Ministry of Health

Basic Obstetric Protocols

2026

1st Edition

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Foreword

The Kenya Government through the Ministry of Health has made remarkable progress in improving maternal and newborn health outcomes through various interventions though more investment must be put in place to attain the Sustainable Development Goals. The Kenyan constitution 2010 Article 43 1(a), Article 28 and the Health Policy Framework (2014-2030) goal is to offer the highest quality attainable standard of health and be responsive to the needs of the Kenyan citizens. Continuous improvement on quality maternal, newborn, child and adolescent health services is a priority for the Kenyan Government that strives to in cooperate / employ evidence based best practices and actionable interventions by use of timely obstetric protocols.

These Basic Obstetric Protocols 2026 have been developed to provide evidence based, practical guidance to health care professionals at all levels of health service delivery. The instrument addresses the Big Six priority conditions in maternal care namely, Antepartum Haemorrhage, Postpartum Haemorrhage, Obstructed/Prolonged Labor, Anaemia in Pregnancy, Hypertensive Disorders in Pregnancy, Sepsis, and Abortion complications which together account for majority of the maternal and perinatal morbidity and mortality in our country. The protocols outlined herein reflect the current evidence on best practices in clinical recommendations adapted to our national context, as guided by the National Guidelines on Quality Obstetrics and Perinatal Care, 2024. They are designed for use by health care professionals to ensure standardized, timely, quality health care.

Target population for these obstetric protocols include National and County health managers, Health Policy Makers, Regulators, Health Care Providers, Researchers, Academia, and Pre-service training institutions. We recommend all healthcare professionals to familiarize themselves with these obstetric protocols and to apply them consistently in their daily practice. Routine use and application of these protocols will significantly reduce preventable adverse outcomes and contribute to safer childbirth for all women.

It is my sincere hope that this document which is designed to provide a practical guide and equip health care professionals with maternal health knowledge, skills, competencies and positive attitude at all levels of health service delivery implementation; will accelerate the reduction of maternal and perinatal morbidity and mortality. Together, we can uphold our commitment to ensuring that every pregnancy and every birth is safe.

Dr. Bashir Issak
Director of Family Health
Ministry of Health

Acknowledgment

The development of the Basic Obstetrics Protocols 2026 involved in-depth consultations with a wide range of multidisciplinary stakeholders including specialized and experienced health care professionals through literature review, consultative meetings and alignment to the National Guidelines on Quality Obstetrics and Perinatal Care 2024.

The Division of Reproductive Maternal Newborn, Child and Adolescent Health wish to express its profound gratitude to all individuals and organizations whose contributions made the development of this Obstetric Protocols possible. The DRMNCAH is indebted to the team of stakeholders constituting the technical working group both at National and County Levels including experts from Moi Teaching and Referral Hospital and Kenyatta National Hospital.

We also acknowledge the role of professional bodies such as Kenya Obstetric and Gynaecology Society (KOGS), Midwifery Association of Kenya (MAK), medical training institutions, regulatory bodies, both development and implementing partners. We extend our heartfelt gratitude to Clinton Health Access Initiative (CHAI) for their technical and financial support availed for this process.

Our appreciation also goes to the esteemed reproductive health coordinators, midwives, nurses, medical officers, obstetricians and gynaecologists, and other front line health care professionals who shared their real-world experiences and practical insights. Your voices ensured that the protocols are not only clinically sound but also realistic for use in diverse health service delivery settings.

It is our sincere hope that these protocols will serve as a trusted companion for healthcare professionals across all levels of the health system and thus ensure that every woman has the opportunity for a safe and positive birth experience.

Dr. Edward Serem
Head, Division of Reproductive, Maternal, Newborn, Child and Adolescent Health
Ministry of Health

Appreciation

The Ministry of Health extends profound gratitude to the Kenya Obstetrical and Gynaecological Society (KOGS) for their visionary leadership in synthesizing the 1st Edition of Basic Obstetric Protocols. This landmark achievement serves as a vital cornerstone for strengthening our health system, through evidence-based standardization that is essential for high-quality maternal care, particularly during life-saving obstetric emergencies. The KOGS has shepherded an indispensable instrument that reinforces the knowledge acquired in training to practice, directly contributing to the reduction of preventable mortality and ensuring a safer future for mothers and newborns across the nation.

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Contents

Glossary

Abbreviation	Full name
ANC	Antenatal Care
ANP	Antenatal Profile
APH	Antepartum Haemorrhage
APLS	Antiphospholipid Syndrome
ARB	Angiotensin Receptor Blocker
AST	Aspartate Aminotransferase
ALT	Alanine Aminotransferase
ACE	Angiotensin Converting Enzyme
ABCDE	Airway, Breathing, Circulation, Disability, Exposure
BP	Blood Pressure
BPP	Biophysical Profile
BTU	Blood Transfusion Unit
BD	Twice Daily
bpm	Beats per Minute
BTU	Blood Transfusion Unit
CBC	Complete Blood Count
CNS	Central Nervous System
CPR	Cardiopulmonary Resuscitation
CRP	C-Reactive Protein
CT	Computed Tomography
CTG	Cardiotocography

Abbreviation	Full name
CCT	Controlled Cord Traction
DIC	Disseminated Intravascular Coagulation
DQA	Data Quality Assessment
FHR	Foetal Heart Rate
FHG	Full Haemogram
GCS	Glasgow Coma Scale
GXM	Group and Cross Match
Hb	Hemoglobin
HDU	High Dependency Unit
HELLP	Hemolysis, Elevated Liver enzymes, Low Platelets
HIV	Human Immunodeficiency Virus
HR	Heart Rate
ICU	Intensive Care Unit
IM	Intramuscular
INR	International Normalized Ratio
IU	International Units
IUFD	Intrauterine Fetal Death
IPTp-SP	Intermittent Preventive Treatment in pregnancy with Sulfadoxine-Pyrimethamine
IV	Intravenous
LDH	Lactate Dehydrogenase
LFTs	Liver Function Tests

Abbreviation	Full name
MAP	Mean Arterial Pressure
MCH	Mean Corpuscular Hemoglobin
MCHC	Mean Corpuscular Hemoglobin Concentration
MCV	Mean Corpuscular Volume
MEOWS	Modified Early Obstetric Warning Signs
MgSO4	Magnesium Sulphate
MRI	Magnetic Resonance Imaging
MVA	Manual Vacuum Aspiration
NASG	Non-Pneumatic Anti-Shock Garment
NBU	Newborn Unit
NEWS	National Early Warning Score
NRM	Non-Rebreather Mask
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
NRFS	Non-Reassuring Fetal Status
OD	Once Daily
OR	Operating Room
POC	Point of Care
OPOCUS	Obstetric Point of Care Ultrasound
PPH	Postpartum Haemorrhage

Abbreviation	Full name
PPROM	Pre-labour Premature Rupture of Membranes
PPE	Personal Protective Equipment
PR	Pulse Rate
PV	Per Vaginal
QID	Four Times a Day
RBC	Red Blood Cells
RR	Respiratory Rate
SBP	Systolic Blood Pressure
SIRS	Systemic Inflammatory Response Syndrome
SpO_2	Peripheral Oxygen Saturation
SLE	Systemic Lupus Erythematosus
STIs	Sexually Transmitted Infections
STAT	Immediately
SVD	Spontaneous Vaginal Delivery
TDS	Three Times Daily
TXA	Tranexamic Acid
UEC	Urea, Electrolytes, Creatinine
UHC	Universal Health Coverage
WHO	World Health Organization

Key Considerations: Obstetric red flags and referral pathways

Take a comprehensive history to identify High risk patients such as:

Preexisting and/or newly diagnosed health conditions:

High blood pressure, diabetes, anaemia, heart disease, kidney disease, thyroid disorders, autoimmune diseases (like lupus), obesity, or infectious diseases (HIV, hepatitis).

Extremes of maternal age:

Age is younger than 20 years old or older than 35 years old.

Multiple gestation:

Twins, triplets, or more increase the risks for both mother and babies.

Past pregnancy complications:

History of preterm birth, recurrent pregnancy loss, previous caesarean birth and other surgeries, Pre-eclampsia, PPH, APH, obstructed labor, still birth, or having a child with a genetic or birth defect.

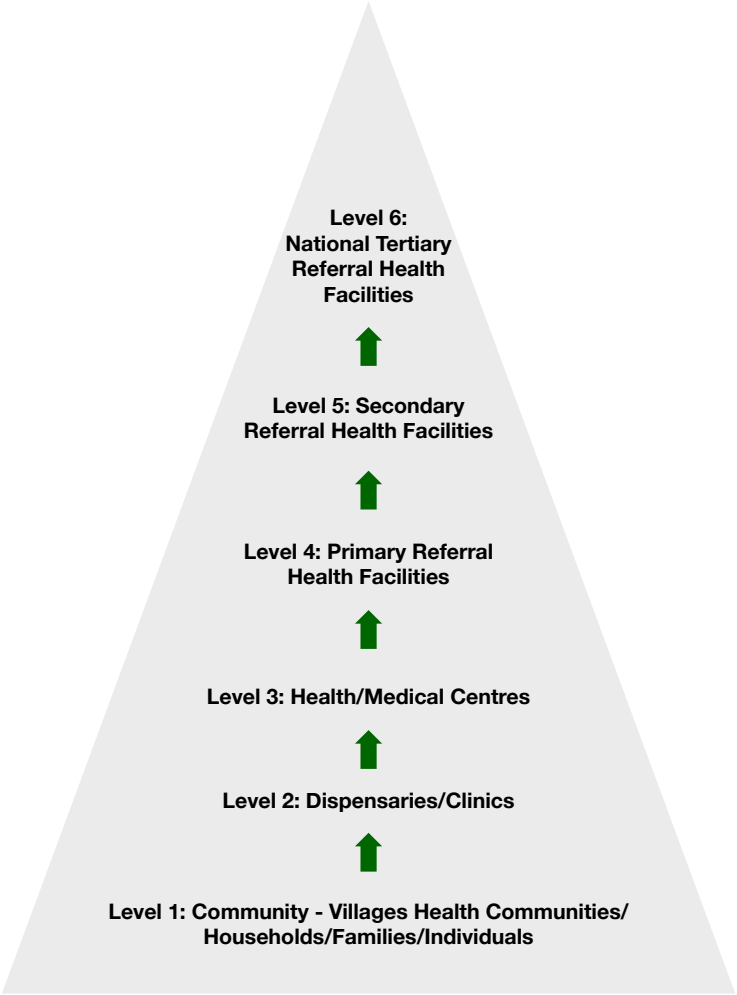
Lifestyle factors:

Use of alcohol, tobacco, illegal drugs, malnutrition, GBV or poor health seeking behavior including inadequate prenatal care.

Fetal Factors:

Babies diagnosed with genetic conditions and/or birth defects.

Should the patient exhibit any of the above, the health professional in lower tier facilities should refer the client to a level 4 OR above facility for further assessment.



1. Hypertensive disorders in pregnancy

Classification of Hypertensive disorders of pregnancy

Chronic hypertension.	Hypertension confirmed preconception or prior to 20 weeks' gestation.
Gestation hypertension.	New onset hypertension arising after 20 weeks' gestation in the absence of proteinuria and other systemic symptoms.
Pre-eclampsia.	Multi-systemic disorder of unknown aetiology characterized by elevated BP ≥ 140/90 developed after 20 weeks of gestation in a previously normotensive woman.
Pre-eclampsia superimposed on chronic hypertension.	Features of Pre-eclampsia developing in a woman who had hypertension prior to conception.
Eclampsia.	Occurrence of one or more generalized tonic clonic seizures superimposed on Pre-eclampsia. Seizures may occur at any point during pregnancy and within the 12 weeks postpartum period.
HELLP syndrome *Although not a classification of HDP, it is an important complication spectrum of Pre-eclampsia.	HELLP syndrome describes a constellation of: • Hemolysis, • Elevated Liver enzymes showing hepatic dysfunction (AST and ALT greater than twice their normal range.), • Low Platelets (platelet count of less than 100,000/dl). It is associated with maternal mortality and severe morbidity including disseminated intra-vascular coagulopathy, liver hematoma, liver failure, and renal failure.

Pre-eclampsia

Definition of Pre-eclampsia

Multi systemic disorder of unknown aetiology characterized by elevated systolic ≥140mmHg and/or Diastolic ≥90mmHg developed after 20 weeks of gestation, and up-to 12 weeks postpartum, in a previously normotensive woman.

Classification of Pre-eclampsia

Pre-eclampsia is classified with severe features and without severe features:

Pre-eclampsia with severe features.

Pre-eclampsia without severe features.

1. Elevated blood pressure: Systolic BP ≥160mmHg or diastolic ≥110mmHg.
2. Proteinuria of ≥300 mg/24hrs. **OR** urine protein/ creatinine ratio of ≥30 mg/mmol. **OR** ≥2+ urine dipstick.
3. Maternal organ dysfunction:
   - a) Renal insufficiency (creatinine ≥ 90 mmol/L) .
   - b) Liver involvement: elevated transaminases ≥ 40IU/L, lactate dehydrogenase ≥600IU and/or severe right upper quadrant or epigastric pain) .
   - c) Neurological complications (severe headache, blurred vision, altered mental status, convulsions, hypereflexia).
   - d) Haematological complications (thrombocytopenia <150,000/µL, DIC, haemolysis).
4. Uteroplacental dysfunction – Foetal growth restriction, abnormal fetal doppler studies, placental abruption. **OR** IUFD.
5. Others – pulmonary oedema, oliguria < 500ml in 24hrs. Note: proteinuria is not mandatory for a diagnosis of pre- eclampsia with severe features.

Risk factors:

- Nulliparity.
- Age: >40 years or <18 years.
- Chronic hypertension.
- Chronic kidney disease.
- Autoimmune diseases (APLS, SLE).
- Inherited Thromobophilias.
- Inter-pregnancy interval > 10 years.
- Diabetes mellitus.
- Family history of Pre-eclampsia.
- Multi-fetal gestation.
- Previous history of Pre-eclampsia.
- Vitamin D deficiency.
- Obesity.

Antenatal care

- Elicit risk factors during preconception care, ANC visits or at first contact with the patient and refer appropriately.
- Educate the patient on danger signs and symptoms. Schedule two weekly follow up visits for full assessment of maternal and fetal well being.
- Use of low-dose aspirin can reduce the risk of preterm Pre-eclampsia by over 62% when started prior to 16 weeks of gestation.
- Initiate 150mg aspirin once a day, and refer to level 4 hospital or above. Ideally initiate at 11-14 weeks of gestation (or at first contact after that) until 36 weeks.
- Initiate Calcium 1g OD at 12 weeks or earliest contact thereafter.

Early Assessment	
History	Ask about headaches, visual disturbances, epigastric pain, and chest pain. Note any signs of mental confusion or agitated behaviour. Ask about fetal movements.
Physical examination	Examine for pallor, jaundice, dehydration, oedema. Vitals: Blood pressure. Heart rate. SpO2. Systemic examination: • Cardiovascular: presence or absence of any abnormal heart sounds. • Respiratory: Auscultate for air entry, comment on normal or abnormal. Presence or absence of crepitations. • Abdominal: Right upper quadrant or epigastric tenderness. Do Leopold maneuverer. • CNS: GCS and reflexes.
Laboratory investigations	FHG, UEC, LFT, urinalysis, uric acid, LDH.
Imaging	Obstetric ultrasound. If indicated, CT/MRI brain.

Principles of management

Pre-eclampsia without severe features

- Schedule 2 weekly follow up visits for serial BP measurements. If BP is equal to or above 160/100 or patient develops any signs of severity, refer to a hospital with an obstetrician.
- Educate the patient on self monitoring, danger signs and symptoms, weight management, exercise and good diet. Involve nutritionist. Discuss the birth plan.
- If BP is ≥150/90, initiate antihypertensive treatment.
- The goal is to maintain diastolic blood pressure between 80 and 100mm Hg and systolic pressure between 130 and 150mm Hg.
- First-line medications are:
- labetalol initial dose 100mg BD. Maximum daily dose is 2400mg.
- Nifedipine 20mg BD. Maximum daily dose of 80mg.
- Methyldopa 500mg TDS. Maximum daily dose of 3000mg.

Note: Atenolol, ACE inhibitors, ARBs, and diuretics should be avoided during pregnancy.

Pre-eclampsia with severe features

1. **Admit patient.**
2. **Blood pressure control.**
3. **Evaluate for end organ damage. Do base line investigations.**
4. **Seizure prophylaxis.**
5. **Fluid management: 60-80ml/h.**
6. **Fetal surveillance: CTG, BPP. Dexamethasone if < 34 weeks.**
7. **Develop a delivery plan: Timing and mode of delivery.**

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Assess the need for referral to a higher level facility and ensure thorough documentation.

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Assess for conservative management versus delivery

≥37+0 weeks	Delivery indicated regardless of symptoms. SVD preferred unless obstetric indication.
34 to 36^{+6} weeks	Delivery may be indicated in the event of development of worsening signs and symptoms.
<34 weeks	Delivery indicated in the setting of fetal/maternal compromise and in the setting of an NBU.

Management of severe acutely elevated blood pressure.

Target blood pressure	• Target sBP range of 130 to 150mmHg. • Target dBP range 80 to 100mmHg. Aim for gradual and sustained lowering of BP so blood flow to the fetus is not compromised.

Anti-hypertensives for use in severe acute elevated blood pressure.

Drug	Initial dose	Follow-up
Labetalol	20mg IV gradually over 2 minutes.	Repeat BP measurement at 10-minute intervals: • If BP remains above target level at 10 minutes, give 40mg IV over 2 minutes. • If BP remains above target level at 20 minutes, give 80mg IV over 2 minutes. • If BP remains above target level at 30 minutes, give 80mg IV over 2 minutes. Cumulative maximum dose is 300mg. If target BP is not achieved, move to another agent. Hold dose if HR<60 beats per minute.
OR		
Hydralazine	5mg IV gradually over 1 to 2 minutes.	Repeat BP measurement at 20-minute intervals: • If BP remains above target level at 20 minutes, give 5mg IV over 2 minutes, depending on the initial response. Cumulative maximum dose is 30mg per treatment event. If target BP is not achieved, switch to another class of agent.

Postpartum considerations

- Ensure continuous monitoring of blood pressure and maintenance within the normal range.
- Ensure completion of magnesium sulphate till 24 hours post delivery.
- Labetalol, nifedipine, hydralazine, amlodipine, atenolol, metoprolol, captopril and enalapril can be used in breastfeeding.
- Methyldopa should be avoided due to risks of postpartum depression.
- Women should be educated on the role of Pre-eclampsia prophylaxis in subsequent pregnancies and the long- term cardiovascular risk.
- Advise to initiate preconception care when planning next pregnancy and after conception early enrollment at high-risk antenatal clinic.
- Advise on appropriate family planning method.

Eclampsia

Described as occurrence of one or more generalized tonic clonic seizures. Seizures may occur at any point during pregnancy including 12 week post partum period.

General principles of management

1. **SHOUT FOR HELP:** Urgently mobilize available personnel. Rapid assessment of mother's condition.
   - **Danger:** Ensure you are safe, put on appropriate PPE. Ensure the environment is safe.
   - **Response:** Mobilize, call for help.
   - **Airway:** Open the mother's airway using a head tilt, chin-lift, or jaw thrust maneuver. Secure the airway using oropharyngeal airway if available.
   - **Breathing:** Confirm presence and rate, if present put on oxygen via NRM at 15 L/min in recovery position.
   - **Circulation:** Check presence and adequacy of pulse. If absent or <60bpm, commence CPR with 30 chest compressions, then give two rescue breaths. Ensure IV access, take blood samples for FBC/LFTS/UEC/coag/GXM.
2. Blood pressure control (Refer to table on Anti-hypertensives for use in severe acute elevated blood pressure).
3. Evaluate capacity to manage patient and initiate early referral if necessary.
4. Active seizures should be treated with IV. Magnesium sulphate as first line agent. Sign's of Magnesium toxicity should be monitored. (Refer to table below).
5. Fluid management.

Magnesium sulphate: Agent of choice to control and prevent recurrent seizures.

Magnesium sulphate	Magnesium sulphate MUST be diluted to a 20% solution for IV use.
Preparation of 4g 20% solution	• Wash hands thoroughly with soap and running water or use 70% alcohol hand rub and air dry. ***For an available solution of 50% MgSO4:*** • Using a 20-ml syringe, draw l2mL of sterile water for injection. • Withdraw 8mL of MgSO4 50% solution* and add to the 12 ml of water for injection to make 20mL of 20% solution. (4g per 20 ml).
Administration of loading dose and maintenance dose.	**Pritchard regimen(IV/IM):** ***Loading dose (IV and IM):*** • Give 4g IV over five minutes (20mL of the prepared 20% magnesium sulfate solution). • Ensure aseptic technique when giving magnesium sulfate deep IM injection. Warn the woman that she will have a feeling of warmth when the magnesium sulfate is given. • Follow promptly with 10g of 50% magnesium sulfate solution: Give 5g (10mL of the undiluted 50% solution) in each buttock as a deep IM injection with 1 ml of 2% lidocaine in the same syringe. • *If convulsions recur after 15 minutes, give 2g (10mL of the prepared 20% magnesium sulfate solution intravenously over 5 minutes.* ***Maintenance dose (Intramuscular):*** Give 5g (10mL of the undiluted 50% magnesium sulfate solution) with 1mL of 2% lidocaine in the same syringe by deep IM injection into alternate buttocks every four hours. Continue treatment for 24 hours after birth or the last convulsion, whichever occurs last. **Zuspan regimen (IV/IV): Intravenous administration (use an infusion pump if available):** ***Loading dose:*** • Give 4g IV over five minutes (20mL of the diluted 20% magnesium sulfate solution). • If convulsions recur after 15 minutes, give 2g (10mL of the diluted 20% magnesium sulfate solution) IV over 5 minutes. ***Maintenance dose (intravenous):*** • Give intravenous infusion 1g (5mL of the diluted 20% magnesium sulfate solution) per hour. • Continue treatment for 24 hours after childbirth or the last convulsion, whichever occurs last.
Monitor for signs of toxicity.	• Count respiration rate for I minute every hour. The rate should be ≥ 16. • Patella reflexes should be present. Check every hour. • Insert an indwelling urinary catheter and measure urinary output hourly. Output should be ≥ 30ml/hour. ***Note: loss of patellar reflex is the first sign of Magnesium toxicity.***

Antidote.	The antidote (calcium gluconate) should be kept ready. In case of respiratory arrest: • Assist ventilation (mask and bag, anaesthesia apparatus, intubation). • Give calcium gluconate 1g (10ml of 10% solution) intravenously slowly over 3 minutes, until respiration begins to counteract the effect of magnesium sulfate.

Management of suspected magnesium toxicity

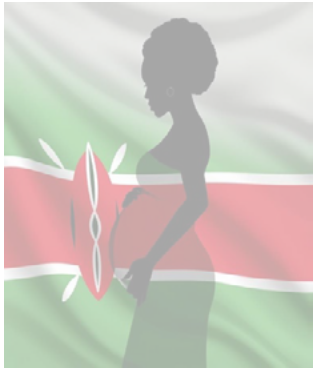
Signs and symptoms	Physical examination and laboratory investigations	Management
Reduced urine output (<0.5ml/kg/H for over 4 hours).	Hydration status. Respiratory examination. Review fluid balance. Check deep tendon, reflexes, respiratory rate, heart rate. Send renal profile and serum Mg if available.	If tendon reflex is ABSENT, STOP MgSO4 infusion. If tendon reflex is present, adjust infusion rate.
Absence of deep tendon reflex.	Check respiratory rate and heart rate. Send renal profile and serum Mg if available.	Stop MgSO4 infusion. Perform ECG for evidence of prolonged PR interval or wide QRS complex. Consider restarting infusion at lower dose when reflexes return.
Respiratory depression.	Check respiratory rate and heart rate. Send renal profile and serum Mg if available.	Stop MgSO4 infusion. Maintain airway, put patient in recovery position. Consider giving IV calcium gluconate.
Respiratory arrest.	Assessment is per maternal collapse (ABC). Send renal profile and serum Mg if available.	Stop MgSO4 infusion. Maintain airway with intubation and ventilation. Give IV calcium gluconate.

Note: Therapeutic level of serum Mg – 1.7-3.5 mmol/L.

Fluid Management

General principles of fluid management are as below:

General principles of fluid management:	1. Total fluid given to women with severe hypertension (60-80ml/hour) of crystalloid). 2. Strict input and output charting. 3. Fluid challenge: when indicated, should be done with careful assessment of the woman's hydration status and after consultation with a specialist. 4. Oral fluid restriction is not routinely practiced except in cases of proven fluid overload, i.e., in acute pulmonary oedema. Women with fluid overload should be managed in a high dependency unit/ intensive care unit with co-management from anaesthetist and physician. 5. Diuretics should NOT be given in the event of oliguria unless there is evidence of acute pulmonary oedema.



Management of Eclampsia

Loading dose MgSO4

4g IV over 20 mins via controlled infusion.
Maintenance does of MgSo4.
1g per hour via controlled infusion for 24 hours after birth or after last convulsion then review requirement.

If seizures reoccur/ongoing after the loading dose:

- Repeat MgSo4 2g IV over 5 mins.
- Diazepam 5-10mg IV at rate of 2-5mg/min (max 10mg).
- Clonazepam 1-2mg IV over 2-5mins.
- Midazolam 5-10mg IV over 2-5mins/IM.

If impaired renal function

- Reduce maintenance does to 0.5g per hour and consider serum monitoring.

Monitor:

- BP and pulse every 5mins until stable then every 30mins.
- Resipartory Rate and patellar reflexes hourly.
- Temperature 2 hourly.
- Urine output hourly.
- Strict fluid balance monitoring.
- Therapeutic serum management level 1.7 to 3.5mmol/liter.
- Stop infusion if toxicity is clinically suspected.

Review with consultant if:

- Urine output <80mls in 4 hours.
- Deep tendon reflexes absent and RR<12 breaths/min.

ANTIDOTE

- Calcium Gluconate 1g intravenously slowly over 3 minutes.

Resuscitation A,B,C,D,E

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Control seizures

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Control Hypertension

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If ante-partum plan delivery ASAP

TREAT HYPERTENSION

- If systolic BP >/= 160mmHg or diastolic BP>/= 100mmHg.
- Aim to reduce Systolic BP to 130-150mmHg and disatolic BP to 80-100mmHg.
- Avoid maternal hypotension.
- Monitor fetal heart rate with continuous CTG.

ANTIHYPERTENSIVE MEDICATION

- PO Nifedipine 10-20mg, repeat after 45 mins, max 80mg.
- Hydralazine: 5-10mg IV over 3 to 10 mins. Repeated doses 5mg IV every 20mins if required. Max dose 30mg. It may also be given as a 10-20mg IV infusion and titrated against BP response.
- Labetalol: Initially 20mg IV bolus over 2mins. Repeated doses 40-80mg IV every 10mins to max of 300mg if required.

BIRTH

- Continue close fetal monitoring.
- Stabilize mother prior to birth.
- Deliver within 8-12 hours after onset of seizures.

2. Obstetric Haemorrhage

Antepartum Haemorrhage (APH)

Definition

Bleeding after 24 weeks of gestation and before delivery.

Differentials

- Placenta previa.
- Placental abruption.
- Uterine rupture.
- Vasa Previa.
- Cervical or Vaginal lesions.
- Trauma.

Relevant History

1. Gestational age by date and ultrasound).
2. Findings of prior ultrasounds (placentation? Presentation?).
3. Duration of signs and symptoms.
4. Foetal status – perceives foetal movements? frequency?.
5. Any clinical symptoms suggestive of shock/ hypo-tension such as general weakness/ malaise, dizziness, fatigues, palpitations, diaphoresis.
6. Abdominal pain.

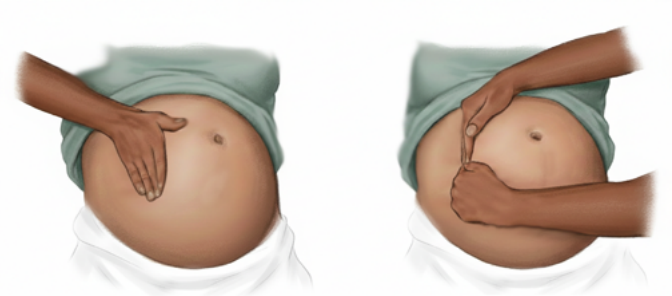
Maternal - General Evaluation	Maternal - Physical Examination	Foetal Evaluation
Signs of shock: • Abnormal BP <90/60mmHg or >140/90 mmHg. • Weak or rapid pulse Tachycardia >100 bpm. • Tachypnoea >20 bpm. • Temperature < 36.1°C or >37.2°C. • Decreased urine output <30ml/hr. • Altered mental state, including reduced alertness and awareness, confusion, and sleepiness. • Cold, moist skin. Hands and feet may be pale.	DO NOT DO digital vaginal exam till ultrasound excludes previa. 1. Uterine palpation, size, tenderness, soft/hard?. 2. Speculum – a speculum examination is mandatory to evaluate for possible causes of bleeding and exclude differentials (listed above).	1. Presence of foetal heart rate (CAUTION: Differentiate from mothers' pulse as may be tachycardic!). 2. Close FHR monitoring in >28/40 – Pinnards/ Doppler/CTG. 3. Normal FHR 110-160 BPM and regular. 4. OPOCUS should be performed immediately where available to assess viability of foetus, placentation and presentation.

Management

SHOUT FOR HELP!!! To urgently mobilize nurses, obstetrician on call, midwives, theatre, radiology and anesthesia teams.

Danger – Put on appropriate PPE.
Response – Mobilise, call for help.
Circulation – Fix two wide bore cannulas. Do full hemogram and Group and cross match blood. Start IV crystalloids(ringers lactate or normal saline). If pulse is absent or <60bpm, start CPR immediately aiming at 100 high quality (achieving a depth of at least 2 inches, and allow for full chest recoil) compressions per minute.
Airway – Open mother's airway using a head-tilt chin-lift or jaw thrust manoeuvre. Secure the airway using oropharyngeal airway if available.
Breathing – Look, listen and feel for breathing. Put on oxygen at 10L/min.

NB: Ensure left lateral tilt of the uterus as shown below:



Perform secondary survey after initial maternal stabilization.

Placenta Previa

Definition

- Placenta Previa refers to the implantation of the placenta over or near the internal os of the cervix.
- Presents with painless bleeding.

Algorithm for management of Placenta Previa

Painless PV bleeding after 28 weeks. Bright red blood with no uterine tenderness. Speculum exam to rule out other causes. If mother and foetus are both stable, a OPOCUS can be done to confirm the diagnosis if available.

- Haemodynamically unstable → Stabilize and refer → Deliver
- Haemodynamically stable
  - Preterm
  - Term → Delivery

Expectant Management

1. Admission.
2. Check hemoglobin and transfuse if <10g/dl.
3. Antenatal corticosteroids – Dexamethasone 6mg IM BD X 2/7 for <34/40.
4. Do antenatal profile if not done.
5. Obstetric ultrasound (OPOCUS) -Determine type of previa, gestation age, fetal well being.
6. Deliver at term if bleeding persists or NRFS develops.

NB: Early recognition, immediate stabilization of patient and urgent transfer to a facility with a theatre, BTU and a consultant obstetrician for further management.

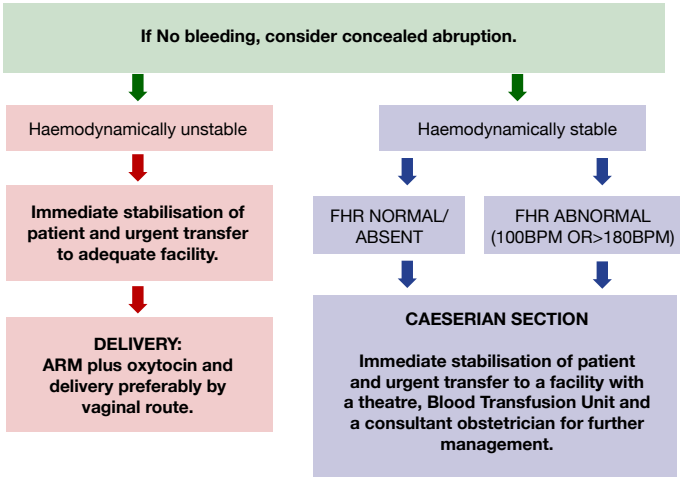
Placenta Abruption

Premature separation of the placenta, presents with uterine tenderness and non reassuring fetal heart rate pattern.
Vaginal bleeding can be obvious or concealed.
OPOCUS has ruled out placenta previa.

Types

Revealed: amount of visible blood loss commensurate with level of shock
Concealed: amount of external blood loss disproportionate with features of anaemia or shock:

Algorithm for management of Placenta Abruption



Post Partum Haemorrhage

Definition

- Blood loss of **≥500mls** OR **≥300mls plus abnormal clinical signs and symptoms**, after *vaginal delivery*.
- Blood loss of **≥1000mls or more after** *cesarean delivery*.

Classification

Primary postpartum hemorrhage: Primary (immediate) PPH occurs within the first 24 hours after delivery.

Secondary postpartum hemorrhage: Secondary (late) PPH occurs between 24 hours after delivery of the infant and up to 6weeks postpartum. Most late PPH is due to retained products of conception, infection, or both.

Etiology

The 4 "T"s:

- Tone (70%): uterine atony.
- Trauma (20%): uterine, cervical, or vaginal injury, uterine inversion.
- Tissue (10%): retained placenta (cotyledon or succenturiate lobe) or clots.
- Thrombopathy (<1%): pre-existing or acquired coagulopathy.

More than one cause may however be present e.g., tone and tissue.

Prevention of PPH

1. Preconception care and Antenatal care

The WHO recommends daily iron and folic acid supplementation with 30mg to 60mg of elemental iron and 400µg (0.4 mg) of folic acid. This should be started as soon as pregnancy is confirmed or at preconception.

2. Active management of third stage of labor

Uterotonic agents

Within 1 minute of delivery of the infant, palpate the abdomen to rule out the presence of an additional infant(s) and give Heat stable carbetocin 100µg IM/IV or Oxytocin 10IU IM.
Alternatives - Ergometrine or Methyl-ergometrine 0.2 mg IM; Misoprostol 600µg orally.

Note: observe all contraindications of medications.

Delayed cord clamping

Delay cord clamping until cord pulsations stop or 2-3 minutes if the new-born is healthy. Immediate cord clamping may be necessary if the newborn requires resuscitation.

Apply cord traction (gentle pull) and counter-traction (push) above the pubic bone on a well contracted uterus to perform CCT.

Uterine Massage

Palpate for a contracted uterus every 15 minutes and repeat uterine massage as needed during the first 2 hours. Ensure that the uterus does not become relaxed (soft) after you stop uterine massage.

4th Stage Monitoring

If risk factors for PPH are identified, monitor the woman for 1 to 2 hours after delivery then 4 hourly for 24 to 48 hours.

OBSERVATIONS FREQUENCY

Temperature every 30 minutes.
Pulse rate, respiratory rate, blood pressure every 15 minutes.
Oxygen saturation Once or as clinically indicated.
Fundus/lochia every 15 to 30 minutes.
Urine output Within the first 2 hours (30 mls/hour).

Management of PPH

The EMOTIVE mnemonic refers to a comprehensive strategy for treating PPH. It is a structured approach to manage Postpartum Hemorrhage (PH) efficiently in emergency settings.

E	M	O	T	IV	E
Early detection and trigger criteria	Massage of uterus	Oxytocic drugs	TXA	IV fluids	Examination and escalation
Calibrated drape for the collection of blood with trigger lines at 300 ml and 500ml for the first h after birth. Observations (blood loss, blood flow and uterine tone) every 15 min documented on the blood-loss monitoring chart. Blood pressure and pulse monitored once in the first hour postpartum and documented on the blood-loss monitoring chart. Trigger criteria: 1) clinical judgment. 2) blood loss 500 ml. 3) blood loss 300ml. plus one abnormal observation.	Massage until uterus has contracted or for 1 min.	10 IU IM oxytocin or 10 IU IV oxytocin diluted in 500 ml crystalloid over 10 min plus a maintenance dose of 20 IU IV oxytocin diluted in 1,000 ml saline over 4h (with misoprostol 800 ug if used).	1g IV injection of TXA or diluted in 200 ml crystalloid over 10-min period.	IV fluids in addition to the infusion should be given if clinically indicated for resuscitation and will require a second IV access.	Ensure bladder is empty, evacuate clots and check for tears with an internal examination and placenta for completeness. Escalate if bleeding does not stop after first response or if clinician is unable to identify or manage cause of bleeding.

Implementation strategies

Audit newsletters: sharing with all staff monthly detection and bundle use rates along with PPH, severe PPH, blood transfusion, laparotomy and death from PPH rates and given feedback at monthly departmental meetings.

Champions: midwife and doctor to oversee change, troubleshoot, give feedback on audit newsletters and connect with other champions through chats, meetings and websites for sharing knowledge and lessons learned.

Trolley or carry case: restocking of all medicines and devices used for PPH treatment after every use and completion of stocking checklist at the start of every shift.

Training: on-site, simulation-based and peer-assisted lasting 90 min to an entire workday facilitated by provider guides, flipcharts and job aids displayed in labor wards.

Management of ATONY

INITIAL RESPONSE

- Shout for help. A skilled health care team should be alerted immediately, midwives, obstetricians, anesthetists and blood bank personnel.
- Insert 2 wide bore cannula (gauge 16/18) to allow for fluid and/or blood administration.
- Take blood samples for grouping and cross matching and preparation of appropriate blood products.
- Set up IV infusion of either normal saline or ringer's lactate,
- Insert Foley's catheter to empty the urinary bladder and leave the cater in situ.
- Perform fundal massage by gently massaging the uterus until it is firm and contracted.
- Administer oxygen by mask to maintain oxygen saturation.
- Evaluate capacity of your facility and consider need for transfer of the woman to the next level of care.

SIMULTANEOUS ACTIONS. TEAM LEAD SHOULD BE APPOINTED TO COORDINATE THESE INTERVENTIONS.

Uterotonics

Administer uterotonic medications to induce uterine contractions.

Preferred 1st line agent: 10 IU IM oxytocin or 10 IU IV oxytocin diluted in 500ml crystalloid over 10min plus a maintenance dose of 20 IU IV oxytocin diluted in 1L saline over 4 hours. With Misoprostol 800µg sublingual or per rectal.

2nd line: Ergometrine: A slow IV or IM injection 0.2mg. Repeat at 2 or 4 hours if indicated. Maximum of 1g in 24hrs. Contraindicated in patients with hypertension.

3rd line: Carboprost: 0.25mg IM every 15minutes (max 2mg).

Monitoring & Escalation

Continuous monitoring: Monitor vital signs (blood pressure, heart rate, respiratory rate) and oxygen saturation frequently.

Evaluate blood loss: Accurately measure and document blood loss to assess the severity of the hemorrhage and the patient's response to treatment.

Concurrent Maneuvers

Bimanual compression of the uterus.

Abdominal aorta compression.

Hydrostatic intrauterine balloon tamponade insertion.

Anti-shock garment (NASG) application.

Tranexamic Acid

Tranexamic acid should be administered as soon as possible after onset of bleeding and within 3 hours of birth.

TXA should be administered at a fixed dose of 1 g in 10 mL (100 mg/mL) IV at 1 mL per minute (i.e., administered over 10 minutes), with a second dose of 1 g IV if bleeding continues after 30 minutes.

Continuous monitoring: Monitor vital signs (blood pressure, heart rate, respiratory rate) and oxygen saturation frequently.

Evaluate blood loss: Accurately measure and document blood loss to assess the severity of the hemorrhage and the patient's response to treatment.

SURGICAL INTERVENTIONS

Laparotomy for:

- Uterine artery ligation.
- B-LYCH sutures OR other compression suture techniques.
- Stepwise devascularization.
- Hysterectomy.

Tears

Vaginal/Cervical/Perineal tears

- Repair the identified tears and lacerations either in the ward or theatre.

Cervical tears

- Examination under anaesthesia (If required).
- Application of fundal pressure to enable close visualization of the cervix. §Use sponge/ring forceps to examine the cervix in its entirety.
- Repair identified cervical tears.
- NB: Cervical tears extending beyond the vaginal vault, laparatomy may be recommended.

Tissue

Retained placenta

- Double set-up is ideal, inform theatre to prepare, GXM.
- Empty bladder using self-retaining catheter.
- Give additional 10 IU of oxytocin.
- Apply controlled cord traction in a gentle fashion to avoid cord avulsion. If the placenta is still adherent, consider manual removal of the placenta.
- For retained fragments, uterine exploration by hand. Remove the fragments by hand, ovum forceps or wide curette. Examine the cervix, vagina and perineum for any tears and repair accordingly.

Thrombin

Use blood products to help control hemorrhage.

- Give fresh whole blood, if available, to replace clotting factors and red cells. If fresh whole blood is not available, choose one of the following based on availability:
  - Packed (or sedimented) red cells for red cell replacement.
  - Fresh frozen plasma for replacement of all clotting factors (15 ml/kg body weight).
  - Cryoprecipitate to replace fibrinogen and factor VIII in case of disseminated intravascular coagulation.
  - Platelet concentrates (if bleeding continues and the platelet count is less than 20,000).

3. Anemia in pregnancy

Definition:

Anemia is a condition in which the hemoglobin is <11g/dl.

Anemia:

Severity:	Haemoglobin values:
Mild	**10 – 11 mg/dl.**
Moderate	**7 – 10 mg/dl.**
Severe	**< 7 mg/dl.**

Etiology of Anemia during pregnancy:

No.	Classifications	Types
1	Physiological anemia.	
2	Pathological anemia.	• Iron deficiency. • Folic acid. • Vitamin B12 deficiency.
3	Haemolytic anemia.	• Familial - congenital jaundice, sickle cell anemia. • Acquired - malaria, severe infection.
4	Bone marrow insufficiency.	Hypoplasia or aplasia due to radiation, drugs, or severe infection.
5	Hemoglobinopathies.	Abnormal structure of one of the globin chains of the hemoglobin molecule ex-sickle cell disease.

Clinical features of Anemia:

Symptoms:

Fatigue, weakness, shortness of breath, low physical and mental capacity, headaches, dizziness, lightheadedness, awareness of heartbeat (palpitations), Pica (craving for non-food items like clay or ice).

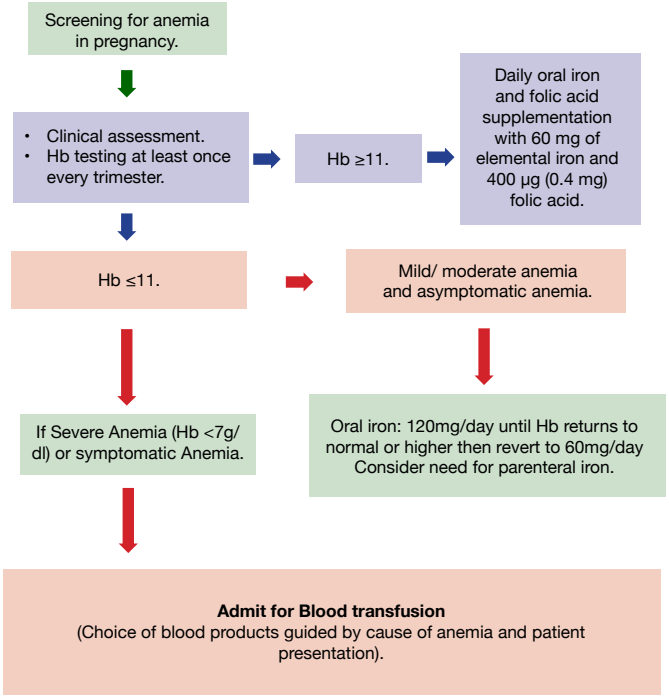
Signs:

Alopecia, mucosal pallor (conjuctival, tongue, nail bed, palmar), tachypnea, angular stomatitis, glossitis, koilonychia (spoon-shaped nails), fundal height smaller than gestational age, tachycardia, systolic murmurs and Congestive cardiac failure in severe cases, Jaundice, hepatosplenomegaly.

Diagnosis of Anemia in pregnancy:

Screening for Anemia in pregnancy	
Clinical Assessment – Symptoms and Signs.	
A comprehensive history must be taken.	
Hb testing at least once in every trimester, and during peripartum.	
Lab and imaging assessment (Guided by clinical findings)	
Complete Blood Count.	Hemoglobin (<11 g/dl) , hematocrit (<33%), Mean corpuscular volume. (MCV) between 80-100 is normal , mean corpuscular hemoglobin. (MCH) of 27-33 pg, mean corpuscular hemoglobin concentration. (MCHC) of 32-36 g/dl.
Reticulocyte count.	Normally 0.5-2.5% of RBC, if more than 5% could indicate hemolytic anemia.
Peripheral blood smear.	Presence of Microcytic/macrocytic morphology, malaria parasites.
Liver Function tests (LFTs).	Elevated ALT, AST,LDH, bilirubin in HELLP syndrome, other hemolytic anemias and chronic liver disease.
Infectious causes.	Stool ova and cyst, occult blood in stool – hookworm, schistosomiasis. Blood also found in stool in case of gastric ulcers, hemorrhoids and other causes of upper and lower GI bleeding.

Management of Anemia in pregnancy:



Prevention of Anemia in Pregnancy:

In settings where anemia in pregnant women is a severe public health problem (40% of higher), a daily dose of 60 mg of elemental iron is preferred over a lower dose.

Preconception: :	Antenatal:
• Identify risk factors for iron deficiency. • Addressing non-nutritional causes of anemia in endemic pockets with special focus on malaria, hemoglobinopathies and fluorosis. • Hb and iron status assessed and, if deficient, appropriately treated before attempting conception. • Begin daily oral iron and folic acid supplementation with 30 mg to 60 mg of elemental iron and 400 µg (0.4 mg) folic acid for 3 months prior to conception. • Nutritional counselling - incorporate diet rich in iron, vitamin B12 and folate rich foods.	• Screening for anemia at least once in every trimester. • Daily oral iron and folic acid. supplementation with 30 mg to 60 mg of elemental iron and 400 µg (0.4 mg) folic acid is recommended. • Nutritional counselling - incorporate diet rich in iron, vitamin B12 and folate rich foods. • Preventive anthelmintic treatment in 2nd trimester with a single dose of mebendazole 500 mg or a single dose of albendazole 400mg. • For malaria endemic zones, Intermittent preventive treatment in pregnancy with sulfadoxine pyrimethamine (IPTp-SP) from 2nd trimester with doses one month apart for at least 3 doses.

Intrapartum:

Active management of 3rd stage of labour to prevent postpartum hemorrhage.

Postpartum:

- Avail modern methods of family planning to increase the inter-pregnancy interval.
- Nutritional counselling - incorporate diet rich in iron, vitamin B12 and folate rich foods.
- Supplementation of iron (60mg) and folic acid (400mg) up to 3 months postpartum.

4. Obstructed/Prolonged labour

Definition

Failure of the fetus to descend through the birth canal in spite of good uterine contractions, either from physical or mechanical obstruction.

Recommendations:

- Educate all mothers on importance of ANC attendance.
- Screen high risk individuals for gestational diabetes.
- Correct use and interpretation of labour monitoring tools for decision-making.

Etiology

Cephalopelvic disproportion

Occurs when there is a misfit between the foetal head and the pelvis. This means it is difficult or impossible for the fetus to pass safely through the pelvis. Cephalopelvic disproportion may be due to a small pelvis with a normal size head, or a normal pelvis with a large fetus, or a combination of a large baby and small pelvis.

Risk factors

Maternal

- Bony obstruction due to: contracted pelvis, tumours of pelvic bones, previous surgery or fractures of the pelvic bone.
- Soft tissue obstruction due to:

1. Uterus: impacted subserous pedunculated fibroid and/or fibroids in the lower segment.
2. Cervix: cervical dystocia.
3. Vagina: septa, stenosis, tumours.
4. Ovaries: Impacted ovarian tumours.

Foetal:

- Malpresentation and malposition's: e.g., Persistent occipital-posterior and deep transverse arrest, Persistent mento-posterior presentation, Brow, Shoulder dystocia.
- Large sized foetus (macrosomia). EFW of 4kg and above.
- Congenital anomalies: e.g., Hydrocephalus, Foetal ascites, Foetal tumours.
- Locked and conjoined twins.
- Any multiple gestation where first foetus is not cephalic.

Management

History

Examination

Signs of maternal distress on general examination include:

- Exhaustion.
- High temperature (38°C).
- Rapid pulse.
- Signs of dehydration: dry tongue and cracked lips.

Abdominal examination:

- The uterus is hard and tender. Presence of strong uterine contractions without relaxation.
- Fetal parts cannot be felt easy.
- Fetal heart rate is Absent or evidence of fetal distress.
- Rising retraction ring (Bandl's ring) is seen and felt as an oblique groove across the abdomen.

Vaginal examination:

- Vulva is oedematous.
- Vagina is dry and hot.
- Cervix is fully or partially dilated, oedematous and hanging.
- The membranes are ruptured, presence of meconium stained, foul smelling liquor. Though based on the duration prior to presentation, liquor may be absent.
- The presenting part: is high and not engaged or impacted in the pelvis. If it is the head, it shows excessive moulding and large caput.

Differential diagnosis

- Constriction ring.
- Fundal myoma.
- Full bladder.

Complications	
Maternal:	Foetal:
• Maternal distress and ketoacidosis. • Rupture uterus. • Necrotic vesico-vaginal fistula. • Infections as chorioamnionitis and puerperal sepsis. • Postpartum haemorrhage due to injuries or uterine atony.	• Asphyxia. • Intracranial haemorrhage from excessive moulding. • Birth injuries. • Infections.

Treatment

SUPPORTIVE MANAGEMENT

- Rehydrate the patient: Put two wide bore needle or cannulas. If the woman in shock, administer intravenous fluids e.g., normal saline I litre in the first I5 minutes or as quickly as possible.If the woman is mainly starved and exhausted, give -2 litres or 10% dextrose 6 hours.
- Catheterize: insert an indwelling urinary catheter
- Give antibiotics:
- To review the antibiotics based on updated AMR guidelines.
- If in a lower-level facility, initiate early referral of patient.

DEFINITIVE MANAGEMENT

- Assess criteria if suitable for assisted vacuum delivery. IF NOT, deliver by emergency cesarean section.
- Retain urinary catheter for 10-14days to prevent obstetric fistula.

Techniques for Impacted Head during cesarean section:

Vaginal Pushing (Abdominovaginal Method): An assistant inserts a hand into the vagina to push the fetal head upward while the surgeon extracts the baby.

Reverse Breech Extraction: The surgeon reaches into the uterus to grasp the feet, delivering the baby breech-first, which often eases delivery of the impacted head.

Uterine Incision Management: Due to the thinned lower segment and potential for extension, a low-segment incision may need extension (e.g., J or T-shaped) to avoid excessive trauma to the cervix or bladder.

5. Maternal sepsis:

Definition:

Life threatening condition defined by organ dysfunction resulting from infection during pregnancy, childbirth, post- abortion or within the postpartum period (42 days from delivery). It's the third leading cause of direct maternal mortality globally.

Pueperal sepsis is commonly due to endometritis.

Other infections include:

- Chorioamnionitis.
- Pyelonephritis.
- Genital tract infections.
- Puerperal sepsis.
- Malaria, viral and fungal diseases.
- Other infections during pregnancy such as HIV and STIs (gonorrhea, chlamydia, trichomonas).

Risk factors for maternal sepsis:

- Maternal comorbidities:
  - » Malnutrition.
  - » Obesity.
  - » Anemia.
  - » Endocrionopathies such as uncontrolled Diabetes Mellitus.
  - » Immunosuppression.
- Genital infections- Bacterial vaginosis, STIs.
- Group B streptococcus infection.
- •Spontaneous events and/or interventions by care providers:
  - » Early rupture of membranes.
  - » Cervical cerclage.
  - » Frequent vaginal examinations.
  - » Manual removal of clots and placenta.
  - » Caesarean section.
  - » Non aseptic techniques.

Clinical picture

Symptoms	Clinical signs	Sites of infection
• Constant abdominal/pelvic pain. • Foul vaginal discharge/liquor. • Fevers and chills. • Diaphoresis. • Nausea & vomiting. • Lower urinary symptoms. • Productive cough • Generalized maculopapular rash. • Conjuctival suffusion.	• Temperature >38°C or <36°C. • Tachycardia >110b/min. • Hypotension: SBP<90mmhg. • Tachypnea: RR>24br/min. • Low saturations <90% room air. • Fetal tachycardia. FHR>160b/min. • Pelvic/ uterine tenderness. • Renal angle tenderness. • Uterine sub-involution. • Capillary refill>2seconds. • Altered mental status, GCS <15. • Urine output <0.5ml/kg/hr.	• Skin and subcutaneous tissue. • Uterus. • Adnexa. • Cervix. • Vagina. • Perineum.

Diagnostic Scoring criteria for sepsis

Modified Early Obstetric Warning Score (MEOWS)

Score							
	3	2	1	0	1	2	3
Respiratory Rate (bpm)				9 - 18	19 - 25	26 - 30	>30
Pulse rate (bpm)		<40	40 - 50	51 - 100	101 - 110	111 - 129	>129
Temperature		<35	35-35.9	36 - 37.4	37.5 - 37.9	38.0 - 38.9	>39
Systolic blood pressure (mmHg)	<70	71 - 80	81 - 100	101 - 164	165 - 200	>200	
Diastolic blood pressure (mmHg)				<5	95 - 104	>105	
Conscious level	Unresponsive	Responds to pain	Responds to voice	Alert	Irritated		
Urine hourly (ml/h) or in 24h		>30 (<720ml)	>45 (<1000ml)	>45 (>000ml)			

Final score = Sum of individual scores at any one time.

Score	Action required.
0 or 1	Repeat observations when appropriate for clinical scenario.
2	Inform midwife in charge, repeat in 15 min.
3	Inform midwife in charge, obstetric registrar and duty anesthetist.
≥4	Consultant obstetrician, consultant anesthetist, and intensive care team should be informed.

Septic shock

Septic shock (below parameters despite adequate Intravenous fluid therapy)

a. Sepsis+ need for vasopressors, SBPs <90mmhg.
b. MAP less than 65mmhg.
c. Lactate more than 2mmol/l.

Investigations

Laboratory investigations	Imaging tests
• Haemogram-white blood count >15,000/mm^3 or <4,000mm^3. • Urea, creatinine, electrolytes. • Liver function tests. • Blood culture. • Procalcitonin, C-reactive protein. • Blood slide for Malaria parasites. • Blood glucose. • Lactic acid levels. • **Urine**-urinalysis, urine culture. • **High vaginal** and endocervical swabs for M/C/S. • Coagulation abnormalities INR>1.5, APTT >60 sec. • Blood gas analysis.	• Pelvic ultrasound. • Abdominal X-ray. • Abdominal CT scan. • Chest X-ray (shielded if pregnant). • Fetal surveillance- Obstetrics scan, CTG.

MANAGEMENT PRINCIPLES

1. Multi-disciplinary team approach as needed- involve infectious disease specialists, critical care team, general surgery teams alongside the team of obstetricians.
2. Early and timely referral as necessary after initial stabilization.
3. General principles- supportive care:
   a. Regular monitoring of all vitals and recording in a MEOWS or NEWS chart.
   b. Correction of hypoxia- Oxygen therapy.
   c. Fluid support- give crystalloids as per need based on clinical assessment and blood pressure, pulse parameters.
   d. Pain control and fever control-Acetaminophen, NSAIDS, opioids.
   e. Empirical antibiotics- **'Golden hour rule'.**
   f. Correct anemia if present- Iron or transfusion.
   g. Venous thromboembolism prophylaxis-Low molecular weight heparin.
   h. Admit into intensive care unit (ICU) or high dependency Unit (HDU) if features of severe sepsis or septic shock or needing ionotropic support.

"Golden hour rule": In cases of maternal sepsis, initiate antibiotics within the first hour of presentation.
Give IV antibiotics at least until 24 hours afebrile.
Continue for 7-10 days or change based on culture and sensitivity.

4. Evidence supported therapy- Change antibiotics based on culture results.
5. Surgical treatment:
   a. Evacuation of any products of conception.
   b. Evacuation of any foreign body e.g. forgotten gauze.
   c. Release of sutures on an infected wound for pus to drain.
   d. Surgical debridement+/- secondary wound closure with non-absorbable, non-woven/monofilament suture material.
   e. Incision and drainage of a local collection on skin or subcutaneous tissue.
   f. Exploratory laparotomy with washout of peritoneal collection.
6. Fetal surveillance- using available strategies-fetal heart auscultation (fetoscope), Cardiotocography (CTG), Obstetric Ultrasound (BPP).
7. Delivery plan:
   a. If at term, initiate delivery plan.
   b. If remote from term, stabilize the mother and manage the source of infection as you discuss with team on pregnancy follow up based on initial response.

Summary of the antibiotics of choice

Mild and Community acquired infections:	Sever infections/2nd line regimen
• Cefuroxime 1.5g IV TDS + Gentamycin 4mg/kg STAT (maintenance 80mg TDS)+ Metronidazole 500mg TDS. OR • *Clindamycin 900mg TDS+. Gentamycin 80mg TDS+. Metronidazole 500mg TDS. OR • Amoxicillin/clavulinate 1.2g TDS or Amikacin 15mg/kg OD+ Metronidazole 500mg TDS. • to review antibiotics based on latest AMR guidelines.	• Piperacillin-tazobactam 4.5g TDS. OR • Meropenem 1g TDS. PLUS • Clindamycin 900mg TDS. If MRSA, • Add Vancomycin 25-30mg/kg STAT. Postpartum Sepsis: • Clindamycin 900mg TDS. • Gentamycin 4-7mg/kg STAT then 80mg TDS.

**Allergic to penicillin*

Algorithm for management of maternal sepsis

Suspected maternal sepsis:

Symptoms	Signs
Fevers &/or chills.	Tachycardia>110b/min.
Smelly PV discharge.	Tachypnea>22br/min.
Abdominal pain.	Hypxia <90%.
Altered mentation.	Hypotension-sbp<90mmhg.

'Golden hour' approach:
- 2 Large bore cannula.
- Antibiotics-see regimens above.
- Antipyretics.
- Fluid resuscitation-Normal saline or ringers lactate 30mls/kg.
- Collect samples for septic screen-haemogram, CRP, procalcitonin, Blood culture, urine culture.
- Once stable, consider imaging as appropriate- pelvic U/S, abdominal X-ray, CXR.

Antibiotic regimen
FIRST LINE ANTIBIOTICS (5-7 day course).
1. Cefuroxime 1.5g IV TID. +Gentamycin 80 TID+ Metronidazole 500mg TID IV.*
OR
2. Clindamycin 900mg TID+. Gentamycin 80mg TID+. Metronidazole 500mg TID.*
OR
3. Clindamycin600mg IV TDS. +Gentamycin 4-7mg/kg STAT then 80mg TDS.**

SECOND LINE ANTIBIOTICS REGIMENT: CONSULT WITH OR REFER TO LEVEL 4 AND ABOVE.

Subsequent principles
Multidisciplinary teams- intensivists, infectious disease specialists, obstetricians.
Critical care/HDU where indicated
Exploratory laparotomy if indicated
If Pregnant:
- Fetal surveillance.
- Decision on timing and mode of delivery.

Strategies for prevention of maternal sepsis

- Access to clean water and sanitation.
- Access to quality obstetric care.
- Prevention and management of risk factors such as anemia, HIV, diabetes mellitus and malnutrition.
- Safe abortion practices.
- Correct and timely use of antibiotics where necessary.

6. Septic Abortion

Definition:

This is abortion characterized by infection of the products of conception, infection of the lining of the uterus and may lead to generalized infection.

Common signs and symptoms of septic abortion

1. Abdominal and pelvic pain.
2. Purulent vaginal discharge.
3. Vaginal bleeding.
4. Fevers and chills.

Suspected maternal sepsis:

Symptoms	Signs
PV bleeding.	Uterus tender.
Foul smelling PV blood/discharge.	Tachycardia >100b/min.
Abdominal/pelvic pains.	Tachypnea >20b/min.
Fevers, chills, rigors.	SBP <90mmhg.
Others: headaches, nausea, vomiting, diaphoresis.	Temperature >38 °C <36°C.

Severe post-abortion infection

Criteria for the systemic inflammatory response syndrome.

The systemic inflammatory response syndrome (SIRS) is clinically recognized by the presence of two or more of the following:
Temperature > 38C or <36C.
Heart rate>90 beats/min.
Respiratory rate >20 breaths/min or PaCO2 <32mmHg.
WBC >12,000 cells/mm3, <4000 cells/mm3, or >20 percent immature (band) forms.

Risk factors to consider in diagnostic evaluation:

1. History of any abortion/miscarriage.
2. Uterine instrumentation.
3. Prolonged per vaginal bleeding in the setting of a pregnancy event.

Investigations for septic abortion

Laboratory tests:

1. Complete blood count- with differential counts- see table above.
2. Kidney function tests- urea, creatinine levels.
3. Grouping and cross match –in cases where patient is heavily bleeding, is anemic or may require surgical evacuation.
4. Lactate levels.
5. Blood gas analysis.
6. Urinalysis and urine culture to assess for infection.
7. Blood cultures.
8. Screening for sexually transmitted infections- in high risk patients-gonorrhea, chlamydia, trichomoniasis, HIV and syphillis.

Imaging tests

1. Pelvic Ultrasonography:
    a. Check for retained products of conception.
    b. Check for uterus size and volume.
    c. Pelvic/tubo-ovarian collection.
2. CT scan abdomen- in case of gas forming organisms e.g. clostridia species or gas due to necrotizing fasciitis.

Management

Principles of management

1. Timely recognition and diagnosis.
2. Assess need for early, timely and appropriate referral.
3. Clinical stability and restoration of physiological function.
4. Circulatory support through intravenous fluid resuscitation.
5. Broad spectrum antibiotic.
6. Pain management.
7. Infection source control .
8. Other comprehensive post-abortion care.
    a. Counseling.
    b. Emergency treatment of incomplete abortion- septic abortion will need surgical evacuation.
    c. Family planning and contraception services.
    d. Linkage with reproductive and other health services such as screening.
    e. Community and service provider partnership.

Clinically unstable patient (features of septic shock as above)

1. Haemodynamic stabilization.
    a. IV fluids resuscitation- crystalloids e.g. Normal saline, Ringers lactate 30mls/kg.
    b. Oxygen if saturations <90% on room air using nasal prongs, face mask or non-rebreather mask.
        i. 4L/min via nasal prongs.
        ii. 10-15L/min when using the non-rebreather mask.
2. Initiation of IV antibiotics- see table below.
3. Early surgical evacuation using MVA.
4. Some cases with uterine perforation and intra-abdominal sepsis may warrant laparotomy +/- hysterectomy.
5. Cross-discipline consultation with infectious disease specialists and critical care team.
6. Admit to the critical care unit.

Stable patient

1. Pain control:
    a. Paracetamol 1g 8 hourly for 2-3 days.
    b. NSAIDS such as Ibuprofen 400mg 12 hourly 2-3 days.
    c. or any other available analgesics.
2. IV fluids as appropriate:
    a. Crystalloids (0.9% saline, Ringer's lactate) at 30mls/kg and monitoring.
3. Empirical antibiotics- see below.

Common antibiotic regimens for Septic abortion

IV Antibiotics regimen (options)	Oral antibiotics (after afebrile for 24hrs) for 10-14 days
First line regimen: until afebrile for 24 hours. • Ampicillin 2g IV every 4 hours+ Gentamycin 5mg/kg OD+ Metronidazole 500mg TDS. OR • Ampicillin 2g IV every 4 hours + Gentamycin 5mg/kg OD + Clindamycin 900mg TDS. Second line regimen (Consult with or refer to level 4 and above) - until afebrile for 24 hours. • Piperacillin-tazobactam 4.5g IV TDS with or without Vancomycin. OR • Meropenem/Imipenem + Cilastatin 500mg QID. OR • Cefepime or Ceftazidime 2g IV TDS + Metronidazole 500mg TDS. OR • Levofloxacin 500mg IV OD + Metronidazole 500mg TDS.	• Doxycycline 100mg BD. • Metronidazole 400mg TDS.

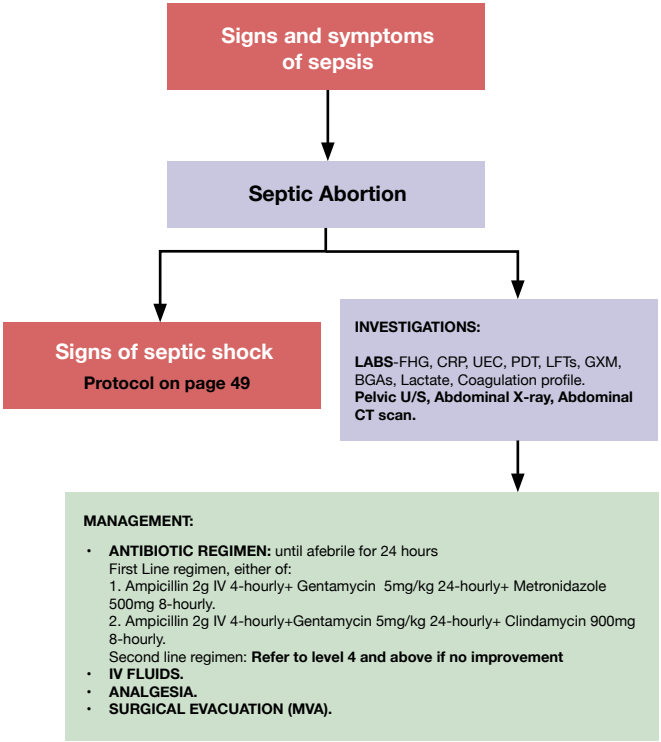
Surgical Evacuation in septic abortion:

1. MVA be commenced as soon as commencement of antibiotics.

Indications for Laparotomy +/- Hysterectomy:

1. Lack of clinical improvement within 48 hours despite surgical evacuation and adequate antibiotic cover.
2. Ongoing and severe intra-abdominal infection:
   a. Persistent fevers.
   b. Unstable vital signs with tachycardia and tachypnea.
   c. Features of obstipation - abdominal distension, abdominal pains, not able to pass stools, vomiting.
3. Massive hemorrhage during or following surgical evacuation.
4. Significant uterine perforation as a cause of the septic abortion or during surgical evacuation.

Algorithm for management of septic abortion

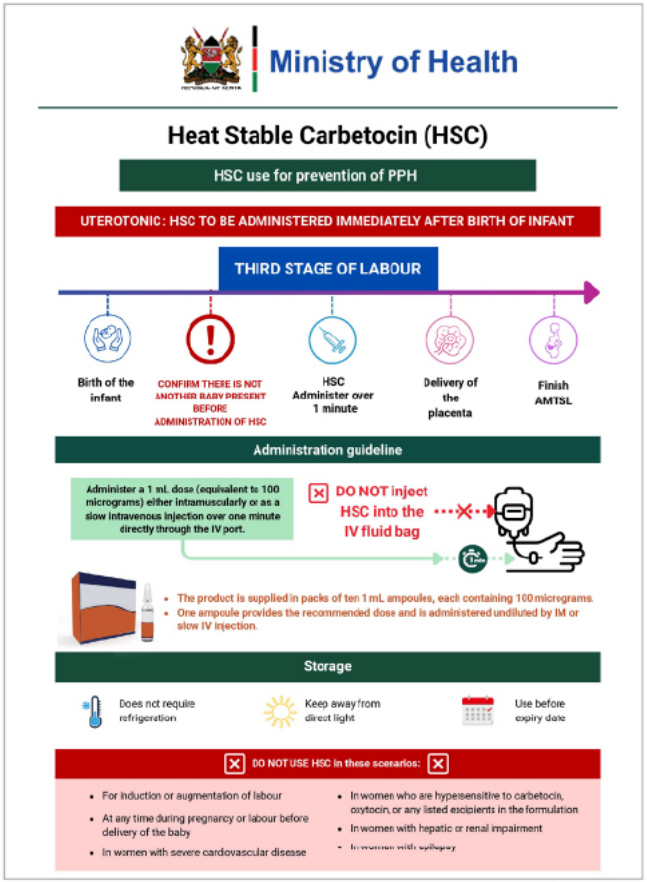


Strategies for prevention of unsafe abortion

- Reduce unintended pregnancies.
- Provision of post-abortion care to prevent complications of unsafe abortion.
- Provide family planning services and offer post-abortion counseling.
- Strengthening policies that promote safe post-abortion care.
- Monitoring and evaluation of adherence to comprehensive post-abortion care services.

Reference ranges

NORMAL RANGES IN PREGNANCY			
Test Category	Analyte	Unit	Range
Hematology	ESR (Westergren)	mm/h	0-20
	Hemoglobin	g/dL	Mild10-11
	Moderate7-10		
	Severe <7		
	RBC Count	x10^12/L	4.1-5.1
	WBC Count	x10^9/L	6.0 – 15.0
	Platelets	x10^9/L	150 – 400
	PT	s	11-13.5
	INR	ratio	0.8-1.2
	Hematocrit	%	36-46
	MCV	fl	80-100
	MCH	ng	27-33
	MCHC	g/dl	32-36
	RDW	%	11.5 -14.5
	Reticulocyte	%	0.5-2.5
	Neutrophils	%	40-70
	Lymphocytes	%	19-48
	Monocytes	%	2-10
	Eosinophil	%	0-6
	Basophil	%	0-2
	Absolute Neutrophil Count	x10^9/L	1.5-7
	Absolute Lymphocyte Count	x10^9/L	1-3.5
	Absolute Monocyte Count	x10^9/L	0.2-1
	Absolute Eosinophil Count	x10^9/L	0-8
	Absolute Basophil count	x10^9/L	0-0.2
Renal	Sodium	mmol/L	130-140
	Potassium	mmol/L	3.3-5.1
	Creatinine	µmol/L	35-80
	Urea (BUN)	mmol/L	1.0 – 4.5
	Uric Acid	µmol/L	120 - 300
Glucose	Glucose (fasting)	mmol/L	<5.1
	OGTT 75g	mmol/L (1hr)	10
	OGTT 75g	mmol/L (2hr)	8.5
	HBA1c	%	4-5.4
Liver function tests	Aspartate Aminotransferase (AST)	U/L	3-37
	Alanine Amino Transferase (ALT)	U/L	0-34
	Alkaline phosphatase(ALP)	U/L	40-250
	Gamma glutamyl transferase (GGT)	U/L	8-35
	Lactate dehydrogenase (LDH)	U/L	140 -280
	Albumin	g/l	25-37
	Total Protein	g/l	64-83
	Total Bilirubin	µmol/L	5-21
	Direct (Conjugated Bilirubin)	µmol/L	0-5
Urinalysis (Dipstick)	RBC	Positive/Negative	Negative
	Protein	Positive/Negative	Negative
	Glucose	Positive/Negative	Negative
	Pus cells	Positive/Negative	Negative


Ministry of Health
Heat Stable Carbetocin (HSC)
HSC use for prevention of PPH
UTEROTONIC: HSC TO BE ADMINISTERED IMMEDIATELY AFTER BIRTH OF INFANT
THIRD STAGE OF LABOUR
Birth of the infant
CONFIRM THERE IS NOT ANOTHER BABY PRESENT BEFORE ADMINISTRATION OF HSC
HSC Administer over 1 minute
Delivery of the placenta
Finish AMTSL
Administration guideline
Administer a 1 mL dose (equivalent to 100 micrograms) either intramuscularly or as a slow intravenous injection over one minute directly through the IV port.
DO NOT inject HSC into the IV fluid bag
The product is supplied in packs of ten 1 mL ampoules, each containing 100 micrograms.
One ampoule provides the recommended dose and is administered undiluted by IM or slow IV injection.
Storage
Does not require refrigeration
Keep away from direct light
Use before expiry date
DO NOT USE HSC in these scenarios:
For induction or augmentation of labour
At any time during pregnancy or labour before delivery of the baby
In women with severe cardiovascular disease
In women who are hypersensitive to carbetocin, oxytocin, or any listed excipients in the formulation
In women with hepatic or renal impairment
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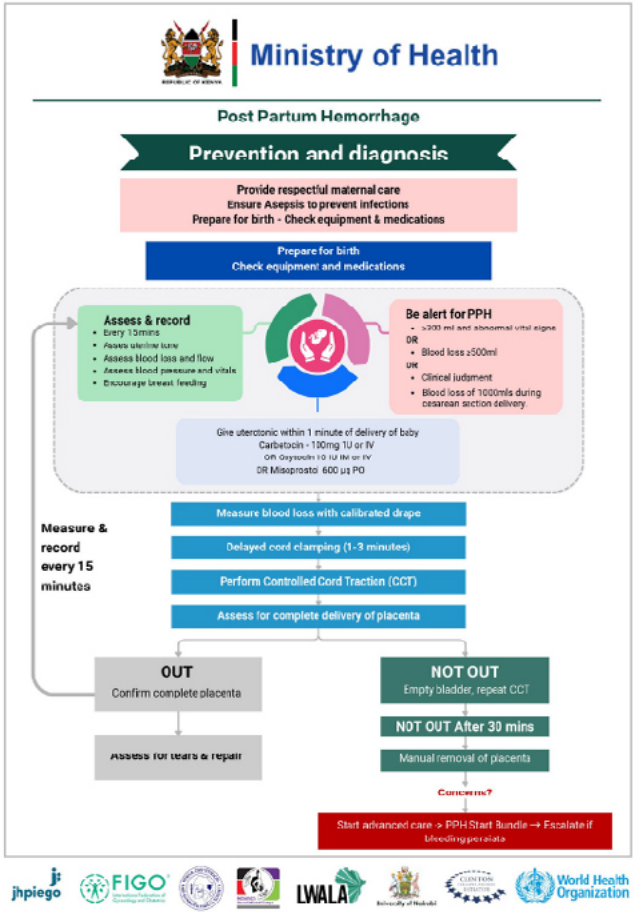
Ministry of Health
Post Partum Hemorrhage
Prevention and diagnosis
Provide respectful maternal care
Ensure Asepsis to prevent infections
Prepare for birth - Check equipment & medications
Prepare for birth
Check equipment and medications
Assess & record
Every 15mins
Assess uterine tone
Assess blood loss and flow
Assess blood pressure and vitals
Encourage breast feeding
Be alert for PPH
≥300 ml and abnormal vital signs
OR
Blood loss ≥500ml
OR
Clinical judgment
Blood loss of 1000mls during cesarean section delivery
Give uterotonic within 1 minute of delivery of baby
Carbetocin - 100mg IU or IV
OR Oxytocin 10 IU IM or IV
OR Misoprostol 600 µg PO
Measure & record every 15 minutes
Measure blood loss with calibrated drape
Delayed cord clamping (1-3 minutes)
Perform Controlled Cord Traction (CCT)
Assess for complete delivery of placenta
OUT
Confirm complete placenta
Assess for tears & repair
NOT OUT
Empty bladder, repeat CCT
NOT OUT After 30 mins
Manual removal of placenta
Concern?
Start advanced care -> PPH Start Bundle -> Escalate if bleeding persists
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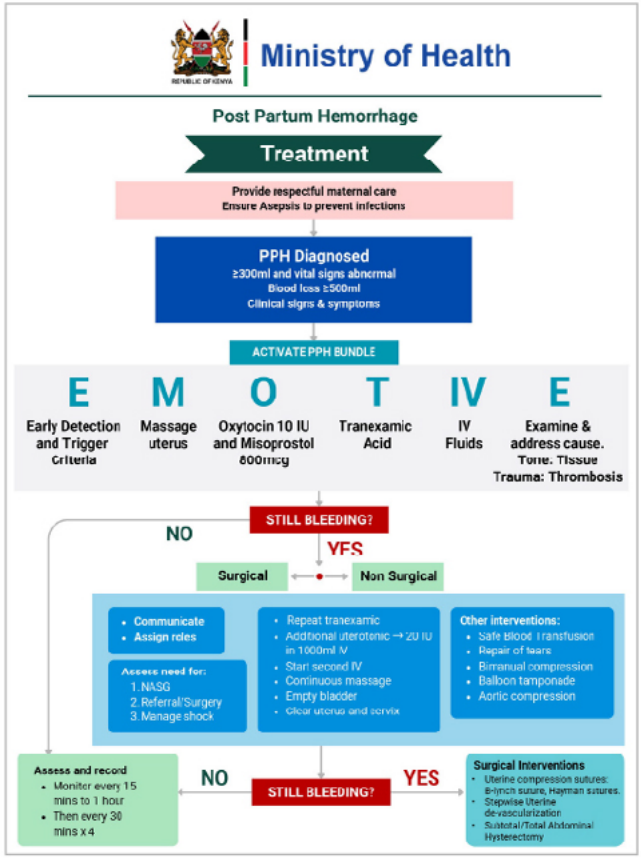
Ministry of Health
Post Partum Hemorrhage
Treatment
Provide respectful maternal care
Ensure Asepsis to prevent infections
PPH Diagnosed
≥300ml and vital signs abnormal
Blood loss ≥500ml
Clinical signs & symptoms
ACTIVATE PPH BUNDLE
E
Early Detection and Trigger Criteria
M
Massage uterus
O
Oxytocin 10 IU and Misoprostol 600mcg
T
Tranexamic Acid
IV
IV Fluids
E
Examine & address cause. Tone. Tissue Trauma: Thrombosis
STILL BLEEDING?
NO
YES
Surgical
Non Surgical
Communicate
Assign roles
Assess need for:
1. NASG
2. Referral/Surgery
3. Manage shock
Repeat tranexamic
Additional uterotonic → 20 IU in 1000ml IV
Start second IV
Continuous massage
Empty bladder
Clear uterus and cervix
Other interventions:
Safe blood Transfusion
Repair of tears
Bimanual compression
Balloon tamponade
Aortic compression
Assess and record
Monitor every 15 mins to 1 hour
Then every 30 mins x 4
NO
STILL BLEEDING?
YES
Surgical Interventions
Uterine compression sutures: B-lynch suture, Hayman sutures.
Stepwise Uterine de-vascularization
Subtotal/Total Abdominal Hysterectomy
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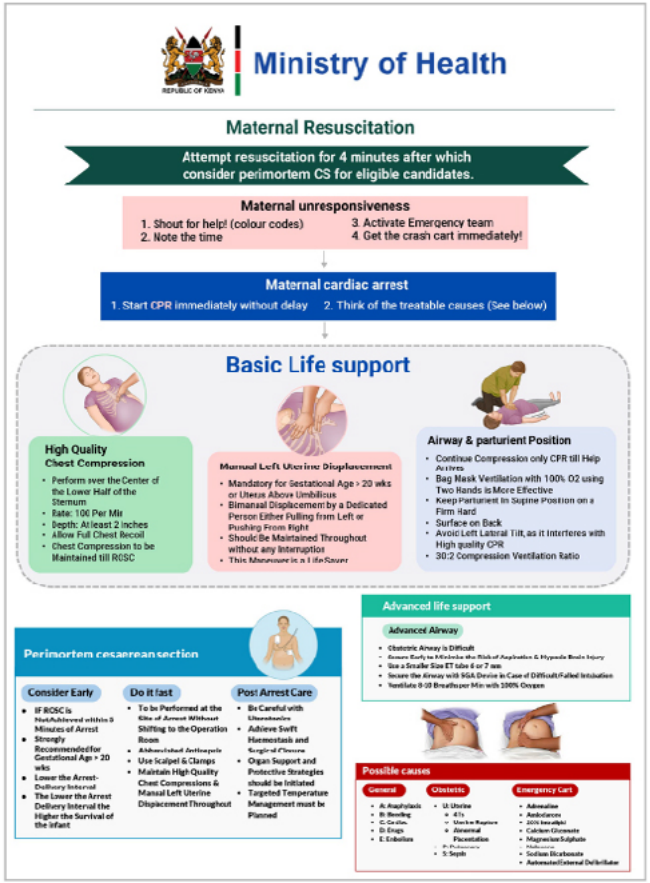
Ministry of Health
Maternal Resuscitation
Attempt resuscitation for 4 minutes after which consider perimortem CS for eligible candidates.
Maternal unresponsiveness
1. Shout for help! (colour codes)
2. Note the time
3. Activate Emergency team
4. Get the crash cart immediately!
Maternal cardiac arrest
1. Start CPR immediately without delay
2. Think of the treatable causes (See below)
Basic Life support
High Quality Chest Compression
Perform over the Center of the Lower Half of the Sternum
Rate: 100 Per Min
Depth: At least 2 inches
Allow Full Chest Recoil
Chest Compression to be Maintained till ROSC
Manual Left Uterine Displacement
Mandatory for Gestational Age > 20 wks or Uterus Above Umbilicus
Bimanual Displacement by a Dedicated Person Either Pulling from Left or Pushing From Right
Should Be Maintained Throughout without any Interruptios
This Maneuver is a LifeSaver
Airway & parturient Position
Continue Compression only CPR till Help Arrives
Bag Mask Ventilation with 100% O2 using Two Hands is More Effective
Keep Parturient in Supine Position on a Firm Hard
Surface on Back
Avoid Left Lateral Tilt, as it Interferes with High quality CPR
30:2 Compression Ventilation Ratio
Perimortem cesarean section
Consider Early
IF ROSC is Not Achieved within 5 Minutes of Arrest
Strongly Recommended for Gestational Age > 20 wks
Lower the Arrest-Delivery Interval
The Lower the Arrest Delivery Interval the Higher the Survival of the Infant
Do it fast
To be Performed at the Site of Arrest Without Shifting to the Operation Room
Administer Antisepsis
Use Scalpel & Clamps
Maintain High Quality Chest Compressions & Manual Left Uterine Displacement Throughout
Post Arrest Care
Be Careful with Uterotonics
Achieve Swift Haemostasis and Surgical Closure
Organ Support and Protective Strategies should be Initiated
Targeted Temperature Management must be Planned
Advanced life support
Advanced Airway
Obstetric Airway is Difficult
Ensure Early to Minimize the Risk of Aspiration & Hypoxic Brain Injury
Use a Smaller Size ET tube 6 or 7 mm
Secure the Airway with SGA Device in Case of Difficult/Failed Intubation
Ventilate 8-10 Breaths per Min with 100% Oxygen
Possible causes
General
A: Anaphylaxis
B: Bleeding
C: Cardiac
D: Drugs
E: Embolism
Obstetric
U: Uterine
4Ts
Uterine Rupture
Abnormal Placentation
P: Pulmonary
S: Sepsis
Emergency Cart
Adrenaline
Amiodarone
Atropine
Calcium Gluconate
Magnesium Sulphate
Naloxone
Sodium Bicarbonate
Automated External Defibrillator
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