Liberia Clinic Treatment Guidelines (CTGs), based on the National Standard Treatment Guidelines (STGs)

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Ministry of Health,
Liberia

Foreword

The Government of the Republic of Liberia (GOL) through the Ministry of Health (MoH) is steadfast to improve the availability, and access to safe, efficacious and affordable quality essential medicines to the general population at all times. This includes promotion and adherence to rational use of essential medicines to manage disease conditions at all levels of care in both public and private sectors. The rational use of medicines entails receiving the required medicines that satisfy their health needs in the right doses for an adequate time with minimum side effects and at an affordable cost. As part of the efforts to improve rational prescription and use of essential medicines and other commodities, the MOH in collaboration with health partners reviewed the second (2nd) Edition of the National Standard Treatment Guidelines (STGs) and elaborated third (3rd) Edition. These Clinic Treatment Guidelines are based on the STGs.

The STGs are scientifically evidence-based guidelines to ensure the safe, effective and rational use of medicines. The second (2nd) Edition of Liberia STG (2017) expired in 2021 and the need for a new edition was critical. Based on this, the MoH embarked on reviewing and updating the second (2nd) Edition of the National STG to include current guidelines and recommendations, cover emerging conditions, approved diagnoses and medicines in use to improve healthcare service delivery. In 2022, the MoH with financial and technical support from the World Health Organization and other partners systematically reviewed and updated the second (2nd) Edition of the National STG into the third (3rd) Edition. The development of the third (3rd) of the National STG was based on consensus and inputs from a host of health care professionals including physicians, pharmacists, nurses, psychiatrists, internists, surgeons, and physician assistants, to name a few. The third Edition (3rd) of the National STG captured newly and frequently used medicines based on MoH disease programs and new treatment protocols to reflect new therapeutic options on changing needs of selected diseases of public health relevance (malaria, TB, HIV, mental health, non-communicable diseases: - diabetes, cardiovascular, neglected tropical disease and nutrition to name a few), emerging diseases (Ebola, covid-19 to name a few) and current healthcare practice to promote quality standardized care at affordable cost. This 3rd Edition NSTG covered medicines for routine and emergency treatments covering the health service tiers of Liberia, primary (clinics) including community health service programs, secondary (health centers) and tertiary (hospitals). It is anticipated that the third (3rd) Edition of the National STG will provide clinical guidance to health practitioners when deciding on the appropriate treatment options for treatment and/or prevention of diseases. It is further expected that this third (3rd) Edition of the National STG will positively influence prescribing practices and behaviors of health practitioners, thus promoting the rational use of medicines for better health outcomes. The STG is intended to provide effective therapeutic benefits and health outcomes to patients or people seeking health care. Lastly, the third (3rd) National STG is also vital to inform the quantification, procurement, distribution of medicines and other supplies in the health sector.

The MoH is grateful to the donors and implementing partners for their continued support to elaborate, disseminate and roll out these Clinic Treatment Guidelines, based on the STGs 2023. I am confident that the Clinic Treatment Guidelines will be useful to health practitioners in clinics across the country who are urged to adhere to the therapeutic recommendations in these CTGs at all times.

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List of abbreviations

ACE	Angiotensin converting enzyme
ACR	Albumin to creatinine ratio
AL	Artemether Lumefantrine fixed dose combination therapy
ALT	Alanine transaminase
ANC	Antenatal care
ARB	Angiotensin receptor blocker
ARI	Acute respiratory infection
ART	Antiretroviral therapy
ARV	Antiretroviral
ASAQ	Artesunate/Amodiaquine fixed dose combination therapy
ASB	Asymptomatic bacteriuria
AZT	Zidovudine
BCG	Bacille Calmette Guerin
BMI	Body mass index
BPD	Bipolar disorder
BPHS	Basic package of health services
BEmONC	Basic emergency obstetrical and neonatal care
BP	Blood pressure
CEmONC	Comprehensive emergency obstetrical and neonatal care
COC	Combined oral contraceptive
COPD	Chronic obstructive pulmonary disease
CPR	Cardiopulmonary resuscitation
CRT	Capillary refill time
CS	Caesarean section
CSB	Corn soya blend
CTGs	Clinic Treatment Guidelines
CV	Cardiovascular
CVD	Cardiovascular disease
CVA	Cerebrovascular accident (stroke)
D&C	Dilatation & curettage
DM	Diabetes mellitus
DOT	Directly Observed Therapy
DOTS	Directly Observed Treatment Short course
DR-TB	Drug resistant tuberculosis
DTP	Diphtheria, tetanus, pertussis
DVT	Deep vein thrombosis
ECG	Electrocardiogram
EC	Emergency contraception
EML	Essential medicines list
EPHS	Essential Package of Health Services
EPI	Expanded programme of immunisation
EPTB	Extra-pulmonary tuberculosis
F100	F100 therapeutic milk
F75	F75 therapeutic milk
FANC	Focused antenatal care
FBC	Full blood count
FDC	Fixed dose combination
FEV1	Forced expiratory volume in 1 second
FSH	Follicle stimulating hormone
FVC	Forced vital capacity
GAD	Generalized anxiety disorder
GDM	Gestational diabetes mellitus
G6PD	Glucose-6 phosphate dehydrogenase
GFR	Glomerular filtration rate

GI	Gastrointestinal
HbS	Sickle Hemoglobin
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HEI	HIV exposed infants
HiBV	Hemophilus influenzae b vaccine
IOP	Intraocular pressure
iPT	Intermittent presumptive treatment
IMCI	Integrated Management of Childhood Illnesses
INR	International normalized ratio
IPV	Intramuscular polio vaccine
IUD	Intrauterine contraceptive device
IUS	Intrauterine system
LARC	Long acting reversible contraceptive
LBW	Low birth weight
LDHS 2019	Liberia Demographic and Health Survey 2019
LDL	Low density lipoprotein
LH	Luteinizing hormone
MAM	Moderate acute malnutrition
MCV	Mean cell volume
MDA	Mass drug administration
MDT	Multiple drug therapy
MI	Myocardial ischemia/ infarction
mhGAP	WHO Mental Health Gap Action Programme guidelines
MDR-TB	Multi-drug resistant Tuberculosis
MSM	Men who have sex with men
MoH	Ministry of health
MTCT	Mother to child transmission
MUAC	Mid-upper arm circumference
MUS	Medically unexplained symptoms
NCD	Non-communicable disease
NG	Nasogastric
NMCP	National Malaria Control Programme
NSAID	Non-steroidal anti-inflammatory drug
OPV	Oral polio vaccine
ORS	Oral rehydration solution
ORT	Oral rehydration therapy
OTP	Outpatient therapeutic program
Penta	Pentavalent vaccine
PE	Pulmonary embolism
PEP	Post exposure prophylaxis
PHCC	Primary health care center
PHCU	Primary health care unit
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission
PTSD	Post traumatic stress disorder
POP	Progestogen-only pill
PPH	Post partum hemorrhage
PrEP	Pre-exposure prophylaxis
PTB	Pulmonary tuberculosis
PWID	People who inject drugs
RBG	Random blood glucose
ReSoMal	Rehydration solution for the malnourished
RHD	Rheumatic heart disease
RUTF	Ready-to-use therapeutic food
RDT	Rapid diagnostic test
RR	Respiratory rate

SAM	Severe acute malnutrition
SC	Stabilization center
SFP	Supplementary feeding program
SLE	Systemic lupus erythematosus
SPO2	Oxygen saturation pressure
SSRI	Selective serotonin reupdate inhibitor
STG	Standard treatment guideline(s)
STI	Sexually transmitted infection
TB	Tuberculosis
TIA	Transient ischemic attack
UPSI	Unprotected sexual intercourse
UTI	Urinary tract infection
VCT	Voluntary testing and counselling
VL	Viral load
VTE	Venous thrombo-embolism
VOC	Vaso-occlusive crisis
WHO	World Health Organization

Units and abbreviations used for treatments

dpm	drops per minute
g	gram
IM	intramuscular
IU	international units
IV	intravenous
kg	kilogram
mcg	microgram
mg	milligram
ml	millilitre
per	for each
PO	Per os (by mouth)
SC	subcutaneous
Tab	tablet
u	Unit
x	times (eg four times for each day = 4 x per day)

1 Introduction

Healthcare professionals need guidelines to assist with the appropriate prescribing and dispensing of medicines for related conditions. These should be updated as needed and disseminated on a regular basis. The dissemination should be backed up by the requisite training. Medicines reduce suffering from disease and save lives. However, used in the incorrect way, these medicines can exacerbate suffering and even provoke premature death.

Once treatment guidelines are updated, health professionals should be informed and where needed, trained to use the updated treatment guidelines and diseases protocols to adhere to evidence-based practice. Ministries of health are responsible for ensuring that people prescribed treatments by health professionals receive the most effective medicine for the condition with the fewest side effects. This is because there are limited government budgets as well as limited capacity for people to pay for their treatment, so it is important to be aware of the most effective treatments at affordable cost that are available and accessible.

The Ministry of Health of Liberia first formulated national standard treatment guidelines (STG) in 1986 which were reviewed and updated in 2011 and 2017. The Government of Liberia, through the Liberia Medicines and Products Regulatory Authority remains committed to ensuring that good quality medicines are available and accessible for all people and that these medicines are affordable and rationally used as per the mandate of the authority. Achieving these objectives requires a comprehensive strategy that focuses on a good supply and distribution chain system of medicines, and on appropriate and rational prescribing, dispensing, and use of medicines. The strategy also requires regular updating of the National STG and Essential Medicines List (EML). The National STGs 2023 has been overseen by the Technical Advisory Committee of the National STG and with technical support of WHO. These Clinic Treatment Guidelines (CTGs) are based on the National STGs 2023.

1.1 The purpose of the Liberia National Clinic Treatment Guidelines (CTGs)

The CTGs have been prepared to assist and guide prescribers (including physician assistants, nurse practitioners, nurses and midwives), pharmacists, pharmacy technicians, dispensers who dispense at health facilities. The guidelines are designed to be used as a guide to treatment choices, and as a reference book to help in the overall management of patients, such as when to refer. These guidelines are designed for use at clinic level and can also be used in health centres by physician assistants, nurse practitioners, nurses and midwives, and by both public and private providers. The content of these treatment guidelines will undergo a process of continuous review. Comments or suggestions for improving future editions of the CTGs are welcome and should be sent to the Chief Pharmacist of the Ministry of Health or his/her designated representative.

Principles that guide the development of the Essential Medicines List (EML) and the STGs and these CTGs include that drugs must be safe, efficacious, high quality, available, affordable, accessible and prescribed based on the evidence for rational prescribing. These CTGs outline principles for rational prescribing the best treatments that are currently available at affordable prices. The application of these guidelines in Liberia brings huge benefits to the health status and well-being of the population, limits potential harm that incorrect prescribing can cause and eases the task of health professionals navigating their way through dozens of manuals and protocols. They are developed in line with the Basic Package of Health and Services (BPHS) and Essential Package of Health Services (EPHS), and their availability greatly simplifies the task of health professionals in prescribing and ensures that those using the health system know that they are

getting the best treatments with the least chance of side effects at low cost. By following the CTGs based on the National STG and the EML, the use of medicines becomes rational.

The STGs and EML bring all those involved in procuring, storing and prescribing drugs, and those being treated, together with the same purpose:

- **Patients** benefit from the application of the STG in knowing that they are receiving the best evidence-based, effective and affordable medicines, improving the quality of treatment they receive and limiting any out-of-pocket expenses.
- **Prescribers** (doctors, physician assistants, midwives, nurses) consult them to ensure all their prescribing is appropriate, evidence-based, and affordable.
- **Dispensers** (pharmacists and those authorised to dispense) check that health professionals are prescribing correctly and not duplicating medicines unnecessarily or using inappropriate or expensive medicines. Dispensers also check that prescribed medicines are in line with the formulary for that level facility.
- **Supply chain managers** should be consulted to ensure affordable generic medicines are available in line with the STG. They are used to set the standards for optimal service delivery in the supply chain of medicines.
- And lastly Ministry of Heatlh **policy makers** use them to set standards and regulate practices.

1.2 The scope of the CTGs

The CTGs are the authoritative medicine prescribing guide for policy makers, managers, dispensers and health professionals working in clinics in Liberia. They are based on the National STGs which have been updated and extended from the previous guidelines written for hospitals and health centres in 1986, 2011 and 2017 and have been adaped for use at two levels: hospital and health centre; and clinic. The CTGs aim to cover the majority of conditions that prescribers and dispensers are managing at clinic level and provide advice on referral. The CTGs are for physician assistants, nurses and midwives who are prescribers.

1.3 The Concept and format of the CTGs

The CTGs are written in a format designed to be concise, clear and easy to use by dispensers in pharmacies and by health professionals during consultations, while observing patients in observation beds or on a home visit. These CTGs have been summarized to include treatments and a few points related to the treatment indication, dosage and key important side effects and interactions. The CTGs are not diagnostic guidelines or clinical protocols, and do not provide detailed descriptions of disease, although do include some diagnostic pointers. This information can be found in other documents including training manuals, reference textbooks, on-line resources and disease-specific protocols.

1.4 The Authority of the STG

The CTGs are based on the STGs which are developed, approved and adopted by the Ministry of Health of Liberia. They are the standardised treatments that should be followed at each level of the health system. Application of the STGs brings huge benefits for patient well-being, reduces the harm caused by inappropriate prescriptions and brings large cost savings for health facilities and the population. Only health professionals licenced to practice (whether in the public or private sector) by the Ministry of Health and the health professional associations are authorised to use these guidelines. The guidelines assume that the health professional at clinic level has

been trained to use the treatment described. Each set of guidelines outlines which professionals are authorised to prescribe which treatments.

These guidelines must not be used by someone who has not been trained to give treatment or by someone who is not authorized by the health ministry to work in a health facility.

The CTGs follow the STGs are based on the current evidence-based prescribing practices from Liberia, from WHO and from other international standards, with cost-effectiveness considerations taken into account. In medicine the evidence is constantly changing as new research is carried out, so it is recommended a structure for review and updating be adhered to.

1.5 Principles of Prescribing and Dispensing

Medicines should be prescribed only when they are necessary following a clear diagnosis. Not all patients need a prescription for a medicine; non-pharmacological treatment may be suitable and should always be kept in mind. In all cases, the benefit of administering the medicine should be considered in relation to the risk involved. This consideration is particularly important during pregnancy where there is risk to both mother and fetus.

Both health workers and patients play an important role in ensuring appropriate use of medicines by:

- Prescribing medicines only when they are needed
- Avoiding polypharmacy to satisfy patients' demands or for financial gain.
- Avoiding the use of symptomatic treatments for minor self-limiting conditions or when the diagnosis is not clear.
- Spending time to educate and reassure the patient instead of prescribing placebos.
- Avoiding expensive alternative or second line medications when an effective and inexpensive first line is available
- Prescribing generic medicines in the STG and on the EML rather than expensive brand-named medicines.
- Avoiding parenteral routes when oral treatment is indicated and possible. Use the parenteral route of administration when there are clear clinical indications for this route
- **Only give IM injections if trained to do so, and only do so when there are clear indications as defined in these CTGs**.
- Ensuring that the correct dose and duration of treatment is prescribed
- Providing adequate *i*nformation and counselling to the patient to encourage adherence to instructions.
- Enquire about drug allergies before prescribing and document in the patient record for future reference

1.6 Rules for writing prescriptions: a prescription is a legal document

PRESCRIPTION WRITING GUIDANCE

No	Prescription writing rules	Reason for the rule
1	Write all prescriptions legibly in ink or electronically. This is to be done by the prescriber only.	Poor writing may lead to errors in interpretation by the dispenser, which may have harmful and possibly life-threatening consequences for the patient
2	Write the full name, age, gender, and address of the patient, and sign and date the prescription form. Provide weight especially in the case of children.	All prescriptions should clearly indicate the name of the prescriber and the address of the prescriber's facility. The patient's demographics are needed to cross-check appropriateness of the prescription
4	Write the name of the medicine or preparation using its full generic name.	Unofficial abbreviations, trade names, and obsolete names should not be used
5	State the strength of the medicine prescribed where relevant: Quantities of one gram or more should be written as 1g, 2.5g, 10g. Quantities under 1g should be expressed in milligrams rather than grams, for example, 500mg and not 0.5g If decimal figures are used, always write a zero in front of the decimal point where there is no other figure, for example 0.5 ml and not .5 ml Quantities less than 1milligram should be written in micrograms- for example, 100 micrograms, not 0.1 mg. Micrograms, nanograms, and units should not be abbreviated. For liquid medicines, use the term milliliter (ml) not cubic centimeter (cc or cm3).	Clarity for the prescriber, dispenser, the person administering and the patient
5	Always state dose regimen in full: – Dose size – Dose frequency – Duration of treatment For in-patients, clearly state the route of administration and specify time of administration.	The quantity to be dispensed is calculated from the regimen. For example, doxycycline 100 mg every 12 hours for 7 days = to be dispensed: 14 tablets of 100 mg.
6	Avoid use of instructions like "prn" or "to be used/taken as required". Indicate a suitable dose frequency instead. In the few cases where "as required" is appropriate, always state the actual quantity of the medicine to be supplied, when to take it and maximum amount	
7	Where relevant, always remember to include on the prescription any special instructions necessary for the correct use of a medicine or preparation, for example "before food" or "apply sparingly"	

1.7 Pharmacovigilance

WHO defines pharmacovigilance as the science and activities relating to the detection, assessment, understanding and prevention of adverse effects of medicines, or any other medicine/vaccine related problem. Reinforcement of correct use of the STGs serves as one tool in the armoury of the Government of Liberia's Pharmacovigilance framework. While medicines and vaccines undergo rigorous testing for safety and efficacy through clinical trials before they are authorized for use, certain side effects may only emerge once these products have been used by a heterogenous population (that may not have been tested during clinical trials), including people with other concurrent diseases, and over a long period of time.

Adverse drug reactions (ADR) (response to a drug which is noxious and unintended and which occurs at doses normally used) may arise in the routine prescribing of these evidence-based

guidelines. All clinicians **are obliged to report** adverse drug reactions. ADR can also present from unexpected drug to drug reactions and drug to food reactions. For this purpose, yellow card reporting is becoming standardised across Liberia, see Appendix 1 for a sample.

1.8 Avoiding Antimicrobial Resistance (AMR)

According to WHO antimicrobial resistance is facilitated 'by the inappropriate use of medicines, for example when taking substandard doses or not finishing a prescribed course of antibiotics. Low-quality medicines, wrong prescriptions and poor infection prevention and control also encourage the development and spread of drug resistance'.

The problem of drug resistance against infectious agents is a serious threat for the modern world:

- The resistance of malaria parasites has caused several changes in antimalarial regimens in the last 15 years
- MDR-TB (multi-drug resistant tuberculosis) is spreading and requires long and complex treatments
- HIV resistance is a serious concern, especially after long term treatment

AMR is spreading and, in some cases, commonly used antimicrobials are not as effective as before. Inappropriate use of antibiotics (in human medicine but also in animal agriculture), poor quality products, and ineffective infection control measures are all contributing factors. We are seriously at risk of finding ourselves in a situation with no affordable antimicrobial available to cure common and dangerous infections. It is urgent that both health workers and patients become aware of the problem and start acting by only using antimicrobials when it is necessary and according to recommendations.

Principles for reducing the risk of AMR include:

- Avoid self-prescription of antibiotics
- Avoid using latest-generation and broad-spectrum antibiotics as first-line treatment
- Prescribe correct dosages for the correct duration and ensuring adherence to the prescription
- Practice strict measures of infection control in health facilities
- Improve hygiene and sanitation in the community, thereby reducing the circulation of germs.

1.9 Enquiring about Allergies

It is standard practice to enquire about medication allergies before administration of the medication. The commonest drug allergies which can be life threatening are due to penicillin allergy. The following penicillin derivatives are listed in the EML. If a patient is **allergic to penicillin**, **do not use these**:

- Amoxicillin
- Ampicillin
- Benzathine penicillin
- Benzylpenicillin
- Cloxacillin
- Phenoxymethylpenicillin
- Procaine benzylpenicillin fortified

For each disease recommending a penicillin antibiotic, the suitable alternative is given in the CTGs for that condition. These alternatives include: macrolides (e.g., azithromycin) tetracyclines (e.g., doxycycline), quinolones (e.g., ciprofloxacin), aminoglycosides (e.g., gentamicin) and glycopeptides (e.g. Vancomycin).

1.10 Prescribing for Children

- Where possible, all children (younger than 12 years) should get dosage according to body weight. In these guidelines, "Child" refers to a patient younger than 12 years unless it is otherwise specified.
- Special care is needed in the neonatal period (the first 28 days) and doses should always be calculated with care.
- Avoid IM injections wherever possible as they are painful in children.
- For ease of administration, syrups or suspensions should be made available to children younger than 5 years where possible, and the dosage of the base of the medicine by weight should be clearly specified.
- Tetracycline should not be given to children younger than 8 yrs.
- Aspirin should not be given to children younger than 8 years and pregnant women.

1.11 Prescribing for Pregnant and Lactating women

- It is advised all prescription medication be checking for contraindications in pregnancy and breastfeeding women
- All medicines should be given with caution in pregnant and lactating women, and in men trying to father a child. Drugs can have harmful effects on the embryo or fetus and can cause congenital malformations in the first trimester. They can affect growth and development during the second and third trimester. Drugs given during labor can have an effect on labor or on the newborn.
- Medicines should only be prescribed in pregnancy if the expected benefit to the mother is thought to be greater than the risk to the fetus. All drugs should be avoided if possible, during the first trimester. Drugs which have been used extensively in pregnancy and appear to be usually safe should be prescribed in preference to new or untried drugs, using the smallest effective dose.
- The CTGs identify drugs that should be used with caution or are contraindicated during breast feeding.

1.12 Prescribing in the Elderly

The fact that older people often receive multiple drugs for their multiple conditions greatly increases the risk of interactions and adverse effects. The balance of benefit and harm may be altered as people get older and therefore their medicines should be reviewed regularly and those not of benefit should be stopped.

In most cases, older adults need lower doses of medications. It is recommended to start low and go slow on dosage and strength. Maximum recommended doses are usually not necessary in older adults.

Non-pharmacological measures may be more appropriate for symptoms such as sleeplessness, headache or light headedness. In some cases, prophylactic drugs may be inappropriate if they complicate existing treatment or other underlying conditions. But at the same time elderly patients should not be denied essential medicines.

1.13 Infection, Prevention and Control (IPC) Guidelines

To be always followed to avoid transmission bloodborne and other pathogens. For more detail refer to Liberia MoH National IPC Guidelines.[1]

- **Hand hygiene**. Hand washing with soap or hand rubbing with alcohol gel before and after any direct patient contact. Follow the WHO Five moments for hand hygiene. [2]
- **Gloves**. Wear gloves when touching blood, body fluids, secretions, excretions, mucus membranes, non-intact skin. Remove after use and perform hand hygiene. Gloves should never be used as a substitute for hand hygiene.
- **Facial protection** (eyes, nose, mouth). Wear a procedure mask and eye protection during activities that are likely to generate splashes or sprays of blood, body fluids, secretions and excretions.
- **Gown**. Wear during activities that are likely to generate splashes or sprays of blood, body fluids, secretions and excretions. Remove soiled gown and perform hand hygiene. If there is any possibility of a patient having a viral hemorrhagic disease like Ebola, then full personal protective equipment (PPE) must be worn as per the Ebola Virus Disease (EBV) guidelines.
- **Prevention of needle-stick injuries**. Use care when handling needles, scalpels and other sharp instruments, when cleaning instruments and when disposing of used needles, which should put in a sharps box, sealed and disposed when ¾ full. Manage needle-stick and other workplace exposure to HIV with post-exposure prophylaxis (PEP)
- **Respiratory hygiene and cough etiquette**. Persons with respiratory symptoms should cover their nose and mouth when coughing / sneezing with tissue or mask, disposed of used tissue or mask and perform hand hygiene after contact with respiratory secretions. Place acute febrile respiratory symptomatic patients at least 1 meter away from others.
- **Environmental cleaning**. Ensure the floors and surfaces of all clinical spaces are clean at all times. Clean up any blood or bodily fluids immediately with 0.5% chlorine solution. There should be *no spraying of surfaces,* instead wipe surfaces.
- **Linen**. Handle and transport used linen in a way that prevents skin and mucous membrane exposure.
- **Waste disposal**. Ensure waste is safely segregated at point of generation and in the external waste zone, not accessible to patients and children, and collected regularly. Sharps boxes should be available at all sites using needles/ scalpels and not more than ¾ full. No unprotected sharps should be left on surfaces and needles should never be re-used. Infectious waste must be treated and disposed of safely and no bandages/ infectious waste lying exposed. Waste needs to be transported and stored securely.
- **Patient care equipment**. Equipment should be handled in a way that prevents any exposure of skin or mucus membranes to blood, body fluids, secretions and excretions. All equipment must be cleaned prior to disinfection and/or sterilization and before use on another patient.

[1] Liberian Ministry of Health National IPC Guidelines

[2] https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/infection-prevention-and-control/your-5-moments-for-hand-hygiene-poster.pdf?sfvrsn=83e2fb0e_16

1.14 Prescribing Paracetamol

Paracetamol is the most common medicine used in the health system. It helps reduce fever, pain and symptoms associated with the common cold such as cough and congestion. It is used for both pain control as an and as an antipyretic to control fever. Paracetamol should not be given more than every 6 hours (i.e. Not more than 4 x in 24 hours or a day). There are several preparations in the EML - 500mg tablets and 125mg tablets, 100mg dispersible tablets, 125mg/5ml liquid, 125mg suppositories and injectable paracetamol, so it is essential that the right amount is given for each preparation.

Like all medicines, paracetamol is effective in the prescribed dosage but is **dangerous** if this dose is exceeded. If a patient accidentally takes too much, or a parent has accidentally given a child more than double the recommended dosage in 24 hours, then they will need **immediate hospitalization**. Depending on the history, and on serum paracetamol levels if available, a specific antidote *see 2.8.3*) can be given.

The dosage table below for the appropriate prescribing of paracetamol should be used whenever "**Give paracetamol**" is mentioned in the CTGs:

PARACETAMOL STRENGTH AND DOSAGE

Medicine	Age	Dose	Side effects
	Premature babies	10 - 15mg/kg 2 x day (max 30mg/kg/ 24 h)	
Paracetamol PO (or rectal if available)	Neonates - 2m	15 - 20mg/kg 3 x day (max 30mg/kg/24 h)	**Rare:** skin reaction, liver toxicity **Paracetamol can be fatal when taken in overdose. All cases should be referred immediately**
	Infants 3 – 5m	60mg 4 x per day (2.5mls of 125mg/ 5mls syrup or ½ 125mg tablet)	
	Children 6m2y	120mg 4 x per day (5mls of 125mg/5mls syrup or 125mg tablet)	
	Children 2y - <4y	187.5mg 4 x per day (7.5mls of 125mg/5ml syrup or 1½ x 125mg tablet)	
	Children 4y - <6y	250mg 4 x per day (5mls of 250mg/5ml syrup or 2 x 125mg tablet or ½ x 500mg tablet)	
	Children 6y - <9y	375mg 4 x per day (7.5mls of 250mg/5ml syrup or 3 x 125mg)	
	Children 9y - <12y	500mg 4 x per day (10mls of 250mg/5ml syrup or 1 x 500mg tablet)	
	Children 12y - <15y	750mg 4 x per day (15mls of 250mg/5ml syrup or 1½ x 500mg tablet)	
	Children >15y and adults	500 - 1000mg 4 x per day (1½ - 2 x 500mg tablet)	

2 Emergencies

2.1 Danger Signs

- Clinic staff must be very attentive to any child or adult presenting with danger signs. Immediate action must be taken, and relevant life-saving treatment administered. Danger signs could include the following:
  - Signs of severe infection
    - High fever ≥39°C
    - Rapid and/or shallow breathing
    - Drowsiness
    - Ashy, bluish or very pale color (cyanosis)
    - Convulsions
    - Stiff neck
  - Signs of severe dehydration

        - Lethargic or unconscious
        - Sunken eyes
        - Dry lips and tongue
        - Not able to drink or breast feed, or drinking poorly
        - Little or no urine output
        - Skin pinch goes back very slowly (children and young adults only)
    - Signs of obstructed breathing/ respiratory distress
        - Rapid and/or shallow breathing
        - Noisy breathing
        - Chest indrawing
        - Cyanosis
        - Facial swelling including lips, tongue and/or face
    - Signs of shock
        - Fast pulse/ heart rate
        - Weak pulse/ heart rate
        - Low Blood Pressure
        - Cold, clammy skin
        - Pallor, grey or blue color
        - Low or no urine output
        - Drowsiness, convulsions, or unconscious/ coma

2.2 Emergency Medical Care – triage, resuscitation and rapid referral

2.2.1 Triage

- Triage is the process of rapidly screening a sick person soon after their arrival, in order to identify:
    - Those with emergency signs, who require immediate emergency treatment to avert death.
    - Those with priority signs, who should be given priority in the queue so that they can be assessed and treated without delay; and
    - Non-urgent cases, who have neither emergency nor priority signs.
    - Assess the ABCDE (Airway, Breathing, Circulation, Disability, Exposure), call for urgent help**,** perform any life-saving measures as described below to stabilize the patient and refer immediately.
    - **A Airway**
        - Assess patient (look, listen, feel)
        - Establish a patent airway
        - Stabilize cervical spine with rigid collar if injured
    - **B Breathing**
        - Assess patient (look, listen, feel)
        - Administer oxygen from concentrator if available
        - Assist ventilation, if indicated
        - Apply a 3-way dressing to an open chest wound
    - **C Circulation and control of hemorrhage**
        - Direct pressure to bleeding site
        - Assess patient (look, listen, feel)
        - Use a large bore cannula to gain intravenous access
        - Fluid resuscitation
        - Cardiopulmonary resuscitation (CPR) if required
    - **D Disability**
        - Assess mental state

        - Protect brain and spine functions
    - **E Exposure**
        - Identify all injuries and any environmental threats
- If a problem is identified in any of these steps it must be addressed immediately before moving on. The ABCDE approach should be performed in the first 5 minutes and repeated whenever a patient's condition changes or deteriorates.
- Call for HELP

Assessing the Airway

- Can the person talk normally? If so, the airway is open. If not, **Does the person's breathing appear to be obstructed?** Look at the chest wall movement and listen to breath sounds to determine whether there is poor air movement during breathing.
- Stridor indicates obstruction. Stridor plus swelling and /or hives suggest a severe allergic reaction(anaphylaxis).
- Look and listen for fluid e.g., vomit or blood in the airway. Remove with suction if available and, if no trauma, turn on side in recovery position.
- **Is a foreign body suspected?** If visible remove it, being careful not to dislodge it. If patient is choking, use age-appropriate treatment to remove the foreign body e.g., chest or abdominal thrusts.
- Other emergency measures to secure airway by staff experienced in these techniques:
    - Head tilt chin lift of forward jaw thrust – these maneuvers help restore upper airway patency when in the unconscious patient the tongue occludes the glottis
    - Insert oro- or naso-pharyngeal airway

Assessing Breathing

- **Is there central cyanosis?** Determine whether there is bluish or purplish discoloration of the tongue and the inside of the mouth. *Is the person breathing?* Look and listen to determine whether the person is breathing.
    - If there is no breathing, perform CPR (Appendix 3)
    - If there is obstructed or absent breathing, central cyanosis, or severe respiratory distress:
        - Give ventilation with Ambu bag and mask if absent respiration.
        - Give oxygen if available
- **Is there severe respiratory distress?** Breathing is very labored, fast, or gasping, with chest indrawing, nasal flaring, grunting or the use of auxiliary muscles for breathing (head nodding). The person is unable to speak because of respiratory distress and tires easily.
    - **Listen to the chest:**
        - If wheezing: treat with salbutamol
    - Check if breath sounds are equal on both sides.
        - Dull to percussion and absent breath sounds, consider pleural effusion or hemothorax. Give oxygen.
        - If tension pneumothorax (no breath sounds one side, hypotension, shifted trachea) give IV fluids and oxygen

Assessing Circulation (for shock)

- People in shock are lethargic and have cold skin, prolonged capillary refill, fast weak pulse and hypotension.
- **Check the pulse (very fast) and the BP (very low)**. If the radial pulse is strong and not obviously fast, the person is *not* in shock. If you cannot feel the radial pulse, feel the carotid pulse.

- **Check whether the person's hand is cold.** If so, determine whether the person is in shock.
    - Check whether the capillary refill time is longer than 3 seconds. Apply pressure to whiten the nail of the thumb or the big toe for 5 seconds. Determine the time from the moment of release until total recovery of the pink color. **If capillary refill is longer than 3 seconds, check the pulse.** Is it weak and fast?
- Look for both internal and external bleeding (into chest, abdomen, from stomach, intestine, pelvic or femur fracture), from wounds.
- If hypotension, distended neck veins and muffled heart sounds consider pericardial tamponade.
- If cause unknown, consider possibility of trauma.

Assessing Disability

- Assess level of consciousness with AVPU scale (Alert, Voice, Pain, Unresponsive) or in trauma cases Glasgow Coma Scale
    - If altered mental status and no evidence of trauma, place in recovery position.
- Check blood glucose level in confused or unconscious patient.
    - If glucose low< 3.5mmol/l or 63mg/dL give glucose.
    - If glucose test not available and patient has altered mental status, give glucose.
- Check for pupil size, whether equal and reactive to light.
- Check movement and sensation in all four limbs
- Look for abnormal repetitive movements on one or both sides of the body (seizure)
- If pregnant and having seizures, ***but only if trained to do so***, give magnesium sulphate
    - Initially, give 5g IM in lateral side of each buttock (10g in total). Refer immediately

Assessing Exposure

- Examine whole body for hidden injuries, rashes, bites or other lesions.
- Rashes can indicate a serious infection.
- If snake bite suspected
    - Immobilize the limb where the snake bite took place
    - Obtain a picture of the snake where possible. No one should risk additional bites to catch/kill snake
- Remove all constricting clothing and jewelry
- Cover the patient to prevent possible hypothermia
- Acutely ill people have difficulty regulating body temperature
    - Remove any wet clothes and dry patient.
    - Respect the patient and protect modesty.
- Remember the possibility of trauma. If suspected spinal injury, only turn patient using a log roll.

Refer the patient as soon as possible and continue stabilization measures during referral.

2.2.2 Hypoxia and use of Medical Oxygen

- *See MOH Guidelines[3] for additional information*
- Hypoxemia is a low saturation level of oxygen in the blood. Hypoxia is inadequate oxygen levels in tissues for normal cell and organ function, which results from hypoxemia.
- Hypoxemia is a life-threatening condition that requires early detection and treatment.

[3] MoH National Clinical Guidelines, Hypoxemia Management and Oxygen Therapy 2022

- In general, hypoxemia is a pulse oximetry measurement of SpO2 < 95%.
- It may also be detected from clinical signs such as cyanosis, respiratory distress, and coma, and most accurately from blood gas analysis.
- Blood gases also detect hypercapnia (raised CO2) which is particularly dangerous as it decreases respiratory drive further pushing up hypoxemia.
- Many things cause hypoxia, including cardiac, respiratory diseases, carbon monoxide poisoning, severe sepsis, anemia, hemorrhage, and shock.

Detection of Hypoxemia and Indications for Medical Oxygen

- Assess oxygenation levels via pulse oximetry.
- Anyone needing oxygen needs urgent referral, ideally with oxygen delivered during the referral journey.
- This should be measured during admission triage of anyone with dyspnea, shortness of breath, or cardiac or respiratory symptoms. Also, in anyone with shock, including septic shock.
- Measure pulse oximetry regularly for anyone in a critical state.
- If $SP0_2$ < 94%, the patient may need medical oxygen immediately and during referral. Other indications for medical oxygen are given in the table below.
- Depending on the level of the person's respiratory effort, they are given either supplemental oxygen via a mask, or via non-invasive positive pressure ventilation (NIV), or invasive ventilation.

Adults and children	• Impaired breathing • Severe asthma • Reduced consciousness if hypoxemia present • Central cyanosis • Trauma – blood loss Anesthesia (depending on patient condition)

Children	• Severe respiratory distress
	  ○ Central cyanosis
	  ○ Nasal flaring
	  ○ Inability to drink or feed
	  ○ Grunting with every breath
	  ○ Drowsy, lethargic
	  ○ Obstructed or absent breathing
	• Signs of shock
	• Coma or seriously reduced level of consciousness and seizures
	• Signs of severe dehydration

Neonates	• Birth asphyxia
	• Neonatal respiratory failure
	  ○ Respiratory distress syndrome in preterm infants
	  ○ Transient tachypnea of the neonate
	  ○ Pneumonia
	• Some patients with congenital heart disorders
	• Sepsis with shock or respiratory distress
	• Seizures during and immediately afterwards until breathing normally

INDICATIONS FOR USE OF MEDICAL OXYGEN

Administering Oxygen for referral

- Perform hand hygiene and put on risk-appropriate PPE.

- Sit the patient up at 30 to 45° and ensure they are comfortable (this position allows for better chest expansion and improves breathing by facilitating oxygenation) while awaiting transport and during transport to hospital.
- Set up the oxygen source (from either concentrator, cylinder, or central piping)
- Identify and fit the appropriate type and size of oxygen delivery interface to patient – nasal cannula/ prongs or simple face mask
- Adjust flowmeter to the flow rate required by the patient during transfer, in general:
  - Neonates: 0.5–1 L/min
  - Infants: 1–2 L/min
  - Older children: 2–4 L/min
  - Adults: 2–6 L/min
- Connect the delivery device and tubing to oxygen source, begin the oxygen flow and check that delivery device is secured on the patient and there are no leaks.
- Monitor the patient's SpO_2 using pulse oximetry to determine whether patient needs higher flow rates of oxygen and monitor for signs of oxygen toxicity.
- A proper fitting of the mask is key for successful NIV. This should be provided by trained staff where possible.
- *See MoH National Clinical Guidelines, Hypoxemia Management and Oxygen Therapy 2022 for setting up these procedures[4].*

2.2.3 CPR – Cardiopulmonary Resuscitation

- See Appendix 3 for CPR algorithms[5] which can be printed off as posters.

2.3 Shock

- Shock is a failure of circulation leading to poor perfusion of the tissues and organs, and eventually irreversible organ damage and death if not corrected. Mortality is high without early diagnosis and treatment.
- Shock can be due to an acute allergic reaction (anaphylaxis), fluid depletion (hemorrhage or dehydration), from septicemia or toxins, or when the heart fails.
- Both the symptoms and cause of shock should be treated simultaneously. The key steps in treatment are:
  - **Call for HELP**
  - Keep the person warm and position them properly – position their head lower than their body by 20% tilt e.g., by elevating their legs, unless they are in respiratory distress or in cardiogenic shock.
  - Give oxygen and ventilatory support if required
  - Refer immediately

2.3.1 Hypovolemic Shock and Fluid Replacement

- Replacement fluids are used in hypovolemic shock to replace abnormal losses of blood or extracellular fluids by increasing the volume circulating in the blood vessels. Initial treatment with these fluids may be lifesaving and provide some time to control bleeding and obtain blood for transfusion if it becomes necessary.
- If they are conscious and can swallow give ORS and refer.

Replacing Fluids in well- nourished children

[4] MoH National Clinical Guidelines, Hypoxemia Management and Oxygen Therapy 2022

[5] https://resus.co.za/#algorithms

- Hypovolemia may be more difficult to recognize in children as there may be very little change in vital signs. Fast heart rate is often the first sign of hypovolemia, but this may also be caused by fear or pain.
- Give ORS and refer.
- Monitor vital signs very closely.
- *S*everely malnourished children with shock are managed differently and are at risk of fluid overload and electrolyte disturbances. They should be referred to the stabilization center (SC).

2.3.2 Anaphylaxis

- A person may develop shock as an acute allergic reaction to a medicine, blood transfusion, a bee sting or snake bite, or after eating a food that they are allergic to.
- They present with fast rapid pulse, low BP, may be pale, cold and clammy and may have an urticarial allergic rash or severe wheezing.

Immediate Life-Saving Treatment

- They need immediate ABC life-saving measures and treatment with adrenaline and IV fluids (Ringer's lactate or 0.9% sodium chloride).
    - If trained to do so, give IM adrenaline (epinephrine) injection. Repeat IM adrenaline dose after 5 min if symptoms of anaphylaxis do not resolve
        - Adrenaline is given IM on the anterolateral aspect, middle third of the thigh. **Do not give it intravenously**
        - It can be repeated every 5 minutes
- Monitor pulse and BP and repeat the adrenaline dose after 5 minutes if there has been no response.
- If they are wheezing, give 10 puffs of inhaled salbutamol via a spacer
- If the heart stops beating, start CPR.
- Do not give any other treatment
- **Refer immediately**

Drugs for Anaphylaxis	Adult or child older than 12 years	Child 6–12 years	Child 6 months – 6 years	Child Under 6 months
Adrenaline (IM) 1:1000 (repeat after 5 minutes if no improvement)	500 micrograms (0.5 mL) (give 300 micrograms IM [0.3 mL] in a child who is small or prepubertal)	300 micrograms (0.3 mL)	150 micrograms (0.15 mL)	100-150 micrograms (0.1 to 0.15 mL)

ADRENALINE FOR ANAPHYLAXIS

2.4 Management of Major Bleeding – Surgical, Obstetric

- Major bleeding from whatever cause needs urgent management with initial measures to ensure survival including fluid replacement and referral.
- Consult surgical and obstetrical protocols. (For Antepartum Hemorrhage, *see 3.7*. For Post-partum Hemorrhage, 3.9.4)

2.4.1 Treatment Steps for Major Bleeding

- Identify the cause of the bleeding and control it if possible. Apply pressure with a gauze pad.
- Monitor status:

- Monitor pulse rate, blood pressure, respiratory rate, conscious level.
- Give tranexamic acid PO or IM 1000mg if major bleeding from trauma or a Post partum hemorrhage.
- Refer immediately

2.5 Life-Threatening Infections

2.5.1 Fever Management

- Fever is a temperature of 38°C and over. It is a response by the body to underlying infection and disease. Fever is a positive reaction by the body in its fight against infection.
- Many causes include focal infections such as pneumonia, urinary tract infections, as well as viral infections, enteric fevers, and bacterial zoonotic illnesses. Some fevers can also be caused by autoimmune disease.
- Treatment
  - Take the temperature of all patients complaining of being unwell or with history of fever.
  - Refer all patients with high fever (> 39°) and danger signs – including drowsiness, pallor, convulsions, signs of shock, severe dehydration, signs of meningitis. see life-threatening infection below.
  - Check for malaria using a RDT (and/or thick film) on all patients with fever over 37.5°. If positive, treat for malaria according to the National Guidelines – *see 5.3*.Ask other questions to establish cause of fever while preparing to refer
  - Give paracetamol. If fever > 39° and in the absence of other signs or symptoms and if the patient is otherwise well, no other treatment is needed, but they should be told to return if not improving.
  - Do not give antibiotics if there is mild fever but no obvious cause.
  - Do not overdress or underdress a child with fever. Sponging a child with water may initially reduce the temperature but should not be done if it is likely to upset the child.

2.5.2 Recognizing Life-Threatening Infection

- Sepsis is a life-threatening condition where there is organ dysfunction due to the body's response to infection. It can lead to septic shock which is associated with high mortality.
- Symptoms are variable and mostly non-specific but often include:
  - Patients often present with fever (≥ 38.0 °C) or hypothermia (< 36.0 °C)
  - Fast heart rate (> 90 beats/ minute in adults)
  - Signs of respiratory distress (rapid breathing (respiratory rate > 20/min) and/or chest indrawing)
  - Acute altered mental status
  - Bulging fontanelle in infants
  - Low blood pressure
  - Reduced urine output
  - Bleeding in a viral hemorrhagic fever
- Neonates and young infants may not have the classic signs, but may be irritable, sleepier than usual, not feeding, have apneic episodes, or be cyanosed/pale, or have mottled skin
- Early identification of sepsis, source of infection, and treatment is important for survival.

General Approach to Treating Life-Threatening infection

- Treatment and control of infection
  - Give first dose IM antibiotics **but only if trained to do so**.
  - Adults. Give 2g of Ceftriaxone by deep IM injection in lateral side of buttock

- Children: Give 100mg/ kg of Ceftriaxone by deep IM injection in lateral side of buttock (maximum dose 2g).
- Refer

- Oxygen if any respiratory distress or reduced Oxygen saturation (<94%) via a non-rebreathable mask during transfer
- Manage seizures if prolonged (>5 minutes)
  - Place in recovery position if unconscious
  - Children: diazepam 0.5 mg/kg rectally, but do not exceed 10 mg.
  - Adults: diazepam10 mg rectally
- Refer

Antibiotics for Life-Threatening Infection

- If a bacterial infection is suspected and patients have the signs of life-threatening infectoin, antibiotics should be started immediately.
- Treatment and control of infection
  - Give first dose IM antibiotics **but only if trained to do so**.
  - Adults. Give 2g of Ceftriaxone by deep IM injection in lateral side of buttock
  - Children: Give 100mg/ kg of Ceftriaxone by deep IM injection in lateral side of buttock (maximum dose 2g).
  - Refer

If severe pneumonia, **but only if trained to do so**, then give first dose:

- Ampicillin or amoxicilin IM 50 mg/kg/ single dose
- plus
- Gentamicin IM
- Adults: 240mg IM single dose
- Newborn babies under 1 month: 5 mg/kg single dose
- Children over 1 month: 7.5 mg/kg single dose (maximum dose 240mg)

OR

- Adults. Give 2g of Ceftriaxone by deep IM injection in lateral side of buttock
- Children: Give 80mg/ kg of Ceftriaxone by deep IM injection in lateral side of buttock (maximum dose 2g).
- Refer

2.6 Meningitis

Clinical Features

- Meningitis is an acute bacterial infection of the meninges covering the brain. The 4 main causes of acute bacterial meningitis that cause half of cases (as well as septicemia and pneumonia) are:
  - *Neisseria meningitidis* (meningococcus)
  - *Streptococcus pneumoniae* (pneumococcus)
  - *Hemophilus influenzae*
  - *Group B streptococcus*
- These bacteria are responsible for more than half of the deaths from meningitis globally and they cause other severe diseases like sepsis and pneumonia.
- Symptoms and signs include:

Adults and Children > 1y	Infants
• Severe headache • Stiff or painful neck • High fever • Avoiding bright light (photophobia)	• Poor feeding • Sleepy, difficult to wake, comatose • Irritable, crying when handled • Difficulty breathing, grunting

• Drowsy, confused, comatose • Convulsions • Rash • Joint pains • Cold hands and feet • Vomiting • Petechial hemorrhage and/or purpura (in some cases of *N. meningitidis*)	• Fever • Neck rigidity • Bulging fontanelle • High pitched cry • Convulsions • Vomiting • Rash • Pale or blotchy skin

SYMPTOMS AND SIGNS OF MENINGITIS

Antimicrobial Treatment

- Meningitis is an emergency condition requiring early administration of antibiotics.
- First dose antimicrobial treatment is given empirically and directed at the most likely bacteria based upon patient age and underlying comorbid disease.
- Different antibiotics are given in newborn babies as the bacteria causing the infection are different (usually Gram-ve bacilli, Group B streptococcus, or Staphylococcus.aureus
- if likely skin infection including umbilical cord infection, and then after 7 days increasingly Streptococcus pneumoniae
- Check for MoH guidance issued with each new epidemic for treatment

    - Give first dose IM antibiotics **but only if trained to do so**.
    - Adults. Give 2g of Ceftriaxone by deep IM injection in lateral side of buttock
    - Children and babies over 1 month: Give 100mg/ kg of Ceftriaxone by deep IM injection in lateral side of buttock (maximum dose 2g).
    - Newborn under 1 month:
    - Ampicillin or amoxicillin IM 50 mg/kg/ single dose
      plus
    - Gentamicin IM Neonates: 5 mg/kg single dose

2.7 Tetanus

Clinical Features

- Tetanus is a severe infection due to the bacillus Clostridium tetani, found in soil, and human and animal waste. Wounds become contaminated in non-vaccinated individuals and wounds are particular risk are umbilical stumps, puncture wounds, where tissue is crushed or contaminated, and during surgery if there is poor aseptic technique.
- It presents as muscular rigidity beginning in the jaw, spreading to face and whole body, and severe, painful muscle spasms, which are spontaneous or triggered by noise, light and touch.
- In newborns, signs appear within 3 to 14 days of birth, and present with irritability, rigidity and difficulty sucking and spasms.

Treatment

- **If suspected refer immediately**
- Treat the spasms and refer
- Treating the spasms with diazepam in the rectum:

Medicine	Age (weight)	Dose - Diazepam given rectally 10 mg/2 ml solution. **Dose 0.1 ml/kg** (0.5mg/kg)	Duration	Side effects
Diazepam 5mg/ml	Newborn to 2 weeks	0.1ml/kg		
	2 weeks - < 2 months (<4kg)	0.3ml	Single dose.	
	2 – < 4 months (4 - < 6kg)	0.5ml		

2ml ampules	4 - < 12 months (4–< 6 kg)	1.0ml		**Common**: drowsiness, confusion **Rare**: stop breathing
	1 - < 3 years (6–< 10 kg)	1.25ml		
	3 - < 5 years (14 – 19kg)	1.5ml		
	5 – 12 years	2.0ml		
	Adult and child > 12 years	3.0ml		
Prescribing tip: Must use a plastic syringe or rectal diazepam tube. Insert gently 3 – 4 cm into rectum via anus.				

RECTAL DIAZEPAM DOSING FOR CONVULSIONS

2.8 Convulsions

2.8.1 Febrile Convulsions in Children

- Children with high fever may have a *febrile convulsion* caused by the fever associated with an infection.
- Most febrile convulsions do not need diazepam unless they continue for more than 3 to 5 minutes.

Treatment

- Put the child on their left side in the recovery position.
- Do a blood glucose if available and if hypoglyemia give glucose
- When recovered give fluids by mouth.
- Treat with paracetamol and treat any cause of fever, *see 2.5.1*
- Give diazepam if prolonged convulsion, i.e., 10 minutes or longer
  - Use rectal diazepam
  - If convulsions continue after 10 min, give a second dose of diazepam.
  - Do not give more than two doses of diazepam
  - **If an infant or young child stops breathing after administering diazepam, give artificial ventilation with bag and mask.**
  - Refer

Medicine	Age (weight)	Dose - Diazepam given rectally 10 mg/2 ml solution. Dose 0.1 ml/kg (0.5mg/kg)	Duration	Side effects
Diazepam 5mg/ml 2ml ampules	Newborn to 2 weeks	0.1ml/kg		
	2 weeks - < 2 months (<4kg)	0.3ml	Single dose.	**Common**: drowsiness, confusion **Rare**: stop breathing
	2 – < 4 months (4 - < 6kg)	0.5ml		
	4 - < 12 months (4–< 6 kg)	1.0ml		
	1 - < 3 years (6–< 10 kg)	1.25ml		
	3 - < 5 years (14 – 19kg)	1.5ml		
	5 – 12 years	2.0ml		
	Adult and child > 12 years	3.0ml		
Prescribing tip: Must use a plastic syringe or rectal diazepam tube. Insert gently 3 – 4 cm into rectum via anus.				

RECTAL DIAZEPAM DOSING FOR CONVULSIONS

Treatment of Convulsions

- Treat cause of convulsions like cerebral malaria (*see 5.3.2.3*) and epilepsy in children and adults. For eclamptic fit in pregnant women *see 3.4.2.*
- Position the patient to avoid injury and do not try to force anything into their mouth. A brief convulsion does not require any treatment.
- Do not leave the person alone.
- Do a blood glucose if available and if hypoglyemia give glucose
- Check ABC and support respiration including the provision of oxygen

- If prolonged convulsion, give diazepam, see above dosage table
- If fever, treat as per *see 2.5.1*
- Refer

2.8.2 Hypoglycemia

- *See 6.3.2* also
- Test blood glucose of all patients with a reagent strip
- If conscious, give oral glucose:
  - Child: a teaspoon of powdered sugar in a few ml of water or 50 ml of fruit juice, maternal or therapeutic milk or 10 ml/kg of 10% glucose PO or NG tube.
  - Adults: 15 to 20 g of sugar (3 or 4 cubes) or sugar water, fruit juice, soda

Non-diabetic patients	Hypoglycemia: < 3.3 mmol/liter (< 60 mg/dl)	Severe hypoglycemia < 2.2 mmol/liter (< 40 mg/dl)
Diabetic patients on home treatment	< 3.9 mmol/liter (< 70 mg/dl)	

DIAGNOSING HYPOGLYCEMIA

2.9 Emergency Treatment of Poisoning

- Some poisons have delayed action, leaving the person looking well soon after they first take the poison or medicine in overdose. These include paracetamol, aspirin, iron, tricyclic antidepressants, alcohol, carbon monoxide, opioids and organophosphate pesticides.
- Some poisons can be absorbed, removed, or eliminated, but the mainstay of treatment is to follow the general treatment steps for poisoning.
- Most poisoned patients are treated with these steps and only in a few circumstances, specific therapy or antidotes are required.
- Do not try to make the patient sick. Do not give them anything by mouth
- Immediately refer all cases

2.9.1.1 General Treatment Steps for Poisoning

- If unconscious, put up IV 5% glucose and put in recovery position. If in shock, put up IV Ringers lactate.
- Where possible establish the identity and dose of the poison.
- Oxygen should be given via a mask (or via assisted ventilation) if there is poisoning by carbon monoxide or irritant gases.
- If there is hypotension (with systolic BP < 70 mmHg), the person should be put in left lateral position with the legs raised, and normal saline infused. They must NOT be lying on their back as this may increase the risk of aspiration.
- Prolonged convulsions (> 5 minutes) should be treated with 10mg rectal diazepam, or a weight appropriate dose in children.
- Refer

2.10 Trauma

2.10.1 Minor Wound Management

- Minor wounds include cuts, scrapes, abrasions, and puncture wounds that are not extensive or deep, no vital organs are compromised and there is insignificant amount of

bleeding. The objective of treatment is to ensure rapid healing without complications such as infection.

- If the wound is infected and the patient has systemic symptoms of infection, give antibiotics immediately and refer. *See 2.5*
- Prophylactic antibiotics are *not given* for non-infected minor wounds, but consider if in high-risk clinical areas (face, hands, near joints). For prophylaxis for high-risk cases give for 3 days.

•	**Antibiotic Choice**
Adults	Amoxicillin + clavulanic acid PO 500 mg + 125 mg given every 8 hours, **or** Cloxacillin PO 500 mg given every 6 hours
Children	Amoxicillin + clavulanic acid PO 80–90 mg/kg/day of amoxicillin component taken every 12 hours ***Oral Weight Bands*** 3– < 6 kg: 250 mg of amoxicillin/dose given every 12 hours 6– < 10 kg: 375 mg of amoxicillin/dose given every 12 hours 10– < 15 kg: 500 mg of amoxicillin/dose given every 12 hours 15– < 20 kg: 750 mg of amoxicillin/dose given every 12 hours ≥ 20 kg: 500 mg of amoxicillin/dose given every 8 hours or 1 g of amoxicillin/ dose given every 12 hours **OR** Cloxacillin PO 15 mg/kg/dose given every 6 hours ***Oral Weight Bands*** 3– < 6 kg: 62.5 mg given every 6 hours 6– < 10 kg: 125 mg given every 6 hours 10– < 15 kg: 250 mg given every 6 hours 15– < 20 kg: 375 mg given every 6 hours ≥ 20 kg: 500 mg given every 6 hours
Duration	3 days (preventive treatment of wounds at high risk of infection) 5 days (treatment of infected wounds)

EMPIRIC ANTIBIOTIC TREATMENT FOR MILD INFECTIONS FROM TRAUMATIC WOUNDS

- If wound infected refer.
- If trained to do so, treat the wound rapidly and maintain hygiene using aseptic technique in the following steps:
  - Cleaning:
    - Wear suitable protective clothing (gown, mask, and protective glasses if there is risk of projection. Always use sterile gloves.
    - Wash the wound thoroughly. Use sterile water or normal saline with chlorhexidine solution or 7.5% povidone iodine scrub solution and rinse.
    - Use running water/saline and do not clean by immersion
  - Explore the wound to see the degree of damage and remove any foreign bodies. Use aseptic technique – create a sterile field, drape, and isolate the area, then clean with 10% povidone iodine or 0.5% chlorhexidine prior to beginning. Use sterile gloves.
  - Excise non-viable tissue
  - Manage infection
    - Give Tetanus Toxoid IM for those who have not been vaccinated.
    - If the wound is high risk, or the patient is high risk (e.g., immunosuppressed or a poorly controlled diabetic), refer.
- Identify wounds that need to be sutured and do so.

- Immediate suturing. Generally, simple and non-dirty wounds no older than 12 hours old with healthy tissue may be sutured. Any dirty wounds or bite wounds should generally not be sutured immediately
- Delayed primary closure. For wounds that cannot be sutured immediately, cover with a simple dressing and refer.

2.10.2 Major Wound Management

- Major wounds are deeper and more extensive wounds, that may compromise an organ and have major hemorrhage.
- Stop bleeding by applying pressure with sterile gauze.
- Refer immediately

2.10.3 Fractures

- Splint the fracture to immobilize.
- If substantial bleeding or signs of shock, give IV Ringers lactate.
- Emergency trauma management and refer.

2.11 Bites

- Irrigate wound then cleanse with 0.5% chlorhexidine (use 10% Povidone iodine if you suspect a rabid animal, *see below)*
- **Do not suture the wound. Cover with sterile bandage**
- **Give prophylactic antibiotics if** the bite has breached the skin (see under minor wound management above)
- Give tetanus toxoid IM
- Refer all snake bites, dog bites or those of wild animals. For the treatment of rabies, *see below*.

Human Bites

- Irrigate wound then cleanse with 0.5% chlorhexidine
- Do not suture – cover with sterile dressing
- Give tetanus toxoid IM
- Give oral antibiotics in selected cases if high-risk clinical areas (face, hands, near joints)
  - If no penicillin allergy, give Co-amoxiclav as above. If penicillin allergy, give cefalexin as above.

Mammal Bites and Rabies

- Rabies is a zoonotic viral disease spread by the bites of dogs and other animals. Once a person has contracted the disease, it is always fatal.
- Incubation time could be up to 12 weeks.
- An early phase of numbness and pain around the bite is followed by the acute phase of excitability, irritability, painful airway spasms, and refusal of water as the virus spreads throughout the central nervous system eventually progressing to paralysis, coma and death.
- If rabies is suspected from a bite of a domestic animal, quarantine and feed the animal for 10 days. If it dies, then rabies is probable. If it develops signs of rabies, it should be humanely killed, and the head sent to the veterinary lab for confirmation.
- Wound management and post-exposure prophylaxis where available is key.
  - Washing and flushing for approximately 15 minutes then apply copious amounts of 10% povidone iodine to kill the rabies virus.

- Do not suture the wound except to stop bleeding. Dress with a dry gauze.
- Give tetanus Anti-Tetanus Serum (if not immune)

- Refer all cases of suspected rabies

Categories of Contact with Suspect Rabid Animal	Post-exposure prophylaxis measures
Category I – touching or feeding animals, licks on intact skin	None. Refer
Category II – nibbling of uncovered skin, minor scratches or abrasions without bleeding	Refer for Immediate vaccination and local treatment of the wound
Category III – single or multiple transdermal bites or scratches, licks on broken skin; contamination of mucous membrane with saliva from licks, contacts with bats	Refer for Immediate vaccination and administration of rabies immunoglobulin; local treatment of the wound

POST EXPOSURE PROPHYLAXIS OF RABIES[6]

Snake Bites

- For identification of snakes in Liberia and first aid management of snakebite, see the very helpful ArcelorMittal: *A Guide to the Snakes of Liberia.*[7]

Immediate Action

- Reassurance
- Assess the area of the bite to see if there is evidence of marks caused by fangs - often the victim has not actually been bitten
- Immobilize bitten limb with sling/splint
- Avoid contact with wound (no vigorous cleaning, cutting, massage or application of creams or herbs). **Tourniquets are NOT recommended. Do NOT try to suck out the bite**
- Obtain description of snake, and try to identify the type of snake
- Refer

2.12 Burns

Initial Steps

- Extract person who is burnt: Check area is safe and wear protective equipment if available if needed (e.g., if managing chemical burn).
- Assess Airway, Breathing and Circulation
- Deal with other trauma which may be life-threatening

Superficial Mild Burns

- Maintain hydration
- Symptom relief – cool baths or showers or compress, simple analgesia and topical emollient (apply daily until skin no longer dry or itchy).
- Give analgesia (paracetamol) and if conscious advise them to drink more fluids during transfer
- Refer all burns unless very small and refer if signs of heat stroke (fatigue, dizziness, nausea, headache, irritability, confusion, hallucinations, fever or tachycardia).

[6] WHO. Rabies Vaccines: WHO Position Paper – April 2018. Weekly Epidemiological Record, No. 16; 2018, 93. 201–20.

[7] ArcelorMittal. Environmental and Social Studies, 2008-2015: Project Phase 2 – Concentrator: A Guide to the Snakes of Liberia. September 2013

- Review if blisters develop (dermal burn).

- Dressings for mild burns
  - Do not use antibiotic or antimicrobial dressings or creams routinely
  - Use non-fibrous, non-adherent dressing. Apply two layers of dressing. A non-adhesive layer such as a paraffin gauze dressing, as this will help keep moisture in the wound and stop the dressing sticking to the skin. The second layer should be a thick dressing made with water-absorbing cloth to help absorb any liquid oozing from the wound. Change every 3 -4 days.
  - Secure with light bandage
  - Do not routinely give antibiotics
  - Refer any burn that has become infected.

3 Reproductive and Maternal Health

3.1 Family planning

- Birth Spacing has many advantages which include:
  - Saves lives
    - At least one woman in the world dies every minute from causes related to pregnancy and childbirth: In developing countries, a woman's lifetime risk of dying due to pregnancy and childbirth is almost 100 times higher than the risk for a woman in more developed countries:1 in 75, compared to 1 in 7,300.
    - Family planning could prevent up to one-third of all maternal deaths by allowing women to delay motherhood, space births, avoid unintended pregnancies and unsafely performed abortions, and stop childbearing when they have reached their desired family size.
    - Family planning prevents abortions: An estimated 20 million unsafely performed abortions take place worldwide each year, resulting in 67,000 deaths annually mostly in developing countries. Family planning can prevent many of these tragic deaths by reducing the number of unintended pregnancies that lead to abortions.
    - In Liberia only 24% of married women and 45% of sexually active unmarried women are currently using a modern method of contraception.
  - Saves Children's lives.
    - Closely spaced births result in higher infant morbidity mortality. International survey data show that babies born less than two years after their next oldest brother or sister are **twice as likely to die** in the first year as those born after an interval of three years.
  - Saves Adolescents' lives
    - Young women and girls face higher risks of dying from pregnancy or childbirth. Women aged 15 to 19 are twice as likely to die from maternal causes as older women. Many adolescents are physically immature, which increases their risks of suffering from obstetric complications. In Liberia, 25% of girls aged 15 to 19 have already given birth.
    - Young women have high rates of unintended pregnancy. Each year 2.5 million teenagers in developing countries end their pregnancy by undergoing abortions that are performed either by persons lacking the necessary skills or in unsafe conditions, or both.
  - Cost effectiveness
    - Voluntary family planning is one of the most cost-effective investments a country can make in its future, it has a positive social and economic impact on the mother

and her community. Every dollar spent on family planning can save governments up to 6 dollars that can be spent on improving health, housing, water, sanitation, and other public services.

3.1.1 Methods:

- Birth spacing counselling and services are provided during the continuum of care from antenatal through to postnatal periods and include counselling on both natural and modern contraceptive methods.
- Natural Contraceptive methods are safe but not reliable.
    - These methods do not require the use of medication to prevent conception.
    - Approximately 1 in 4 women will fall pregnant each year using fertility awareness methods.
    - This involves abstaining or using condoms on fertile days.
    - The newest methods: standard days method like in the use of cycle beads and 2-day method may be the easiest and consequently more effective.
    - The lactational amenorrhea method (LAM) is an effective **temporary** form of contraception.
    - Women living with HIV are advised to use dual method (condom and another contraceptive method).
    - The condom prevents re-infection with other HIV strains or STIs.
    - Women with HIV can use most methods of birth spacing apart from spermicides, the diaphragm, or caps with spermicide.
- Modern contraceptive methods require the use of medication to prevent conception and fall into 2 categories:
    - short acting which requires the user to remember to use/take the contraceptive
    - long acting usually administered by the health professional for the duration of use and/or can be permanent.
- Anyone prescribing contraception should be trained and follow approved protocols for use of each method.
- **Principles of contraception provision**
    - Counsel patients according to the WHO medical eligibility criteria[8]
    - Start with asking the client questions that screen for pregnancy:
        - Did your last monthly bleed/period start within the past 7 days?
        - Have you abstained from sexual intercourse since your last monthly bleed/period, delivery, abortion, or miscarriage?
        - Have you been using a reliable contraceptive method consistently and correctly since your last monthly bleeding, delivery, abortion, or miscarriage?
        - Have you had a baby in the last 4 weeks?
        - Did you have a baby less than 6 months ago, are you fully or nearly-fully breastfeeding, and have you had no monthly bleeding since then?
        - Have you had a miscarriage or abortion in the past 7 days? (Or 12 days if planning on starting the copper IUD)
    - If the client answers **YES** to any of the questions, then pregnancy is unlikely.
    - If she answers **NO** to **ALL** of the questions, pregnancy needs to be excluded by doing a pregnancy test before starting contraception.

3.1.2 Short-acting Methods

[8] Medical Eligibility Criteria for Contraceptive Use https://www.who.int/publications/i/item/9789241549158

3.1.2.1 Barrier methods

- This includes the male and female condoms, diaphragms and caps; however, the male condom is the most readily available.
- Counselling is given on condom use at appropriate moments in consultations with men, women and adolescents in line with training and national birth spacing guidelines.
- Condoms must be used correctly to prevent STIs and to reduce pregnancies.
- To reduce the risk of conception and infection, condoms should be used with every act of sex

3.1.2.2 Combined hormonal contraception (CHC)

- CHCs include the combined oral contraceptive pill (COC) and other less commonly available methods like combined injectable contraceptives, combined patch and combined vaginal ring.
- The recommendations that follow describe the COC and apply to other CHC too.

COC types

Medicine	**Dose**	**Duration**	**Side effects**
Ethinylestradiol + Levonorgestrel 30mcg + 150mcg tablet, **28 pack** with 7 inactive tabs Brands: Microgynon, Zinna-F	1 tablet per day	Continuous ; take next pill packet without a break.	**Common**: shorter, lighter periods, nausea, breast changes, mood changes, acne (improve or worsen), migraine **Rare**: deep vein thrombosis (in calf of leg) can also cause pulmonary embolus (but DVT risk less than in pregnancy)

Medicine	**Dose**	Duration	Side effects
Ethinylestradiol + Levonorgestrel 30mcg + 150mcg tablet, **21 pack**	1 tablet per day	7 days break after 21 continuous days of taking the tablet. See below.	As above

- The COC can be used for contraception and/or helping control menstrual bleeding with some gynecological disorders (*see 3.10.1*).
- There is no evidence that one COC pill is more effective than another, though thrombotic risk is variable.
- If available, COCs different from those described above may be preferred in certain circumstances to others.
- The COC protects against cancer of the ovary and uterus.
- The COC may slightly increase the risk of breast cancer in those who have used the COC within the last 10yrs and slightly increase lifetime risk of cervical cancer in those who have taken the COC for more than 5yrs. These are small risks.
- Most COC pills are licensed for 21 days of pill taking followed by 7 days off. The endometrial lining is shed during these 7 hormone-free days. However, there is no biological need to have a monthly endometrial shedding. Therefore, women may take the COC as an **extended regime**, during which pills are taken every day, without a pill-free week for 3 months followed by a 4-7 day break and then continuing for another 3 months. The advantages to using an extended regime including reduced risk of unintended pregnancy, reduced bleeding days and suppression of hormonal symptoms.
- **Important points to note for safe prescribing of COC**:
  - Take one pill every day, at about the same time each day.
  - Take any missed pill as soon as possible. See ‘missed pills rules’ below
  - Bleeding changes are common but not harmful

- A woman can start using COCs any time she wants if she is not pregnant
- It is recommended that alternative contraception to the COC is prescribed in women who smoke, have a BMI of >35kg/m^2 and/or are 40years and older.
- Women who are <42 days post-partum and/or <6 months postpartum and are breastfeeding should not use CHCs (see below)
- COC should be avoided in women who have a personal history of heart, breast or liver disease, of sickle cell disease, or history of a deep vein thrombosis, pulmonary embolus or stroke, or of migraine headaches.
- Blood pressure should be measured before initiation and at least annually whilst the women continue to use a COC.
- Prescribe 3 months of the COC with a full explanation on how to use.
- Review in 3 months, ask about side effects and measure the blood pressure. If the COC is tolerated, up to 12 months can be prescribed.
- The COC should be **stopped** if there is sudden severe chest pain, sudden breathlessness, unexplained swelling in the calf, severe stomach pain, severe headache or migraine or neurological effects, hepatitis or significantly raised BP.
- The woman should be referred immediately if there is a possible deep vein thrombosis, pulmonary embolus or other pathology.
- The COC should be stopped before surgery and barrier contraception use is advised. The COC can be restarted once the woman is fully ambulant after surgery.

- **Missed COC pill rules:**
  - If the client vomits within 2hrs of taking a COC, they should take a further pill and continue as normal. If there is vomiting or severe diarrhea for more than 2 days follow instructions below for two or more missed pills. Further guidance in table below:

One missed pill	Take a pill now immediately even if this means taking two at the same time, continue with the rest of the packet.
Two or more missed pills	Take a pill immediately even if this means taking two at the same time, discard the remaining missed pills, continue with the rest of the packet and use extra precautions to prevent pregnancy. If the client has had unprotected sexual intercourse in the 7 days prior, they may need emergency contraception so seek advice.

  - If women are established on an extended regime, the missed pill rules become irrelevant unless more than 3 pills are missed around the time of the 4–7 day break.

- **Use of COC in the postpartum period**

Breast Feeding	<6 weeks postpartum	Do not use	<21d postnatal: concern about VTE risk because residual pro-thrombotic state of pregnancy COC reduces milk volumes. After 6w there is no detrimental effect on infant growth
	>6weeks to <6months postpartum	Only if partially breastfeeding not when fully breastfeeding	
	>6months postpartum	Safe	
Not Breast Feeding	<3w postpartum	Do not use	Do not use
	3-6w postpartum	Use with caution	Do not use if other risk factors for VTE present
	>6w postpartum	Safe	Use with caution if other risk factors for VTE present

- Women with HIV can safely use the COC except when they are on ritonavir for ART which affects its efficacy. Condoms are also advised to help prevent HIV transmission.

3.1.2.3 Progesterone Only Pill (POP)

Medicine	Dose	Duration	Side effects
Levonorgestrel 30mcg 28 pack	Take 1 per day	Continuous treatment.	Common: irregular periods (may spot or bleed throughout cycle); nausea, headache Rare: vomiting, breast discomfort, depression, skin disorders

- The POP is a good alternative to COC when estrogens are contraindicated.
- The POP needs to be taken within 3 hours of the same time each day otherwise the contraceptive effect may be lost.
- It is not an ideal method for women who find it difficult to remember to take pills.
- Women with HIV can safely use the POP unless they are on ritonavir for ART.
- **Important points to note for safe prescribing of POPs.**
    - Take one pill at the same time every day, no breaks between packs.
    - Provides effective contraception when breastfeeding
    - Frequent or irregular bleeding is common but not harmful.
    - A woman can start using the POP any time she wants if she is not pregnant.
    - Do not give if continued vaginal bleeding, severe cirrhosis of the liver, current DVT/PE, taking medication for TB/seizures (refer to guidelines), have ever had breast cancer or current severe hypertension.
    - Measure the blood pressure before initiation and at least annually.
    - Give 3 packs for 3 months and fully explain how to take it, at the same time each day and without a break.
    - Review in 3 months, ask about side effects and measure the blood pressure. If the POP is tolerated, up to 12 months can be prescribed.
    - If switching from a COC, continue directly from one method to the other without a break.
- **Missed POP pill rules**
    - If there is vomiting within 2 hours of taking the pill, then another pill should be taken immediately.
    - If vomiting or diarrhea continues for more than 24 hours, she should continue taking the pill and use other precautions (condoms) or abstain from sex for up to 2 days after recovery.
- **Use of POP in the postpartum period**

If fully breastfeeding <6months after birth	If monthly bleeding hasn't started start POP any time. If it has returned, then she can start at any time if pregnancy has been excluded
If fully breastfeeding >6months after birth	As above but use a backup method for first 2 days of use.
If partially breastfeeding <6months after birth	If monthly bleeding hasn't started start POP any time and use backup method for first 2 days of use, having excluded pregnancy
If partially breastfeeding >6months after birth	Start as per women with normal menstrual cycles.

3.1.3 Long-acting Methods

3.1.3.1 Progesterone Only Injection

- (As DMPA-IM or DPMA-SC: Depot medroxyprogesterone acetate intramuscularly or subcutaneously and NET-EN: norethisterone enanthate)
- Is a progesterone only contraceptive and usually causes a reduction in menstrual flow

Medicine	Dose	Duration of action	Side effects
Norethisterone enanthate (NET-EN)	1 ampoule	8 weeks	**Common**: absence of periods, or irregular periods; delayed return to fertility **Rare**: prolonged bleeding
Depo-medroxyprogesterone acetate Brands : DMPA-IM : depo-provera DMPA-SC : Sayana Press	1 ampoule deep IM/SC	12 weeks	

- DMPA is now available for subcutaneous injection in a prefilled syringe with a short needle designed for injection just under the skin. The Uniject system (marketed under the brand name Sayana Press) may be particularly useful in community-based programs as women can easily learn how to self-administer. It is as effective as effective as DMPA given IM but can be given discretely by the woman to herself. It has the same side effects. ***Only administer if trained to do so***.
- **Important points to note for safe prescribing of progesterone only injection**
  - Bleeding irregularities are common but not harmful.
  - Usually causes a reduction in menstrual flow or amenorrhoea, which may be beneficially especially in those with menorrhagia, sickle cell or iron deficiency anemia.
  - Returning when next injection is due; every 3 months (12weeks) for DMPA or every 2 months for NET-EN is important for greatest effectiveness. Not taking the next injection when due can lead to ovulation and subsequent pregnancy before they have experienced a period.
  - Gradual weight gain is common. This is on average 1-2kg a year.
  - A woman can start the injectable any time she wants if she is not pregnant.
  - Use a backup method for 7 days if starting later than Day 5 of her cycle
  - Do not give if severe liver disease, severe hypertension, diabetes with complications, heart disease, breast cancer or unexplained vaginal bleeding
  - Give either IM or SC. If given SC, demonstrate use and on the second occasion watch the patient self-administer and if patient confident with use, the patient can then be given further SC injectables to self-administer before returning for a review. They should be reviewed once a year at least.
  - There is usually a delay in return to fertility of 3-4months and no evidence of permanent infertility
  - Progestin injectables are a safe and reliable method to use whilst breast feeding but must not be started until 6 weeks after birth

3.1.3.2 Contraceptive Implant

- **Important points to note for safe prescribing for contraceptive implant**

Medicine	Dose	Duration	Side Effects
Etonogestrel Implant	68mg: 1 radiopaque rod	3years	**Common**: change in bleeding pattern, **Rare**: acne, mood changes, weight gain
Levonorgestrel Brand: Jadelle, Levoplant	75mg : 2 silicone rods	5yrs	

  - Implants are small flexible rods containing progesterone type hormone placed just under the skin of the upper arm
  - Depending on the type of implant, they provide immediately reversible protection for 3-5yrs

- Requires a specifically trained provider to insert and remove. ***Only insert if trained and authorised to do so.***
- Bleeding changes are common but not harmful
- A woman can start the implant any time she wants if she is not pregnant
- Do not start if severe liver disease, a current DVT/PE, a current or past history of breast cancer or unexplained vaginal bleeding.
- Can be inserted within 7 days after the start of her monthly bleeding, or after if it is confirmed, there is no pregnancy. She will need a backup method for the first 7 days after insertion
- Women who are living with HIV and/or are on ART can safely use implants. Efavirenz may reduce effectiveness, so women are advised to use condoms in addition.
- Implants are safe to use whilst breast feeding. If fully breast feeding and less than 6 months postpartum, the implant can be inserted without back up. If over 6 months, if fully or partly breastfed, and bleeding has not returned, pregnancy must be excluded before insertion, that must then be followed by 7 days backup. If periods have returned whilst breastfeeding, follow the usual rules for administration of the implant.

3.1.3.3 Intrauterine Contraceptive Device (IUD)

- An IUD is a flexible device fitted inside the uterus.
- The most effective IUD is the intra-uterine system (IUS) that are plastic devices with slow-release progestogen.
- The IUS is also useful in reducing menorrhagia.
- More widely available is the copper IUD (Cu-IUD), (currently the TCu380A) made of plastic in a “T” shape, with copper sleeves on the arms and copper wire wrapped around the stem.
- It can provide protection from pregnancy for as long as 12 years.
- Return of fertility is not delayed after removal.
- ***Only insert IUDs if trained and authorized to do so***.

Medicine	Dose	Duration	Side Effects
Tcu380A Intrauterine Contraceptive Device (Cu-IUD)	n/a	10yrs	**Common**: Heavier and longer periods (Cu-IUD only). Bleeding irregularities, amenorrhoea with the IUS. Pelvic inflammatory disease (PID) may occur if the woman has chlamydia or gonorrhoea at the time of IUD insertion. **Rare:** Risk of expulsion 1:10, Infection 1:100 and perforation 1:1000 after fitting
Levonorgestrel releasing intrauterine system. Mirena	52mg	5yrs (unless fitted after 45yrs old, then 7yrs)	

- **Important points to note for safe administration of intrauterine contraceptive device**
  - ***Only insert if trained and authorised to do so***.
  - Provides effective, long lasting, immediately reversible pregnancy protection
  - Ideal for a woman who has delivered one baby, but wishes to space out her next pregnancy and does not wish to consider hormonal contraceptive
  - Requires fitting by a specially trained service provider with the following guidance
  - Do not fit the Cu-IUD if the patient gave birth more than 48hrs and less than 4 weeks ago; if she had an infection following childbirth/abortion and if there is unexplained vaginal bleeding or genital/pelvic conditions, HIV with severe or advanced disease or high risk of STIs

- Ensure a pelvic examination is carried out to exclude where possible STIs, PID and anatomical abnormality that would interfere with fitting.
- As long as the patient is not pregnant the IUD can be fitted without requirement for a backup method and the IUS can be fitted at any time but if after day 7 of the menstrual cycle, then a backup method is required for 7 days
- Do not use IUS if current or past history of breast cancer, current DVT/PE, severe liver disease
- Both the IUD and IUS are safe and effective to use whilst breast feeding
- Women living with HIV can safely have an IUD inserted if they have mild or no clinical disease, whether or not they are on ART. Those with advanced or severe clinical disease should **not** have an IUD inserted. If a woman becomes infected with HIV while she has an IUD in place, it does not need to be removed. An IUD user living with HIV who develops advanced or severe clinical disease can keep the IUD and should be closely monitored for pelvic inflammatory disease. The IUD does not increase the risk of becoming infected with HIV.

3.1.3.4 Permanent Methods

- Female and Male Sterilisation
- *Refer for counselling about sterilization.*

3.1.3.5 Emergency Contraception (EC)

- Any woman or girl of reproductive age may need emergency contraception to avoid an unwanted pregnancy.
- There are no absolute medical contraindications to the use of emergency contraception.
- There are no age limits for the use of emergency contraception.
- **Assess** pregnancy risk and ask the following:
  - When were the episodes of unprotected sexual intercourse (UPSI) in relation to her LMP?
  - Use the height and weight to calculate the BMI
  - Other medication or hormonal contraception
- **Advice:**
  - Condom use going forward until otherwise protected
  - Counsel about and offer quick start hormonal emergency contraception
  - Offer STI testing if needed
  - Advise pregnancy test ≥3w if an entirely normal period does not occur
- EC can be used:
  - At any point in a natural menstrual cycle.
  - In cases of inconsistent or compromised contraceptive use, e.g. missed pills, split condoms.
  - From day 21 post-partum (unless <6m postnatal, fully breastfeeding and amenorrhoeic).
  - From day 5 post-miscarriage/abortion/ectopic pregnancy/uterine evacuation for gestational trophoblastic disease.
- Types of EC

  <u>Oral EC</u>
  - Levonorgestrel 1.5mg PO stat. If overweight (BMI >26 or weight >70kg): give 3mg dose
  - If vomiting occurs within 2 hours of taking a dose, the dose should be repeated.
  - Can be given up to 72h after UPSI but is ineffective > 96h

- Can quick start long-term contraception immediately.
- Can be used by breastfeeding women.
- May be prescribed if UPSI has occurred previously in the cycle.
- May be prescribed more than once in a cycle.
- Is unlikely to prevent pregnancy if given after ovulation
- Is highly unlikely to do any harm: no evidence of adverse events associated with use, or teratogenesis when accidentally taken in pregnancy

Cu-IUD

- ***Only insert if trained and authorised to do so***.
- Is the most effect form of EC.
- Prevents fertilization due to toxic effect on sperm and ova.
- If fertilization does occur, the local inflammatory endometrial effect prevents implantation. As implantation occurs on day 6 at the earliest following fertilization, it can be fitted up to 5 days after UPSI or up to 5 days after ovulation.
- Some women may have cultural/religious reasons for wishing to avoid a method which has a post-fertilization effect. This should be explained fully during counselling.
- Highly effective (failure rate of 0.1%) and is the only method which is effective post-ovulation (but pre-implantation)
- Provides ongoing contraception if required.
- Should not be given for 1m after delivery (risk of perforation)
- Current symptomatic STI is a contraindication. If in doubt give antibiotic cover.

3.2 Antenatal Care

- According to the Liberian ANC Protocol[9], pregnancy should be detected by clinical examination or urinary pregnancy test or ultrasound
- Registration should be done as early as pregnancy is suspected or diagnosed and aim for at least 8 contact visits across all 3 trimesters:

Visit(Contact)	Gestation
1st ANC Contact	First 12 weeks 1-12 weeks
2nd ANC Contact	Second trimester 13-20 weeks
3rd ANC Contact	Second trimester 21-26 weeks
4th ANC Contact	Third trimester 27-30 weeks
5th ANC Contact	Third trimester 31-33 weeks
6th ANC Contact	Third trimester 34-35 weeks
7th ANC Contact	Third trimester 36-37 weeks
8th ANC Contact	Third trimester 38-40 weeks

- Antenatal care with eight contacts with a healthcare provider reduces perinatal mortality and improve women's experience of care.
- The aim is to provide pregnant women with respectful, individualized, person-centred care at every contact, with implementation of effective clinical practices (interventions and tests), and provision of relevant and timely information, and psychosocial and emotional support, by practitioners with good clinical and interpersonal skills within a well-functioning health system.

[9] Ministry of Health Liberia Antenatal care protocol December 2021

- In case of complications, additional ANC visits as required by the health condition of the pregnant woman and referral to the health center/ hospital.
- At each ANC clinic, conduct triage by asking and observing for any **danger signs** in the pregnant woman and carry out immediate care and referral.
- Screen women for malnutrition with MUAC bands
- **Nutrition supplements**
  - The following supplementation is recommended during pregnancy:
    - **Daily oral iron and folic acid supplementation** throughout pregnancy
      Ferrous sulphate 200mg PO 1 x a day
      AND
      Folic acid 5mg PO 1 x a day
    - **Daily calcium supplementation** from 20 weeks to reduce pre-eclampsia
      Calcium lactate 600mg PO 2 x a day from 20 weeks to term
    - **Vitamin A supplementation** is recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem, to prevent night blindness. A maximum dose of 25,000IU can be given weekly.
    - **Balanced energy and protein dietary supplementation** in the undernourished is recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates:

Moderate Acute Malnutrition (MAM)	Women enrolled where possible in a Supplementary feeding programme (SFP) are given take-home dry rations or supplementary Plumpy®. The quantities given are monitored as part of any SFP that are available, and clear instructions are given on how to give supplementary Plumpy® or prepare CSB or UNIMIX at home.
Severe Acute Malnutrition (SAM)	As per MAM and enrollment in either outpatient therapeutic care or the inpatient therapeutic centre if complications

Multiple micronutrients, Vitamin B6 (pyridoxine) C, D, E supplementation are not recommended for pregnant women to improve maternal and perinatal outcomes

- **Anthelminthic treatment** is recommended for pregnant women as part of worm infection reduction programs: Albendazole 400mg PO as a single dose in second trimester.
- **Tetanus toxoid vaccination** is recommended for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus with a maximum of 5 doses in a lifetime:

Type of vaccine	**Toxoid**
Number of doses	At least two primary doses (lifetime total of 5)
Schedule	See next table
Contraindications	Anaphylactic reaction to previous dose
Adverse reactions	Mild local or systemic reactions are common and increase in frequency with increasing numbers of doses, and may constitute a contraindication to further doses
Dosage	0.5ml
Injection site	Outer upper arm
Injection type	Intramuscular
Storage	Store between 2°C–8°C. Never freeze

- A maximum of 3 doses of tetanus toxoid immunization (TT2+) are given during pregnancy depending on previous immunization history as below:

Dose	**Time of administration**	**Duration of protection**
TT1	At first contact	No protection
TT2	4 weeks after TT1	Three years

TT3	At least 6 months after TT2	Five years
TT4	At least one year after TT3	Ten years
TT5	At least one year after TT4	For thirty years (throughout a woman's reproductive life)

- **Intermittent preventive treatment of malaria with sulfadoxine-pyrimethamine** (IPT)
  From the second trimester, give SP 3 tablets (sulfadoxine 500mg + pyrimethamine 25mg) as a single dose PO once a month to ensure that at least three doses are received during the pregnancy.
  HIV infected women on cotrimoxazole do not need to take IPT
  Avoid IPT if there is a history of sulphonamide allergy
- **Hemolytic disease of the newborn** (HDN)
  - caused by antibodies produced by the mother which cross the placenta and destroy the baby's red cells.
  - HDN due to blood groups ABO incompatibility between mother and infant does not affect the fetus in utero but is an important cause of neonatal jaundice.
  - Rhesus D incompatibility is an important cause of severe fetal anemia.
  - The fetal red cells are hemolyzed, causing severe anemia or death in utero, brain damage after birth from high levels of bilirubin.
  - Anti-Rh D immunoglobulin prevents the sensitization and production of antibodies in a Rh D-ve mother to Rh D+ve red cells that may have entered the maternal circulation.
  - HDN is prevented by:

- Test the ABO and Rhesus factor on 1st ANC visit.
- If Rhesus antibodies are detected at the first antenatal visit, the pregnant woman should have a further Rhesus antibody check at 28–30 weeks' gestation.
- Antenatal prophylaxis: If available, the following can be given to all pregnant women who are Rh D -ve: 500 mg anti-Rh D immunoglobulin IM at 28 and 34 weeks (**or** a single larger dose: 1,200 mg IM early in the third trimester).
- Postpartum prophylaxis: Give anti-Rh D immunoglobulin in a dose of 500 mg/IM to a Rh D -ve mother within 72 hours of delivery if the baby is Rh D +ve.
- If any sensitizing event occurs during the antenatal period, give:
  - 250 mg of anti-Rh D immunoglobulin IM for <20 weeks' gestation
  - 500 mg of anti-Rh D immunoglobulin IM for >20 weeks to term

- **Antenatal Screening**
  - **Screening for diabetes.** Hyperglycemia first detected at any time during pregnancy should be classified as either gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to 3.4.3 and refer to health center/ hospital.
  - **Screening urine for infection with urine dipstick**. A minimum of a 5-day antibiotic regimen is recommended for all pregnant women with asymptomatic bacteriuria (ASB) to prevent persistent bacteriuria, preterm birth and low birth weight:
    Nitrofurantoin 100mg 2x day PO for 5-7 days in the first and second trimesters.
    Avoid in third trimester and at term
    OR
    Amoxicillin + clavulanic acid 500mg+125mg 3 x per day PO for 5-7 days and is safe to use throughout pregnancy
  - **Screening for HIV**

Provider-initiated testing and counselling (PITC) for HIV should be considered a routine component of the package of care for pregnant women in all antenatal care settings. All women are offered voluntary counselling and tests for HIV and other diseases as part of routine bloods in the ANC. All women who test positive for HIV or syphilis are enrolled in the appropriate treatment program (*see 5.5.6.1)*
Oral pre-exposure prophylaxis (PrEP) containing tenofovir disoproxil fumarate (TDF) should be offered as an additional prevention choice for pregnant women at high risk of HIV infection as part of combination prevention approaches. Refer to health center.

- **Screening for TB**

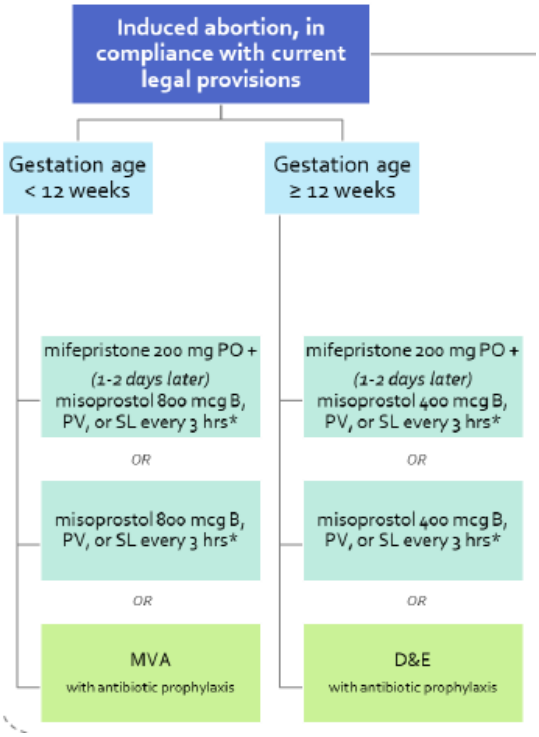
Systematic screening for TB should be conducted. Assess for any **ONE** of the following in the pregnant patient:

- Cough for any duration
- Fever for any duration
- Night sweats
- Weight loss OR failure to gain weight in pregnancy

If any of the symptoms are present, she should have sputum investigation for TB. Refer to health center. If positive she will need to be enrolled for TB treatment (*See 5.6.3*)

3.3 Termination of pregnancy/abortion:

Termination of pregnancy is legal in Liberia as long as legal requirements are fulfilled. Safe termination of pregnancy or abortion can be performed according to the comprehensive abortion care guidelines.[10] Refer to health center.



3.4 Antenatal Care Complications

[10] Ministry of Health, Liberia: National Guidelines for Comprehensive Abortion Care December 2019

3.4.1 Malaria in Pregnancy

- Malaria in pregnancy is associated with low-birth-weight infants, increased anemia and, in low-transmission areas, increased risks for severe malaria, pregnancy loss and death. In high-transmission settings, despite the adverse effects on fetal growth, malaria is usually asymptomatic in pregnancy or is associated with only mild, non-specific symptoms.
- Insecticide-treated nets should be used to reduce the risk of malaria in pregnant women. It is recommended that the level of parasitemia and hence the severity of disease is assessed in women with malaria in pregnancy in order to guide management.
- Treat pregnant women with uncomplicated P. falciparum malaria with artemether-lumefantrine in all trimesters (AL) *see 5.3.3*
- Women in the 2nd and 3rd trimesters are more likely to have **severe malaria** than other adults.
- Parenteral antimalarial drugs should be given to pregnant women with severe malaria and/or who are unable to tolerate oral treatment in full doses without delay. **Parenteral artesunate is the treatment of choice in all trimesters**:
  - Intramuscular artesunate for at least 24 h and until they can tolerate oral medication. Give first IM dose and refer. Once a patient has received at least 24 h of parenteral therapy and can tolerate oral therapy, complete treatment with 3 days of ACT
  - If artesunate is unavailable, intramuscular artemether can be given and refer. If this both of these are unavailable then refer immediately. *See 5.3.3.*
- Obstetric advice should be sought at an early stage, and where relevant a pediatrician alerted, and blood glucose checked frequently. Refer.
- Hypoglycemia should be expected, and it is often recurrent if the patient is receiving quinine.
- Severe malaria may also present immediately after delivery.
- Postpartum bacterial infection is a common complication and should be managed appropriately.

3.4.2 Hypertension in Pregnancy

- Measure blood pressure at every clinic or antenatal visit.

Pre-eclampsia is a medical emergency.
Diagnosed when there is raised blood pressure > 140/90mmHg at >20 weeks pregnancy AND proteinuria. Take it seriously even in women who appear well. Follow local protocols and do not delay treatment. Maternal and fetal death may occur.

- There are 3 categories of hypertension in pregnancy:
  - Chronic hypertension = women who have high blood pressure before conception
  - Gestational hypertension = women who develop hypertension in pregnancy
  - Pre-eclampsia = hypertension with proteinuria in pregnancy
- If Proteinuria is **absent** manage chronic and gestational hypertension in the same way.
  - **Offer aspirin 75mg daily from 12 weeks to delivery to reduce risk of pre-eclampsia.**
  - **Do not advise bed rest. There is no evidence of benefit and increases risk of pulmonary emboli.**
  - **Refer all cases of raised BP.**

- If proteinuria is **present** refer. Once pre-eclampsia is diagnosed there is no need to test for proteinuria again.
- Treatment is not initiated in clinics, but clinic staff may be asked to give continuation doses in a *care plan* from the health center or hospital.

DRUG TREATMENT FOR HYPERTENSION IN PREGNANCY (*NOT PRESCRIBED IN CLINICS*)

Methyldopa	**Tablets:** Start at 250mg PO 2-3 x a day, maximum 3g/day.
Labetalol Contraindicated in Asthma	**Tablets:** Start at 100mg PO 2 x a day, maximum dose 2400mg/day.

- **Emergency treatment of pre-eclampsia and eclamptic fits**
  - If **unconscious:**
    - Check airway
    - Put in the recovery position on left side
    - Protect from injuries but do not restrain
    - Start emergency treatment and monitoring with a member of staff in attendance at all time
    - If **convulsing**: Give Magnesium Sulphate by IM injection as indicated below.

Then give 10g by deep IM injection, 5g (one 10ml ampoule) into each buttock, adding 1ml of 2% lignocaine.
Withhold Magnesium Sulphate if:
- Respiratory rate < 16 per minute

Or
If Magnesium Sulphate is not available:
Give rectal diazepam 10mg or give rectally.

  - Once the convulsions have been controlled, refer for **emergency delivery** by whatever method is most appropriate.
  - Refer immediately

3.4.3 Diabetes in Pregnancy

- All women with pre-existing diabetes should have optimum control of their diabetes before becoming pregnant (*See 6.3*). Tight control is associated with markedly improved outcomes for mother and baby. Ideally all pregnant women should be screened for gestational diabetes:
- Refer for an Oral Glucose Tolerance test (OGTT) should be done on all pregnant women at 24-28 weeks' gestation.
- If this is not possible, then pregnant women at high risk for diabetes should be screened. High risk includes:
  - family history of diabetes mellitus
  - history of large babies- 4kg or more
  - previous gestational diabetes
  - obesity
  - hypertension
  - history of pre-eclampsia or polyhydramnios
- Metformin is safe in pregnancy and can be used alone or in combination with insulin. Sulphonylureas are safe from 11 weeks' gestation. Insulin is used either as basal bolus or twice daily premixed (*see 5.3*).

3.4.3.1 Anemia in pregnancy

- All women are screened for anemia at all visits and given supplements (*see above*). Severe anemia requiring transfusion can be a complication of malaria. If blood transfusion is needed (*see* ***Error! Reference source not found.***).

3.4.4 Nausea and vomiting in pregnancy

- Nausea in the first trimester of pregnancy is generally mild and *does not* require drug therapy. If vomiting is severe, treat short-term with an antihistamine. Give first dose promethazine, 25mg PO and refer
- **Hyperemesis gravidarum** is severe vomiting in pregnancy, which requires admission:
  - refer

3.4.5 Thyroid disease in Pregnancy.

- *See 6.8*

3.4.6 Brucellosis in pregnancy.

- Brucellosis can cause miscarriage and is also very dangerous to the woman. *See 5.9.6*

3.5 Pre-term labor

- Premature rupture of membranes (PROM) is rupture of the membranes before labor has begun. PROM can occur either when the fetus is preterm (< 37 weeks) or when the fetus is term. If there are palpable contractions and blood-stained mucus discharge, suspect p

If there are signs of infection (fever, foul-smelling vaginal discharge) this is **amnionitis**, treat with antibiotics regardless of gestational age

- 1st dose: Ampicillin 2 g IM + Gentamicin 5 mg/kg body weight IM and refer

If there are no signs of infection, and the pregnancy is <37 weeks. Prophylactic antibiotics are needed to reduce maternal and neonatal infection:

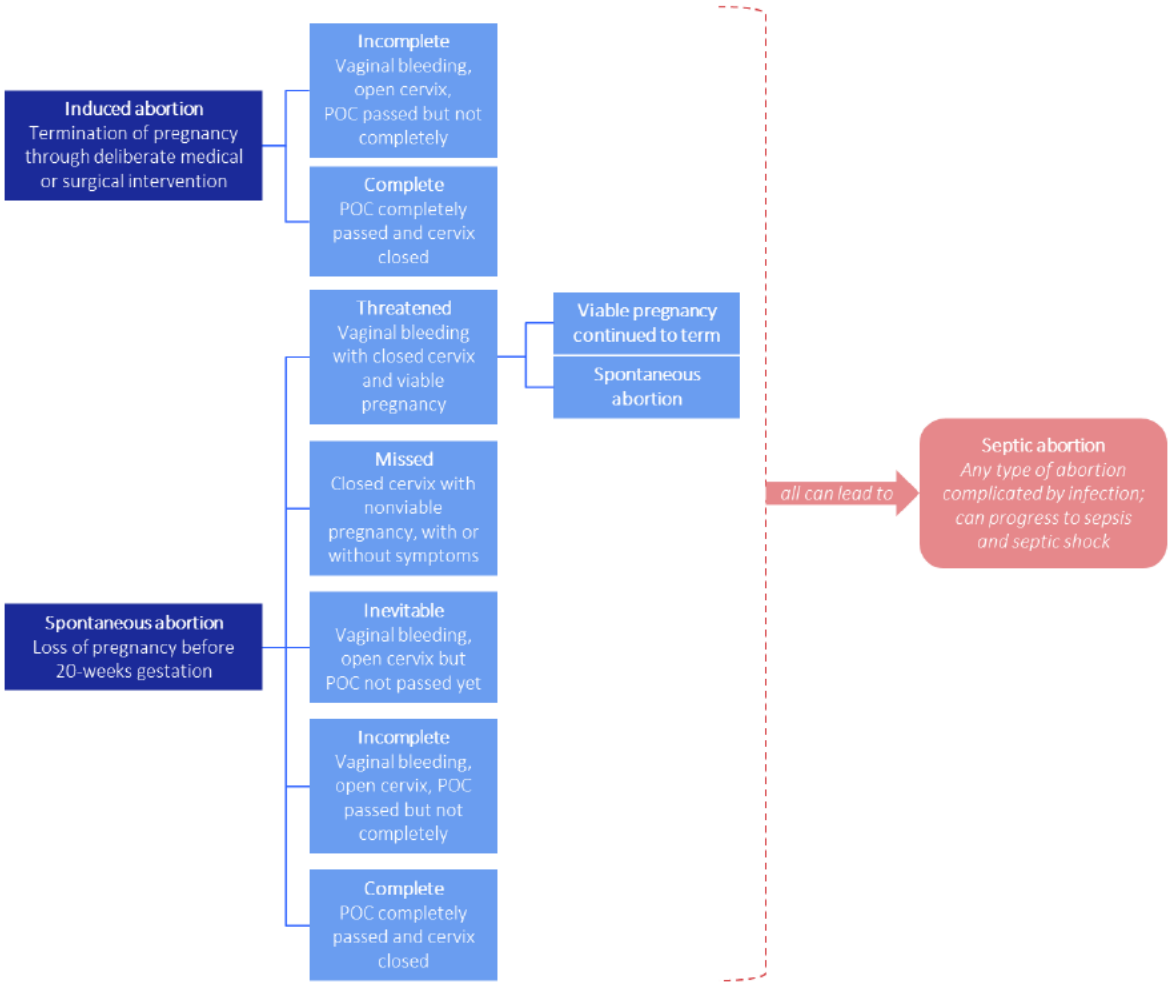
- Amoxicillin PO 500mg and Erythromycin PO 250mg and refer

If there are no signs of infection, and the pregnancy is >37 weeks, prophylactic antibiotics are needed to reduce Group B streptococcus infection in the neonate, even if the woman received antibiotics previously:

- Ampicillin 2 g IM and refer.
  Refer all cases

3.6 Bleeding in Pregnancy – abortion/miscarriage

- Up to 28 weeks this is called a threatened abortion or miscarriage and after 28 weeks, it is antepartum hemorrhage (APH). If bleeding is severe, the patient may be at risk of **shock**, a life-threatening condition that requires immediate and intensive treatment. This can happen at any stage of pregnancy, with infection or trauma (*see 2.3).* According to the CAC[11] guidelines, there are different clinical presentations of bleeding in pregnancy.



3.6.1 Threatened abortion/miscarriage

- If there is light vaginal bleeding and mild pain monitor closely. Advise the woman to avoid strenuous exercise and sexual intercourse, but bed rest is not necessary. Give paracetamol for pain but no other medication. Refer.
- If heavier or persistent bleeding. Refer immediately
  - Give analgesia, oral paracetamol.

3.6.2 Inevitable and incomplete abortion/miscarriage

[11] Ministry of Health, Liberia: National Guidelines for Comprehensive Abortion Care December 2019

Misoprostol dose for inevitable and incomplete abortion

Type of abortion	Gestation < 13 weeks	Gestation ≥ 13 weeks
Incomplete abortion	• 600 mcg orally OR • 400 mcg sublingually	• 400 mcg buccally, vaginally, or sublingually, every 3 hours
Missed abortion / Inevitable abortion	• 800 mcg vaginally OR • 600 mcg sublingually (every three hours for a maximum of 3 doses [i.e. total 1800mcg])	• 200 mcg buccally, vaginally, sublingual (every 6 hours) (for gestation 13-26 weeks)

- Follow the CAC[12] guidelines. Give first dose of misoprostol and antibiotics and refer.
- Patients receiving misoprostol for management of bleeding from spontaneous or induced abortion should also receive antibiotic prophylaxis:
  - Amoxicillin 500 mg PO every 3 x a day for 7 days
    OR
  - Doxycycline 100 mg PO 2 x a day for 7 days
    AND
  - Metronidazole 500 mg PO 3 x a day for 7 days
- Refer all cases.
- Counsel the woman on indications requiring urgent review: severe vaginal bleeding, fever or rigors, nausea and vomiting, severe abdominal pain and/or foul smelling vaginal discharge
- See CAC guidelines on safe practice of these procedures.

3.6.3 Complete Abortion

- Evacuation of the uterus is usually not necessary. If certain that abortion is complete then give 800 mcg misoprostol PO for management of post-abortal hemorrhage and refer.

3.6.4 Ectopic pregnancy

- Pregnancy outside the uterine cavity, usually in the fallopian tubes resulting in severe hemorrhage into the abdomen when the tube ruptures. **This is a medical emergency.**

[12]Ministry of Health, Liberia: National Guidelines for Comprehensive Abortion Care December 2019

- **Symptoms** include abdominal or pelvic pain, amenorrhoea or missed period, and vaginal bleeding. Less common symptoms include gastrointestinal symptoms, dizziness, shoulder tip pain, and urinary symptoms.
- **Signs** include pelvic, adnexal, and abdominal tenderness and cervical motion tenderness, abdominal distension, pallor, shock, and hypotension
- Confirm diagnosis with pregnancy test
- Refer immediately

3.7 Basic Emergency Obstetric and Neonatal Care and Comprehensive Emergency Obstetric and Neonatal Care (BEmONC & CEmONC)

- **Basic emergency obstetric and neonatal care** (BEmONC)[13] is a set of lifesaving services considered essential to reduce maternal and neonatal mortality during normal delivery. **Comprehensive emergency obstetric and newborn care** (CEmONC) [14]includes all BEmONC services and adds surgical management of complications of delivery, and blood transfusion.
- BEmONC includes:
  - Parenteral treatment of infection (antibiotics)
  - Parenteral treatment of severe pre-eclampsia/eclampsia (e.g., MgSO4)
  - Treatment of PPH (e.g., uterotonics)
  - Manual vacuum aspiration of retained products of conception
  - Assisted vaginal delivery (e.g., vacuum-assisted delivery)
  - Manual removal of placenta
  - Newborn resuscitation
- CEmONC includes:
  - All components 1 to 7 of BEmONC and
  - Surgical capability, including anesthesia (e.g., Caesarean section)
  - Blood transfusion
- Major obstetric complications cause the majority of preventable maternal deaths. Each of the EmONC functions acts to combat this.
- BEmONC (normal delivery) can be done in the clinic. CEmONC is only done in health centers and hospitals.

3.7.1 Normal Labor (BEmONC)

- **This refers to vaginal delivery without complications and can be managed under BEmONC services.**
- Provide care to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labor and childbirth.
- There should be effective communication between maternity care providers and women in labor, using simple and culturally acceptable methods.
- A companion of choice is recommended for all women throughout labor and childbirth and continuity of care promoted.

[13] https://www.unfpa.org/publications/monitoring-emergency-obstetric-care
[14] https://www.unfpa.org/publications/monitoring-emergency-obstetric-care

- A partogram is used to monitor progression of labor. PMTCT guidelines for HIV are followed and adhered during labor as during antenatal care (*see 5.5.6.3*).

Diagnosing the start of labor	Onset of intermittent uterine contractions progressively increasing in strength and frequency; Cervical changes: progressive effacement and dilation • in a primipara, the cervix will first efface then, dilate • in a multipara, effacement and dilation occur simultaneously.
1st Stage of labor	The *latent* 1st stage is characterized by uterine contractions and some degree of effacement and slower progression of dilatation up to 4 cm. Acceleration of the 1st stage is not recommended. The *active* 1st stage is characterized by regular uterine contractions, a substantial degree of cervical effacement and more rapid cervical dilatation from 4 cm until full cervical dilatation
Duration of the first stage of labor	The standard duration of the latent 1st stage can vary widely from one woman to another. However, the duration of active first stage averages 7.5 hours in primiparas, and just over 3 hours for multiparas. It should not usually extend beyond 12 hours in first labors, or beyond 10 hours in subsequent labors. 1st stage is usually quicker in preterm births and if the membranes rupture early on. Labor is usually longer if the fetus is very large (above 4kg). For women with spontaneous labor onset, cervical dilatation rate threshold of 1 cm/hour during active 1st stage is inaccurate to identify women at risk of adverse birth outcomes and not recommended. Routine artificial rupture of the membranes and oxytocin is not recommended but only if there are obstetrical indications.
Routine assessment of fetal well-being	Intermittent auscultation using a ultrasound probe if available, doppler ultrasound device or Pinard fetal stethoscope is recommended throughout 1st stage.
Digital vaginal examination	At intervals of 4 hours is recommended for routine assessment of active first stage of labor in low-risk women. Routine vaginal cleansing with chlorhexidine during labor is not recommended.
Regular fetal heart rate auscultation in labor	Every 30 mins with a ultrasound probe if available, doppler ultrasound device or pinard fetal stethoscope is recommended for healthy pregnant women in labor.
Analgesia for pain relief	Parenteral opioids, such as pethidine, are recommended options for healthy pregnant women requesting pain relief during labor. Relaxation and manual techniques (e.g., massage) are other options.
Oral fluid and food	For women at low risk, oral fluid and food intake during labor is recommended
Maternal mobility and position	Encouraging the adoption of mobility and an upright position during labor in women at low risk is recommended

2nd Stage of labor	The time between full cervical dilatation and birth of the baby, during which the woman has an involuntary urge to bear down, as a result of expulsive uterine contractions. Women should be informed that the duration of the 2nd stage varies. In first labors, birth is usually about 1 hour whereas in subsequent labors, 2nd stage is usually less than half an hour. It should not be longer than 3 hours for primiparas and 2 hours for multiparas.
Birth position	The adoption of a birth position is a woman's choice, including upright.
Method of pushing	Women in the expulsive phase should be encouraged and supported to follow their own urge to push. Fundal pressure is not advised. Routine episiotomy is not advised.
Techniques for preventing perineal trauma	Techniques to reduce perineal trauma & facilitate birth (including perineal massage, warm compresses & a "hands on" guarding of the perineum) are recommended based on a woman's preferences & available options.

3rd Stage of labor: delivery of the placenta	
Oxytocin administration	Is used to prevent postpartum hemorrhage (PPH) during the 3rd stage of labor. Give Oxytocin 10IU IM (if oxytocin not available, give Misoprostol 600 mcgs PO)
Uterine massage	Sustained uterine massage is not recommended as an intervention to prevent postpartum hemorrhage (PPH) in women who have received prophylactic oxytocin.
Controlled cord traction (CCT)	Controlled cord traction (CCT) is done to reduce blood loss to the baby and reduce the length the 3rd stage.
Delayed umbilical cord clamping	Delay umbilical cord clamping not earlier than 1 minute after birth to improve maternal and infant health and nutrition outcomes.
Routine post-partum care (first 24 hours)	Regular assessment of vaginal bleeding, uterine contraction, fundal height, temperature and heart rate (pulse). BP should be measured shortly after birth. If normal, the second BP measurement should be taken within six hours. Urine void should be documented within six hours. The tone of the uterus is re-established as the uterus contracts again in the 2 hours after delivery, expelling any remaining contents. These contractions are hastened by breastfeeding, which stimulates production of the hormone oxytocin. Monitor closely and take action if any PPH *see 2.7*

- The following are **not** recommended during labor:
  - Routine perineal/pubic shaving, vaginal cleansing or administration of enema.
  - The use of IV fluids, antispasmodic agents, amniotomy alone or early amniotomy with early oxytocin augmentation for prevention of delay/shortening the duration of labor.
  - Routine episiotomy for women undergoing spontaneous vaginal birth.
  - Fundal pressure on uterus to facilitate childbirth during the second stage of labor.
  - Routine clinical pelvimetry or cardiotocography for the assessment of fetal well-being on labor admission in healthy pregnant women presenting in spontaneous labor.

3.7.1.1 Pethidine for pain control during labor

- If pain control is needed during labor, pethidine IM may be used with care. Pethidine should only be used if naloxone is available in case of respiratory depression in the newborn. These are the steps for safe administration of pethidine during labor:
  - Give prochlorperazine 5mg IM to prevent nausea from pethidine.
  - Give IM injection of 50mg pethidine if pain control needed.
  - Assess after 30 minutes and if analgesia not adequate and no side effects, the IM injection can be repeated once.
  - Further IM injection may be given 3 - 4 hours later but not before.
  - The onset of action for IM pethidine is within 10 - 20 mins and its analgesic effect lasts for 2 - 4 hours.
  - Do not exceed recommended dose.

- It may cause depression of breathing of fetus and mother.
- Do not give more than 400mg pethidine in 24 hours.
- Do not give if woman has any difficulty breathing or any fetal distress.

PETHIDINE TREATMENT

Medicine	Age	Dose	Duration	Side effects
Pethidine 50mg/ml in 1ml vials	Adults	1 x 50mg vial given by deep IM injection in buttock.	1 x 50mg IM can be repeated after 30 minutes if pain control not adequate. Injection can be repeated after 3 to 4 hours.	**Common**: nausea & vomiting, lower BP, faster or slower heartbeat, drowsiness **Rare**: depression of breathing (increases with dose), palpitation

3.7.2 Induction and augmentation of labor

- Induction and augmentation of labor should only be done in CeMONC centers by experienced staff where onsite operative delivery is available.
- Refer all cases that may need induction and augmentation of labour

3.8 Labor Complications (CEmONC)

- The survival of a woman experiencing an obstetric emergency is determined by **the amount of time** it takes for care to be delivered from onset of the emergency and by the level and quality of care provided.

Initial management if an obstetric emergency

- Stay calm. Think logically and focus on the needs of the woman. Take charge. Choose one person to be in charge to avoid confusion
- **CALL FOR HELP**. Have one person go for help and have another person gather emergency equipment and supplies (e.g., oxygen cylinder, emergency kit).
- If the woman is unconscious, assess the airway, breathing and circulation. Begin resuscitation of the woman, as needed (e.g., assist breathing).
- If shock is suspected, immediately begin treatment (*see 2.3*). Even if signs of shock are not present, keep shock in mind as you evaluate the woman further, because status may worsen rapidly. **If shock develops, begin treatment immediately.**
- Position the woman lying down on her left side with her feet elevated. Loosen tight clothing. Talk to the woman and help her stay calm. Ask her or someone with her what happened, what symptoms she is experiencing and when they started.
- Perform a rapid evaluation of the woman's general condition, level of consciousness, presence of anxiety and/or confusion, blood loss, color, and temperature of skin.
- Check the fetal heart rate and ask about fetal movements: If there are fetal heart rate abnormalities (< 100 or > 180 beats per minute), suspect fetal distress. If fetal heart cannot be heard, ask others to listen or use am ultrasound probe, doppler ultrasound or pinard fetal stethoscope.
- Perform a rapid targeted history and physical examination to make a differential diagnosis of the problem.
- Document history, findings, actions and plan for continued management based on the cause of the emergency.
- Refer immediately

MANAGEMENT OF SPECIFIC EMERGENCY PRESENTATIONS

Condition	Treatment
Abruptio placentae (Detachment of a normally located placenta from the uterus before birth of the baby)	Refer immediately
Ruptured Uterus	Refer immediately
Placenta praevia (Implantation of the placenta at or near the cervix)	Do not perform a vaginal examination. Restore circulating volume with IV fluids. If bleeding heavily, arrange for caesarean section irrespective of fetal maturity, if bleeding is light and the fetus is alive consider expectant management keeping the mother in hospital. Refer immediately
Atonic Uterus (Failure of the uterus to contract after childbirth)	Continue to massage the uterus, *see 2.7* for management of PPH.
Tears to the Cervix, Vagina or Perineum	Examine carefully and repair, if bleeding occurs then consider management of PPH. Insert foley's catheter to prevent fistula. Refer
Pre-eclampsia or **Eclampsia**	*See 3.4.2*

3.8.1 Unsatisfactory Progress of Labor

- The cervix is not dilated beyond 4 cm after eight hours of regular contractions.
- Cervical dilatation is to the right of the alert line on the partograph.
- The woman has been experiencing labor pains for 12 hours or more without giving birth (prolonged labor).
- Inadequate uterine contractions (< 3 strong contractions per 10 minutes)
- The cervix fully dilated, and the woman has the urge to push, but there is no descent.

A = augment labor with oxytocin, **C**=perform a caesarean, **V**=obstetric vacuum

Condition	Treatment
False Labor	Examine for UTI, other infection or ruptured membranes and treat accordingly. If none, discharge the woman and encourage to return if signs of labor recur or danger signs.
Prolonged latent phase	If in the latent phase for > 8 hours and little sign of progress, reassess the cervix: If there is no change, review whether she is in labor. If change in cervical effacement or dilatation refer immediately .
Prolonged active phase	Assess uterine contractions: If contractions are inefficient (<3 contractions in 10 minutes, lasting < 40 seconds), suspect inadequate uterine activity. If contractions are efficient (3 or more contractions in10 minutes, lasting > 40 seconds), suspect cephalopelvic disproportion (CPD), obstruction, malposition or malpresentation. Refer immediately Do not rupture membranes, if the woman is HIV infected
Cephalopelvic disproportion	Refer immediately.
Obstruction	Refer immediately .
Prolonged Expulsive Phase	Refer immediately

3.8.2 Malpresentation

- Malpositions are abnormal positions of the vertex of the fetal head (with the occiput as the reference point) relative to the maternal pelvis.
- Malpresentations are all presentations of the fetus other than vertex.
- For all malpresentations, refer immediately.

A = augment labor with oxytocin, **C**=perform a caesarean, **V**=obstetric vacuum

Occiput Posterior	Spontaneous rotation occurs in 90%. If there are signs of obstruction but fetal heart rate is normal encourage walking around for spontaneous rotation. Refer immediately.
Brow Presentation	In brow presentation, engagement is usually impossible and arrested labor is common, spontaneous conversion is rare.
Face Presentation	Chin Anterior Position - If the cervix is fully dilated: Allow normal childbirth to proceed while referring. If descent is unsatisfactory refer If the cervix is not fully dilated and there are no signs of obstruction refer. **A**. Review progress as with vertex presentation. Chin Posterior Position – Refer immediately
Breech Presentation	**Breech births should take place in a hospital with the ability to perform an emergency caesarean section.** **Do not rupture the membranes. If fully dilated do not encourage the woman to push during transfer.** **Refer**
Transverse lie of Shoulder Position	Refer immediately

3.8.3 Fetal Distress in Labor

- Abnormal fetal heart rate (<100 or >180 beats per minute)
- Thick meconium-stained amniotic fluid
- General Management
  - Prop up the woman or place her on her left side.
  - Refer immediately

- Management of Abnormal Fetal Heart Rate
  - A normal fetal heart rate may slow during a contraction but usually recovers to normal as soon as the uterus relaxes.
  - A very slow fetal heart rate in the absence of contractions or persisting after contractions is suggestive of fetal distress.
  - A rapid fetal heart rate may be a response to maternal fever, drugs causing rapid maternal heart rate (e.g., salbutamol), hypertension or amnionitis. In the absence of a rapid maternal heart rate, a rapid fetal heart rate should be considered a sign of fetal distress
  - If a maternal cause is identified (e.g., maternal fever, bleeding, drugs), initiate appropriate management.
  - If a maternal cause is not identified and the fetal heart rate remains abnormal throughout at least three contractions, perform a vaginal examination to check for explanatory signs of distress. If the cord is below the presenting part or in the vagina, manage as prolapsed cord
  - Refer immediately

3.8.4 Prolapsed Cord

- If the cord is pulsating, the fetus is alive. Put the woman in the knee to chest position; or in left lateral with a pillow underneath her left hip; or in Trendelenburg; or for manual elevation of the fetal head:
  - **If the woman is in the 1st stage of labor**
    Wearing sterile gloves, insert a hand into the vagina. Push the presenting part up to decrease pressure on the cord and dislodge the presenting part from the pelvis. Place the other hand on the abdomen in the suprapubic region to keep the presenting part out of the pelvis. Once the presenting part is firmly held above the

pelvic brim, remove the other hand from the vagina. Keep the hand on the abdomen. Refer immediately.

- **If the woman is in the second stage of labor**
  Do not encourage her to push
  If the baby is coming out, then continue with delivery, if not then refer immediately.

3.9 Routine Postnatal Care

- After an uncomplicated vaginal birth in a health facility, healthy mothers and newborns should receive care in the facility for at least 24 hours after birth. If birth is at home; the first postnatal contact should be as early as possible within 24 hours of birth.
- At least three additional postnatal contacts are recommended for all mothers and newborns, on day 3 (48–72 hours), between days 7–14 after birth, and six weeks after birth.
- **First 24 hours after birth:** All postpartum women should have regular assessment of vaginal bleeding, uterine contraction, fundal height, temperature and heart rate (pulse) routinely during the first 24 hours starting from the first hour after birth. BP should be measured shortly after birth, then every 30 minutes for 1 hour and then every hour for 6 hours.
- **Beyond 24 hours after birth:** At each subsequent postnatal contact, enquiries should be made about general well-being and assessments made regarding:
  - micturition and urinary incontinence, bowel function, healing of any perineal wound, headache, fatigue, back pain, perineal pain and perineal hygiene, breast pain, uterine tenderness and lochia.
  - breastfeeding progress
  - emotional well- being and encouraged to tell their health care professional about and changes in mood, emotional state and behaviour outside of the woman's normal pattern.
- **10–14 days after birth:** all women should be asked about resolution of mild, transitory postpartum depression ("maternal blues"). If symptoms have not resolved, the woman's psychological well-being should be assessed for postnatal depression. *See7.2*
- Women should be observed for any risks, signs and symptoms of domestic abuse and told whom to contact for advice and management.
- All women should be given information about the physiological process of recovery after birth, and to report any health concerns to a health care professional, in particular: signs and symptoms of PPH, pre-eclampsia/eclampsia, infection, thromboembolism.
- Iron and folic acid supplementation should be provided for at least three months.
- The use of antibiotics among women with a vaginal delivery and a 3rd or 4th degree perineal tear is recommended for prevention of wound complications.

3.9.1 Postnatal Care Complications

- After delivery, the woman is monitored in closely for any signs of further bleeding, ensuring that the uterus remains well contracted. BP and signs of infection are monitored. For raised BP and anaemia refer to the guidelines previously in this section on maternal health.

3.9.2 Preventing Mother To Child Transmission (PMTCT) of HIV

- *see 5.5.6*
- Full PMTCT guidelines are followed and adhered to after delivery for mother and baby in referral centers. Women not previously tested are given pre-test counselling and have voluntary testing for HIV, followed by post-test counselling. Any women with HIV and HIV

exposed infants who had not previously been referred before or during labor need initiation of ARV and appropriate interventions. *See 5.5.6.2*

- Refer

3.9.3 Post-Partum Infection

- If Uterine (fever and foul-smelling lochia) or other significant infection is suspected. Give 1st dose:
  - Amoxicillin PO 500mg (if penicillin allergy give: erythromycin PO 500mg instead)
  - AND
  - Metronidazole PO 400-500mg
  - Give paracetamol for pain.
  - Refer immediately

3.9.4 Post-Partum Hemorrhage

- Primary postpartum hemorrhage (PPH) is defined as a blood loss of 500 ml or more within 24 hours after birth; secondary PPH is after 24 hours.
- PPH is **the leading cause of maternal mortality in low-income countries**, and the primary cause of nearly one quarter of all maternal deaths globally.
- Most deaths resulting from PPH occur during the first 24 hours after birth; the majority of these could be avoided through the use of prophylactic uterotonics during the third stage of labor and by timely and appropriate management.
- PPH can be prevented by the use of a uterotonic during the third stage of labour:
  - oxytocin 10IU IM
    OR
  - misoprostol 600 micrograms PO.
- Treatment of PPH:
  - Elevate the legs to increase venous return
  - Use anti-shock garment appropriately if there are signs of shock
  - Uterine massage is recommended for the treatment of PPH.
  - If misoprostol has not been given, then give 800 PO micrograms PO
  - Give tranexamic acid PO or IM 1000mg
  - Refer immediately

3.9.5 Other postnatal conditions

Lower Urinary Tract UTI	Treat with oral antibiotics *see 6.6.1*
Malaria	Treat as per *see 5.3.3*
Urinary Incontinence	Check for perineal trauma, treat as per lower UTI
Pus or pain in perineum	Remove sutures if necessary. Clean wound, give analgesia and give antibiotics if evidence of infection. Refer
Abnormal vaginal discharge	Consider whether treatment may be needed for vaginal candidiasis or STIs

3.9.6 Breast Problems in the postnatal period

- For all conditions listed below encourage continued breast feeding, check correct positioning and attachment and ensure adequate breast support.

Nipple Soreness or Fissure	Consider expressing from affected side and apply glycerine gel or vaseline to the nipple straight after feeding
Breast Engorgement	Consider expressing prior to feeds to relieve discomfort
Mastitis (fever, breast pain and tenderness)	Treat with antibiotics: • Cloxacillin 500mg PO 4x per day for 7 – 10 days OR • Amoxicillin + Clavulanic Acid 500mg/125mg PO 3x per day for 7 - 10 days

	OR • Cefalexin 500mg PO 3x per day for 7 –10 days If there is penicillin allergy: • Erythromycin 500mg PO 4x per day for 7 – 10 days/ Give paracetamol for pain • Refer
Abscess (a collection of pus in the breast)	Refer

3.9.7 Mental Health in the postnatal period-

- For the treatment of depression and psychosis *see section 7 Mental Health*

Postnatal Blues	Within first 2 weeks	The symptoms are similar to post-partum depression but do not last beyond 2 weeks' post partum
Post Partum Depression	Usually after 2 weeks	Two or more of the following symptoms during the same 2-week period representing a change from normal and last for longer than 2 weeks: • Inappropriate guilt or negative persistent sad or anxious mood or irritability • Low interest or pleasure in carrying out activities that used to be pleasurable. • Low concentration • Reduced appetite • Difficulties with carrying out usual activities. • Negative feelings about herself or the newborn. • Multiple symptoms (aches, pains, palpitations, numbness) with no clear physical cause • Suicidal thoughts
Puerperal psychosis	Usually after 2 weeks	Is a psychiatric emergency. Consider this in patients who present with symptoms of psychosis which include hallucinations, delusions, disorganization of speech, thoughts and/or behaviour with catatonia or negative symptoms. Symptoms may progress rapidly and there can be depression and mania symptoms. All patients with puerperal psychosis should be under specialist care.

3.10 Gynecology

3.10.1 Menstrual Problems

- These can be:
  - absence of regular menstrual bleeding (amenorrhea)
  - heavy bleeding (menorrhagia)
  - increased frequency of bleeding (polymenorrhea)
  - intermenstrual bleeding
  - painful periods (dysmenorrhea) or pre-menstrual syndrome
- When bleeding is not thought to be related to the menstrual cycle (intermenstrual bleeding or persisting bleeding, bleeding in post-menopausal women) **urgent investigation may be needed** to exclude cancer of the cervix or uterus.
- Refer

3.10.1.1 Primary Amenorrhea

- Absence of periods should be investigated if there is a failure to establish menstruation by the age of 14years in girls without secondary signs of sexual development, or by the age of 16 in the presence of normal secondary sexual characteristics.
- The most common cause is constitutional delay, but primary ovarian failure, Turners syndrome or an absent vagina/uterus are rare causes.
- Refer

3.10.1.2 Heavy menstrual bleeding in adolescents

- This is common in adolescence, affecting up to 40% of girls, and can have a significant impact on quality of life, leading to time away from school, hobbies and activities.
- For the first 2 years after periods first start, around 50% of cycles are anovulatory (and egg is not released) and may be characterised by infrequent, heavy and prolonged bleeding episodes.
- Ovulatory function gradually improves in subsequent years. Anovulatory cycles are the leading cause of heavy menstrual bleeding in adolescents

- Treatment:
  - NSAIDs such as ibuprofen 200mg – 400mg PO 3x a day commenced as menses start and continued for the duration of menses
  - Refer

3.10.1.3 Premenstrual Syndrome (PMS)

- Diagnosis requires a history of physical or mood symptoms occurring in a cyclical basis.
- Many different symptoms are possible but often include; mood problems (e.g., irritability anxiety and appetite changes), cognitive or performance symptoms (e.g., difficulty in concentrating) and fluid retention.
- Most women suffer from mild premenstrual symptoms which do not require treatment but 3-5% suffer more extreme cases.
- Treatment:
  - Healthy lifestyle advice: diet and exercise
  - Analgesia (paracetamol or ibuprofen) if dysmenorrhea or cyclical breast pain is prominent.
  - Refer.

3.10.1.4 Secondary amenorrhea

- Defined as the absence of menstruation for 6 consecutive months in a woman who has previously had regular periods.
- Excessive exercise and weight loss are common causes.
- Investigation and treatment of the underlying cause is important to prevent complications arising from estrogen deficiency and where appropriate counselling for the woman and her partner where relevant regarding future fertility. Refer

3.10.1.5 Irregular menstrual bleeding, dysmenorrhea and menorrhagia

- Refer all women presenting with heavy menstrual loss or irregular bleeding
  - If anemic, treat with Ferrous sulphate 200mg PO at least 1 –3 x a day depending on level of anemia.

3.10.2 Genital tract disorders[15]

- **Vulvovaginal condition**

  Vulvovaginal candidiasis (Thrush) classically causes itch, is odourless and there is a white, thick vaginal discharge. When severe it can cause erythema and fissuring.

  Treatment:
  - Fluconazole 150mg stat dose oral
    OR
  - Clotrimazole pessary 500mg + Clotrimazole 1% cream
  - Refer women with recurrent candidiasis.

  It is more common after recent use of antibiotics, pregnancy, hormonal contraceptives and diabetes. It can be transmitted between partners and partners can be treated if they are symptomatic. Prevention actions include avoiding the use of soap and douches to wash and the use of cotton underwear.

  Bacterial Vaginosis (BV) is a common condition giving a thin watery discharge with a 'fishy' odor. BV is not an STI but symptoms may be exacerbated by sexual activity and

[15] Guidelines for the management of symptomatic sexually transmitted infections. https://www.who.int/publications/i/item/9789240024168

can increase the of contracting HIV. It can also lead to infective complications after surgery and premature birth. Refer.

For Sexually transmitted infections (STIs), *see 5.4*

3.10.3 Menopause

- A woman is said to be post-menopausal after 1 year of amenorrhea.
- Many changes are associated with the time around the menopause including flushes, sleep disturbance, urinary symptoms and mood changes.
- The low estrogen state is associated with symptoms that need managing and increases the risk of bone thinning, heart disease and stroke.
- Ageing in itself leads to increased risk of disease, so a menopause consultation provides an opportunity to address any medical risk factors and encourage lifestyle changes to maximize long-term health and happiness.
- Women may experience symptoms typically for between 2–7y and has been known to persist for up to 15y.
- Refer women with menopausal symptoms

MENOPAUSE SYMPTOMS AND SIGNS

Physical	Psychological	Gynecological
• Hot flushes and night sweats (75% of women) • Joint and muscle pains • Palpitations. • Skin/hair changes • Weight gai	• Sleep disturbance • Tiredness and lack of energy • Mood changes and irritability • Anxiety • Cognitive disturbance (‘brain fog’)	• Menstrual irregularities • Vaginal dryness and dyspareunia • Loss of libido/ sexual dysfunction • Urinary problems/ incontinence • Uterovaginal prolapse

MANAGING SYMPTOMS OF MENOPAUSE

Vasomotor symptoms	Sleep disturbances and cognitive/mood symptoms	Physical symptoms
• Regular exercise (but avoid late in the day) • Weight loss (if overweight) • Wear lighter clothes • Reduce stress. • Avoid triggers, e.g., smoking, spicy food, caffeine, alcohol	• Keep the bedroom cooler if possible • Maintain regular bedtime routine and use sleep hygiene measures • Regular exercise • Relaxation and counselling • If she is struggling at work, advise her to discuss with senior female colleagues so they are aware	• Reduce heavy lifting or repetitive joint use • Weight loss (if overweight). • Regular exercise regime with a gradual increase in activity • Analgesia if indicated and beneficial • Lubricants or moisturisers for vaginal dryness (vulvovaginal atrophy) • Pelvic floor exercises/ Kegel exercises to reduce/ prevent incontinence

- Encourage menopausal women to adopt a cardiovascular and bone-friendly lifestyle involving:

    - Balanced, healthy diet, including adequate calcium and vitamin D
    - Regular weight-bearing exercise
    - Maintaining a healthy BMI

- Smoking cessation
- Minimizing alcohol consumption
- Screening for CV disease risk by checking BP, measuring BMI and diabetes

- Symptoms can also be greatly improved by continuing contraception. The COC should not be continued beyond 50y because of the increased risk of ovarian and endometrial carcinoma. Similarly, the progestogen-only injection should be stopped at 50y because it can reduce bone mineral density. But IUS, POP and implant can all be continued until 55y.
- Hormone Replacement Therapy (HRT) is not currently on the EML

3.11 Sexual and gender-based violence (SGBV)

- Refers to any act that is perpetrated against a person's will and is based on gender norms and unequal power dynamics.
- It encompasses threats of violence and coercion.
- It can be physical, emotional, psychological, or sexual in nature, and can take the form of a denial of resources or access to services.
- It inflicts harm on women, girls, men and boys.
- In Liberia, 60% of women aged 15-49 have experienced physical violence and 9% have experienced sexual violence.
- Among women who have ever been pregnant, 7% have experienced physical violence during pregnancy.

3.11.1 Clinical management of sexual violence survivors

- There are a number of steps involved in providing good medical care to survivors of sexual violence:
  - Treat the person with the upmost respect, dignity and confidentiality. Ensure other people cannot over-hear the consultation.
  - Assess vital signs. Treat hemorrhage
  - Provide 1st dose PEP
  - Provide emergency contraception
  - Refer

Management principles described below apply to male and female survivors except in pregnancy prevention.

MANAGEMENT OF MALE AND FEMALE SURVIVORS OF SGBV

Treat life threatening complications first	Assess vital signs e.g., BP, pulse, temperature. Treat hemorrhage (*see 2.4*
Prevent HIV transmission	• Provide PEP < 72 hours of rape, but: 1st dose the sooner the better (*see 5.5.8*) •
Prevent pregnancy	• provide emergency contraception (EC) the sooner the better (*see 3.1.3.5*)
Mental Health Care	• Remember psychological first aid (**LIVES –** Listen, Inquire about needs and concerns, Validate, Enhance safety, Support)

3.11.1.1 Intimate Partner Violence

- Refers to behaviour by an intimate partner or ex-partner that causes physical, sexual or psychological harm, including physical aggression, sexual coercion, psychological abuse and controlling behaviours.

- Be aware and ask relevant questions during confidential consultation if any likelihood of patient being a victim of intimate partner violence.
- In Liberia, 55% of ever-married women have experienced spousal emotional, physical, or sexualviolence. A significant proportion of these reported injuries.

3.12 Female Genital Mutilation (FGM)

- Female Genital Mutilation, also known as 'female circumcision' or cutting, is either the partial or total removal of the external female genitalia or other injury to the female genital organs for non-medical reasons.
- FGM is entrenched in Liberian culture, dating back many centuries. Strong taboos surrounding the practice and associated Sande secret societies make tackling the practice challenging.
- Girls and women living with female genital mutilation (FGM) have experienced a harmful practice and should be provided quality health care.
- All stakeholders – at the community, national, regional and international level – should initiate or continue actions directed towards primary prevention of FGM.
- Immediate complications include infection, severe pain, urinary retention, shock from severe pain or/and hemorrhage *(see 2.3*).
- Treatment of Infection post-FGM:
  - Give 1st dose antibiotics and refer:
    Amoxicillin PO 1g 3 x a day for 7 – 14 days (Azithromycin 500mg 1 x a day for 3 -5 days) AND
    Metronidazole PO 400mg 3 x a day for 7 -14 days
- Long-term complications:
  - Obstetric – complications during delivery including difficulties assessing, tearing to perineum, development of vaginal fistula, obstructed labor, birth injury to the baby
  - Gynecological: fistula, incontinence, chronic pelvis infection, sexual dysfunction
  - Psychological - need for psychological support
  - Physical complications: scarring, neuroma of the clitoris, cysts, vulval abscesses, UTI's, menstrual disorders

4 Child Health

4.1 Newborn Care - Normal

- Newborn deaths account for 40% of deaths among children under 5 in Liberia (Neonatal MR 37 per 1000 newborns, Under 5 MR 93 per 1000. LHDS 2019).
- Two thirds of these deaths can be easily prevented.

IMMEDIATE CARE OF THE NEWBORN

Start the clock at delivery	
Dry and provide warmth	Immediately dry the baby thoroughly using a clean dry cloth and do a quick check of baby's breathing while drying. Cover the baby and mother with a warm clean cloth and the baby's head with a hat.
If breathing or crying	Continue skin to skin contact with the head to one side. **Do not** wipe off vernix or bathe the baby
If gasping or not breathing within 30 seconds	**Start resuscitation** *(see 2.2)*
Appropriately time cord clamping and cutting	Ensure gloves are sterile when touching or handling the cord. Clamp and cut the cord after cord before 1 minute & clean with chlorhexidine.
Calculate the APGAR score within 4 minutes *(see below)*	
Within 90 minutes	
Breastfeeding	Provide breastfeeding support to ensure good positioning and attachment. If attachment or suckling is not good, try again, and reassess. If the breast is engorged, express a small amount of breast milk before starting breastfeeding to soften the areola area so that it is easier for the baby to attach. If the baby has signs of illness or does not show readiness to feed, i.e. does not follow feeding cues within 90 minutes: **examine the baby and manage urgent conditions.**
HIV	If the mother is HIV infected, take measures to prevent mother-to-child transmission. (*See 5.5.6*)
Eye Care	After baby has located the breast, administer tetracycline ointment, to both eyes according to national guidelines. Apply from the inner corner of each eye, outwards.
Maternal Complications	If the mother cannot keep the baby in skin-to-skin contact because of complications: wrap the baby in a clean, dry, warm cloth. Place in a cot; cover with a blanket; and encourage another family member to keep the baby in skin-to-skin contact or use a radiant warmer if room is < 28 °C.
90minutes to 6 hours	
Examine the baby	Checking for abnormalities, including breathing difficulties and birth injury, and plot the newborn's birth weight, height and head circumference on a growth chart For complications 4.2
Give Vitamin K prophylaxis	Give vitamin K (phytomenadione) 1 mg IM. If preterm < 1.5kg give 0.5mg IM
Inject Hepatitis B and BCG vaccinations and oral polio	As per EPI program. BCG at birth and Hep B as part of Penta timetable *see 3.1*. if mother Hep B +ve give Hep B immunization at birth *see 4.3*
Dry Cord Care	Instruct the mother to keep cord stump loosely covered; wash stump with clean water and soap; only if it is soiled and dry it thoroughly with a clean cloth; fold diaper below the stump; put nothing on the stump; seek care if the umbilicus is red or draining pus
Care prior to discharge	
Advise on staying in the facility	After an uncomplicated vaginal birth, advise the mother that she and her healthy baby should receive care in the birthing facility for at least 6 hours.
General advice	Support unrestricted, on demand breastfeeding day and night. Ensure warmth of the baby, demonstrate good hygiene and look for danger signs including signs of jaundice
Check for infection	Look for signs of local infection in the eyes, umbilicus, skin, baby's mouth
Follow Up	Promote birth registration and timely vaccinations, according to national guidelines. Counsel the mother on prompt recognition of danger signs. Schedule postnatal contacts at Day 3, between the 1st and 2nd week and around the 6th week.

4.2 Newborn Care - Complications

4.2.1 Detecting danger signs

- Danger signs are assessed for when the newborn is in the maternity unit and when seen on postnatal visits.
- The family should be encouraged to seek health care early if they identify any of the following danger signs in-between postnatal care visits:

- Unable to suck or feed well
- Convulsions
- Fast breathing (breathing rate ≥60 per minute), severe chest in-drawing
- No spontaneous movement
- Fever (temperature >37.5 °C)
- Low body temperature (temperature <35.5 °C)
- Any jaundice in first 24 hours of life, or yellow palms and soles at any age
- Bulging fontanelle
- Bleeding or infection of umbilical stump
- Any signs of congenital abnormality
- Not passing urine or stools
- Diarrhea or vomiting

4.2.2 Immediate Management

- Many serious conditions in newborns such as bacterial infections, malformations, severe asphyxia and respiratory distress syndrome due to preterm birth tend to present with danger signs as previously listed.
- Even if a specific diagnosis cannot be made treatment must start immediately.
- Calculate the APGAR score within 4 minutes:

SCORE	0 points	1 point	2 points
Appearance (Skin color)	Cyanotic / Pale all over	Peripheral cyanosis only	Pink
Pulse (Heart rate)	0	<100	100-140
Grimace (Reflex irritability)	No response to stimulation	Grimace or weak cry when stimulated	Cry when stimulated
Activity (Tone)	Floppy	Some flexion	Well flexed and resisting extension
Respiration	Apneic	Slow, irregular breathing	Strong cry

- If gasping or not breathing within 30 seconds and usual methods of drying fail then:
  - Stimulate breathing by rubbing the baby's back two or three times.
  - **CALL FOR HELP**
  - Start the clock.
  - Clamp and cut the cord.
  - Transfer the baby to a firm, warm surface, if possible, under a radiant heater, or wrap a towel under
  - Start resuscitation within 60 seconds if not breathing as below:

Initial Assessment	Action
Blue, breathing inadequately, heart rate <100bpm	Dry and wrap, open airway, give 5 inflation breaths using bag and mask with room air. A heart rate that increases within 30 seconds to > 100, confirms adequate ventilation/ oxygenation.
Blue or white, note breathing, heart rate <60bpm	Dry and wrap, open airway, start ventilation, reassess, **call for help**

- Specific ABC Management:
  Airway

- Position the head in the neutral position to open the airway. Overextension or flexion will collapse the airway. In floppy infants, pulling the jaw forwards
- Most babies, even those born not breathing, will resuscitate themselves given a clear airway. If the baby is floppy, use the jaw thrust to bring the tongue forward and open the airway.
- **Suction is only required if there is airway obstruction.** This can be due to mucus, vernix, meconium, blood clots which is confirmed through inspection of the pharynx after failure to achieve aeration.
- Apply very gentle suction of the oropharynx, or nostril using a soft suction catheter. Deep suction is dangerous and should not be used as it can cause bradycardia and spasm of the larynx.
- In the unconscious baby, airway obstruction is usually due to loss pharyngeal muscle tone and to foreign material in the airway. Simply opening the airway will solve the problem.

Breathing

- If the baby does not respond to opening the airway as described above:
- Place the mask (attached to the bag) firmly over the newborn's mouth, chin and nose, to form a seal between the mask and the newborn's face.
- Using the bag and mask, given 5 inflation breaths, each of 2-3 seconds.
- Check the rise of the chest. The chest may not move during the first one to three inflation breaths, which are needed to displace fluid from the lungs.
- Check the seal and that the chest rises and falls with inflation breaths after that.
- Reassess the heart rate after the first 5 breaths: an increasing heart rate or a heart rate maintained at more than 100 beats per minute is a sign of adequate ventilation.
- If the heart rate has not responded check again for chest movement and check for patent airway when attempting to deliver ventilations.
- Ventilations should be continued at 30 breaths/minute with inflation time of 1 second.
- For newly born term or preterm (more than 32 weeks' gestation) babies requiring positive pressure ventilation, ventilation should be initiated with air.
- If oxygen is being used for preterms, start ventilation with maximum 30% oxygen concentration.

Circulation

- If there is no heartbeat or the heartbeat is less than 60bpm, even when the chest is being ventilated, give chest compression. However, the most common reason for the heart rate remaining low is that successful ventilation has not been achieved.
- Chest Compressions should only start after ventilating first.
- The best way to give cardiac massage is the encircle the baby's chest with 2 hands so that the thumbs meet on the sternum below the line between the nipples.
- Compress chest by one third of its depth 100 times a minute.
- Use a synchronous technique with 3 compressions to one ventilation at 15 cycles per 30 seconds.
- If oxygen available, give 100% oxygen (or in preterms 30%) until HR > 60bpm.
- Once the heart rate is above 60bpm, chest compressions can be discontinued

- **If the APGAR score remains at <7 after 10 minutes then this is neonatal asphyxia and the baby should be referred to a special care baby unit immediately.**

- Aftercare to be provided if the baby's breathing is normal (30-60 breaths/minute) and there is no indrawing of the chest and no grunting:
  - Put in skin-to-skin contact with mother, observe at frequent intervals, measure temperature to maintain above 36°C, encourage breastfeeding and keep under observation for at least 6 hours.

- If there is no breathing or gasping at all after 20minutes of ventilation or gasping but no breathing after 30mins of ventilation or no heart rate, stop ventilating.

- Naloxone for respiratory depression is administered to reverse the respiratory depression effects of pethidine or morphine and should be available if either of these are authorized for use for pain control during labor. Use as follows:
  - If Apgar score < 7 at birth or if breathing decreases after birth, there may be respiratory depression caused by pethidine.
  - Continued breathing support is given with a mask and bag to the newborn.
  - If spontaneous respiration has still not established after continued bag use, naloxone may be needed.
  - If indicated, give Naloxone 0.1mg/kg IM single dose to the newborn.
  - Measure the naloxone carefully. It usually comes in vials of 0.4mg in 1ml. See administration guidance below
  - Continue with bag and mask if needed.

NALOXONE ADMINISTRATION IN THE NEWBORN

Medicine	Age	Dose	Duration	Side effects
Naloxone 0.4mg in 1ml	Newborn 2kg	0.2mg (0.5ml) IM	Single dose	**Common**: fast heart rate **Rare**: vomiting
	Newborn 3kg	0.3mg (0.75ml) IM		
	Newborn 4kg	0.4mg (1ml) IM		

- If infection is suspected, give an immediate loading dose of ampicillin and gentamicin as below and transfer to a special care baby unit:

- Gentamicin 5 mg/kg body weight IM if at term, 3 mg/kg body weight IM if preterm, 1 x a day AND
- Ampicillin 50 mg/kg body weight IM

For Low Birth Weight (<2.5kg) or Preterm Babies(<37 weeks):

- Caring for low birth weight or preterm babies should include kangaroo care and:
  - Ensure that the baby's head is covered to prevent heat loss.
  - Encourage the mother to begin breastfeeding or express breastmilk to prevent hypoglycemia.
  - If the baby's axillary temperature drops below 36.5°C, rewarm the baby (use radiant heater, blankets, skin to skin or use an incubator if sustained access to power is possible).
- If a baby is <1800g or <34 weeks, severe health problems are more likely such as difficulty in breathing, inability to feed, severe jaundice and infection and the baby should be moved to the special care baby unit, maintaining kangaroo care during transfer and ensuring breast milk has been given (expressed, using a cup and spoon) or glucose.
- **Monitor the baby closely**. Prior to feeds check levels of consciousness, heart rate, tone, temperature, respiration and color. Any changes in these may indicate hypothermia, hypoglycemia or sepsis.
- Refer immediately

4.2.3 Kangaroo Care for all newborns

- Is a method of holding an infant dressed in just a nappy in skin-to-skin contact, prone and upright on the chest of the patient.
- The infant is enclosed in the parent clothing in order to maintain temperature stability.
- All newborns can be provided with kangaroo mother care as soon as clinically stable and close to continuously as possible.
- The key features of kangaroo mother care for preterm infants are early, continuous and prolonged skin-to-skin contact between the mother and the baby, and exclusive breastfeeding (ideally) or feeding with breastmilk.
- Kangaroo Care has been studied widely and found to have numerous benefits for medically stable babies (including babies on CPAP and ventilation) and their parents, so regular use of skin-to-skin care is recommended.
- For good resources for care of newborns, see the Health Newborn Network[16]:

4.2.4 Hypothermia

- Monitor the baby's axillary temperature hourly for at least 3 hours and until normal.
- If the baby's temperature has increased by at least 0.5°C per hour over the last three hours, rewarming has been successful. Continue measuring the baby's temperature every two hours.
- If the baby's temperature does not rise or is rising more slowly than 0.5°C per hour,refer
- Once the baby's temperature is normal, measure the temperature every three hours for 12 hours.

[16] https://www.healthynewbornnetwork.org/resources/

4.2.5 Hypoglycemia

- Prevent hypoglycemia by ensuring breast feeding within an hour of birth.
- Refer all premature babies, low birth weight babies or newborns with infection and/or other complications.
- Look out for signs for hypoglycemia such as apnea, cyanosis, jitter movements or convulsions. If these are present: give oral glucose gel or sugar and water and refer.

4.2.6 Vaccination of premature babies and low birth weight babies

- Immunization schedule is the same for as other babies. However, BCG may be delayed if they are sick.
- If the baby has completed 2 months at the time of discharge, give BCG and Pentavalent and OPV on the same day.

4.2.7 Newborn sepsis

- WHO has defined sepsis in neonates according to the features of possible serious bacterial infection (PSBI).
- A young infant is classified as having PSBI when any one or more of the following signs is present:
  - Not able to feed since birth or stopped feeding well (confirmed by observation)
  - No movement or movement only on stimulation
  - Convulsions
  - Fast breathing (60 breaths per minute or more) in infants younger than 7 days of age
  - Severe chest in-drawing
  - Fever (≥ 38.0 °C)
  - Low body temperature (< 35.5 °C)
- If at least one of the signs is present, the neonate or young infant requires prompt treatment with antibiotics. Give 1st dose antibiotics and refer.

Medicine	Age	Dose	Duration	Side effects
Ampicillin (add 1.3ml sterile water to a 250mg vial)	Newborns < 7 days	Give 1st dose: 50mg/kg IM	Refer	Rare: allergy, mild or severe reaction,
	Newborns 7 – 28 days	Give 1st dose: 50mg/kg IM		
Prescribing tip: Calculate dose carefully				

AND

Medicine	Age	Dose	Duration	Side effects
Gentamicin 80mg vials (40mg/ml)	Newborns < 7 days	Give 1st dose: 2.5mg/kg IM	Refer	Rare: vomiting, deafness, kidney damage
	Newborns 7 – 28 days	Give 1st dose: 2.5mg/kg IM		
Prescribing tip: Calculate dose carefully				

- If the source of the infection is suspected to be from a skin infection (staph aureus) in origin, replace the ampicillin with cloxacillin 25 –50mg/kg IM 1st dose.
- Where possible, blood cultures should be obtained before starting antibiotics. If an infant does not improve in 2 days, review with cultures and antibiotic treatment should be changed.

- <u>Prophylactic antibiotics:</u>

Consider giving 1st dose ampicillin AND gentamicin significant risk factors for infection as follows and refer.

- Membranes ruptured > 18 hours before delivery.
- Mother had fever ≥ 38.0 °C before delivery or during labor.
- Amniotic fluid was foul smelling or purulent

4.2.8 Newborn seizures

- Seizures in newborns are serious if they last longer than 3 minutes or are brief serial seizure episodes.
- Consider underlying causes such as hypoglycemia and/or infection.
- Refer
- Treat seizures with phenobarbitone 20mg/kg IM loading dose and maintenance at 5mg/kg/day (or same dose of oral phenobarbitone if IM not available).

4.2.9 Jaundice of newborns

- Clinic staff should monitor newborns for jaundice:
  - Refer all babies if jaundice appears on day 1.
  - All babies if palms and soles are yellow at any age.
- If there is slight yellowing of the conjunctivae in a term newborn older than 1-2 days and they are well, then they can be observed. If they are yellow, then refer.

4.3 Immunizations

- Immunizations in children are to be given according to the expanded program immunization (EPI) [17]strategy and policy of Liberia
- The health center and health clinic are the key sites where children under five and pregnant women are immunized against preventable diseases but all **staff in all health facilities including hospitals** should ensure all children are fully immunized
- Routine doses are also given to pregnant women and newborn children.
- Tetanus toxoid is given up to 5 times to all women of reproductive age, with up to 3 doses administered in the ANC.
- At birth, the oral polio vaccine is given and BCG (*see 4.3*).
- HIV infected children should receive EPI vaccines as per the schedule.
- Sick children can receive EPI vaccines if they are well enough to go home.
- Only staff trained to give vaccines are authorized to do so. They must carefully follow the detailed instructions for each vaccine in the EPI guide, which includes how to store vaccines at the right temperature, how to reconstitute vaccines with diluent, the multi-dose vial policy, how to administer vaccines, contraindications to vaccines and adverse events after immunization.
- Transport of vaccines must safeguard the cold chain, using freezing compartments in fridges to prepare ice packs and Styrofoam boxes with ice packs when transporting vaccines to rural settings is important.
- Periodic immunization campaigns will take place during epidemics including for measles, yellow fever, Covid 19, cholera, typhoid, polio.

[17] Expanded Program on Immunization Policy and Strategy, 2019 – 2023, Ministry of Health, Liberia

LIBERIA EPI SCHEDULE

Age	Vaccine	Route of administration	Injection site	Dose
At birth and up to 11 months	BCG	Intra-dermal	Upper left arm	0.05ml
	OPV*	Oral	Mouth	2 drops
6 weeks	OPV1	Oral	Mouth	2 drops
	Penta1	Intra-muscular	Outer mid- left thigh	0.5ml
	Pneumo 1	Intra-muscular	Outer mid-right thigh	0.5ml
	Rota 1	Oral	Mouth	2.0ml
10 weeks	OPV2	Oral	Mouth	2 drops
	Penta2	Intra-muscular	Outer mid-thigh	0.5ml
	Pneumo2	Intra-muscular	Outer mid-right thigh	0.5ml
	Rota2	Oral	Mouth	2.0ml
14 weeks	OPV3	Oral	Mouth	2 drops
	Penta 3	Intra-muscular	Outer mid-thigh	0.5ml
	Pneumo3	Intra-muscular	Outer mid-right thigh	0.5ml
	IPV 1	Intra-muscular	Outer mid-right thigh	0.5ml
Infants 6-11 months	Vitamin A	100,000 IU cap	Oral	Every 6m
9 Months	Measles	Subcutaneous	Upper Left arm	0.5ml
	Yellow Fever	Subcutaneous	Upper right arm	0.5ml
	TCV	Intramuscular	Left thigh	0.5ml
15 Months	Measles	Subcutaneous	Upper left arm	0.5ml
9 Years	HPV 1	Intramuscular injection	Upper right arm	0.5ml
6 – 12 months after HPV 1	HPV 2	Intramuscular injection	Upper right arm	0.5ml

- If doses of a vaccine are given within less than the recommended 4 weeks interval, then these should not be counted as part of the primary series. The dose should be repeated instead

4.3.1 Immunization Techniques and Body Sites

- The following procedures for administration of vaccines must be adhered to at all times including preparing for vaccination sessions.
- Health workers should always wash their hands with soap and water before beginning a vaccination session.
- Vaccine administration area shall be located out of direct sunlight that preferably allows smooth patient flow.
- Waiting clients shall be screened so that (a) sick person(s) can be given vaccines first and reduce possibility of spreading infections; and (b) person not within the age group can be sent home without unnecessary delay.

- Only one vial of each antigen can be removed from the vaccine carrier or fridge and placed in the foam in the neck of the vaccine carrier and expiry dates of each vial shall be rechecked to ensure viability.
- The patient's skin shall be wiped clean at the site where the vaccine will be given. Clean water shall be used for this.
- Reconstituted vaccines of Measles, Yellow Fever ad BCG vaccines shall be discarded at the end of the daily session or after six hours, whichever comes first. Open vials of TT, PENTA and Polio vaccines can be re-used in subsequent sessions as long as they are stored under the appropriate cold chain conditions (+ 2 to + 8°C)
- The MoH is moving to auto-disabled syringes (AD) for all immunizations
- Detailed information on vaccines:

BCG	
Protection	Against tuberculosis (TB)
Number of doses	One
Schedule	At or as soon as possible after birth. **Do not give BCG after 1 year of age**
Diluent	Use the same diluent from the same manufacturer of BCG
Dosage and administration	0.05ml, intradermal, left forearm
Storage temperature	Store between +2°C to +8°C

Measles	
Type of vaccine	Live attenuated viral
Number of doses	Two doses
Schedule	At 9–11 months of age but need a second dose at 13 months (often given during campaigns). In campaigns may is also given from 6 months upwards.
Booster	A second opportunity for measles immunization is recommended (routine or campaign)
Contraindications	Severe reaction to previous dose; pregnancy; congenital or acquired immune disorders (not HIV infection)
Adverse reactions	Malaise, fever, rash 5–12 days later; idiopathic thrombocytopenic purpura; rarely, encephalitis, anaphylaxis
Dosage	0.5ml
Injection site	Rt upper arm
Injection type	Subcutaneous
Storage	2°C–8°C (vaccine maybe frozen for long-term storage but not the diluent)

Pentavalent Vaccine. (Diphtheria, Tetanus, Pertussis, Hepatitis B & hemophilus influenza (Hib))	
Type of vaccine	Pentavalent vaccine
Number of doses	Three
Schedule	6, 10, 14 weeks of age, (each dose 4 weeks apart).
Booster	None
Contraindications	Do not use as a birth dose, usually not given over 6 years of age. Do not give Penta 2 or 3 if child had convulsion within 3 days of Penta 1.
Adverse reactions	Mild local and systemic reactions are common
Dosage	0.5ml
Injection site	Outer left mid-thigh
Injection type	Intramuscular
Storage	2°C–8°C. Never freeze

OPV	
Type of vaccine	Live oral polio vaccine (OPV)
Number of doses	Four in endemic countries (including birth dose)
Schedule	At birth, 6, 10, 14 weeks (each dose 4 weeks apart)
Booster	Supplementary doses given during polio eradication activities
Contraindications	Children known to have rare congenital immune deficiency syndromes should receive IPV rather than OPV.
Adverse reactions	VAPP (paralysis) occurs very rarely (approximately 2 to 4 cases per million children vaccinated)

Dosage	2 drops by mouth
Storage	Store between 2°C–8°C (maybe frozen for long-term storage)

IPV	
Protection	Against poliomyelitis (polio)
Number of doses	One
Schedule	14 weeks
Dosage and administration	0.5ml, intramuscular, outer right mid-thigh
Storage temperature	Store between +2°C to +8°C; do not freeze.

Pneumococcus vaccine	
Type of vaccine	Conjugate
Number of doses	3
Schedule	6, 10 and 14 weeks
Contraindications	prior severe allergic reaction (e.g. anaphylaxis) to previous dose of PCV13 or to any vaccine containing diphtheria toxoid
Adverse reactions	feeling drowsy, loss of appetite, sore or swollen arm from the shot, fever, headache. Rarely anaphylaxis
Dosage	0.5ml
Injection site	Anterolateral thigh
Injection type	Intramuscular
Storage	2°C–8°C. Never freeze

Rotavirus vaccine	
Type of vaccine	Live attenuated
Number of doses	2
Schedule	6 and 10 weeks
Contraindications	Prior severe allergic reaction to a previous dose of rotavirus vaccine, severe allergy to any component of rotavirus vaccine, severe immunodeficiency
Adverse reactions	Usually mild; may include crying, diarrhea, and vomiting. Some studies have shown a small rise in cases of intussusception within a week after the first or second dose of rotavirus vaccine
Dosage	2.0ml
administration	oral
Storage	2°C–8°C. Never freeze

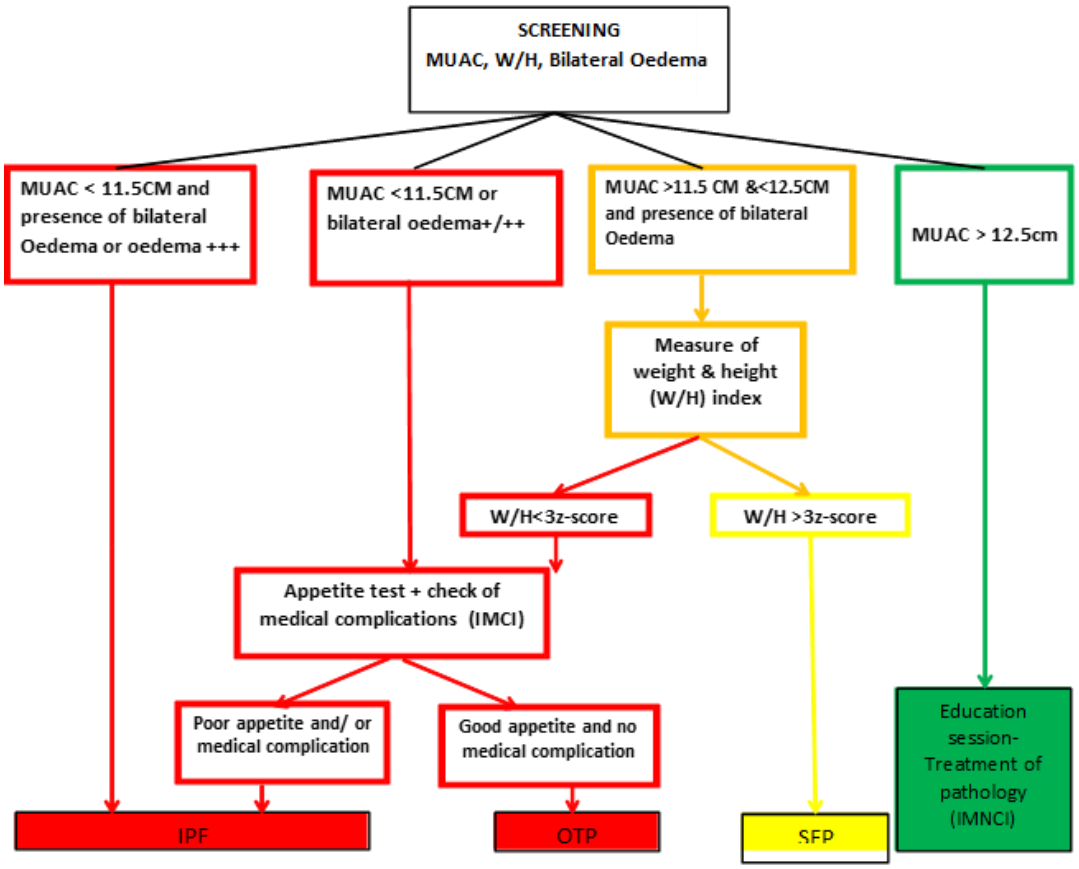
Yellow fever Vaccine	
Type of vaccine	live attenuated, reconstituted before use. Should be used within an hour after reconstitution
Number of doses	One.
Schedule	Immunity is life-long and international travel certificate is issued once and valid for life
Booster	Not needed
Contraindications	• infants less than 6 months of age (higher risk of encephalitis) • allergy to eggs or chicken proteins or previous dose of yellow fever vaccine • a suppressed immune system due to disease
Adverse reactions	• *Mild*: Soreness, redness, swelling are common after YFV. • Fever sometimes happens. Headache and muscle aches can occur. • *Severe* (rare): encephalitis, meningitis, or Guillain-Barré Syndrome • Life-threatening severe illness with organ dysfunction or failure,anaphylaxis
Dosage	0.5 mL given
Injection site	intramuscularly on the upper arm
Injection type	Intramuscular
Storage	2°C–8°C. Never freeze

4.4 Malnutrition in children

- Malnutrition can be under or over nutrition (e.g., in obesity).
- Undernutrition often results from a combination of insufficient nutritional intake, poor absorption and diseases. The 4 forms of undernutrition are:
    - Acute malnutrition (or wasting)

- Stunting
- Underweight
- Micronutrient deficiencies (including anemia).

- **Severe Acute Malnutrition (SAM)** is defined by the presence of bilateral pitting oedema or severe wasting, and other clinical symptoms such as poor appetite. A child with SAM is highly vulnerable and has a high risk of death.
- **Moderate Acute Malnutrition** is defined by moderate wasting.
- Both can be identified through a triage screening program



- The management of malnutrition depends on an assessment of severity.
  - SAM indicated in red in the flow chart above can be treated either as an inpatient feeding (IPF) or outpatient therapeutic program(OTP)
  - MAM indicated in yellow and can be treated with supplementary food program(SFP)

- All health and nutrition staff provide a vital role in preventing, detecting and treating malnutrition. They can be involved in the following key nutrition activities:
  - Promoting good nutrition: teach parents and caregivers about infant and young child feeding (IYCF) and exclusive breastfeeding, and how to give micronutrient supplements. Staff and volunteers are also trained with a check list for home visits of children who may be malnourished and to give key nutritional messages on prevention and treatment.
  - Detecting malnutrition: Active case finding is done in the community by trained volunteers in house-to-house visits, doing mid upper arm circumference (MUAC) measurements and oedema assessments; and referring identified cases to health facilities. Passive case finding is done in health facilities by health workers for self-

referred cases, and staff actively assess all children with MUAC and looking for oedema. MUAC should be measured in any child or pregnant woman thought to have malnutrition in health facilities and height and weight in addition.

- Treating malnutrition and anemia: All staff may be involved in providing care for malnourished children. Children with SAM and complications are treated in the Stabilization Centre in hospitals. Children with SAM without complications are managed in the outpatient therapeutic programs (OTP) in health centers. Supplementary feeding programs (SFP) for children and pregnant and lactating women with MAM may at times also be run from health centers.

4.4.1 Micronutrients

- Young children are given vitamin A and, **if indicated**, iron and folic acid to help prevent chronic and acute malnutrition and anemia and to help reduce the impact and likelihood of getting infections. See below for doses.
- **Do not give vitamin A, iron or folic acid if child is receiving therapeutic feeding which already contains these**.
- Vitamin A:
  - Infants 6 – 11 months 100,000 IU. Give a single dose. Give 3 drops from red capsule or 1 blue capsule.
  - Children 12 to 59 months (1 to 5 years) 200,000 IU. Give a single dose every 6 months. 1 red capsule or 2 blue capsules.

4.4.2 Anemia

- Anemia is a reduction in the amount of red blood cells and is a sign of many underlying conditions. It is caused by the following:
  - Poor nutrition (insufficient iron or folate or Vitamin B12 in the diet)
  - Loss of blood (including bleeding or dysentery)
  - Rapid breakdown of red cells as happens with malaria or sickle cell disease
  - Reduced production of red cells by the bone marrow (as in a leukaemia).
- Symptoms and signs include irritability, tiredness and pallor of the conjunctivae, lips, tongue, nail beds and palms. Jaundice if rapid breakdown of red cells.
- Diagnosis is made by measurement of hemoglobin. Moderate anemia is between 7 and 10.9g/dl and severe anemia is < 7g/dl with signs of distress.

Normal Hemoglobin levels by age

Age	Lower limit of normal range Hb (g/dL)	
2 months	9.0	
2 – 6 months	9.5	
6 – 24 months	10.5	
2 – 11 years	11.5	
>12 years	female – 12.0	male – 13.0

- Treatment for most moderate and mild cases is with iron and folate tablets and severe anemia may need blood transfusion.
- Many of the STG treatments help prevent anemia. These include micronutrient supplementation and the prevention and treatment of malaria.
- Children with sickle cell disease need regular follow up.
- Deworming medication is given regularly to young children to prevent and treat all worms including the hookworms which cause anemia:

Medicine	Age	Dose	Duration	Side effects
Albendazole tablet or Mebendazole	Infants < 12 months	Do not give any deworming medicines.		**Common:** Abdominal discomfort **Rare:** Diarrhea, dizziness
	Children 12 – 23 months	½ tablet of albendazole 400mg	Single dose	
	Children 24 months and older	1 tablet of albendazole 400mg	Single dose	
Prescribing tip: Children over 1 year old should have deworming medicine once a year.				

- Management of anemia:
  - Test the hemoglobin for all suspected cases of anemia.
  - Give iron and folate for 3 months if anemia diagnosed. See below.
  - Do not give iron if the child has sickle cell anemia (or thalassemia) (*see 6.9*).
  - Reinforce all prevention measures, including handwashing, exclusive breastfeeding, infant & young child feeding (IYCF) and the best food for children and pregnant women.

IRON AND FOLATE DOSES

Medicine	Age	Dose	Duration	Side effects
Iron & folate tablets (60mg iron + 400 mcg folate)	Children < 2 years	½ tablet per day	3 months	**Common:** Abdominal discomfort; constipation
	Children 2 – 12 years	1 tablet per day	3 months	
	Adults including pregnant women	2 tablets per day	3 months	

  - If 25mg/ml ferrous sulphate syrup is used, then give:
    - 2m –12m: 1ml PO 1x a day
    - 1 – 3 years: 2mls PO 1 x a day
    - 3 – 5 years: 2.5mls PO 1 x a day

4.4.3 Severe anemia

- A child with severe anemia may have adapted to having a very low hemoglobin. However, the pulse and respiratory rate may be raised.
- When the child can no longer cope, other signs develop such as rapid breathing and signs of respiratory distress, difficulty eating, poor capillary refill, enlarged liver and spleen and signs of left and right heart failure.
- There is no exact level of hemoglobin to transfuse at as it depends on the clinical condition and presence of other illnesses.
- Give paracetamol if fever and treat for malaria if RDT +ve.
- Urgently refer the child sitting up, not lying down.
- For thalassemia and sickle cell disease. *See 6.9*

4.4.4 Management of severe acute malnutrition (SAM) without complications[18]

- Patients with SAM can be referred to an OTP

Outpatient therapeutic program (OTP)criteria
W/H < -3 Z-score MUAC < 11.5cm (age ≥6 months
Bilateral edema Grade 1 (+) Grade 2 (++) only
Passes Appetite Test
Alert and no medical complications

[18] WHO Outpatient management of severe acute malnutrition 9789240029941-eng.pdf (who.int)

Presence of second twin Caregiver's choice

- OTPs are usually held in health centers as per IMAM guidelines[19]. Clinic staff may have been trained to work in OTPs.
- In the OTP, feed the child with 200 kcal/kg body weight per day of Ready to use therapeutic food (RUTF).
- Use the RUTF look-up tables in the IMAM guidelines for the weekly amounts based on the child's weight. Explain the daily amount the child will need to consume to the caregiver.
- Give Amoxicillin on admission to OTP to treat small bowel bacterial overgrowth and minor infections. Children who have SAM with edema may be infected with bacteria that are normal commensals in children without SAM:

Weight Range (Kg)	**Amoxicillin (50-100 Mg/Kg/Day) syrup (or tabs/caps) PO 2 x a day for 7 days**	
	mg	Cap/Tab (250mg)
<5kg	125 mg	½ cap
5 – 10	250 mg	1 cap
11 – 20	500 mg	2 cap
21 – 35	750 mg	3 cap
> 35	1000 mg	4 cap

- Give ACT (Arthemesin Combined Therapy) for all SAM on admission to OTP:

Weight	**Artesunate (AS) (4mg/kg) + Amodiaquine(AQ) base (10mg/kg) PO**	**Dosage**
≥ 5 kg < 9kg	25mg AS + 67.5mg AQ	1 tablet/day x 3 days
≥ 9kg < 18kg	50mg AS + 135mg AQ	1 tablet/day x 3 days
≥ 18kg < 36kg	100mg AS + 270mg AQ	1 tablet/day x 3 days
≥ 36kg	100mg AS + 270mg AQ	2 tablet/day x 3 days

- Give measles vaccination and de-worming (*see above*) for both those transferred from IPF to OTP and those admitted directly to OTP at the 4th outpatient visit at the same time as the measles vaccination.
- **Micronutrients are not needed as this is contained in the RUTF**.
- If there are signs of anemia, give Folic Acid 5mg PO on day 1and continue with Folic Acid 1 mg PO daily.

4.4.5 Management of SAM with medical complications

- Treatment is done on an inpatient basis in a treatment stabilization center.
- Refer any child with SAM and medical complications to the stabilization center.
- Standard inpatient management of severe acute malnutrition involves two phases:
  - Initial stabilization when life-threatening complications are treated.
    AND

[19] Integrated management of acute malnutrition guidelines in the context of covid-19 and beyond. Ministry of Health, Liberia. August 2021

- Nutritional rehabilitation when catch-up growth occurs.

4.5 Childhood constipation

- Acute simple constipation may occur after illness and respond to increase in fluids.
- Treat any underlying cause.
- There is no evidence for increasing fluids above the recommended daily level in managing chronic constipation.
- Ensure adequate fiber and consider natural laxatives (fruits & whole grains).
- Encourage regular toileting after meals, rewards for passing stool, encourage praise and positive feedback from parents.
- Medication needs to be used long term and not suddenly stopped- treat for at least 3 months before reviewing and always aim for gradual reduction in medicine use.
- A third of young children may need treatment until aged 2 years old, a third until aged 5 years old and a third need longer term treatment.
- Refer to health center.
- Consider referral also if faltering growth, developmental delay and concern about child's wellbeing.

5 Communicable Diseases

- In addition to specific national and WHO guidelines referenced below, the Médecins Sans Frontières treatment guidelines[20] are a useful and concise general resource.

5.1 Diarrhea

- For more information on diarrhea, see WHO's manual on treatment of diarrhoea[21]

Clinical Features

- Diarrhea is the passage of liquid and watery stools three or more times in a day. Common causes include:
  - Infection
  - side-effects of drugs
  - Gastrointestinal disorders
  - Accumulation of non-absorbed osmotically active solute in the gastrointestinal tract when intestinal motility is altered.
- Acute diarrhea lasts less than 14 days, but usually improves within 2 – 4 days. Persistent diarrhea is diarrhea lasting longer than 14 days.
- Stools could be watery (Acute Watery Diarrhea or Cholera) or bloody (Dysentery).
  - Acute Watery diarrhea is commonly caused by viruses and parasites such as Giardia, although Cholera must always be considered as a differential. It could also be caused by other diseases such as malaria, and respiratory infections.
  - Bloody diarrhea is commonly caused by bacteria and parasites, particularly Amoeba.
- Given the above, most episodes of diarrhea will probably not require antibiotic treatment. The main concern with diarrhea is that it causes dehydration which in turn may lead to kidney failure and death, so the priority of treatment urgent rehydration to correct

[20] Médecins Sans Frontières. Clinical guidelines - Diagnosis and treatment manual. December 2022. https://medicalguidelines.msf.org/en/viewport/CG/english/clinical-guidelines-16686604.html?language_content_entity=en

[21] World Health Organization. The treatment of diarrhoea : a manual for physicians and other senior health workers, 4th rev. World Health Organization. 2005. https://apps.who.int/iris/handle/10665/43209

dehydration.

Principles of Treatment

- The main approach to treatment is as follows:
  - Assess for and treat dehydration
  - Zinc supplementation in children
  - Vitamin A supplementation to children who have not received it the past 6 months.
  - Prevention of malnutrition by continuing nutritious feeding
  - Consider special additional treatment for malnourished children and people with HIV
  - Avoid the use of laxatives or enemas
  - Avoid ibuprofen as it can lead to kidney damage in dehydration
- Antibiotics should be avoided as they may worsen or prolong the condition.
  - Give antimicrobials for dysentery (bloody diarrhea)
  - Generally, treatment with antibiotics is only reserved for those who have severe diarrhea, have experienced failure of initial rehydration, and those at high risk of complications due to pregnancy, immunosuppression, severe malnutrition, or have evidence of infection responsive to antibiotics e.g., dysentery.

5.1.1 Manage Dehydration

Assessing Dehydration

- Dehydration from diarrhea is graded for treatment in the Integrated Management of Newborn and Childhood Illnesses, IMNCI[22]. This can be applied to anyone with diarrhea.
  - No dehydration (Plan A, Green):
    - Not enough signs to classify as some or severe dehydration.
    - Treat at home according to 4 rules of home treatment
  - Some dehydration (Plan B, yellow):
    - At least two of the following signs:
      - Restlessness/irritability
      - Sunken eyes
      - Thirsty or drinks quickly
      - Skin pinch goes back slowly > 2 seconds
    - Treat with ORS and observe in health facility
  - Severe dehydration (Plan C, red)
    - At least two of the following signs.
      - Lethargy/ unconsciousness
      - Sunken eyes
      - Unable to drink or drinks poorly
      - Skin pinch goes back very slowly > 2 seconds
    - Refer
- **Do not give ibuprofen to dehydrated people as it can damage their kidneys.**

Treating Dehydration

- Treat dehydration according to assessed severity:
  - **No dehydration (Plan A):**
    - Treat at home
      - Advice patient/caregiver(s) to seek medical attention if there are any signs of dehydration or progression of symptoms, including blood in stools

[22] Handbook : IMCI integrated management of childhood illness. Geneva: World Health Organization 2005.

- Continue feeding and drink more fluids than usual to prevent dehydration
- Advise a child's parent(s) that:
  - Breastfed infants should be fed frequently with feeds lasting longer than usual.
  - Children that are not exclusively breastfed should be offered ample food-based fluids, including soup, rice water and yoghurt drinks.
- Feeding must never be stopped or else children are at risk of malnutrition.
  - Additional oral fluids should be taken after every loose stool as per WHO Plan A:
    Children under 2 years of age: 50-100 ml (a quarter to half a large cup) of fluid
    Children aged 2 up to 10 years: 100-200 ml (a half to one large cup);
    Older children and adults: as much fluid as they want.
- Additional oral fluids should Offer oral Zinc supplementation everyone with acute diarrhea

- **Some dehydration (Plan B):**
  - Initiate treatment with Oral Rehydration Salts (ORS) and monitor in the health facility.
  - Give 75ml/kg of ORS over 4 hours. Follow the WHO Plan B aged-based table below if you are unable to obtain a weight measurement .
  - Encourage increasing oral fluid intake as for plan A
  - Additional oral fluids after loose stools as for Plan A
  - Reassess dehydration status and treat accordingly

WHO PLAN B: APPROXIMATE AMOUNT OF ORS TO GIVE IN FIRST 4 HOURS

Weight	< 5 kg	6 – 7.9kg	0 – 10.9 kg	11 – 15.9kg	16 – 29.9Kg	30 Kg
Age	Up to 4 months	4 - 11 months	12 - 23 months	2 - 4 years	5 - 14 years	15 years and older
Quantity of ORS over initial 4-hour period	200 – 400ml	400 - 600ml	600- 800ml	800 - 1,200ml	1,200 – 2,200ml	2,200 – 4,000ml

- **Severe dehydration (Plan C):**
  - Refer immediately. Give ORS during transfer.

5.1.2 Oral Rehydration Salts (ORS)

- Home-made ORS
- The following are required to make ORS:
  - ½ teaspoon or a good pinch of salt
  - 6 teaspoons of sugar
  - 1 liter of boiled and cooled water (**allow the water to cool before preparation and administration)**
- To make the ORS: wash your hands with soap and water
- Mix salt, sugar and water together in a clean container,
- Stir with a clean spoon until dissolved.

- Packaged ORS
  - Check the sachet carefully beforehand as packaged ORS usually comes in two different strengths. One has to be diluted in 1 liter of water, and the other has to be diluted in ½ a liter of water.
  - Explain to the patient/their caregiver to:
    - Pour all the powder into a clean container
    - Pour the correct amount of boiled and cooled water into the container, and then stir until the powder is fully dissolved.

- How to give ORS
  - Give in frequent small sips from a cup with a spoon (child under 2 years, 1 teaspoon every 1 -2 minutes)
  - If a person vomits, try again 10 minutes later but give more slowly
  - Give extra fluids and breastfeed infants until the diarrhea stops.
  - Show the carer / parent how much fluid to give in addition to the usual drinks:
    - Up to 2 years old: 50 to 100ml after each loose stool
    - years and older: 100-200ml after each loose stool
  - Throw away the solution after 24 hours (one day) and make up more in a clean container

Zinc Supplementation

- Oral zinc can reduce the duration and severity of diarrhea, and prevent further occurrences the following two to three months.
- Give supplemental zinc to children for a total of 14 days, continuing even when they are better. Tablets can be crushed, dissolved in water, ORS, or breast milk. They can also be chewed whole. Doses as below:
  - Children under 6 months: 10 mg by mouth once daily for 14 days

- Children from 6 months to 5 years: 20 mg by mouth once daily for 14 days
- Give supplemental zinc to adults at a dose of 25 – 50 mg once daily for 14 days

Vitamin A Supplementation

- Diarrhea can lead to reduced absorption and increased need for vitamin A.
- In areas of endemic deficiency, children can rapidly develop eye complications of vitamin A deficiency, including blindness.
- Examine children all children in such areas for corneal clouding and conjunctival lesions (Bitot's spots). If either is present, oral vitamin A should be given at once and again the next day.
  - Younger than 6 months: 50,000 units PO per dose
  - 6 – 12 months old: 100,000 units PO per dose
  - 12 months — 5 years: 200,000 units PO per dose
- All children with severe malnutrition or who have had measles within the past month should receive the Vitamin A supplementation as above too.
- Encourage mothers to routinely feed their children food rich in carotene when possible. These include orange fruits and vegetables, and green leafy vegetables, as well as eggs, liver, or full fat milk.

Anti-Microbial Treatment

- Acute Watery Diarrhea
  - Most acute watery diarrhea is caused by viruses and the majority will not respond to antimicrobials.
  - Treatment is with rehydration, zinc and probiotics.
  - Always consider cholera as a diagnosis in endemic settings. Initiate epidemic protocol and organize testing according to WHO guidelines.
  - Generally, treatment with antibiotics is only reserved for those who have severe diarrhea, have experienced failure of initial rehydration, and those at high risk of complications due to pregnancy, immunosuppression, severe malnutrition, etc.
  - For malnourished and immunocompromised patients, refer to the SAM guidelines. *See 4.4.5*
- Bloody Diarrhea
  - If there is dysentery but no fever or abdominal pain, treat dehydration and refer with ORS during transfer. Do not give antibiotics.
  - If there is dysentery and fever and abdominal pain, refer with ORS during transfer. Give 1st dose of ciprofloxacin before transfer.

1ST DOSE ANTIBIOTIC TREATMENT OPTIONS FOR DYSENTERY WITH FEVER[23]

	Adults	Children	Duration of Treatment
1st Line	**Ciprofloxacin** PO 500 mg	**Ciprofloxacin** PO 15 mg/kg/dose ***Oral weight bands:*** *3–< 6 kg: 50 mg* *6–< 10 kg: 100 mg* *10–< 15 kg: 150 mg* *15–< 20 kg: 200 mg*	

[23] The WHO AWaRe (Access, Watch, Reserve) antibiotic book. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

		20–< 30 kg: 300 mg *≥ 30 kg: use adult dose*	

Treatment of Children with Severe Acute Malnutrition (SAM) and Dehydration

- There are some important considerations when caring for children with SAM
- It is difficult to estimate dehydration status in a severely malnourished child using clinical signs alone. *Assume all children with watery diarrhea may have some dehydration and treat as such.*
    - Give fluid slowly to prevent overload or heart failure.
    - Rehydration Solution for Malnutrition (ReSoMal) should be used in preference to standard ORS which has too much sodium and too little potassium for children with SAM. Give fluid slowly to prevent overload or heart failure.
    - Refer urgently.
    - Give ReSoMal orally during transfer. Give 5ml/kg every 30 minutes for the first 2 hours, followed by 5-10ml/kg/hour for the next 4 - 10 hours depending on what the child wants, stool loss, and vomiting.
        - Alternate ReSoMal with F-75 (starter feeding) from hours 4 -10, i.e., at 4, 6, 8 and 10 hours with F-75 if rehydration is continuing at these times.
        - If ReSoMal unavailable then give ORS during transfer.
    - If the child is breastfed, encourage to continue

- **Children with HIV**
    - Prevent diarrhea with Vitamin A supplementation in all HIV -infected or exposed children aged 6 months to 5 years.
        - Give 6-monthly, as below in doses given every 6 months
        - 100,000 IU for those aged 6–12 months, and 200, 000 IU for those aged > 12 months).
    - Refer.
    - Daily multiple micronutrients for 2 weeks are recommended for all HIV infected or exposed infants and children with persistent diarrhea.

5.2 Acute Respiratory Infections

- Infections of the Respiratory Tract could be divided into those of the upper airway, and those of the lower airway. Upper airway infections include the common cold, croup, tonsillitis, ear infections, sinusitis, epiglottis, and influenza. Lower airway infections include pneumonia, bronchitis, and bronchiolitis**.**

5.2.1 Common Cold (Coryza)

Symptoms

- A self-limiting viral illness characterized by nasal congestion and discharge, sneezing, sore throat, and cough.
- It may be caused by more than 200 different viruses, including rhinoviruses (the most common cause), coronaviruses, RSV and parainfluenza viruses. Transmission is by either direct contact or aerosol transmission. People can remain infectious (shedding the virus) for several weeks.
- Most colds resolve in 7 – 10 days but the cough may persist for 14 days. Nasal discharge is often profuse and clear at first but becomes thicker and darker as the infection progresses. Severe nasal congestion may interfere with feeding, breathing, and sleep in infants who may also become restless or irritable.

Treatment

- Treatment is supportive and symptomatic; there is no evidence that any treatment improves the time course of infection. The aim is to relieve symptoms of runny or blocked nose, sneezing, sore throat and hoarse voice, cough, mild fever, headache, loss of taste and smell.
    - Give paracetamol for symptom relief
    - Advise to drink more fluids and get adequate rest, although normal activity will not prolong the illness.
    - Advise healthy food but that no specific diet or mineral or vitamin will speed healing.
    - Breastfeed infants frequently and clear a blocked nose with 0.9% sodium chloride drops: place child on back, turn head to side, instil 0.9% sodium chloride into nostril.
    - Advise patients/care givers that antibiotics and antihistamines are ineffective against colds and may cause adverse effects.
    - **If fast, difficult, or noisy breathing, consider pneumonia or croup.**

5.2.2 Croup/ Acute Laryngotracheobronchitis

Clinical Features

- Usually due to a viral infection.
- Presents with a characteristic hoarse voice and “barking” cough due to swelling of the upper airways. There may be inspiratory stridor – an unusual high-pitched sound on inspiration. There may also be wheezes.
- It could be mild, moderate or severe.
    - In mild croup, there is no stridor. In moderate croup, there is stridor on activity but no respiratory distress.
    - In severe croup, there is obvious stridor at rest. There may also be signs of respiratory distress such as and increased rate breathing, sinking in of the chest wall, breathlessness, and blueness of the lips. Severe episodes are more likely to present in children younger than 2 years.

Treatment

- Treatment is based on severity, ranging from mild (no stridor) to moderate (stridor on activity/agitation), to severe (stridor respiratory distress at rest)
    - Mild croup
        - No stridor.
        - Treat symptomatically, ensuring adequate fluid intake.
    - Moderate croup
        - Stridor on activity/agitation.
        - Refer.
    - Severe Croup
        - Stridor at rest or respiratory distress
- Refer. If available during transfer give oxygen continuously, at least 5 liters per minute to maintain SpO_2 94-98%. If wheezing is present, give salbutamol inhaler via a nebulizer 2-3 puffs every 20-30 minutes as needed during transfer.

5.2.3 Tonsillitis

Clinical Features

- Infections of throat and/or tonsils are characterized by sore throat, redness of the throat and/or tonsils, swelling and pus.
- The majority are caused by viruses and can be treated with analgesia and supportive

care. Bacterial infections can occur, or which Group A Strep is the most common. Bacterial tonsilitis can lead to local complications such abscess and epiglottitis, as well rheumatic fever which can damage the heart valves and kidneys.

- If a person has two or more of the following, their tonsilitis is most likely bacterial and should be treated with antibiotics:
    - Fever
    - Absence of cough
    - Pus on the tonsils
    - Tender anterior cervical lymph nodes require antibiotic treatment

Treatment

- Pain and fever control:
    - Mild tonsillitis is treated with analgesia alone.
    - For children, give paracetamol as first choice, ibuprofen as second choice.
    - For adults, give ibuprofen or paracetamol for pain and fever. Ibuprofen is more effective than paracetamol for pain control in tonsillitis in adults.
- General Care
    - Encourage people to continue to eat and drink sufficiently. It may help to crush food to make it easier to swallow.
    - Assess for dehydration and consider admission or parenteral fluids for those who are unable to stay hydrated by mouth
    - Review if there is no improvement after two days or any new symptoms
- Antibiotic Treatment
    - Only give penicillin for severe tonsillitis. If allergic to penicillin, give cefixime or a macrolide such as clarithromycin.
        - If the patient has glandular fever as well as severe otitis media, then amoxicillin can cause a rash, so use clarithromycin instead.
    - For those who are not allergic to penicillin
        - Give amoxicillin 500mg by mouth three times daily for 6 days (45mg/kg by mouth twice daily for children)

Age	Amoxicillin Dose
Infants 2 months - 1 year	125mg PO twice daily
Children 1 year – 5 years	250mg PO twice daily
Children 6 years – 11 years	500mg PO twice daily
Children > 12 and Adults	750mg PO twice daily

AMOXICILLIN DOSING IN CHILDREN BY AGE

Weight	Oral Dose of Amoxicillin
3 - <6 kg	250mg
6 - <10kg	375mg
10 - <15kg	500mg
15 - <20kg	750mg
[3] 20Kg	500mg three times daily **or** 1gram twice daily

AMOXICILLIN DOSING BY WEIGHT IN CHILDREN

        - OR give phenoxymethylpenicillin 500mg by mouth four times daily for 10 days (15mg/kg/dose in children)
    - For those with penicillin allergy
        - Cefixime 400mg by mouth once daily for 5 days (25mg/kg two times daily in children)

5.2.4 Otitis Media (Acute Inflammation of the Middle Ear)

Clinical Features

- Acute infection of the middle ear commonly seen in children under the age of 3 years. It is characterized by ear pain and fever, and sometimes vomiting, irritability, lethargy and ear discharge. The tympanic membrane is usually red or dull on examination. It may also be accompanied by signs of a common cold.
- These ear infections are often caused by viruses and generally do not need antibiotics, except in those with serious infection or those that are at high risk of complications which may include mastoiditis and intracranial infections.

Treatment

- Make sure the child continues to eat and drink.
- Review if there is no improvement or any new symptoms.
- Pain and fever control.
    - For children, give paracetamol as first choice and ibuprofen as second choice.
    - For adults, give ibuprofen or paracetamol for pain and fever. Ibuprofen is more effective than paracetamol for pain control in ear infection in adults.
- Antibiotics should not be offered routinely as many people with ear infections get better without antibiotics. Antibiotic treatment should be offered to certain groups:
    - children under the age of 2 (if clear clinical signs of otitis media and fever),
    - Those with severe disease (severe earache, vomiting, and high temperature above 39°C),
    - Those at high risk of complications (people with malnutrition, HIV, uncontrolled diabetes, or ear malformations).
    - For those without penicillin allergy,
        - First Line: Amoxicillin
            - Adults: 500mg by mouth three times daily for 5 days
            - Children: 45mg/kg twice daily in children up to 20kg
    - For those allergic to penicillin/amoxicillin, use a macrolide such as Erythromycin or Clarithromycin. Dose as follows:
        - Erythromycin
            - Children >40kg: 500mg PO every 6 hours for 5 days
            - Children < 40kg: 10mg/kg PO every 6 hours for 5 days
        - Clarithromycin
            - Adults and Children older than 12 years: 500mg PO twice daily for 5 days
            - Children 6 months – 12 years: 7.5mg/kg PO twice daily for 5 days
        - For pregnant women, give Erythromycin 500mg by mouth four times daily.
- Refer if there is fast or difficult breathing, or if a child is drowsy, has a rash, or is **very** unwell.

Pain and fever control

- Give paracetamol *or* ibuprofen. *See 6.12.1.1*

5.2.5 Sinusitis

Clinical Features

- Sinusitis is an infection of the sinus spaces of the front part of skull, most commonly in the maxillary or ethmoid sinuses.
- It is usually caused by viruses but may be caused by bacteria. As well as symptoms of a viral cold, the person may have pain and tenderness over these sinuses, with purulent (pus-like) discharge.

Treatment

- Acute sinusitis can be managed with supportive care, including clearing the nose with a small amount of normal saline (for children, lie on back, turn head to side, and instill *no more than* 1ml of saline into each nostril), steam inhalation with decongestants such as "*Vicks"*, and pain control medicine (ibuprofen or paracetamol).
- Give antibiotics if symptoms have gone on for longer than ten days, the sinus(es) is very tender, or there is a large amount of pus discharge. Also for those at risk of complications, particularly the immunosuppressed, people with HIV, and those with uncontrolled diabetes.
    - Not penicillin allergic
        - Give amoxicillin to those without a penicillin allergy. For children, 30mg/kg by mouth three times daily. For adults, 500mg by mouth three times daily. The duration of treatment is 5 – 7 days.
        - For children up to 20kg, use at the dose that gives 45mg/kg of the amoxicillin component twice daily for 5 - 7 days.
    - If penicillin allergic, use a macrolide such as erythromycin or clarithromycin:
        - Erythromycin
            - Children >40kg: 500mg PO every 6 hours for 5 days
            - Children < 40kg: 10mg/kg PO every 6 hours for 5 days
        - Clarithromycin
            - Adults and Children older than 12 years: 500mg PO twice daily for 5 days
            - Children 6 months – 12 years: 7.5mg/kg PO twice daily for 5 days
        - For pregnant women, give Erythromycin 500mg by mouth four times daily.
- Refer if high temperature, continued symptoms, or signs of severe systemic infection, cellulitis or swelling around the eye or face or forehead, a displaced eyeball, double vision, the eye not moving, reduced vision, symptoms or signs of meningitis, severe frontal headache, or neurological signs.

5.2.6 Influenza

Clinical Features

- Flu starts as an upper airway infection by the influenza A & B viruses. It presents like the common cold with runny nose and sore throat but is accompanied by high fever, muscle pains, headache, and exhaustion. Most symptoms last less than a week, but the cough can continue for two weeks. In children, there may also be nausea and vomiting.
- It can be dangerous to young children, older people, those with chronic disease and pregnant women. Complications of flu include viral pneumonia or secondary bacterial pneumonia, sinusitis, and exacerbations of asthma.

Treatment

- Treatment is usually supportive. Manage fever and pains with paracetamol and/or ibuprofen and encourage the person to take more oral fluids. Signs of pneumonia should be treated (*see1.2.8 below*).
- Antiviral medication is expensive, does not help most cases and is not routinely available in the country.
- Refer any severe cases.

Prevention

- Like the common cold, influenza is contagious and spread with aerosols and droplets. Encourage regular hand washing, hygiene measures, and mask-wearing and isolation to minimize spread
- Outbreaks of the Influenza A strain of flu may come in large epidemics, which can be very dangerous depending on the sub-strain of virus. Bird flu and pig or swine flu are variants of the influenza A virus that predominantly infect these animals but can also infect humans.
- Immunization may become available in the country if there are serious or new epidemics and epidemic control measures put in place. It should in particular be offered to the vulnerable, particularly elderly people and those with chronic lung diseases and those on ARVs.
- If Covid-19 is currently spreading then request the person do a rapid test at home or do one in hospital (see Covid 19, below).

5.2.7 Acute Bronchitis

Clinical Features

- Acute bronchitis is an infection in the trachea and bronchi of the lungs, usually caused by viruses, sometimes by bacteria and may follow a common cold or inhalation of smoke or dust.
- There is no consolidation of the lung parenchyma as seen in pneumonia, but pneumonia can be a complication.
- Consider acute bronchitis if a patient presents with a cough and green or yellow sputum, with or without fever, but without fast breathing.

Treatment

- Most mild cases of acute bronchitis will resolve with supportive care e.g., paracetamol for fever.
- Antibiotics are rarely needed. If a person is systemically unwell with fever or a rapid respiratory rate, or if the person is coughing up a lot of yellow or green sputum, or at high risk of complications then treat with antibiotics.
    - If not allergic to penicillin, treat adults with amoxicillin 500mg PO three times daily for 5 days.
    - If allergic to penicillin, give
        - Erythromycin 500mg PO four times daily for 5 days or
        - Clarithromycin 500mg PO twice daily for 5 days
- If there is fast breathing, high fever, or any danger signs, or if symptoms are not improving, treat for pneumonia (see below) and refer.

5.2.8 Pneumonia

- Pneumonia is an infection of the lower airway (lung parenchyma) caused mainly by bacteria, sometimes by viruses or fungi.

- The signs of pneumonia are fast and difficult breathing, chest indrawing, cough, fever, sputum.
- New onset (<2 weeks) or worsening cough with fever (≥ 38.0 °C), difficult or fast breathing, reduced oxygen saturation, crepitations in the chest, cyanosis, grunting, nasal flaring, pallor.
- D**iagnosis is clinical, and signs include rapid breathing for age and chest indrawing on breathing. Consolidation may be seen on examination or on chest radiograph.**

5.2.8.1 Pneumonia in Children

Clinical Features

- Pneumonia is diagnosed by either of:
  - Fast breathing for age (> 50 breaths/minute if aged 2-11 months; > 40 breaths/min if aged 1-5 years), OR
  - Chest indrawing.
- It should be classified as either pneumonia without signs of serious illness, or severe pneumonia as this will determine treatment
  - Pneumonia without signs of serious illness:
    - Rapid breathing +/- chest indrawing with no danger signs.
  - Severe Pneumonia
    - Rapid breathing a +/- chest indrawing plus a general danger sign such as
    - Inability to breastfeed or drink ·
    - Convulsions
    - Lethargy or reduced level of consciousness
    - Inability to eat or drink
    - Malnutrition
    - Signs of consolidation.
    - Blue color to the lips and tongue, or SpO2 <90%
    - Noisy breathing (not coming from the nose), with stridor and grunting.

Treatment

- Pneumonia without signs of serious illness
  - Should be treated with oral amoxicillin at home with home care advice
  - A child who cannot take/tolerate oral antibiotics should be admitted to hospital and treated with intravenous antibiotics
  - Antibiotic Choice
    - If no penicillin allergy, Amoxicillin 45mg/kg by mouth twice daily for 5 days.
      - Consider adding atypical cover by switching to Erythomycin if no improvement after 3 days of treatment.
    - If penicillin allergy, give Erythromycin
    - Erythromycin
      - Children 1 month – 12 years: 10mg/kg PO once daily for 3 days
      - Adults and Children older than 12 years: 500mg PO once daily for 3 days
    - Home care advice includes resting, increasing or at least sustaining fluid intake, and a nutritious diet. Breastfeeding should be continued.
    - If a child is being treated as an outpatient, advise the parents or carer to *come back day or night if the child is not improving*, or if their breathing is getting faster.

- In absence of severe respiratory difficulty: breast feed on demand and give milk/food by spoon on demand
- Give Vitamin A 50,000 IU for infants 2 – 5 months; 100,000 units for infants 6 – 11 months and 200,000 units for children > 1 year.

- **Severe Pneumonia**
  - This includes pneumonia in a child under the age of 2 months.
  - **Requires urgent referral to hospital**
  - Give 1st dose antibiotic:
    - Children from 2 months to 5 years
      - 1st line treatment with Ampicillin + gentamicin as below. 2nd line treatment is Ceftriaxone.

	Antibiotic	Total Treatment Duration
Severe Pneumonia	Amoxicillin or Ampicillin (IV/IM): 1st dose 50 mg/kg/dose (first week of life) 50 mg/kg/dose given every 8 hours (>first week of life) and Gentamicin (IV/IM): Neonates: <7 days is 2.5mg./kg 7 - 28 days 2.5 - 5mg >28 days 5 - 7.5mg Children: 7.5 mg/kg/dose or Ceftriaxone (IV/IM): 80 mg/kg/dose *Ceftriaxone should be avoided in neonates less than 3 months old because of the risk of jaundice*	

ANTIBIOTIC TREATMENT OF SEVERE PNEUMONIA IN CHILDREN[24]

5.2.8.2 Pneumonia in Adults

Clinical Features

- Nearly all respiratory diseases can mimic the symptoms of pneumonia.
- Based on clinical features alone it is often impossible to distinguish bacterial from viral pneumonia or from other noninfectious causes; district health office may advise on causes.
- Well established clinical features of pneumonia include a combination of:
  - New onset (< 2 weeks) of symptoms
  - Worsening cough with or without sputum production,
  - Dyspnoea (difficulty in breathing),
  - Tachypnoea (abnormal respiratory rates to diagnose rapid breathing vary with age),
  - Reduced oxygen saturation,
  - Crepitations on lung auscultation, or chest pain or discomfort without an alternative explanation.
  - Fever ≥ 38.0 °C for 3–4 days is usually present but may be absent, especially in elderly people**.**

[24] The WHO AWaRe (Access, Watch, Reserve) antibiotic book. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

- Features beyond the lungs include confusion or disorientation and may be the main symptoms in elderly people, immunocompromised patients and malnourished children.
- Severe pneumonia with respiratory distress and sepsis requiring intensive care and intravenous antibiotic treatment has a high associated mortality

Assessment of severity,

- CRB-65 is an easy non-invasive way to assess severity.
  - Give one point for each signs/symptoms below.
    - Presence of Confusion (new onset)
    - Respiratory rate > 30/min
    - Systolic BP < 90 mmHg or Diastolic BP <60 mmHg
    - Age 65 or older
  - Scores 0 – 1 are considered mild cases and can be managed in the community
  - Score of 2 – moderate case, consider inpatient treatment
  - Scores of 3 or more - severe case and requires inpatient treatment, consider admission to intensive care where available.

Treatment

- Mild to Moderate Illness
  - Antibiotic therapy
  - Supportive care and safety netting
    - Patients and/or their caregivers in the primary health care setting should be informed about the natural course of pneumonia, including the possibility of virus that would not benefit from antibiotic treatment and that cough and other symptoms often take 2–3 weeks to fully recover from.
    - Patients should also receive clear advice on seeking medical care with any worsening of symptoms and recommended symptomatic treatment (e.g. paracetamol for fever > 38.5°)
    - If available, check pulse oximetry**. If < 94% refer, give oxygen during transfer if available.**
  - If unable to feed, eat or drink refer.
    - Refer any cases with difficulty breathing, or those unable to walk home.
  - Rule-out TB
    - TB is a cause of lower respiratory tract infection and should always be considered, especially in high-risk patients (e.g. children or adults with HIV), with a slow onset of symptoms and persistent cough, or those who do not respond to the initial antibiotic treatment. *See 5.6*

	Drug and Dose	Duration of Treatment
1st Choice	Amoxicillin PO 1 g every 8 hours	5 Days

EMPIRIC ANTIBIOTICS FOR MILD CASES OF COMMUNITY ACQUIRED PNEUMONIA

- **Severe illness** *See 2.5* **Oxygen therapy** See 2.2.2

5.2.9 Bronchiolitis

Clinical Features

- Bronchiolitis is a common infection of the bronchi and bronchioles caused by the respiratory syncytial virus (RSV) in infants (predominantly in under ones), presenting with fast breathing, wheeze and loose cough.
- On listening to the chest, there are often widespread fine crackles but no focal consolidation.
- Mild disease is characterized by faster breathing but without signs of severe disease. The infant can continue feeding.
- Severe disease is characterized by fast breathing (over 50 breaths per minute), difficulty feeding, grunting, agitation, pallor, delayed capillary refill and drowsiness from hypoxia and signs of signs of exhaustion, cyanosis, and involvement of accessory muscles. Reducing oxygenation on pulse oximetry.

Treatment

- Mild disease can be managed at home with supportive care.
- Give more oral fluids/ breastfeeding.
- Fever and pain control
- Gentle nasal suction may be required
- Antibiotics are not needed if the nurse is confident, it is not pneumonia.
    - Consider treatment for pneumonia if any chest indrawing, coarse crackles, consolidation, or other sign of pneumonia.
- Refer if moderate to severe bronchiolitis

5.2.10 COVID-19

Consult *MoH & NPHIL Interim guidance on clinical care for patients with C19 in Liberia 2021*[25].

Clinical Features

- COVID-19 (Coronavirus disease or SARS-CoV-2 infection) is predominantly a respiratory illness transmitted through inhalation of infectious respiratory droplets from an infectious person.
- An asymptomatic infected person can transmit the virus.
- Early detection, isolation, and diagnosis of infected persons and quarantine of their close contacts are essential.
- To prevent COVID-19 in clinical settings, IPC guidelines must be followed (*see 1.13*) and in particular: Social distancing, frequent hand hygiene, correct use of mask, respiratory hygiene, and eye protection in proximity to other people.

Lab confirmation

- Suspected cases are tested from nose and throat swabs with a PCR, or with RDT if PCR not available.

Treatment

- Advise all mild and moderate cases to isolate at home and provide them with full written guidance as per national protocols
- Refer all moderate to severe patients,
- Diagnostic Testing

Severity	Symptoms	Signs	Management	Advice
Mild	Dry cough, loss of sense of taste or smell, mild fever, sore throat, nasal	SPO2 >94% on room air and normal vital	*Home isolation* • Give antipyretic if fever, paracetamol or ibuprofen	• Psychosocial support and bed rest.

[25] MoH & NPHIL Interim guidance on clinical care for patients with C19 in Liberia 2021

	congestion, headache, GI symptoms (e.g., fatigue, diarrhea, discomfort, anorexia).	signs, - feeding adequately	• If the fever persists, reassess and treat specific symptoms and co-morbidities.	• Reassess once daily, including SPO2, vital signs and symptoms check. If new symptoms or escalation, estimate and document the severity score. • Nutritional support: Balanced diet and high intake of water/ fluids.
Moderate	Cough, mild dyspnea	SPO2>94%: Non-severe pneumonia RR 22 – 25/ min	*Home isolation* • Give antipyretic if fever, paracetamol or ibuprofen • Give empiric oral ABs to treat non-severe pneumonia where indicated: • PO Amoxicillin or PO Cefixime 400mg daily x 10 days. • Treat co-morbidities	• Psychosocial support and bed rest. • Reassess once daily, including SPO2, vital signs and symptoms check. If new symptoms or escalation, estimate and document the severity score. • Nutritional support: Balanced diet and high intake of water/ fluids.
Severe	Fever, labored breathing or shortness of breath.	SPO2<94%; RR 26-29 cycles per minute. severe pneumonia	*Refer* • Administer oxygen via face mask during transfer if available. •	
Critical		SPO2<90%; Respiratory rate >30 cycles per minute Severe pneumonia, organ dysfunction • - Severe respiratory distress or SOB (e.g., gasping, grunting, etc.) • - signs of respiratory congestion or pulmonary edema. • - Altered mental status or coma • - Convulsions • - Low (BP < 90/60mmHg) or elevated BP (BP > 150/90mmHg) in a patient without hypertension. • - Reduced urine output		Refer

MANAGEMENT OF COVID-19 BY SEVERITY

Further Care

- For aspects of care not discussed here, including mental health support, post-discharge care and follow up, and management of COVID-19 in special populations such as pregnant women, as well as for full IPC and quarantine guidelines, consult *MoH & NPHIL Interim guidance on clinical care for patients with C-19 in Liberia 2021.*

5.3 Malaria

- For more information, consult Liberia's Pocketbook for Malaria Case Management and

Malaria in Pregnancy[26]. and WHO's Malaria Guidelines[27]

- Malaria is caused by a parasite that is injected into the body through the bite of the infected *Anopheles* mosquitos. It is endemic in Liberia and transmission occurs year-round within all geographic areas. It remains the leading cause of sickness and death, accounting for a third of outpatient consultations and half inpatient cases.

Clinical Features

- **Symptoms:**
  - The parasite destroys the red blood cells, causing fever and symptoms such as headache, chills, sweating, body pains, malaise, loss of appetite and nausea.
  - In children, it commonly presents with vomiting and diarrhea. Mild to moderate anemia is frequent in children and pregnant women.
  - It can quickly progress to complications including anemia, miscarriage, enlarged spleen, convulsions and death.
- Diagnosis
  - Malaria is confirmed with the Rapid Diagnostic Test, RDT
  - Do not repeat RDT within 3 weeks of antimalarial treatment because the test may stay positive even though the malaria parasites have all been destroyed in the blood. Instead, use microscopy to confirm malaria infection.

5.3.1 Uncomplicated Malaria

5.3.1.1 1st line Treatment

- Do not give anti-malarial medication if the RDT is negative
- If RDT is positive, treat with oral artemisinin-based combination therapy. The options include:
  - Artemether + Lumefantrine (AL)
  - Artesunate + Amodiaquine (ASAQ)
  - Artesunate + Pyronaridine
- Give the first dose under direct observed therapy, and follow-up doses can be given at home.
  - The patient should remain about 30 minutes after the first dose under DOT (directly observed treatment) in case he or she vomits up the medication. If so, another dose should be given but counted as the first dose and observed.
  - Refer if further vomiting or signs of severe malaria.
  - The first two doses should, ideally, be given 8 h apart
- Manage Fever
    - Give paracetamol if fever above 38.5°
    - Other causes of acute febrile illness should also be looked for.
  - Give fluids.
    - Patients with fever need more fluids
    - Encourage mothers to provide extra breastfeeding
    - If there is diarrhea, assess and treat as per the diarrhea guidelines.
  - Give advice and consider the risk of escalation to severe malaria

[26] Pocketbook for Malaria Case Management and Malaria in Pregnancy. National Malaria Control Program Ministry of Health, Republic of Liberia. July 2020

[27] WHO Guidelines for malaria, 3 June 2022. Geneva: World Health Organization; 2022 (WHO/UCN/GMP/2022.01Rev.2). License: CC BY-NC-SA 3.0 IGO

- Ask the patient to come back immediately in case of danger signs, or after 2 days if persisting fever.
- Treat for severe malaria if any danger signs:
  - Unable to drink, repeated vomiting, anemia, drowsiness, jaundice, convulsions, unconscious, passing no urine, weak or rapid pulse, severe dehydration, bleeding, difficulty breathing, neck stiffness

- Consider treatment failure:
  - If not improving on the treatment given but no danger signs, change treatment to 2nd line treatment and look for other causes of fever.
- **Treat infants weighing < 5 kg with uncomplicated P. falciparum malaria with ACT at the same mg/kg bw target dose as for children weighing 5 kg.**

Artemether + Lumefantrine

- Each tablet contains a combination of artemether 20mg and lumefantrine 120mg. A six-dose regimen of artemether–lumefantrine is administered twice a day for three days for treatment as in the table below.
- Artemether-lumefantrine can be given throughout pregnancy and in children weighing less than 5kg. In such children use the same dosage schedule as for children weighing 5kg.
- **Avoid in those with history of heart failure**

Weight	Fixed Dose Combination	Dose
≥5kg <15kg	20mgA + 120mg L	1 tablet twice daily for 3 days
≥15kg <25kg		2 tablets twice daily for 3 days
≥25kg <35kg		3 tablets twice daily for 3 days
≥35kg		4 tablets twice daily for 3 days

FIXED DOSING OF ORAL ARTEMETHER-LUMEFANTRINE (AL) IN UNCOMPLICATED MALARIA

Artesunate + Amodiaquine

- Available as fixed-dose combination tablets containing 25 + 67.5 mg, 50 + 135 mg or 100 + 270 mg of artesunate and amodiaquine, respectively. Administered once daily for three days as per the table below
- Can lead to severe low blood white cell count, especially in patients co-infected with HIV and those on zidovudine and/or cotrimoxazole.
- Use with efavirenz also increases exposure to amodiaquine and hepatotoxicity.
- Avoid use in patients taking zidovudine, efavirenz, or cotrimoxazole, unless this is the only ACT promptly available.

Weight	Age	Fixed Dose	Frequency and Duration
≥4.5kg <9kg	2–11 months	25mg AS + 67.5mg AQ	1 tablet daily for 3 days
≥9kg <18kg	1–5 years	50mg AS + 135mg AQ	1 tablet daily for 3 days
≥18kg <36kg	6–13 years	100mg AS + 270mg AQ	1 tablet daily for 3 days
≥36kg	≥14 years	100mg AS + 270mg AQ	1 tablet daily for 3 days

FIXED DOSING OF ORAL ARTESUNATE AMODIAQUINE (ASAQ) IN UNCOMPLICATED MALARIA

Artesunate + Pyronaridine

- Can be used in adults and children weighing 5 kg and over in all malaria-endemic areas.
- Avoid in patients with clinical signs or symptoms of liver disease (such as nausea and/or abdominal pain associated with jaundice) or known severe liver disease.
- Avoid in severe renal impairment

Weight	Fixed Dose Tablet	Number of Tablets	**Duration of Treatment**
20 - <24 kg	Artesunate + Pyronaridine 180mg + 60mg	1 tablet once daily	3 days
24Kg - < 45 kg		2 tablets once daily	
45 - < 65 kg		3 tablets once daily	
65 kg and above		4 tablets once daily	

ARTESUNATE + PYRONARIDINE DOSING

Weight	**Fixed Dose Sachets for Oral Suspension**	**Number of Tablets**	**Duration of Treatment**
5 - <8 kg	Artesunate + Pyronaridine 60mg + 20mg	1 sachet once daily	3 days
8 - < 15 kg		2 sachets once daily	
15 - < 20 kg		3 tablets once daily	

ARTESUNATE – PYRONARIDINE 60 MG/20 MG GRANULES FOR ORAL SUSPENSION

5.3.1.2 2nd Line Treatment

- **Quinine**
  - Only used when ACTs are not available
    - Children and adults under 50 kg: 10 mg/kg three times daily
    - Adults 50 kg and over: 600 mg three times daily

5.3.1.3 Treatment Failure

- Ensure the patient has taken the full course of treatment
- They may have vomited the treatment
- Consider whether there might be another cause for the fever
- Consider whether the quality of the drug is poor i.e., there has been incorrect storage and the drug may have passed its expiry date.
- Refer

5.3.1.4 Treatment of other Malaria species

- *P. vivax, P. malariae*, and *P. ovale* typically cause milder forms of malaria compared to *P. falciparum*.
- They are all sensitive to ACTs
- *P. vivax* and *P.ovale* can form hypnozoites, parasite stages in the liver that can cause multiple relapses. Treatment with primaquine eliminates hypnozoites, removing this risk.
- Treat with ACT as above and refer
- Supportive care remains the same
  - Anti-pyretic treatment with paracetamol should be given, and anemia should be treated

5.3.2 Severe Malaria

5.3.2.1 Clinical Features

- If in addition to a positive test result, the patient has any of the following signs and symptoms, she/he is determined to have severe or complicated malaria:
  - Persistent fever beyond 48 hours

- Inability to feed, drink or, in infants, breastfeed
- Persistent vomiting or vomiting everything taken in
- Convulsions
- Lethargy or unconsciousness (coma)
- Inability to sit or stand
- Fast/difficult breathing
- Becoming weaker and sicker

- Refer immediately all severe malaria cases.

5.3.2.2 Pre-referral Care and referral

- If there are any danger signs that cannot be managed at your level of care, give malaria pre-referral treatment (an initial dose of parenteral artesunate/artemether/quinine as below) and refer immediately to nearest higher-level health facility

Drug	Dose	
Artesunate IM	**In children < 20kg**	**3mg/kg**
	Children > 20kg and adults	**2.4 mg/kg**
Artesunate PR **Only in children aged 6 years and younger** **If the suppository is expelled from the rectum within 30 min of insertion, a second suppository should be inserted and the buttocks held together for 10 min to ensure retention of the dose.**	**10mg/kg**	
Artemether **This is only used where artesunate is not available. Artemether is always given IM and *never* IV**	**Children and Adults**	**3.2 mg/kg**
	Children > 20kg and adults	**2.4 mg/kg**

PRE-REFERRAL TREATMENT OF SEVERE/COMPLICATED MALARIA

Artemisinin-Based Therapy

- Admission is required and 1st line treatment is usually with Artesunate although artemether can be used where artesunate is not available.
- The first dose should be administered prior to transferring the patient
  - Artesunate –
    - Administer the 1st dose of artesunate prior to transferring the patient
    - Dose: In children < 20kg, give 3mg/kg, In children > 20kg and adults, give artesunate IM 2.4 mg/kg of bodyweight.
      - *Note that children that weigh less than 20kg receive a higher unit dose per kg of bodyweight than adults and children that weight more than 20kg.*
  - Artemether - this is only used where artesunate is not available.
    - Artemether is always given IM
    - For adults and children, the dose is 3.2 mg/kg

Protocol for Administration of Artesunate

- Mix the vial of artesunate powder with 1 ml of 5% sodium bicarbonate solution (provided) and shake until clear. The solution should be prepared freshly for each administration and should not be stored.
- IM administration: add 2 ml of 5% glucose or normal saline or distilled water to make the concentration of artesunate 20 mg/ml.
- Example artesunate IM Calculation:
    - Example 1: A Child was brought to the health facility with severe malaria with a weight of 15kg calculate the amount of Artesunate to be given, both IM/IV
        - IM: 15kg x 3mg/kg x 3ml divided by 60mg = 136/60 = 2.2ml
    - Example 2: A Child was brought to the health facility with severe malaria with a weight of 25kg calculate the amount of Artesunate to be given, both IM/IV
        - IM: 25kg x 2.4mg/kg x 3ml divided by 60mg = 180/60 = 3ml

PROTOCOL FOR ADMINISTRATION OF ARTESUNATE

5.3.2.3 Cerebral Malaria

- This is a form of severe malaria that may present with coma and convulsions.
- The treatment is as for severe malaria.
- If there are convulsions, then treat these with diazepam (*see 2.8*).
- Do not give steroids or any other medication.
- Refer immediately

5.3.2.4 Hypersplenism

- Repeated infections with malaria can leave a person with a very large spleen.
- Refer

5.3.3 Prevention and Control of Malaria in Pregnancy

- Malaria in pregnancy can adversely affect the pregnant woman, the developing fetus and the newborn infant.
- In areas of intense and moderate transmission of P.falciparum, most adult women are semi-immune to malaria but immunity may reduce during pregnancy, and malaria may contribute to severe anemia in the mother, which leads to low-birth-weight infants and higher infant mortality.
- In areas lower levels of *P.falciparum* transmission, women have a low level of immunity and are more prone to developing a severe illness and are at risk of death, spontaneous abortion, premature labor or stillbirth.
- For prevention and control of malaria in pregnancy the following recommendations are made:
    - Effective treatment of confirmed malaria cases
    - Intermittent Preventive treatment (IPT) (see 3.1)
    - Sleeping under long lasting insecticide treated mosquito nets.
- Identify malaria
    - Consider diagnosis in all pregnant women with a fever
    - If not available, do a RDT (rapid diagnostic test.)

5.3.3.1 Uncomplicated Malaria in Pregnancy

- Artemether-Lumefantrine can be given in all trimesters of pregnancy.
- Artemether + Lumefantrine can be given in 1st trimester (Dosage as below)
- Oral quinine at a dose of 600mg by mouth three 3 times daily for 7 days is a safe and is an alternative treatment for uncomplicated malaria in the first trimester. Where possible, it should be combined with clindamycin at a dose of 10 mg/kg by mouth twice daily for 7

days.

Stage of pregnancy	First line Treatment for Malaria	Intermittent Preventive Treatment
Before 12 weeks	AL	No
2nd and 3rd Trimester (From 13-40 weeks)	AL	SP (Sulfadoxine/Pyrimethamine)
Post delivery	AL	No

RECOMMENDED MEDICINES FOR TREATMENT AND PREVENTION OF MALARIA DURING PREGNANCY

5.3.3.2 Treatment of Severe Falciparum Malaria in Pregnancy

- Start immediate resuscitation measures especially the airways
- Give recommended 1st dose anti-malarial drug (see below)
- Reduce body temperature with paracetamol, tepid sponging
- Correct convulsions with 10mg rectal diazepam
- Refer immediately

Anti-Malarial Drugs For Severe Malaria In Pregnancy

- The principles are the same as for severe malaria in non-pregnant adults
- Give Artesunate 2.4mg/kg body weight IM and refer.
- Where artesunate is not available, give Artemether 3.2mg/kg body weight IM on diagnosi and refer.

Managing High Risk Complications of Malaria In Pregnancy

- Consult Liberia's Pocketbook for Malaria Case Management and Malaria in Pregnancy[28]
- **Anemia**
  - Mild to Moderate Anemia
    - 120 mg of elemental iron daily, in two separate doses (i.e., 60 mg in the morning and 60 mg in the evening), and
    - 0.4 mg folic acid supplementation until the hemoglobin concentration returns to normal.
  - Severe Anemia:
    - Refer
- **Threatened Preterm Birth**
  - If less than 34 weeks' gestation, stable, and at risk for preterm delivery within 7 days, refer.

Intermittent Preventive Treatment (IPT)

- Pregnant women should be given antimalarial medicine at predetermined intervals during pregnancy to reduce their risk of malaria and adverse birth and pregnancy outcomes.
- Dosage: Three tablets of Sulfadoxine/Pyrimethamine (each tablet containing 500 mg/25 mg Sulfadoxine/Pyrimethamine) dose, for the total required dosage of 1500 mg/75 mg SP.
- It should ideally be administered as directly observed therapy (DOT)
- Sulfadoxine/Pyrimethamine should not be given before week 13 of pregnancy due to an increased risk of fetal malformation. It should start in the second trimester and doses given at each scheduled ANC contact until the time of delivery. Each dose must be at

[28] Pocketbook for Malaria Case Management and Malaria in Pregnancy. National Malaria Control Program Ministry of Health, Republic of Liberia. July 2020

least one month apart.

- At least three doses of IPT with Sulfadoxine/Pyrimethamine should be received during pregnancy. The last dose can be administered up to time of delivery
- Do not give Sulfadoxine/Pyrimethamine if a woman is allergic to sulphonamides. Do not give to women already receiving a sulfa-based medicine as treatment or prophylaxis, including co-trimoxazole (trimethoprim–sulfamethoxazole) for HIV
- High doses of folic acid (daily dose ≥ 5 mg) block effectiveness of SP as an antimalarial, so advise women not to exceed 400mcg daily.

Malaria In Pregnant Women who are HIV infected

- HIV positive pregnant women are at greater risk of developing malaria and get higher levels of parasitemia compared to other pregnant women
- They should be given at least 4 doses of SP for IPT
- HIV positive women on cotrimoxazole do not need to take IPT.

Other Febrile Diseases

This section includes measles and typhoid. For meningitis and septicemia*, see 2.5*

5.3.4 Measles

- Measles is a notifiable and highly contagious disease with high mortality in children who have not been immunized.
- It is rarely seen in infants under 3 months as they have some protection from maternal antibodies.

Symptoms and Complications of Measles	
Symptoms	**Complications**
• Typical viral rash • Conjunctivitis • Sore throat • Cough • Mouth ulcers • Ear infection • Koplik spots	• *Acute malnutrition* • Gastrointestinal: *severe anorexia,* diarrhea with or without dehydration • Respiratory and ENT: otitis media, croup, *pneumonia (50% of children will get with secondary bacterial infection)* • *Central nervous system: febrile seizures, encephalitis* • Eye: conjunctivitis with pus, corneal lesions (pain, photophobia, erosions, and opacities) often from associated Vitamin A deficiency

SYMPTOMS AND COMPLICATIONS OF MEASLES

Principles of Management

- Notify the MoH and begin all measures for control of an epidemic, following MoH guidelines.
- Examine the child and look for complications as above
- Refer all cases with complications, keeping the child isolated from other children.
- Those without major complications can be managed at home. Advise parents/caregivers to monitor for complications and come to clinic if they happen (and refer).
    - Provide supportive care
        - ORS and other fluids to prevent and treat dehydration
        - Zinc to children with diarrhea
        - Paracetamol for fever and distress
        - Treat any symptoms of pneumonia, or eye and ear infections with antibiotics (see 4.2 and 5.2)

- Give Vitamin A to all children to restore low levels caused by disease and prevent eye complications, particularly blindness
  - Do not give vitamin A if given in the past one month or if child is on RUTF
  - Dosage:
    - 50,000 IU for infants 2 – 6 months old
    - 100,000 units for infants 6 – 11 months
    - 200,000 units for children > 1 year
- Treat any ear or eye infections or pneumonia with antibiotics (All unimmunized contacts should be immunized.

Treatment of Severe Measles

- Follow the guidelines given in other sections of this manual for the management of the following complications of measles. Give the 1st dose treatment and refer immediately:

Complication	Treatment
Pneumonia	• Give antibiotics according to severity for pneumonia to all children with measles any signs of pneumonia (*see 5.2.8*)
Otitis Media	• *See 5.2.4*
Diarrhea	• Treat dehydration, bloody diarrhea or persistent diarrhea. (*see 5.1*)
Measles Croup	• Give supportive care, including dexamethasone (see 5.2.2)
Eye Problems	• Conjunctivitis and corneal and retinal damage may occur due to infection, vitamin A deficiency or harmful local remedies. • In addition to giving vitamin A, treat any infection present. • Clean the eyes with a clean cloth dipped in clean water. • Apply tetracycline eye ointment 4 x a day for 5 days. Or Gentamycin 0.3% eye drops or Ofloxacin 0.3% eye drops 4 x day for 5 days. DO NOT USE TOPICAL STEROIDS. *See 6.10*
Mouth Ulcers	• If the child can drink and eat, clean the mouth with clean, salted water (a pinch of salt in a cup of water) at least four times a day. • If any likelihood of development of *Cancrum oris*, *see 4.4.5*
Neurological Complications	• Convulsions, excessive sleepiness, drowsiness or coma may be symptoms of encephalitis or severe dehydration. • Assess the child for dehydration and treat convulsions accordingly. Intensive nursing care.
Severe Acute Malnutrition	• *see 4.4.5*

5.3.5 Typhoid fever

Clinical Features

- Systemic disease caused by ingestion of food or water contaminated with *Salmonella typhi* or *paratyphi,* or contracted from persons who are acutely ill with or healthy carriers (1 – 3% of those who recover) of the disease.
- Acute febrile illness. Fever > 38°C for over 3 days, and headache, diarrhea or constipation, anorexia, and nausea. 50% of patients have enlargement of the liver and spleen. Rose spots, a rash on the skin and chest, are difficult to see.
- Complications include intestinal bleeding and perforation, pneumonia, myocarditis, convulsions and meningitis.

Diagnosis

- Dangerous disease but over diagnosed due to misinterpretation of antibody tests.
- Diagnosis is in hospital by blood culture or clinically.
- Antibody tests correlate poorly with blood culture result—many healthy people have antibodies from previous infection with one of the 200 related salmonella organisms that cause mild diarrheal disease.
- A positive antibody test does not necessarily mean a patient has active disease from Salmonella typhi or paratyphi.

Treatment

- Treat milder cases for 7 days, severe cases for 10 days with one of the following antibiotics:
- If low risk of fluoroquinolone resistance, give 1st does ciprofloxacin PO 500mg
- 1st dose Ciproflloxacin PO 15 mg/kg/dose
    - 3-<6 kg 50 mg
    - 6-<10 kg 100 mg
    - 10-<15 kg 150 mg
    - 15-<20 kg 200 mg
    - 20-<30 kg 300 mg
    - 30 kg 500 mg
- Refer

5.4 Genitourinary and Sexually Transmitted Infections

- *Consult WHO guidelines on the management of STIs[29], and WHO's AWaRE antibiotic book[30].*

5.4.1 Prevention of STIs & HIV

- Dual protection significantly reduces the risk of STIs (including HIV, hepatitis B and C) and unplanned pregnancy.
- It can be achieved by the consistent use of male and/ female condoms and the use of another method to protect against unplanned pregnancy (a hormonal method or IUD, *see 2.1*).
- The involvement of men is crucial to the success of dual protection.
- Hormonal methods do not protect women against STIs including Hepatitis B, C and HIV.

Condoms

- Male condoms significantly reduce the risk of becoming infected with HIV or another STI when used correctly with every act of sex. All men can safely use male condoms except those with a severe allergic reaction to latex. Correct condom use must be explained when dispensing condoms.

Consistent messaging to prevent HIV and STIs

- Stigma reduction by raising awareness
- HIV prevention through Behavioural Change Communication (BCC)

[29] Guidelines for the management of symptomatic sexually transmitted infections. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO

[30] The WHO AWaRe (Access, Watch, Reserve) antibiotic book. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

- Display and dissemination of educational materials
- Provision of female and male condoms
- Post-test clubs
- Community mobilization
- Promotion of abstinence; faithfulness and condom use
- Promotion of partner engagement.

5.4.2 Antibiotics in Pregnant and Breastfeeding Women

- The following antibiotics **should not be prescribed** during pregnancy, childbirth and breastfeeding:
    - Ciprofloxacin
    - Doxycycline
    - Fluconazole
    - Tetracycline
    - Metronidazole (in high doses)

5.4.3 Syndromic Management of STIs

- Syndromic management is an important approach to managing symptomatic STIs, particularly where laboratory diagnosis is not readily available.
- enables all trained first-line service providers to diagnose an STI syndrome and treat patients on the patient's first visit,
- It involves using symptoms and clinical findings to diagnose probable causes of STI syndromes, allowing early treatment and reducing spread of disease.
- Where available, rapid diagnostic tests can be used to refine the diagnosis.
- Advise all patients on risk reduction and condom use, and offer HIV counselling and testing

5.4.3.1 Vaginal Discharge

- Establish clinical diagnosis based on sexual history and risk assessment.
- Examination:
    - Assess for pelvic inflammatory disease, surgical conditions, or pregnancy
    - External vulvovaginal examination to visualize any lesions, overt genital discharge or vulval erythema and excoriations.
- If patient has lower abdominal pain as well as discharge, treat for *pelvic inflammatory disease (*but first see Lower Abdominal Pain, *below*)
- Assess risk:
    - If sexually high risk, treat for *chlamydia* and *gonorrhea (*treat partner also).
    - If low risk and sexually active, as below
        - Discharge is frothy and green, treat for *Trichomonas* (treat partner also)
        - Discharge is grey with a fish-like smell, treat for *bacterial vaginosis*
        - Discharge is white and creamy, with itch, treat for *Candida*
- Advise on risk reduction, HIV counselling and testing and condom use if appropriate
- Remember that there may be more than one cause present, that discharge may be physiological or due to a foreign body in the vagina
- Ask to return in 3 days if not better

5.4.3.2 Genital Ulcer Disease, Women and Men

- Establish clinical diagnosis based on sexual history, risk assessment and clinical examination.

- If the patient has several painful vesicles or small ulcers, treat for *genital herpes simplex*
- If the patient has a single ulcer and no enlarged or tender inguinal nodes, treat for *syphilis* and *chancroid*
- If the patient has a single ulcer and tender inguinal lymph nodes, treat for syphilis and chancroid, and for *Lymphogranuloma venereum*
- Add treatment for chlamydia and gonorrhea if the patient has positive sexual risk factors, or if urethral or vaginal discharge is present.
- Treat partner as appropriate
- Follow-up as follows:
  - Ask to return for in 7 days if not improving
  - If ulcer(s) still present and not healing, reconsider diagnosis as a course of treatment might be needed for an alternative diagnosis.

5.4.3.3 Lower Abdominal Pain, Women

- If missed or overdue period, recent delivery, or abortion, abdominal mass, rebound tenderness or guarding or abnormal vaginal bleeding, investigate as *potential ectopic pregnancy*: Do urine pregnancy test, if positive refer urgently.
- If pregnancy test negative, and vaginal discharge is present, treat for *pelvic inflammatory disease* (*below*)

5.4.3.4 Urethral Discharge in Men and Women

- Confirm discharge
- If confirmed, treat for chlamydia and Gonorrhea as below
- Advise on risk reduction – offer HIV and Syphilis testing, counsel on condom use
- Notify and manage partner
- Ask to return for retest in 3 to 7 days
- If re-infection or poor compliance, treat again
- If re-infection unlikely and compliance good, treat for trichomonas.

5.4.3.5 Inguinal Swelling and Bubo

- Usual Causes include Chancroid and lymphogranuloma venereum. Treat as below.

5.4.4 Treatment of Genitourinary Infections and STIs

5.4.4.1 Candida

Medicine	Age	Dose
Clotrimazole Vaginal Pessary	Adults	Woman to insert in vagina at home. 200mg pessary for 3 consecutive nights, **or** 500mg pessary as a single dose
Miconazole 200mg Vaginal Pessary		Woman to insert in vagina at home. 1 x 200mg Miconazole pessary each night for 3 nights

TREATMENT OF CANDIDA WITH VAGINAL PESSARIES

Medicine	Age	Dose	Duration
Fluconazole	Adults	150mg capsule	Single dose
Do not give Fluconazole in pregnancy.			

ORAL FLUCONAZOLE FOR CANDIDA

5.4.4.2 Bacterial Vaginosis and Trichomonas

Medicine	Age	Dose
Tinidazole	Adults	2g PO as a single dose
Metronidazole		2g PO as a single dose 400mg – 500mg twice daily for 7 days.
In case of suspected Trichomonas, treat partner also		

TREATMENT OF BACTERIAL VAGINOSIS AND TRICHOMONAS

5.4.4.3 Gonorrhea

- Genital and anorectal infections, oropharyngeal infections
    - Adults and children >45kg:
        - Ceftriaxone 250mg IM, single dose **plus** Azithromycin 1g PO, single dose, **or**
        - Cefixime 400 mg, PO, single dose **plus** Azithromycin 1 g, PO, single dose
- Retreatment after treatment failure
    - Refer.

5.4.4.4 Chlamydia and Lymphogranuloma Venereum

- Suspect Lymphogranuloma venereum if unilateral inguinal or femoral lymphadenopathy with or without an associated primary lesion. The primary lesion is usually a transient ulcer or papule on the genitalia or rectum which often goes unnoticed.
- Can also present as itching, discharge and bleeding and pain of the rectum if rectal exposure.
- Refer

5.4.4.5 Genital herpes

- Refer

5.4.4.6 Syphilis

- Refer

5.4.4.7 Chancroid

- Refer

5.4.4.8 Epididymitis

- Refer

5.4.4.9 Genital warts

- Refer

5.5 HIV (Human Immunodeficiency Virus)

- *Consult Liberia National Integrated Guidelines*[31] and subsequent updates
- Around 1.1% of Liberia's population is HIV positive, meaning there are an estimated 34,000 people living with HIV in the country.

[31] Liberia Integrated Guidelines for Prevention, Care and Treatment of HIV and AIDS. November 2022.

- One third of these do not know their status, and may not be taking appropriate actions, such as engaging in safe sex or receiving treatment, to avoid transmitting the disease
- Just under a half are not on ART.
- Most new infections occur in sex-workers, their clients, and through peri-natal transmission, and new infections are more common in women than men. Testing should focus on these groups and other high-risk groups such as: truck drivers; migrant workers; people in prisons and other closed settings; members of the uniformed forces; men who have sex with men (MSM); and survivors of sexual assault.
- Testing should also be carried out on all those with tuberculosis (TB) and opportunistically, when treating for other illnesses such as pneumonia, diarrhea, sexually transmitted infections, malnutrition and in pregnancy.

5.5.1 General Principles of Management (PLHIV)

- Clinicians should follow the *Liberia National Integrated Guidelines for prevention, care and treatment of HIV and AIDS in Liberia 2022* and subsequent updates.
- These include guidance on assessing HIV status and on voluntary counselling and testing, clinical review of patients, reviewing TB status, managing chronic problems, dispensing ART and other medication, positive prevention for people with HIV and special considerations in chronic HIV care.
- These guidelines are summarized here.

5.5.2 Testing

- HIV testing is either patient initiated, or provider initiated. The aim is to identify as many HIV infected people as early as possible, and ensure they start ART as soon as possible. Provider initiated testing should be offered to everyone.
- Regardless of the approach or model, *testing is voluntary*.
- All patients need validated HIV antibody test according to Liberia national HTS guidelines.
    - HIV serostatus is confirmed with positivity on three different rapid diagnostic tests.
- All children < 2 y need a confirmatory DNA-PCR test (but do not delay treatment to await results).
- Testing must adhere to the five C's: Consent, Confidentiality, Counselling, Correct test, and linkage to Care.
- Key populations noted above should be retested at least annually. This is also recommended for HIV negative partners in serodiscordant couples.
- After a positive HIV test a patient should ideally have a counselling session to explain the diagnosis and then have an assessment by a health care worker.
- Refer any people with positive test or possibility of HIV or those wanting a test if test unavailable.

5.5.3 Staging

- WHO staging should be carried out at time of diagnosis and at follow-up appointments. Patients should be weighed and assessed for malnutrition and local guidelines followed if concerns.
- CD4 count <200 at diagnosis needs special attention and more intensive screening for opportunistic infections including checking serum cryptococcus antigen
- If known to be using any hazardous substances (alcohol or drugs) patients should be advised to gradually reduce.

- If patient is pregnant follow prevention of mother to child transmission (PMTCT) guidelines (see below).

5.5.4 Non-ART Treatment

5.5.4.1 Treatment of Co-Infections

- Any pre-existing infections should be treated as a priority. Many patients will present with opportunistic infections at time of diagnosis. Refer all patients for testing and screening.
- TB and cryptococcal meningitis are the most common causes of morbidity and mortality in people with HIV in West Africa.
- If a symptomatic patient is diagnosed with TB:
    - TB treatment should be initiated first and ART should be started *within 2 weeks* of TB treatment.
    - If patient is stable when HIV and TB are diagnosed, then ARV and TB treatment can be started immediately.

5.5.4.2 Co-trimoxazole Prophylaxis

- Co-trimoxazole prophylaxis should be started immediately in all those diagnosed with HIV: adults (including pregnant women); children > 6 weeks old; and HIV exposed infants > 6 weeks old. Clinics may give follow up doses after prophylaxis has been initiated in ART center.
- *It is contra-indicated in infants < 6 weeks as it can cause hepatotoxicity.*
- Co-trimoxazole is a fixed-dose combination of two antimicrobial drugs (sulfamethoxazole and trimethoprim) that covers a variety of bacterial, fungal, and protozoan infections.
    - It prevents *Pneumocystis jiroveci* pneumonia but also other organisms causing pneumonia, toxoplasmosis, diarrhea, and malaria.
- Co-trimoxazole preventive therapy is a feasible, well-tolerated and inexpensive intervention for people living with HIV to reduce HIV-related morbidity and mortality.
- Co-trimoxazole prophylaxis should be continued for adults (including pregnant women) with HIV infection even when clinically stable on ART. They are also taken for those with TB co-infection
- Contradictions
    - Do not give if jaundiced or in kidney failure
    - Do not give if previous reaction to a sulfa medicine
    - If grade 1 allergic skin reaction refer.

Weight Band	Co-trimoxazole (Sulfamethoxazole/ Trimethoprim/) Dose
3.0–5.9 kg	100mg/20mg PO once daily
6.0–9.9 kg	200mg/40mg PO once daily
10.0–13.9 kg	200mg/40mg PO once daily
14.0–19.9 kg	400mg/80mg PO once daily
20.0–24.9 kg	400mg/80mg PO once daily
Children > 25kg and Adult	800/160 PO once daily

WEIGHT DOSING CHART FOR CO-TRIMOXAZOLE PROPHYLAXIS

5.5.4.3 TB Preventive Therapy (TPT)

- All adults and children diagnosed with HIV should be considered for TPT—TB is 20 times more common in people living with HIV.

- Studies have shown that IPT reduces TB incidence by about 60% in HIV infected individuals.
- To prevent TB disease in PLHIV the “three I’s” strategy is implemented:
    - Intensified Case Finding (ICF)
    - Isoniazid Preventive Therapy (TPT)
    - Infection control whenever PLHIV present to health facilities

Intensified Case Finding

- This involves ruling out active TB with the standard screening questions below:
    - Current cough: any duration, productive or non-productive
    - Unexplained weight loss (adults)
    - Failure to thrive and/or malnutrition (children)
    - Fever and/or night sweat
- If so they should be referred for sputum testing for TB.

Isoniazid Preventive Therapy (IPT)

- Liberia presently adopts daily IPT for 6-months. It can prevent active TB disease in people who are at high risk for about 3 years.
- Clinics may give follow up doses after prophylaxis has been initiated in ART center.
- Give IPT to the following:
    - HIV infected children and adults, including pregnant women, for 6-months
    - Children under 5 years – regardless of HIV status - who live with a patient with pulmonary TB (sputum smear negative or positive), for 6-months.
    - Pregnant Women who are HIV positive and do not have symptoms of TB
- In all PLHIVs:
    - New patients: start IPT together with ART and CPT.
    - Patients already on ART: start IPT regardless of the time on ART.
    - Give IPT regardless of previous TB treatment or prior use of IPT.
- IPT is well tolerated by over 95% of patients and most side effects are mild and disappear within the first 3 months, however, the safety of IPT in pregnancy is debatable and currently awaiting WHO guidance.
- It is **given with** Pyridoxine to prevent the side effect of peripheral neuropathy.
- Alcohol should be avoided while on Isoniazid therapy
- Serious side effects are uncommon: hypersensitivity, neuropathy and severe hepatitis.
    - Stop IPT if any of the following are seen:
        - Vomiting
        - Pellagra-type skin rash in sun-exposed areas and other severe skin rash
        - Yellow eyes / Dizziness / confusion / convulsions
        - Severe numbness/burning pain and muscular weakness of legs and/or arms

IPT in Children

- In children IPT should be given as for adults if aged > 1 yrs.
- Clinics may give follow up doses after prophylaxis has been initiated in ART center.
- If < 1 yr, only those who have **definite contact** with a case of TB should be given IPT – and only after being actively assessed for TB.
- IPT is also recommended for children of breastfeeding mothers with active TB and for any HIV infected children exposed to TB through household contacts.
- Always exclude active TB before starting.

Medicine	Age	Dose
Isoniazid	Children 14 years and under	10mg/ kg by mouth once daily
	Adults, including pregnant women	> 60kg: 300mg by mouth once daily < 60kg: 5mg/kg by mouth once daily
Pyridoxine	Children 14 years and Under	25mg by mouth once daily
	Adults (including pregnant women)	50mg by mouth once daily

ISONIAZID PREVENTION THERAPY IN HIV

Alternatives to Isoniazid-based TPT

- An alternative and shorter TPT to Isoniazid is 3HP
- Clinics may give follow up doses after prophylaxis has been initiated in ART center.
- It is a short-course treatment to prevent TB; it combines Isoniazid (H) – 900mg and Rifapentine (P) – 900mg to be taken **once weekly for 12 weeks**.
- Those that can benefit from 3HP are people living with HIV and other household contacts above the age of 2 years irrespective of their HIV status.
- 3-HP is as effective as IPT, but evidence suggests it is less toxic on the liver.
- Has a higher chance of completion, but more risk of systemic reaction Follow the table below for 3-HP administration based on weight:

Table 8: Dosing of rifapentine and isoniazid for treatment of latent TB infection

Medicine	Formulation	Weight bands for patients 2-14 years					Comments
		10–15 kg	16–23 kg	24–30 kg	31–34 kg	>34 kg	
Isoniazid	100 mg	3	5	6	7	7	adult 300 mg tab. can reduce pill burden
Rifapentine	150 mg	2	3	4	5	5	
Isoniazid+ Rifapentine	150 mg / 150 mg	2	3	4	5	5	FDC being developed

Medicine	Formulation	Weight bands for patients >14 years					Comments
		30–35 k	36–45 kg	46–55 kg	56–70 kg	>70 kg	
Isoniazid	300 mg	3	3	3	3	3	
Rifapentine	150 mg	6	6	6	6	6	
Isoniazid+ Rifapentine	300 mg / 300 mg	3	3	3	3	3	FDC being developed

3HP DOSING FOR TB PREVENTION

5.5.5 Anti-retroviral therapy (ART)

Initiating ART

- ALL HIV positive adults, adolescents, and children are eligible to start ART irrespective of CD4 count or WHO stage.
- Only NACP-approved and trained clinical ART providers are authorized to prescribe ART. All patients need a validated HIV test as per Liberia HTS guidelines.
- Once started, ART must be taken every day for life.
- ART is started as soon as possible after testing HIV positive, and for pregnant women ideally on the day of diagnosis.
- Treatment may need to be delayed if treating an opportunistic infection (*see above*).
- ART requires combining 3 different ARVs that act differently to avoid development of drug-resistant HIV.
- Refer to ART center.
    - 1st Line regimens are the best. Patients can remain on the same 1st line regimen possibly for life if they are fully adherent and virally suppressed.
    - 2nd Line regimens are offered for patients who have confirmed treatment failure on1st line regimen (usually due to poor adherence in the past). The appropriate

2nd line regimen is determined by the 1st line regimen that the patient was taking when failing.

- 3rd Line regimen is a last resort for patients failing on second line. This requires confirmation of drug resistant virus using genetic analysis in the lab.

Adherence

- Prior to starting ART patients should receive psychosocial assessment and adherence counselling at the ART center.
- Where possible ART is given as a Fixed Dose Combination to be simple, effective and better tolerated. It enhances adherence and simplifies procurement and supply chain management.
- Patients need to take 95% of doses at prescribed intervals for life to prevent HIV drug resistance.

General Considerations

- ART should be taken the same time each day, at the most convenient time to patient (morning, noon, or night; before, with or after food) but see under DTG and EFV.
- For a forgotten dose if less than half-way to next dose, take the missed dose and the next dose on time; if over half-way, skip the dose and take the next one on time.
- For women provide contraceptive counselling. Advise condom use in all HIV positive people during sex especially during the 1st 6 months after starting ART.

5.5.5.1 Follow-up on ART

- Follow-up care is an important component of care of PLHIV
- Ensure patients attend regular face-to-face follow-up at ART center as below, ensuring that those who have missed their appointments are traced.

Follow-up Interval	Tasks	Specific Tasks
2 Weeks	• Record WHO staging • Monitor weight at every appointment (and height of children every 6 months) • Check BP in adults > 30 years every 6 months • Refer for nutritional support if available and appropriate • Treat any inter-current infections.: ○ If ongoing infections and illness after 6 months on ART, consider treatment failure. • Ask about side effects and adherence • Provide routine adherence support at every assessment and intensive adherence counselling if needed. • Trace anyone who has missed their appointment.	• Ask about side effects and adherence
4 Weeks		• Monitor and assess for signs of Immune Reconstitution Inflammatory Syndrome (IRIS)
Then follow up as follows: ○ Monthly for 6 months ○ Once every 6 months		

FOLLOW-UP AFTER INITIATION OF ART

5.5.6 Prevention of Mother-to-Child Transmission (PMTCT)

- Globally, 90% of children with HIV infection get HIV from mothers during pregnancy, childbirth and breastfeeding.

- Without intervention, the rate of transmission of HIV from mother to child via pregnancy, labor, or breastfeeding ranges from 15 – 45%. Intervention can reduce this to less than 1%.
- The 4 main strategies for PMTCT are:
    - Primary prevention of HIV infection
    - Prevention of unintended pregnancies in women living with HIV
    - Prevention of HIV transmission from women living with HIV to their infants
    - Provision of care and support to women infected with HIV, their children and families
- PMTCT is offered at ANC, during delivery and postnatally as an integrated service.

HIV Status Ascertainment

- Test all women not known to have tested positive, as well as those who have tested negative in the past.
- Women should be tested in first trimester/or at first ANC visit; in 3rd trimester during labor/or delivery; and at 6 weeks postnatally.

5.5.6.1 General Antenatal Care

- Women who are positive for HIV need to be seen at the ART centre and by the team who will supervise their delivery care.
- If newly diagnosed with HIV, women should be referred to start on ART as soon as possible.
- Pregnant and breast-feeding women should receive the same care and treatment services as other PLHIV. VL monitoring, where available, should be a priority in this group.
- Couple testing should be offered as well with support for disclosure if needed. If a woman is negative but her partner positive, consider PrEP.
- At least monthly ANC visits are recommended. Offer:
    - Co-trimoxazole prophylaxis
    - TB screening, counselling and prophylaxis
    - Nutrition education, counselling and nutrition assessment.
    - Education about preventive WASH activities at home.
    - Apply principles of good chronic care.
    - Birth spacing counselling for after delivery

5.5.6.2 ART in PMTCT

- Mothers already on ART will be advised as follows by the ART center:
    - Continue the same ART regimen at regular prescribed intervals.
    - Pregnancy / breastfeeding are no indication to change women from any previous ART regimen.
- HIV positive mothers not yet on ART / who interrupted / stopped ART: refer for emergency ART initiation
    - Start lifelong TDF/3TC/DTG as soon as possible, during labor or after delivery.
    - Deliver individual ART counselling and IEC before discharge.

5.5.6.3 Intrapartum Care

- Any woman with known HIV should deliver in the hospital.
- Testing should be carried out in labor if a woman has not been previously tested or tested negative more than 3 months ago.

- To reduce obstetric risk of HIV transmission, it is suggested that medical staff:
    - Use a partogram to allow early detection and management of prolonged labor.
    - Artificial rupture of membranes (ARM) increases the risk of HIV transmission.
    - ARM is not indicated if labor is progressing well. ARM should not be performed in clinics.
- Refer all HIV+ve women in labor to hospital
- If prolonged labor due to poor uterine contraction refer.
- Do not perform routine episiotomy except for specific obstetric indications (e.g. vacuum extraction).
- Avoid vaginal examination.
- Do not 'milk' the umbilical cord before cutting if a HIV+ve woman delivered in the clinic.
- Do not suction with a nasogastric tube unless there is meconium-stained liquor.

5.5.6.4 Newborn Prophylaxis

- Nevirapine is used for prophylaxis in the newborn/neonate. It protects the baby from HIV infection during the riskiest time of pregnancy, delivery, and breast feeding. It is given at the hospital to newborns of HIV+ve women.
    - NVP syrup is given in hospital as soon as possible after birth. The earlier the start, the more effective it is.
    - NVP syrup is given to the baby 24-hourly for 6 weeks.
    - All babies should take NVP syrup for the same duration regardless of the mother's ARV regimen and regardless of, if the mother was not taking ARVs at all.
- Although, NVP syrup can be started anytime between birth and 4 weeks of age if the mother presents late, starting NVP prophylaxis later is less effective and may cause drug-resistant HIV if the baby is already infected (and needs to start ART).
- NVP syrup is stopped when the infant is 6 weeks old. The infant will receive less than 6 weeks of prophylaxis if NVP syrup has been started late.
- If authorized, it can sometimes be dispensed at ANC (or maternity) as soon as the mother is known to be HIV-infected.
    - Unopened bottles of NVP syrup have a long shelf-life. Therefore, never delay dispensing until later in pregnancy.
    - Dispense 2 x 100ml bottles and a syringe. Make sure the expiry date is at least 2 months after the estimated delivery date.
    - Ask at every following visit if the NVP syrup and the syringes are still available. Immediately replace any items that may have been lost or spoilt.

Birth weight	NVP Syrup	AZT
2,500g or less	10mg once daily	10mg twice daily
Over 2,500g/ unknown	15mg once daily	15mg twice daily

DOSING OF NVP SYRUP FOR INFANT PROPHYLAXIS

5.5.6.5 Breastfeeding

- Mothers known to be infected with HIV (and whose infants are HIV uninfected or of unknown HIV status) should *exclusively breastfeed their infants for the first 6 months* of life and then breast feed and give solids till when the baby is around 18 months and then phase out breast feeding, stopping by 22 months.
- If there is inadequate alternative feeding, breastfeeding may need to be continued for the first 12 months of life. Breastfeeding should then only stop once a *nutritionally adequate and safe diet* without breast milk can be provided.

- If a mother cannot breastfeed, consider/offer:
    - Wet nursing with a HIV negative mother
    - Breastmilk substitute. Give instructions on cleaning bottles and teats correctly.
- HIV exposed infants can have very fast disease progression. Without treatment, one out of every two children infected at birth die by two years of age.
- **Advise breastfeeding women that the key to avoiding HIV transmission is adherence to ART in the mother.**

5.5.6.6 Follow-up Postnatal and Newborn Care

- A joint follow-up visit at 6 weeks for mother and child at the health center or hospital. If she doesn't make it there, then do this in the clinic but advise her to also attend the health center or hospital.
    - For the mother:
        - post-partum check
        - provision of vitamin A
        - family planning counselling services
        - reinforcement of safe feeding practices
        - cervical cancer screening where available
- For the child:
    - Ongoing ARV prophylaxis if appropriate
    - Infants who are diagnosed as being HIV infected are referred to the ART center.
    - Routine immunization, growth and development monitoring
        - All HIV exposed and infected individuals should be immunized as per Liberia's EPI schedule.
        - BCG should *not be given* to infants and children with symptomatic HIV infection.
    - Co-trimoxazole prophylaxis from 6 weeks
    - Vitamin A every 6 months
    - Isoniazid prophylaxis to prevent TB if appropriate
    - Mother and family care
- Regular follow-up at the ART center should continue for mother and the child, until the child is 18 months or until the mother stops breastfeeding. HIV infection below 18 months is confirmed using DNA PCR. Infection among children 18 months and older can be confirmed using rapid HIV antibody tests.

5.5.7 Children Living with HIV

Care of Children Living with HIV

- ALL infants and children with HIV should be started on ART regardless of WHO stage or CD4 count. This includes those less than 18 months who have a presumptive diagnosis of HIV.
- Refer to ART center
- Prior to starting treatment children and parents/guardians should receive adherence counselling at the ART center.
    - They should be educated that treatment will be life-long.
    - The counselling covers topics similar to adult counselling but in addition touches on timing of disclosure of status, the challenge of sustaining confidentiality and minimizing stigma.

Malnutrition in Children with HIV

- Severe acute malnutrition (SAM) is a common presentation of HIV, especially in children.

- Any child with malnutrition should be tested for HIV.
- Children with SAM who are HIV-infected should be treated in the same way as those who are not HIV-infected. Refer to OTP
    - F-75 is initially used for feeding as per local treatment guidelines.
    - If not receiving F-75, F-100 or therapeutic food, HIV infected children with SAM should receive high dose vitamin A and zinc if they have diarrhea. (*See 3.4*).
- Overall, amongst infants (SAM and non-SAM), early ART initiation is associated with a 4-fold reduction in mortality.
    - Children with SAM who are HIV infected should be referred to start on ART as soon as possible **after stabilisation** of metabolic complications and sepsis.
    - This would be indicated by return of appetite and resolution of oedema.
    - HIV-infected children with SAM should be monitored closely once on ART to identify opportunistic infections and complications.
- If TB is identified at presentation of SAM, TB treatment will be given before ART, and ART initiation delayed by at least 2 weeks.
- Other minor opportunistic infections should be treated at presentation, but this should not delay ART initiation.

5.5.8 Post-Exposure Prophylaxis (PEP)

- PEP is short term use of ART to reduce the likelihood of acquiring HIV infection after potential exposure either occupationally or through sexual intercourse.
- In the **occupational setting** this initially involves giving immediate care after a sharps injury or exposure.
    - PEP can only be given in the 72 hours after exposure and when there has been a definite risk of HIV infection.
    - wash the wound or exposed area thoroughly.
    - counsel about HIV risk and benefits of PEP
    - refer
- PEP can be given **after sexual assault** again up to 72 hours after exposure. There must be a definite risk of infection.
    - Counsel about HIV risk and benefits of PEP
    - Strongly recommend VCT. If tests HIV +ve then refer for HIV care
    - Refer for assessment, PEP and follow up
- .Give emergency contraceptive (EC) if needed

5.5.9 Pre-Exposure Prophylaxis (PrEP)

- Consult national guidelines on PREP[32] for more information.
- PrEP is defined as the use of ART by people who are not infected with HIV before HIV exposure to prevent HIV infection.
- This may include members of key populations (i.e., men who have sex with men [MSM], female sex workers [FSWs], people who inject drugs [PWID]), HIV-negative partners in serodiscordant relationships, members of priority populations (e.g., uniformed services, transport workers, prisoners, mobile traders, and miners), and others who request PrEP for reasons they do not wish to disclose
- In all cases, oral PrEP should be used as part of a broader combination of HIV prevention approaches e.g., condom use.

[32] National AIDS-STI Control Program (NACP). Step-by-Step with Oral PrEP: Using Oral Pre-exposure Prophylaxis for the Prevention of HIV in Liberia. Monrovia, Liberia. 2021.

- When used as directed, oral PrEP can reduce the risk of HIV through sexual transmission among at-risk individuals by more than 90 percent.
- Contraindications include:
    - HIV-positive test result using the national HIV testing algorithm
    - Known exposure to HIV in the past 72 hours (offer PEP)
    - Symptoms of Acute HIV infection **and** potential exposure or risk within the past 14 days.
        - Defer oral PrEP and consider PEP counseling for clients with a history of unprotected sex in the past three days, even in the absence of symptoms of AHI.
    - Inability to commit to adhere to oral PrEP and to attend scheduled oral PrEP clinical visits
    - Drug allergy to any component of the drugs being used for oral PrEP
    - Creatinine clearance less than 60 mL/min, if known, or concurrent nephrotoxic medication
    - Chronic hepatitis B infection (ED-PrEP only) Impaired renal function is a contraindication for this type of PrEP.
- In Liberia, the current preferred regimen for daily oral PrEP is TDF/3TC or TDF/FTC. Refer to ART center

5.5.10 Treating HIV-Related Diseases

- Most of the problems in this section indicate active HIV disease and are seen in patients who either have not yet or have only recently started ART. They can also indicate a problem with adherence or resistance. Some may delay initiation of treatment.
- Consult national[33] and WHO[34] guidelines for additional information on managing these conditions.
- Refer these cases

Persistent Diarrhea

- For more than 4 weeks for adults (more than 2 weeks for children)
- Assess for, prevent, and treat dehydration.
- Ensure a supportive diet, give zinc supplements for 10 days
- Refer

Vaginal Candidiasis:

- Give fluconazole 200mg PO on the first day and refer.
- Do not give during pregnancy.

Oral Candidiasis

- Use nystatin oral suspension for 7-14 days
    - Adults: 4ml 6 hourly, Child:1ml 6 hourly
- Refer if persisting

Esophageal Candidiasis:

[33] National AIDS-STI Control Program (NACP). Step-by-Step with Oral PrEP: Using Oral Pre-exposure Prophylaxis for the Prevention of HIV in Liberia. Monrovia, Liberia: NACP; 2021.

[34] Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO.

- Refer

Herpes Zoster
- Refer

Tinea Corporis/Cruris/Pedis
- Treat with clotrimazole or miconazole cream.
- Refer if not settling improving.

Persistent Fever
- Test and treat for malaria if RDT +ve *see 5.3.*
- If RDT -ve manage as acute fever, *see 5.4*
- For severe sepsis, *see 2.3.*
- If fever persists after acute treatment, consider chronic causes of fever including TB.
- Refer

Prolonged Acute Respiratory Infection (ARI)
- PLHIV and particularly children commonly present with prolonged ARIs
- Children can get frequent and severe otitis media
- Antibiotic treatment will be given for longer and higher doses but refer.

Pneumonia
- Grade severity and treat appropriately
- Mild Presentation
    - Children – *see 5.2*
    - Adults
        - If mild infection, use oral amoxicillin **or** doxycycline **or** erythromycin **or** azithromycin once daily for 5 days in adults.
- Severe
    - Children – *see 5.2*
    - Adults
        - Refer

5.5.11 *Pneumocystis jirovecii* Pneumonia
- Presents with progressive shortness of breath, dry cough, progresses rapidly. Causes low oxygen levels especially on exertion.
- Refer if suspected.

5.5.12 Cryptococcal Meningitis
- This is an AIDS-defining illness
- Slow onset severe headache; confusion; convulsions; +/- fever; +/- neck stiffness
- Refer

5.5.13 Toxoplasmosis
- New convulsions, possibly reduced consciousness, focal neurological symptoms
- Refer

Tuberculosis
- See HIV-TB Co-Infection, *see 5.7*

5.6 Tuberculosis

- Consult national[35] and WHO[36] guidelines
- TB is a notifiable chronic mycobacterium infection that most commonly affects the lungs (Pulmonary TB, PTB) but can also affect every other part of the body (Extra-pulmonary TB, ETB).
- In 2018 there were an estimated 15,000 people infected with TB in Liberia, 2,600 of these co-infected with HIV. Anyone is at risk of TB, but significant risk groups in Liberia that make up a third of those infected also include children, close contacts with a person who has active TB, having diabetes, living in slums, prisoners and people who inject drugs.
- Tuberculosis is treatable with a six-month course of antibiotics. 2.5% of new TB cases are resistant to standard TB drugs.

Transmission

- Transmission is by inhalation of airborne droplets containing bacilli expelled by infectious people (during sneezing or coughing) or by ingestion of raw milk containing *Mycobacterium bovis.*
- TB can be transmitted to health care workers so patients should be assessed in a well-ventilated area if possible.
- Face masks should be used by patients and staff if available to prevent nosocomial transmission.

Latent Disease

- In healthy people, infection with Mycobacterium tuberculosis (MTB) often causes no symptoms since the person's immune system acts to “wall off” the bacteria.
- About one in ten latent infections eventually progresses to active disease which, if left untreated, has more than 50% mortality.

Active Disease

- The most common symptom of Tuberculosis is persistent cough for 2 weeks or more duration.
- Other symptoms of TB are:
    - Fever, especially evening rise (night sweat)
    - Pain in the chest
    - Loss of weight and malaise
    - Loss of appetite
    - Coughing up blood-stained sputum
    - Shortness of breath and Tiredness
- Symptoms of extra-pulmonary tuberculosis depend on the organ involved. In addition to the general symptoms described above, patients may also have symptoms related to the organ(s) affected by TB:
    - Swollen glands (TB lymphadenopathy)
    - Severe backache sometimes with difficulties in walking (Spinal TB)
    - Swollen Joints (TB arthritis)

[35] National Tuberculosis Management Guidelines, Liberia. Ministry of Health and Social Welfare. 2019.

[36] Consolidated guidelines on HIV, viral hepatitis and STI prevention, diagnosis, treatment and care for key populations. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

- Abdominal pain and distention (TB peritonitis
- Intermittent diarrhea, sometimes with blood (TB bowel)
- Recurrent urinary infections, which are culture unresponsive to antibiotics (renal TB)

- The symptoms of active TB of the lung are coughing, sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweats.

Diagnosis

Presumptive diagnosis of TB	Symptoms suggestive of TB and exclusion of other causes
Clinical diagnosis of TB	Clinical and x-ray signs, but bacilli not identified
Bacteriologically confirmed TB	Sputum positive for acid-fast bacilli or approved rapid test

DIAGNOSIS OF TUBERCULOSIS

- Diagnosis may be based on a positive sputum (or other pulmonary or extra-pulmonary sample) result, symptoms, or clinical and x-ray findings.
- Active TB is confirmed by the detection of M. tuberculosis organism or part of its genetic material.
- Refer all suspect cases.

5.6.1 Treatment of TB

5.6.1.1 Standardized TB Treatment Regimes

- Consult guidelines and algorithms for adults and children in National TB Management Guidelines, Liberia 2019[37], and updates.
- The aims of treatment of TB are the following:
  - Cure the patient of TB.
  - Prevent death from active TB or its late effects.
  - Prevent relapse of TB.
  - Decrease transmission of TB to others.
  - Prevent the development and transmission of acquired drug resistance tuberculosis.
  - Treat any co-infection with HIV.
- There are three main properties of TB drugs: *bactericidal* activity, *sterilizing* activity and the ability to *prevent resistance*.
  - The TB drugs possess these properties to different extents.
  - Isoniazid and rifampicin are the most powerful bactericidal drugs.
  - Rifampicin is the most potent sterilizing drug available.
  - Pyrazinamide is also bactericidal against certain populations of TB bacilli.
  - Ethambutol is used in association with more powerful drugs to prevent the emergence of resistant bacilli.
- Fixed dose regimes with combined medicines are used where possible, when quality control is assured, to facilitate acceptability and adherence.
- Refer all cases. Clinic staff may be involved in giving continuation doses.

Drug Susceptible Tuberculosis
1st line treatment

[37] National Tuberculosis Management Guidelines, Liberia. Ministry of Health and Social Welfare. 2019.

- Treatment is divided into the initial (intensive) phase of 2–3 months and the continuation phase of 4–6 months, depending on the medicine combinations used.
- TB treatment regimens are expressed in a standard format (e.g., 4RH) where the letters represent abbreviated medicine names, and the numbers show the duration in months and "/" shows the division between treatment phases. Medicines used are ethambutol (E), isoniazid (H), rifampicin(R), and pyrazinamide (Z)
- Refer to TB treatment center.
- Intensive Phase
    - Use directly observed therapy (DOT) in the initial phase
    - Infectious patients become rapidly non-infectious (within approximately 2 weeks), and there is symptomatic improvement. The vast majority of patients with sputum smear-positive TB cases become smear-negative on sputum testing within 2 months, in which case they can proceed to the continuation phase.
    - If a positive sputum smear is found at completion of the intensive phase, the extension of the intensive phase is not recommended
- Continuation phase
    - Fewer drugs are necessary but for a longer time. The sterilizing effect of the drugs eliminates remaining bacilli and prevents subsequent relapse.

	Intensive Phase	**Continuation Phase**	**Dosing Frequency**
New Smear Positive or Negative Pulmonary TB	2 months of RHZE	4 months of HR	Daily
Children aged 3 months – 16 years with Pulmonary TB or Non-severe Extra-pulmonary TB	2 months of HRZE	2 Months of HR	Daily
Miliary TB and TB meningitis All children, adolescents and adults.	2 Months of RHZE	10 Months of HR	Daily
Bone and joint TB All children, adolescents and adults.	2 Months of HRZE	7 – 9 Months of HR	Daily
R-Rifampicin, H-Isoniazid, Z-Pyrazinamide, E-Ethambutol ***In case of meningitis and pericarditis, adjuvant corticosteroid treatment is recommended. Seek specialist advice for management plan for these patients.***			

CONVENTIONAL DS-TB REGIMENS ACCORDING TO THE INFECTION SITE

Drug	Action	Dosage in mg/kg Body Weight	
		Children	Adults
Isoniazid (INH or H)	Bactericidal	10 – 20 (Max 300 mg)	5 (Max 300 mg)
Rifampicin (R)	Bactericidal	Bactericidal 10 – 20 (Max 600 mg)	10 (Max 600 mg)
Ethambutol (E)	Bacteriostatic	15 - 25	15 – 25
Pyrazinamide (P)	Sterilizing	15 - 20	15 – 30

FIRST LINE DRUGS (FLDS) FOR TREATMENT OF DRUG SUSCEPTIBLE TB

Weight	Intensive phase R150mg H75mg Z400mg E275mg	Continuation phase R150mg H75mg
30 – 38 kg	2 tabs	2 tabs
39 – 54 kg	3 tabs	3 tabs
55 – 70 kg	4 tabs	4 tabs
>70 kg	5 tabs	5 tabs
(R-Rifampicin, H-Isoniazid, Z-Pyrazinamide, E-Ethambutol)		

DOSAGES OF FIXED-DOSE PREPARATIONS OF TB DRUGS IN ADULTS

Mycobacterium bovis

- *M. bovis* may account for 2.8% TB cases in Africa and is more common in people who drink raw milk
- Prevention is by boiling or pasteurizing milk.
- It presents in similar ways to other TB but can present with very large lymph nodes in the neck.
- Refer any suspect case.
- Treatment is as above, but without Pyrazinamide (*M. bovis* is resistant to it), and given for 9 months as only 3 drugs are used:
    - Intensive phase: 2 months HRE daily
    - Continuation phase: 7 months of HR daily

Retreatment cases:

- Retreatment cases include all TB patients who were treated as new cases for more than one month and are now smear or culture positive (failure, relapse, return after default).
- They have a higher likelihood to have drug resistance which may have been acquired through inadequate prior chemotherapy.
- Previously these retreatment cases were managed differently from new cases with 8 months of treatment called category 2. Streptomycin was given in addition to the normal four drugs.
- Since the development of GeneXpert this management has been stopped. This is because evidence has shown that this was harmful and could make drug resistance worse.
- All retreatment cases should be assessed by GeneXpert and all cases of drug sensitive TB – new and retreatment - are treated for 6 months with a combination of RHZE treatment.

5.6.2 TB in Children

Overview

- Children (0-14 years) account for up to one-third of all TB cases.
- Most cases are PTB cases. Extra pulmonary TB (EPTB) is also common, and presentation varies with age.
- TB disease can be more severe and of rapid onset in infants and young children. Children with TB disease usually have poor weight gain, may lose weight, or be malnourished.
- The presentation and approach to diagnosis of pulmonary TB in older children (>10 years) and adolescents is like that for adults.
- Have a low threshold for diagnosis of TB in a child if a close family member has PTB, especially if the child is HIV infected.
- Refer any suspect child.

Child Contact Screening and Management

- TB preventive therapy (TPT) greatly reduces the risk of an infant or young child exposed to TB infection developing disease:
- All children who are close contacts with cases with smear-positive TB should be screened for TB
- If the TB source case is the child's parent and is HIV-infected, test all the children for HIV
- Symptoms alone are used to screen child contacts for possible TB disease.
- This will be done by the TB treatment center, but clinic staff may be involved.
- All children aged less than 5 years and all HIV-infected children (less and more than 5 years of age) who were exposed to an index TB case and in whom TB assessment did not identify any active TB should receive TB preventive therapy using 12 weeks of 3RH.

Weight bands	Numbers of Dispersible tablets
	RH
	75/50mg
4-7kg	1 tab
8-11kg	2 tabs
12-15kg	3 tabs
16-24 kg	4 tabs
>24 kg	Adult dosages and preparations are recommended

TUBERCULOSIS PREVENTION THERAPY - 3RH DOSING IN CHILDREN

5.6.3 TB Treatment Regimens in Special Situations

Co-infection with HIV/TB

- See 5.7.2

Pregnant and breastfeeding women:

- Ask all women about pregnancy before starting TB treatment and do a pregnancy test if appropriate.
- Most TB drugs are safe for use in pregnant and breastfeeding women and so the standardized regime can be used.
- Pyridoxine supplementation is recommended for all pregnant or breastfeeding women taking isoniazid.
- When active TB in the baby is ruled out, the baby should be given 6 months TPT, followed by BCG vaccination 2 weeks after completion of the course of TPT or TB treatment. Mother and baby should stay together, and the baby should continue to breastfeed.
- Refer all cases.

Women on Oral Contraceptives

- Rifampicin interacts with contraceptive medications with a risk of decreased protective efficacy against pregnancy.
- A woman who is receiving contraception may choose between the following two options while receiving treatment with rifampicin: either take an oral contraceptive pill containing a higher dose of estrogen (50mcg) or use another form of contraception. Refer to health center

5.6.4 Managing Side Effects of TB drugs

- Side effects are infrequent but should be properly managed.
- *Consult National TB guidelines[38] for more detailed management of drug side effects.*

Side effects	Drug	Management
Minor		**Continue TB drugs, check dose**
Anorexia, nausea, abdominal pain	Pyrazinamide, rifampicin	Give drugs with small meals or last thing at night
Joint pains	Pyrazinamide	Paracetamol
Burning sensation in the feet	Isoniazid	Pyridoxine 50 - 75 mg daily
Orange/red urine	Rifampicin	Reassurance to patients, this is normal
Major		**Stop responsible drug**
Itching, skin rash	(R,H,Z)	Refer
Jaundice (other causes excluded), hepatitis	Isoniazid, pyrazinamide, rifampicin)	Refer
Confusion (suspect drug-induced acute liver failure if jaundice present)	Most TB drugs	Refer
Visual impairment (other causes excluded)	Ethambutol	Refer
Shock, purpura, acute renal failure	Rifampicin	Refer

SYMPTOM-BASED APPROACH TO SIDE EFFECTS OF TB DRUGS

5.6.5 TB Drug Induced Hepatitis

- Stop TB treatment and refer.
-

5.6.6 Interactions of TB drugs

- The majority of interactions will be due to Rifampicin. If any interaction is suspected, refer to TB treatment center.

5.6.7 Drug Resistant TB (DR-TB)

- DR-TB develops because of poor adherence to treatment but most DR-TB is transmitted between patients. This means someone can have DR-TB even if it is his or her first episode of TB infection.
- Infection control and early diagnosis and treatment are vital aspects in the management of DR-TB.

[38] National Tuberculosis Management Guidelines, Liberia. Ministry of Health and Social Welfare. 2019.

- Refer any suspect cases.

5.7 HIV-TB Co-infection

- *Consult current national HIV[39] and Tuberculosis[40] guidelines and updates for additional information*
- Tuberculosis is one of the most common opportunistic infections in People living with HIV (PLHIV). HIV increases the risk of acquiring and developing active TB disease following exposure to *M. tuberculosis.*
- HIV fuels the TB epidemic through progression of *M. tuberculosis* infection to active TB disease. HIV also increases the rate of recurrent TB. The immune system is less able to prevent the growth and local spread of M. tuberculosis.
- Active TB can present differently in the presence of a weakened immune system. There are less lung cavities and so less bacilli in the sputum; this makes it more difficult to diagnose TB using smear microscopy. Disseminated and extra-pulmonary disease is more common in PLHIV.
- It is important to screen PLHIV for TB as a diagnosis of TB can affect the timing of when ART is initiated and sometimes influence the choice of ART due to drug interactions.

5.7.1 Diagnosing TB in PLHIV

- Symptoms should be screened for at each clinic visit. Suspicion of TB is defined by the presence of any one of the following symptoms:
    - *Adults or adolescents living with HIV*: current cough, fever, night sweats, weight loss
    - *Children living with HIV*: poor weight gain, fever, current cough or history of contact with a TB case. In children living with HIV there should be a higher suspicion for TB and lower threshold for treatment.
    - Most HIV patients with TB do not have typical TB symptoms (productive cough). Many are sputum smear negative.
- All HIV positive persons should be routinely screened for TB on initial presentation and during each subsequent visit.
- Refer any suspect case.
- Co-trimoxazole will be initiated for all PLHIV (adults and children) who have been diagnosed with TB.

5.7.2 Treatment of TB in PLHIV

New Diagnosis of TB when HIV treatment Has Not Been Initiated

- TB treatment should be initiated first followed by ART as soon as possible, ideally following 2 weeks of TB treatment. (*See 4.8*).
- Refer

[39] Liberia Integrated Guidelines for Prevention, Care and Treatment of HIV and AIDS. November 2022 https://www.differentiatedservicedelivery.org/wp-content/uploads/HIV-Treatment-Guidelines_2022_Liberia.pdf

[40] National Tuberculosis Management Guidelines, Liberia. Ministry of Health and Social Welfare. 2019.

5.8 Viral Hemorrhagic Fevers (VHF)

(*Consult national guidelines and WHO guidelines[41] for full protocols*)

- Viral hemorrhagic fever (VHF) is a general term for a severe illness occurring in epidemics, sometimes associated with bleeding, that may be caused by several viruses.
- In Liberia, these may include Ebola, Lassa fever, yellow fever, and dengue. All are zoonotic diseases, with a reservoir in animals and initially spread to humans by contact with infected bush meat, rat droppings or urine, or by insect bites.
- **During epidemics:**
  - Ebola and Lassa fever can also be transmitted from person-to-person
  - Yellow fever and dengue are only transmitted to humans through mosquito bites
- **Clinical manifestation:**
  - The initial clinical manifestations of Ebola, Lassa and Yellow fever Marburg are non-specific and mimic many common infections, making them difficult to diagnose early, and bleeding may not occur in > 50% of cases.
  - Staff need a high suspicion in fevers that are RDT -ve for malaria, are not responding to treatment for other infectious diseases, and especially if there is unexplained bleeding or rapid deterioration.
  - *Bleeding* can be from puncture sites, in rashes, from the gums, conjunctiva, nose, vagina in women, or in vomit, stools, sputum. Pregnant women may miscarry.

- **Case Definition**
  - Ebola or Marburg **suspected case**
    - Sudden onset high fever after contact with Ebola case or dead animal *OR*
    - High fever (temperature > 37 °C or 98.4°C) and three of: headache, vomiting, diarrhea, anorexia, abdominal pain, lethargy, aching muscles or joints, difficulties swallowing or breathing, hiccups *OR*
    - Unexplained bleeding *OR*
    - Sudden unexplained death *OR*
    - Clinical suspicion of Ebola or Marburg
  - **Probable case**
    - If they had a link to a confirmed EVD or MVD case
  - **Confirmed case**
    - Tested positive for EVD

5.8.1 Ebola

- Consult national[42] and WHO[43] Guidelines

Clinical Features

- Ebola Virus Disease (EVD) is a life-threatening multisystem, highly contagious infectious disease associated with fever, gastrointestinal (GI) and other systemic symptoms, that frequently leads to hypovolemia, metabolic acidosis, hypoglycemia, and multi-organ failure.

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[41] Clinical management of patients with viral haemorrhagic fever: a pocket guide for front-line health workers: interim emergency guidance for country adaptation. World Health Organization. 2016 https://apps.who.int/iris/handle/10665/205570

[42] Liberia Ebola Virus Disease (EVD) Clinical Management Guidelines. National Public Health Institute of Liberia and Ministry of Health. July 2021

[43] Optimized supportive care for ebola virus disease: clinical management standard operating procedures. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO.

- **Transmission:**
    - Human infection occurs through contact with the blood, secretions, organs, or other bodily fluids of infected animals such as fruit bats and mammals. Fruit bats are believed to be the natural hosts.
    - Epidemics (one confirmed case) occur through human-to-human transmission via direct contact with blood and bodily fluids of an infected person. This includes sexual transmission (Oral, vaginal, or anal), indirect contact of non-intact skin or mucous membranes with infected body fluids or with contaminated needles, syringes injuries, linens and other clothing.
    - Health-care workers face the highest risk of infection.
    - Other high-risk activities include burial ceremonies that involve direct contact with the body of the deceased and home care of EVD patients by family members such as women.
- **Diagnosis**
    - Suspect case has fever and abnormal bleeding (may include bloody diarrhea, bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine).
    - Confirmation is with a positive IgM antibody, positive PCR, or viral isolation, or epidemiological link to a confirmed case or outbreak.

Initial Management

- Screening during epidemic:
    - No physical exam but only temperature is checked.
    - Health workers must wear *light* personal protective equipment (PPE: face shield, gown, clean gloves) during interview.
- Prevent transmission and prevent deaths of patients and staff from viral hemorrhagic fever:
    - Wear light PPE for all suspect cases and any suspect deaths
    - Wear full PPE for all probable & confirmed cases and deaths
    - Full intensive medical support (as above) for suspect, probable and confirmed cases has been proven to saves lives in people with VHF.
- Transfer & isolation
    - For suspect patients transfer by staff to Ebola Treatment Unit while providing clinical care wear full PPE.
- Immediate notification of any suspected case to MoH.
- Oral rehydration with ORS in patients who can drink with ORS and give zinc. See 5.1.
- Ensure communication with family and friends is maintained while maintaining a safe distance with the patient.

5.8.1.1 Vaccination During Ebola Epidemic

- During epidemics of the Zaïre strain the live attenuated Ervebo (RVSV-ZEBOV) vaccine has been found to be 100% effective in preventing EVD in people who took the vaccine more than 10 days after high-risk exposure to Ebola infection. It does not work against other strains.
- Persons ≥18-year-old at high risk of contracting EBV in outbreak settings including frontline health-care workers, pregnant women, contacts and for ringfencing cases.
- Only health personnel trained to give Ebola vaccine will be involved in the vaccination programme.
- Give Ervebo 1-mL IM, in the deltoid area of the non-dominant arm.

- Do not mix the vaccine in the same syringe with any other vaccines or drug.
- Side effects: It is safe, but symptoms can include fever, headache, nausea, arthralgia, mild flu, and pain, swelling, and redness at the injection site. Anaphylaxis is rare. There is a small potential risk of transmission within 14 days but this has not been documented.
- Contraindications: history of severe allergic reaction (e.g., anaphylaxis) to rice protein. Insufficient data on the safety in immunocompromised individuals. The benefits should be weighed against the risk of disease.

5.8.1.2 Caring for Ebola Survivors

- Consult national[44] and WHO guidelines[45]

When to Discharge

- Patients will be discharged back to the community when they meet the criteria below:
  - Asymptomatic for 72 hours and able to eat and carry out daily routine activities without assistance
  - Two negative RT-PCR tests 48hours apart.

Follow-Up Schedule

- Follow-up will be continued from the Ebola team, as needed and agreed upon by the patient and provider

Post-Ebola Complications

- Patients who survive the disease undergo a long convalescent period during which they continue to experience a spectrum of clinical and psychosocial problems. The conditions reported include the following categories:
- Post-Ebola clinical sequelae:
  - EVD survivors can experience inflammation in the eye, impaired vision, arthralgia, headache, urinary symptoms and memory loss.
  - Post-Ebola complications decrease gradually over several years for most survivors, while others persist or develop late complications with manifestations months after they have recovered from the initial illness
- Ebola virus persistence:
  - The Ebola virus may persist in body fluids, including semen, eyes, central nervous system, pregnancy-related fluids (e.g., amniotic fluid, blood, fetus, etc.) and breast milk for variable duration.
  - Viral persistence poses risk of remote transmission events causing sporadic EVD outbreaks long after an outbreak is declared ended.
  - Male survivors should obtain sexual counselling and remain abstinent or practice safe sex (e.g., use condoms) until their semen has tested negative twice six weeks apart.
  - However, intermittent detection occurs in a small proportion of males. It is not known whether viral particles detected intermittently are infectious. Testing is advised up to 36 months after Ebola virus infection.
- Relapse of Ebola Virus Disease:
  - Relapse or recurrence of acute EVD after recovery is very rare but has been documented, likely due to increased replication of the virus in specific site.

[44] Liberia Ebola Virus Disease (EVD) Clinical Management Guidelines. National Public Health Institute of Liberia and Ministry of Health. July 2021

[45] Cinical care for survivors of Ebola virus disease, World Health Organization (WHO) (2016)

    - Any EVD survivor who presents with clinical symptoms suggestive of EVD within one year of their acute EVD diagnosis should be isolated and be evaluated for EVD according to the national guidelines.
- The patient should be treated with respect and without stigma.

5.8.2 Yellow Fever

Symptoms

- Mild: Many people do not experience symptoms, but when these do occur, the most common are fever, muscle pain with prominent backache, headache, loss of appetite, and nausea or vomiting. In most cases, symptoms disappear after 3 to 4 days.
- Severe: A small percentage of patients experience the 1st mild phase, start recovering but within 24 hours enter a 2nd toxic phase. High fever returns and several body systems are affected, usually the liver and the kidneys. In this phase people are likely to develop jaundice (yellowing of the skin and eyes, hence the name 'yellow fever'), dark urine and abdominal pain with vomiting. Bleeding can occur from the mouth, nose, eyes or stomach, which is associated.
- Differential diagnosis: severe cases can be confused with severe malaria, leptospirosis, viral hepatitis, other hemorrhagic fevers, infection with other flaviviruses (such as dengue hemorrhagic fever), and poisoning.

Treatment

- Notify the county health office and refer all cases.
- Treat mild disease supportively:
    - Manage fever, give analgesia, ensure hydration, give anti-emetics, and other supportive measures and refer.
- For severe disease:
    - Refer

Prevention

- For control measures, consult MoH guidelines
- Vaccination is highly effective.
- Mass vaccination is the standard for stopping transmission during epidemics with yellow fever vaccine in the EPI.

5.8.3 Lassa Fever

- Transmission:
    - The reservoir (host) of Lassa virus is a rodent called "multimammate rat" (*Mastomys natalensis*).
    - An infected rodent can excrete virus in urine for a lengthy period of time.
    - Transmission occurs by direct contact with infected rodents, person-to-person transmission may occur after exposure to virus in the blood, tissue, secretions, or excretions of a Lassa virus-infected individual.
- Signs and Symptoms
    - Occur 1-3 weeks after the patient encounters the virus.
        - Mild symptoms: Slight fever, general malaise weakness, and headache.
        - Severe symptoms: Hemorrhaging (in gums, eyes, or nose, as examples), respiratory distress, repeated vomiting, facial swelling, pain in the chest, back, and abdomen, and shock. Neurological problems: hearing loss, tremors, and

encephalitis. Death may occur within two weeks after symptom onset due to multi-organ failure.

- Because the symptoms of Lassa fever are so varied and nonspecific, clinical diagnosis is often difficult
- Lassa fever is also associated with occasional epidemics, during which the case-fatality rate can reach 50%.

- Clinical Stages of Severe Lassa Disease
  - Stage 1 (days1-3)
    - General weakness and malaise
    - High fever, >39°C, constant with peaks of 40-41°C
  - Stage 2 (days 4-7)
    - Sore throat (with white exudative patches) very commo
    - Headache; back, chest, side, or abdominal pain
    - Conjunctivitis, nausea, vomiting and diarrhea, productive cough, proteinuria, low blood pressure (systolic <100 mm Hg), anemia
  - Stage 3 (after 7 days)
    - Edema of the face and neck, convulsions
    - Mucosal bleeding (mouth, nose, eyes), internal bleeding
    - Encephalopathy with confusion or disorientation
  - Stage 4 (after 14 days)
    - Coma may lead to death
- Risk of Exposure
  - Risk of Lassa virus infection is greatest among those who live in or visit endemic regions (Sierra Leone, Liberia, Guinea, and Nigeria) and have exposure to the multimammate rat.
  - Nosocomial infections are not common if protective measures and proper sterilization methods are used.
- Diagnosis
  - Lassa fever is most often diagnosed by using enzyme-linked immunosorbent serologic assays (ELISA)
  - Reverse transcription-polymerase chain reaction (RT-PCR) can be used in the early stage of disease; this is the gold standard test for diagnosis of Lassa Fever.

Treatment

- Refer to quarantine in Lassa unit.
- Staff wear full PPE and follow measures as with Ebola.

Prevention

- Transmission of the Lassa virus from its host to humans can be prevented by avoiding contact with *Mastomys* rodents, storing food away in rodent-proof containers and keeping the home clean help to discourage rodents from entering homes.
- When caring for patients with Lassa fever, further transmission of the disease through person-to- person contact or nosocomial routes can be avoided by taking preventive precautions against contact with patient secretions (called VHF isolation precautions or barrier nursing methods).
- Such precautions include wearing protective clothing, such as masks, gloves, gowns, and goggles; using infection control measures, such as complete equipment sterilization; and isolating infected patients from contact with unprotected persons until the disease has run its course.

5.8.4 Viral Hepatitis

- Viral hepatitis is an inflammation of the liver caused by five viruses: A, B, C, D and E.
- Hepatitis A and E are transmitted by the faecal-oral route. Hepatitis B, C and D are transmitted by infected blood, poor sterilisation, sexually (hepatitis B and possibly C and D), and vertical spread from mother to child.
- Hepatitis A, and E cause acute infections whilst B, D and C can cause chronic infections. This chronic active hepatitis can progress to cirrhosis and liver cancer (hepatoma).
- More than 90% of healthy adults who are infected with hepatitis B virus will recover naturally from the virus within the first year. This number is much less in those co-infected with HIV and Hep B infection.
- Hepatitis E is also a common cause of outbreaks resulting in deaths due to acute hepatitis among displaced populations in internally displaced camps and refugee settings.
- Individuals are often co-infected with both Hepatitis B and C, and often also with HIV or Tuberculosis (TB).

Clinical Features

- All of the viruses may present as an acute phase infection with high fever, jaundice, anorexia, vomiting, fatigue, dark urine, enlarged tender liver and significantly raised ALT. Occasionally this can result in fulminant hepatitis which has a very high mortality.
- Viral hepatitis can also be asymptomatic, particularly with hepatitis B in children.
- Serology, where available, is necessary for diagnosis of the exact virus.
- Treatment of acute phase infection should be supportive.
- **Refer**

5.8.4.1 Hepatitis A and E

- Hepatitis A and E can take up to 6 weeks to resolve with some improvement usually seen after 3 weeks.
- Alcohol, paracetamol and any unnecessary medicines should be avoided during this acute illness.
- Most people do recover fully after the infection.
- Pregnant women have a higher mortality rate (up to 20%) with fulminant hepatitis E infection. It can be associated with post-partum hemorrhage.
- Hepatitis A, and E can be prevented by ensuring clean water and sanitation is available and used. In camps with displaced people one of the most urgent priorities is to install clean water and sanitation and promote hygiene to prevent the spread of water-borne disease like hepatitis A and E. There is an effective vaccination for Hepatitis A which can provide protection if available to use in an outbreak.
- Refer

5.8.4.2 Hepatitis B and C

- Hepatitis B and C are caused by different viruses, but result in a similar disease process. Both start with an acute infection, which can vary from being asymptomatic to causing fulminant hepatic failure.
- This infection may then resolve entirely and the patient will become immune or it may progress to a chronic infection.
- This chronic infection can eventually result in cirrhosis or hepatocellular cancer if untreated.

- Both infections have become a public health concern in Sub-Saharan Africa with both thought to have a prevalence > 5%. In Sub-Saharan Africa there are an estimated 4 million people co-infected with HBV and HIV and similar numbers co-infected with HCV and HIV.
- Co-infection with HIV accelerates both viruses and causes much higher-than-normal rates of cirrhosis and death.
- Refer all cases

5.8.4.3 Hepatitis B (HBV)

- Consult WHO guidelines on Hepatitis B.[46]

Clinical Features

- Transmission
  - Most HBV is transmitted via mother to child transmission (MTCT) and in early childhood whilst playing.
  - It is also transmitted via sex and saliva, and via people who inject drugs. There is a risk of occupational exposure for health care workers.
- Diagnosis:
  - Hepatitis B surface antigen (HBsAg) and hepatitis B surface antibody (HBsAb).
    - Presence of HBsAg indicates ongoing infection. If this infection is cleared and the patient becomes immune, they develop HBsAb and HBsAg disappears.
    - Screening for HBV should be carried out in the following groups:
      - All PLHIV
      - Household and sexual contact of HBV positive people
      - People who inject drugs (PWID)
      - Men who have sex with men (MSM)
      - Commercial sex-workers
      - Prisoners and pregnant women.
  - Prevention of Transmission
    - People found to be HBV positive should be counselled about reducing spread by using condoms and not sharing needles, toothbrushes, razors etc. Negative contacts should be vaccinated.
    - Vaccination
      - All children should be vaccinated via the EPI programme with doses given three times at 6, 10 and 14 weeks.
      - The complete course gives protection for at least 20 years and is probably lifelong.
      - Healthcare workers who are HBV negative should also be vaccinated.
      - PLHIV who are HBV negative should be vaccinated.
  - If babies are born to mothers with known HBV, they should be vaccinated immediately at birth with HBV vaccine. Refer

Treatment

- There is no cure for HBV but it can be controlled using anti-viral medication. The goal of treatment is to prevent the development of cirrhosis, reduces incidence of liver cancer and improves long-term survival.
- Refer

[46] World Health Organization. Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection. March, 2015 https://apps.who.int/iris/bitstream/handle/10665/154590/9789241549059_eng.pdf

5.8.5 Hepatitis C (HCV)

- For additional information, consult WHO Guidelines on Hepatitis C[47]

Clinical Features

- Transmission:
  - Most HCV is transmitted by body piercing, blood products and People Who Inject Drugs (PWID). Unsafe injections and reuse of needles in medical facilities is also a significant risk.
  - There is a risk of occupational exposure for health workers.
  - Risk of sexual transmission is much less than with HBV but is higher in PLHIV especially in MSM.
  - Mother-to-child transmission (MTCT) is also higher in PLHIV.
- Diagnosis:
  - HCV antibodies. If +ve, check HCV RNA.
  - There are many known genotypes for HCV infection which can affect the type of treatment recommended.
  - Screen high-risk groups, including PLHIV, PWID, pregnant women, MSM, prisoners, people with tattoos and piercings.
  - People who test positive for HCV should be counselled about trying to reduce risk of onward transmission by using condoms, not sharing needles or razors etc.
  - They should also be given advice about reducing alcohol intake as this can accelerate decline in liver function.

Treatment

- The aim of treatment is to eradicate the Hepatitis C virus. It is very expensive but is gradually becoming available.
- Refer

5.8.6 Hepatitis D (HDV)

- HDV is a form of chronic hepatitis which occurs only in people who already have established chronic Hep B infection.
- It is transmitted in the same way as HBV and causes similar disease.
- In some countries it can be treated with interferon, but responses are poor. This infection cannot yet be diagnosed or treated in Liberia.

5.9 Neglected Tropical Diseases

5.9.1 Mass Drug Administration

- Liberia has a mass drug administration programme using albendazole, praziquantel and Ivermectin for the prevention of soil transmitted helminths, schistosomiasis, and onchocerciasis and lymphatic filariasis in endemic areas.

5.9.2 Schistosomiasis (Bilharzia)

Clinical Features

- Schistosomiasis is a waterborne parasitic infection caused by several species of trematode worms.

[47] World Health Organization. Guidelines for the care and treatment of persons diagnosed with chronic hepatitis C virus infection. July 2018 http://apps.who.int/iris/bitstream/handle/10665/273174/9789241550345-eng.pdf?ua=1

- The route of transmission is by penetration of skin by from larvae in infested water. They then migrate to different tissues of the body.
- Initial entry often passes unnoticed. Symptoms are related to parasite activities in different body systems.
- There are two main forms:
  - *Schistosoma mansoni* affects the gastroenterological system.
    - Symptoms include abdominal pain, diarrhea, blood in stool, liver, and spleen enlargement. C*omplications* include ascites, esophageal varices, and anemia.
    - Most patients with S. Mansoni infection have minimal or no symptoms unless there is heavy infestation.
    - *Diagnosis* is by seeing *S. mansoni* eggs in stools on microscopy, but Infection should be suspected in young patients with unexplained iron deficiency anemia, large spleen and liver, or non-resolving chronic salmonella infection
  - *Schistosoma haematobium* affects the urinary system.
    - *Urinary symptoms include urinating frequently*, painful urination, and blood in urine. *Genital symptoms include* pelvic pain, discharge, pain during sex, vulval and cervical lesions in women; blood in semen in men. *Complications include* scarring and calcification of the urinary system and recurrent infections, infertility, bladder cancer.
    - *Diagnosis is* by seeing S. haematobium eggs in urine on microscopy but clinics without microscopes can treat Schistosoma haematobium infection based on visible hematuria or positive urine strip test for blood and or protein in children and adolescents.

Treatment

- Clinics without microscopes can treat Schistosoma haematobium infection based on visible hematuria or positive urine strip test for blood and or protein in children and adolescents. Treat with Praziquantel as a single dose, see below**.**
- Do not give Praziquantel in pregnancy, treat 7 days after delivery.
- Treatment with Praziquantel will also have eliminated any roundworm and tapeworm infections.

Single Dose Praziquantel Height Dosing Chart **(**Praziquantel is generally available as a double-scored 600mg tablet)	
Height	**Number of Tablets**
90cm – 109cm	1
110cm – 124cm	1 ½
125cm – 137cm	2
138cm – 149cm	2 ½
150cm – 159cm	3
160cm – 177cm	4
178cm or more	5
The drug should not be taken on an empty stomach. *Side effects include: abdominal discomfort, nausea, vomiting, headache and (rarely) hypersensitivity reactions.*	

SINGLE DOSE PRAZIQUANTEL HEIGHT DOSING CHART

5.9.3 Filariasis

5.9.3.1 Onchocerciasis (River Blindness)

Clinical Features

- For additional information, consult CDC guide[48]
- Caused by a tissue-dwelling nematode, the microfilaria, *Onchocerca volvulus,* is transmitted from human to human by bites of the black fly. Black flies breed near fast-flowing water.
- Symptoms and Signs
  - A range of skin symptoms
    - Onchocercomas – single, multiple, or clustered subcutaneous nodules on bony prominences.
    - Onchodermatitis - intensely itchy, papular rash on lower limbs and buttocks.
    - Hyperpigmented/Hypopigmented patches
  - Eye infestation microfilariae, leading to pruritis, reduced visual acuity and visual field defects, corneal lesions, iritis, chorioretinal lesions and eventually blindness
- Diagnosed by the finding of microfilariae in skin snips, or adult worms in biopsy specimens of skin nodules.

Treatment

- Refer suspect case with Ivermectin which kills microfilariae.
- Do not treat children under the age of 5, pregnant or breastfeeding women.
- Seek expert help for patients with Loa-loa co-infection due to the risk of a fatal encephalitic reaction to ivermectin.

Drug	Dose	Notes
Ivermectin	Adults: 150mcg/kg by mouth as a single dose Children (5 years and older): 150mcg/kg by mouth as a single dose *Consider repeating after 6 months and 1 year If still symptomatic*	Avoid in children under the age of 5 or under 15kg, pregnant or breastfeeding women, and seriously ill people

TREATMENT OF ONCHOCERCIASIS

Prevention and Control

- Mass Drug Administration programme
  - Liberia has an MDA programme for prevention of onchocerciasis.
  - All >5yrs in communities at risk receive one dose of ivermectin as per the above table.
- Reduce or avoid contact with black flies by
  - Cultivating, fishing or washing during times when the black fly doesn't bite
  - Staying in open places
  - Covering arms and legs when in high-risk areas
  - Sleeping under a bed net

5.9.3.2 Lymphatic Filariasis (Elephantisis)

Clinical Features

- Caused by the tissue-dwelling nematode – *Wucheria bancrofti* locally.
- Infection is passed from human to human through the bites of female mosquitoes. The adult worms mature in the lymph vessels.
- Symptoms and signs

[48] Centers for Disease Control and Prevention, Resources for Health Professionals, Onchocerciasis. Nov 2021 https://www.cdc.gov/parasites/onchocerciasis/health_professionals/index.html#tx

    - Acute (after up to 1 year incubation): Adenolymphangitis—recurrent episodes of lymph node and duct inflammation associated with fever; general malaise; nausea and vomiting. Resolve spontaneously.
    - Chronic (5 -20years after acute infection): Lymphedema due to obstruction of the lymph vessels by microfilariae with eventual chronic edema; skin hypertrophy and permanent swelling of the affecting limb(s)—elephantiasis; chyluria – lymph in urine; breast and testicular enlargement.
- Investigations
    - Detection of microfilariae in the thick blood film of blood taken between 9pm and 3am; ultrasound.
- Check for co-infection with onchocerciasis.

Treatment

- Conduct MDA with albendazole in endemic areas
- Refer all cases.
- Treat with ivermectin and/or albendazole first if co-infection
- Treatment is not administered during an acute attack
- Supportive treatment
    - Wash affected limb daily, keep nails clean and short
    - Treat infections quickly with antibiotics/antifungals as appropriate
    - Wear comfortable footwear
    - Elevate limb where possible; massage regularly to encourage lymph flow
    - Provide home based self-care kit for the patients

5.9.4 Soil-Transmitted Helminthiases (worms)

Clinical Features

- Soil-transmitted helminths are intestinal worms infecting humans acquired from contaminated soil.
- Helminths in the intestinal tract release eggs into the faeces of infected humans passed into soil. There is often co-infection with different worms
    - *Ascariasis* and *Trichuriasis:* eggs in soil contaminate food and are ingested
    - *Ankylostoma* and *Strongyloides:* penetrate skin when humans walk barefoot on contaminated soil
    - *Enterobious vermicularis* from soil contaminated food or auto-infection
- Symptoms
    - Usually asymptomatic, symptoms present when there is heavy infestation
    - They include abdominal pain, distension, diarrhea (sometimes bloody), obstruction, rectal prolapse and hypersensitivity reactions.
    - Perianal itch and visualization of worms with *Enterobius*
- Investigations
    - Detection of parasite eggs in stools

Prevention

- Mass Drug Administration: albendazole 400mg once every 6 months to children between 1 and 15 years.

Treatment

- As per the table below.
- Safety in pregnancy has not been established for Albendazole; do not use in the first trimester of pregnancy. In most cases, treatment can be given after delivery.

Parasite	Treatment
Ascariasis (roundworms) *Ascaris lumbricoides*	Albendazole PO single dose Children > 6 months and adults: 400 mg Children > 6 months but < 10 kg: 200 mg **or** Mebendazole, PO Adults and children > 12 month: 100 mg 12 hourly for 3 days, or 500 mg as single dose
Trichuriasis (whipworms) *Trichuris trichiura*	Albendazole PO for 3 days Children > 6 months and adults: 400 mg once daily Children > 6 months but < 10 kg: 200 mg once daily **or** Mebendazole as for ascariasis
Ankylostomiase (hookworms) *Ancylostoma duodenale* *Necator americanus*	Albendazole single dose, as for ascariasis **or** Mebendazole as for ascariasis **Treat for Anemia:** *A one-month course of Ferrous Sulphate should be added for a patient with confirmed hookworm infection. Dosing by weight of Ferrous Sulphate:* ‣ *if 6 - < 10kg - 12mg once a day for 30 days* ‣ *if 1-3yrs - 18mg once a day for 30 days* ‣ *if 3-5yrs - 24mg once a day for 30 days*
Strongyloidiasis *Strongyloides stercoralis*	1st Line: **I**vermectin PO as a single dose Children > 15 kg and adults: 200 micrograms/kg, on an empty stomach **or** 2nd Line (*Less effective)*: Albendazole PO for 3 days Children > 6 months and adults: 400 mg once daily Children > 6 months but < 10 kg: 200 mg once daily *Consider repeating treatment after 3 weeks if no improvement/resolution.*
Cutaneous Lava Migrans	
Enterobiasis (pinworms)	**albendazole** PO single dose, as for ascariasis
Caution: Safety in pregnancy has not been established for Albendazole; do NOT use in the first trimester of pregnancy. *In most cases, treatment can be given AFTER delivery***.**	

TREATMENT OF SOIL TRANSMITTED HELMINTHS

5.9.5 Taeniasis and Cysticercosis (Tapeworm Infestation)

Clinical Features

- *Taenia saginata* and *Taenia solium* are adult tapeworm infestations acquired by ingesting raw or undercooked beef or pork respectively.
- Mostly asymptomatic but can also cause abdominal pain, distension, nausea, diarrhea. Diagnosis is by detection of eggs or tapeworm segments in stools
- Cysticercosis develops when the larvae of *Taenia solium* invade the body and develop in the muscles, skin and eyes.
- If larvae invade the central nervous system, the infection leads to Neurocysticercosis. Symptoms can include chronic headaches, blindness, seizures, meningitis and dementia. **Specialist inpatient treatment is required**

Prevention:

- Thorough cooking of meat and monitoring of abattoirs

Treatment*:* Refer suspected cases.

5.9.6 Brucellosis

Clinical Features

- Consult CDC Guide on Brucellosis[49]
- Brucellosis is a bacterial infection of acute or slow onset.
- Common as an occupational disease among people working with infected livestock or associated fresh animal products, for example butchers, farmers, abattoir workers, and vendors of contaminated roasted meat.
- Contracted by eating undercooked meat or consuming unpasteurized/raw dairy products, breathing in the bacteria that cause brucellosis (inhalation), bacteria entering the body through skin wounds or mucous membranes.

Symptoms

- Develop after incubation of 5 to 60 days.
- Symptoms are general (fever, weakness, joint pain, lymphadenopathy) and specific (including hepatosplenomegaly and meningitis)
- Key prevention is to boil or pasteurise milk.
- Diagnosis is clinical and by serum antibody testing or culture.
- Refer all suspect cases.

5.9.7 Buruli ulcer

- Caused by the bacterium *Mycobacterium ulcerans*. It produces a toxin, which breaks down skin and soft tissue to cause large ulcers on arms and legs, if untreated, affected persons are left with significant reduction in limb function.
- Infection may begin as a painless nodule or plaque or localized oedema with progression to an ulcer within 4 weeks. The disease is staged according to severity.
- Mode of transmission is unknown.
- Refer all cases

5.9.8 Mycetoma

Clinical Features

- Is a chronic infective and inflammatory process involving skin and soft tissues due to entry of bacteria or fungi through minor breaks in the skin.
- Symptoms:
  - A painless subcutaneous mass, multiple sinuses and discharge containing grains, leading to destruction of tissue and significant loss of function in affected limbs.
  - Sepsis may also result.
- Diagnosis:
  - The causative organism is detected from biopsy of the affected skin or culture of fluid from the draining sinuses.
  - Refer any suspect case

[49] Centers for Disease Control and Prevention, Brucellosis Reference Guide: Exposures, Testing, and Prevention. Feb 2017.

5.9.9 Leprosy

Clinical Features

- For additional information, consult WHO guidelines[50]
- Caused by *Mycobacterium leprae*
- Leprosy is uncommon but staff should be vigilant when examining new rashes. Possible signs include:
  - Hypo-pigmented (light colored) skin lesions with loss of sensation
  - Nodules
  - Generalized infiltration of the skin
- All patients with signs suggestive of leprosy must be examined for loss of sensation – light touch, pinprick and temperature where possible. Palpate peripheral nerves for tenderness, thickening and nodules.
- The disease can be classified based on clinical manifestations and skin smear results. Each classification is treated differently.
  - Skin smear:
    - Patients showing negative smears at all sites are grouped as paucibacillary leprosy (PB), while those showing positive smears at any site are grouped as having multibacillary leprosy (MB).
    - A positive skin smear should be treated with a medicine regimen of MDT for multibacillary (MB) leprosy irrespective of clinical presentation.
  - Clinical manifestations:
    - The number of skin lesions and nerves involved determine whether it is multibacillary (MB) or paucibacillary (PB) leprosy.
      - Paucibacillary leprosy: ≤5 lesions (PB)
      - Multibacillary leprosy: >5 lesions (MB)
      - Patients with multibacillary disease are not treated with the regimen for the paucibacillary form of the disease.
- Diagnosis:
  - Ziehl-Nielsen stain of fluid from a skin lesion, skin lesion snip or nasal smear

  Refer any suspect case.

Treatment

- Clinic staff do not initiate treatment but may be involved in giving continuation medication under supervision of Leprosy/ TB programme.
- Patients with multibacillary disease are not treated with the regimen for the paucibacillary form of the disease
- Multi-drug therapy (MDT) is the main approach for treatment, and drugs are provided in blister packs according to whether it is PB or MB.
  - MDT can be given to HIV-positive patients, those on antiretroviral treatment and to patients on treatment for TB.
  - If a leprosy patient is treated for TB, the MDT regimen should omit rifampicin if the TB regimen already contains rifampicin.
  - PB patients need two drugs for six months while MB patients need three drugs for 12 months.
- Every effort must be made to ensure adherence so that PB cases complete their treatment in six months and MB cases in 12 months.
- Relapse and default cases are treated as new cases

[50] Guidelines for the diagnosis, treatment and prevention of leprosy. New Delhi: World Health Organization, Regional Office for South-East Asia; 2017. Licence: CC BY-NC-SA 3.0 IGO.

Adult Treatment Regimen for MB Leprosy *Duration: 12 months (12 blister packs)* Rifampicin: 600 mg 1 x per month Clofazimine: 300 mg 1 x per month, and 50 mg 1 x per day Dapsone: 100 mg 1 x per day **Adult Treatment Regimen for PB Leprosy** *Duration: 6 months (6 blister packs)* Rifampicin: 600 mg 1 x per month Dapsone: 100 mg 1 x per day
Child (age 10-14) treatment regimen for MB leprosy *Duration: 12 months (12 blister packs)* Rifampicin: 450 mg 1 x per month Clofazimine: 150 mg 1 x per month, and 50 mg 1 x every other day Dapsone: 50 mg x per day **Child (age 10-14) treatment regimen for PB leprosy** *Duration: 6 months (6 blister packs)* Rifampicin: 450 mg 1 x per month Dapsone: 50 mg 1 x per day
For children under 10 years of age with either MB or PB leprosy Follow the same regime as above with the following dosages Rifampicin: 10 mg/kg Clofazimine: 1 mg/kg Dapsone: 2 mg/kg

TREATMENT REGIMENS FOR LEPROSY

Common drug side-effects

- Reddening of the urine and darkening skin are inevitable.
- Dapsone can cause anemia so iron folate is given.
- Allergy can occur to both dapsone and rifampicin in which case they should be stopped.
- If rifampicin causes jaundice, it should also be stopped.

Leprosy Reactions

- These can occur and can be treated.
- They include the skin rash becoming red and swollen again, pain or numbness in the limbs, weakness of hand or feet, loss of vision, pain or redness of the eyes.
- Mild reactions can be treated with acetylsalicylic acid or chloroquine.
- Severe reactions can be treated with a reducing dose of prednisolone.

Prevention of Deformities in Leprosy

- Permanent damage to nerves will require long-term care to prevent ulceration and eventual loss of limb/function.
- Keep skin clean and moisturized, check regularly for injuries and wear appropriate protective footwear.

6 Non-communicable Diseases

6.1 Skin Disease

6.1.1 Acne vulgaris

- Caused by blocked sebaceous glands which lead to inflamed lesions (papules, pustules and/or nodules).
- It affects mainly the face and upper body, can range from mild to severe, and cause scarring and pigmentation.
- **Principles of management**
  - This focuses on the management of acne vulgaris.
  - The choice of treatment depends on the type of lesion: comedone, papule-pustule, nodule and scarring.
  - Be aware of the psychological impact of having acne and have a low threshold for addressing mental health issues.
- **Treatment**
  - If mainly comedonal acne: treat with benzoyl peroxide cream 2.5% at night to skin that has been washed. Alternatively, use sulphur and salicylic acid cream or ointment (2%+2%) or topical retinoid if available.
  - If mainly mild to moderate popular/pustular acne: Treat with fixed dose topical combination of antibiotic and benzoyl peroxide if available.
  - If severe refer

6.1.2 Scabies

- An allergic reaction to infestation of the skin by the scabies mite resulting in an intensely itchy rash all over the body.
- Burrows from the mites are often found in web spaces between the fingers and toes and on the penis.
- Scratching from the itch may result in secondary bacterial infection of the skin with crusting and exudative discharge.
- **Treatment**
  - Wash the body with soap, drying, then apply:
  - Topical Permethrin: 30g tube apply to skin for 8-14 hours; second application after one to two weeks.
    OR
  - Ivermectin 200mcg/kg single oral dose followed by a repeat dose after one to two weeks. The second treatment is necessary because ivermectin has limited ovicidal activity.
    OR
  - Sulfur: 10% ointment, repeat after 1 - 2 weeks.
  - **Treat all children and adults** in the family and advise them to expose clothes and bedding to the sun as this helps to kill the mite.
  - If there is secondary bacterial infection, apply an antiseptic – chlorhexidine, povidone-iodine.
  - If badly infected, treat with and consider referral:

	Antibiotic Choice
Adults	Amoxicillin + clavulanic acid PO 500 mg + 125 mg given every 8 hours, **or** Cefalexin PO 500 mg given every 8 hours, **or** Cloxacillin PO 500 mg given every 6 hours
Children	Amoxicillin + clavulanic acid PO 80–90 mg/kg/day of amoxicillin component taken every 12 hours

	Oral Weight Bands 3– < 6 kg: 250 mg of amoxicillin/dose given every 12 hours 6– < 10 kg: 375 mg of amoxicillin/dose given every 12 hours 10– < 15 kg: 500 mg of amoxicillin/dose given every 12 hours 15– < 20 kg: 750 mg of amoxicillin/dose given every 12 hours ≥ 20 kg: 500 mg of amoxicillin/dose given every 8 hours or 1 g of amoxicillin/ dose given every 12 hours **or** Cefalexin PO 25 mg/kg/dose given every 12 hours ***Oral Weight Bands*** 3– < 6 kg: 125 mg given every 12 hours 6– < 10 kg: 250 mg given every 12 hours 10– < 15 kg: 375 mg given every 12 hours 15– < 20 kg: 500 mg given every 12 hours 20– < 30 kg: 625 mg given every 12 hours ≥ 30 kg: use adult dose **or** Cloxacillin PO 15 mg/kg/dose given every 6 hours ***Oral Weight Bands*** 3– < 6 kg: 62.5 mg given every 6 hours 6– < 10 kg: 125 mg given every 6 hours 10– < 15 kg: 250 mg given every 6 hours 15– < 20 kg: 375 mg given every 6 hours ≥ 20 kg: 500 mg given every 6 hours
Duration	5 days

ANTIBIOTIC DOSING FOR SKIN INFECTIONS

- **Crusted/Norwegian scabies** is a more severe form of scabies seen in the immunosuppressed such as HIV infected patients.
- Refer

6.1.3 Hair and body lice

Pediculosis capitis (hair lice), pediculosis pubis (pubic hair lice), pediculosis corporis (body lice), pediculosis ciliaris (eyelash lice)

- Describes bodily hair infestation by lice
- Topical pediculicides such as permethrin is the mainstay of treatment for all pediculosis.
- In addition, nits should be removed with fingernails, a nit comb, or tweezers, if feasible. Shaving of hair in the affected area is not necessary.
    - For pediculosis capitis/pubis/corporis:
        - Ensure skin is cool and dry for absorption.
        - Apply to all areas of suspected involvement.
        - Wash off the pediculicide after 10 mins.
        - Remove nits with fingernails, a nit comb or tweezers.
        - Put on clean garment.
        - In addition to topical treatment launder clothes, towels and bedding in a hot wash. Lice can be removed from clothing, but eggs should be left to be killed by washing.
    - For pediculosis ciliaris, apply topical petroleum to the eyelashes and remove lice manually.

6.1.4 Eczema, dermatitis and allergic rash

- Eczema (atopic) and dermatitis are inflammatory conditions of the skin presenting with a raised itchy rash but with different etiology.

- In children, the associated rash commonly occurs the elbows and knees and can be on the face.
- Infants may have a scaly rash on their scalps which is called seborrheic dermatitis.
- Seborrheic dermatitis affects the scalp, eyebrows, nasolabial folds, axillae, groins and upper chest. It appears as a greasy rash with yellow scales and may be severe in HIV infection.
- Allergic contact dermatitis is a local reaction to contact with some plants, metal, rubber, cosmetics or medicinal lotions and creams.
- Allergic rashes may occur in response to food or drink, or in response to medicines.
- Management generally aims to break the cycle of dry skin causing itch and scratching which causes inflammation and the risk of secondary bacterial infection.
- **Treatment**
  - Avoid soap and known irritant or allergic triggers.
  - Apply an emollient at least twice daily to dry skin, and always after bathing. Shea butter, coconut or palm oil may be used as emollients.
  - Use lotions or cream for weeping areas and use ointments for chronic, lichenified areas.
  - Remove thick scales with salicylic acid ointment before applying steroid creams.
  - Apply a small amount of steroid cream or ointment to more inflamed areas for up to 7 days. Avoid strong steroids in children. Hydrocortisone 1%, a weak steroid, can be used on the face and flexures.
  - Refer cases not responding
  - For severe itching give chlorphenamine by mouth as in table below:

CHLORPHENIRAMINE DOSES

Medicine	Age	Dose by PO	Duration	Side effects
Chlorpheniramine syrup (2mg/5ml) and Chlorpheniramine tablet (4mg)	Child <1m	Do not give		**Common**: drowsiness **Rare**: headache, dry mouth, abdominal discomfort
	Children 1m – 23m	2.5mls (1mg) or ¼ tablet (1mg) 2 x per day	2 – 3 days	
	Children 2 – 5 years	2.5mls (1mg) or ¼ tablet (1mg) 4 - 6 x per day. Maximum 6mg in 24 hours.	2 – 3 days	
	Children 6 – 11 years	5mls (2mg) or ½ tablet (2mg) 4 – 6 x per day. Maximum 12mg in 24 hours	2 – 3 days	
	Adults and children over 12 years	1 tablet (4mg)4 – 6 x per day. Maximum 24mg in 24 hours.	2 – 3 days	

  - If there is secondary bacterial infection, apply an antiseptic – chlorhexidine, povidone-iodine.
  - If badly infected, refer

6.1.5 Fungal skin infections

- Describes infected areas of the scalp, skin and nails with fungal elements.
- Conditions such as pre-existing dermatitis, diabetes mellitus, poor hygiene and immunosuppression increase the risk of fungal skin infections.
- Infections are described according to body location:

- **Tinea pedis**
  - Macerated, itchy areas between the toes.
  - Treat with clotrimazole cream 1% or miconazole cream 2% twice daily for at least 7 days or until the infection has resolved.
- **Tinea corporis (ringworm)**

- Raised, itchy circular discrete rashes on the body.
- Treat with clotrimazole 1% or miconazole 2%, benzoic acid 6% and salicylic acid 3% Treat 2 x day for 2 - 4 weeks.

- **Tinea capitis**
  - Raised itchy circular white lesions on scalp.
  - For limited lesions apply miconazole 2%.
  - Refer more extensive lesions
  - May be necessary to shave the scalp to promote response to treatment.
- **Onychomycosis (Tinea unguium)**
  - Chronic infection of part of whole of nail. Only treat if severe as this responds best to oral treatment but refer for treatment.
- **Candidal nappy rash**
  - Rash in perineal and genital area due to irritation of the skin usually from urine or looser stools. There can be secondary fungal infection.
  - **Treatment**
    - Wash the area with water only and pat dry. Avoid vigorous rubbing.
    - Apply an emollient cream or zinc oxide 10% cream
    - If there is a red rash, with satellite lesions then this is likely to be candida. Apply clotrimazole 1% or miconazole 2% twice a day for 5 days.
    - Any ulcerated areas may need the application of topical antibiotic like bacitracin and the infant seen daily.
    - Advise parents to change the baby cloth/ diaper as frequently as possible.
    - Exposure to the air without a nappy will also help.

6.1.6 Bacterial skin infections

- **Impetigo**
  - A bacterial infection of the skin presenting with golden-yellow crusting of exudate from the rash.
  - It is highly contagious and common in children.
  - **Treatment**
    - Wash the area with soap and water.
    - Apply an antiseptic like chlorhexidine, povidone-iodine.
    - Apply topical antibiotic like bacitracin.
    - If badly infected, see antibiotic dosing for skin infection table *6.1.2*
- **Follicutitis**
  - Bacterial and/or fungal infection causing inflammation and infection of the hair follicles.
  - **Treatment**
    - Apply an antiseptic like chlorhexidine, povidone-iodine.
    - Apply topical antibiotic like bacitracin.
    - If badly infected, see antibiotic dosing for skin infection table *6.1.2*
    - Chronic deep folliculitis seen in men: refer.
    -
- **Abscess**
  - Smaller collections of pus under the skin may discharge themselves and can be treated with antiseptic and a gauze dressing.
  - If collection gets bigger or does not resolve then the collection or abscess will need incision and drainage. Refer.
    - If there is surrounding cellulitis, see antibiotic dosing for skin infection table *6.1.2*

- **Ulcer**
  - An ulcer is a chronic wound(break) in the skin and may release exudate.
  - Apply an antiseptic like chlorhexidine, povidone-iodine.
  - Apply paraffin gauze dressing or similar bacteriostatic dressing.
  - Change dressings every 1 – 2 days if possible until wound heals
  - Refer any large ulcers or any ulcer not rapidly healing
  - Patients who have ulcers on the feet may have undiagnosed diabetes so screen them for diabetes and refer.

6.2 Cardiovascular Disease

6.2.1 Hypertension

This section does NOT apply to pregnant women. In pregnancy BP ≥140/90 can be a sign of pre-eclampsia which can be fatal. See 3.4.2 for treating hypertension in pregnancy.

- **Hypertension is a serious condition that significantly increases the risk of cardiovascular disease (CVD).**
- As well as being the leading cause of death worldwide, CVD also leads to significant multiorgan disabilities for those affected, including myocardial infarction and heart failure, renal failure, stroke and vascular dementia.
- Identifying and treating hypertension is an important risk reduction strategy for CVD.
- Hypertension is mostly asymptomatic.
- Symptoms are present when there are associated complications.
- 90% of hypertension is identified as essential hypertension for which there is no currently known etiology.
- There is an increased risk of developing hypertension if the following factors are present:
  - **Non-modifiable risk factors**
    - Older age
    - Ethnicity (more common in people of African descent)
    - Family history of hypertension
    - Being male
    - History of hypertension in pregnancy
  - **Modifiable risk factors**
    - Excess salt in the diet
    - Unhealthy diet
    - Being overweight
    - Smoking
    - Harmful use of alcohol
    - Physical inactivity
    - Use of drugs: steroids, NSAIDs
- In 10% of hypertension cases, there is an identifiable cause. This is called secondary hypertension. Consider secondary hypertension in patients <30yrs and hypertension that is proving difficult to control.
- As hypertension is asymptomatic, consider screening for hypertension in:
  - Age ≥ 30years
  - BMI ≥ 30 or abdominal circumference >102cm in men; >88cm in women
  - Family history of hypertension

- Medical history of hyperlipidemia, diabetes mellitus, heart disease, kidney disease, hypertension in pregnancy and/or stroke
- Medication such as steroids, NSAIDs
- Social history of smoking and alcohol intake of more than 2 standard units daily

Diagnosis of hypertension:
BP measurements need to be taken with the patient seated, relaxed and not talking.

- BP to be measured in both arms, and the higher arm to be the reference arm for subsequent measurements.
- If ≥140 and /or 90mmHg then repeat after one minute
- If still high repeat after 30 minutes.
- If still high, aim for 3 readings of over one week before a diagnosis of hypertension is made
- Patients can also be asked to conduct home blood pressure measurements over 3 days and then reviewed

(If BP ≥180/110mmHg, treat as severe hypertension. See below section on management of severe hypertension)
Hypertension is persistent blood pressure ≥140 and /or 90mmHg.

- **Principles of management**
  - BP≥140/90mmHg (or systolic BP≥130mmHg in diabetes, CVD and chronic kidney disease) requires treatment.
  - Aim of treatment is to reduced risk of CVD
  - Measure, weight, height and Body Mass Index (BMI)
  - Refer for diagnosis and baseline investigation
  - Non-pharmacological management: lifestyle recommendations
    - If BMI > 30 or waist circumference >102cm in men; >88cm in women, advice weight loss.
    - Advise a healthy diet with little fat, moderate portion of protein and starch with plenty of fruits and vegetables like the DASH diet. [51]
    - Recommended salt intake should be ≤ 2g/day.
    - Avoid adding salt to already cooked food.
    - Aim to drink about 2 liters of water a day and avoid fizzy, carbonated and sweetened drinks.
    - Alcohol intake should be no more than one large glass or bottle of beer/lager, a shot of spirits or a small glass of wine a day.
    - Physical activity in the form of exercise should be recommended.
      Moderate intensity exercise for 30 –60 minutes 5 days or week. This should make the heart race faster, cause some breathlessness, prevent singing but allow talking.
      Vigorous intensity exercise can be done 15 –30 minutes 5 days a week and of enough intensity to prevent talking.
      Muscle strengthening exercises are advised for 2 days in the week in addition.
      Encourage physical activity choice that fits in with the person's lifestyle and in addition to their activities of daily living.
    - Advise no tobacco smoking. There is no level of tobacco smoking or second-hand exposure to tobacco smoke that is safe.

[51] https://www.nhlbi.nih.gov/education/dash-eating-plan

- **Pharmacological treatment**
  - See table below for treatment choices.
  - Refer to initiate treatment. Clinic staff may be involved in continuation treatment if trained and authorized within the NCD programme.
  - There are four classes of antihypertensives: calcium channel blockers, thiazide diuretics, ACE inhibitors (ACEi) or Angiotensin receptor blockers (ARBs).
  - The choice depends on the presence of pre-existing conditions and risk of side effects.
  - People of African descent and/or people >65 years start with either thiazide diuretic or calcium channel blocker, beta-blockers in ischemic heart disease, ACEis/ARBs in patients with severe proteinuria, diabetes mellitus, heart failure or kidney disease.
  - If available and BP ≥20/10 mmHg higher than the target on diagnosis or there are concerns about compliance, then a fixed dose combination anti-hypertensive (usually a combination of CCB +/- ARB/ACEi+/-Thiazide diuretic) is begun
  - Educate about the importance of taking medication as prescribed.
  - Review every 2-4 weeks and if needed increase up to maximum tolerated dose before adding next agent from another class.
  - Repeat this process till on maximum tolerated doses of 4 classes.
  - If using an ACEi or ARB, ideally renal function should be checked after every dose increase.
  - Aim for treatment target <140/90 or SBP<130 if has CVD, CKD or diabetes mellitus.

ANTIHYPERTENSIVE DRUG CHOICES BY CLASS

Class	Example	Starting dose	Maximum dose	Common side effects	Comments
Calcium channel blocker (CCB)	Amlodipine	5mg PO 1 x a day	10mg PO 1 x a day	Headache Oedema	
Thiazide diuretic	Hydrochlorothiazide	12.5mg PO 1 x a day	25mg PO 1 x a day	Hypokalemia Hyponatremia Hyperglycemia Hyperuricemia Erectile dysfunction	
ACEI (Angiotensin-converting enzyme inhibitor)	Enalapril	5mg PO 1 x a day	40mg PO 1 x a day	Cough Hyperkalemia Raised creatinine	First choice in patients with diabetes. See below re ARBs in people of African descent
ARB (Angiotensin-receptor blocker)	Losartan	50mg PO 1 x a day	100mg PO 1 x a day	Vertigo Headache	Preferred in people of African descent as less likely angioedema

- **CVD prevention**
  - CVD risk is calculated in the NCD clinic and if > 20% then atorvastatin 20mg PO 1 x a day (or another statin) is given for **primary prevention**.
  - Aspirin is not indicated in primary prevention. The risks outweigh the benefits.
  - If they also have diabetes, the person is recommended to be on atorvastatin 20mg PO 1 x a day (or another statin) if they are >40 years as **primary prevention.**

- Once stable, patients are reviewed in the NCD clinic every 3-6 months: In clinics regularly check adherence to lifestyle recommendations and medication.

6.2.1.1 Management of severe hypertension

- **Severe hypertension is a medical emergency.** Patients are at significant risk of end-organ damage to the brain, eyes, heart, and kidneys and will need immediate assessment, treatment and close monitoring.
- If first reading is ≥180/110mmHg, assess for signs of strike or CVA (See 6.2.7)
  - **F**ace: ask the person to smile. Does one side of the mouth or face drop?
  - **A**rms: ask the person to raise both arms. Can they do this? Does one drift down?
  - **S**peech: Ask the person to repeat a sentence. Can they repeat it correctly? Do they slur their words?
  - **T**ime: If any of the above are present, arrange for admission and management of stroke (see below) within a short **T**ime
- Refer immediately

6.2.2 Cardiovascular disease (CVD) presentations

- Further cardiac events must be prevented in people with established CVD.
- This is secondary prevention. The management of specific CVD conditions are expanded in detail below. Clinic staff my be involved in continuation treatment.
- **Secondary prevention involves a 3 – 6 monthly review in the NCD clinic and ensuring that:**
  - Recommended lifestyle advice offered.
  - Aspirin 75 – 100mg daily and/or another antiplatelet agent like clopidogrel as appropriate.
  - Atorvastatin 80mg PO 1 x a day (or another statin).
  - Measure BP and aim for target SBP<130mmHg.
  - Check pulse. If fast >100bpm, check for causes and manage appropriately. If slow <50bpm may be secondary to beta-blocker overtreatment. If not, check for causes and manage appropriately.
  - Ensure taking all medication as prescribed.

6.2.3 Angina

- Suspect angina if chest pain brought on by activity, which is like a tight band on the chest and may radiate to jaw of left arm. Pain resolves on resting.
- Refer immediately

6.2.4 Acute coronary syndrome (ACS)

- **This is a CVD emergency.**
- Consider when sudden onset of chest pain that becomes prolonged does not resolve on resting.
- Pain may be localized to the central part or left of the chest; ranging from mild to severe and can radiate to the left arm, neck and back.
- It may be associated with sweating, dyspnea, vomiting, anxiety, low BP and tachycardia.
- If ACS suspected, refer the patient immediately. Give 300mg aspirin before transfer. Give paracetamol, 2 x 500mg PO. Transfer with oxygen by mask if available.

6.2.5 Peripheral Arterial Disease

- Symptoms include claudication pain on walking, worse going up a hill and relieved on rest. Peripheral foot pulses are absent.
- Advise to walk to the point of pain and a little beyond to encourage new blood supply.
- Secondary prevention of CVD as above.
- Refer

6.2.6 Heart Failure

- Is associated with breathlessness on exertion and/or when lying flat and ankle swelling.
- Bilateral basal crepitations on chest auscultation.
- Refer

6.2.6.1 Acute pulmonary edema

- **This is a CVD emergency.**
- Characterized by acute onset of shortness of breath at rest, basal crepitations and/or ankle swelling.
- There may be a history of heart failure or may be due to end organ damage from hypertension.
- Refer

6.2.7 Cerebrovascular Accident (CVA)/Stroke

- **This is a CVD emergency.**
- See 6.2.1.1 for symptoms and signs of CVA/stroke.
- Most strokes are thrombotic (from a clot).
- A hemorrhagic stroke (bleeding) is more likely in a patient that is already on warfarin or aspirin or has a clotting disorder and is relatively younger.
- Management is aimed at reducing risk of progression of the stroke and restoring function as much as possible.
- Refer immediately.

6.2.8 Atrial Fibrillation (AF)

- Due to disordered heart contraction
- Patients will have an irregular pulse and the heart rate may be fast.
- AF also increases the risk of heart failure and a stroke
- Refer.

6.2.9 Rheumatic fever

- Rheumatic fever is a non-contagious inflammatory disease that involves the heart, joints, skin, and brain.
- It is an autoimmune disease, typically developing three weeks after a streptococcal tonsillitis and may cause lifelong heart complications.
- It most commonly presents in children aged between 5 and 17. Treating people who have streptococcal throat with antibiotics, such as penicillin, decreases their risk of getting rheumatic fever.
- Symptoms and signs of include fever, multiple painful joints, carditis, a characteristic but uncommon rash erythema marginatum, and subcutaneous nodules.
- The heart is involved in about half of cases as rheumatic heart disease (RHD), affecting all layers of the heart and permanently damaging the valves, with stenosis, and regurgitation causing heart failure, and atrial fibrillation in 10%.

- Children who have been affected can present with rheumatic heart disease (RHD) and heart failure.
- **Treatment**
  - Needs to be under specialist care by a cardiologist or pediatrician. Clinic staff may be involved in continuation treatment. Do not initiate these treatments.
  - Antibiotics:
    - Benzathine penicillin (or erythromycin/azithromycin if allergic to penicillin).
    - Adult and child > 30kg: 900mg (1.2 million IU) IM single dose monthly
    - Child: < 30kg: 450 – 675mg (0.6 – 0.9 IU) IM single dose monthly
    - Continue these for 5 years if no carditis, for 10 years if carditis and until aged 40 or lifelong if chronic rheumatic valvular disease.
  - Anti-inflammatories
    - NSAIDs: such as ibuprofen *see 6.12.1.1*
    - OR naproxen: child >2 years old: naproxen 10 to 20 mg/kg/day PO in two divided doses given every 12 hours (maximum daily dose 1000 mg). Adult: 250 to 500 mg PO 2 x a day
    - Oral steroids (prednisolone) may be given if NSAIDs not tolerated.
    - Proton pump inhibitors may be needed for gastroprotection.
  - Heart failure is treated with furosemide, spironolactone and digoxin if needed.

6.3 Diabetes

- Diabetes mellitus (DM) is an endocrine disease whose main impact is on the blood vessels on the body.
- Diabetes is characterized by high blood glucose levels (hyperglycemia).
- It is due to either the pancreas not producing enough insulin (Type 1 and 2 diabetes) or the cells of the body not responding appropriately to the insulin produced (Type 2 diabetes). There are less common types.
- Type 1 disease has no clear cause but does have an association with autoimmune disease.
- Type 2 diabetes is more likely to occur if these risk factors are present:
  - **Modifiable**
    - Hypertension
    - Obesity: BMI > 30 or waist circumference >102cm in men; >88cm in women, and high lipids in the blood
    - Physical inactivity
    - Unhealthy diet
  - **Non-modifiable**
    - > 40years
    - Ethnicity
    - Family history
    - History of gestational diabetes
    - Drugs: steroids, antipsychotics, ART
- Symptoms and signs
  - **excessive thirst**
  - **frequency of urination**
  - **excessive hunge***r*
  - Weight loss
  - Increasing tiredness and lethargy

- Change in vision.
- Slow healing of wounds, recurrent frequent infections

- Diabetes can lead to disability and death.
- Complications such as loss of limbs and vision as well as life-threatening complications like hyperglycemic state, stroke, CVD, coma and death can occur.
- Screen for diabetes in people who have risk factors as described above

Diagnosis

If symptoms that suggest diabetes are present, then refer for testing for hyperglycemia (high blood glucose)

- Fasting blood glucose (after 8 - 10 hour fast from the evening before) ≥ 7mmol/l or 126mg/dl.
  OR
- Random blood glucose ≥11.1mmol/l or 200mg/dl (fasting blood glucose is more reliable).
  OR
- Hba1c (glycosylated hemoglobin) ≥48mmol/mmol or 6.5%. Hba1c is not reliable for diagnosis in type 1 diabetes, sickle cell disease and anemia.

If asymptomatic, diabetes is diagnosed as below:

- 2 fasting blood glucose readings on 2 separate days ≥7mmol/l or 126mg/dl
  OR
- 2 random blood glucose readings on 2 separate days ≥11.1mmol/l or 200mg/dl
  OR
- Hba1c (glycosylated hemoglobin) ≥48mmol/mmol or 6.5% tested 2 weeks apart.

6.3.1 Type 1 diabetes

- Tends to present in children and younger adults.
- Management requires a careful diet, blood glucose monitoring and subcutaneous insulin injections.
- In addition to having diabetic symptoms, patients may also present with diabetic ketoacidosis DKA (see below).
- **Principles of management**
  - Hyperglycemic control
  - Prevention and treatment of associated risk factors
  - Prevention and treatment of acute and chronic complications
  - Control of high blood pressure
- **Refer for diagnosis and treatment**
  - Non-pharmacological management: lifestyle recommendations
    - Advice a healthy diet with little fat, moderate portion of protein and starch with plenty of fruits and vegetables. Aim to drink about 2 litres of water a day and avoid fizzy, carbonated and sweetened drinks.
    - Alcohol intake should be no more than one large glass or bottle of beer/lager, a shot of spirits or a small glass of wine a day.
    - Physical activity in the form of exercise should be recommended. Moderate intensity exercise for 30 –60 minutes 5 days or week. This should make the heart race faster, cause some breathlessness, prevent singing and allow talking. Vigorous intensity exercise can be done 15 –30 minutes 5 days a week and of enough intensity to prevent talking. Muscle strengthening exercises are advised for 2 days a week in addition. Encourage physical activity choice that fits in with the person's lifestyle and in addition to their activities of daily living.
    - Advise no tobacco smoking. There is no level of tobacco smoking or second-hand exposure to tobacco smoke that is safe.

- If BMI > 30 or waist circumference >102cm in men); >88cm in women, advise weight loss.

- Pharmacological treatment. Clinic staff may be involved in continuation treatment.
  - **Insulin only.** Aim for 0.6-1.5 u/kg/day SC. To be started by personnel who are trained in insulin therapy.
  - Insulin short acting, regular soluble. Can be given 3 times daily, 30 minutes before meals. It has a rapid onset within 30 minutes, peaks at 2-5 hours, duration of effect is 5-8 hours.
  - Insulin intermediate isophane. Can be given once or twice daily (evening +/- morning). Onset within 1-3 hours; peaks at 6-12 hours, duration of effect is 16 – 24 hours.
  - Insulin biphasic, mixture of short acting soluble and intermediate isophane. Can be given once or twice daily. Onset within 30 minutes, peaks at 2-12 hours, duration of effect is 16 -24 hours.
  - Regimen options:
    A combination of short acting and intermediate acting agents. Give short acting before meals and intermediate acting (should be 40-50% of total daily insulin requirement) in the evenings, e.g. a 50kg 16-year-old type 1 diabetic will require total insulin about 1u/kg/day – 50u SC. 25u (50%) can be given as intermediate insulin in the evenings and the short acting given pre-meals: 8u at breakfast, 9u at lunch and 8u at dinner
    OR
    Insulin biphasic mixture given twice daily. 2/3rds of daily dose 30 minutes before breakfast and 1/3rd 30 minutes before dinner in the evening: eg a 50kg 16 year old type 1 diabetic with a 50u daily requirement, can have 33u in the morning and 17u in the evening
- All patients will need close monitoring of their blood glucose to ensure they are not overtreated or undertreated.
- They should check their own blood glucose where possible or be seen frequently at the clinic till their blood glucose levels are stable.
- **Treatment target:**
  - Fasting blood glucose <7 mmol/l (126mg/dl)
  - Postprandial glucose (2 hours after a meal) <10 mmol/l (180mg/dl)

6.3.2 Hypoglycemia

- **This is a diabetic emergency.**
- Blood glucose ≤ 3.0mmol/l or 55mg/dl
- Teach patients how to recognize and respond to symptoms of hypoglycemia which include tremors, feeling lightheaded, sweaty, pale and confused. It may progress quickly to coma.
- If conscious:
  - 200mls of a sweet drink or 4 teaspoons of sugar dissolved in water.
  - Repeat after 15 minutes and refer.
- If unconscious refer immediately
- Assess for cause: overtreatment, dehydration, intercurrent illness, fasting, excessive alcohol intake.
- NCD clinic will advise on insulin regime as appropriate. Advise to keep well hydrated and to seek medical help early when unwell.

6.3.3 Hyperglycemia in adults

6.3.3.1 Diabetic Ketoacidosis (DKA)

- **This is a diabetic emergency.**
- Blood glucose ≥18mmol/l (325mg/dl) with ketones in the urine (ketonuria). Also consider euglycemic DKA in a known diabetic who has ketonuria.
- Is seen in Type 1 and Type 2 diabetes
- Features

- Acute onset
- May have recent history of polydipsia, polyuria, weight loss and increasing tiredness.
- Abdominal pain, vomiting.
- Altered consciousness, coma.
- Deep breathing (acidotic)
- Sweet, acetone smell on the breath (from ketosis)
- Hypotension

- Refer immediately

6.3.3.2 Hyperosmolar Hyperglycemic State (HHS)

- **This is a diabetic emergency.**
- Very high blood glucose levels can be seen.
- Slower onset than DKA
- More severe dehydration than DKA and fluid deficit with no ketonuria
- Associated with type 2 diabetes only
- General malaise
- Altered consciousness, coma.
- Has a high fatality rate.
- Refer immediately

6.3.4 Hyperglycemia in children:[52]

- Diabetic Ketoacidosis (DKA) may be the first presentation of diabetes in children/young adults.
- **This is a diabetic emergency.**
- Features
  - Blood glucose > 200mg/dl
  - Ketones on urine dipstick
  - 5-10% dehydration
  - Vomiting
  - Abdominal pain
  - Drowsiness
- **Refer immediately**

6.3.5 Type 2 diabetes

- It is important people living with type 2 diabetes are identified before they develop symptoms to prevent complications.
- This is done by **screening** for diabetes in people who at high risk of diabetes and includes:
  - Adults >40 years and BMI >25kg/m2
  - Adults with BMI >30kg/m2
  - Pre-existing hypertension, CVD, hyperlipidemia, chronic kidney disease
  - 1st degree relative with type 2 diabetes
  - History of pre-eclampsia, gestational diabetes or polycystic ovarian syndrome
  - Frequent infections, particularly skin infections and those with TB infection
  - On drugs long-term that cause high blood glucose: oral steroids, ART, antipsychotics
- For diagnosis see 6.3.1
- Refer any suspect cases

[52] Diabetic Ketoacidosis Protocol,J.F.K. Medical Center, Liberia. Pediatric Department, January 2023

- **Principles of management**
  - Hyperglycemic control
  - Prevention and treatment of associated risk factors
  - Prevention and treatment of acute and chronic complications
  - Control of hypertension
- **Treatment**
  - Refer all cases. Clinic staff may be involved in continuation treatment and in lifestyle advice
  - Non-pharmacological management: lifestyle recommendations see below.
  - Pharmacological treatment:
  - Treatment is started immediately if there are signs of diabetic complications (kidney damage, eye damage, nerve damage in the feet or severe hyperglycemia).
  - If none of the above; then encourage lifestyle changes for 3 months and review.
  - Oral diabetic treatment options:
    - Start with metformin 500mg PO 1 x a day for 1 week and titrate up weekly to a maximum of 1g twice daily till blood glucose at target.
    - Avoid metformin in severe kidney impairment.
    - If still not achieving target (see 6.3.1), add in a sulphonylurea:
      - Glibenclamide start at 5mg PO 1 x a day (2.5 mg in the elderly) to a maximum 10mg daily in divided doses.
        OR
      - Glimepiride start at 1mg PO 1 x a day, titrate up to a maximum of 4mg 1 x a day.
        OR
      - Gliclazide start at 30mg 1 x a day titrate up to a maximum dose of 120mg a day in divided doses.
    - Advice patients of risk of hypoglycemia on sulphonylureas
  - If blood glucose is not controlled on oral medication and lifestyle changes then will need to start insulin, see 6.3.1
  - Stop or reduce sulphonylurea if changing to insulin and maintain on metformin
- **Treatment target**

	Venous glucose		**Capillary glucose**		**Glycosylated hemoglobin (HbA1c)**
	mg/dl	mmol/l	mg/dl	mmol/l	53mmol/mol or 7%
Fasting	75 – 130	4 – 7	115	6.5	
After meal	180	10	160	9	

- **Prevention and management of complications**
  - Refer all cases. Clinic staff may be involved in continuation treatment and in lifestyle advice
  - Aim for tight blood glucose control.
  - CVD primary prevention: Atorvastatin 20mg daily in adults >40years
  - CVD secondary prevention: Atorvastatin 80 mg and Aspirin 75-100mg daily
  - Hypertension and preventing kidney impairment: target SBP <130mmHg.
  - Eyes: diabetic changes and cataracts to be reviewed by ophthalmologists
  - Feet: manage ulcers and prevent secondary infection
  - Advice for diabetics regarding feet:
    - Never walk barefoot. Use emollients for dry and cracked feet for prevention of ulcers.
    - Wear shoes that enclose the feet.
    - Ensure that feet fit comfortably into the shoes, without any compression of the feet, especially the toes.

- Check feet every night looking for injuries, color change, infection, coldness or ulcers. Report to health center if present.
- Check inside shoes before putting them on to ensure there are no stones inside.

6.4 Respiratory Disease

For acute respiratory infection (ARI) see 5.2.

Asthma

- A chronic disease of the airways. Inflammation of the airways leading to thickening of the walls and a build-up of mucus results in narrowing of the passages and reduces air flow in and out of the lungs.
- Symptoms include wheezing, shortness of breath, chest tightness or cough which are variable and can be worse at night.
- **Symptoms can be triggered by:**
  - Changes in the air due to dust, perfumes, pollution, cigarette smoke, smoke from open fires during cooking.
  - Mouldy environment: when the air is damp and there is little or no ventilation especially in the rainy season/cold and wet months.
  - Weather changing from hot to cold or damp to dry and vice versa.
  - Medications like NSAIDs, beta-blockers (atenolol, bisoprolol, carvedilol).
  - Exercise.
  - Allergies to certain foods; pollen from flowering plants, grasses and trees.
  - Contact with animal fur.
  - Strong emotions like stress or anger.
- Examination findings depend on severity of the asthma. Chest examination may be normal or there may be faster breathing than normal and/or wheezing on auscultation of the chest.
- There may be signs of alternative diagnosis such as:
  - Heart failure: history of hypertension, ankle swelling, basal creps, raised JVP.
  - COPD: chronic productive cough, history of smoking
  - TB: chronic cough, night sweats, weight loss, hemoptysis
  - Hyperventilation: light-headedness, tingling in fingers and toes, normal examination

Diagnosis

Refer to NCD clinic in health center.

Using a peak flow (PF) meter:

Measure PF and record. Then ask patient to inhale 2 puffs of 200 mcg of salbutamol.

Wait 10 minutes and measure PF again and record.

$$\text{Percentage PF change} = \frac{\text{PF after salbutamol} - \text{PF before salbutamol}}{\text{PF before salbutamol}} \times 100$$

If >20% change in PF, then diagnose asthma.

- **Principles of management**
  - Advise person to stop smoking.
  - Follow stepwise treatment below and increase to next step if symptoms persist.
  - Use a spacer with an inhaler.
  - Ask about and check inhaler use.
  - Encourage exercise. Treat obesity/ malnutrition

- Advice about trigger avoidance.
- Provide education on how to increase medication if often breathless and breathlessness interferes with activities of daily living.
- Look for anxiety/ depression as breathlessness is frightening.
- Once condition is stable, review every 6 months.

- **Treatment**
- Refer for treatment, but clinic staff may be involved in continuation treatment

	Medicine	**Dosage**	**Treatment advice**
Step 1	**Start reliever**: Short acting bronchodilator via spacer (salbutamol or if not better after 1 month try ipratropium)	Salbutamol 200mcg as needed. (Ipratropium 40mcg as needed)	Only give oral salbutamol if no inhaler available. Only use ipratropium if salbutamol not working as risk to heart and not as effective
Step 2	**Add preventer**: Inhaled steroids at normal dose – beclomethasone. Continue reliever therapy.	Adults: 200 - 400mcg 2 x per day. Children: 100 – 200mcg 2 x per day	All inhaled steroids are equally effective – use the cheapest available.
Step 3	**Add second preventer**: (If available) Over 5 years old: long acting beta agonist (LABA). Aged 2 -5 leukotriene receptor agonist (montelukast)	Salmeterol 50-100mcg 2 x per day Montelukast Child 2-5y 4mg;	**Never use LABA without inhaled steroids as there is a risk of death**. **Do not give to children < 6 years.**
Step 4	Check inhaler use & technique. Review diagnosis. Increase to 'high dose' inhaled steroids. Continue other medicines.	Adults: Beclomethasone 1000mcg 2 x per day Child > 5 400mcg 2 x per day.	In children inhaled steroids can affect growth: seek specialist help.

6.4.1.1 Acute exacerbation of asthma

- **This is a respiratory emergency.**
- Describes a sudden worsening and limitation of the airways.
- Symptoms and signs include:
  - Sitting and leaning forward with hands on knees. May be agitated becoming quiet when severe.
  - Not talking in full sentences which can progress to not talking at all when severe.
  - Using accessory muscles for breathing: nasal flaring, indrawing of the chest wall, paradoxical breathing.
  - Audible wheezing which may disappear when the attack becomes severe.
  - Oxygen saturation reduced to 92 - 95%
  - Increased pulse and respiratory rate according to these parameters by age:

Age	**<6y**	**6-10y**	**>10y to adult**
Heart rate	>130	>120	>110
Respiratory rate	>50	>30	>25

- **In severe and life-threatening exacerbations,** there will be:
  - Feeble respiratory effort
  - Exhaustion/confusion/coma
  - Cyanosis
  - Bradycardia or hypotension
  - Silent chest

- **Treatment**
  - High flow oxygen via a face mask

- Assess the severity (pulse, BP, respiratory rate, temperature, colour, how much they can talk, oxygen saturation < 92% is abnormal at any age)
- Bronchodilator:
  - Salbutamol via spacer, 10 puffs, over 10-15 minutes (shaking inhaler before each puff). Repeat 2 – 4 hourly.
  - Oral salbutamol can be given only if alternative routes are not available. The side effects of tremor and palpitations are worse. Give one dose as below and arrange immediate transfer to hospital.

Medicine	Age	Dose
Salbutamol syrup (2mg/5ml), 4mg tablet	Children 1 – 5 years	1mg (2.5ml or ¼ tablet)
	Children 5 – 12 years	2mg (5ml or ½ tablet)
	Adults and children over 11 years	4mg single dose

Refer immediately with oxygen and after giving salbutamol

- **Management after exacerbation**
  - Start inhaled steroids.
  - Antibiotics are not indicated unless there is clear evidence of infection (fever, productive cough, crepitations in the chest). If pneumonia, *see 5.2*
  - After they return, ensure person and parents/caregivers know how to use inhaler and spacer, how to take oral prednisolone and know signs of exacerbation and when to return.
  - Arrange a routine review in 3 – 7 days after completion of course of oral steroids.

6.4.2 Chronic Obstructive Pulmonary Disease (COPD)

- A respiratory disease that affects the airways with chronic inflammation of the bronchi.
- Damage to the airways over time leads to recurrent build-up of mucus and a permanent narrowing of the air passages therefore reducing airflow in and out of the lungs.
- Risk factors:
  - Adults > 35 years who smoke or used to smoke tobacco.
  - Adults who have been exposed to excessive air pollution such as open fires.
- Symptoms:
  - Difficulty breathing, feeling breathless and/or wheezing especially after exercise
  - Chronic cough (Rule out TB: chronic cough, night sweats, weight loss, hemoptysis)
  - Producing a lot of sputum especially in the rainy season/ colder and wetter months
  - Recurrent chest infections requiring treatment
- Diagnosis:
  - Is clinical.
  - Chronic cough, productive cough, history of smoking.
  - Refer for diagnosis
- **Principles of management:**
  - Advise person to stop smoking.
  - Follow stepwise treatment below and increase to next step if symptoms persist.
  - Use a spacer with an inhaler.
  - Ask about and check inhaler use.
  - Encourage exercise. Treat obesity/ malnutrition.
  - Increase medication if often breathless and breathlessness interferes with activities of daily living.
  - Look for anxiety/ depression as breathlessness is frightening.

- Once condition is stable, review every 6 months.

- **Treatment:**
- Not initiated in clinic but staff may be involved in continuation treatment

	Medicine	Dosage	Treatment advice
Step 1	Short acting bronchodilator via spacer (salbutamol or if not better after 1 month try ipratropium)	Salbutamol 200mcg as needed. (Ipratropium 40mcg as needed)	Only give oral salbutamol if no inhaler available. Only use ipratropium if salbutamol not working as risk to heart.
Step 2	**Add** long-acting drug (if available): tiotropium or salmeterol.	Tiotropium 18mcg one puff 1 x per day NOT MORE than once per day) Salmeterol 50-100mcg inhaled 2 x per day.	Give these if available and not too expensive, otherwise go to step 3.
Step 3	**Add** inhaled corticosteroids (beclomethasone)	200 – 400mcg inhaled 2 x per day.	Inhaled steroids reduce exacerbations but increase risk of pneumonia. Only use if severe disease.

6.4.2.1 Acute exacerbation of COPD

- Patients may present with:
  - Worsening breathlessness
  - Fever
  - Wheezing
  - Productive cough with plenty of discolored sputum
  - Fast breathing ≥ 25 cycles/min
  - Fast heart rate ≥100 beats/min
  - SpO2 ≤90% on air
- **Treatment**
  - Bronchodilator:
    - Salbutamol via spacer, 10 puffs, over 10-15 minutes, shaking inhaler before each puff.
  - Refer

6.5 Gastrointestinal diseases

6.5.1 Upper gastrointestinal tract

6.5.1.1 Gastritis, Gastro-esophageal reflux disease (GERD):

- Gastritis describes inflammation of the mucosal lining of the esophagus, stomach and duodenum often due to excess gastric acid production and GERD describes the leaking of acid into the esophagus from the stomach sometimes due to an incompetent esophageal sphincter.
- **Treatment:**
  - Treat mild indigestion related symptoms in adults with:
    - Magnesium trisilicate compound, 1 -2 tabs PO as needed (maximum 8 a day) OR
    - Other magnesium or aluminium antacid in tablet or liquid form
    - Advice to avoid eating late, spicy and/or fatty foods, caffeine and the use of NSAIDs.
  - If symptoms persist more than 2 days or person describes more acute pain rather than mild discomfort which is exacerbated either by hunger or after eating, then refer.
- If **severe symptoms**, any history of hematemesis or melaena or severe epigastric pain, refer immediately

6.5.1.2 Pediatric Gastro-esophageal Reflux Disease:

- Reflux in newborns is physiological and settles usually by a year as the sphincters are not yet fully developed.
- Symptoms of reflux in the baby include frequent distress especially after feeds, back arching, and crying.
- In mild cases ensure frequent lower volume responsive feeds with correct positioning post feeds.
- If using formula using a feed thickener may help.
- Refer
- 3% may need to avoid cow's milk as they may have a cow's milk protein allergy. This resolves over time in most cases.

Viral hepatitis see 5.8.4

6.5.1.3 Chronic liver disease:

- Describes irreversible damage to the liver.
- There are many causes including hepatitis (infection, drug-induced, alcohol, autoimmune) as well as parasitic infections such as schistosomiasis.
- **Principles of management**
  - Treat underlying cause
  - Avoid alcohol and drugs that can affect like the liver like paracetamol
  - Ensure adequate nutrition and hydration.
  - Refer

6.5.1.4 Acute cholecystitis

- Inflammation of the gallbladder that presents with biliary colic.
- It usually occurs when a gallstone completely obstructs the gallbladder neck or cystic duct.
- It can cause sepsis, jaundice, perforation and peritonitis, gangrene of the gall bladder or ascending cholangitis.
- Symptoms:
  - Usually presents with right upper quadrant pain radiating through to back, nausea and sometimes vomiting, fever.
  - Acute cholangitis is a complication of cholecystitis and due to ascending infection in the bile duct. This is more severe and there is also jaundice.
- Refer

6.5.1.5 Pyogenic liver abscess:

- A pyogenic liver abscess is defined as a collection of pus within the liver.
- Parasitic infection with entamoeba histolytica causes amoebic liver abscess.
- Symptoms and signs:
  - Fever (≥ 38.0 °C) and abdominal pain (mostly localized in the right upper abdominal quadrant) +/- vomiting, nausea, anorexia, malaise and jaundice.
- Refer

6.5.1.6 Schistosomiasis

- Can cause gallstones or intrahepatic stones as a complication.
- Treat schistosomiases *see 5.9.2*

- Refer

6.5.1.7 Ascariasis and hookworm

- Treat parasites with albendazole.
- If obstruction is suspected all the patient is unwell, refer.

6.5.2 Lower Gastro-intestinal Tract

- For infectious causes of diarrhea *see 5.1*

6.5.2.1 Diverticular disease

- Maintaining high fibre with fluids to prevent infection is key.
- Diverticulitis may present with fever, abdominal pain with rectal bleeding.
- Refer

6.5.2.2 Inflammatory bowel disease

- May present with indigestion, abdominal cramps and frequent loose stools with blood and mucus.
- Refer

6.5.2.3 Hemorrhoids

- Usually precipitated by straining at stool.
- Encourage a soft, regular bowel habit with water, plenty of fruit and vegetables.
- Constipation may need treatment with stool softeners such as lactulose 5 –10 mls twice daily +/- stimulant laxative senna 5mg once daily at night.
- Mild cases treated with any topical product that might soothe the pain (such as 1% hydrocortisone or bismuth) or suppositories.
- Refer any person with persisting or large hemorrhoids

6.6 Urinary Tract and kidney

6.6.1 Lower Urinary tract infection (UTI)

- Describes bacterial infection affecting the bladder and urethra.
- Patients may present with dysuria, frequency and urgency.
- Loin pain, rigors and blood in urine suggest ascending infection.
- Children may present with persistent fever for more than 4 days with or without abdominal pain.
- **Investigations**
  - UTI can be confirmed by urine dipstick which shows: nitrites +/- leukocytes +/- blood +/-
- **Treatment**
  - Oral nitrofurantoin for 5 days is the main recommended treatment for lower UTI:

Medicine	Age	Dose	Duration	Side effects
Nitrofurantoin 50mg tablets	Child 3 months – 11 years	750mcg/kg 4 x per day	3 days 5 days if more severe symptoms	**Common** : Anorexia, nausea **Rare** : vomiting and diarrhea; allergic reaction
	Child 12 years and adults	50mg 4 x day	3 days. 5 days if more severe symptoms	
Prescribing tip: Do not give if previous allergic reaction to nitrofurantoin. Avoid in pregnant women near term – consider amoxicillin 500 mg three times daily for 5 days				

- Alternative is 2nd line give cefalexin 250mg PO 2 x a day for 5 days.
- If symptoms persist for more than 2 days or if symptoms worsen, test urine again and if still positive on dipstick, then refer.
- Refer a person with moderate to severe symptoms (including high fever, abdominal pain, blood)
- Refer all infants under 12 months

6.6.2 Upper urinary tract infection (acute pyelonephritis):

- Infection of the kidneys (pyelonephritis) in which microorganisms ascend the urinary tract via the urethra, bladder, ureters or reach the kidneys through the bloodstream.
- Symptoms and signs:
  - Pain in side of abdomen, tenderness below the ribs, nausea and vomiting, blood in urine, fever and signs of systemic illness +/- symptoms of UTI
  - Severity varies from mild disease (most cases) that can be managed with oral treatment (no nausea/ vomiting, low grade fever) to severe cases requiring intravenous treatment and hospital admission.
- Factors that may increase the risk of a complicated upper urinary tract infection:
  - Obstruction at any site of the urinary tract
  - Foreign body (e.g., urinary catheters and stents)
  - Incomplete voiding
  - Vesicoureteral reflux
  - Recent history of instrumentation
  - Male sex
  - Pregnancy
  - Diabetes
  - Immunosuppression
  - Health care-associated urinary tract infection
- Treatment:
- Refer.

6.6.3 Glomerulonephritis and acute nephritis

- Usually occurs after streptococcal infection and is diagnosed by observing blood in the urine
- Often accompanied by hypertension and swelling.
- Refer

6.6.4 Nephrotic syndrome

- This presents with protein in the urine and swelling of the face and entire bodies in children and dependent edema in adults.
- It has many causes (kidney disease, diabetes, occasionally from viral hepatitis or HIV) but most cases are of unknown cause.
- It may also present in those with sickle cell and go onto to renal failure. Where possible establish histology
- Refer

6.6.5 Acute Kidney Injury (AKI)/acute renal failure

- Pre-kidney causes: fluid or blood loss, dehydration, sepsis, renal disease (includes infections such as malaria and leptospirosis), snake bites, drugs and toxins, glomerulonephritis.

- Post kidney causes are related to obstruction and due to e.g., stones, blocked catheter, pelvic mass, large prostate.
- Refer

6.6.6 Chronic Kidney Disease (CKD)

- CKD is diagnosed from blood tests of kidney function.
- It can be caused by:
  - nephrotoxic drugs (NSAIDs, celecoxib, aminoglycosides, contrast agents)
  - chronic obstruction (stones, prostate enlargement)
  - glomerulonephritis
  - hypertension, diabetes
  - HIV and some tropical disease e.g., Schistosoma haematobium
- Symptoms and signs:
  - Progressive decline in kidney function initially symptomless, later resulting in: fatigue, anemia, and fluid overload (edema) and raised urea (causing anorexia, vomiting, neuropathy, confusion).
  - Refer

6.6.6.1 Prescribing in kidney failure

- Many medicines are excreted through the kidneys and accumulate when urinary output is reduced. **Be careful when prescribing any medicine and check prescribing information.** Check on prescriptions that a patient had been given by health centers and hospitals, and ask patient to check back if they may be on a drug that is dangerous in kidney failures.
- Drugs which are usually safe:
  - Doxycycline
  - Erythromycin
  - Benzylpenicillin (but max 6 g daily in severe impairment)
  - Phenytoin
  - Rifampicin
- Drugs to use with care in reduced doses:
  - ACE inhibitors (e.g., lisinopril)
  - Amoxicillin
  - Chloramphenicol (avoid in severe impairment)
  - Ciprofloxacin
  - Cotrimoxazole
  - Diazepam
  - Digoxin
  - Insulin
  - Isoniazid-containing medicines
  - Pethidine (increase dose interval, avoid in severe impairment)
  - Phenobarbital
  - Propranolol

Drugs to **avoid** using:

  - Acetylsalicylic acid (aspirin) and other NSAIDS e.g. ibuprofen, indomethacin
  - Codeine
  - Ethambutol
  - Gentamicin
  - Metformin

- Nalidixic acid
- Nitrofurantoin
- Streptomycin
- Tenofovir (TDF)

6.7 Neurological Disease

6.7.1 Epilepsy

- A chronic neurological condition, characterized by recurrent unprovoked seizures. It has several causes:
  - Genetic
  - Past history of birth trauma
  - Brain infections
  - Head injury.
- In some cases, no specific cause can be identified.
- Seizures are caused by abnormal discharges in the brain and can be of different types. People with epilepsy can have more than one type of seizure.
- The two major types of seizures are **convulsive** and **non-convulsive:**
  - Non-convulsive epilepsy has features such as change in awareness, behavior, emotions or senses (such as taste, smell, vision or hearing) similar to mental health conditions, so may be confused with them.
  - Convulsive epilepsy has features of generalized convulsions such as sudden muscle contraction, causing the person to fall and lie rigidly and unconscious, followed by the muscles alternating between relaxation and rigidity, with or without loss of bowel or bladder control. This type is associated with greater stigma and higher morbidity and mortality.
- Refer to specialist for further investigations
-

6.7.1.1 Generalized convulsions

- For management of a person with convulsions or status epilepticus as an emergency, *see 2.8*
- **Generalized convulsions (Tonic-Clonic seizures) may be of unknown origin or secondary to conditions such as fever, meningitis, head injury, substance withdrawal, metabolic abnormality e.g. hypoglycemia, hyponatremia.**
- May start with a warning sensation or aura such as flashing lights, sounds, smells, or abdominal pain.
- Abrupt loss of consciousness with initial stiffness/rigidity (tonic phase)
- Followed by rapid jerking movements lasting longer than 1–2 minutes (clonic phase).
- There may be tongue biting, frothing, incontinence of urine or faeces.
- Followed by a period of drowsiness, confusion, abnormal behavior and headache or muscles aches (post-ictal phase)
- Differential diagnoses include:
  - simple faint
  - rigors
  - postural hypotension
  - cardiac syncope
  - dissociative seizures.
- If the event was definitely a seizure, rule out potential causes such as drug/alcohol use/withdrawal, meningitis or electrolyte disturbance and treat these.

- Diagnosis of epilepsy is confirmed when there have been at least 2 convulsions in the last 12 months on 2 different days with no underlying cause. Eyewitness account of the seizure will help with this.
- Refer
- **Principles of management**
  - *Clinic staff do not initiate treatment but may be involved in continuation treatment.*
  - The patient is started on one treatment at the lowest dose and dose is built up slowly.
  - The aim of treatment is to achieve the lowest maintenance dose that provides complete seizure control.
  - Adherence to medication is very important.
  - If a single drug at maximum tolerated dose is not controlling seizures, then add in a second drug, increase up to therapeutic levels then slowly reduce and stop the first drug.
  - If the patient is not controlled on one medication, two together may be needed..
  - Initial follow up is monthly to monitor for side effects, but once the person is seizure-free and with very few side effects then they can be reviewed every 3 months.
  - Treatment may be reduced slowly (and eventually stopped) if there has been absence of seizures for 2 years, but dose increased again if there are further seizures after reducing the dose. A person should avoid doing jobs that are not seizure safe such as driving or using heavy machinery with a history of epilepsy unless they have been stabilized on medication and after being at least 1-year seizure free.
  - See table below for medication options. Most medications are given twice a day, but phenobarbital can be given once a day. Seizures may still occur during the first 2 to 3 weeks of starting phenobarbitone as blood levels increase slowly.
  - The patient should be reviewed in the NCD clinic every 1 -2 weeks.

	Child		**Adult and adolescent**	
	Starting dose	**Maintenance dose**	**Starting dose**	**Maintenance dose**
Carbamazepine	2.5 mg/kg PO 2x daily	5mg/kg PO 2 - 4 x day	100 – 200 mg PO 2 x day	400 – 600mg PO 2 x day
Phenobarbital	6 - 8mg/kg PO 2 x daily	6 – 8 mg/kg PO in 1 - 2 doses daily	30 – 60 mg PO at night	1 - 3mg/kg PO at night
Phenytoin	1.5 -2mg/kg PO 2 x daily	2.5 – 4 mg/kg PO in 1 - 2 doses (max 4mg/kg twice daily)	150 – 300 mg PO daily	200 – 500 mg PO daily
Sodium valproate	7.5 – 10 mg/kg PO 2 x daily	15 – 30 mg/kg PO in 2-3 doses daily	400 mg PO daily	400 – 2000 mg PO in 2 doses daily
Lamotrigine			25 mg PO daily	100-200mg PO in 1-2 doses daily

COMMON ANTIEPILEPTIC DRUGS AND DOSES

  - To prescribe anti-epileptic drugs safely it is important to be aware of the side effects:

Carbamazepine: double/blurred vision, impaired coordination, rashes/urticaria, gastrointestinal upset, increased liver enzymes. Rarely blood disorders (anemia, leucopenia, increased bleeding) and Stevens-Johnson syndrome.

Phenobarbital: drowsiness, lethargy, hyperactivity in children, skin rash. Rarely bone marrow depression, liver failure.

Phenytoin: drowsiness, unsteadiness, tremor, confusion, coarsening of features of face and gums, acne, hirsutism, gastrointestinal upset, headache, anemia, hepatitis. Rarely hepatitis, blood disorders and Stevens-Johnson syndrome.

Valproate: 10% risk of teratogenicity. Hair loss, behavior changes, tremor, gastrointestinal upset, weight gain, menstrual disturbance. Rarely pancreatitis, bone marrow failure. Use with caution in liver disease.

Lamotrigine: rash, blurred or double vision

  - If on antiretrovirals for HIV, valproate is used in preference to other epilepsy drugs (as valproate is not an enzyme inducer). Phenytoin and carbamazepine are avoided if possible.

- In women of childbearing age who are on antiepileptic medication:
  - The NCD clinic will discuss contraception, preconception advice and pregnancy.
  - All epilepsy drugs increase the risk of congenital anomalies with valproate having the highest risk (10%). Carbamazepine and lamotrigine have the lowest risk.
  - The copper coil is a good choice for contraception as it is not affected by any epilepsy drugs.
  - When discussing contraception with women taking anti-epilepsy drugs, consult specialist guidance, as most anti-epilepsy drugs induce enzymes that can reduce the effectiveness of oral contraceptives.
  - All women of childbearing age on antiepileptics should take folic acid 5mg daily to reduce the risk of neural tube disorders if they do get pregnant.
- Prescribing in pregnancy
  - Where possible pregnant women should only be given one antiepileptic medicine (Avoid valproate).
  - All five medicines can be used during breastfeeding though valproate can cause bleeding problems in infants. At birth, the newborn is given vitamin K 1mg IM if the mother has been on epilepsy medication.
- Psychoeducation
  - Provide information on: "What is a convulsion/epilepsy" and the importance of medication.
  - Provide information on: How carers can manage convulsion at home.
  - Provide information on: When to get medical help.
  - Promote functioning in daily activities and community life.

6.7.1.2 Absence seizures

- Usually, a disorder of children

- Characterized by a brief lack of awareness (staring vacantly into space) for several seconds.
- These can occur multiple times a day.
- In most children absence seizures resolve but they may persist into adulthood.
- Refer

6.7.2 Cerebral Palsy

- A neurological syndrome caused by damage to the immature brain. It usually occurs prenatally but can also occur perinatally and up to the age of 3 years.
- Potential causes include toxins, teratogens, genetic problems, intrauterine infections, metabolic problems, perinatal hypoxic-ischemic injury, meningitis, cerebral malaria, other infections, seizures and head injury.
- It results in a permanent disability with posture and movement disorders (poor coordination, weakness, spasticity, ataxia and involuntary movements) and intellectual disabilities (communication, behavioural and emotional difficulties).
- It also can cause problems with vision, hearing and swallowing.
- Refer. Clinic staff may be involved in continuation treatment
- **Treatment**
  - Diazepam or baclofen can be used to treat spasticity. Baclofen is preferable for chronic severe spasticity.
  - Baclofen: Child 1 month – 17 years start on 300 mcg/kg PO in 4 divided doses increasing gradually until satisfactory response (< 7 years max 40mg, 7 -17 years max 60mg). Adult 10mg PO 3 x a day (increase up to 100mg daily).
  - Side effects are drowsiness, weakness, dizziness, seizures, nausea, vomiting, headache.

6.7.3 Migraine

- A periodic severe headache which usually occurs unilaterally and is often described as throbbing, and worse with physical activity.
- It typically lasts between 4-72 hours, with associated nausea and or/vomiting, and sensitivity to light and/or sound.
- Some patients have migraine with aura.
- This typically lasts for 5-60 minutes before the headache starts and may be visual (flashing lights/jagged lines), or sensory (numbness/tingling).
- **Treatment**
  - Treat the acute episode with ibuprofen or Aspirin:
    - Ibuprofen 400mg PO 3 – 4 x daily
    - Acetylsalicylic acid PO 300 – 900 mg 3 – 4 x daily (maximum 4g daily)
    - If unable to take ibuprofen or aspirin use paracetamol 1g PO maximum 4 x daily
    - Add promethazine 25mg PO or metoclopramide 10mg PO for nausea.
    - Refer

6.7.4 Parkinson's Disease

- A degenerative condition of the brain caused by loss of dopamine releasing neurones in the brain.
- It presents as a progressive movement disorder that causes tremor, stiffness, and movement problems. It is a disease of the elderly. Certain drugs such as chlorpromazine and promethazine can cause drug-induced parkinsonism.
- The diagnosis is clinical:

- Tremor at rest (unilaterally initially but progressing to bilateral, often worse on one side)
- Rigidity (stiffness noted with passive movement)
- Bradykinesia (slowness of voluntary movements and reduced movements such as arm swing, spidery writing)
- Balance and gait disorder (difficulty in rising from a sitting position and starting to walk, small shuffling steps, difficulty turning and stopping, falls)
- Other features include loss of facial expression, impaired communication and understanding, mood and behaviour changes, sleep problems, orthostatic hypotension and postural instability, bowel/bladder problems, unexplained pain, hypersalivation, dementia, and altered sensation of smell. Some of these can occur before the presentation of motor symptoms.

- Parkinson's disease dementia is similar to Alzheimer's but may include visual hallucinations and fluctuations in lucidity. Depression is common.
- Refer all suspect cases

6.8 Thyroid Disease

6.8.1 Thyrotoxicosis

- This should be suspected in people with goiter, tremor, heat intolerance, sweating, anxiety, weight loss and palpitations. The pulse may be faster.
- There may also be exophthalmos.
- Most cases are caused by Grave's disease which is an autoimmune disease.
- Refer any suspect case.

6.8.1.1 Thyrotoxic crisis (thyroid storm)

- This is a rare but life-threatening complication of thyrotoxicosis caused by excessive release of thyroid hormone. If left untreated it can be fatal. Patients may have a pre-existing diagnosis of hyperthyroidism or this may be the initial presentation.
- Symptoms and signs:
  - Fever>38.5°C and frequently hyperpyrexia (>41°C), profuse sweating
  - Tachycardia
  - Poor feeding in children and weight loss
  - Hypertension – which may lead to congestive heart failure and subsequently cardiac arrhythmias, hypotension and shock
  - GI symptoms – vomiting, diarrhea, jaundice and abdominal pain
  - Neurological symptoms - anxiety, altered behaviour, seizures/coma.
- **Refer immediately**

6.8.2 Hypothyroidism

- This is due to an underactive thyroid gland.
- It affects 1-2% of the population worldwide and is most caused by low iodine in the diet.
- Almost one third of the world's population live in areas of iodine deficiency.
- It is also caused by autoimmune disease, post-thyroiditis and is always present after a total thyroidectomy.
- It is more common in women.
- It is particularly important to diagnose hypothyroidism in pregnancy as it is associated with congenital hypothyroidism in the newborn.
- This can affect brain development of the fetus and cause delayed development and disability.

- Symptoms and signs:
- Weight gain
- Poor concentration
- Tiredness
- Depression
- Muscle weakness
- Facial puffiness
- Dry skin
- Hair loss
- Fertility problems
- Impaired cardiac function
- In children can lead to delays in growth and intellectual development.
- In extreme cases it can be fatal.

- The diagnosis of hypothyroidism is based on a raised TSH. T4, if measured, is usually low.
- Refer any suspect cases

6.8.2.1 Hypothyroidism in pregnancy

- Pregnancy can trigger the progression of subclinical hypothyroidism to overt hypothyroidism and can increase levothyroxine requirements.
- If a woman with hypothyroidism becomes pregnant, increase the usual levothyroxine dose by 30% as soon as it is known she is pregnant.
- If available, monitor TSH at least once each trimester.
- Women with subclinical hypothyroidism who are trying to conceive should be given levothyroxine.
- If hypothyroidism is diagnosed during pregnancy, the woman is followed up in hospital for ANC and labour.

6.8.2.2 Endemic goiter

- Is an enlargement of the thyroid gland and occurs in iodine deficient areas of the world.
- It can also be caused or aggravated by goitrogens such as manioc, cabbage, turnips and millet.
- Vitamin A deficiency and protein energy malnutrition can be contributing factors.
- Thyroid function usually remains normal but in pregnancy it can cause fetal and perinatal mortality, and physical and mental retardation.
- Treatment
  - Prevention
    - The use of iodized salt has made it a rare disease in many areas and supplying iodized salt/sugar/oil capsules are the recommended method of prevention. If iodized salt is not available and the County Health Office have advised prevention in endemic areas, then give 190mg iodized oil capsule PO as a single yearly. Children under 1 y: 1 capsule, Children 1 - <6y: 2 capsules, Children 6 – 15y: 3 capsules and women of childbearing age: 2 capsules PO
  - Curative – refer

6.9 Blood disorders

6.9.1 Anemia

- Describes a finding of low hemoglobin and needs investigation of its causes:
- Decreased production of red blood cells:

- Nutritional iron, and/or folic acid/vitamin B12 deficiency (poor diet or poor absorption)
- Depressed bone marrow function (blood cancer, aplastic crisis)
- Infections (TB, malaria, visceral leishmaniasis)
- Anemia of chronic disease (e.g., kidney failure, liver disease)
- Drugs side effects (chloramphenicol)

- Increased destruction of red blood cells (hemolysis)
  - Malaria
  - Drug side effects (dapsone, cotrimoxazole, zidovudine)
  - Hemoglobinopathies (e.g., sickle cell anemia, thalassemia)
- Loss of red blood cells (hemorrhage and parasites)
  - Acute and chronic blood loss (trauma, hookworm infestation, pregnancy complications, menorrhagia, schistosomiasis, GI bleeding)

If the hemoglobin is <6g/dl in adults and children and they are symptomatic, refer for further treatment, investigation (FBC, peripheral smear) including consideration of transfusion. See blood transfusion for more details

- Management in non-urgent cases is based on underlying cause.

6.9.1.1 Iron deficiency anemia

- Is common and often due to poor nutritional intake and chronic blood loss.
- Treat with a combination of ferrous sulphate and folic acid:
  - Ferrous sulphate 200mg/Folic acid 0.4mg for 2-3 months. Use syrup in children if available and affordable calculated to the equivalent dose depending on the formulation:
    - Child 0 - 12 months: ¼ tablet PO 1 x day
    - Child 1 - 4y: ½ - 1 tablet PO 1 x day
    - Child 5 – 10y: 1 - 2 tablets PO 2 x day
    - Child >10y and adults: 1-2 tablets PO 2 x day
  - Also give presumptive treatment for worms: Albendazole:
    - Child <1 y are not given deworming medication
    - Child 1 to < 2 y: 200mg single dose
    - Child > 2y and adults 400mg single dose (not during first trimester of pregnancy).
  - For children also give Vitamin A (if last dose > 4 weeks ago)

6.9.1.2 Thalassemia

- Is an inherited disease with faulty hemoglobin production. It is not common in Liberia. Thalassemia minor (a person has the thalassemia gene from only one parent) presents with mild anemia > 10g/dl and is asymptomatic.
- Thalassemia major (when a person has inherited thalassemia genes from both parents) is a permanent condition of severe anemia, jaundice and splenomegaly with complications of recurrent infection and bone deformities.
- Treatment involves repeated blood transfusions.
- Refer

6.9.1.3 Sickle cell disease

- Is common in Liberia.

- It is an inherited disease with faulty hemoglobin production leading to red cells that form a crescent shape. In sickle cell trait, the person inherits the gene from only one parent and the only effect is mild anemia.
- In sickle cell disease, a person inherits the genes from both parents.
- There is increased destruction of red blood cells (hemolysis), an increase in blood thickness and obstruction of small blood vessels causing severe chronic anemia, jaundice, large spleen, skeletal abnormalities and delayed puberty.
- Acute complications include painful occlusive crises of the blood vessels, blood cell destruction (hemolysis) or aplastic crises (new blood cells no longer made by the bone marrow). Life threatening complications include stroke, overwhelming infections and acute chest syndrome.
- **Features**
- Chronic anemia: Hb 6-9 g/dl
- Painful occlusive crisis (VOC)
    - Common, due to small blood vessels being blocked, precipitated by cold, infection, dehydration, or hypoxia.
    - Children under 2 years of age present with pain and swelling in the hands and feet (dactylitis), or non-specific signs such as irritability, refusal to walk and lack of appetite.
    - Older children and adults present with acute pain in the back, chest, and extremities.
    - These crises can cause stroke, acute chest syndrome, acute abdomen (mesenteric ischemia), priapism, renal infarction, and bone infarction.
    - **Principles of management**
        - Pain control *see 6.12*
        - Rehydration: Oral fluids and if necessary IV normal saline
        - Correct hypoxia with supplemental oxygen
        - Test for malaria and treat if diagnosis confirmed.
        - **refer**
- Stroke
    - Usually ischemic, may resemble meningitis or cerebral malaria.
    - Refer
- Acute chest syndrome
    - This presents with chest pain, tachypnoea, respiratory distress, hypoxia, fever
    - It can lead to multiorgan failure.
    - Refer
- Acute abdomen
    - refer
- Priapism
    - Can occur in boys and men and lead to necrosis and irreversible erectile dysfunction.
    - Treat with hydration, warm compresses and analgesia and refer.
- Severe anemia (Hb <6g/dl and symptomatic)
    - Acute on chronic severe anemia may be precipitated by splenic sequestration, hemolysis or an aplastic crisis.
    - Splenic sequestration is more common age 1-4 years and there is sudden enlargement of the spleen, left upper quadrant pain, thrombocytopenia and signs of shock.
    - Refer
- Prevention
    - Treat all infections promptly.

- Avoid precipitating factors like dehydration, hypoxia, infection and cold
- If severe anemia give transfusion
- Prophylactic antibiotic will be started in the health center. *Clinic staff may be involved in continuation treatment:*
- Prevent pneumococcal infections till age 15 years (at a minimum to 5 years old), starting at 1-2 months of age with:
  - Phenoxymethylpenicillin
    Children < 1 year: 125 mg/day PO in 2 divided doses
    Children 1 to < 5y: 250 mg/day PO in 2 divided doses
    Children 5 to 15 years: 500 mg/day PO in 2 divided doses
    OR
  - Benzathine penicillin
    Children ≤ 12m: 600,000IU IM once a month
    Children ≤ 5y: 1.2 million IU IM once a month
    Children >5y: 2.4 million IU IM once a month
- All immunizations as per national guidelines, with pneumococcal conjugate vaccine PCV13 especially important.
- Folic acid.
  Children < 1 year: 2.5 mg PO 1 x day.
  Children ≥ 1 year and adults: 5 mg PO 1 x day
- Malaria chemoprophylaxis is important for people with sickle cell disease to reduce anemia and prevent painful crises. Prophylaxis will be started in the health center. *Clinic staff may be involved in continuation treatment:*
  - Sulfadoxine - pyrimethamine:
    Child 2-5y ½ tab PO monthly,
    Child 5-10y 1 tab monthly PO
    Child 10-15y 2 tabs PO monthly
    Child > 15 y/adults 3 tabs PO monthly
    OR
  - Mefloquine
    250mg 1 x week PO
    Child 6 months - 5y and > 5 kg: 5 mg base/kg PO once weekly
    OR
  - Chloroquine
    Adult 300mg PO base weekly, child 5mg/kg PO base weekly
    AND
  - Paludrine (proguanil)
    Adult and children1.5mg/kg PO daily or as intermittent preventive in the rainy season.

6.9.2 Thromboembolic disease

6.9.2.1 Deep vein thrombosis (DVT)

- Clinical features of a DVT:
  - Leg pain (80–90% of those with a DVT).
  - Swelling (80%).
  - Localized tenderness on palpation (75–85%).
  - Prominent collateral superficial veins (30%).
  - Redness (25%).

- In pregnancy, the risk of DVT/VTE is about 4x higher than in non-pregnant women, in part because of the hypercoagulable state and stasis. The majority of DVTs are left-sided, due to uterine compression of the left iliac vein. Symptoms for DVTs in the leg are similar to non-pregnant women. However, there is an increased risk of pelvic DVT (usually left iliac vein) which may present as lower abdominal/pelvic pain, back or buttock pain.
- If a DVT is suspected, do a **Wells' DVT score**:

Criteria	**Wells score for DVT**
Active cancer (treatment within last 6 months or palliative)	+1 point
Calf swelling ≥ 3 cm compared to asymptomatic calf (measured 10 cm below tibial tuberosity)	+1 point
Swollen unilateral superficial veins (non-varicose, in symptomatic leg)	+1 point
Unilateral pitting edema (in symptomatic leg)	+1 point
Previous documented DVT	+1 point
Swelling of entire leg	+1 point
Localized tenderness along the deep venous system	+1 point
Paralysis, paresis, or recent cast immobilization of lower extremities	+1 point
Recently bedridden ≥ 3 days, or major surgery requiring regional or general anesthetic in the past 12 weeks	+1 point

    - Refer all suspect cases

6.9.2.2 Pulmonary embolism (PE)

- The commonest clinical features are:
    - Breathlessness (80% of patients).
    - Hypoxia (70%).
    - Fast heart (65–70%).
    - Pain on breathing in (60–70% of patients).
    - Blood in sputum (5–13%).
    - Hypotension, faint, confusion or sudden death) 10–20%.
- In those thought to be at **low risk** of a PE, use the PE Rule-out Criteria (PERC) as below.
- In those at higher risk of PE, use the Wells' PE score to determine whether to do a D-dimer and treat whilst awaiting results (see below)
- PE Rule-out Criteria (PERC)
    - PE can be ruled out if **none** of the following features are identified:
    - Age ≥50 years
    - Heart rate ≥100 bpm
    - Oxygen saturation <95%
    - Hemoptysis
    - Estrogen use
    - Prior DVT or PE
    - Unilateral leg swelling
    - Surgery/trauma within the previous four weeks
- Wells' score for PE:

Variable	Points
Clinical signs and symptoms of DVT	3
An alternate diagnosis is less likely than PE	3
Heart rate >100	1.5
Immobilization or surgery in the previous 4 weeks	1.5
Previous DVT / PE	1.5
Hemoptysis	1
Malignancy (treatment currently, in the previous 6 months, or palliative)	1

- Refer any suspect case

6.10 Eye disease

6.10.1 Stye

- This is a localized infection of a hair follicle of the eyelid which presents with swelling under the skin in that area and pain.
- A stye usually clears up by itself.
- A warm compress applied three times daily may help.
- Advice to patients:
  - Never squeeze the stye
  - Do not wear eye makeup until the infection has healed.
  - The wearing of contact lenses is not recommended until the infection has cleared.
- For more severe cases:
  - Apply tetracycline1% eye ointment or gentamicin 0.3% or ofloxacin 0.3% drops topically to affected eye 2 - 4 x day.
  - Refer if the whole eye lid is swollen and give oral erythromycin 500mg PO 4 x a day for 5 to 7 days.

6.10.2 Blepharitis

- Blepharitis is a mild but chronic inflammation of the eye lids with small flakes/ scales on the lashes and mild swelling of the lid margins.
- Use warm water compresses to soften crust and scale and clean the eyelids gently with baby shampoo.
- If persistent, treat with tetracycline 1% eye ointment topically to the lid margins at night.
- This may be needed for several weeks.

6.10.3 Conjunctivitis

- Conjunctivitis is an inflammation of the conjunctiva of the eye.
- Symptoms and signs include eye discomfort and itch, and discharge and redness of conjunctiva (the white of the eye).
- It is commonly bilateral and is often caused by infection (viral or bacterial).
- The discharge maybe be watery or purulent, this is more likely with bacterial infection).
- It can also be caused by trauma (chemical, foreign body), allergy or irritant (smoke). The cornea is usually clear and visual acuity is normal.
- **Treatment**

- For infective conjunctivitis, apply gentamicin 0.3% or ofloxacin 0.3% eye drops or tetracycline 1% eye ointment topically 4 x a day for 5 days. Lubricants eye drop can also be used to reduce irritation.
- **Refer if:**
  - Eye is painful, or if there is redness around the cornea, if the eye lids are puffy or if there is photophobia, and examine for potential keratoconjunctivitis, corneal ulcer or iritis.
  - Conjunctivitis does not improve in 2 days. If not responding and diagnosis still only conjunctivitis (and not iritis) then change to gentamicin or ciprofloxacin drops

- Hyperacute Bacterial Conjunctivitis is severe infection that presents with decreased vision, purulent eye discharge, eyelid swelling, pain on palpation and preauricular adenopathy. Refer

6.10.4 Allergic conjunctivitis

- This is a relatively benign condition that causes itch and watering of the eyes.
- It may present with enlarged papillae of the upper eye lid, seen when this is inverted.
- It must be distinguished from infectious conjunctivitis and other eye conditions such as uveitis.
- Refer

6.10.5 Neonatal Conjunctivitis

- This is caused by Neisseria gonorrhoeae or Chlamydia trachomatis and occurs in babies born to infected mothers. If there is purulent conjunctivitis within the first 28 days of life:
- **Refer immediately to hospital**
  - Clean eyes with 0.9% sodium chloride and apply tetracycline eye ointment hourly.
  - If systemic treatment is not immediately available apply tetracycline eye ointment in both eyes every hour until hospitalised.
  - Continue hourly topical treatment and cleaning till pus stops then reduce to 4 x daily.
  - Treat mother and partner.
- **To prevent neonatal conjunctivitis**
  - Clean eyelids with sterile 0.9% sodium chloride.
  - Apply tetracycline eye ointment 1% once in both eyes.

6.10.6 Herpes simplex keratoconjunctivitis

- This is infection of the eye can cause ulcers, uveitis and result in blindness.
- Suspect it in any conjunctivitis where there is acute pain.
- Refer
- **Treatment**
  - Tetracycline eye ointment or chloramphenicol eye drops topically 4 x per day for 7 days to treat secondary bacterial infection.
  - Atropine eye drops to dilate the pupil and prevent adhesions between the inflamed iris and the lens.
  - An eye pad to cover and protect the affected eye.

6.10.7 Inflammation in the eye (Iritis/ Uveitis)

- Anterior uveitis presents with pain on looking at the light, red eye, poor vision, a small and irregular pupil.
- Refer

6.10.8 Orbital cellulitis

- Orbital cellulitis is an infection of the tissues in the orbit which presents with painful swelling of the eye, worse with eye movements, possible diplopia, decreased vision, fever and headache.
- It usually arises as spread from sinusitis.
- Refer all cases and treat with ceftriaxone and cloxacillin or clindamycin.

6.10.9 Trachoma

- Trachoma is a cause of preventable blindness in the country.
- It is caused by Chlamydia trachomatis which is highly contagious and endemic in certain areas.
- Repeat untreated infections and chronic inflammation cause scarring of the eyelid which turns inwards (entropion) and causes the eyelashes to scratch the cornea (trichiasis). This in turn causes chronic inflammation of the cornea, scarring, opacity and irreversible blindness.
- The infection is identified by examining the upper tarsal conjunctiva which when infected appears as follicular with whitish, grey or yellow elevations, paler then the surrounding conjunctiva.
- With chronic inflammation the tarsal conjunctiva becomes red, rough and thickened and then scars with white lines, bands and patches.
- **Treatment**
  - Treat trachoma conjunctivitis with tetracycline ointment 1% 3 x a day for 7 – 14 days.
  - Refer all cases
- **Prevention**
  - **SAFE** is WHO's strategy for trachoma control:
  - **S** = surgery for trichiasis including surgical campaign
  - **A** = antibiotics for early treatment of conjunctivitis and mass treatment. For mass drug administration in endemic areas, azithromycin is distributed 1-2 times a year to everyone over the age of 1 year in villages with high prevalence.
  - **F** = facial cleanliness. Health promotion for use of soap; regular washing of hands and face.
  - **E**= environmental improvement. This includes improved sanitation and separating people and animals to reduce flies, use of latrines and better access to water.

6.10.10 Chemical eye injury

- Chemical (alkali and acid) injury of the conjunctiva and cornea is a true ocular emergency and requires immediate intervention.
- Alkalis are more dangerous than acids.
- Chemical injuries to the eye can produce extensive damage to the ocular surface and anterior segment leading to visual impairment and disfigurement.
- Thoroughly wash the eye with clean water.
- Apply tetracycline ointment or chloramphenicol eye drops.
- Cover with a pad
- Refer immediately.

6.10.11 Foreign body removal

- Foreign body may be on the conjunctiva or cornea and could be superficial or deeply embedded.

- Examination with torch light
- Apply topical eye antibiotic and cover with a pad.
- Refer any person with a foreign body

6.10.12 Corneal ulcer

- Corneal ulcers are very painful, and present with watering of the eye, photophobia and redness around the cornea.
- Visual acuity is usually reduced.
- **If not properly treated, they can cause blindness.**
- Apply antibiotic eye ointment or eyedrops and cover with a pad
- Give vitamin A capsule (*see below*)
- Refer immediately

6.10.13 Vitamin A deficiency/Xerophthalmia

- Vitamin A deficiency can cause night blindness.
- This can progress to dry eyes, eye pain, corneal ulcerations, keratomalacia and total blindness.
- High dose vitamin A supplementation can prevent xeropthalmia and also reduce the severity and morbidity of certain childhood infections, particularly measles and diarrhea.
- Children with clinical signs of vitamin A deficiency are at high risk of developing blindness and death.
- If there are any clinical signs of severe vitamin A deficiency (e.g. night blindness, conjunctival xerosis with Bitot's spots, corneal xerosis or ulceration, or keratomalacia), or the child had recent measles then treat asap.
- **Treatment**

Age	**Vitamin A Oral for a patient with severe vitamin A deficiency on the first 2 days, followed by a third dose at least 14 days later**
< 6 months	50,000 IU
6 to 11 months	One blue capsule (100,000 IU)
12 months and older	One red capsule or two blue capsules (200,000 IU)

- If eye show corneal clouding or ulceration, give chloramphenicol drops or tetracycline ointment topically 4 x a day.
- If there is ulceration **refer immediately.** Parenteral antibiotics are likely to be needed to treat or prevent secondary bacterial infection, and the child is likely to also have severe acute malnutrition (SAM) so will need to be admitted for inpatient therapeutic nutritional care (*see 4.4.5*).
- **Prevention**
    - Prevention guidelines advocate Vitamin A to be given twice a year to children under five during immunization days.
        - Children under 6 months 50,000 IU as a single dose
        - Children 6-12 months 100,000 IU every 6 months
        - Children 1-5 years 200,000 IU every 6 months
        - Children with measles on day 1 and day 2
        - Mothers after giving birth 200,000 IU as a single dose after delivery or within 8 weeks of delivery.

- All doses of vitamin A should be recorded.
- Avoid excessive Vitamin A as this may cause raised intracranial pressure, impaired consciousness and convulsions.

6.10.14 Glaucoma

- Glaucoma causes increased pressure in the eye that damages the retina, causing initial loss of the peripheral vision and leading to tunnel vision which progresses to blindness if left untreated.
- It is important that glaucoma is diagnosed early, by routinely measuring the pressure of the eyes of people over 50 and those with a family history of glaucoma as well as people with trauma to eye or uveitis.
- Refer any suspect case

6.10.15 Cataract

- Cataract is an opacity of the lens that causes a progressive loss of visual acuity. Cataract is common in the elderly.
- The center of the eye may look white.
- Children can be born with congenital cataracts.
- The presence of cataract in both eyes leads to blindness. Refer for surgery which is the only treatment with lens replacement.

All patients on long-term steroids are at risk of cataracts and glaucoma and should have regular ophthalmological reviews.

6.11 Ears, nose, throat and oral

6.11.1 Ears

6.11.1.1 Ear wax

- Wax occurs naturally in the ear canals and has a protective function.
- Do not remove wax unless specifically trained to do so.
- If the canal is blocked, apply sodium bicarbonate 1 drop 3 x day for at least 1 week.
- Ear wax can be syringed out of the canal by someone specially trained to do so.
- Advise people never to put cotton buds or any instrument inside the ear canal.

6.11.1.2 For acute ear infections

- *See 5.2*

6.11.1.3 Chronic suppurative otitis media

- Perforation of the tympanic membrane with a purulent discharge to the external canal from the middle ear is a relatively frequent presentation of acute otitis media in children.
- These perforations usually close within a few weeks.
- Antibiotics are often not needed in acute otitis media but they should be considered if there are severe symptoms (e.g. systemically very unwell, ear pain despite analgesics, fever ≥39.0°C) or there is persistent discharge for more than 2 weeks.
- **Treatment**
- *See 5.2*

If the pus discharge continues refer.

Consider mastoiditis in case of new onset high fever, severe ear pain and/or tender swelling behind the ear, in a patient who appears unwell. Refer

Consider brain abscess or meningitis in case of impaired consciousness, neck stiffness and focal neurological signs such as facial nerve paralysis. Refer immediately.

6.11.1.4 Otitis externa

- Is an inflammation of the external ear canal, which causes pain and discharge and swelling with closing of the canal.
- Movement of the pinna can be tender.
- It is associated with flaking of the skin in the canal.
- **Treatment**
  - Mild infectious cases often respond to acetic acid drops or spray which are anti-fungal and anti-bactericidal (or aluminum acetate 3% ear drops) 1 drop 3 x a day for 7 days.
  - Some people have recurrent eczematous otitis externa and may benefit from steroid drops alone: Betamethasone ear drops: 1 drop 4- 6 x daily to start and reduce frequency as symptoms improve. Do not use for more than 2 weeks.
  - Refer persisting cases
  - Give paracetamol and/or ibuprofen for pain.
  - Treatment is usually for 5-7 days.
- Chronic suppurative ear infections may indicate immunosuppression, investigate for HIV and diabetes.

6.11.2 Teeth and gums

6.11.2.1 Preventive dental care

- Plaque formation leads to periodontal disease, gingivitis, dental caries, dental abscesses and tooth loss. Oral hygiene helps prevent plaque formation. It includes:
  - Teeth brushing with fluoride toothpaste at least twice a day and flossing.
  - Reduction of smoking
  - Minimizing the eating of sweets and foods containing sugar
  - Regular dental check-ups

6.11.2.2 Gingivitis

- This is an inflammation of the gums and is often a result of plaque accumulation.
- It is prevented by good dental hygiene (tooth brushing and flossing).
- The gums are swollen and red and bleed easily, especially with brushing.
- **Treatment**
  - Use any of these mouthwashes three times daily:
    - Warm salt solution
    - Chlorhexidine gluconate solution 0.20% rinse or gargle 10 ml (side effects of chlorhexidine: change in taste, calculus formation on teeth)
    - Refer

6.11.2.3 Vitamin C deficiency (scurvy)

- Is due to poor diet.
- It causes gingivitis with bleeding gums and lower limb pain in infants from subperiosteal hemorrhage.
- Refer suspect cases

6.11.2.4 Dental caries

- These are holes in the teeth caused by decay.
- This happens mainly as a result of poor oral hygiene (e.g., teeth not brushed or flossed) where bacteria attack and corrode the teeth. In adults, smoking or excess alcohol intake can be contributory causes.
- Signs and symptoms include pain after hot and cold foods or drinks, or constant sharp pain, and a small hole may be visible on examination.
- It is treated initially with pain control (ibuprofen or paracetamol) but needs dental care.
- Where available the hole is filled by a dentist or dental assistant with amalgam.
- Tooth extraction should be avoided unless there is no alternative to relieve severe pain or the hole is open to root.
- Refer to dental team

6.11.2.5 Dental abscess

- A dental abscess is a collection of pus around an affected tooth which may spread into the surrounding tissue and develops from gum disease or dental decay.
- Signs and symptoms include throbbing pain, fever, sensitive tooth when touched, tender swelling of the surrounding gum and discharge.
- Refer. Give Paracetamol, ibuprofen or diclofenac for pain control and warm saline gargles or chlorhexidine mouth wash

6.11.3 Mouth and Throat

6.11.3.1 Stomatitis

- This is an inflammation of the mucous membranes of the mouth caused by fungal, viral or bacterial infection, vitamin deficiency, an injury etc.
- Prolonged or painful stomatitis may contribute to dehydration or may cause loss of appetite.
- It is important to maintain adequate hydration and feeding.

6.11.3.2 Angular stomatitis

- Fissures and inflammation at the corners of the mouth can be caused by candidiasis, dentures and iron or vitamin deficiency.
- Refer

6.11.3.3 Glossitis

- Smooth, red and sore tongue can be caused by iron, folate or vitamin B12 deficiency.
- **Treatment**
  - Correct iron and vitamin deficiencies
  - Treat with oral nystatin if candidiasis likely (*see below*).
  - Refer

6.11.3.4 Mouth (aphthous) ulcers

- Small, shallow, painful ulcers on the tongue or oral mucosa. Most resolve within 7 days.
- **Treatment**
  - Make a mild saline solution at home with salt and water for mouthwash or use chlorhexidine mouth wash.

- If multiple or severe persisting ulcers refer

6.11.3.5 Oral and oropharyngeal candidiasisIs

- Common in infants, immunocompromised and diabetic patients.
- Other risk factors include treatment with oral antibiotics or high dose inhaled corticosteroids.
- On examination there are white patches on the tongue, inside the cheeks and possible spread to the pharynx.
- If frequent recurrences or extensive with spread to esophagus (pain and difficulty with swallowing) consider HIV infection.
- **Treatment**

Medicine	Age	Dose	Duration	Side effects
Nystatin 100,000 IU/ml oral suspension	Neonoates	100,000 IU PO (1ml) 4 x per day (apply to tongue and inside each cheek)	5 to 7 days	**Common**: Oral irritation **Rare**: Nausea
	Infants and older children	100,000 IU PO (1ml) 4 x per day (apply to tongue and inside each cheek)	5 to 7days	
	Adults	100,000 IU PO 4 x per dy (keep in mouth for 2-3 minutes and then swallow)	5 to 7 days	
Prescribing tip: 1ml is measured with the pipette and given by caregiver				
Advice slot: Give after feeding. Continue giving treatment for 2 days after rash has gone				

- If possible spread, or persisting symptoms, refer.

6.11.3.6 Oral herpes

- Oral herpes simplex virus (HSV) usually causes a mild, self-limiting infection of the lips, cheeks, or nose (herpes labialis or 'cold sores') or oropharyngeal mucosa (gingivostomatitis).
- Herpes simplex virus type 1 (HSV-1) is the cause in more than 90% of cases. Rarely, infections may be caused by HSV type 2 (HSV-2).
- Most HSV-1 infections are subclinical and asymptomatic, or there may be one or two vesicles.
- Infection is life-long and reactivates when someone is stressed, presenting usually with one or two vesicles on the lips that open as a ‘cold sore’ ulcer but that rapidly crust over and heal.
- Symptomatic primary infection can present as gingivostomatitis in children with multiple painful vesicles/ulcerations on oral mucosa and lips and can be severe with general malaise, fever and lymphadenopathy.
- There is significant pain and decreased feeding.
- **Treatment**
  - Mild: do nothing or topical acyclovir 5% cream up to 5 x a day for 5 days
  - Refer severe cases

6.11.4 Nose

6.11.4.1 Nose bleeds (epistaxis)

- Nose bleeds are common in children and in some adults and can occur spontaneously or after mild trauma.
- Usually, the bleeding comes from the lower, soft part of the nose.
- **Treatment**

- Advise the person to sit forward and hold the soft part of the nose for 10 minutes.
- A parent may hold the soft part of a young child's nose.
- Advise them not to blow or pick their nose afterwards for the rest of the day.
- If bleeding continues, refer urgently.

6.11.4.2 Allergic rhinitis

- This presents with a history of nasal itching, chronic clear nasal discharge, sneezing and nasal congestion, worse when exposed to certain allergens such as certain plant/ tree pollens, smoky fumes. There may be associated allergic conjunctivitis.
- **Treatment**
  - Antihistamines:

Medicine	Age	Dose by PO	Side effects
Chlorpheniramine syrup (2mg/5ml) and Chlorpheniramine tablet (4mg)	Child <1m	Do not give	**Common**: drowsiness **Rare**: headache, dry mouth, abdominal discomfort
	Children 1m – 23m	2.5mls (1mg) or ¼ tablet (1mg) 2 x per day	
	Children 2 – 5 years	2.5mls (1mg) or ¼ tablet (1mg) 4 - 6 x per day. Maximum 6mg in 24 hours.	
	Children 6 – 11 years	5mls (2mg) or ½ tablet (2mg) 4 – 6 x per day. Maximum 12mg in 24 hours	
	Adults and children over 12 years	1 tablet (4mg)4 – 6 x per day. Maximum 24mg in 24 hours.	

  OR
  - Loratadine PO 10 mg
    Child 2-11 y: 5mg once daily (If > 30 kg give 10mg once daily)
    Child >12 y: 10 mg once daily
  - Nasal steroids: Beclomethasone nasal spray: 1 – 2 sprays in both nostrils 1 - 2 x a day
  - Refer

6.11.4.3 Nasal Polyps

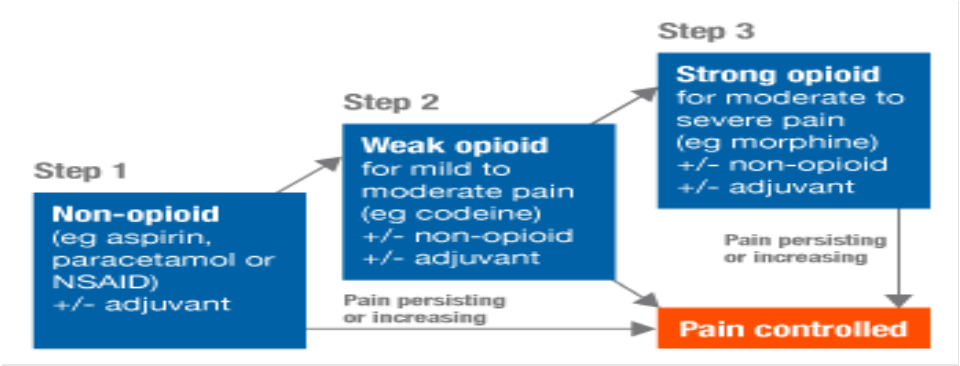
- Nasal steroids may also reduce the development of nasal polyps.
- If nasal obstruction from a nasal polyp is not improved with a nasal steroid spray, then surgical excision by a specialist may be needed.

6.12 Pain control

6.12.1 Analgesics

- Divided into three groups:
- Non-opioids:
  - These include paracetamol (acetaminophen) and the non-steroidal anti-inflammatory drugs (NSAIDs), e.g., aspirin, ibuprofen and diclofenac. NSAIDs are useful in managing pain from bones and joints.
- Opioids:
  - These are the morphine-like drugs and include codeine, tramadol and morphine. Morphine is usually reserved for severe pain conditions and in palliative care.
- WHO classifies group 1 and 2 which are for tissue inflammation and damage on a three-step ladder of increasing potency:
  - Step 1: non-opioid analgesics such as paracetamol and NSAIDs
  - Step 2: weak opioid analgesics such as codeine and tramadol
  - Step 3: strong opioid analgesics such as morphine
- **Analgesics should be given:**

- **By mouth:** Giving analgesics by mouth is the simplest and most reliable method for most patients. If the patient cannot take tablets by mouth, then the subcutaneous, rectal, and buccal routes are alternatives.
- **By the clock:** Constant pain needs regular analgesics to keep it away. Pain that is allowed to build up is more difficult to control. Avoid waiting for the pain to return by give analgesics at regular intervals according to their duration of action, e.g., codeine 30mg every four hours.
- **By the ladder:** The WHO analgesic ladder gives a logical way of increasing the strength of analgesia in steps as pain increases as below.



- Advice to the patient:
  - The medicine is to keep the pain away. Take it regularly and do not wait for the pain to return before taking the next dose.
  - The medicine needs to be continued as long as the cause of the pain is still there. If the cause of the pain was an infection that has now been treated, they may be able to reduce or stop the medicine.
  - If the cause of the pain is something for which there is no available treatment, then they will need to continue taking the medication.

6.12.1.1 Medications for tissue inflammation and damage

- **Paracetamol**

  Forms: Tablet, liquid, dispersible tablet, suppository
  Fatal in overdose due liver toxicity

Medicine	Age	Dose	Side effects
	Premature babies	10 - 15mg/kg 2 x day (max 30mg/kg/ 24 h)	**Rare:** skin reaction, liver toxicity **Paracetamol can be fatal when taken in overdose. All cases should be referred immediately**
Paracetamol PO (or rectal if available)	Neonates - 2m	15 - 20mg/kg 3 x day (max 30mg/kg/24 h)	
	Infants 3 – 5m	60mg 4 x per day (2.5mls of 125mg/ 5mls syrup or ½ 125mg tablet)	
	Children 6m2y	120mg 4 x per day (5mls of 125mg/5mls syrup or 125mg tablet)	
	Children 2y - <4y	187.5mg 4 x per day (7.5mls of 125mg/5ml syrup or 1½ x 125mg tablet)	
	Children 4y - <6y	250mg 4 x per day (5mls of 250mg/5ml syrup or 2 x 125mg tablet or ½ x 500mg tablet)	
	Children 6y - <9y	375mg 4 x per day (7.5mls of 250mg/5ml syrup or 3 x 125mg)	
	Children 9y - <12y	500mg 4 x per day (10mls of 250mg/5ml syrup or 1 x 500mg tablet)	
	Children 12y - <15y	750mg 4 x per day (15mls of 250mg/5ml syrup or 1½ x 500mg tablet)	

	Children >15y and adults	500 - 1000mg 4 x per day (1½ - 2 x 500mg tablet)

- **Non-steroidal anti-inflammatory drugs (NSAIDs)**
  - **Aspirin PO**
  - 300 mg – 1 g every 4 - 6 hours (maximum 4 g daily)
  - Avoid in children < 16 years. **Avoid aspirin in children** as it can cause Reye's syndrome (affecting liver and brain, potentially fatal)) unless it is specifically indicated as in for Kawasaki disease or acute rheumatic heart disease whilst under the care of a specialist.

  - **Ibuprofen PO**
  - Avoid ibuprofen in children who are dehydrated as it can cause damage to the kidneys. In analgesia needs for sickle cell disease, if NSAIDs are used monitor the renal function +/- urinalysis.

Medicine	Age	Dose	Side effects
Ibuprofen	Infants < 2 months	Do not give	**Common:** nausea and abdominal pain, bronchospasm **Rare:** allergic reaction; ulcer in stomach; damage to kidneys & liver
	Infants 2 – 1 year	50mg PO (1.25mls of 200mg/5ml syrup) 3 x a day	
	Children 1 – 4 years	100mg PO (2.5mls of 200mg/5ml syrup) 3 x a day	
	Children 5 – 8 years	200mg PO (5mls of 200mg/5ml syrup) or 200mg tablet 3 x a day	
	Children 9 – 15 years	300mg PO (7.5mls of 200mg/5ml syrup) or 1½ x 200mg PO tablet 3 x a day	
	Adults	400mg tablet PO 3 x a day	

  - Side effects of NSAIDs:
    - Gastritis, take with food and consider adding omeprazole 20 mg daily for gastroprotection.
    - Risk of gastrointestinal ulceration and bleeding, especially in elderly
    - Renal toxicity, avoid in renal impairment and if dehydrated.
    - Bronchospasm in asthmatics
    - Increased risk of thromboembolic events

- **Opioids**
  - **Not prescribed in clinics, but may be involved in contined doses on shared care with NCD clinic**
  - **Codeine PO**
  - Child > 12 y and adult 30 – 60 mg every 4 hours (maximum 240 mg daily)
  - **Morphine**
  - Used in palliative care. Analgesic effect is dose dependent.
  - It may be necessary to give increasing doses in palliative care.
  - Reduce dose and give less frequently in elderly and in those with severe renal or hepatic impairment.
  - Dose is gradually increased by 30 – 50% each time.

Morphine in infants	**Oral**	1 m – 1 yr 80–200 mcg/kg every 4 hrs
	Slow IV injection or SC	1–6 months: 100 mcg/kg every 6 hrs 6–12 months: 100 mcg/kg every 4 hrs (max 2.5 mg /dose)
Morphine in children	**Oral**	1- 2 yr: 200–400 mcg/kg every 4 hrs 2–12 yr 200–500 mcg/kg every 4 hr (max 5 mg)
	Slow IV injection or SC	1–2 yr: 100 mcg/kg every 4 hr 2–12 yr 100–200 mcg/kg every 4 hr (max 2.5 mg)
	Oral	2.5 – 5mg every 4 hr

Morphine in adults	**Slow IV injection or SC**	5mg every 4 hr (SC 5 – 10mg)

- Side effects of opioid drugs:
  - Constipation and if needed give a laxative such as bisacodyl, lactulose.
  - Nausea and vomiting can be avoided by the use of an emetic (haloperidol or metoclopramide, (specialist use: ondansetron)
  - Drowsiness is common when first starting on morphine or when the dose is increased. This usually improves after three to four days. If it does not improve, then it may be a sign that the morphine dose is too high
  - Sweating and itching

6.13 Musculoskeletal conditions

6.13.1 Gout

- Characterized by sudden onset intense pain, redness, warmth and swelling in the affected joint.
- Occurs most commonly in the first metatarsal-phalangeal joint of the foot, the mid foot, ankle, knee, finger joints, wrist or elbow.
- It is more common in males and is usually associated with raised uric acid in the blood.
- Urate crystals form on the joint cartilage and are shed into the joint space, causing pain and inflammation.
- An attack usually lasts about 2 weeks without treatment. Recurrent attacks cause joint damage and deposition of tophi in soft tissues.
- **Treatment**
  - Acute attack:
    - Start NSAIDs like ibuprofen or naproxen to start as soon as possible.
    - Refer
- **Prevention of attacks**
  - Weight loss and reduction of purine-rich foods (including meat and alcohol).
  - Other risk factors should be assessed such as cardiovascular and diabetes risk, and the body mass index (BMI) and BP measured.

6.13.2 Rheumatoid Arthritis

- This is the most common inflammatory arthritis and is more common in women.
- It presents with bilateral symmetrical joint involvement particularly affecting the fingers and small/medium joints.
- There is pain and stiffness in the joints, usually worse in the morning, and often with associated malaise.
- On examination joints are swollen, warm and tender.
- The disease is variable with acute flares and remissions.
- Disease progression can lead to joint deformity, rheumatoid nodules, tendon rupture and significant disability.
- **Treatment**
  - NSAIDs and paracetamol for pain and inflammation in acute flare
  - For severe inflammation a short course of steroids may be needed (see below)
  - Weight loss and physiotherapy
  - Refer all cases

6.13.3 Osteoarthritis

- This is a degenerative condition and is the commonest form of joint disease.
- It may involve any joint and is most common in knees, hips and spine.
- It causes pain, restriction of movement and advanced disease results in joint deformity and disability.
- **Treatment**
  - Weight reduction
  - Regular exercise to maintain mobility and increase muscle strength.
  - Using a walking stick of appropriate height
  - Paracetamol – regular use
  - Limited use of NSAIDs for acute exacerbations
  - Refer

6.13.4 Bone and joint infections

6.13.4.1 Acute osteomyelitis

- This is an infection of bones, presenting particularly in the long bones of children or in adults with diabetes or immunosuppression.
- Causative organisms include Staph. aureus, Strep. pyogenes, Strep. pneumoniae and gram-negative organisms.
- In children with sickle cell disease, salmonella species may cause osteomyelitis. The most common cause is blood borne spread from an infection nearby, or from trauma or surgery.
- It presents with fever, pain and reduced use of the affected limb, and tenderness and warmth at site of infection with swelling.
- Early treatment stops future deformity and allows normal growth of the long bone infected.
- Refer all suspect cases

6.13.4.2 Chronic osteomyelitis

- Chronic osteomyelitis usually presents with a suppurating wound.
- Suspect underlying osteomyelitis in a deep or extensive ulcer that fails to heal (especially in diabetes or non-healing fractures).
- The treatment is primarily surgical, because the pus originates from a cavity where a small piece of dead bone is located (called a sequestrum).
- Refer all suspect cases

6.13.4.3 Septic arthritis

- This is an acute infection in joints.
- This is usually due to hematogenous spread from another infection.
- Causative bacteria include Staphylococcus aureus, Hemophilus influenza and group B Streptococcus.
- It presents with severe pain, a warm and swollen joint and systemic symptoms.
- Refer immediately

7 Mental Health

- Health care providers need to make every effort to respect and promote the will and preference of people with mental health problems and support and engage them and their carers in the most inclusive way.
- They should be treated with respect and dignity in a culturally appropriate manner.
- As they are often more vulnerable to human rights violations, their rights need to be promoted and protected in line with international human rights standards.

7.1 Principles of mental health care

- **Good communication skills:**
  - Create an environment that facilitates open communication.
  - Involve the person in all aspects of assessment and management.
  - Promote active listening. Allow the person to speak without interruption.
  - Be empathic and sensitive.
  - Be professional, respectful and non-judgemental at all times.
  - Use good verbal communication skills with simple language and open-ended questions.
  - Respond with sensitivity when people disclose difficult experiences.
- **Psychoeducation should be provided to all patients and their families and include:**
  - Education about their diagnosis and basic information about the condition
  - Emphasis about human rights of all people including patients, their right to confidentiality and the right to be involved in decisions concerning their treatment
  - Impact of management in alleviating suffering and problems
  - Importance of adherence to any prescribed medication
  - Importance of follow-up (both patients and care providers)
  - Importance of continuing regular social, educational and occupational activities
  - Importance of staying healthy, by keeping physically active, eating a healthy diet, avoiding tobacco, alcohol and other psychoactive substances and maintaining personal hygiene
- **Psychosocial Interventions:**
  - Play a cardinal role in the management of people with mental health disorders, and should be considered an important part of treatment.
  - **Refer** if necessary to competent specialists for expert management.
  - Some simple interventions can be easily adopted by all health professionals in primary and secondary care. Common psychosocial interventions include:
    - Supportive counselling: empathetic listening; discussion of stressors and how they may be addressed; exploring and strengthening support systems - family, community, religious groups.
    - Explaining Mind / Body relations: use simple examples from daily life to explain how stressful emotions can generate physical symptoms, and vice versa.
    - Coping skills: teach simple strategies that help cope better with stress: regular exercise, nutrition, leisure time, spiritual observance and work/life balance
    - Sleep hygiene techniques: regularizing timings of going to bed and getting up; avoiding/minimizing caffeinated drinks (especially around bedtime) and alcohol; improving the environment for sleep (quiet, dark, comfortable temperature; avoiding stimulating activities at night)
    - Focus on functional improvement: regularize daily routine; involve in home chores; use distraction to change focus from symptoms to other activities; encourage return to full normal functioning as soon as possible

- Involving and engaging family in care: educate families, support them and empower them as co-therapists in the patient's care

7.2 Depression

- Depressive disorders are characterized by depressed mood (e.g., sad, irritable, empty) or loss of pleasure accompanied by other cognitive, behavioral, or neurovegetative symptoms that significantly affect the individual's ability to function.
- A depressive disorder should not be diagnosed in individuals who have ever experienced a manic, mixed or hypomanic episode, which would indicate the presence of a bipolar disorder.
- Depression commonly occurs alongside other mental health conditions as well as physical conditions (which need to be diagnosed and treated).
- To assess the severity of the depression, use a diagnostic tool such as Patient Health Questionnaire (PHQ-9).
- This will identify whether the person has been experiencing the following symptoms in the preceding two weeks and how the symptoms are affecting their daily lives.
  - Reduced concentration and attention.
  - Indecisiveness
  - Anxiety
  - Reduced self-esteem and self-confidence.
  - Feelings of guilt and worthlessness
  - Sense of hopelessness about the future
  - Sleeping too much or too little
  - Significant change in appetite or weight (may increase or decrease)
  - Restlessness and agitation or talking or moving more slowly than usual.
  - Ideas or act of self-harm or suicide – **a mental health emergency** *see below*

- Multiple, persistent physical symptoms (headache, abdominal pain, musculoskeletal pain) with no clear cause are a common presentation of depression. In patients with multiple unexplained symptoms, ask about the symptoms of depression listed above.

- **Principles of management:**
  - Psychoeducation of person and family/ caregivers.
  - Address major stressors if possible.
  - Refer to other community resources as needed and available.
  - Strengthen coping skills and advice regular sleep .
  - Encourage a return to full activity as soon as possible using a daily activity diary with new activities added to their daily schedule in small steps.
  - Refer for psychotherapy such as cognitive behavioral therapy
  - Refer for consideration for antidepressant medication.

- **Management of mild depression:**
  - Use formal psychotherapy and psychosocial interventions as mainstay of management; consider antidepressants if symptoms worsen.

- **Management of moderate to severe depression:**
  - The use of antidepressant is recommended in the treatment of moderate to severe depression and should be prescribed by a competent clinician.

- Refer all cases
  Clinic staff do not prescribe drugs for mental health but may be involved in continuation treatment from mental health/ NCD clinic.

- **Cautions about the use of medication:**
  - Antidepressants should not be needed for patients when symptoms are normal reactions to a bereavement or major loss.
  - Antidepressants in children younger than 12 years old should not be prescribed without specialist input.
  - In adolescents 12 – 18 years of age use psychosocial interventions first and if there is no improvement, mental health team may consider using Fluoxetine and/or referring to a specialist.
  - Be cautious with the use of antidepressants in pregnancy (as there is increased risk of congenital heart defects, pulmonary hypertension and neonatal withdrawal symptoms) and breast feeding. Consult a specialist when managing depression in pregnancy and in breastfeeding mothers.
  - Use amitriptyline with caution in the elderly and in patients with cardiovascular disease.
  - In patients at risk of self-harm or suicide, start with fluoxetine as a 1st line medication; dispense small quantities (1 week) and review patient before issuing more.
  - It is recommended that antidepressants are continued for 6 – 12 months after symptoms have resolved. To stop, reduce the dose gradually over a period of 4 weeks. If the patient suffers severe withdrawal symptoms, or relapses, the antidepressant may need to be reintroduced.
  - Stop antidepressants immediately if the patient develops a manic episode.

- **Treatment options:**
  - Selective serotonin reuptake inhibitors (SSRIs)
    - Fluoxetine: starting dose 20mg PO 1 x daily
    - If there is no response after 3 – 6 weeks and there are no dose-limiting side-effects, the mental health team may increase the dose to 40mg.
    - Maximum dose is 60mg daily.
    - Effects can be seen within 2 - 6 weeks
    - In patients at risk of self-harm or suicide, fluoxetine is used a 1st line medication; dispense a week's supply at a time with weekly reviews till patient is stable.
    - Be cautious with treatment with NSAIDs as there is increased risk of GI bleeding.
    - Common side effects of SSRIs include: restlessness, insomnia, anorexia and GI disturbances, headache, sexual dysfunction. In people aged under 30 there is an increased risk of suicide. Rarely: bleeding abnormalities.

    OR
  - Tricyclic antidepressants (TCAs)
    - Amitriptyline: starting dose 25mg PO 1x at night
    - If there is no response mental health team may increase by 25mg every 1 -2 weeks.
    - Usual effective dose: 75 – 100mg. Maximum dose: 200mg.
    - Common side effects of TCAs include: low BP on standing, dry mouth, constipation, difficulty urinating, dizziness, blurred vision, sedation, heart arrhythmias, impaired ability to perform skilled tasks like driving.

- **Stopping antidepressant medication:**
  - Treatment is usually continued for at least 6 – 12 months after symptoms have improved and the patient has returned to their usual activities.
  - The mental health team may reduce the dose gradually over a period of 4 weeks.
  - If the patient suffers severe withdrawal symptoms, or relapses, the antidepressant may need to be reintroduced.

7.2.1 Self-harm and suicide

- Suicide is the act of deliberately killing oneself.
- Self-harm is a broader term referring to intentional self-inflicted poisoning or injury, which may or may not have a fatal intent or outcome.
- Although suicidal thoughts are a common feature of moderate to severe depression, not all suicidal patients are depressed.
- Adults and adolescents with any mental health problems, chronic pain or acute emotional distress are at risk and should be asked about thoughts or plans of suicide in the last month.
- Asking people about suicidal thoughts does not increase the risk they may act on them; on the contrary it may lead to reduced anxiety and helps the person to feel understood.
- **Assessment**
  - Has the person attempted a medically serious act of self-harm?
    Is there an imminent risk of self-harm/suicide?
  - Do they have a concurrent mental health or substance use disorder?
  - Do they have chronic pain?
    Do they have emotional symptoms severe enough to need psychosocial intervention?
- **Treatment steps**
  - Remove access to all possible means of self-harm
  - Create a secure and supportive environment
  - Do not leave the person alone if there is high risk.
  - Refer urgently

7.3 Anxiety disorders

- **Generalized Anxiety Disorder (GAD)**
  - GAD is diagnosed when the person has symptoms of worrying all or most of the time, that cause distress or difficulty with daily functioning, often associated with insomnia and distractibility.
  - There may also be a feeling of dread as if something bad is about to happen.
  - Also consider GAD in patients with multiple physical symptoms (gastrointestinal, palpitations, headache, back pain) for which no medical cause can be found and who may not admit worrying or distress.
  - GAD can be assessed by using a diagnostic tool such as GAD-7 questionnaire which assesses symptoms related to anxiety over the preceding 2 weeks and how they have affected the person's daily life.
  - Depression and anxiety disorders also commonly co-exist.
  - Refer

- **Panic Disorder**
  - Panic attacks are sudden, unpredictable attacks with symptoms like sweating, shortness of breath, shakiness, palpitations, nausea, fear of dying, usually provoked

by something the patient finds difficult and often in a confined space or where it is difficult for them to leave.
    - Panic Disorder involves panic attacks that cause the sufferer to change how they go about their lives.
    - GAD and Panic disorder may co-exist.
    - Both are more common in patients under physical or emotional stress or who have a history of emotional or physical trauma.
    - Refer

- **Principles of management**
    - Try to help the patient find practical solutions to help with contributing stressors .
    - Co-existing depression is common: if there is more severe than anxiety, treat the former first.
    - Co-existing substance misuse: patients may 'self-medicate' with alcohol or other substances as a way of coping with symptoms. Treat substance misuse first if harmful and there is dependence.
    - Co-existing medical conditions: optimize treatment.
    - Explanation, reassurance and support
    - Encourage exercise and measures to improve sleep.
    - Breathing exercises: train the person in slow, regular diaphragmatic breathing.
    - Progressive muscle relaxation: rain the person to systematically tense and relax muscle groups, working from the feet upwards
    - Cognitive-behavioral psychotherapy
    - Assess for suicide risk in moderate to severe GAD. Risk is increased if there is anxiety severe enough to cause very poor day to day functioning or if there is severe co-existing depression or other mental health disorder.
- **Treatment options:**
    - Refer
    - Clinic staff may be involved in continuation treatment
    - Psychotherapy is the mainstay of management
    - Benzodiazepines can be used for the short-term treatment of anxiety especially when severe. There is high risk of dependency especially where there is a history of substance misuse
    - SSRIs or tricyclic antidepressants can be tried although psychological interventions are the mainstay of treatment. See treatment for depression above.

7.4 Psychosis

- Psychosis is a severe mental health disorder in which there is extreme impairment of ability to think clearly, respond with appropriate emotion, communicate effectively, behave appropriately and understand reality.
- People with psychosis usually lose insight and are frequently unaware that they have a mental disorder.
- An acute psychotic episode can be triggered temporarily by drug use (cannabis for example).
- If symptoms persist, chronic psychosis (e.g. schizophrenia) or bipolar disorder is likely.
- Psychosis as a diagnosis is a broad concept and can be qualified based on duration, etiology, and other features, and includes for example, acute and transient psychotic disorders, schizophrenia, psychotic disorder due to substance use, etc.

- The diagnosis is made based on set diagnostic criteria (more detail can be found under ICD-11 or DSM 5).
- **Assessment:**
  In psychosis, there are disturbances in three main areas (perception, thinking, behavior and emotions):
  - Perception which results in hallucinations. These are sensory experiences in the absence of a stimulus (e.g., hearing, seeing, smelling, tasting, or feeling things that are not there)
  - Thinking which includes:
    - Delusions which are fixed beliefs held by the ill person on unfounded grounds despite evidence to the contrary that most people from the same culture, religion, or educational status would agree are wrong.
    - Incoherent speech
    - Disorganized, illogical thoughts
    - Possession of thought (eg. believing others are inserting thoughts in one's mind, removing one's thoughts from mind or broadcasting one's thoughts to others)
  - Behavior and Emotions:
    - Negative emotions, social withdrawal, apathy, personal neglect, inactivity, displaying bizarre behavior, aimless wandering, mumbling to oneself, giggling inappropriately, hyperactivity.
    - Loss of ability to function in all activities of daily living such as academic, social, and occupational.
- **Other types of psychosis:**
  - Severe depression with psychotic features especially in older people
  - Mania: Reduced need for sleep, euphoria, rapid mood swings, hyperactivity, grandiose thinking, impulsive behavior. If these are present, manage as bipolar disorder.
- **Rule out other causes:**
  - Delirium: acute onset, fluctuating symptoms of disturbed consciousness (disorientation in time, place and person) agitation, hyperactivity, drowsiness, hypoactive, and usually due to an underlying infection, metabolic disturbance or head injury
  - Frontal or temporal lobe tumors
  - HIV psychosis
  - Syphilis psychosis
  - Hyperthyroidism
  - Neuropsychiatric side effects from medication such as in mefloquine, steroids
  - Drug, alcohol or substance intoxication or withdrawal

- **Principles of management**
  - Psychoeducation is given by staff trained in it to the person and caregivers about psychosis. Families need to understand that a person with psychosis may not agree that they are ill, and this will cause difficulties. They need to know that the person may hear voices or believe things that are untrue, and that confrontation and criticism should be avoided.
  - Whenever possible involve the relatives in understanding the nature of illness and the importance of drugs compliance.
  - Refer

- **In severe agitation:**
  - Refer urgently

7.5 Bipolar disorder

- Bipolar disorder (BPD) is characterized by episodes in which the person's mood and activity levels are significantly disturbed.
- These episodes of disturbances include:
  - Mania: abnormal elevation of mood and increased energy and activity; or sometimes excessive irritability and agitation
  - Depression: significant lowering of mood, decreased energy and activity
- Characteristically, recovery is complete between episodes.
- Bipolar disorder is diagnosed when people experience only manic episodes or have experienced 2 or more episodes of mania or have had 1 episode of mania with adverse consequences or one episode of mania and one episode of depression.
- Symptoms and signs of an acute mania episode:
  - Several days of markedly elevated or irritable mood plus several of the following:
    - Increased energy, activity, restlessness and excitement
    - Reduced need for sleep.
    - Excessive talking
    - Loss of normal social inhibitions and recklessness
    - Elevated sexual energy or sexual indiscretion.
    - History of depressive episodes

- **Principles of management:**
  - Supportive management for the affected person and their family as described for psychosis – understanding the illness, signs of relapse, following a healthy lifestyle, self-care, sleep hygiene and rehabilitation.
  - Begin treatment of acute mania with a mood stabilizer valproate, carbamazepine, lamotrigine or with antipsychotics as below
  - Consider a short-term benzodiazepine for behavioral disturbance or agitation.
  - Consider discontinuing any antidepressants and/or prescribe with a mood stabilizer if there is moderate to severe depression.
  - Provide regular follow-up as high suicide risk, and when mania occurs adherence to treatment usually fails.
  - Continue treatment with mood stabilizers for at least two years after the last episode of mania or depression.
  - Refer all suspect cases

7.6 Medically unexplained symptoms (MUS) / Somatic symptom disorder

- "Medically unexplained" means "no underlying physical condition can be identified".
- MUS is a diagnosis of exclusion, and it may take several encounters and investigations to reach this diagnosis.
- It is not uncommon for people with somatic symptom disorder to have comorbid depression or anxiety. These conditions must be assessed for and if present be treated appropriately.
- MUS is characterized by:

- A history of multiple aches and pains that often move from one part of the body to another.
- Patients presenting with a history of repeated collapse without seizures, or with seizures that are not typical of epilepsy seizures.

- **Diagnosis**
  To make the diagnosis, patients should have:
  - Symptoms that have been present for some time and are not explained by another diagnosis.
  - A reduced ability to perform their daily activities.
  - Before diagnosing MUS, assess for, and exclude:
    - Recent exposure to traumatic events, acute stress, loss or grief
    - Harmful substance misuse
      Abuse, domestic violence
    - Underlying physical illness
  - Take a thorough history without interrupting, encouraging the person to tell you in their own words about their symptoms and the impact these have on their daily life.
  - Ask about problems, stressors and significant life events.
  - The person's concerns should not be dismissed as being 'imaginary' and the person should not feel judged.
  - Take time to explain to the person that although their symptoms are real and distressing, there is no serious underlying medical cause. Avoid prescribing benzodiazepines and managing complaints with placebos, injections or other ineffective treatments such as vitamins.
  - Refer anyone who you think may have medically unexplained symptoms.
- **Principles of management:**
  - Listen carefully and with empathy.
  - Summarize what the patient has said about symptoms and their impact and their relationship to life events.
  - Refer

7.7 Substance Use Disorders/Substance dependence

- Substance use disorders/dependence describe maladaptive patterns of substance use that impair health in a broad sense.
- The diagnosis of dependence is made when patient has at least three of six symptoms within the last 12 months.
- These symptoms include craving (strong psychological desire for the substance); tolerance (requires more of the substance to have the same effect); preoccupying thoughts about having the substance; loss of control over using the substance and withdrawal effects.
- Although there are several classes of psychoactive substances that are common in this setting, alcohol and opioids will be covered.

7.7.1 Alcohol

- Misuse of alcohol may lead to:
  - Harmful drinking - a person continues to drink despite knowing he has a physical or social complication from alcohol e.g., liver damage; financial problems; violence towards others.
  - Dependent drinking – a person has had at least three of the six symptoms mentioned above.

- Signs and symptoms of acute intoxication.
- Signs and symptoms of alcohol withdrawal.

- **Manage harmful drinking using brief motivational techniques:**
  - **Ask:** about the amount of alcohol used, the pattern of drinking and the person's understanding of the problem
  - **Assess:** harm to self and others: medical problems, injuries, accidents, financial, legal or occupational problems, ability to care for dependents, relationship problems, violence; nutritional status; motivation to stop drinking
  - **Advise:** provide information about the harmful effects and ways to reduce or stop drinking
  - **Assist:** with management of medical problems, helping the patient to formulate their own plan to reduce or stop drinking, psychosocial support and follow up

7.7.1.1 Alcohol withdrawal

- Alcohol withdrawal symptoms appear within 6-24 hours after stopping alcohol, are most severe after 36 – 72 hours and last for 2 – 10 days.
- Symptoms include:
  - Anxiety
  - Sweating
  - Tremors
  - Nausea and vomiting
  - Insomnia
  - Diarrhea
- Signs include:
  - Dehydration
  - Increased heart rate and blood pressure
  - Seizures
  - Hallucinations
  - Delirium
  - Extreme fluctuations in body temperature and blood pressure
  - Extreme agitation
- **Principles of management**
  - If there are acute signs of withdrawal as above, then refer.

7.7.1.2 Opioid withdrawal

- Caution is needed before withdrawal from opioids.
- There needs to be a careful assessment and it is best undertaken when there is a plan for admission to a residential rehabilitation or other psychosocial support program.
- Refer anyone planning to withdraw from opioids.

8 Cancer

- Cancer will be covered in more detail in the next STG update
- This section covers symptoms and signs that require further investigation for cancer

8.1 General symptoms and signs of cancer

- Very heavy night sweats
- Fatigue
- Unexplained bleeding or bruising
- Unexplained weight loss

- An unusual lump or swelling anywhere on your body
- A new mole or changes to a mole of the skin
- Skin changes or wounds that won't heal
- Refer anyone with any of these symptoms and signs.

8.2 Indications for specialist referral for further investigation by cancer:

- **Lung cancer**

Are aged 40 and over with blood in their sputum; have 2 or more of the following unexplained symptoms, or if they have ever smoked and have 1 or more of the following unexplained symptoms:

  - cough
  - fatigue
  - shortness of breath
  - chest pain
  - weight loss
  - appetite loss
  - Refer anyone with any of these symptoms and signs.

- **Upper gastrointestinal cancer**
  - Unexplained weight loss AND upper abdominal pain, reflux, dyspepsia, low haemoglobin levels or nausea and/or vomiting
  - Unexplained upper abdominal pain
  - Dysphagia
  - Upper abdominal mass
  - Treatment resistant dyspepsia
  - Painless jaundice
  - Refer anyone with any of these symptoms and signs.

- **Lower gastrointestinal cancer**
  - Unexplained weight loss and lower abdominal pain
  - Unexplained lower abdominal pain
  - Aged 60 and over with iron-deficiency anaemia or changes in their bowel habit
  - Rectal bleeding without identifiable cause or not responding to hemorrhoid treatment if hemorrhoids present
  - Unexplained anal ulceration
  - Refer anyone with any of these symptoms and signs.

- **Breast Cancer**
  - An unexplained breast and/or axillary lump, skin or nipple changes with or without pain. (This applies to men also).
  - Refer anyone with any of these symptoms and signs.

- **Gynecological Cancer**
  - Persistent lower abdominal bloating without an identified cause
  - Bleeding between periods without an identified cause
  - Post coital bleeding
  - Bleeding after the menopause (post-menopausal bleeding)
  - Refer anyone with any of these symptoms and signs.

- **Urological Cancer**
  - Lower urinary tract symptoms such as nocturia, urinary frequency, hesitancy, urgency or retention
  - Erectile dysfunction
  - Blood in semen
  - Enlarged prostate on rectal examination
  - Unexplained haematuria (visible or on dipstick)
  - Unexplained testicular lump or swellings
  - Refer anyone with any of these symptoms and signs.

- **Head and Neck Cancer**
  - Unexplained persistent ulceration in oral cavity
  - Unexplained lesion in oral cavity
  - Unexplained persistent cervical lymphadenopathy
  - Unexplained neck swelling
  - Persistent hoarseness of voice >4 weeks
  - Unexplained nasal swelling
  - Acute loss of hearing/vertigo
  - Persistent ear discharge
  - Refer anyone with any of these symptoms and signs.

- **Skin cancer**
  - Change in skin and/or nail lesion exhibiting the following features:
  - Change in size
  - Irregular shape
  - Irregular colour.
  - Largest diameter 7 mm or more
  - Inflammation
  - Oozing
  - Change in sensation
  - Refer anyone with any of these symptoms and signs.

- **Blood cancer**
  - Pallor
  - Persistent fatigue
  - Unexplained fever
  - Unexplained persistent or recurrent infection
  - Generalised lymphadenopathy
  - Unexplained bruising
  - Unexplained bleeding
  - Unexplained petechiae
  - Hepatosplenomegaly
  - Pruritus
  - Unexplained back pain
  - Refer anyone with any of these symptoms and signs.

- **Brain and central nervous system**
  - Persistent unexplained headache of recent onset +/- nausea and vomiting
  - Progressive, sub-acute loss of central neurological function
  - Refer anyone with any of these symptoms and signs.

- **Bone and sarcoma**
  - Bone pain and swelling
  - Unexplained, growing soft tissue mass
  - Refer anyone with any of these symptoms and signs.

9 Palliative Care

9.1 Overview

- Palliative care is holistic care given to people suffering from incurable conditions.
- Its aim is to relieve any physical, psychological, social, or spiritual symptoms and suffering to improve their quality of life.
- Palliative care is helpful in many conditions, including cancer; progressive neurological
- illnesses including dementia; kidney, liver or heart failure; end-stage lung disease; advanced HIV disease; other life-limiting illness.

Palliative Care* = *Pain and Symptom Control* + *Psychological, Social and Spiritual Support

- Common problems of a person needing palliative care include:
  - Physical – pain, cough, tiredness, fever
  - Psychological – worries, fears, sadness, anger
  - Social – needs of the family, issues of food, work, housing and relationships
  - Spiritual – questions of meaning of life and death, the need to be at peace.
- Health Consultation in Palliative Care requires a multidisciplinary approach, and good communication is essential. Important listening skills include:
  - Finding a quiet place if possible, and sitting at the patient's level
  - Paying attention, keeping eye contact
  - Active listening
  - Allowing silence, not interrupting
  - Clarifying and summarizing
- When talking to patients:
  - Always be respectful and polite.
  - Avoid medical terms that may not be understood
  - Give information rather than advice
  - Only give accurate information. It is okay to say that you do not know.
  - Avoid false reassurance
  - Check that the patient has understood
  - Family members should be included if they wish.

  Telling the Truth:
  - Lying destroys trust and false reassurance is damaging.
  - People cope with truth better than with uncertainty
  - To allow people to make informed decisions about their treatment and care.
  - To prevent unrealistic hope. Sometimes people spend much time and money looking for treatment because no one has been brave enough to tell them that there is no cure for their illness.
  - To give opportunity for mending difficult relationships or exploring spiritual issues.

- To allow patients and families to prepare for the future – this might involve writing a will, preparing financially, travelling to the family home, planning a funeral etc.
- Truth telling can be very difficult and painful, therefore should be done with empathy with each case considered individually.

9.2 Assessing Patients with Palliative Care Needs

- Clinic staff do not initiate palliative care but may be involved in shared care with the NCD clinic team.
- The palliative care assessment can be split into three parts:
  - Diagnosis
  - Medication
  - Holistic Assessment.
- Make a problem list to help focus on the problems that are most affecting quality of life. Try to establish the cause of each problem then make a plan with the patient and family to address each one.

Diagnosis	Medication	Holistic Assessment
What is their main illness?	What medication are they taking?	How are they coping?
How long have they been ill?	What have they tried in the past?	What support do they have?
What do they understand about their illness?	Has any medicine helped?	How is their family coping?
What does their family understand?	Have they had any side effects?	Do they have food and housing?
What treatment have they had?	Do they need all their medication?	Do they have any spiritual concerns?
Do they have any other illnesses?	Can they access their medication?	What are their priorities and goals?
What are their main problems/symptoms at the moment?	Are they able to take oral medications?	Are they prepared for death?

PALLIATIVE CARE ASSESSMENT

9.3 Aim of Palliative Care Treatment

- Symptom control is an important component of Palliative Care.
- Good symptom control involves:
  - Physical care
  - Treating the primary disease
  - Treating complications e.g., pneumonia, constipation
  - Prescribing of Palliative Care drugs to target specific symptoms.
- In some situations, some treatments available may offer little benefit in return for significant distress or burden to patients and their families. Discussing things with patients and their families is often very helpful in such situations.
- For more information on symptom control in Palliative Care, refer to the Worldwide Palliative Care and Hospice Assoiciation's Palliative Care Toolkit[53].

[53] Vicky Lavy, Charlie Bond and Ruth Wooldridge, Palliative Care Toolkit: Improving Care in Resource Poor Settings. London: Worldwide Hospice and Palliative Care Alliance. 2016

9.3.1 Pain

- Under-recognition of pain and underdosing of analgesics are common mistakes in chronic pain management. Analgesics should be given regularly with caution, rather than on an 'only as required' basis to reduce unnecessary suffering.
- Take a history of the pain to work out the cause of the pain and how to treat it. There may be several different pains. For each, ask about:
  - Where is the pain, what does it feel like, how long has it been there?
  - How does the pain affect life/work/sleep?
  - What makes it better or worse?
    - Has any medication or other treatment helped?
    - Does the pain get worse with movement? Are the bones or joints tender?
  - Associated symptom
    - Any changes in feeling of the skin at the site of pain? (Neuropathic pain) Are the muscles tense or tender? (Muscle spasm)
  - Severity
    - How severe is the pain on a scale of 1 to 10? (Can also be used to monitor response when treatment begins
  - Start with simple analgesia and work up the WHO analgesia ladder. *See 6.12.*

Morphine Dosing

- Morphine may be prescribed by the NCD team. Clinic staff might be involved in continuation doses
- Give a breakthrough dose at any time for pain that is not controlled by regular doses. This is one sixth of the total daily dose e.g., 10mg in a person requiring 60mg total daily.
  - If the patient is still in pain after 24 hours, increase total daily morphine dose by adding together all regular doses plus additional breakthrough doses used in last 24 hours. Divide the total daily dose by 6 to give a new 4 hourly dose.
  - A new breakthrough dose will have to be calculated as well
- There is no maximum dose of morphine. The correct dose for each patient is the dose that takes away the pain without giving unacceptable side effects or toxicity**.**
- Manage any toxicity by stopping morphine then slowly restarting with lower dose.

Morphine Dose by Age

Age Category	Route	Dosage
Infants	Oral	1 m – 1 yr 80–200 mcg/kg every 4 hrs
Children	Oral	1- 2 yr: 200–400 mcg/kg every 4 hrs 2–12 yr 200–500 mcg/kg every 4 hr (max 5 mg)
Adults	Oral	2.5 – 5mg every 4 hr

MORPHINE DOSING BY AGE

Managing side-effects of Morphine

See section 6.12for side effects of opiates.

- If a patient complains of drowsiness, dizziness, confusion; reassure them to continue treatment as the effects go away after three days.
- Prevent constipation from opioids by always co-prescribing laxatives.
- Prevent or treat nausea with anti-emetics e.g., metoclopramide 10 – 20mg by mouth once daily

- Toxicity/overdose is more likely if a person is dehydrated or in renal failure. Symptoms include:
  - Drowsiness that does not improve or is severe
  - Confusion
  - Hallucinations
  - Myoclonus (sudden jerking of the limbs)
  - Respiratory depression – rare if morphine started at low dose and increased slowly to match level of pain
- Toxicity is managed by reducing morphine dose by 50%. If patient has respiratory depression, morphine must be stopped.

Adjuvants for Pain Relief

- Other treatments are used to manage pain, called adjuvants that work in association to reduce symptoms.
- They can be started at any step of the analgesic ladder. Pains that can be helped by adjuvants are
- Refer for pain adjuvants and for medication for nausea and vomiting

9.3.2 Nausea and Vomiting

- *Prescribed by NCD team.*
- Treat possible reversible causes**:** oral or esophageal candidiasis, constipation, infections (malaria, gastroenteritis, urinary tract infection etc.), raised intracranial pressure (treat with dexamethasone), indigestion/heartburn.
- Review likely causes of nausea and vomiting including new medication
- Encourage fluids – small frequent sips are better absorbed. Cold drinks often preferable
- If dehydrated, give fluid as ORS if available or fresh coconut water or rice water
- Consider trial of anti-emetic medication. Choose according to suspected cause. Only use injectable medication if unable to tolerate oral.
  - Gastroparesis:
    - Metoclopramide 10mg 3x per day PO or IM.
    - Neurological/metabolic cause
    - Promethazine 25mg 3x per day PO or IM.
  - Bowel obstruction
    - Hyoscine butylbromide
    - Severe, persistent vomiting not settling with other measures: ondansetron 8mg 2x per day PO or IM.

9.3.3 Breathlessness

- Treat any reversible causes e.g., respiratory infections, anemia, asthma, heart failure, pleural effusion, anxiety.
- Find the most comfortable position for the patient (usually sitting up but the prone position can maximize oxygenation and may be more comfortable).
- Open windows to allow air to circulate. Use a fan if available.
- Arrange pillows so that patient can rest forwards on table or firm surface
- Teach the patient to move slowly and carefully to avoid increasing the breathlessness.
- Demonstrate how to slow their breathing by breathing out through pursed lips (as if about to whistle).
- Try to manage anxiety.

9.3.4 Constipation

- Terminal patients will pass very little stool due to poor oral intake – this does not need treatment.
- Care measures include:
  - Encourage plenty of drinks and fruit and vegetables in diet.
  - Give a tablespoon of vegetable oil before breakfast.
  - Encourage patient to be as mobile as possible.
  - Encourage the patient to take laxatives with opioids as prescribed by NCD team.
  - If available, dried papaya seeds can be chewed (five to 30 seeds at night).
  - Hard stool which is painful to pass can be helped by petroleum jelly or a small pellet of soap inside the anus
- Medication options:
  - **Prevent constipation from opioids by always co-prescribing laxatives with NCD team**. Review the need for other drugs which can cause constipation (e.g., amitriptyline, hyoscine).
  - Bisacodyl 10mg – 20mg at night
  - Senna 1 - 2 tablets PO at night, increasing if necessary.
  - Use bisacodyl or senna tablets in combination with stool softeners if hard stool e.g., lactulose 10-20mls twice daily or sodium docusate 100-200mg twice daily.

9.3.5 Fever and Sweating

- Commonly caused by viral infections, malaria, and many opportunistic infections associated with HIV.
- Look for and treat infections. HIV and some cancers, particularly lymphomas, may also cause fever.
- Give paracetamol, ibuprofen, or aspirin (aspirin should not be given to children)

9.3.6 Anxiety and sleeplessness

- Serious illness frequently causes anxiety because of distressing symptoms and fears about the future. Sleeplessness may result from physical problems such as pain or from anxiety or depression.
- Encourage patient to talk about worries or concerns
- Avoid coffee and tea in the evening.
- Ensure room where they sleep is quiet with reduced light
- Assist patient to find a comfortable sleeping position
- Try relaxing music.

9.3.7 Depression

- Diagnosis of depressive illness is difficult in palliative care as symptoms of depression such as anorexia, weight loss, loss of energy, loss of sex drive and sleeplessness may be caused by the illness itself. Ask about:
  - Low mood more than 50% of each day
  - Loss of any enjoyment or interest
  - Excessive or inappropriate guilt
  - Thoughts of suicide.
- Treat pain which can be a major cause of depression.
- NCD team may prescribe antidepressants: amitriptyline 25mg by mouth at night, increasing gradually to 75mg - 150mg or fluoxetine 20mg – 60mg by mouth once a day. (*See 7.2)*

9.3.8 Sore Mouth and Swallowing Difficulties

- Treat oral/esophageal candida (*see 6.11.3.5*) for opportunistic infections.
- Bacterial infection. Give:
  - Penicillin V (PO 500mg 4 x per day for 3 - 5 days) **or**
  - Amoxicillin (PO 500mg 4 x per day for 3 - 5 days).
  - If penicillin allergy give erythromycin (500mg PO 4 x per day for 3 – 5 days)
- For infections advise mouthwash after eating and at night (one pinch of salt or sodium bicarbonate in cup of cooled boiled water, or one teaspoon of vinegar or lemon juice in one liter of cooled boiled water). For dry mouth, moisten mouth with regular sips of cold water (or ice if available), suck pieces of fruit, e.g., pineapple, passion fruit, lemon, etc.; use petroleum jelly on the lips.
- Medicated mouthwashes can be made to manage oral symptoms:
  - Pain: Soluble aspirin 600mg 4x per day for painful mouth. Rinse, gargle, and swallow.
  - Aphthous ulcers – Saltwater gargles.

9.4 End-of-Life Care

- As death approaches, talking about this with the patient and family can allow them to make plans for the funeral, address spiritual issues, have important conversations and 'say goodbye'.
- Refer to NCD team
- Signs that death is approaching (the terminal phase):
  - Patient's condition is getting worse day by day or hour by hour
  - Sleeping much of the time, may be confused or comatose
  - Minimal oral intake – little hunger or thirst
  - Reduced bowel and urine function, may be incontinent
  - Breathing becomes irregular, sometimes noisy ('death rattle')
  - Change in color – skin becomes grey or purple, hands and feet cold.

  Pain relief should be continued, if possible, even after patient is unconscious

10 Anesthesia

- The objectives of anesthesia are to
  - Relieve pain
  - Maintain of optimal physiological function during procedures
- Anesthesia could be general or local.
- Provision of anesthesia relies on the availability of the correct equipment, correct medication, and adequately trained staff.

10.1 Regional/Local Anesthesia (LA)

- Stops the detection of painful stimuli during the operative procedure. There is no loss of consciousness. The location of the anesthesia depends on the anatomical location of the procedure:
  - Surface anesthesia
  - Infiltration anesthesia

  - Lignocaine is used for LA. Infiltration anesthesia should only be performed by a staff member trained to do so and authorised by the County Health Department:
  - Lignocaine 2.5-5 mg/ml with or without adrenaline concentration 1:2,000,000

- Dose should not be exceeded
  - Plain lignocaine: 3 mg/kg body weight
  - Lignocaine with adrenaline 6-7 mg/kg body weight.
  - Lignocaine with adrenaline should not be used to anesthetize the following:
    - D – Digits (Fingers and toes), P – Penis, E – Ear, N – Nose tip

10.1.1 Using Local Anesthesia Safely

- Only to be used by a staff member trained and authorized by County Health Department
- Choose appropriate type of LA for the procedure
- Do a pre-operative assessment and prepare patient for the procedure
- Local infection is a contraindication
- Identify injection site and decide the appropriate route of injection
- Select the appropriate concentration and volume of lignocaine according to the procedure
- Use a small-bore needle under aseptic technique and introduce a small amount of the lignocaine
- Aspirate to ensure no accidental entry into a vessel
- Introduce the rest of the anesthetic slowly
- Allow 5 – 10 minutes for anesthetic effect
- Monitor the patient during the procedure

10.1.2 Local Anesthetic Systemic Toxicity (LAST)

- Can occur when too much local anesthetic is given, or rapid absorption has happened such as after accidental intravenous injection.
- Symptoms
  - Sudden alteration in mental status, severe agitation or loss of consciousness, with or without tonic-clonic convulsions
  - Cardiovascular collapse
- Immediate Management:
  - Stop injecting the LA
  - Get help
  - Maintain the airway, administer 100% oxygen and intubate if necessary
  - Administer rectal diazepam to control seizures.
  - Monitor BP, pulse, oxygen saturations
  - Call for referral help to the clinic.

11 Appendices

11.1 Appendix 1: sample adverse drug reporting form

https://www.sahpra.org.za/wp-content/uploads/2020/01/6.04_ARF1_v5.1_27Jan2020.pdf

SAHPRA
SOUTH AFRICAN HEALTH PRODUCTS REGULATORY AUTHORITY

ADVERSE DRUG REACTION (ADR)/PRODUCT QUALITY PROBLEM REPORT FORM
(PUBLIC AND PRIVATE SECTOR) (Including Herbal Products)

Reporting Health Care Facility/Practice					
Tel: 012 842 7609/10 (SAHPRA) 021 447 1618 (NADEMC) **Fax:** 021 448 6181 **E-mail:** adr@sahpra.org.za	Facility/Practice				
	District		Tel		
	Province		Fax		

Patient Details									
Patient Initials		File/Reference Number			Date of Birth/Age				
Sex	□ M □ F □ Unk	Race		Weight (kg)		Height (cm)		Pregnant?	□ N □ Y
Allergies				Estimated Gestational Age at time of reaction					

Suspect Medicine(s) [Medicines suspected to have caused the ADR]							
Trade Name [Generic Name if Trade Name is unknown]	Route	Dose (mg) and Interval	Date Started/Given	Date Stopped	Reason for use	Batch Number	Expiry Date

All other Medicines Patient was taking at time of reaction [including over-the-counter and herbal products]							
Trade Name [Generic Name if Trade Name is unknown]	Route	Dose (mg) and Interval	Date Started/Given	Date Stopped	Reason for use	Batch Number	Expiry Date

Adverse Drug Reaction/Product Quality Problem			
Date and time of onset of reaction		Date reaction resolved/duration	

Please describe Adverse Reaction/Product Quality Problem: (kindly add as much clinical information as possible)

Intervention(tick all that apply)	**Patient Outcomes (tick all that apply)**
□ No intervention	□ ADR recovered/resolved □ recovering/resolving
□ Intervention unknown	□ not recovered/not resolved
□ Patient Counselled/non-medical treatment	□ Patient Died: Date of death: _____
□ Discontinued Suspect Drug; **Replaced with**: _____	□ Impairment/Disability □ Congenital Anomaly
□ Decreased Suspect Drug Dosage; **New Dose**: _____	□ Patient Hospitalised or Hospitalisation prolonged
□ Treated ADR - with: _____	□ Life Threatening □ Other: _____
□ Referred to Hospital: **Hospital Name**_____	□ ADR reappeared after restarting suspect drug/similar drug (rechallenge)?: □ N □ Y □ Not done □ Unknown
□ Other Intervention (e.g. dialysis): _____	

Laboratory Results			**Additional Laboratory Results**		
Lab Test	**Test Result**	**Test Date**	**Lab Test**	**Test Result**	**Test Date**

Co-morbidities/Other Medical Condition(s)

Reported by			
Name		E-mail	
Designation	□ Nurse □ Pharmacist □ Doctor □ Other:	Telephone	
Date reported:		Signature	

THIS ADR REPORT IS NOT A CONFIRMATION THAT THE REPORTER OR THE SUSPECT MEDICINE(S) CAUSED THE ADR **V5.0 05/19**

11.2 Appendix 3: CRP Algorithms

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CPR for Everyone

HAZARDS

Ensure safety

HELLO

Tap and shout: 'Are you okay?'

Is the person:
Awake?
Breathing?
Call for help?

HELP

Local Ambulance: .....
Cellphone: 112
Landline: 10177

Awake or breathing normally?

- Roll patient on their side
- Keep checking for breathing until help arrives

Not awake and not breathing normally?

- Push on the middle of the chest 30 times
- Push hard and fast (2 per second)
- Give 2 breaths

AED

- Use AED when it arrives

KEEP DOING CPR UNTIL HELP ARRIVES

If unable to give breaths, push on the chest repeatedly Rescue breaths are especially important in the rescue of children and infants

How to use an AED

- Switch "On"
- Follow the voice prompts
- Stand clear when analysing
- Ensure no one is touching the patient, then press the shock button if prompted
- Immediately start CPR after shock delivered, starting with chest compressions

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CPR for Everyone
in the COVID-19 setting

2021

2021

HAZARDS

Check the scene is safe before approaching the person
Put on any available Personal Protective Equipment (PPE)

HELLO

Awake
While keeping your face as far away from the person as possible, firmly tap on the person's shoulders and shout: "Are you OK?"

Breathing
Check to see if the person is breathing by only looking for chest rise and fall. Do not put your face or hand next to the person's mouth to feel for breathing

Call
If the victim is unresponsive and not breathing or only gasping, call for help and an AED

HELP

Local Ambulance: .....
Cellphone: 112
Landline: 10177

Have you been in recent close contact or living with the person?

Yes

Has the person shown any signs or symptoms of COVID-19 prior to collapse?

No

CHEST COMPRESSIONS

- Begin CPR by pushing on the chest 30 times

BREATHS

- If you are willing, trained and able to do so, consider providing 2 rescue breaths
- Rescue breaths are especially important in the rescue of children and infants

Continue 30:2 until help arrives

Yes

No

Ensure you have put on any available PPE even if this means a delay in starting CPR

Fold a towel, cloth or suitable substitute 3 times and place it over the person's mouth and nose to help reduce the risk of possible COVID-19 transmission

Push on the chest repeatedly until help arrives (Hands-only CPR)

Try to alternate rescuers every 2 minutes or 5 cycles to avoid rescuer fatigue

Breaths are not recommended due to the potential risk of COVID-19 transmission

AED

Use the AED as soon as it becomes available
Switch it on and follow the voice prompts

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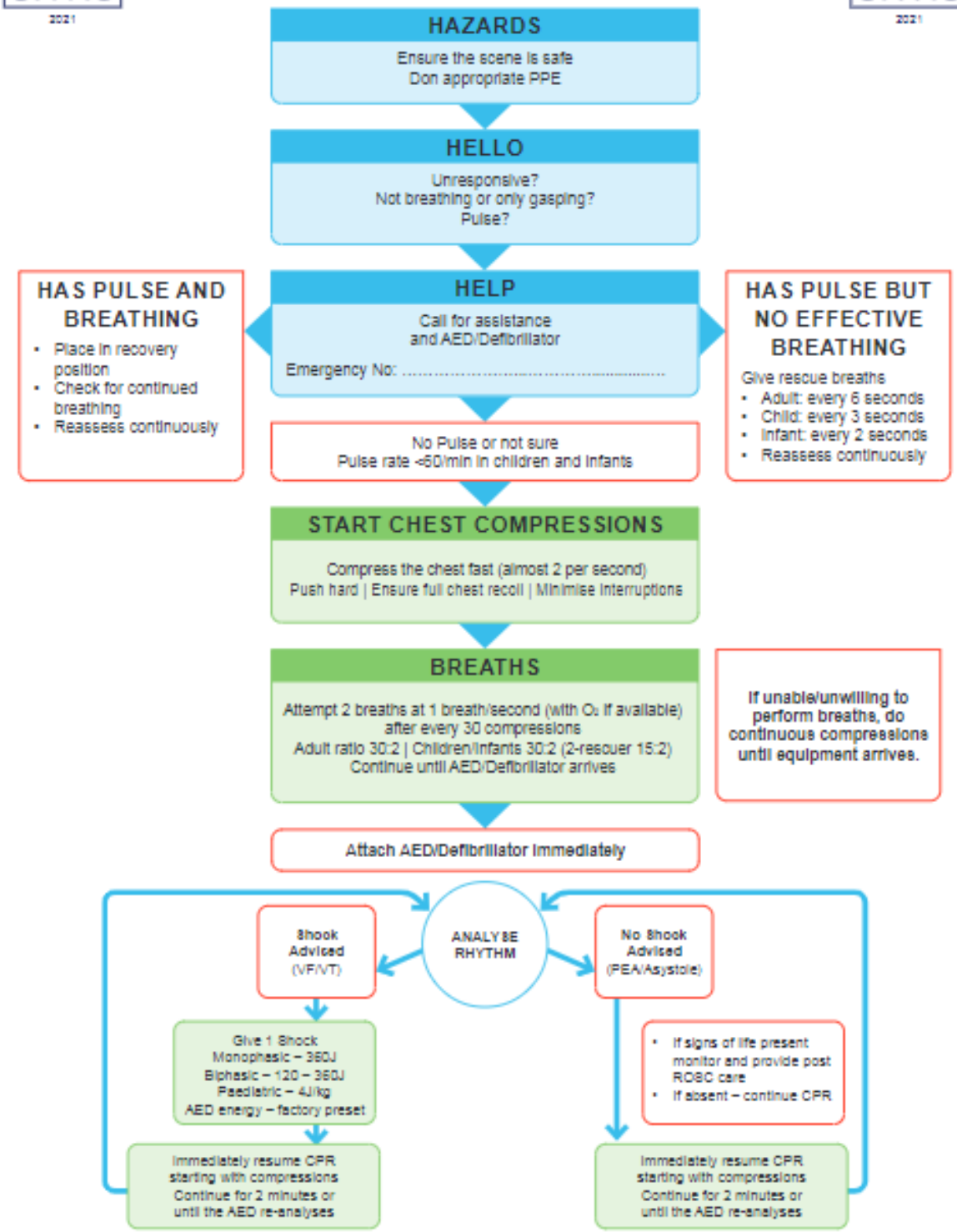
Basic Life Support Algorithm

2021



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Basic Life Support Algorithm for Suspected Communicable Disease

2021

HAZARDS

Ensure the scene is safe → Alert for Communicable Disease → Put on all appropriate PPE → Pre-cardiac arrest discussion on DNAR

HELLO

- Start initial assessment from at least 2 meters away, keep bystanders safely away
- Do not feel for breathing. Look for visible chest rise and feel for a carotid pulse

HAS PULSE AND BREATHING

- Place in recovery position
- Reassess continuously
- Maintain "Crowd control" at least 2m from the patient

HELP

Call either 112 or local ambulance
Call for assistance and Defib/AED

Emergency No: .....

No pulse, unsure or less than 60/min in children and infants

HAS PULSE BUT NO EFFECTIVE BREATHING

Apply a tight seal using a two hand technique on the BVM with a viral filter

Provide rescue breaths

- Adult: every 6 seconds
- Child : every 3 seconds
- Infant: every 2 seconds

Single rescuer – cover the patient's face with a surgical mask or cloth folded 3 times
Team rescuer – cover the patient's face using a BVM with a viral filter and apply a tight seal using a two hand technique

START CHEST COMPRESSIONS

- Push Hard and Fast (almost 2/second)
- Ensure full chest recoil
- Minimise interruptions

BREATHS

- Delay breaths with continuous compressions until full PPE donned for airway manager/rescue team
- Attempt 2 breaths at 1 breath/second (with 100% supplementary oxygen if available)
- Adult ratio 30:2/Children or Infants 30:2 if alone (2 rescuer 15:2)
- Continue until AED/Defibrillator arrives and attach immediately

Attach AED/Defibrillator immediately

ANALYSE RHYTHM

Shock Advised (VF/VT)

Give 1 Shock
Monophasic – 360J
Biphasic – 120-360J
Paediatric – 2-4J/kg
AED energy – factory preset

No Shock Advised (PEA/Asystole)

If signs of life are present, monitor and provide post ROSC care.
If absent continue CPR

Immediately resume CPR starting with compressions
Continue for 2 minutes or until the AED re-analyses

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Advanced Cardiac Arrest Algorithm for Suspected Communicable Disease (Respiratory)

2021

HAZARDS

Ensure the scene is safe → Alert for Communicable disease → Don appropriate PPE → Pre-cardiac arrest discussion on DNAR

HELLO

- Look from a distance, keep others safely away
- Do not feel for breathing, but look for visible chest rise and feel for pulse

HELP

Call either 112 or local ambulance,
Call for assistance and Defib/AED

Emergency No: .....

No Pulse or not sure
Pulse rate <60 in children and infants

HAS PULSE AND BREATHING

- Place in recovery position
- Reassess continuously
- Maintain "Crowd control" at least 2m from the patient

HAS PULSE BUT NO EFFECTIVE BREATHING

Apply a tight seal using a two hand technique on the BVM with a viral filter
Give rescue breaths

- Adult: every 6 seconds
- Child: every 3 seconds
- Infant: every 2 seconds

Single rescuer – cover patient's face with surgical mask or cloth folded 3 times
Team rescuer – cover patient's face with BVM + tight seal + filter

START CHEST COMPRESSIONS

- Push Hard and Fast (almost 2/second)
- Ensure full chest recoil
- Minimise interruptions
- If witnessed arrest, complete 200 compressions with tight fitting non-rebreather mask, while waiting for ECG analysis

BREATHS

- Delay breaths with continuous compressions until full PPE donned for airway manager/resus team
- Attempt 2 breaths at 1 breath/second with 100% oxygen
- Adult ratio 30:2 | Children 30:2 if alone or 15:2 2-rescuer
- Continue until AED/defibrillator arrives and attach immediately

Attach AED/Defibrillator Immediately

ANALYSE RHYTHM

Shock Advised (VF/VT)

Give 1 Shock
Monophasic – 360J
Biphasic – 120-360J
Paediatric – 4 J/kg
AED energy – factory preset

No Shock Advised (PEA/Asystole)

- If signs of life present monitor and provide post ROSC care
- If absent – continue CPR

Immediately resume CPR starting with compressions
Repeating cycles - 2 minutes of CPR and analysing
Follow AED voice prompts if advised

AIRWAY MANAGEMENT

- NB – highest risk of viral contamination to rescuers
- Rescuer must have full PPE
- Early definitive airway with attachment to ventilator
- Viral filter protection placed on BVM and ventilator
- Video laryngoscopy is recommended to distance rescuer from the patients mouth and nose
- Cover the patient's mouth and nose after the airway is secured

HIGH QUALITY CPR

- Compression rate 100-120 per minute
- Avoid excessive ventilation
- 1 breath every 6 seconds if advanced airway
- Change or switch compressors every two minutes
- Consider capnography and arterial monitoring

ADVANCED CONSIDERATIONS

- Correct the cause as soon as possible
- Avoid prolonged resuscitations
- Obtain IO/IV access, take ABG/VBG
- Early intubation with viral protection due to aerosol generation
- Continuous chest compressions after definitive airway – place on ventilator as soon as possible with viral protection (adjust alarm settings)
- Consider Adrenaline and other anti-arrhythmics
- Adrenaline 1mg every 3-5 mins (0.1 mls/kg of 1:10 000 in paeds)

CONTRIBUTORY CAUSES

- Hypoxia
- Hypovolaemia
- Hypothermia
- Hydrogen Ion (Acidosis)
- Hypo/Hyperkalaemia
- Hypoglycaemia
- Tension Pneumothorax
- Tamponade (Cardiac)
- Toxins
- Trauma
- Thrombosis (Coronary)
- Thrombosis (Pulmonary)

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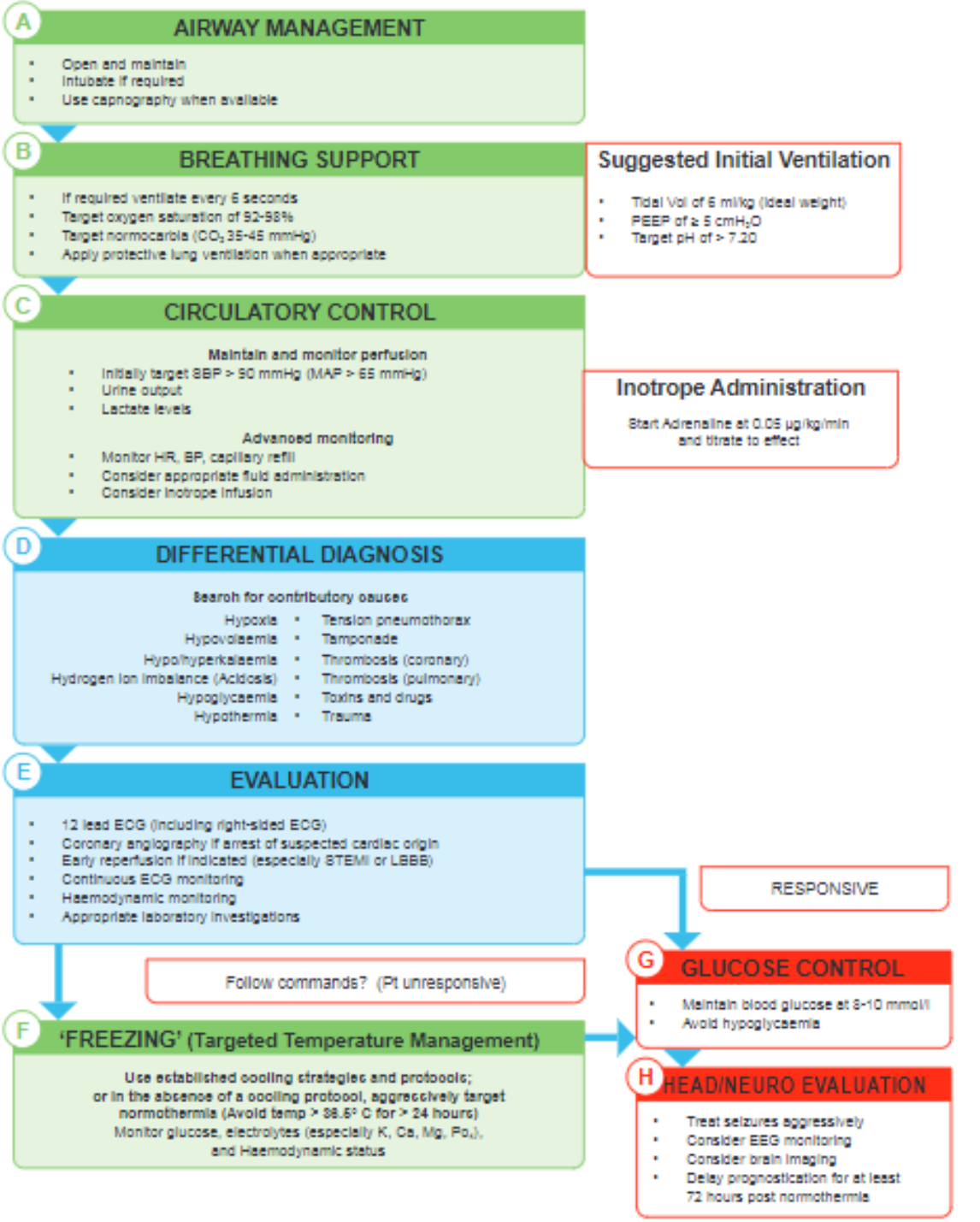
Post Cardiac Arrest Care
(Return of Spontaneous Circulation)

2021



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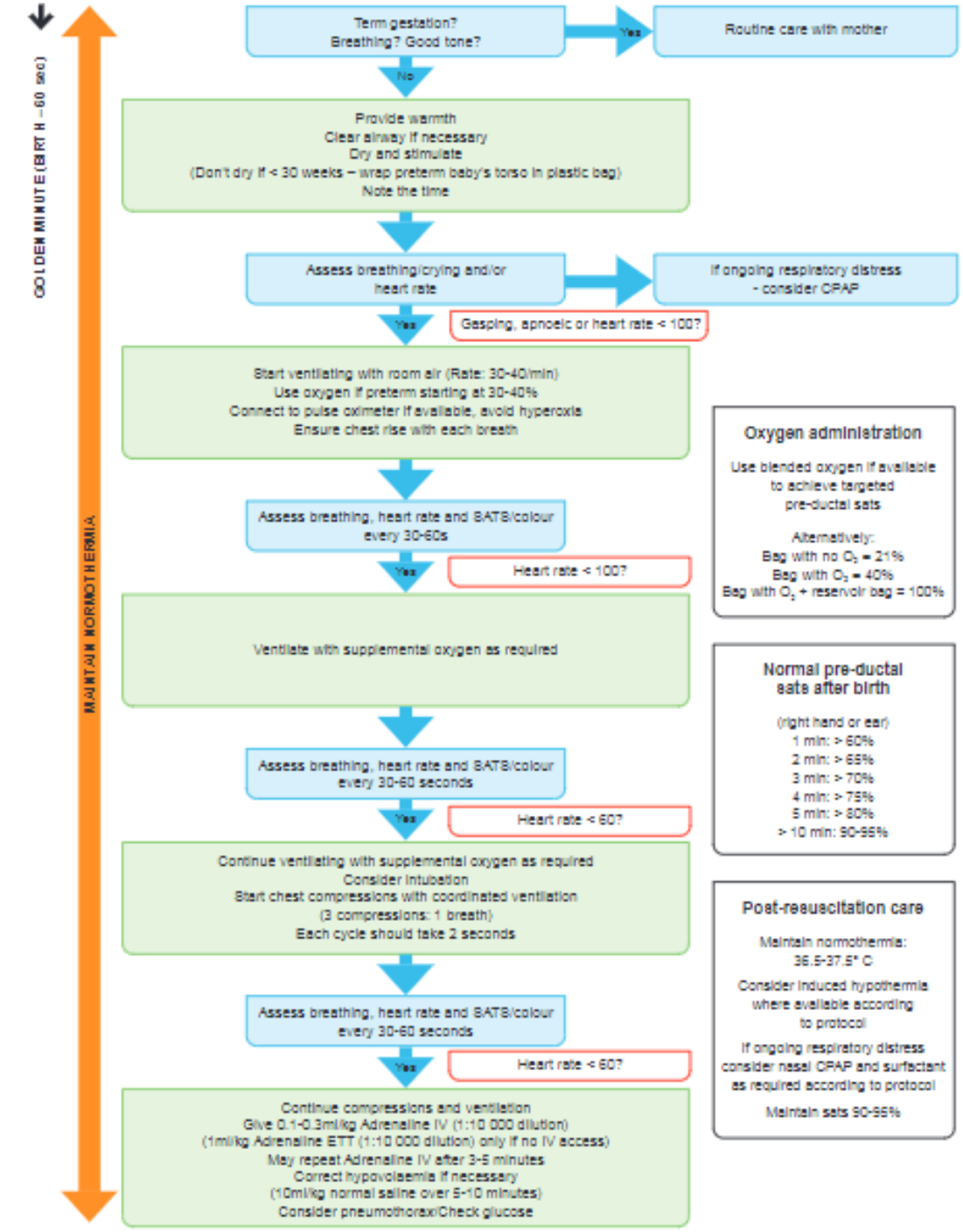
Newborn Resuscitation Algorithm

2021



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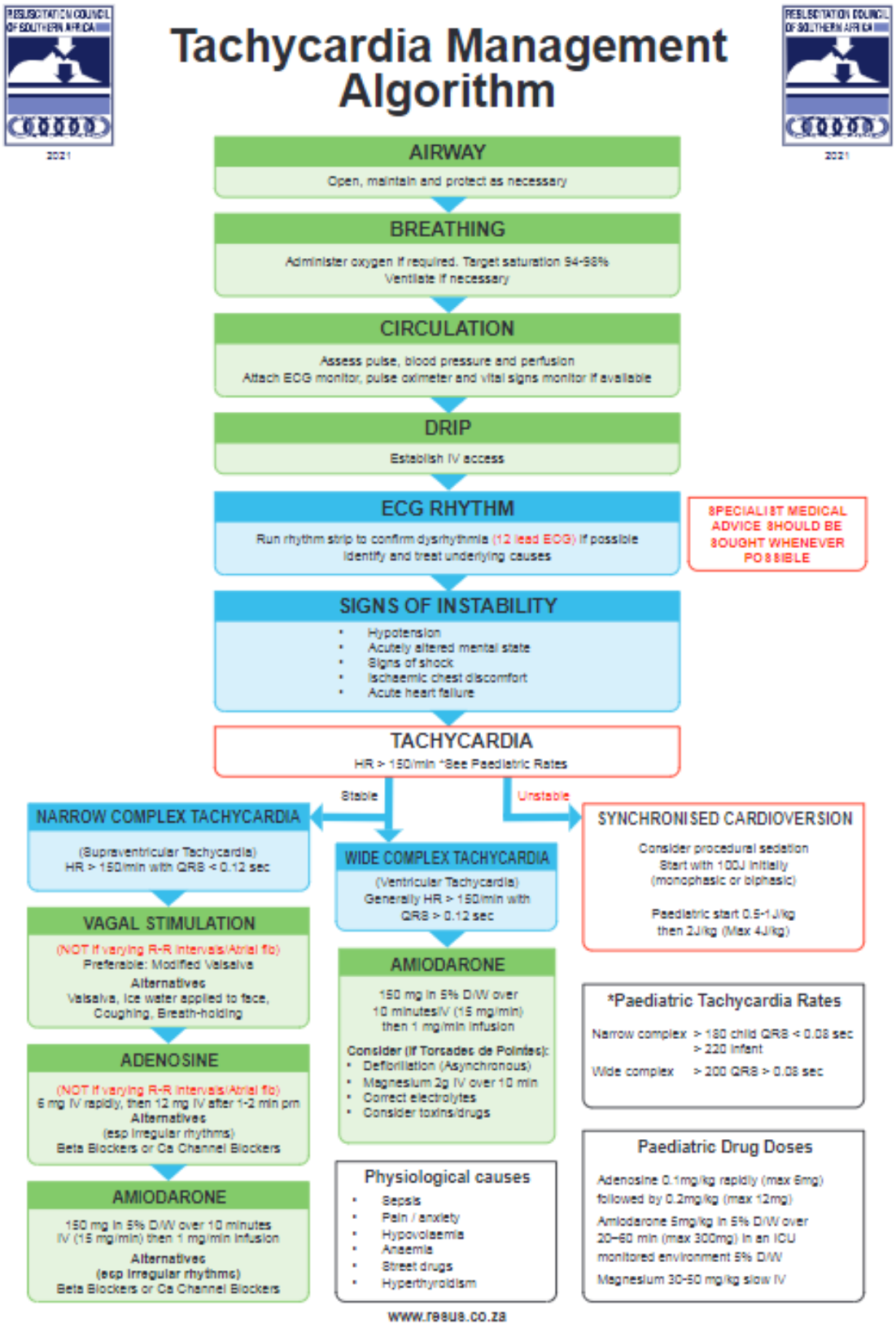
Tachycardia Management Algorithm
2021
2021
AIRWAY
Open, maintain and protect as necessary
BREATHING
Administer oxygen if required. Target saturation 94-98%
Ventilate if necessary
CIRCULATION
Assess pulse, blood pressure and perfusion
Attach ECG monitor, pulse oximeter and vital signs monitor if available
DRIP
Establish IV access
ECG RHYTHM
Run rhythm strip to confirm dysrhythmia (12 lead ECG) if possible
Identify and treat underlying causes
SPECIALIST MEDICAL ADVICE SHOULD BE SOUGHT WHENEVER POSSIBLE
SIGNS OF INSTABILITY
Hypotension
Acutely altered mental state
Signs of shock
Ischaemic chest discomfort
Acute heart failure
TACHYCARDIA
HR > 150/min *See Paediatric Rates
Stable
Unstable
NARROW COMPLEX TACHYCARDIA
(Supraventricular Tachycardia)
HR > 150/min with QRS < 0.12 sec
WIDE COMPLEX TACHYCARDIA
(Ventricular Tachycardia)
Generally HR > 150/min with QRS > 0.12 sec
SYNCHRONISED CARDIOVERSION
Consider procedural sedation
Start with 100J initially
(monophasic or biphasic)
Paediatric start 0.5-1J/kg
then 2J/kg (Max 4J/kg)
VAGAL STIMULATION
(NOT if varying R-R intervals/Atrial flo)
Preferable: Modified Valsalva
Alternatives
Valsalva, Ice water applied to face,
Coughing, Breath-holding
ADENOSINE
(NOT if varying R-R intervals/Atrial flo)
6 mg IV rapidly, then 12 mg IV after 1-2 min prn
Alternatives
(esp irregular rhythms)
Beta Blockers or Ca Channel Blockers
AMIODARONE
150 mg in 5% D/W over 10 minutes
IV (15 mg/min) then 1 mg/min infusion
Alternatives
(esp irregular rhythms)
Beta Blockers or Ca Channel Blockers
AMIODARONE
150 mg in 5% D/W over
10 minutes/IV (15 mg/min)
then 1 mg/min infusion
Consider (if Torsades de Pointes):
Defibrillation (Asynchronous)
Magnesium 2g IV over 10 min
Correct electrolytes
Consider toxins/drugs
Physiological causes
Sepsis
Pain / anxiety
Hypovolaemia
Anaemia
Street drugs
Hyperthyroidism
*Paediatric Tachycardia Rates
Narrow complex > 180 child QRS < 0.08 sec
> 220 infant
Wide complex > 200 QRS > 0.08 sec
Paediatric Drug Doses
Adenosine 0.1mg/kg rapidly (max 6mg)
followed by 0.2mg/kg (max 12mg)
Amiodarone 5mg/kg in 5% D/W over
20–60 min (max 300mg) in an ICU
monitored environment 5% D/W
Magnesium 30-50 mg/kg slow IV
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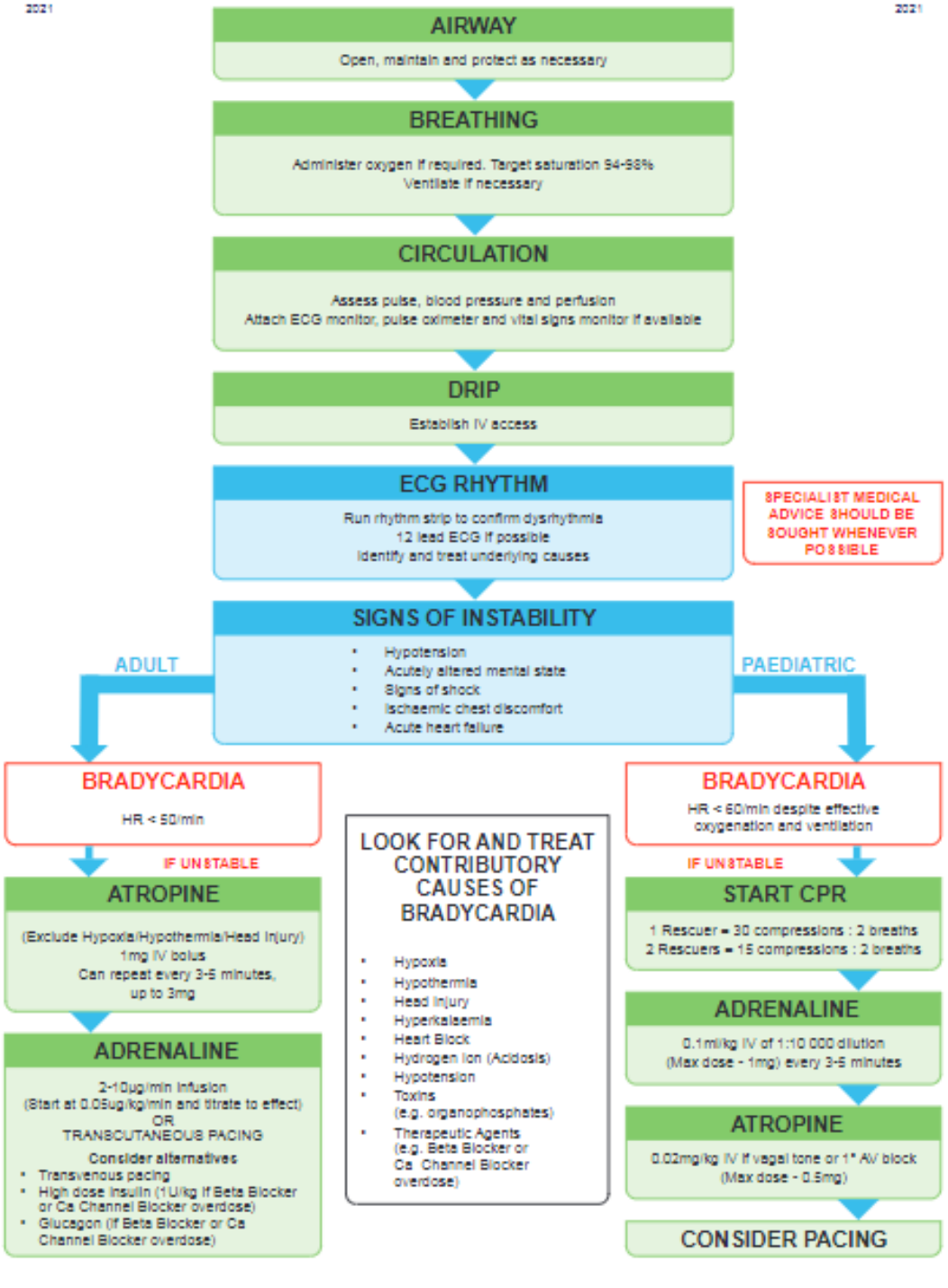
Bradycardia Management Algorithm

2021



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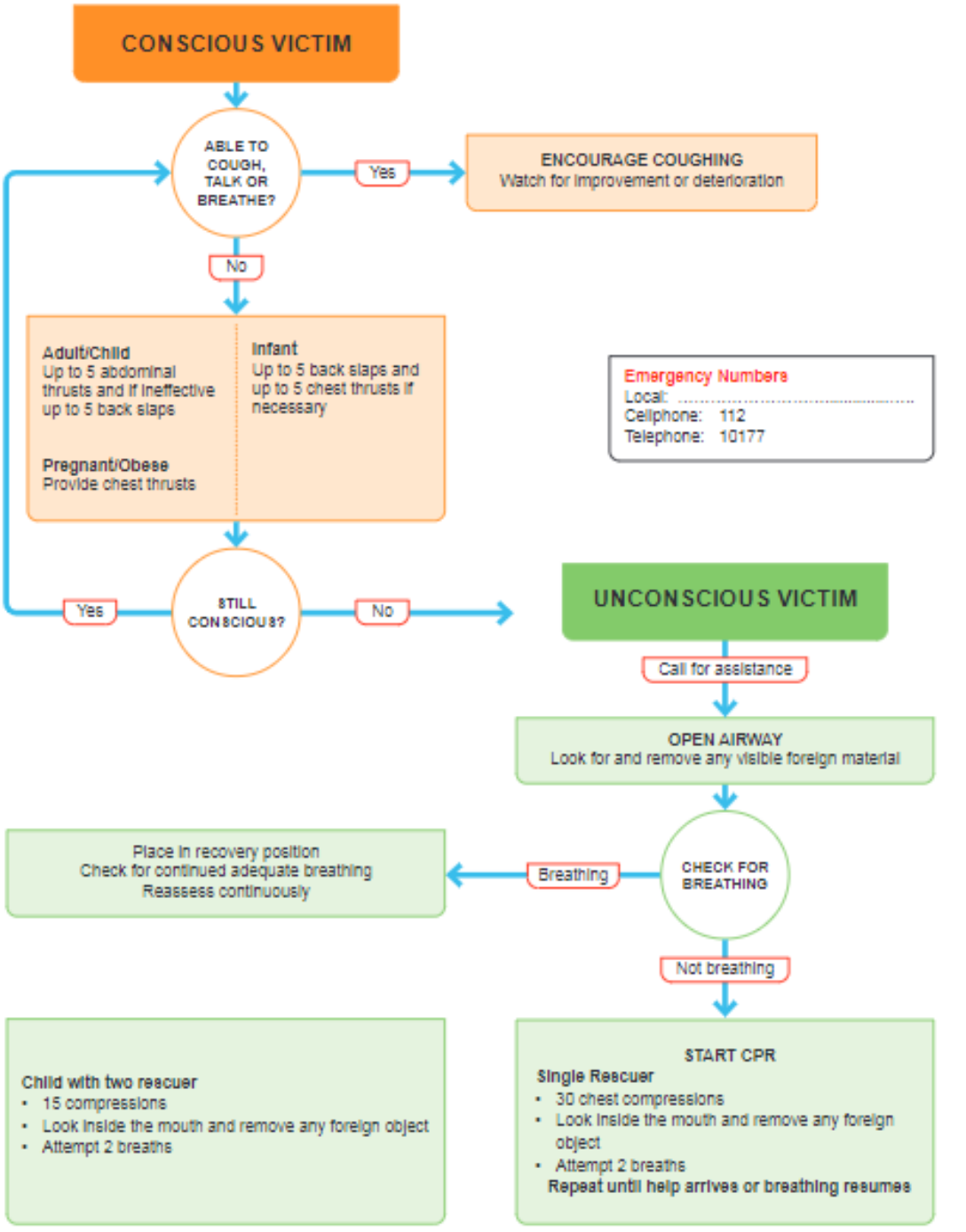
Choking Algorithm



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EMERGENCY MANAGEMENT OF ADULT & CHILD ANAPHYLAXIS

1 RECOGNIZE THE SUDDEN ONSET OF EITHER:

EXPOSURE TO KNOWN OR [illegible]KNOWN ALLERGEN

- **SK[illegible]/MUCOSAL INVOLVEM[illegible]NT** ([illegible]) **AND AN[illegible] OF:**
- **[illegible]ESPIRATORY COMPROMISE** (dyspnoea, wheeze), **OR**
- **CAR[illegible]OVASCULAR DYSFUNCTION, OR**
- **SEVERE GASTROINTEST[illegible]NAL SYM[illegible]TOMS** (abdom[illegible]nal [illegible]ain, repetitive [illegible]o[illegible]iting)

A[illegible]TER EXPOSURE TO [illegible]O[illegible]N ALLERGEN

- **RESPIRATORY DI[illegible]FICULTY** ([illegible], hyp[illegible]xaemia, di[illegible]tre[illegible])

AND/OR:

- **CARDIO[illegible]ASCU[illegible]AR DYSFUNCTION** ([illegible])

([illegible] skin or [illegible] membrane in[illegible]olvement)

2 IMMEDIATE TREATMENT:

- REMOVE EXPOSURE
- CALL FOR HELP

ADRENALINE

1mg/ml (1:1000) - 0.01mg/kg IM (Max 0,5ml IM) anterolat[illegible] aspect of thigh

Repeat eve[illegible], 5-15 minutes i[illegible] no imp[illegible]ovement or us[illegible] an auto-inje[illegible]tor

[illegible] - 0,5ml IM

3 ASSESS VITAL SIGNS: OXYGEN - MONITORS - IV ACCESS

High flow [illegible]xygen, [illegible]

High flow [illegible] ECG mo[illegible]to[illegible]ing

[illegible] supine w[illegible]h [illegible]

4 ADJUNCTIVE TREATMENT IF NECESSARY

H1 ANTIHISTAMINE
Promethazine
2-6 yrs - 6,25mg IM or slow IV
6-12 yrs - 12,5mg IM or slow I[illegible]
>12 yrs - 25mg IM or slow IV
(Avoid if <2yrs old and low BP)

CRYSTALLOID
(e.g. Ringers/Balsol)
Rapid infusion of 20ml/kg (max 1-2 litres)
Repeat IV infusion as necessary
A[illegible]renaline infusion (0,1 - 1 [illegible]/min)
[illegible]

NEBULISED BRONCHODILATORS
Every 15-20 mins if severe bronchospasm
Salbutamol 5mg
WITH
Ipratropium 0,5mg

H2 RECEPTOR ANTAGONIST
Cimetidine
IM or Slow IV
5mg/kg (Max - 300mg)
Diluted in 20ml over 2 min

CORTICOSTEROIDS
Hydrocortisone
IM or Slow IV
<1 yr - 25mg 1-6 yrs - 50mg;
6-12 yrs - 100mg >12 yrs - 200mg

GLUCAGON
20µg/kg (Max 1-2mg)
IM or slow IV every 5 mins if unresponsive to adrenaline (Look out for vomiting and hyperglycaemia)

RISK REDUCTION STRATEGIES

[illegible]

FAQ's:

[illegible]

[illegible] June 2021

Ref: Cardona et al. World allergy organization anaphylaxis guidance. [illegible]