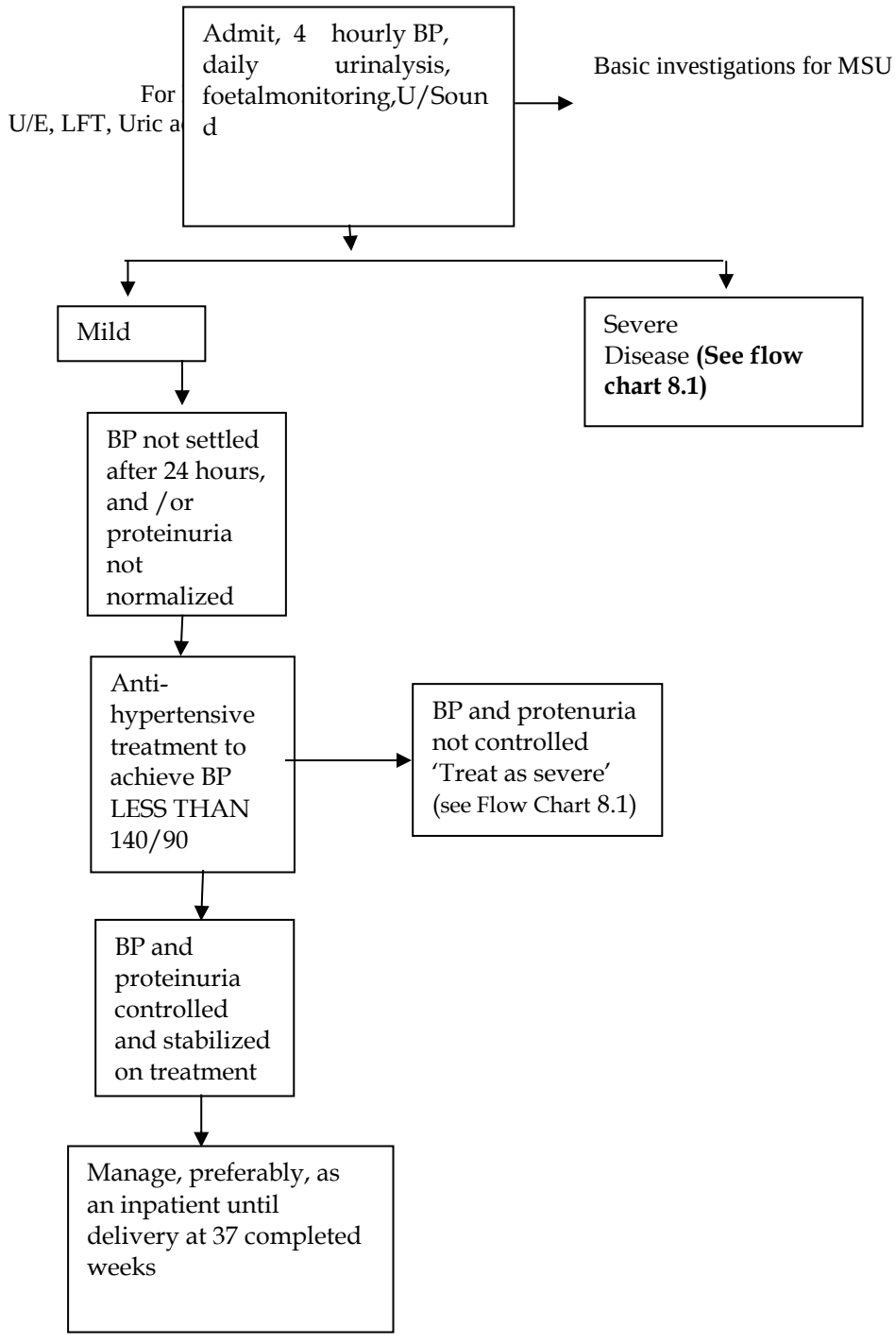
T.POSTPARTUM CARE PRE-ECLAMPSIA AND POST ECLAMPSIA

- Keep the mother in hospital for at least3 days after delivery
- Continue oral antihypertensive medications and modify orreduce the dosage as necessary
- Treat BP more than 160/110 as an emergency
- Discharge the mother from hospital if the BP is stable for 24 hours
- Write a referral note to the local clinic for a woman discharged onantihypertensive medication to attend there every week for 6 weeks for measurement and adjustment (or discontinuation) of therapy

U.USEFUL DRUGS POST-PARTUM:

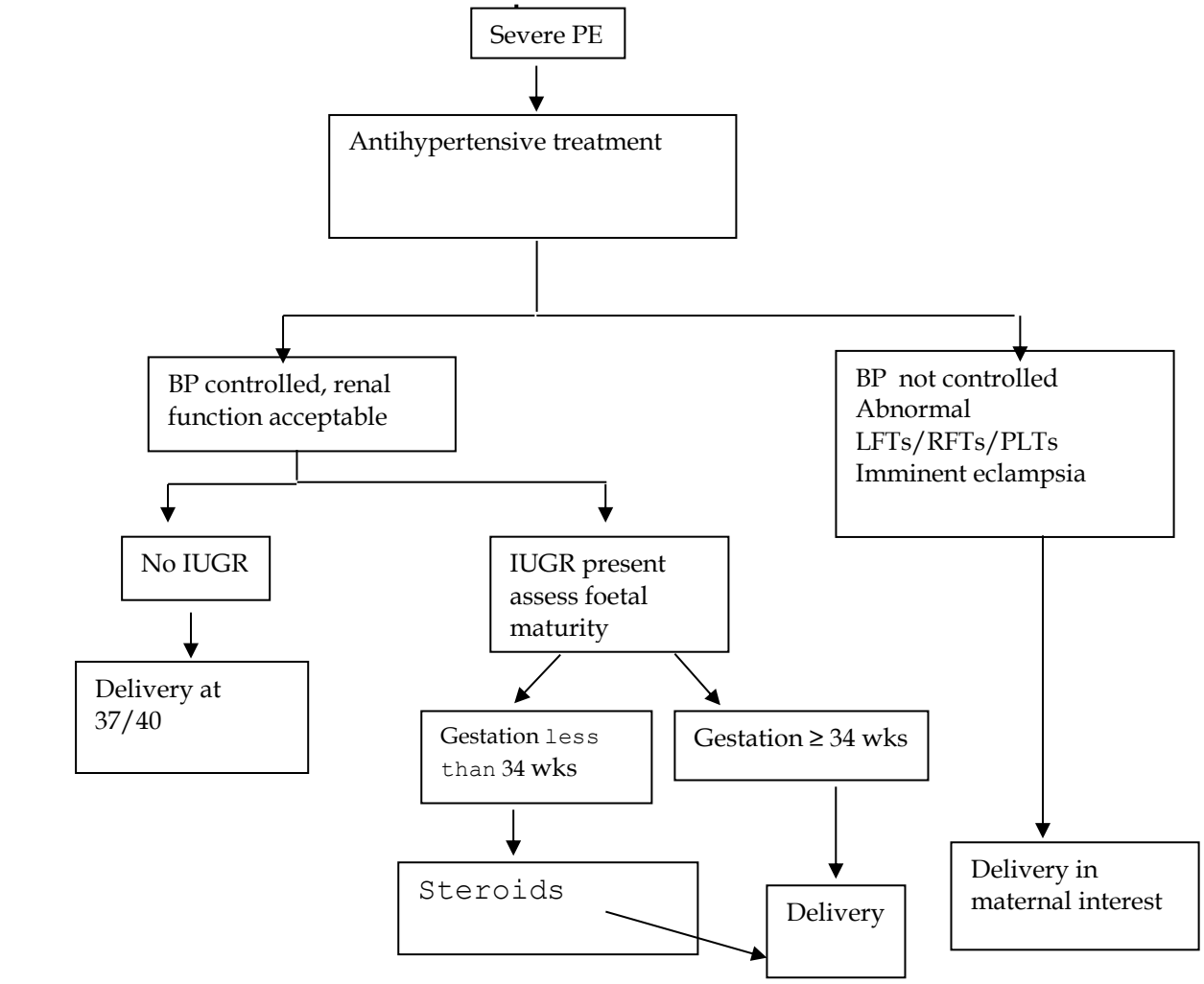
- Stop methyldopa (increased risk of post natal depression)
- Nifedipine XL/HCT/Enalapril

Flow Chart 8.0 GENERAL MANAGEMENT OF MILD PRE-ECLAMPSIA



Flow Chart 8.1

GENERAL MANAGEMENT – SEVERE PE MOH TABLE



After having given magnesium sulphate; deliver or refer.

In a patient that continues to fit despite adequate and repeated MgSO4, Diazepam should be given (5-10 mg IV)

Table 12.3: Chart for Monitoring Patient on Magnesium Sulphate (PUT IN INDEX)

TIME	BP	PULSE	RESP	FHR	URINE OUTPUT	IV FLUIDS DROPS/MIN	KNEE JERK REFLEX	LEVEL OF CONSCIOUSNESS	MAGNESIUM SULPHATE GIVEN	SIGNATURE

Pre-Eclampsia/Eclampsia Management

BLOOD PRESSURE (>20 w	PROTEINURIA Dipstick ++, +++ • Urine test >5 gr/24 h	DANGER SIGNS • Severe Headache • Visual Disturbance

Severe PE	DBP>110, SBP>160	+++	No sign	Severe PE
	DBP>90, SBP>160	1/2+	Any sign	
Eclampsia	Any BP with Seizures			Eclampsia

SEVERE PRE-ECLAMPSIA

1. Prevent the fits:

• Admit to a high dependency room in the hospital. An eclamptic episode can occur at any time

• IV canula and monitor fluids. FBC group and cross match, LFT, creatinine

• Check urine for proteinuria

Magnesium Sulfate – 1st choice

ECLAMPSIA

1. Stop the fitting:

• SHOUT FOR HELP but do not leave the patient alone

• Place the woman in left lateral position

• IV canula with wide bore (green or grey) with N/S or R/L and monitor fluid balance chart to prevent fluid overload

• FBC group and cross match, coagulation profile.

MAGNESIUM SULFATE ($MgSO_4$)

- Load dose: 14 gr Mg SO4 (4 gr diluted in 200 ml N/S IV infusion over 20 min, then 10 gr Mg SO4 (10 ml + 1 ml lignocaine) deep IM divided in two doses, one in each buttock
- Maintenance dose: 5 gr of Mg SO4 (10 ml + 1 ml lignocaine) deep IM every 4 h in alternating buttocks during 24 h after delivery or last fit (whichever comes later)

2. Control Blood Pressure

- Hydralazine 6.25-12.5 mg IM PRELOAD with 300 ml NS before hydralazine
- Nifedipine, Atenolol, HCT, after delivery
- Methyldopa (Aldomet) (maintenance): 500 mg TDS, it can be increased to 750 mg TDS for prolonged treatment, if necessary

3. Expedite Delivery

Gestation >34 weeks? — YES → -Deliver within 6 hours -Oxytocin 10 Units IV bolus after delivery, followed by Oxytocin 20-40 IU diluted in 1L dextrose 5% to prevent PPH

NO → Give steroids to promote foetal lung maturity in severe pre-eclampsia

I.SPECIAL NOTES

1. Normal blood pressure is individualised and varies from person to person. It is also influenced by other factors amongst them age. The use of blood pressure (BP) of 140/90 as a cut off point in the diagnosis of hypertension is therefore, arbitrary and could be misleading. Its relevance should be based on pre-pregnancy or first trimester BP. The more accurate diagnosis and assessment of the severity of hypertension should be based on the level of rise in BP over the pre-pregnancy or first trimester BP.

2. When a pregnant woman presents with mild hypertension for the first time without protenuria and or oedema, a decision to admit or treat her as an outpatient case should be reached after two readings 4 - 6 hours apart. This means the patient should have a place to rest at the clinic for that interval. If the BP settles to normal values at the second reading, the patient can be sent home with an appointment for recheck of the BP in a week's time. If the second reading confirms the hypertension the patient should be admitted for treatment and further investigations.

3. The use of diuretics in Pre eclampsia is not recommended except if there is pulmonary oedema and cardiac failure.

4. When patients develop eclampsia, urgent delivery should take place once patient is stableirrespective of foetal maturity. Both maternal and foetal well-being is in jeopardy. The first priority is to control the fits and or prevent further occurrence with magnesium sulphate. Concurrently BP should be stabilized and delivery options considered.

5. **Some cases of Pre eclampsia can be complicated by HELLP syndrome.**
(Haemolysis, Elevated Liver Enzymes Low Platelets) clinical signs include malaise, epigastric pain, nausea, vomiting, jaundice. HELLP syndrome is associated with poor maternal and foetal outcome. The severity of HELLP syndrome requires delivery of the foetus.

5.OBSTETRIC HAEMORRHAGE

Management of Obstetric Haemorrhage (OH) Management of OH is guided by two main principles:

I. Prompt arrest of the bleeding to prevent severe complications to both the mother and the foetus.

II. Availability of blood transfusion facilities and skilled medical and surgical management.

Pregnant women who are identified as being at risk of having OH should be referred to and managed at relevant competent institutions. All institutions conducting in-patient maternity care must have facilities and capabilities to provide basic life-saving management or at least perform time-buying procedures to enable relatively safe transfer of the patient to more competent facilities.

A. DEFINITION:

Obstetric haemorrhage (OH) is defined bleeding related to pregnancy and childbirth. It is broadly divided into the following:

I. Bleeding in early pregnancy

This is due to:

a) Abortion

b) Ectopic pregnancy

c) Molar pregnancy

II. Antepartum haemorrhage

This is pregnancy related bleeding before the onset of labour and after the 24th week of gestation, i.e. after the viability stage of pregnancy.

III.Postpartum haemorrhage:

This refers to abnormal bleeding after the delivery of the baby and includes bleeding prior to and after the delivery of the placenta. The current widely used definition of postpartum haemorrhage considers the loss of blood in excess of 500ml after vaginal delivery and 1000mls after C/S. However, it is important to note that severe morbidity and mortality may happen even with less amount of blood loss in women who are anemic or have other serious health conditions.

Postpartum haemorrhage is further divided into two parts:

i) Primary postpartum haemorrhage: (PPH): haemorrhage that occurs within 24 hours after delivery.

ii) Secondary postpartum haemorrhage haemorrhage occurring after 24 hours but within 42 days post delivery.

B. CAUSES OF AND PREDISPOSING FACTORS TO OH

I. Bleeding in early pregnancy

For causes, clinical presentation, complications and management of bleeding in early pregnancy refer to the relevant sections of this manual i.e. abortion , ectopic pregnancy and molar pregnancy.

II. Antepartum haemorrhage (APH)

APH is classified according to the causes :

a) **Placenta praevia:** this causes bleeding due to early separation of abnormally sited placenta wholly or partially in the lower uterine segment.

Marginal placenta previa –a placenta that is partially sited in the lower uterine segment and does not cover the internal os. (Type 1)

Complete placenta previa – a placenta that is wholly inserted into the lower uterine segment and lies over the internal os. (Type 2, 3 and 4)

b) **Abruptio placentae:** this is bleeding occurring during pregnancy due to early or premature separation of the placenta that is normally sited in the upper uterine segment.

c) **Incidental:** this is bleeding occurring during pregnancy but due to causes unrelated to pregnancy.

These include:
- Uterine cervical lesions (e.g. cervical erosion, polyps and cancer)
- Genital infections (e.g. genital warts)
- Vaginal varicosities

d) **Vasa – praevia:** This is whereby foetal vessels unsupported by placental tissue go through membranes and present at the cervical os. Bleeding is fatal and associated with a high fetal loss.

III. Postpartum Haemorrhage (PPH)

Causes of postpartum haemorrhage may be divided into two groups, as primary PPH and secondary PPH:

a) **Causes of primary postpartum haemorrhage:**

- **Uterine Tone:** In uncomplicated vaginal delivery postpartum bleeding is naturally controlled by the contraction of the uterine muscles during which the interlacing myometrial fibres surrounding the uterine blood vessels constrict and occlude the

blood supply to the placental site. In uterine atony, this process fails to occur resulting in PPH. Uterine atonyis the most common cause of PPH (80%).

- **Trauma to the birth canal:** Excessive blood loss may occur due to deliberate surgical procedures intended to expedite the delivery of the baby (episiotomy) or spontaneous lacerations (uterine rupture, cervical, perineal and vulval tears).

- **Tissue:** Retained placenta or part thereof, large portion of membranes.

- **Thrombin (Coagulation defects):** This may present as DIC, thrombocytopaenia or hypofibrinogenaemia. Some women may present on anti coagulants.

b) **Causes of secondary PPH:**

- Retained POC
- Endometritis
- Blood coagulopathy
- Shedding ofnecrotic tissue following obstructed labour

Predisposing factors to bleeding in pregnancy may be pre-existing or inherent to pregnancy itself or those created by poor and inappropriate management of pregnancy, labour and delivery.

IV.Pre-existing or pregnancy inherent factors:

- **Blood coagulopathies:**Thrombocytopaenia, pancytopaenia, drug-induced coagulopathy.

- **Previous history of PPH**
- **Previous caesarean section:** this may lead to the rupture of the uterus and placenta praevia
- **Multiparity:** this may predispose to uterine atony and malpresentation
- **Multiple pregnancy:** this is usually associated with over distension of the uterine muscles leading to inefficient postpartum uterine contraction and involution. It also predisposes to abruptio placentae and placenta praevia
- **Macrosomia:** this may cause uterine over distension and prolonged and even obstructed labour.

- **Polyhydramnios:** over distension of uterine muscles resulting in post-partum uterine atony,sudden and rapid drainage of amniotic fluid may result in early separation of placenta.
- HELLP SYNDROMME**:**which may cause blood coagulopathy.
- **Precipitate labour:** this often leads to multiple irregular lacerations of the birth canal.
- **Uterine tumours like fibroids:** frequently the contraction and involution of the uterus is interfered with postpartum.
- **APH**

V.Factors due to inefficient management of pregnancy, labour and delivery:

- **Anaemia in pregnancy:** anaemic uterine muscles have inefficient contractability postpartum.
- **Obstructed labour:**which may cause rupture of the uterus or lead to exhaustion of uterine muscles which subsequently fail to contract after the delivery of the baby.
- **Prolonged labour:** This predisposes to PPH along the line similar to obstructed labour.
- **Injudicious use of oxytocin:** for induction or augmentation of labour may result in rupture of the uterus, precipitate labour, or abruptio placentae.
- **Uncontrolled drainage of amniotic fluid during ARM in cases of polyhydramnios**. This may lead to abrupt contraction of the uterus with the resultant Placenta abruptio
- **Traumatic instrumental vaginal delivery:** particularly forceps delivery. This can cause serious lacerations of the birth canal.

VI. **Other factors:**

- Trauma on the gravid uterus. This may result from physical assault and includes application of fundal pressure in the second stage of labour.

-

C. CLINICAL PRESENTATION OF O.H.

I. Antepartum Haemorrhage (APH)

Placenta Praevia	**Abruptio Placentae**
. History of spotting in the first and second trimester	. Varying severity of abdominal and back pain

. Painless bleeding usually in the third trimester	. Irritable, tender uterus, often hypertonic
. Usually blood is bright in colour	. Haemorrhage may be overt or concealed
. Abdomen soft May follow coitus	. If placental separation is not marginal blood is usually dark in colour

. Expression of "heavy show" is often erroneously used to describe overt bleeding from the uterus in early labour, which subsequently stops with active labour and when the presenting foetal part becomes fixed or engaged in the pelvis. **"Show" represents blood stained mucoid discharge** which often appears a few hours to two days prior to onset of labour. The mucoid discharge is the plug in the cervical canal which comes out as the cervix begins to efface and dilate. During the effacement there is separation of amniotic sac from the uterine wall of the lower segment which results in the slight bleeding that stains the mucoid plug. This must not be confused with the significant overt bleeding that is described as "heavy show" thus the use of the word heavy show is inappropriate.

D. DIAGNOSIS OF OBSTETRIC HAEMORRHAGE

I. APH: ESSENTIALS OF DIAGNOSIS

1.Placenta Praevia:
Placenta praevia denotes the implantation of the placenta in the lower uterine segment. Any effacement and cervical dilatation therefore, is bound to cause bleeding.

i) Identification of risk factors:

- Age > 35 years
- Multiparity of > 4 with short birth intervals < 2 years.
- Previous C/S
- Repeated uterine curettage
- Multiple pregnancies
- Previous history of APH

ii) Thorough general physical examination with special attentionto:

- Pallor
- Abdominal tenderness and consistency.

iii) Obstetric and Gynaecological examination including ultra sound:
- Uterine size
- Foetal assessment:

In placenta praevia, the presenting foetal part remains high above the brim even at term because of obstruction from the low lying placenta. Mal-presentation of the foetus may be due to placenta praevia.

iv) Gentle speculum examination will reveal where the bleeding is coming from. If a praevia is suspected a digital examination should not be carried out. (Please see special notes on O.H)

A clinical diagnosis of placenta praevia can be made on clinical grounds. A definite diagnosis of placenta praevia is by ultrasound. All cases of placenta praevia may be delivered electively by c/section at 38 completed weeks of gestation or earlier as emergency c/section if the clinical picture demands.

E.MANAGEMENT

I.Antenatal

Repeat ultrasound at 32 and 34 weeks. As the lower segment continues to develop minor degrees of placenta previa may normalise.
All women with aprevia should be advised to avoid coitus.
Admit all women with a previa at 34 weeks gestation and plan for c/section at 37 weeks.
All women with a placenta previa to be delivered under specialist supervision.
A decision to deliver women with minor degrees of previa should be taken at specialist level and preferably after ultrasound to make sure the fetal head is well below the leading placental edge.

Care for women that present with vaginal bleeding should be individualised.
Women that present with mild bleeding that stops should be admitted for observation
2 large bore canullas should be inserted
Ensure blood product availability as small bleeds are usually a precursor to much larger bleeds.
Delivery by caesarean section irrespective of gestation should be done in women with profuse bleeding
A placenta previa with a dead fetus still requires delivery by caesarean section

2.**<u>Abruptio Placentae</u>:**

Placental abruption is a clinical diagnosis. There is no role for ultrasound in the diagnosis ofabruptio placenta.

i) Identification of risk factors:

- Previous abruptio placenta
- Pre eclampsia or Eclampsia
- Maternal age
- Multiparity
- Polyhydramnios
- Multiple pregnancy
- Medical diseases affecting vascular system e.g.diabetes mellitus
- Uterine tumours - e.g. fibroids

- Cocaine

ii)

In abruptio placenta the abdomen may be very tense depending on the amount of placental separation. This may make it difficult to auscultate foetal heartbeat or palpate foetal parts. Bleeding may be concealed

Placental abrution is an indication for delivery.

The quickest route to preserve both maternal and fetal health should be used. Placental abruptionis not an indication for caesarean section per se.

Women with an abruption deliver relatively quickly. Vaginal delivery is preferable to caesarean section.

A vaginal assessment with ARM and Oxytocin usually leads to a quick delivery.

However a caesarean section is normally indicated with alivefetus unless the woman is in advanced labour or in a patient with a grossly unfavourable cervix (ARM not possible) with abnormal coagulation/thrombocytopenia.

This women tend to have explosive deliveries that result in significant cervical and genital trauma THUS extreme care should be taken to prevent genital injury.

II. POSTPARTUM HAEMORRHAGE:

Other aids to diagnosis:

Laboratory Investigations

Blood tests to assess the degree of anaemia caused by the blood loss and exclude the presence of coagulopathy. These should include:

i) Full blood count

ii) Coagulation screen with at least determination of prothrombin time index (PTT) and clotting time.

RFTS, Blood crossmatch

F.COMPLICATIONS OF OH

i) **Maternal:**

- Anaemia
- Shock
- Embolism
- Sepsis
- DIC
- Acute Cardiac failure
- Renal cortical and tubularnecrosis
- Transfusion infections: hepatitis, HIV, malaria, syphillis etc.
- Anterior pituitary necrosis (Sheehan's syndrome).
- Maternal death

i) **Foetal:**

- Prematurity
- Severe asphyxia with brain damage
- IUFD
- IUGR
- Still Birth

G. PREVENTION OF OBSTETRIC HEMORRHAGE:

1. Emergency treatment of all types of abortion (see section on abortion).

2. Good ANC which focuses on risk identification, counselling of the mothers on the risks, channelling those with risks to appropriate centres for the management and prompt emergency referral.

3. All patients identified to have the risk of OH should be managed in labour with an IV line in situ. Emergency tray for the treatment of PPH must be prepared in advance. The tray should include:

    - oxytocin
    - ergometrine/syntometrine
    - misoprostol
    - IV fluids
    - PPH pack
    - Catheter

This is besides the usual delivery tray.

4.Active management of the third stage of labor must be applied in all deliveries. All women who give birth should receive a utero tonic at the third stage of labour for the prevention of PPH. Oxytocin is the utero tonic of choice (10 IU IM/IV) for PPH prevention followed by 20 IU Oxytocin infusion Other injectable utero tonics or misoprostol (600 mcg oral) can be used where oxytocin is not available. **NB: Administration of ergometrine is contraindicated in cardiac or HDP patients.**

H. SPECIAL NOTES ON O.H

I. Patients presenting with APH should not have digital examination before placenta praevia is ruled out. The purpose of the speculum examination is to exclude local causes of bleeding. Digital examination may need tobe done in theatre when ready to proceed with delivery process.

II. All patients with APH should be treated as potential cases of abruption placenta until proven otherwise.

III. Use of ultra sonography for localization of the placenta should be done serially in cases of conservative management.

IV. Bleeding in abruptio placentae may be overt or concealed. The severity of the condition should therefore not be assessed solely on the amount of external bleeding. More serious attention must be paid to the clinical signs of tenderness, abdominal hypertonicity and foetal distress. The general condition of the mother should be taken note of. The patient with abruptio placenta is managed based on clinical findings.

V. There must be no VBAC in patients with APH.

VI. In a patient that presents with recurrent bleeding the decision to continue with conservative management should be reviewed.

VII. In abruptio placentae the risk of DIC developing due to the retroplacental clot is a serious complication. Coagulation screening should be done.

VII. Generally augmentation of labour in cases of abruptio placentae is successful and labour is usually short because the uterus is already very irritable.

IX. Assessing blood loss by considering the amount of soaking around the delivery area is inaccurate because of the amniotic fluid that follows the delivery of the baby.

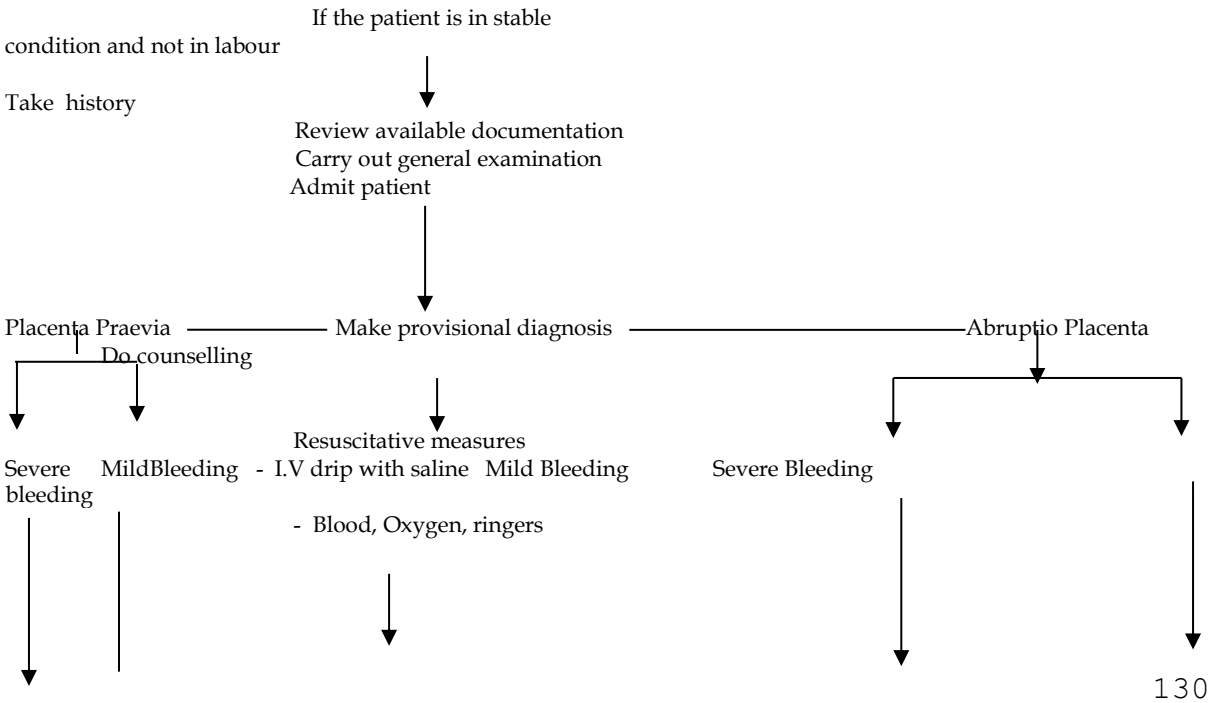
The definition of PPH therefore may be misleading and in some cases dangerous as it may cause false complacency. The determination of 500ml may be both difficult and inaccurate. The effect of blood loss on the mother depends on the level of Hb prior to delivery, general maternal response to blood loss and pre-existing co-morbidities.

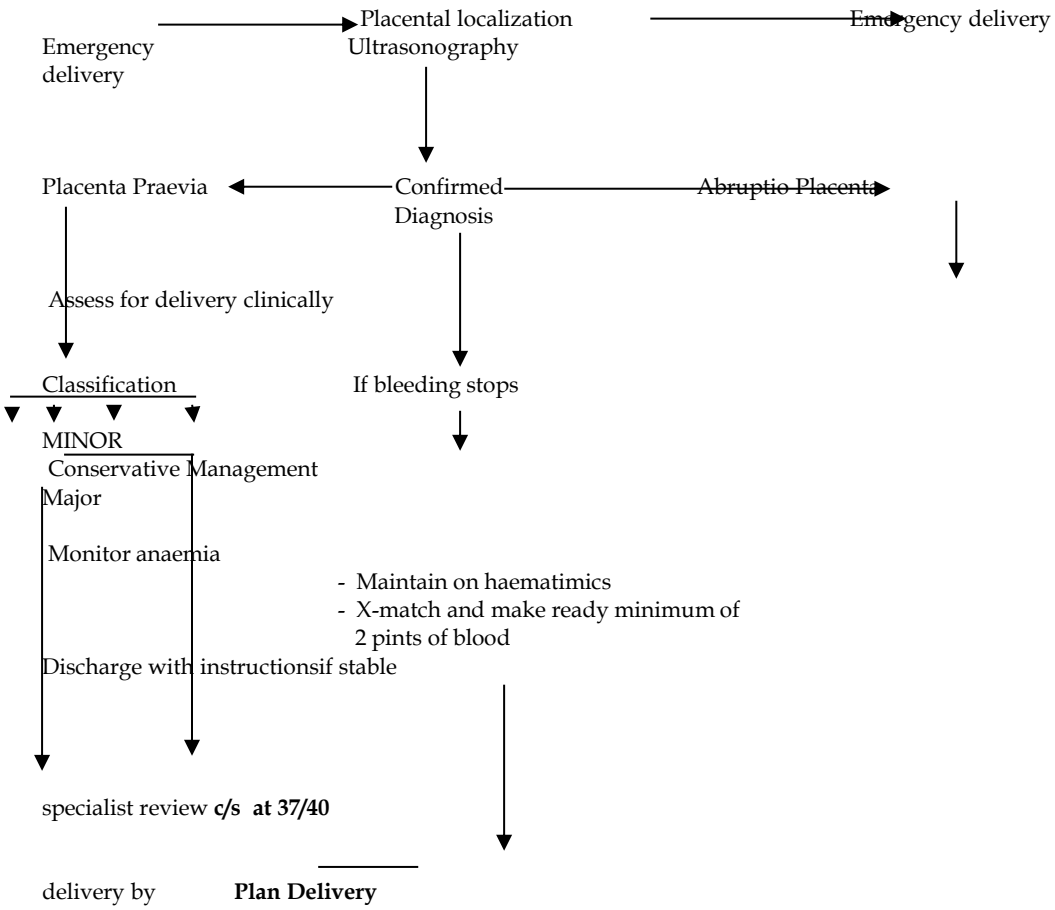
Therefore, close observation of vital signs in the immediate postpartum period (4th stage of labour) is the key to proper management of postpartum period in general and PPH in particular.

XI. Rupture of vasa praevia, is an indication for an emergency caesarean section as the fetus can exsanguinate quite rapidly.

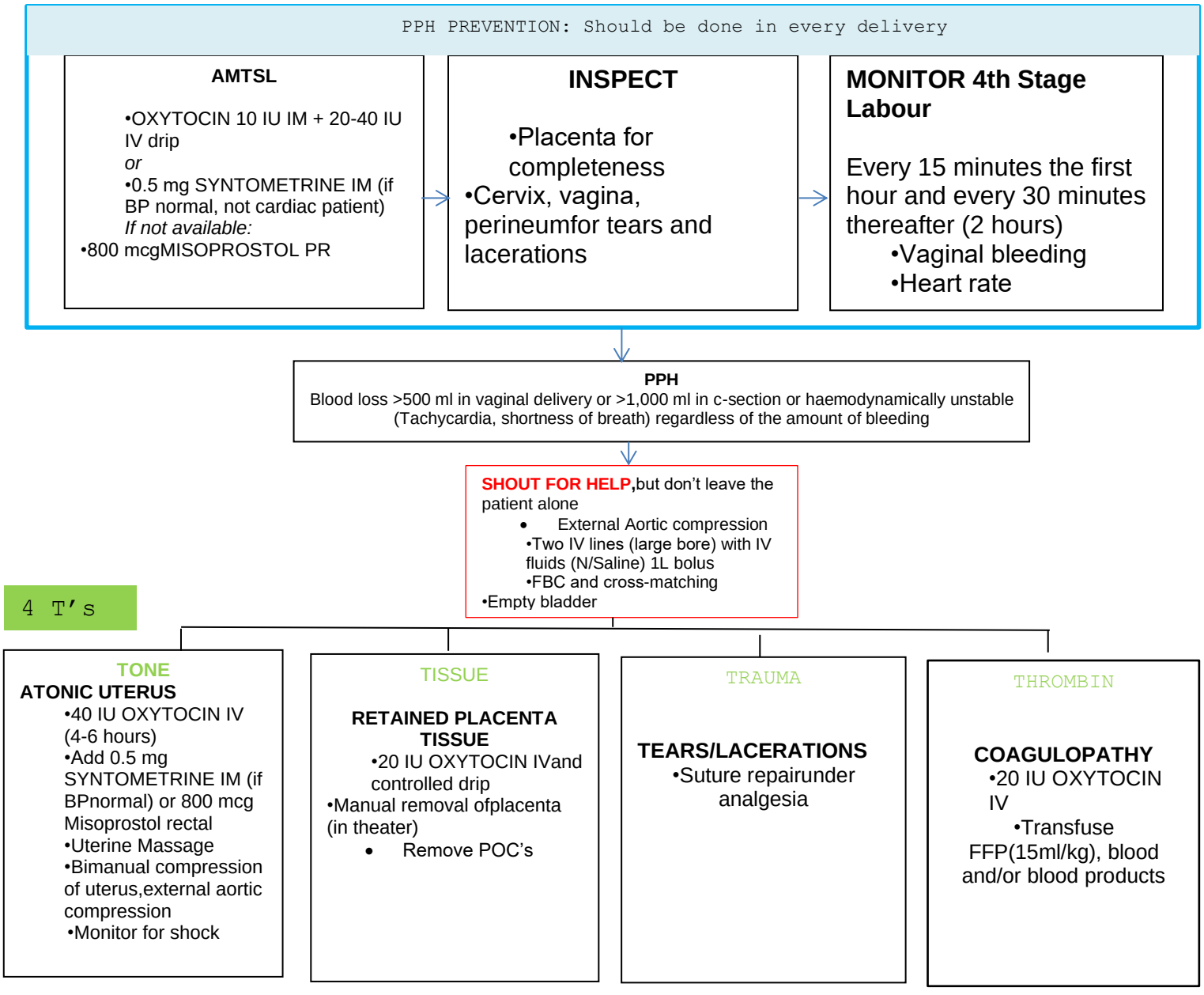
XII. Anti-D should be given for episodes of APH in unsensitised Rh negative women.

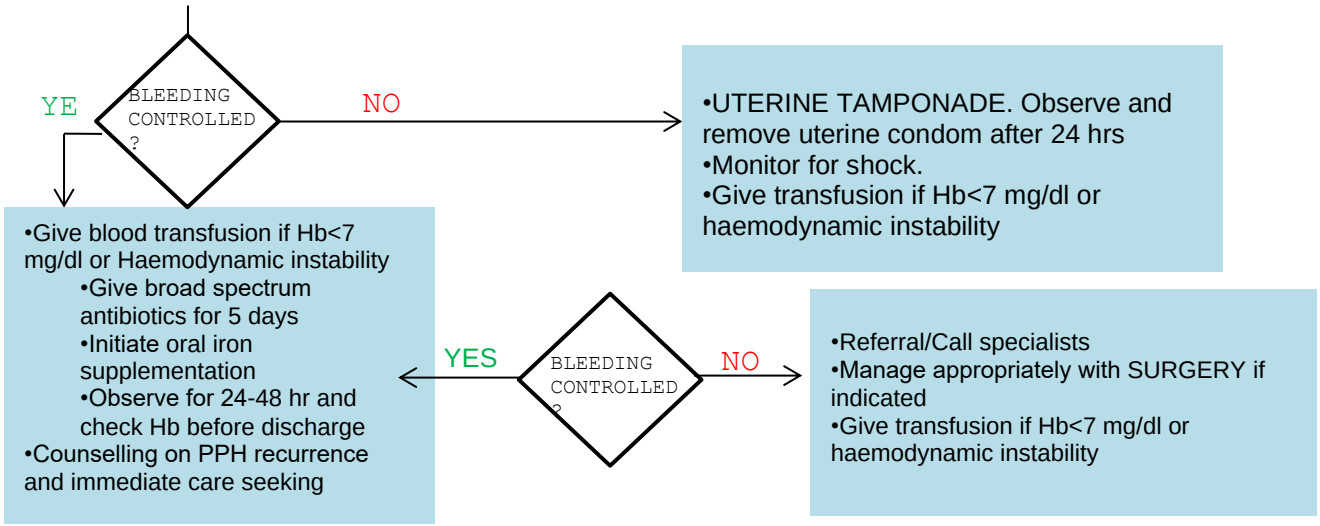
Flow Chart 9.0 **MANAGEMENT OF APH**




Placental localization
Ultrasonography
Emergency delivery
Emergency delivery
Placenta Praevia
Confirmed Diagnosis
Abruptio Placenta
Assess for delivery clinically
Classification
If bleeding stops
MINOR
Conservative Management
Major
Monitor anaemia
- Maintain on haematimics
- X-match and make ready minimum of 2 pints of blood
Discharge with instructionsif stable
specialist review c/s at 37/40
delivery by
Plan Delivery

Postpartum Haemorrhage Prevention, Early Diagnosis and Management Flow Chart




YE
BLEEDING CONTROLLED ?
NO
•UTERINE TAMPONADE. Observe and remove uterine condom after 24 hrs
•Monitor for shock.
•Give transfusion if Hb<7 mg/dl or haemodynamic instability
•Give blood transfusion if Hb<7 mg/dl or Haemodynamic instability
•Give broad spectrum antibiotics for 5 days
•Initiate oral iron supplementation
•Observe for 24-48 hr and check Hb before discharge
•Counselling on PPH recurrence and immediate care seeking
YES
BLEEDING CONTROLLED ?
NO
•Referral/Call specialists
•Manage appropriately with SURGERY if indicated
•Give transfusion if Hb<7 mg/dl or haemodynamic instability

Treatment of PPH

Table X: Drugs used for treatment of PPH

	Oxytocin	**Ergometrine/ Methyl-ergometrine**	**15-Methyl prostaglandin F2a**	**Misoprostol**
Dose and route	IV: Infuse 40 units in 1 L IV fluids at 4-6 hours	IM 0.2mg	IM: 0.25 mg	800- 1000 mcg PR
Continuing dose		Repeat 0.2 IM after 15 minutes If required, give 0.2 mg IM (slowly every 4 hours)	0.25 mg every 15 minutes	
Maximum dose	Not more than 2L of IV fluids continuing oxytocin	5 doses (Total 1.0 mg)	8 doses (Total 2 mg)	1000 mcg
Precautions/ contraindications	Do not give as an IV bolus	Pre-eclampsia, hypertension, heart disease	Asthma	May develop diarrhea/pyrexia

A.PPH treatment recommendations

I. Intravenous oxytocin is the recommended uterotonic drug for the treatment of PPH.
II. If intravenous oxytocin is unavailable, or if the bleeding does not respond to oxytocin, the use of intravenous ergometrine, oxytocin-ergometrine fixed dose, or a prostaglandin drug (including sublingual misoprostol) is recommended. All uterotonics can be used in combination.
III. The use of isotonic crystalloids is recommended in preference to the use of colloids for theinitial intravenous fluid resuscitation of women with PPH.
V. Uterine massage is recommended for the treatment of PPH.
VI. If there is no response to uterotonics, or if uterotonics are unavailable, the use of intrauterine balloon tamponade is recommended for the management of PPH due to uterine atony.
VII. If bleeding does not stop in spite of treatment using uterotonics and other available conservative interventions (e.g. uterine massage, balloon tamponade), then

surgical intervention is indicated. Surgical intervention should be considered as early as possible (Sub-TAH, Compression sutures/ Uterine-Internal artery ligation)
VIII. The use of bimanual uterine compression is recommended as a definitive or temporary measure until appropriate care is available for the treatment of PPH due to uterine atony after vaginal delivery.
IX. The use of external aortic compression for the treatment of PPH after vaginal birth is recommended as a temporary measure until appropriate care is available.
X. Uterine packing is dangerous and should not be done.
XI. The use of ergometrine for the management of retained placenta is not recommended as this may cause tetanic uterine contractions which may delay the expulsion of the placenta.

6. ECTOPIC PREGNANCY

A. DEFINITION:

Ectopic pregnancy refers to a pregnancy in which implantation occurs outside the uterine cavity.

B. CLASSIFICATION:

I. **Tubal (interstitial, isthmic, ampullary, fimbrial):**
The implantation occurs in the various parts of the tube, the commonest being the ampullary area. Tubal pregnancy constitutes about 99% of all extra-uterine pregnancies.

II. **Ovarian:** In this form of ectopic pregnancy the fertilization and implantation occur at the ovulation site in the ovary adjoining the fimbrial end of the tube. It is commonly tubo-ovarian which eventually becomesan abdominal pregnancy. This constitutes about 0.5% of extra-uterine pregnancies.

III. **Abdominal:** Often is secondary to tubal, ovarian or tubo-ovarian pregnancy.

IV. **Rare forms:** Cervical, cornual and heterotopic pregnancy (ectopic combined with intrauterine pregnancy)

Extra-uterine pregnancy can also be classified according to clinical presentation:

- Ruptured ectopic pregnancy. This causes severe intra-peritoneal bleeding.
- Slow leaking or chronic ectopic pregnancy. The point of rupture generally is small and the bleeding is not acute causing vague and inaccurate symptoms and signs.

_ Unruptured ectopic pregnancy.

C. CAUSES OF EXTRA-UTERINE PREGNANCY:

The primary causes of extra-uterine pregnancyare related to factors that either prevent or interfere with the movement of the fertilized ovum through the fallopian tube into the uterine cavity. These include:

I.	**Tubal pathology:**	- Chronic salpingitis - Tubal distortion and kinking due to chronic PID, previous pelvic surgery -tuboplasty, previous ectopic pregnancy. - Congenital abnormality: diverticula, accessory ostia. - Previous tubal ligation - endometriosis
II.	**Ovarian factors:**	- Multiple follicular development - Fertilization of unextruded ovum - Ovum transmigration (external).
III.	**Others include:**	- Use of exogenous hormones particularly progesterones at the time of conception. - Use of intrauterine contraceptive devices.

D. NATURAL HISTORY OF EXTRA-UTERINE PREGNANCY

I.	Rupture:	Almost all tubal pregnancies terminate in rupture of the section of the tube. Abdominal and Ovarian pregnancies may also rupture into the peritoneal cavity.
II.	Abortion:	This may occur with all types of ectopic pregnancies
III.	Development to viability:	Only some abdominal pregnancies are known to develop to viability stage. These are usually undiagnosed.

E. CLINICAL PRESENTATION

Symptoms	Signs

Pain: Lower abdominal pain sometimes unilateral occurs in almost all cases	Adnexal tenderness: This may be elicited by abdominal palpation or bimanual examination
Bleeding: Abnormal uterine bleeding (usually irregular, scanty and dark) occurs in nearly 3/4 of cases	Adnexal mass: Unilateral tender adnexal mass in the presence of amenorrhoea is a strong indicator
Amenorrhoea: Patients often present with history of amenorrhea.	Uterine size: Changes in the uterus including the size are not correlative to duration of amenorrhoea and pregnancy
Dizziness and Fainting: Syncope often of sudden onset may occur. This is more frequent in cases of ruptured ectopic pregnancy	Cervical Excitation: This is generally positive. Shock – signs of shock

Shoulder tip pain

Related to irritation of the diaphragm by blood from a ruptured ectopic. (referred pain)

F. DIAGNOSIS

Clinical	Special Examination
Proper History: - Attention to menstrual history and onset of symptoms - Risk factors (see causes of extra-uterine pregnancy)	Paracentesis: Drawing non-clotting blood is indicative of ruptured ectopic but often proves negative. Culdocentesis: More accurate than paracentesis should be preferred. However it will be negative in an unruptured ectopic.
Examination: - General physical with special reference to pallor and	Ultrasound:

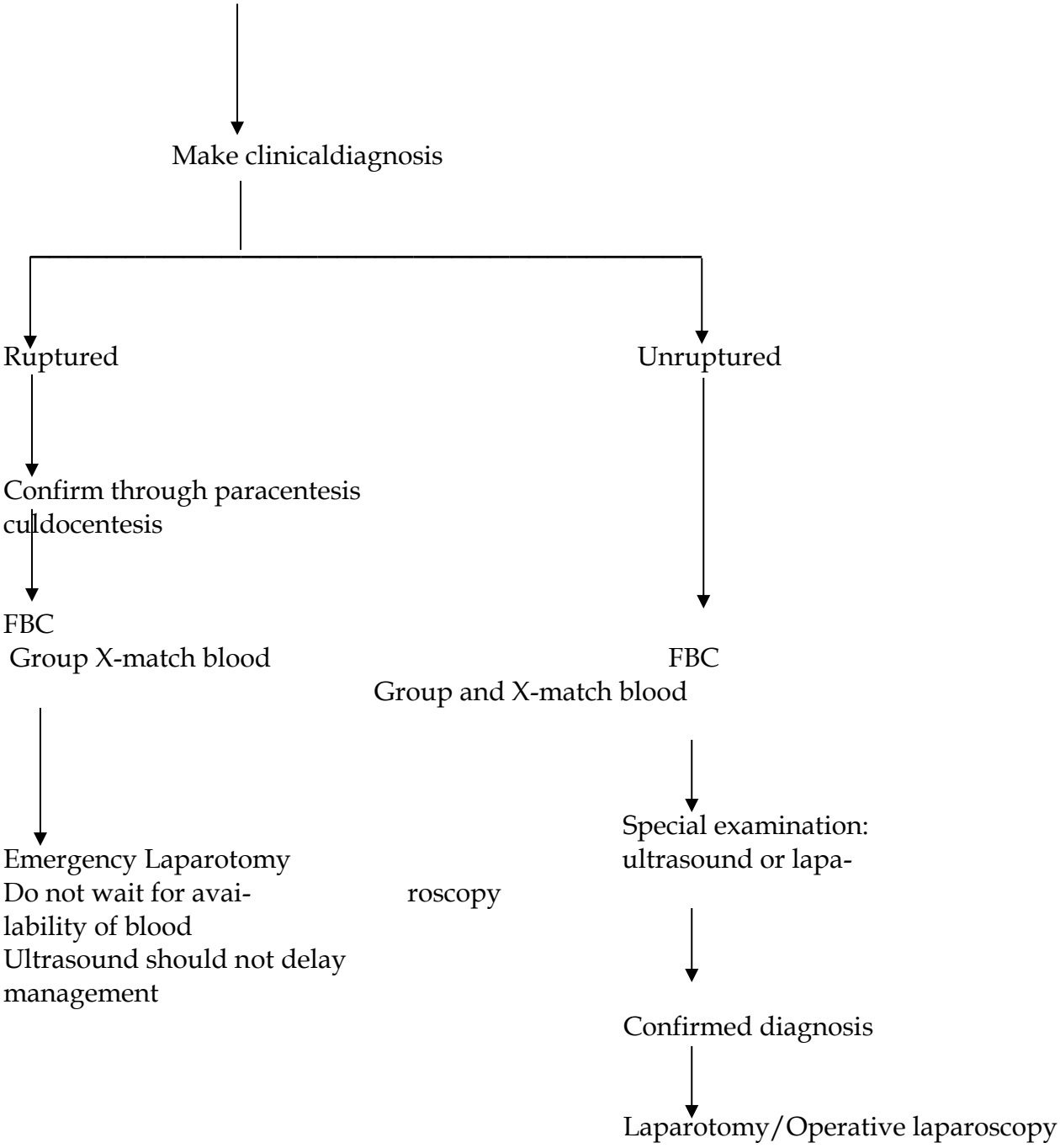
abdominal tenderness, guarding and shifting dullness.	Usefulin demonstrating anempty uterine cavity or an adnexal mass or free fluid.
- <u>BP, P and Temp</u>. Blood pressure may be low, pulse may be rapid and thready and a degree of fever may be present. Normal findings however, do not exclude ectopic pregnancy.	<u>Laparoscopy</u>: Most accurate special examination
- Gynaecological: . Speculum examination . Digital examination to assess uterus, adnexae and POD for abnormal mass and tenderness	<u>Laboratory</u>: - Pregnancy test - FBC - Group and X-match blood

G. MANAGEMENT

When a patient presents with what appears to be ectopic pregnancy, the way to proceed is as follows (flow chart 11.0):

Flow Chart 10.0: MANAGEMENT OF ECTOPIC PREGNANCY

. Take general and specific history
. Perform general physical and gynaecological examination. Do pregnancy test



H. COMPLICATIONS OF ECTOPIC PREGNANCY

- Hypovolemic shock in acute rupture.
- Peritonitis if laparotomy is delayed.
- Salpingitis particularly in chronic tubal pregnancy.
- Infertility following surgical treatment of the ectopic pregnancy and or chronic salpingitis.
- Recurrent ectopic pregnancy.
- Maternal mortality

I. SPECIAL NOTES:

I. Confirmed extra-uterine pregnancy is a serious emergency and once diagnosed, urgent definitive treatment must be instituted i.e. laparotomy.

II. Blood should be made available for possible transfusion but it must not be a condition for laparotomy. In the absence of blood products laparotomy should be done and not delayed. Mortality will be caused by ongoing haemorrhage which needs to be arrested.

III. Special tests and examinations for confirmation of diagnosis should be done at appropriate health institutions with relevant skills and facilities. However,paracentesis/culdoscentesis to confirm intraperitoneal bleeding is simple and can be performed in any setting.

IV. Various surgical procedures can be performed at laparatomy depending on the site of the ectopic pregnancy:

a) Salpingectomy:
This is the commonest operation for tubal pregnancy whether ruptured or not. This involves removal of the affected tube.

b) Salpingoophorectomy:
This is indicated where there is involvement of the ovary in the pregnancy mass.

c) Resection of ectopic:
This is performed if the " pregnancy" is implanted into the uterine myometrium as in cornual pregnancy.

ABDOMINAL PREGNANCY

In abdominal pregnancy where the placenta is attached to vascular abdominal organs or bowel, the practice is to extract the foetus and tie the cord.**DO NOT REMOVE THE PLACENTA.** It will dissolve over time. Attempts to extract the placenta carry serious risk of uncontrollable haemorrhage. These patients need close follow up.

NB: Once a diagnosis of ruptured ectopic has been made, management is operative. Do not waste time with investigations that will not change management.

7. SEPSIS IN OBSTETRICS

Pregnancy has a negative influence on the woman's immune resistance to infections. If a pregnant woman does not receive adequate ANC, which should include advice on nutrition and correction of conditions like anaemia, she has an increased risk of succumbing to infection during pregnancy, delivery and the puerperium. Infection in pregnancy develops into severe forms of sepsis, which is one of the leading causes of severe morbidity and mortality in developing countries. Prevention and adequate management of infection in obstetrics is, critical in the effort to reduce maternal morbidity and mortality.

The critical infections are those that occur after delivery and abortion. These infections are prevalent when the management of labour, delivery and abortions is inappropriate and does not conform to basic principles of asepsis. They are promoted by circumstances in which illegal abortions thrive and where there is poor and inadequate maternity care. Patients with underlying immune deficiency may have severe infections in pregnancy.

INSERT SURVIVING SEPSIS CAMPAIGN VARIABLES

Sepsis: Infection, documented or suspected and some of the following general variables	Inflammatory Variables	Hemodynamic variables	Tissue Perfusion variables	Organ dysfunction variables

Fever > 38 Hypothermia < 36 Tachycardia >100 Tachypnea> 25 Altered mental status Edema Hyperglycemia in non diabetics	Leucocytosis >12 000 Leukopenia <4000 White cell count >10% immature forms Plasma c-reactive protein >2 SD above normal Plasma calcitonin >2 SD	1 arterial hypoperfusion SBP <90 Map <70 SBP decrease >40	Hperlactemia >1 mmol/L Decreased capillary refill or mottling	Arterial hypoxemia Acute oliguria Raised creatinine Coagulation abnormalities (INR > 1.5) Thrombocytopenia <100 Hyperbilirubinemia

A. DEFINITION:

Septicaemia:

Sepsis is defined as a known or suspected infection plus systematic manifestations of infections (eg. Traditional systematic inflammatory response syndrome criteria- tach-cardia, tachypnea, white blood count changes, and fever/hypothermia as well as other metabolic pertubations or organ dysfunctions)

Severe sepsis is defined as sepsis plus infection induced organ dysfunction or infection-induced acute tissue hypoperfusion. Organ dysfunctions associated with sepsis include acute lung injury, acute kidney injury, coagulopathy, liver dysfunction and cardiovascular abnormality. Tissue hypoperfusion abnormalities include hypotension, elevated lactate, oliguria, and altered mental status. There is some overlap between tissue hypoperfusion abnormalities and organ dysfunction associated with the cardiovascular system.

Bacteraemia: Bacteremia is defined as the presence of viable bacteria within the liquid component of blood. It may be primary (without an identifiable focus of infection). Although sepsis is associated with bacterial infection, bacteremia is not a necessary ingredient in the activation of the inflammatory response that results in severe sepsis. In fact,

septic shock is associated with culture-positive bacteremia in only 30-50% of cases.

B. CLINICAL CLASSIFICATION:

For the purpose of this manual obstetric infections will be discussed under three groupings:

I. Infections in pregnancy
II. Puerperal sepsis: sepsis associated with delivery and post delivery state.
III. Abortal sepsis: sepsis related to abortion.

C. CAUSES, CLINICAL PRESENTATION AND MANAGEMENT

I. Infections in Pregnancy:

These infections are mentioned because of the potential they carry in predisposing to abortal or puerperal sepsis. Many women may conceal the symptoms that suggest these infections to avoid social embarrassment or they may not appreciate the significance of these symptoms. It is, therefore prudent for the health provider at the ANC to specifically enquire about these symptoms and carry out the relevant examinations.

a) **Table 13.0 Causes and clinical presentation of antenatal infection**

Infection	**Cause**	**Predisposing factors**	**Signs & Symptoms**
Trichomoniasis	Trichomonas Vaginalis	. Sexual intercourse . Poor personal hygiene . Common sitting Toilets . Common bath tabs	. Genital irritation . Fetid foamy or Greenish P.V discharge. . Reddish petenchiae on cervix or vagina.
Candidiasis	Candida Albicans	. Poor personal hygiene	. Genital pruritis . Curdy white PV discharge

		. Diabetes mellitus	. Vulvovaginitis . Swelling of the vulva
Non-specific Vaginitis and Cervicitis	Non-specific pathogens	. Poor personal hygiene . Vaginal douching . Anaemia . Cervical erosion.	Offensive P.V. Discharge

D. **INVESTIGATIONS AND TREATMENT:**

All women who present with possible genital infections should undergo the following examinations and investigations:

- Thorough genital examination including speculum examination.
- Urinalysis and MSU for culture.
- Endocervical swab and posterior fornix specimen for wet preparations and culture.

E. **TREATMENT:**

Specific treatment is best prescribed after results of the investigations are received. However, sometimes the symptoms may be causing severe discomfort and relieving therapy may be necessary immediately. The following prescriptions are recommended for general treatment:

i) Antimycotics: Clotrimazole, pessaries and creams. This also relieves general symptoms.

ii) Anti Trichomonas: metronidazole

iii) Antibiotics: Ampicillin, cloxacillin, ampiclox, penbrittin etc.

The treatment of specific infections must include the concurrent treatment of the partner even if the partner has no symptoms.

F. **PREVENTION OF GENITAL INFECTIONS IN PREGNANCY:**

The mainstay of preventing genital infections is general and sexual hygiene. The antenatal mothers should be counselled specifically in this area to

minimize chances of infection. In the cases of specific and sexually transmittable infections, the treatment and counselling of sexual partners is mandatory if recurrence is to be avoided.

II. **Abortal Sepsis:**

Unsafe abortion performed under circumstances of illegality is the commonest source of abortion related sepsis. The procedure to terminate pregnancy in this case is carried out by incompetent (often untrained) persons in dubious environment, using unorthodox (frequently dangerous) non-aseptic instruments. However all types of abortions, should be considered as potentially infective conditions since the environment in which they start and develop are uncertain.

a) Table 13.1 Clinical Presentation

Severity of Sepsis	**Symptoms**	**Signs**
Mild	. Headache . Lower abdominal pain . Thirst . General body malaise . Nausea and vomiting . Dysuria . Occasional diarrhoea	. Fever and hypothermia . Brownish or blood stained purulent vaginal discharge . Suprapubic tenderness . Pelvic tenderness . Positive cervical excitation . Dehydration
Severe sepsis	. All of the above symptoms . Dizziness	. Rigor . All the above signs except dehydration which may be severe . Oliguria . Jaundice due to haemolysis . Abdominal tenderness and guarding . Abnormal pulse rate
septic shock	. Patient may be disorientated or unconscious.	. Marked paleness . Cyanosis . Pupils may be dilated . Pulse-weak, rapid

	. High fever with rigors or hypothermia.	. BP may be lowered . Restlessness . Hyperventilation . Tachycardia . Severe jaundice . Renal failure

b) Investigations

i) Basic investigations include:
- . Urinalysis
- . Full blood count
- . HVS for culture and sensitivity
- . U/E
- . LFT
- . Pregnancy test
- . HIV testing

ii) Advanced investigations:
- . Blood culture
- . Ultrasonography of the abdomen and pelvis
- . Blood gases
- . Coagulation
- . X-ray of the chest and abdomen

c) Principles of Management

i) Hydration of the patient is of cardinal importance. Avoid cardiac overload.

ii) Aggressive antibacterial therapy must be instituted immediately and adjusted accordingly after the sensitivity reports are received. Triple antibiotic therapy is prescribed.

iii) Blood and or blood products (plasma, packed blood cells) should be made available and ready for possible administration.

d) **Prevention of abortal sepsis:**

i) Spontaneous abortions are generally unexpected events and often occur in potentially infective environment. Induced abortions are even more so. It is therefore safe to regard them as infected conditions at the time of diagnosis and provide wide spectrum antibiotic treatment.

ii) The specific and definitive management of the various clinical types of abortion must be initiated promptly without undue delay.

iii) Education and counselling on personal and sexual hygiene for pregnant women right from the beginning of the pregnancy will help to minimize the chances of sepsis if abortion may occur.

III. Puerperal Sepsis:

Puerperal infections can be precipitated through:

i) Pre-existing genital infection that was not diagnosed in the antenatal period or was inadequately treated and flares up in the puerperium.

ii) Non-conformity to aseptic techniques in the management of labour and delivery and poor approach to repair of episiotomies and genital lacerations.

iii) Inappropriate management of the puerperium including:

- inappropriate breastfeeding techniques
- coitus before genital wounds have healed
- poor personal hygiene leading to poor care of the genital wounds and breasts.

iv) Prolonged rupture of membranes.

v) prolonged and or obstructed labour with repeated vaginal examinations.

vi) nosocomial infections .

vii) Immunosuppression (HIV/AIDS)

a) Classification of puerperal sepsis - See table 14.0

Effort to classify puerperal sepsis is necessary for purposes of planning and focusing treatment schedules. Frequently the infection may be localized in specific tissues and organs which may dictate the choice of the drugs to be used. When the sepsis is generalized many organs and systems are affected and therefore a more aggressive treatment approach is required. The commonest types of puerperal sepsis are:

i) mastitis: when infection is localized to one or both breasts

ii) pelvic abscess - the infection is localized in the pelvic region. Often uro-genital system is involved.

ii) sepsis - multiple organs and systems are involved.

b) Predisposing factors and clinical presentation:

Puerperal sepsis will present with a variety of symptoms and signs depending on the organs and or body systems involved. Hence the symptoms and signs may be localized or generalized. (See table 14.0)

Table 14.0 Classification of Puerperal infections and diagnosis

Diagnosis	**Signs and Symptoms**	**Predisposing factors and conditions**
Endomeometritis:	Temp 38°C and above six hours after delivery Malaise, LAP Offensive lochia Uterine subinvolution	Poor personal hygiene Repeated vaginal exam Prolonged labour C/section
Infected wounds	Temp 38°and above Malaise	Poor personal hygiene Repeated vaginal exam
Mastitis	- Breast engorgement - Segmental erythema - Tenseness in breast - Axillary adenopathy - Fever, but not always - Nipple purulent discharge (not always)	- Nursing mothers - Galactostasis in the breast - Cracked nipples - Breast tumours - Staphylococcus aureus. - Oral thrush on the baby
Pelvic sepsis	- Pelvic pain - Lower abdominal pain - Dysuria (urethral pain during urination) - Copious purulent or brownish lochia - Fever - Lower abdominal tenderness - Pelvic tenderness - Infected and opened up genital wounds.	- Prolonged labour - Obstructed labour - Premature rupture of membranes - APH - Pre-existing lower genital infections - Lack of conformity to asepsis in the management of labour and delivery. - Difficult vaginal delivery - Poor repair of lacerations. - HIV
Septicaemia	- Exaggerated signs and symptoms of pelvic sepsis - Generalized body pain - Symptoms and signs of peritonitis: vomiting, severe	- As in pelvic sepsis - Inefficient management of puerperal pyrexia i.e. neglected puerperal sepsis - Inaccessibility to PNC.

	abdominal guarding, dehydration. - Olyguria - Renalfailure - Jaundice	

i) **General considerations:**

. Early diagnosis and specific antimicrobial treatment is key to successful treatment of puerperal sepsis.

. Puerperal infections are multibacterial and any treatment should take account of gram-positive, gram-negative and anaerobic bacteria.

. Patients with puerperal sepsis require adequate hydration to avoid haemo-concentration and renal cortical and tubular damage. They also need high protein diet.

. Effort must be made to establish laboratory diagnosis in the shortest possible time in order to institute specific antimicrobial treatment.

ii) **Specific management:**

IV.Mastitis:

Because frequently mastitis is accompanied by cracked nipples, breastfeeding from the affected breast should be suspended for 48 hours while aggressive treatment is undertaken. Expression of milk with a breast pump, however should be done to avoid stagnation of milk that may later affect breastfeeding which should resume after 48 hours. If an abscess has formed, breastfeeding from that particular breast must cease altogether since surgical incision and drainage will be necessary. In mild form of mastitis breastfeeding should be allowed uninterrupted to prevent milk congestion which predisposes to abscess formation.

Mild Sporadic Mastitis	**Severe Mastitis with Abscess Formation**
. Continue breastfeeding . Culture of nipple discharge or milk . Broad spectrum antibiotics & analgesics . Topical cream for the treatment of cracked nipples	. Prompt weaning in case of abscess or temporary suspension of breastfeeding . Broad spectrum antibiotics . Cold compresses and supporting

. Cold compresses and firm Brassiere.	Brassiere.

Usually if aggressive treatment is instituted in time abscess formation is avoided. However, if abscess has formed or becomes apparent after treatment has started incision and drainage of the abscess must not be delayed.

V.Pelvic sepsis and septicaemia:

When appropriate diagnosis and treatment is initiated early puerperal sepsis is less likely to degenerate into septicaemia, peritonitis and formation of abscesses. General approach to management therefore is as described below.

A. Once a clinical diagnosis has been made the following laboratory investigations should be requested for:

- Urinalysis, MSSU for culture
- Endocervical swab for culture
- Full blood count
- Blood urea and electrolytes

In severe cases where pelvic or abdominal abscesses are suspected, in addition to these the following should be considered:

- Blood culture
- Blood gasses
- Ultrasound of the abdomen with focus on pelvis where this is possible.
- Abdominal X-ray
- HIV counselling and testing

B. Meanwhile the patient should be commenced on:

- broad spectrum antibiotics to cover for gram-positive, gram-negative and anaerobic microorganisms
- adequate nutrition
- adequate hydration
- appropriate correction of anaemia if present.

C. As soon as results from the tests are available including culture report the treatment must be reviewed and adjusted accordingly.

D. The necessity and frequency of repeat tests should be dictated by the condition of the patient and response to therapy.

E. If abscesses have formed the patient should have laparotomy and drainage of the abscess as soon as the patient's conditions allows surgery under general anaesthesia. Failure to intervene surgically in time leads to serious long-term complications.

VI.Technique of laparatomy for drainage of abscesses

- Longitudinal median incision in the lower abdomen is recommended unless subphrenic abscesses are suspected when this incision can be extended beyond the umbilicus. This incision permits better exploration of the abdominal cavity.
- Effort must be made to separate the tissues and organs to minimize massive adhesions.
- POT-O-VAC drains should be inserted through the abdominal wall into the pelvic cavity for continued drainage.
- In severe wide spread peritonitis, tension sutures should be used to close the abdomen to avoid opening up of the wound.
- Patients should be on intravenous antibiotics before, during and after operation.

A.**SUPPORT TREATMENTS INCLUDE:**

- Adequate hydration with, Hartman's or Ringer's solution and active movement in and out of bed.
- Transfusion of blood products where indicated.
- Emotional and psychological support through constant counselling and reassurance is very important.

VII. COMPLICATIONS OF SEPSIS IN OBSTETRICS:

I. Antenatal Infections:

. abortion and premature labour,
. premature rupture of membranes,
. congenital infection of the newborn (neonatal, septicaemia),
. puerperal sepsis.

II. Abortal and Puerperal sepsis:
. inability to provide adequate breastfeeding,
. infertility due to tubal blockage and or uterine synechia,
. maternalmortality

SPECIAL NOTES ON SEPSIS IN OBSTETRICS:

I. Good ANC including screening for genital infections, aseptic and appropriate management of labour and delivery through the use of the partogram as well as good PNC are fundamental in prevention and management of sepsis in obstetrics.

II. The common causative bacteria include:

- haemolytic staphylococcus aureas,
- haemolytic streptococcus pyogenes,
- escherichia coli,
- pseudomonas,
- chlamydia trachomatis.
- anaerobic

III. Broad spectrum antibiotics are used either singly or in combination depending on the spectrum of activity against Gram positive, gram negative and anaerobic bacteria.

IV. Early diagnosis and prompt initiation of treatment is essential if short and long term complications are to be avoided or at least minimized.

V. Puerperal Sepsis: Was defined as infection of the genital tract occurring at any time between the onset of rupture of membranes or labour, and the 42nd day postpartum.

Puerperal Infection: is a more general term than puerperal sepsis and includes not only infections due to puerperal sepsis, but also all extra-genital infections and incidental infections.

VI. Crystalloid solution is the best solution to use in cases of obstetric haemorrhage and sepsis.

LIST OF REFERENCE

1) FIGO Misoprostol Recommended Dosages 2012. Available at: http://www.figo.org/publications/miscellaneous_publications/Misoprostol_Recommendation_2012
2) WHO. Safe Abortion Technical and Policy Guidance for Health Systems. Second Edition 2012. Available at: http://apps.who.int/iris/bitstream/10665/70914/1/9789241548434_eng.pdf