

NON-COMMUNICABLE DISEASES

Programmatic and clinical guidelines

2020 Edition (v5.2)



Editors

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Contributors

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Version control

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Foreword from the Medical Director of MSF OCA

Non-communicable diseases (NCDs) make the largest contribution to mortality both globally and in the majority of low- and middle- income countries (LMICs). Worldwide, NCDs account for 60% (35 million) of global deaths. The major NCDs used to be diseases of affluence; however, the changing epidemiology of NCDs (increasingly affecting low- and middle-income countries) and the changing patterns of refugee crises (away from settings where infectious disease represents the main burden of disease) mean that they now represent an increasing proportion of the cases we see in many MSF projects.

When we talk about NCDs throughout MSF, what are we referring to? We tend to use the term ‘NCDs’ to refer to those chronic conditions that represent the highest burden of disease: hypertension and cardiovascular disease, chronic respiratory disease (asthma and COPD), diabetes and hypothyroidism, epilepsy and cancer. Mental illness has historically been considered as a separate specialist domain throughout MSF, yet we should start to consider it together with the other NCDs in view of the very high levels of comorbidity and poor outcomes in NCD patients who suffer from mental illness. In a few projects, MSF also provides treatment for haematological disorders (e.g. sickle cell anaemia, thalassaemia). Whilst these conditions are excluded from the scope of this current document, they will be considered for inclusion in the next revision.

Although NCDs have only recently entered the MSF lexicon, we have in fact been providing care for NCDs since the very beginning. Currently in our OPD/IPD services, we offer *basic care* for the above mentioned NCDs, and in our HIV/TB programmes, we provide *care for comorbid NCDs* where capacity and local circumstances allow this. Increasingly we are providing ‘*stepped up*’ care for one or more of these NCDs in settings where NCDs represent a significant unmet health need. In these projects, we aim for a patient-centred model of care, integrating mental health care as well as care for other comorbidities where possible. In these projects we carry out rigorous monitoring and evaluations, to learn how we can improve the quality, accessibility, and efficiency of NCD services.

In all settings, our focus is on **diagnosis and treatment, acute management, and secondary prevention of complications** arising from NCDs. With the exception of health education activities, we currently do not provide **screening and primary prevention for NCDs**¹. Evidence suggests that this approach maximises impact on death and disability, especially where resources are limited.



Dr Sidney Wong

Medical Director, MSF-OCA

¹ With the exception of treatment of patient with HIV and asymptomatic hypertension in patients at very high risk of cardio-vascular events, in certain settings.

How to use these guidelines

These guidelines cannot cover NCDs in great depth but they aim to address the particular information needs faced by MSF projects. Some conditions (e.g. diabetes) are discussed in more detail, where these conditions pose particular challenges in the settings in which we practice.

Section A (Programmatic Guidance) provides detailed guidance on how to set-up and deliver an NCD service, including standard lab and drug lists, patient files and standard reporting. Projects will generally provide core/basic NCD care, whereas some may be providing 'stepped-up care' for NCDs. The tools and checklists included will be of use to standard IPD/OPD services providing basic NCD care, as well as HIV/TB programmes providing care for comorbid NCDs.

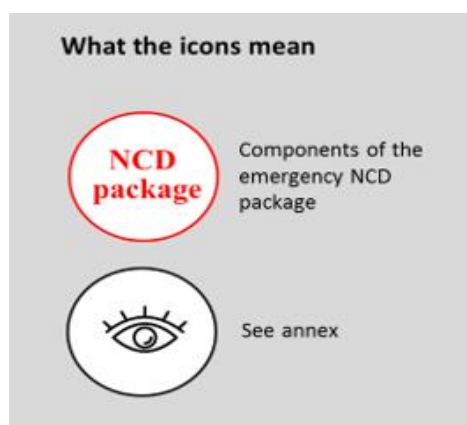
Section B (Clinical Guidelines) will be of use to all MSF projects that see patients with chronic diseases. These 'model' guidelines can be used to develop simplified standard operating procedures (SOPs) adapted to context, and taking into account local guidelines where applicable. This is because:

- The guidelines are primarily **aimed for projects with a focus on NCDs**. For emergency projects, projects providing basic NCD care, and HIV/TB projects, we suggest converting the relevant sections into brief SOPs (see annex 3 for an example).
- These model guidelines are **based on a typical lower-middle income context**. They may thus represent 'unattainable' level of care in lower-income contexts and would need to be adjusted accordingly. In particular, we should minimise the use of therapies that will not be available when MSF leave.
- Many of the contexts where MSF provides NCD care have their own **national or medical association guidelines**. We may be required to use those guidelines; or we may choose to use them, as this maintains continuity when the patient moves back to MoH care. However, beware that some national guidelines are not evidence-based, and/or are out of date and may not be impartial.
- Some countries have **national drug formularies or restrictions on importation**, therefore the drug choices in these model guidelines may need to be modified. Where there are several possible alternatives in a particular drug class (e.g. β blockers), the preferred alternative is given in brackets.

These guidelines are mainly focused on primary care.

Section C (Emergency Care) deals with acute presentations of NCDs and how to manage them. Generally, this will require the patient to be transferred to an emergency room or inpatient environment, but the patient may need to be stabilised (and care initiated) in the primary care setting.

Throughout the document, red text has been used to highlight components of an 'emergency NCD package' (see sections marked ENCD) that can be used in the first phase of emergency interventions.



Guideline development and changes from previous versions

These guidelines were developed by medical specialists in MSF who have provided and implemented chronic disease care (including HIV and TB) in MSF field projects, and have been piloted and used in varied field settings (and updated regularly) since 2015. The guidelines were informed by: WHO Guidelines on Prevention and Control of Non-Communicable Diseases, WHO Package of Essential Non-communicable Disease Interventions for Primary Health Care, WHO Disease Specific Guidelines, the National Institute of Clinical Excellence (NICE) Guidelines, British Thoracic Society Guidelines, and European Society of Cardiology Guidelines. Numerous other guidelines were consulted (see references). External specialist input (e.g. cardiology, diabetology) was sought for the specific disease chapters.

Primary changes in this version (v5)

- Hypertension management with fixed-dose combination treatment, with a flowchart using telmisartan 40mg + amlodipine 5mg – pages 53 and 71-76
- Cardiovascular risk management using highest-risk categories (rather than risk calculation charts, which are discontinued) and standard dose atorvastatin – in diabetes p45; hypertension p74 and p76; cardiovascular disease medication table p83; renal impairment p87

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Abbreviations

ACEi	Angiotensin Converting Enzyme Inhibitor	HAS-BLED	<i>An indicator of bleeding risk in the context of atrial fibrillation</i>
ACS	Acute Coronary Syndrome	Hb	Haemoglobin
AED	Anti-epileptic drug	HbA1c	Glycosylated Haemoglobin
AF	Atrial Fibrillation	HTN	Hypertension
ARB	Angiotensin 2 Receptor Blocker	IPD	In-patient department
ARV	Antiretroviral Medication	LABA	Long acting beta-adrenoreceptor agonist
B-Blocker	Beta Blocker	LFTs	Liver Function Tests
BMI	Body Mass Index	MoH	Ministry of Health
BP	Blood Pressure	MRI	Magnetic Resonance Imaging scan
CCB	Calcium Channel Blocker	NCD	Non-communicable disease
CHA2DS2-VASc	<i>An indicator of Stroke risk in the context of atrial fibrillation</i>	NNRTI	Non-nucleoside reverse transcriptase inhibitor
COCP	Combined Oral Contraceptive Pill	NPH	Neutral Protamine Hagedorn Insulin (intermediate acting)
COPD	Chronic Obstructive Pulmonary Disease	NSAIDS	Non-steroidal anti-inflammatory drugs
CRP	C-reactive protein	OPD	Out-patient department
CT	Computed Tomography scan	PAD	Peripheral Arterial Disease
CVA	Cerebro-vascular accident	PCI	Primary Care International
CVD	Cardiovascular Disease	PE	Pulmonary Embolus
CXR	Chest X-ray	PEFR	Peak Expiratory Flow Volume
DM	Diabetes Mellitus	PI	Protease Inhibitor
DVT	Deep Venous Thrombosis	PPI	Proton pump inhibitor
ECG	Electrocardiogram	SABA	Short acting beta-adrenoreceptor agonist
EEG	Electroencephalogram	SCA	Sickle Cell Anaemia
ENCD	Emergency NCD package	SOP	Standard Operating Procedures
ESR	Erythrocyte Sedimentation Rate	TSH	Thyroid Stimulating Hormone
FAST	<i>A screening tool for acute Stroke</i>	U&Es	Urea and Electrolytes (as a minimum, includes Sodium, Potassium & Urea)
FBC	Full blood Count	UTI	Urinary Tract Infection
FBG	Fasting Blood Glucose	VA	Visual Acuity
FEV1/FVC	Forced Expiratory Volume in 1 second/ Forced Vital Capacity	WHO	World Health Organisation
GDM	Gestational Diabetes Mellitus		

1. Prioritisation in NCD Interventions

Choice of Interventions

Many of the health needs assessment and surveillance tools used by MSF were developed primarily for lower-income settings and are well adapted to certain types of emergency (e.g. mass displacement in closed settings) and health problems (e.g. infectious disease outbreaks).

Changing patterns of mass displacement (open settings), urbanisation, and the increasing conflict burden in low- and middle-income settings have resulted in an epidemiological shift towards non-communicable diseases in the contexts where MSF is likely to intervene. Many traditional assessment tools are poorly adapted for these situations and may not provide the information required to enable appropriate programmatic decisions.

In these contexts, it is important to ensure that the assessment covers:

- Local demographics (e.g. age distribution, urbanisation)
- Disease patterns in that context (including type and burden of non-communicable diseases)
- Types and distribution of vulnerability (especially elderly and socially isolated)
- Understanding within the population (and patients) of these diseases, their health priorities, their experience of accessing care for these problems

Health programme design should be based on this assessment; if assessment did not take place at the start, it is still of great value to conduct an interim assessment and adjust programme design accordingly. In general, mixed methods (qualitative and quantitative) assessments will be required,

Ideally the approach should be robust and simple enough to be repeated every year to provide data on changing health needs and vulnerabilities, as well as enabling monitoring of the health system response. Using a standardised methodology on an electronic platform such as ODK is advisable.

Prioritising patients within a programme

Whilst we aim to provide care to anyone who access our services, it will often be necessary to prioritise to ensure that the most vulnerable patients receive care rapidly. In the case of NCDs, these will normally be:

- Patients on life preserving medications such as Insulin,
- Symptomatic / uncontrolled patients with abnormal parameters (i.e. medically at risk)
- disabled / mentally ill / pregnant / <15 or >70 (i.e. socially vulnerable)

Patients not in these groups should be included when possible, and a 'waiting list' logic can be applied. However, if the waiting list is long (e.g. > 1 month) or these patients face access barriers, it is usually possible to provide them with essential medication whilst awaiting inclusion into the programme. E.g. if they have previously been diagnosed with an NCD and know which medication they were on, this can be re-prescribed. This approach is usually safer than not prescribing medication at all for > 1 month.

ENCD: Prioritisation in a new emergency

In the first 1-3 months, the priority is to ensure clinical management/stabilisation and referral of acute exacerbations (life-threatening or severely symptomatic); ensure identification of the sub-group of patients for whom discontinuation of treatment could be life-threatening; ensure continuation of treatment, prioritising patients in this sub-group; ensure basic care for symptoms of advanced NCDs is available.²



2. Levels of care

	BASIC OPD (OR EMERGENCY INTERVENTIONS)	SPECIALISED “STEPPED-UP” NCD PROGRAMME OPD WITH MINILAB (INCLUDING HIV /TB PHC FACILITIES)
Clinical conditions	<ul style="list-style-type: none"> • Diagnosis of cardio-vascular disease, hypertension, diabetes, asthma/COPD, epilepsy • Stabilisation and referral of acute exacerbations/ complications • Provision / continuation of life-improving or life-sustaining treatment for chronic conditions (including 2ary prevention) • Basic wound care • Basic palliative care 	<p>As for basic PLUS</p> <ul style="list-style-type: none"> • Diagnosis and management of chronic renal disease • Annual review (e.g. fundoscopy and foot check for DM) • Primary prevention of CV disease using total CV risk approach • Non-surgical management of diabetic ulcers • Clinical Breast examination and VIA assessment of women with breast or cervical symptoms • Diagnosis and referral of Kaposi’s Sarcoma • Diagnostic confirmation of arrhythmias and DVT
Referral criteria	<ul style="list-style-type: none"> • Definitive treatment of acute complications and exacerbations • Chronic conditions where optimal management is in doubt or not available at OPD level • Annual specialist review including annual Diabetes Check • Diagnostic confirmation and management of DVT, arrhythmias, epilepsy, chronic renal failure, cancer • Ulcer care 	<ul style="list-style-type: none"> • Definitive treatment of acute exacerbations / complications; • Chronic conditions where optimal management is in doubt or not available at OPD level; • Chronic renal failure requiring dialysis • Laser eye surgery for proliferative retinopathy • Surgical ulcer care • Diagnostic confirmation and management of arrhythmias and DVT • Referral of suspected cancer
Meds	ENCD kit as minimum (see section 4)	Standard NCD list + consider non-standard items (section 4)
Labs & diagnostics	Blood glucose, Urinalysis (Ket, Pro, Glu)	As for basic + Hb, PEFR, Creatinine, HbA1c Where available; sodium, potassium, ALT or AST, cholesterol, ECG, CRP/ESR, INR, monofilament testing, visual acuity testing chart, spirometry, urinary micro-albuminuria
Patient files / M&E	No patient files held at facility but patients should all have “health passport”/self-held files, aggregate reporting on OPD tool	If using individual patient files, consider NCD cohort reporting using NCD tool. If not, aggregate reporting on OPD tool. If possible, facility-held patient files and a patient held treatment card and cohort reporting using NCD tool is ideal.

3. Set-up of an out-patient NCD service

The 'standard' patient circuit

The table below represent an idealised NCD service, but the actual set-up will depend on:

- Whether the service is run by MSF, or by the Ministry of Health/another provider with MSF support.
- What the service is aiming to achieve. For example, an NCD service in a refugee transit centre may aim just to ensure that people with established NCDs have enough medication until they move on; whereas a comprehensive NCD service in an established community may aim to identify, test, and treat for NCDs as well as providing long-term supportive care.
- Whether it is integrated with management of other pathologies (e.g. comprehensive health care, HIV/TB/NCD service) or a vertical service targeting one or more specific NCDs.
- Whether the service is at primary care level, secondary care level (including hospitalisation), or both.

STEPS OF NCD SERVICE	PERSONNEL INVOLVED	TASKS
Patient registration	Usually by a receptionist, data clerk or nursing assistant	<p>New patients - entered into a new-patient (NCD) register</p> <ul style="list-style-type: none"> • New file is opened - receptionist fills in basic demographic info and gives file to patient <p>Return patients - 'ticked' in the appointment register</p> <ul style="list-style-type: none"> • Patient is given their file.
Triage and stabilisation of acute presentations	Usually by a nurse / auxiliary nurse	<ul style="list-style-type: none"> • Takes and records vital signs (HR, RR, BP, Temp, Ht, Wt, BMI) • Check capillary blood glucose and urinalysis and record results • Rapidly identifies outpatients requiring urgent medical care and provides first aid and urgent referral.
Medical assessment and management plan	Usually by a doctor or clinical officer; follow up can be task-shifted to nurses	<p>Initial assessment: In NCD care this can be very detailed (ideally 30 minutes); In the case of new diagnosis, use a step-by-step approach. In case of multi-morbidity, Dr will need to prioritise and treat less urgent conditions at subsequent appointments.</p> <p>Follow-up appointments are shorter (10-15 minutes). All notes are recorded in the patient file. If the patient requires specialist referral or diagnostic tests, the doctor gives the patient a request form/ letter.</p>
Standard diagnostic tests	Nurse, lab tech, or external lab	If available, new diabetic, hypertensive and CVD patients should have: FBC, U&E, Creatinine, LFT, Total cholesterol. Diabetics should also have HbA1c and microalbuminuria/urinalysis. See lab section below.
Patient support and education (and counselling if necessary)	Nurse, health educator, dietician or similar	At the 1 st visit, an in-depth 'new patient' session should take place to ensure the patient understands and is ready for chronic care. Patient group/education sessions should be arranged where available. For 1:1 consultations, brief notes are recorded in the patient file. Where resources are limited, the Dr can identify and refer those most in need for patient education and support. At each subsequent visit all patients should be provided with support and education. If necessary, referral can be made again to the dietician, health educator or nurse educator
Pharmacy / dispensary	Pharmacist or Nurse	On receiving medication, the patient's understanding of their treatment should be checked and the medication explained again. Colour coding of medicines for different conditions can be useful.
Arrange next appointment	Receptionist, data clerk or any other staff member	For new patients with confirmed NCDs: passport (see section 5) given to patient. The date of the next appointment should be recorded in the appointment register (if available) and on the patient held card/file. The patient returns their file to the receptionist which should be stored in the facility. Patients who missed the day's appointment should be identified and followed up by phone.

Additional services

The following services should be provided on-site or at an accessible location for referral:

- Emergency room or facility to stabilise patients (e.g. acute asthma, DKA)
- Nursing room or facility to provide basic wound care/diabetic foot care

In stepped up facilities these services should also be available:

- Dietician or equivalent patient health educators
- Chiropodist, nurse, or other trained healthcare worker trained to do foot and nail care
- Psychologist or trained counsellor (and ideally a social worker)
- Comprehensive laboratory services (see section 4).

Appointment schedule

- The appointment schedule depends on the condition being treated. For some conditions, e.g. diabetes, newly diagnosed patients will usually require weekly reviews until their condition is stable and they fully understand their treatment, according to the opinion of the Dr and patient education team.
- For some conditions, e.g. hypothyroidism, stabilisation takes longer. Therefore, patients can be seen monthly until stable.
- Stable patients can generally be seen at 3 to 6-month intervals, with monthly to three monthly medication pick-ups to ensure good adherence. Frequency of medication pick-ups will be determined by several factors e.g. drug availability, ease of access to the clinic and adherence.

Standard procedures to improve efficiency and quality of care (see annex 1 for example from Jordan)



The following supporting activities can improve quality of care and efficiency of the service:

- Having **clear criteria** for (1) identification of patients, inclusion, and exclusion for the service, (2) triage for urgent cases, and (3) identifying those patients requiring medical review (if consultations are done by nurses).
- Locally adapted **clinical SOPs and a local formulary** based on the clinical guidance and drug list in this document, national or Ministry of Health (MoH) clinical guidelines and formularies, and local procurement legislation. Clinicians should be trained how to use these tools which should be available in all consulting rooms.
- Establishing **referral pathways** (and clarify who will pay) for patients who do not meet the inclusion criteria, for those who meet the inclusion criteria but have a co-morbidity that is not covered by the service, or for those included patients that have a complication that cannot be managed in the service.
- **Reliable follow-up**: Use of SMS appointment reminders and a system of contacting patients who miss appointments
- Regular **supportive supervision**: attention to hygiene, availability of medical equipment, drug stock and consumption, adherence to SOPs and triage criteria, appropriate observance of inclusion and exclusion criteria. Regular clinical audit helps ensure maintenance of good quality of care.
- **Service demand management**: define a target maximum waiting time for 1st appointment (e.g. 2 weeks). If waiting time exceeds this, can you expand the service through opening more clinics/consultation rooms? If not, are there additional measures that may improve efficiency?
 - Space out follow-up appointments e.g. from 3 to 6 monthly

- Reduce appointment times (e.g. 20 mins for initial appointment, 10 mins for follow-up)
- Task-shift follow-up appointments from doctor to nurse and health education from nurse to lay counsellor
- Decentralise nurse-led care to health posts or small primary care centres.

Integration with mental health services

In humanitarian settings, a significant proportion of patients with NCDs will also suffer from mental illness, whether due to traumatic experiences (e.g. stress disorders), secondary to the NCD (e.g. depression), or coincidental. In general, the presence of a mental illness significantly worsens the prognosis of the NCD. It is thus important to integrate mental health care into NCD services where possible. This is ideally done by:

- Ensuring clinicians are confident in prescribing antidepressants
- Training NCD staff in basic mental health care (e.g. using the WHO MH-GAP materials)
- Ensuring access to a specialist mental health service providing in-depth counselling and psychiatric care. Attention should be given to establishing referral and counter-referral systems, as well as regular meetings between the two teams for service harmonisation.

Palliative Care

Life-saving intervention is usually MSF's primary goal, but our broader medical and humanitarian outlook – in particular our emphasis on relieving suffering and restoring dignity – requires us to identify and address the needs of people with progressive chronic, incurable and terminal illnesses. Many patients with NCDs will reach a stage where their life-limiting conditions may cause distressing symptoms such as chronic pain, breathlessness, nausea and constipation and dependence on family members. The palliative approach initiated at diagnosis helps us keep focus on quality of life for patients and families. The crucial element for palliative care is patient- and family-centred communication to establish goals of care. Although this guideline will not address palliative care in detail, it will emphasise the recognition of the those with end-stage disease and give guidance for symptom control.

Integration with HIV/TB services

Integration can mean: integration of entry points/clinical services/decision making/technologies etc.
Integration may depend on context: whilst generally one-stop-shop is preferred, in some countries (e.g. Swaziland) patients may be less likely to come if integrated. It also depends on the structure of the health system.

If an integrated approach is possible then ideally clients with both an NCD and HIV should receive care for both diseases on the same day by the same healthcare worker and in the same consultation room. Clients with co-morbidities that are stable should be offered their medication refills through the same differentiated model of care as their ART receiving the same duration of medication for their NCD as their ART where available

Highly unstable settings

Providing NCD care in highly unstable setting presents a number of additional challenges, including:

- Interruptions to access of patients to the health service
- Interruptions of service provision
- Interruptions of presence of senior/experienced staff due to evacuations or security concerns
- Interruptions of supply of drugs and medical materials to the service.

Projects in these settings are encouraged to plan for these interruptions, for example through:

- Ensuring patients have a self-held record of key info e.g. health passport
- Providing larger take-home medication supplies for patients (e.g. 3 months), at times where access to clinics is difficult. (For insulin, 3 month's supply can be given if patient has access to refrigeration; otherwise 1 month's supply can be given with instruction of how to keep the insulin cool)
- Ensuring patients receive training in self-management of their condition
- Regular training of junior staff, so that the service can run autonomously (i.e. without senior staff input) for several months at a time
- Ensuring significant buffer stocks of drugs and medical materials if supply chain is at risk.

This plan should ideally be written down as a project-specific SOP, validated by the Medco.



ENCD: Emergency Interventions

Set up of the intervention will be highly variable and should be discussed with the NCD advisor on a case-by-case basis. Generally speaking:

- Simplified SOPs (see annex 3), supervision tool, drug list, and lab list should be implemented
- Patients should be given their full medical record ('patient passport') in case they attend another facility on the subsequent occasion. Standard OPD register and data tool are kept at the facility.

4. Medications



When preparing the Mission Standard List (MSL), it is important to take into account national clinical guidelines local restrictions on importing, as this may oblige you to seek alternative formulations after discussion with the OCA pharmacist. (**Red = ENCD kit; see annex 2 for full details for ordering; italics = non-standard list**)

MSF CODE	ASTHMA/COPD	EXPLANATION
DORASALB2SF	SALBUTAMOL sulfate, eq.0.1mg base/puff, 200 puffs, aerosol	Asthma (reliever)
DORASODC6V-	SODIUM chloride 6%, for nebulizer, 4 ml, vial	Asthma (severe exacerbation)
EMEQLPAC2--	SPACER, 155 ml with masks + mouthpiece	Asthma
DORASALB1N-	SALBUTAMOL, solution for nebulizer, 2 mg/ml, 2.5ml monodose	Asthma (severe exacerbation)
DORABECL1SF	BECLOMETASONE dipropionate, 0.10mg/puff, 200 puffs, aerosol	Asthma
EMEQLPEFM1MP1	(peak flow meter) MOUTH PIECE, s.u.	COPD / asthma
EMEQLPEFM1	PEAK EXPIRATORY FLOW METER	COPD / asthma
DORABECL5SF	BECLOMETASONE dipropionate, 0.05mg/puff, 200 puffs, aerosol	Asthma
DORASALM2SF	SALMETEROL, 25µg/puff, 120 puffs, aerosol	Asthma (preventer)
DORAIPRA5N-	IPRATROPIUM bromide, 0.250mg/ml, 2ml, sol. for nebuliser	Asthma and COPD protocols
DORAIPRA2SF	IPRATROPIUM bromide, 20µg/puff, 200 puffs, aerosol	COPD step 2
DINJMAGS5A-	MAGNESIUM sulfate, 0.5 g/ml, 10 ml, amp.	Acute life-threatening asthma
DORAMONT5TC	MONTELUKAST, 5 mg, chewing tab.	Asthma step 3 - Needs HA approval
DORAPRED5T-	PREDNISOLONE, 5 mg, tab.	Asthma step 5 or acute exacerbation
DINJHYDR1V-	HYDROCORTISONE sodium succinate, eq.100mg base, powder, vial	Asthma severe exacerbation
DORAFLUT5SF	FLUTICASONE propionate, 50µg/puff, aerosol, 120 doses	Asthma / COPD - Needs HA approval
DIABETES		
DORAMETF5T-	METFORMIN HYDROCHLORIDE, 500 mg, tab.	Diabetes
DORAGLIB5TB	GLIBENCLAMIDE, 5 mg, breakable tab.	Diabetes
DORAGLIC8TB	GLICLAZIDE, 80mg, breakable tab.	Diabetes
DINJGLUC5V5	GLUCOSE HYPERTONIC, 50%, 50 ml, vial	Hypoglycaemia
DINJINSHB1VN	INSULIN HUMAN, BIPHASIC 30-70 IU/ml, 10ml, vial N	Diabetes
DINJINSHI1VN	INSULIN HUMAN, ISOPHANE (NPH) 100 UI/ml, 10 ml, vial N	Diabetes
DINJINSHR1VN	INSULIN HUMAN, RAPID 100 IU/ml, 10 ml, vial N	Diabetes
DINJPOTC1A-	POTASSIUM chloride, 100 mg/ml, 10 ml, amp.	Diabetic ketoacidosis (DKA)
DINJINSAB3APN	INSULIN ASPART, BIPHASIC 30-70 IU/ml, 3ml, autoinj.pref. N	Needs HA approval
EMEAEST1--	POINT AESTHESIOMETER, retractable, 10g, incl. 2 monofil.	Diabetic neuropathy screening
EMEAEST101	(point aesthesiometer) MONOFILAMENT, 10 g	Diabetic neuropathy screening
EMEQLVIAC1E-	TUMBLING E EYE CHART, 23 x 35.5cm	Diabetic eye testing
HYPOTHYROIDISM AND HYPERTHYROIDISM		
DORALEVO1T-	LEVOTHYROXINE SODIUM, 0.1 mg, tab.	Thyroid hormone (in ITC)
DORALEVO2T-	LEVOTHYROXINE sodium, 0.025 mg, tab.	Thyroid hormone (in ITC)
DORACARZ2T-	CARBIMAZOLE, 20 mg, tab.	Hyperthyroidism
EPILEPSY		

DORACARB2T-	CARBAMAZEPINE, 200 mg, tab.	Epilepsy (Partial) +Bipolar Disorder
DORAVALP2TG / 5TG	VALPROATE SODIUM, 200 mg / 500mg, gastro-resistant tab.	Epilepsy (Generalised) +Bipolar Disorder
DORAVALP2S-	VALPROATE SODIUM, 200mg/5ml, 300 ml, bot.	Epilepsy (Generalised) +Bipolar Disorder, paediatric
DORALEVE2T-	LEVETIRACETAM, 250 mg, tab.	Epilepsy in selected patients (Needs HA approval)
DORAPHEY1T-	PHENYTOIN sodium, 100 mg, tab.	Epilepsy (Generalised)
DORAPHEN6T-	PHENOBARBITAL, 60 mg, tab.	Epilepsy (Generalised)
DINJDIAZ1A-	DIAZEPAM, 5 mg/ml, 2 ml, amp.	Treatment of convulsions
DINJPHEN2A1	PHENOBARBITAL sodium, 200mg/ml, 1 ml, amp.	Treatment of convulsions
CARDIOVASCULAR AND RENAL DISEASE		
DORAHYDO2T-	HYDROCHLOROTHIAZIDE, 25 mg, tab.	Hypertension
DORABISO5T-	BISOPROLOL fumarate, 5 mg, tab.	Cardio-selective B-blocker
DINJLABE1A-	LABETALOL hydrochloride, 5 mg/ml, 20 ml amp.	Hypertensive emergency
DORAAMLO5T-	AMLODIPINE, 5 mg, tab.	Hypertension
DORAENAL5T- / 2T-	ENALAPRIL maleate, 5 mg / 20mg, tab.	Hypertension
DINJENOX10S	ENOXAPARIN sodium, 10,000IU/1ml, syringe	Anticoagulation - Needs HA approval
DINJSTRK1V	STREPTOKINASE, 1.500.000 IU, powder, vial	Acute MI - Needs HA approval
DINJMORP1A-	MORPHINE hydrochloride, 10 mg/ml, 1 ml, amp.	Acute MI - Needs HA approval
DORALOSA5T-	LOSARTAN potassium 50mg, tab	ACEi intolerance - Needs HA approval
DORAATOR1T-	ATORVASTATIN calcium, eq. 10mg base, tab.	CVD prevention
DORAATOR2T-	ATORVASTATIN calcium, eq. 20mg base, tab.	CVD prevention
DORAACSA7TG	ACETYLSALICYLIC acid (aspirin), 75 mg, gastro-resistant tab.	Cardio-prevention
DORACLOP7T-	CLOPIDOGREL 75 mg, tab.	Cardiovascular disease secondary prevention
DINJHYDA2A-	HYDRALAZINE hydrochloride, 20 mg, powder, amp.	Hypertensive crisis
DORAMETY2T-	METHYLDOPA, 250 mg, tab.	Hypertensive emergency
DORAGLYT5T-	GLYCERYL TRINITRATE, 0.5 mg, sublingual tab.	Acute angina (1st line)
DORAISOB5T-	ISOSORBIDE DINITRATE, 5 mg, tab.	Angina (prevention)
DINJFURO2A-	FUROSEMIDE, 10 mg/ml, 2 ml, amp.	Cardiac failure (emergency)
DORAFURO4T-	FUROSEMIDE, 40 mg, tab.	Cardiac failure (symptomatic relief, 1st line)
DORASPIR2T-	SPIRONOLACTONE, 25 mg, tab.	Cardiac failure (symptomatic relief, 2 nd line)
DORADIGO2T-	DIGOXIN, 0.25 mg, tab.	Arrhythmias
DORAWARF1T-/5T-	WARFARIN, 1 mg, tab./ WARFARIN, 5 mg, tab	Anticoagulation - Needs HA approval
DORAPHYT1A1	PHYTOMENADIONE (vitamin K), 10 mg/ml, 1 ml, amp.	Warfarin reversal - Needs HA approval
DINJAMIO1A-	AMIODARONE hydrochloride, 50 mg/ml, 3 ml, amp.	Arrhythmias
DINJEPIN1AV	EPINEPHRINE (adrenaline) tartrate, eq.1 mg/ml base, 1ml amp IV	Arrhythmias / cardiac arrest
PSYCHIATRY		
DINJHALP5A-	HALOPERIDOL 5 mg tab	Schizophrenia / Acute Behavioural Disturbance
DORACHLM2T-	CHLORPROMAZINE 25 mg tab	Schizophrenia
DORABIPE2T-	BIPERIDEM 2 mg tab	Extra-pyramidal side effects
DORATRIH2T-	TRIHEXYPHENIDYL hydrochloride, 2 mg, tab.	Extra-pyramidal side effects
DORARISP1T-	RSIPERIDONE 1 mg tab	Schizophrenia
DORAFUX2C-	FLUOXETINE 20 mg tab	Depression
DORAPARX2TB	PAROXETINE, 20 mg, breakable tab.	Depression
DORAAMIT2T-	AMITRYPTYLIN 25 mg tab	Depression

5. Diagnostic services and medical equipment²



Diagnosics

The availability of investigations will vary according to setting. The following tests should ideally be available for good NCD care (**diagnosics for emergencies (ENCD) are in red- see annex 2 for full details for ordering**).

- **Glucose**
- **Urinalysis (ketones, protein, glucose)**
- Hb
- PEFR

These tests may be available in a more specialised service (NCD +/- HIV);

- Creatinine
- HbA1c
- Sodium, Potassium, ALT or AST⁵, ECG
- Total Cholesterol, TFTs, CRP/ ESR, INR, Troponin, monofilament testing, visual acuity testing chart, spirometry, urinary micro-albuminuria.

In settings with a MSF OPD/IPD, the lab will be able to provide these services on site (an upgrade may be required). In some contexts, the project may need to provide investigations directly, training non-lab personnel to use simple point-of-care tests (e.g. glucose, Hb, creatinine, electrolytes, HbA1c). In others a local laboratory may be able to provide tests at an acceptable level of quality (the OCA lab advisor must validate this). The MSF OCA laboratory advisor can help the team identify the most appropriate choice in their setting.



Key equipment

The minimum essential items (**ENCD**) are listed in red:

- **BP cuff** (large and standard adult, paediatric) and **stethoscope**
- **Glucometer with strips, lancets, swabs, cotton wool, gloves, and sharps bins**
- **Urine pots and dipsticks**
- **Thermometer**
- Scales, height measure, tape measure
- Peak flow meter and disposable mouthpieces

The following equipment should be available in a more specialised NCD service:

- Nebuliser and oxygen concentrator, oxygen cylinders, oxygen masks, and tubing
- Monofilaments
- Visual acuity charts
- HbA1c meter
- Spirometer
- ECG machine and defibrillator
- Ophthalmoscope

³ WHO: Package of Essential Non-Communicable Disease (PEN) Interventions for Primary Health Care in low resource settings

⁵ For patients initiating Statins

6. Patient files and registration

Where we provide ‘basic care’ for NCDs, in OPDs and IPDs, we do not use NCD specific files and registration, because all patient encounters are treated as one-off interactions. The minimum requirement is a clinic register and a patient held card (health passport). Although we suggest to the patient to return when their medication runs out, we are essentially treating them as acute presentations each time.

Optimal treatment for NCDs requires a long-term (“chronic”) care approach. Well-kept patient files are a valuable tool to enable communication between clinic staff, allow the patient’s condition to be monitored over time and drug treatment to be checked, and ensure that systematic health assessments are being done.

Whether an Electronic Medical Record (on computers or tablets) or a paper file is used, there are four parts to the basic file/registration package (in red: ENCD paperwork):



1. **A patient file (with a unique identifier) stored at the facility.** Generally, this will have a front page(s) where demographic and general health information is recorded: and continuation pages where each subsequent visit is recorded in a smaller space. Test results will usually be stored in the file and there may be a page for annual review where this is provided.
2. **A patient-held card** which has their unique identifier on it - this enables the reception staff to quickly locate their file by searching for their unique identifier. Most projects will record some other pieces of info on this card, such as their diagnosis, their next appointment and their current prescription (in case they cannot come to the MSF clinic and need to obtain their drugs elsewhere). In some cases, you may wish to include on the card some information about the condition and how to manage it, for the patient to better understand their conditions. This detailed card is sometimes called a “health passport”.
3. **The new patient (NCD) register** – all patients who are new to the service are recorded once in this register. Each patient is recorded on a separate line with their unique identifier – so that their file can be traced even if they lose their patient card.
4. **An appointment register**, with one page per day: the name of each patient with an appointment on a given day is recorded on a separate line. This enables planning of the clinic, appointment reminders (if offered) and identification of those who have missed appointments so that they can be traced (if this service is provided).

Note: if patient files are replaced by electronic medical records, paper registers may no longer be required but a patient-held card is still essential.

7. Patient Support and Education

Being diagnosed with a chronic illness such as diabetes, cancer or arthritis can be a shock so it's normal for patients to experience a range of negative feelings and emotions. Illness can also have a substantial impact on lifestyle, education/work, self-esteem and social relationships as well as physical well-being. Patients will often be required to make regular visits to hospital and adhere to complex medical regimens. Financial challenges are also faced by those with chronic illness, such as medical bills, medications but also the financial burden if the patient is no longer able to work which can create a dependence on others.

Patient education focusing on self-management is an essential part of supporting people with NCD's. This aims to improve the patients' health and enable them to actively participate in their care and treatment; ultimately to make them into experts who can manage their condition. The role of the health professional is to help patients to understand these changes and why they are necessary to maintain their health.

Good self-management requires patients/carers:

- To have a good understanding of their condition and know how to manage it.
- To empower patients to work with healthcare professionals and others to discuss and agree treatment plans and goals. Actively share decision-making with health professionals
- To follow a treatment plan (care plan) agreed with their health professionals
- To be able to monitor and manage signs and symptoms of their condition and know when and how to access specialist services.
- Be able to cope with and manage the impact of the condition on their physical and emotional wellbeing and maintain their everyday activities of living
- Be able to change their lifestyle behaviours in order to prevent further deterioration or progression of their condition and improve their general health
- To have access to support services and has the confidence and ability to use them.

Group based patient education vs Information-only patient education

Group based self-management interventions are more likely to produce positive outcomes in terms of behaviour change and health outcomes. Information-only patient education has limited effectiveness, and only leads to improvements on knowledge and not behaviour change. Some of the benefit of group support is that participants make use of each other's personal knowledge, share practical solutions for day to day context specific problems like: where to store your medication, tips and tricks for not forgetting your medication, new recipes for diet food, when to tell your new partner about your disease, what kind of daily activities or gym activities can be done. These groups can also provide support for members outside the health facility using WhatsApp groups and joint activities e.g. walking groups.

Web-based solutions, mobile phones, WhatsApp, Facebook and other social media can also be used to share messages either individually or more generally.

Although there is a wide range of patient education approaches, some overarching principles apply to all of them.

- **Patient centred:** Self-management support programmes should empower people with NCD's to take a leading role in their care planning (as they are able to) and support them to work in partnership with their health care professionals to set goals and action plans.
- **Psychological support:** It may be necessary to provide psychological support so that people can self-manage.
- **Cultural relevance:** Programmes should be culturally sensitive and appropriate for diverse ethnic groups.

- **Systematic follow-up:** Primary care providers should undertake clinical assessment and follow-up care.

Health literacy

Health literacy is the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions. Health professionals have a pivotal role in improving health literacy. They must tailor their style of communication and the level of information given according to the patients (and their families) current understanding. It is important to assess patient recall and comprehension by asking them what they have understood about what they have been told. Effective strategies to improve patient comprehension include conveying a few key points at each patient visit, jargon-free communication, use of pictures to clarify concepts, and making information available in multiple forms (leaflets, posters, digital etc).

Behaviour change

Along with health literacy education, people need support to help them change their health behaviour. In self-management programmes, the five essential elements to changing health behaviour are:

1. Active involvement in problem solving, goal setting and written action plans (especially for conditions where the risk of deterioration is high)
2. Lifestyle changes, including eating a healthier diet, being physically active and stopping smoking
3. Informed decision-making
4. Medication management
5. Stress management and positive mental health.

Health professionals should recognise and address the potential barriers to changing health behaviour, which will be different for each individual. It is also important to recognise that people's support needs will change over the disease pathway from diagnosis to end of life.

Living Well / Patient Support groups

Living Well groups can be established to cover some core topics relevant for the management of NCD's. Whilst the feasibility of running these groups and the exact format of them would depend on the content in general they would usually be a closed group with 8 to 10 participants, with 6-8 sessions and one per week although this can be adapted to the context. The facilitation is shared between a counsellor and the health promotion team (if both teams exist in the project). The participants are newly diagnosed patients and/or patients struggling to manage their illness. The patients can suffer from different NCD's or can be specifically focused on one particular NCD (which would then allow more specific information on the management of that condition, e.g. diabetes). However, there are common issues that apply to all NCD's so groups for patients with multiple NCD's also work well. Groups can be mixed or gender specific as appropriate and age groups can also be varied, or specific to a particular age group, for example adolescents.

During the course participants should be/are enabled to:

- Identify their own wellbeing aims
- Set small steps each week towards their goals

Participants during the course should learn a process for goal setting, developing action plans, and solving some of the problems they experience, while "tailoring" the program to his/her needs. The focus of these groups is to meet others, learn and share information and experiences from each other.

In each session a limited amount of information should be provided as patients will only remember a few essential points. The most important part is to involve patients and to have a discussion with them about the topic.

Sample content & structure for a six-week living well group programme

Adjustment to NCD: What is it like to have an NCD? It will focus on physical, social, psychological and practical implications of having the illness. The patients should be encouraged to identify which changes they struggle with most, which they can work on during the session. The type of symptoms that people have is identified (according to their illness) e.g. pain, sleeping problems, breathing difficulties etc., and then include self-management of these symptoms in the programme. Handout with definition of NCD; physical, social, psychological and practical implications of having the illness; adjustment strategies/coping mechanisms

Motivation: explain behaviour changes and strategies on how to not fall back into old and unwanted behaviours, patients will be encouraged to develop an individual relapse-plan Handout with stages of change, motivational strategies

Living well with a chronic illness: explain healthy diet and diet change, the benefits of regular exercise (focusing on strength, flexibility and endurance) and discuss how to implement these recommendations in daily life. Handout on healthy diet and healthy life style examples

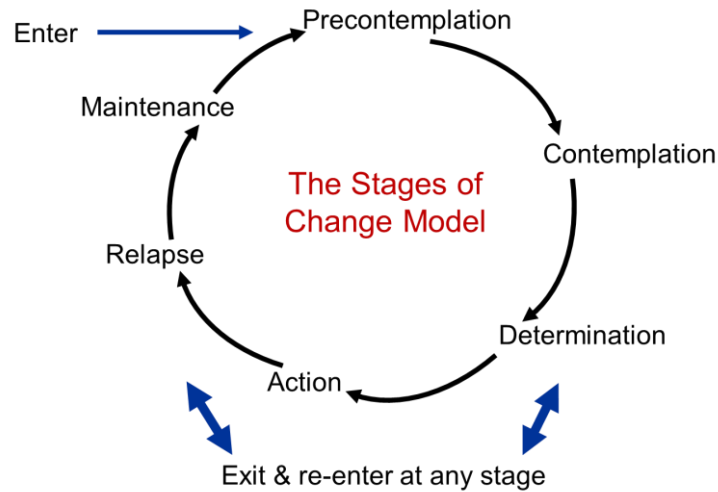
Adherence to treatment/ being a responsible patient: invite doctor to talk about importance of adherence; this will include barriers to adherence and some strategies to overcome these. Also include appropriate use of medications. Adherence should also cover behaviour change, lifestyle changes, not just medication (medication is not the only solution to their problems). Handout with information about definition and importance of adherence

Improve communication skills – teach the patient how to communicate effectively with the doctor in order to understand everything and be an informed patient, how to communicate effectively with family, friends and other healthcare professionals. Exercises and role plays can be used. Handout with examples of good communication skills

Managing emotions that may arise because of having an NCD. Handout with a list of emotions and possible strategies on how to deal with these

Stages of Change

Living with an NCD requires behaviour change (taking medications, changes in lifestyle – losing weight, abstaining from alcohol, smoking and/or drug use, health monitoring) and as a rule, these changes don't occur overnight. Most people move through a series of stages when modifying behaviour. While the time a person can stay in each stage is variable, the tasks required to move to the next stage do not. Often, individuals recycle through the stages or regress to earlier stages from later ones.



Stage of Change	Characteristics
Pre-contemplation	Not currently considering change
Contemplation	Ambivalent about change: Not considering change currently
Determination (Preparation)	Made a decision about change: Planning to act within 1 month
Action	Putting change / new behaviour into practice (up to 6 months)
Maintenance	Continued commitment to sustaining new behaviour
Relapse	Resumption of old behaviours.

Motivational Interviewing

Motivational interviewing is a counselling method that helps people resolve ambivalent feelings about change and find the internal motivation they need. It is a practical, empathetic and short-term process that takes into consideration how difficult it is to make lifestyle changes. It is often used for the management of NCD's as it helps people become motivated to change the behaviours that are preventing them from making healthier choices.

There are two main goals in motivational interviewing.

1. To increase the person's motivation
2. The person to makes the commitment to change – this helps improve a patient's ability to actually make those changes.

The role of the therapist is more about listening than intervening. Patients/clients are encouraged to talk about their need for change and their own reasons for wanting to change. The role of the interviewer is mainly to evoke a conversation about change and commitment.

Interaction between Physical and Mental Health

Poor mental health exacerbates physical health problems ('No health without mental health') and people with NCD's are two to three times more likely to experience mental health problems than the general population. Co-morbid mental health problems have a number of serious implications including poorer clinical outcomes, lower quality of life and reduced ability to manage physical symptoms effectively. People with depression have particularly poor adherence to treatment. Detection is the first step in providing effective support for those who have mental health needs. Use of existing screening tools (for example the PHQ9 for depression) that are culturally appropriate to the context can be helpful for assisting with this.

Objectives and main activities of mental Health activities

The MHPSS (Mental Health and Psychosocial Support) strategy is driven by the goal of improving the health of patients with NCD's. Mental health support is offered to:

1. Support adjustment to the illness
2. Support the patient with adherence
3. Support of mental health problems related to the diagnosis
4. Support for pre-existing mental health problems that are impacting to the patient's ability to adjust to and manage their illness

In order to accomplish this general goal for mental health, the following core activities would include the following:

Individual counselling sessions	<ul style="list-style-type: none"> • Individual and /or family counselling are helpful for dealing with sensitive and/or private issues that the patient doesn't want to discuss in a group. • Depending on mental health need it can be a brief intervention (1-5) sessions or medium-term intervention (6-12) sessions. • The first session is usually 60 min. • Screening tools can be used • Each follow up session is between 30-60 mins. • Patients can be re-referred if there are new issues.
Support group	<ul style="list-style-type: none"> • Support groups are also useful for getting patients to share their experiences, helping them understand that they are not alone in their journey, which helps reduce the sense of isolation and build a sense of community • Weekly support group, 2 hours • Facilitated by counsellors • Open space where people can get support from peers and counsellors • No fixed structure
"Living well" group (see above)	<ul style="list-style-type: none"> • Weekly, 2 hours structured content • Sessions moderated by the Counsellor, with support from health promotion team and medical team as required. • Closed group with a 6-week concept for newly diagnosed and/or patients struggling to manage their illness: adjustment (psychological and lifestyle related), behaviour change/ motivation, adherence to treatment, disclosure (if applicable), communication (with healthcare promoter) and living well, being a responsible patient)
Psychoeducation group	<ul style="list-style-type: none"> • Brief information sessions aimed to raise awareness of the psychological impact people might experience and the services on offer. • Conducted in the waiting areas • These sessions can be moderated by the counsellor or health promoter
Psychiatric Support	<ul style="list-style-type: none"> • Patients with psychiatric needs should have access to assessment, diagnosis and psychotropic medication, according to their clinical needs. • This can be done within the NCD clinic by mhGAP trained doctors/clinical officer or via referral to an external psychiatrist.

8. Service quality and supervision

Like any clinical service, NCD services require regular supervision to ensure maintenance and continual improvement in quality of care. Quality of care can be defined in many ways, but most definitions include the key elements of clinical effectiveness, patient safety, and patient centeredness.

Supervision can also take many forms, from the informal day-to-day supervision to formal monthly or quarterly service reviews using a detailed checklist. We recommend a mixture of the two. Whichever approach is used, supervision should aim to address the following key elements⁵:

Structure (best assessed through visiting the facility and analysis of project documentation):

- Material resources (safety and cleanliness of facilities, sufficient space, equipment in working order)
- Human resources (number of personnel, appropriateness of personnel in terms of competencies, working conditions, clarity of job descriptions)
- Organisational structure (medical staff organisation, methods of peer review).

Process (best assessed through file / document review and direct observation of consultations):

- Patient circuit: Coherent circuit that is understandable to patient, acceptable wait times
- Dignity: Patient treated with respect, confidentiality, and privacy observed
- Triage: exclusion / inclusion criteria observed, quality of clinical observations
- Nursing care (health education, triage, dressings): guidelines or SOPs followed where applicable
- Pharmacy: Conditions of storage, supply issues, and stock-outs, adequacy / appropriateness of treatments issued
- Clinical management: appropriateness / thoroughness of history and examination, accuracy of diagnosis, appropriateness / coherence of treatment, investigation and follow-up, guidelines / SOPs followed where applicable
- Hygiene and infection control practices
- Quality Improvement activities in place (medical incident reporting, audit, and means of collecting patient feedback)
- Staff meetings / education sessions and on-the-job training

Outcomes (best assessed through analysis of current data sources):

- Aggregate clinical and programmatic outcomes from project M&E (next page)
- Analysis of deaths, critical event, nosocomial infections, adverse drug reactions, and medical errors
- Patient satisfaction analysis or exit interviews.

In emergencies (**ENCD**), a simplified supervision tool based on a selection of these elements can be used.



⁵ Donabedian, A. (1988). "The quality of care: How can it be assessed?". *JAMA* 121 (11): 1145-1150. [doi:10.1001/jama.1988](https://doi.org/10.1001/jama.1988). [PMID 3045356](https://pubmed.ncbi.nlm.nih.gov/3045356/).

9. Monitoring and Evaluation



Monitoring and evaluation means using the routine data we gather in our projects to assess the quality of care we are delivering and to identify problems that require intervention. In order to measure the quality of care provided, “indicators” are used. OCA has defined a minimum set of indicators for NCD projects which give an overview of the level of activity and quality of care to enable comparison across settings. Some OCA projects measure additional indicators to give more detailed information about where the gaps are and the problems requiring intervention. Data fields for a standard NCD database are given in annex 5.

A project that only targets one NCD should select those data fields that are relevant to that condition. If the project is an HIV/TB project managing comorbid NCDs, then the unique identifier would be their HIV or TB number.



Projects providing basic NCD care only, and emergency projects (**ENCD**), will generally use the standard OPD tool and will not measure these NCD indicators.

It is important to ensure that the data necessary to calculate these indicators are extracted from the patient files and registers regularly and are accurately entered into a database that has been configured appropriately.

All indicators are broken down by age (<20, 20-40, >40), sex, clinic, and principal diagnosis. The active cohort is defined as those patients who were seen within the 90 days prior to the start of the current reporting period. See tables below for service activity, process and quality outcome indicators that should be used.

INDICATOR CATEGORY	INDICATOR HEADING	INDICATOR DESCRIPTION	NUMERATOR	DENOMINATOR	BREAKDOWN	TARGET	FREQUENCY
Service activity	New patient consultations (#/% of total)	number / % of consultations that are for patients seen for the first time	# consultations for patients seen for the first time	# total consultations	age, sex, clinic, main diagnosis		Monthly
Service activity	Follow-up consultations (#/% of total)	number / % of consultations that are for patients who have been seen before	# consultations for patients seen previously	# total consultations	age, sex, clinic, main diagnosis		Monthly
Service activity	New Diagnoses	Number/% of new diagnoses (DM Type I, DM Type II, Hypertension, other cardiovascular disease, Asthma, COPD, Hypothyroidism, other) as a proportion of total patient cohort	# new diagnoses (DM Type I, DM Type II, Hypertension, other cardiovascular disease, Asthma, COPD, Hypothyroidism, other)	# active patients*	age, sex, clinic		Monthly
Service activity	Total Diagnoses	Number/% of new + existing diagnoses (DM Type I, DM Type II, Hypertension, cardiovascular disease, Asthma, COPD, Hypothyroidism, other) as a proportion of total patient cohort	# new + existing diagnoses (DM Type I, DM Type II, Hypertension, cardiovascular disease, Asthma, COPD, Hypothyroidism, other)	# active patients*	age, sex, clinic		Monthly
Service activity	Referrals for acute complications	Number of patients referred with at least one acute complications over the total number of active patients*	# patients referred with 1+ acute complication	# active patients*	age, sex, clinic, main diagnosis		Monthly
Service activity	Referrals for chronic complications	Number of patient referred with at least one chronic complications over the total number of active patients*	# patients referred with 1+ chronic complication	# active patients*	age, sex, clinic, main diagnosis		Monthly
Service activity	Mortality	Number of patients reported to have died over the total number of active patients*	# Patients reported to have died	# active patients* + deaths in reporting period	age, sex, clinic, main diagnosis		Monthly
Service activity	Defaulters	Number of patients not seen within the last 90 days over the total number of active patients*	# Patients not seen at service within last 90 days	# active patients* + defaulters in reporting period	age, sex, clinic, main diagnosis		Monthly
Service activity	Transferred or other exits	Number of patients reported as moved, voluntary or other exit over the total number of active patients*	# patients who have moved elsewhere or otherwise Exited	# active patients* + transferred / o exits in reporting period	age, sex, clinic, main diagnosis		Monthly

INDICATOR CATEGORY	INDICATOR HEADING	INDICATOR DESCRIPTION	NUMERATOR	DENOMINATOR	BREAKDOWN	TARGET	FREQUENCY
Process	BP in patients with hypertension	#/% hypertensive patients with BP recorded at last visit	# hypertensive patients with BP measured at last visit	# active patients* with hypertension	age, sex, clinic	80%	Quarterly
Process	BP in patients with diabetes	#/% diabetic patients with BP recorded at last visit	# diabetic patients with BP measured at last visit	# active patients* with diabetes	age, sex, clinic	80%	Quarterly
Process	Cardiovascular risk Assessment	# / % of patients >40 with hypertension, cardiovascular disease and/or diabetes who have had cardiovascular risk assessment done	# Patients >40yo with hypertension cardiovascular disease and/or diabetes who had cardiovascular risk assessment done	# active patients* >40yo with hypertension, cardiovascular disease and/or DM	age, sex, clinic, main diagnosis	80%	Quarterly
Process	Microalbuminuria in Diabetes	# / % diabetes patients with microalbuminuria / urinary protein testing in past 12 months	# diabetes patients with microalbuminuria / urinary protein testing in past 12m	# active patients* with diabetes	age, sex, clinic	80%	Quarterly
Process	HbA1c in diabetes	# / % diabetes patients with an HbA1c in the past 12 months	# diabetes patients with HbA1c testing in past 12m	# active patients* with diabetes	age, sex, clinic	80%	Quarterly
Process	Asthma/COPD review	# / % asthma/COPD patients with control review in the past 12 m	# asthma/COPD patients with control review recorded in last 12 m	# active patients* with asthma / COPD	age, sex, clinic	80%	Quarterly
Process	Secondary prevention cardiovascular disease	# / % patients with previous CV event on statin + aspirin	# patients with previous CV event on statin + aspirin	# active patients* with previous CV event recorded (MI, angina, stroke, PVD)	age, sex, clinic	80%	Quarterly
Process	Creatinine testing in ACEi use	# / % patients on ACEi with creatinine testing in past 12 months	# patients on ACEi with creatinine test recorded in past 12 m	# active patients on ACEi	age, sex, clinic	80%	Quarterly
Outcomes	BP control in Hypertension	# / % patients with hypertension whose last BP in the reporting period was < 140/90	# patients with hypertension whose last BP in the reporting period was < 140/90	# active patients with hypertension with at least 1 BP recording in the reporting period	age, sex, clinic	80%	Quarterly
Outcomes	BP control in diabetes	# / % patients with diabetes whose last BP in the reporting period was < 140/90	# patients with diabetes whose last BP in the reporting period was 140/90	# active patients with diabetes with at least 1 BP recording in the reporting period	age, sex, clinic	80%	Quarterly
Outcomes	Epilepsy control	# / % patients with epilepsy who report having had no seizures during all their visits over the past year	# patients with epilepsy without seizure in past 12 months	# active patients with epilepsy	age, sex, clinic	80%	Quarterly
Outcomes	Asthma/COPD control	# / % asthma/COPD patients who are free from exacerbations/ admissions in the last year.	# asthma/COPD patients without exacerbation recorded	# active patients with asthma / COPD	age, sex, clinic	80%	Quarterly
Outcomes	HbA1c control in Diabetes	# / % diabetic patients with last HbA1C <8 (or fasting Glu<180mg/dL) within the reporting period.	Active diabetic (type 1 or 2) patients with a last HbA1C< 8% (or fasting glucose <180mg/dL) within the reporting period.	Number of active patients with a diagnosis of diabetes type 1 or 2, who underwent HbA1c testing within the reporting period	age, sex, clinic	80%	Quarterly

1. Asthma

Background

Asthma is a chronic respiratory disease that affects 235 million people globally. It is the most common chronic disease among children. Over 80% of asthma-related deaths occur in low- and middle-income countries.

Asthma is a **chronic inflammatory disorder of the airways**, characterised by **reversible airflow limitation**. Airway narrowing occurs due to bronchial smooth muscle contraction in response to stimuli including allergens and irritants. Patients with asthma have recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. Symptoms may occur several times in a day or week, and for some people become worse during physical activity or at night. Recurrent asthma symptoms frequently cause sleeplessness, daytime fatigue, reduced activity levels, and days missed in school or work.

Clinical features

- **Diagnosis is clinical.** Asthma should be suspected in patients with **episodic, recurrent wheeze, chest tightness, or cough (dry) of variable frequency**, severity, and duration. In MSF settings, adults need to be evaluated carefully, as it may be over-diagnosed without differentiation from chronic obstructive pulmonary disease (COPD) – see next section.
- Diurnal variation is typical - symptoms worse in the night and morning yet improve later in the day; often disturbing sleep. Symptoms may be triggered during or after exercise, after exposure to allergens or irritants (e.g. cold air, perfumes, animal dander, dust), by viral infections, weather changes, and certain medications (aspirin, NSAIDs, or beta blocker).
- A personal or family history of **atopy** (eczema, allergic or chronic rhinitis/conjunctivitis) or a family history of asthma increases probability of asthma, but their absence does not exclude asthma.
- Presence of an expiratory wheeze and/or response to asthma therapy in children, and response to treatment in adults supports diagnosis of asthma. Sputum production and fever reduce the likelihood of asthma.
- **Lower probability of asthma if:** isolated/chronic productive cough, repeatedly normal exam or peak expiratory flow rate (PEFR) when symptomatic, failure to respond to asthma therapy, smoking history – see COPD section.
- Asthma diagnosis in children <5 years should be carefully considered and repeatedly reassessed. In general, it should not be made under the age of 2 years. Different childhood diseases may cause symptoms similar to asthma, and wheeze with viral illnesses is frequently seen.

History and examination

- Diagnosis is clinical. A careful history should be taken.
- When asymptomatic: examination should be normal
- When symptomatic there should be widespread expiratory wheeze throughout the chest
- In more severe illness, respiratory rate increases and there may be tachycardia and global inspiratory wheeze.
- In very severe (life threatening) asthma, the chest may be silent and there may be haemodynamic changes (hypo- or hypertension and tachycardia).

Investigations

- An improvement of 20% in PEFR pre- and post-bronchodilator supports the diagnosis of asthma (but non-response to bronchodilators does not rule out a diagnosis of asthma).
- In patients over 5 years of age, confirm the diagnosis with spirometry if available.
 - In adults and children an improvement in FEV1 of 12% or more to a rapid-acting beta-2 agonist (salbutamol) within 15 minutes or over 2 to 6 weeks of treatment with inhaled corticosteroids makes asthma highly likely
- If not available, and diagnosis is in doubt, consider a therapeutic trial of 6 weeks of regular (twice daily) inhaled beclomethasone (250µg twice daily) or 14 days oral Prednisolone (30mg daily in an adult, 1 mg/kg in a child) if inhaled steroids are not available. X-ray and blood tests are useful only to rule out other conditions, if suspected.
- **Consider alternative diagnoses:**
 - In children: epiglottitis, croup, viral induced wheeze, foreign body in bronchus, cystic fibrosis, TB
 - In adults: TB, COPD, lung cancer, heart failure, bronchiectasis, pulmonary embolus, hyperventilation, pulmonary fibrosis, gastro-oesophageal reflux, or asbestosis

Management of chronic asthma

Goal

Appropriate management can control the disease and enable people to enjoy a good quality of life.

The goal is to reduce chronic symptoms, maintain (near) normal lung function and activity levels, reduce need of short-acting “rescue” medications, and **reduce risk of exacerbations**, including need for emergency care and hospitalisation, preventing loss of lung function, and minimise drug side effects.

Patients with asthma should rarely or never require emergency care – if a patient requires emergency care once or more per year, their asthma care needs to be reviewed.

Triage

Any patient who is breathless, cannot complete full sentences, or has visible signs of respiratory distress should be moved to a treatment room, ABCs assessed at the same time as treatment is initiated, and urgent doctor review. Patients who are lethargic or with signs of life-threatening asthma should be moved to the treatment room, with immediate resuscitation and immediate review by a doctor (see emergency section for further management)

Assessment and monitoring

First visit: Assess severity to decide which treatment step to start with.

Follow-up visits: Assess **asthma control** to decide if treatment needs to be adjusted. Review history of exacerbations, use of rescue inhaler or oral corticosteroids, and time off work or school since last assessment. Check if patient recognises triggers to asthma symptoms. Check medication side effects,

use of written asthma action plan, patient concerns, exposure to tobacco smoke. Check growth in children.

- **Asthma control.** Ask: “In the last week (or month):
 - Have you had difficulty sleeping because of your asthma symptoms (including cough)?
 - Have you had your usual asthma symptoms during the day (cough, wheeze, chest tightness, or breathlessness)?
 - Has your asthma interfered with your usual activities (e.g. housework, work/school etc.)?”

“No” to ALL questions = controlled asthma
- **Patient adherence:** It is important to check with patients when they are taking their inhalers and other medication. Adherence can deteriorate when symptoms become mild or less frequent.
- **Review inhaler technique:** Incorrect or inadequate use of medicines and inhalers remains the most common reason for failure to achieve good control. Offer a spacer to all patients (see annex 6 for details).
- **Review smoking status and smoky environment** e.g. from cooking fires inside dwellings. Advise to stop smoking and reduce exposure to indoor air pollution.

Pharmacological therapy

- Use a **stepwise** treatment approach. Start treatment at the step most appropriate to the patient’s condition, and then maintain control by stepping treatment up or down if necessary.
- First, check patient adherence and understanding. Check and eliminate trigger factors if possible.
- Check cultural attitudes towards inhalers before prescribing and try to address these before starting treatment
- Check inhaler technique. Spacer devices allow much better drug delivery and are recommended for adults and children. See below.
- Do not step-up if the patient is unwell or breathless during the visit - treat as an exacerbation.
- Step-up asthma treatment if there are persistent symptoms e.g. persistent cough.
- **Step-up** if asthma is poorly controlled i.e. using a reliever inhaler more than three times per week, waking at night with symptoms more than once a week or using more than one canister of reliever every three 3 months.
- **Step-down** if well controlled for 3 months. Decision on which drug to stop first and at what rate depends on the severity of asthma, treatment side effects, time on current dose, beneficial effects achieved, and patient preference.
- **Inhaled corticosteroids** are the most effective long-term control therapy. Patients should be maintained on the **lowest possible dose of inhaled steroids**. Reduce dose slowly, 25-50% at a time. Inhaled corticosteroids are very safe and are only associated with side effects if used in high doses.

- **Do not** use antihistamines/cough suppressants/mucolytics. Use of oral salbutamol/salbutamol syrup is undesirable; inhalers are preferred because of lower delivered dose.

Patient education and self-management

At each visit review the following:

1. **Self-monitoring:** Ensure the patient is able recognise symptoms of worsening control. Agree on treatment goals with patient. Include: daily actions to control asthma, adjusting medications in response to worsening asthma, when to seek medical care.
2. **Medication:** Ensure patients know how and when to take their medication. Explain long-term **“preventer” medications** reduce inflammation and should be taken daily. They do not give quick relief but prevent/reduce exacerbations that interfere with daily life or require hospitalisation. **“Reliever” medications** relax airway muscles and provide fast symptom relief. If used more than three times per week, may need to start/increase long-term preventer medication. Check inhaler technique (see below).
3. **Adherence:** Explain the importance of continuing to take their inhalers and medication as prescribed and continue to use their **“preventer” medications** even when symptoms improve, are mild, or infrequent.
4. **Avoid/reduce exposure to triggers** that worsen asthma e.g. smoking. Cooking on open fires indoors should also be avoided or adequate ventilation for the smoke to leave the building should be put in place.
5. Develop a **written asthma action plan (see annex 4)**.
6. **Involve** family and other healthcare providers (pharmacist, nurse etc), provide encouragement.
7. Explain the importance of attending **follow up appointments**.
8. **Encourage exercise** on a regular basis.

Special circumstances

Comorbidities: Consider rhinitis and sinusitis, gastro-oesophageal reflux, obstructive sleep apnoea, stress, or depression. Treatment of these conditions may improve asthma control.

Exercise induced bronchospasm (EIB): Encourage physical activity. EIB should not limit patient’s participation in sport. Advise patients to take two puffs of **Salbutamol** 30 minutes before exercise. EIB is often a marker of inadequate asthma control so consider adding / increasing dose of inhaled corticosteroid.

Pregnancy: It is important to maintain asthma control during pregnancy to ensure adequate oxygen supply for the foetus. Use **beclomethasone** if long-term ‘preventer’ inhaler is required. Check control at antenatal visits. Asthma can either worsen or improve during pregnancy; inhalers are safe in pregnancy.

HIV: If on Ritonavir, inhaled corticosteroids doses may need to be reduced due to the risk of hypercortisolism (fatigue, weight gain, truncal obesity, hirsutism, Cushing’s syndrome, osteonecrosis); if you need to co-prescribe, then Beclomethasone is the best choice. If oral steroids are required to treat an acute exacerbation, be aware of increased glucocorticoid concentrations and side effects as well as a potential reduction in blood levels of protease inhibitors.

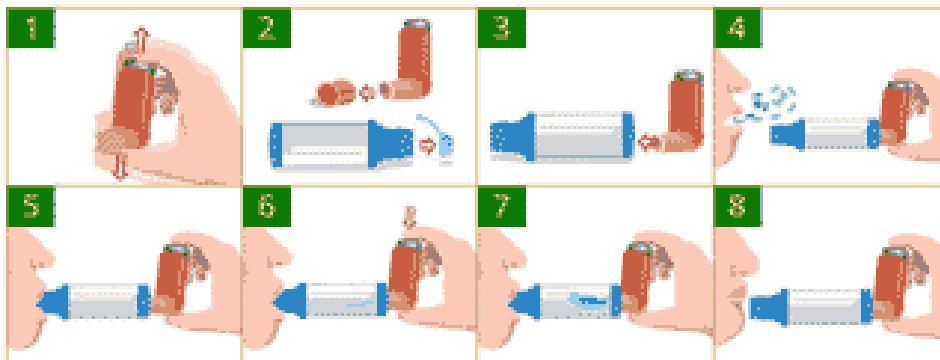
TB: Risk of TB is increased by the long-term doses of oral prednisolone of 7.5 mg daily or more. In contexts of high TB prevalence, screen for TB before starting oral/inhaled steroids (CXR and sputum smear/GeneXpert),

Inhaler technique

Only 20-35% of the drug reaches the lungs. Always check technique before stepping up treatment.

Using an pMDI inhaler with a spacer

1. Shake the inhaler well before use (3-4 shakes)
2. Remove the cap from the inhaler, and from the spacer, if it has one
3. Put the inhaler into the spacer
4. Breathe out, away from the spacer
5. Bring the spacer to the mouth, put the mouthpiece between the teeth and close lips around it
6. Press the top of the inhaler once
7. Breathe in **very slowly** until a full breath has been taken.
8. Hold breath for about ten seconds, then breathe out.

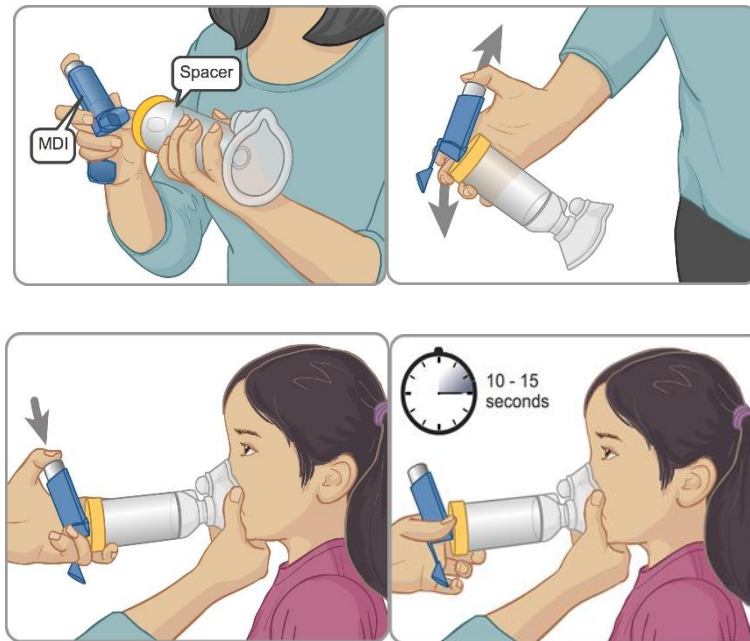


If the above method is difficult for a child, then they can follow the steps to number 6 and then just breathe in and out normally 5 times through the spacer after each dose.

Using an inhaler with a spacer in young children

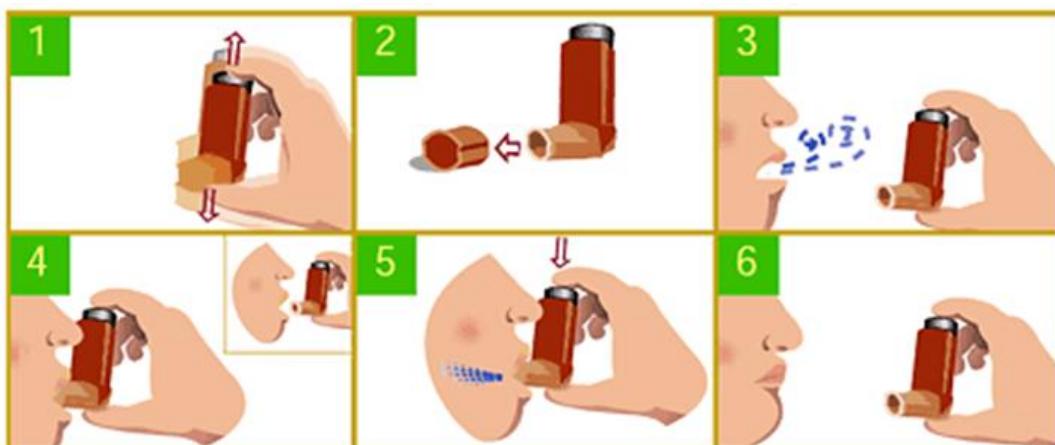
1. Remove the cap from the inhaler, and from the spacer, if it has one
2. Put the inhaler into the spacer
3. Hold the inhaler and spacer together. Shake it 3-4 times.
4. Make sure the child is sitting comfortable. For younger children sit on parents lap
5. Put the mask firmly onto the child's face. Be sure to cover the mouth and nose
6. Hold the mask over the child's face with one hand. Hold the spacer with the other hand and press the inhaler down firmly with your thumb. This will release 1 puff into the space

7. Hold the mask over the child's nose and mouth for 10 to 15 seconds. This should allow the child to take 6 breaths. You can also watch a valve move inside the spacer to count the breaths.
8. Take the mask off the child's face.
9. Wipe the child's face. Let the child drink or rinse their mouth with water afterwards. This will remove the medicine left in the mouth to reduce the risk of developing thrush.



Using an inhaler if a spacer is not available

1. Shake the inhaler and ensure that liquid is heard in the canister. Remove the cap.
2. Inhale and then exhale as completely as possible.
3. Place the lips firmly around the mouthpiece.
4. Start to inhale with a long, slow breath and continue to breathe as deeply as possible while activating the inhaler.
5. Close the lips and hold the breath for 10 seconds, or as long as is comfortable.
6. Exhale, wait a few seconds, shake again and then repeat for the next puff, if required.



- Repeat the steps, if a second dose is required.
- Mouth should be rinsed with water after using a steroid inhaler to avoid oral candidiasis.
- Depressing the canister's button and coordination with the breath may be more difficult for some patients (for example, the elderly). A spacer device is essential in these groups and is recommended for all patients if possible.

Management of chronic stable asthma in ADULTS and CHILDREN

Move UP AND DOWN steps to control symptoms – check compliance and inhaler technique before moving up 				
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
<p>START RELIEVER INHALER: Inhaled short acting B2 agonist (SABA) as needed</p> <p>Salbutamol 100 mcg 2 puffs</p> <p><u>Check compliance and inhaler technique before you move to the next treatment step</u></p>	<p>ADD PREVENTER: Inhaled steroid regularly</p> <p>Beclometasone⁶</p> <p>ADULT (>12 years) 200-400mcg twice daily</p> <p>CHILD (≤12 years): 100-200mcg twice daily</p> <p>SEEK SPECIALIST ADVICE ON ANY CHILD < 2 NOT CONTROLLED AT THIS STAGE. DO NOT PROCEED TO STEP 3</p>	<p>ADD SECOND PREVENTER (if available):</p> <p>1. In adults and children (5+), use Inhaled long acting b2 agonist: Salmeterol BUT do not stop Inhaled steroid (risk of death). Dose: ADULT(>12): 50-100 mcg twice daily CHILD 5-12 years: 50mcg twice daily</p> <p>If good response to LABA, continue. If some response to LABA but inadequate control, continue LABA and ensure Beclometasone is at full dose (see column to left). If no response to LABA:</p> <p>2. In children <5, or any age showing no response to LABA, start Montelukast (if available). Otherwise proceed to step 4 Dose: ADULT (>12) 10 mg daily CHILD (6 - 12 years): 5 mg daily CHILD (6m – 5 years) 4mg daily</p>	<p>INCREASE INHALED STEROID regularly</p> <p>Beclometasone ADULT (>12): up to 1000 mcg twice daily CHILD (5-12): to 400 mcg twice daily CHILD (<5): to 200 mcg twice daily</p> <p>INTRODUCE Montelukast (if available) in addition CONTINUE reliever inhaler as needed.</p>	<p>DAILY STEROID TABLET</p> <p>ADULT: Start 25 mg Prednisolone⁷ daily. Aim to reduce to 10 mg daily within 2 months reducing slowly. Consider increasing high dose inhaled steroid to 1000 mcg twice daily</p> <p>CHILD: Refer to specialist</p> <p>-Use lowest dose providing adequate control</p> <p>-Refer patient for specialist care</p> <p>CONTINUE other inhalers.</p>

- Refer to Specialist if: child <2 uncontrolled at step 2; child <5 uncontrolled at step 4; child < 12 uncontrolled at step 4; adult uncontrolled at step 5; frequent exacerbations requiring hospitalization; diagnostic uncertainty
- People on long-term steroid tablets (for example, longer than three months) or requiring frequent courses of steroid tablets (for example three to four per year) should be offered monitoring of: blood pressure, urine or blood sugar (ideally measured by HbA1c), cholesterol, risk of fractures, vision (to assess for cataracts and glaucoma).

FORMULARY - MEDICATIONS USED IN ASTHMA AND COPD

DRUG (CLASS)	DOSE	SIDE EFFECTS/ COMMENTS
Salbutamol (Short acting Beta2-agonist bronchodilator)	1. Pressurised metered dose inhaler (100 mcg/ puff) Maintenance: 2 puffs as needed. Step up during a respiratory infection to 2 puffs twice per day or more frequently as needed. If needed more often than 4 hourly, the patient should seek medical review. Acute exacerbation: 6-12 puffs every 20 minutes or continuously 2. Solution for nebulization (nebule: 1. 5 mg in 2.5ml, 2.5 mg in 2.5ml, 50mg in 10 ml) -Adults and child > 5 years: 2.5 - 5 mg /nebulisation; -Child < 5 years or < 15 kg: 2.5 mg/nebulisation -Repeat every 20-30 minutes as needed	Indication: Rapid relief of bronchoconstriction. Onset within minutes and duration of action approximately 4 hours. Clean the mouthpiece before and after each use. Side effects: may cause bad taste, headache, dizziness, muscle cramps, tremor, palpitations and tachycardia, arrhythmias, sleep and behaviour disturbance; Potentially serious lactic acidosis, hyperglycaemia or hypokalaemia may result from high dose administration. Contraindicated hypersensitivity to the ingredients Caution serious cardiac disorders, recent MI, severe heart failure, CHD, tachyarrhythmia, severe and untreated hypertension, aneurysm, hyperthyroidism, phaeochromocytoma, poorly controlled diabetes (risk of DKA). Not contraindicated in pregnancy or breastfeeding; foetal/infant heart rate may increase.
Ipratropium Bromide (anticholinergic bronchodilator)	1. Pressurised metered dose inhaler (20mcg/puff) Maintenance in COPD: Adults: 1-2 puffs 3-4 times daily (some patients need up to 4 puffs). Acute Exacerbations (asthma / COPD): see tables above. 2. Solution for nebulization Adults and child 6+ years: 500 mcg nebule Child 0-5 years: 250 mcg nebule	Indication: For rapid relief of bronchoconstriction. Used for maintenance treatment in COPD. May be added to Salbutamol in treatment of severe/ life-threatening asthma. Onset of action: 30-60 minutes; Duration > 4 hours. Side effects: dry mouth, bad taste, gastrointestinal motility disorder (including constipation and diarrhoea), cough, headache; less commonly nausea, vomiting, gastro-oesophageal reflux disease, dysphagia, tachycardia, palpitations, atrial fibrillation, throat irritation, pharyngitis, dysphonia, bronchospasm, urinary retention, angle-closure glaucoma, blurred vision, and nasopharyngitis. Contraindicated hypersensitivity to the ingredients. Safety in pregnancy or breastfeeding has not been established. Caution: narrow-angle glaucoma, urinary tract obstruction, prostate hyperplasia, cystic fibrosis; avoid eye contact.
Salmeterol (long acting Beta2-agonist bronchodilator)	Pressurised Metered dose inhaler (25 mcg/ puff). Asthma: Adult 50 micrograms (2 puffs) twice daily, up to 100 micrograms (4 puffs) twice daily in more severe cases. Child 5-12 years, 50 micrograms (2 puffs) twice daily. COPD: 50 micrograms (2 puffs) twice daily.	Indication: Step 3+ in maintenance treatment of either asthma or Step 2+ in COPD. In asthma, must be used with an inhaled corticosteroid. Can be given without inhaled corticosteroids in COPD patients. Side effects: See Salbutamol. Caution: Hyperthyroidism, cardiovascular disease, arrhythmias, susceptibility to QT-interval prolongation, and hypertension. Use with caution also with diabetes (risk of DKA). Can use in pregnancy or breastfeeding although the foetal/infant heart rate may increase.
Beclometasone dipropionate	Pressurised metered dose inhaler 100 mcg/puff. Asthma: Adult: 200-2000mcg twice daily according to severity Child: 100-400 mcg twice daily according to severity See management of chronic stable asthma chart COPD: 200 mcg twice daily. No need to increase steroid dose.	Indication: Step 2 in maintenance treatment of asthma or patients in step 3 for COPD (2 or more exacerbations in the last year OR breathless on walking 100 metres OR FEV1<50% on spirometry). Rinse mouth after use Side effects: adrenal suppression, reduced bone mineral density, small risk of glaucoma, hoarseness, dysphonia, throat irritation, mouth or throat candida. Paradoxical bronchospasm very rarely. Anxiety, depression, sleep disturbances, behavioural changes including hyperactivity, irritability, and aggression, hyperglycaemia (usually only with high doses), cataracts, skin thinning and bruising reported. Contraindicated in untreated TB. Can use in pregnancy or breastfeeding
Fluticasone propionate	Aerosol inhaler 50mcg/ puff. COPD: 100-500mcg twice daily according to response.	As for Beclometasone
Magnesium sulphate (bronchodilator)	Solution for parenteral injection Adults: 2 g (20 mmol) Children 2 years and over: 0.1–0.2 mmol/kg	Indication: Severe/life threatening asthma not responding to nebulisation Side effects: flushing, mild fatigue, burning sensation at IV site, headache, dizziness. Major toxicity tends to occur at serum levels of ≥ 9 mg/dL e.g. loss of reflexes, blurred vision, lethargy, muscle weakness, pulmonary oedema Caution. Bowel obstruction, renal impairment, use of other magnesium-containing medications
Montelukast	Tablet, asthma only: Adult (>12): 10mg daily Child (6m-5yrs): 4mg daily, (6yrs – 12yrs) 5mg daily	Indication: Step 3 treatment of asthma in children under 5, or any patient not responding to LABA Side effects: abdominal pain, thirst, headache, hyperkinesia Caution: limited data in pregnancy and breastfeeding – avoid where possible
Prednisolone	Tablet, enteric coated, 5mg Acute exacerbation of asthma / COPD: see table above for dosing	As for Beclometasone
Hydrocortisone	Solution for injection, 100mg/ml, 1ml Acute exacerbation of asthma / COPD: see table above for dosing	As for Beclometasone

2. Chronic obstructive pulmonary disease

Background

COPD is a common disease characterised by persistent airflow limitation that is usually progressive and associated with an enhanced inflammatory response in the airways. Cigarette smoking is the most common cause. Second-hand tobacco smoke inhalation, smoking marijuana, exposure to high levels of indoor air pollution from burning biomass fuel for cooking in poorly ventilated housing, and occupational exposure to dusts, chemicals, and fumes are also risk factors.

Clinical features

Consider in patients over 40, smoker or ex-smoker, occupational exposure, or exposed to indoor air pollution.

Ask about common symptoms; two or more symptoms are suggestive of COPD:

- **Chronic cough** (daily for at least 3 months without features of TB)
- **Chronic sputum production** especially during wet/cold seasons
- **Breathlessness** and/or wheeze, especially on exertion; progressive and persistent
- **Repeated chest infections** requiring treatment (≥ 3 in the last 2 years suggests COPD)
 - Cough and sputum may precede dyspnoea by many years
 - Ask the patient how their symptoms affect their day to day activities, consider functional capacity, psychosocial impact and family supports.

Differential diagnosis

- Consider Asthma, TB, heart failure, lung cancer, pulmonary embolus, bronchiectasis, asbestosis, fibrosis
- Differentiate between COPD and asthma:

CHARACTERISTICS	COPD	ASTHMA
Age onset	Usually >40	Usually early in life (often childhood)
Smoking history	Usually yes	Not causal
Sputum production	Frequent	Infrequent
Disease progression	Progressive	Stable (usually with exacerbations)
Symptoms	Persistent and progressive	Intermittent and variable from day to day. Worse at night and early morning.
Past History /family history		Asthma, allergies, or atopy
Co-morbidities	Often present	

Investigations

Diagnosis is clinical. **If spirometry is available, it can be used to confirm the diagnosis.** FEV1/FVC <0.7 after bronchodilator use is diagnostic. Refer for chest x-ray to exclude tuberculosis. Chest X-ray in COPD may show hyperinflation.

Assessment and monitoring

First visit: Assess severity to decide which treatment step to start with.

Review visits: Review at 1 month after any change to medications; Review every 6 months if patient is stable.

At the review appointment:

- Check symptoms, history of exacerbations and spirometry (if available), and adjust medication accordingly. Review smoking status, exercise, diet, and weight; look for and treat anxiety/depression.
- Ask about symptoms and exacerbations; consider stepping-up medications. In COPD (unlike in asthma) medication step-down is unlikely unless there are side effects.
- Review inhaler use and technique at each visit, especially if control is poor (see asthma).

Management of stable COPD

The aim of treatment is to reduce symptoms (complete relief is often not possible), improve quality of life, and reduce the frequency of exacerbations and disease progression.

Patient education and self-management

1. Smoking cessation is the most important measure to stop progression of disease.

Combined drug treatment and behavioural interventions are the most effective strategies.

Consider nicotine replacement therapy if available.

➤ Use the five 'A's brief intervention:

- Ask - every patient at every visit about smoking and document
- Advise - strongly urge all smokers to quit
- Assess - readiness to make quit attempt in the next 30 days
- Assist – practical counselling, refer to group/peer counselling/social support, pharmacotherapy, and education materials
- Arrange – follow-up.

2. Advise reducing exposure to indoor air pollution if possible, e.g. ventilation, cooking outdoors, using alternatives to bio-mass fuels, using fuel-efficient stoves.

3. Medication and how to take it: Check the patient understands why they are taking each medication, how and when they should take them, and that they use the correct inhaler technique.

4. Adherence: Explain the importance of continuing to take their inhalers and medication as prescribed even when symptoms improve, are mild, or infrequent.

5. Self-monitoring: Ensure the patient is able to recognise when they are having an exacerbation, which is when they have any two of the following:

- Worsening breathlessness
- Increased sputum
- Discoloured sputum.

Advise what action they must take when this happens and check their understanding. i.e. taking rest, ensure adequate fluid intake, ensure adequate nutrition (small meals often), increase dose of inhaled salbutamol or ipratropium to maximum dose if taking these, seek medical care if symptoms are persistent (see annex 4).

6. Physical activity: Encourage activity such as walking; start slowly and gradually increase to a goal of 20 - 40 minutes four times per week (note feeling breathless is not harmful). Refer to a physiotherapist or pulmonary rehabilitation programme if available.

7. **Weight management:** Look for and treat obesity or malnourishment. Check BMI.

8. **Check for symptoms of depression** and treat if this is present. Refer for counselling support if required.

9. **Vaccination for Flu and Pneumonia** (if available)

Pharmacological therapy in COPD

Step Approach to COPD Management			
Most important advice for any patient at any stage of COPD is to STOP SMOKING – this is the only thing that improves outcome. Treatments below only improve symptoms, they do not prolong life			
Step 1	Step 2	Step 3	Step 4
<p>Start salbutamol via spacer Dose: 100 mcg; 2 puffs as needed</p> <p>If not helping after 1-month trial Ipratropium instead Dose: 40 mcg; 2 puffs as needed</p> <p>If helping but not controlling symptoms – move to step 2</p> <p>(continue salbutamol in all other steps for a cute relief of symptoms)</p>	<p>ADD long acting drug e.g.</p> <p>Salmeterol (LABA) – Dose : 25 mcg; 2 puffs twice daily</p> <p>Continue salbutamol or ipratropium for acute symptoms relief as needed</p> <p>OR</p> <p>Tiotropium (LAMA) Dose : 1 capsule (18mcg) once daily</p> <p>Not to be used with Ipratropium/SAMA</p> <p>If not controlling symptoms both LAMA and LABA can be used together or move to step 3</p>	<p>ADD inhaled steroid</p> <p>Fluticasone (100 mcg – 500mcg 2 times/day) OR Beclomethasone (200 mcg twice daily) AND Inhaled salmeterol (25 mcg; 2 puffs twice daily) – usually given as a combination inhaler</p> <p>If no improvement after 1 month then stop inhaled steroid as they can increase risk of pneumonia Consider step 4</p>	<p>Seek specialist advice if available</p> <p>Consider daily oral prednisolone (1-5 mg); monitor side effects (osteoporosis, Cushing’s syndrome, gastritis, mood changes, skin thinning, myopathy etc.) Stop if no clear benefit as risk likely to outweigh benefit – wean over several months if stopping.</p> <p>Consider long term oxygen therapy (if available) as a treatment for low oxygen levels if needed</p>

Inhaler technique

This is essential for successful treatment in COPD. Even with correct technique, only 20-35% of the drug reaches the lungs. Always check technique before stepping-up treatment. See above for details.

Indications for referral to specialist

(discuss with medical coordinator / NCD advisor)

- Diagnostic uncertainty e.g. < 40 years, non-smoker, atypical symptoms
- Suspicion of TB or lung cancer (e.g. weight loss, night sweats, haemoptysis, TB exposure)
- Severe acute exacerbation not resolving with treatment
- Requiring Step 4 treatment, for pulmonary rehabilitation or palliative care if available

COPD in HIV

- The frequency and severity of bacterial pneumonias is also increased
- The risk of developing pneumocystis pneumonia is higher
- If on Ritonavir, inhaled corticosteroids doses may need to be reduced due to the risk of hypercortisolism (fatigue, weight gain, truncal obesity, hirsutism, Cushing's syndrome, osteonecrosis); if you need to co-prescribe, then Beclomethasone is the best choice. If oral steroids are required to treat an acute exacerbation, be aware of increased glucocorticoid concentrations and side effects as well as a potential reduction in blood levels of protease inhibitors.
- If oral steroids are required to treat an acute exacerbation, be aware of increased glucocorticoid concentrations and side-effects as well as a potential reduction in blood levels of protease inhibitors.

COPD in tuberculosis

COPD is one of the most common comorbidities with TB.

- There is a greater predisposition to developing **TB**, the response to treatment is poorer, there is a longer duration of infectivity, a higher likelihood of recurrence and a higher mortality, even with effective treatment
- TB, in addition, via its destructive effects on the lung is a significant contributing factor towards the development of COPD
- In countries with moderate-high prevalence of TB, screen all patients with cough >2 weeks for TB with chest x-ray and sputum smear or GeneXpert (if available)
- Have a high index of suspicion for COPD in patients with previous or active TB, especially if >40 years, current or former smoker, or of low socio-economic status
- Avoid fluoroquinolone antibiotic use in infective exacerbations of COPD in patients with active TB

Avoid long-term use of oral corticosteroids in patients with active TB if possible. If patients are taking rifampicin, oral and inhaled steroid doses (for treating exacerbations or long-term) should be doubled as rifampicin reduces the bioavailability of steroids.

3. Diabetes

Background

Diabetes mellitus is a chronic metabolic disease characterised by elevated levels of blood glucose, caused either by a lack of or impaired utilisation of insulin. Diabetes increases cardiovascular risk and results in damage to large blood vessels of the heart, limbs, and brain and small vessels of the kidneys, eyes, and nerves.

Classification

Type 1 diabetes

Type 1 diabetes is characterised by insulin deficiency that results from the destruction of the insulin-producing cells of the pancreas. It manifests as sudden and severe hyperglycaemia, diabetic ketoacidosis, and death unless treated with insulin. Onset of the disease is most common in childhood or adolescence, but it may appear later in many populations (including in sub-Saharan Africa and the United Kingdom) and can be difficult to distinguish from type 2 diabetes. Treatment consists of total replacement of endogenous insulin.

Type 2 diabetes

Type 2 diabetes is characterised by progressive insulin resistance and a relative lack of insulin. It may be asymptomatic and diagnosed several years after onset, once complications have already arisen. It may present with hyperglycaemic symptoms, often less marked than in type 1 diabetes; ketosis is rare. Globally the most common type of diabetes, increasing prevalence is linked to obesity, high fat, salt and sugar diets, and urbanisation; it usually occurs in those over 40 years but is now also occurring in children.

Pre-diabetes

Patients found to have raised blood sugar on random or fasting blood testing, but who do not fulfil WHO criteria for diagnosis of diabetes (see below), are considered to have 'pre-diabetes'. These patients are at increased risk of developing diabetes.

Gestational diabetes (GDM)

Onset or first recognition during pregnancy; often resolves at the end of pregnancy. Usually develops in late pregnancy when insulin antagonistic hormones peak, leading to insulin resistance, glucose intolerance, and hyperglycaemia. It does not include previously diagnosed diabetics who become pregnant. If diagnosed in 1st trimester, this is considered pre-gestational diabetes.

Other types

WHO published an updated classification of diabetes April 2019. It includes 2 hybrid forms: 1) slowly-evolving, immune-mediated diabetes of adults (formerly known as LADA – latent autoimmune diabetes of adults), which may not require insulin at diagnosis but eventually do as time progresses; 2) ketosis-prone type 2 diabetes, which presents with ketosis but later does not require insulin treatment. Genetic mutations, exocrine pancreas diseases, drug-induced and infection-related types are also noted. [reference to the table and/or include in annex]

Clinical features

Diabetes may present with

- Acute hyperglycaemic symptoms:
 - **Neurological** (lethargy, impaired consciousness, or coma);
 - **Ketoacidosis** (rapid or sighing respiration, sweet-smelling breath, abdominal pain, vomiting)
 - **Infections** (UTI, candida, cellulitis, etc, signs of shock, or septicaemia). Confirm with a FBG test
 - Consider type 1 diabetes with any acute presentation.
- Classic symptoms of hyperglycaemia – thirst, polyuria, polydipsia, recent, often rapid weight loss, nocturia, bedwetting, dehydration – and/or chronic complications (see below) due to undiagnosed disease
- Asymptomatic hyperglycaemia (>200mg/dl or 11.1mmol/L) on random blood glucose screening, which should be confirmed with a second test – either fasting blood glucose or HbA1c – particularly in these at risk groups:
 - people with cardiovascular disease (heart attack, stroke, or transient ischaemic attack)
 - any person of age >40 years with one of the following risk factors: obesity (BMI >30 kg/m²), hypertension >160 mmHg systolic, smoker, first degree relative with diabetes, women with polycystic ovaries or history of gestational diabetes, or who delivered a macrosomic baby (>4kg)
 - any pregnant woman with one of these risk factors (all pregnant women in the Middle East)
 - any patient taking medications that can induce diabetes.

Note: Hypoglycaemia is not a clinical feature of diabetes. It is a complication of treatment with oral hypoglycaemic drugs or insulin. It occurs when blood sugar <75mg/dL (4.2 mmol/L), and usually presents with:

- Autonomic symptoms: weakness, dizziness, shaking, palpitations, sweating, anxiety, hunger, nausea
- Neuroglycopenic symptoms: poor concentration, headache, confusion, lethargy, blurry vision, difficulty speaking, impaired consciousness, convulsions, or coma

Diagnosis (WHO criteria)

If symptomatic only a single test is needed for diagnosis. If asymptomatic, two tests must be performed on different days (ideally at least 2 weeks apart).

TEST	DIABETES	PRE-DIABETES	COMMENT
Fasting glucose	≥126 mg/dL (7 mmol/L)	≥110-125 mg/dL (6.1-6.9 mmol/L)	Eat / drink only water for 8 hours before the test; most accurate test
Random glucose	≥200 mg/dL (11.1 mmol/L)	n/a	Least accurate
Glycosylated Haemoglobin (HbA1c)	≥48 mmol/mol (>6.5%)	38 – 47 mmol/mol (5.7-6.4%)	Reflects glucose over the past 6-8 weeks Not used in children/young people, pregnancy, acutely ill patients, suspected type 1 diabetes, haemolytic anaemia, haemoglobinopathy, iron deficiency anaemia, HIV, pancreatic damage or renal failure
Oral glucose tolerance test (OGTT)	≥200 mg/dL (11.1 mmol/L)	≥140-199 mg/dL (7.8-11.0 mmol/L)	Results given are 2 hours after a 75g glucose load This is the ideal test for diagnosis of gestational diabetes

Oral glucose tolerance test

Patients must have normal carbohydrate intake and normal exercise levels for 3 days before the test. Patients must fast for 8-10 hours before the test, consuming water only. A fasting glucose sample is collected.

75g dose of glucose is given as a drink, which must be consumed within 5 minutes. (e.g. 394 ml of Lucozade original). The patient must sit quietly, must not smoke, and may only consume plain water during these 2 hours. A second glucose sample collected exactly 2 hours after the glucose load is consumed.

Management of pre-diabetes

Inform the patient that he/she is at risk of developing diabetes and that certain lifestyle changes should be made in order to reduce that risk:

1. Increase physical activity: 150 mins/week of exercise reduces risk of developing diabetes by 52%
2. Eat regular, healthy meals
3. Lose weight, if BMI>25
4. Have an annual fasting glucose test.

Management of newly diagnosed diabetes

Severe: If fasting glucose is >500 mg/dL (>27.8mmol/L) **OR** if >200 mg/dL (11.1mmol/L) and either ketotic or with severe hyperglycaemic symptoms, admit and provide urgent/emergency treatment (see diabetic emergencies).

Less severe: If fasting glucose is >126 mg/dL (7nmol/L) but <500 mg/dL (27.8nmol/L) without ketosis/severe hyperglycaemic symptoms, initiate management as an outpatient:

1. Patient Education

- **Explain what diabetes is** and how it affects the body. Provide a setting where the patient feels comfortable to ask questions, discuss fears and concerns. This can be done both 1:1 or in a group session (see patient support and education section).
- **Advise on the importance of an appropriate diet:** Daily portions, five+ vegetables and one fruit; low fat; salt < 5 g; low sugar; minimal alcohol. Try to maintain 3 meals per day at regular times; if on Insulin, should also plan 2 snacks per day. Include guidance on better carbohydrate choices and restriction on portion size.
- **Monitoring blood sugars:** Explain to the patient what blood sugar is, why it needs to be checked and how to check it, as well as how to correctly read the results, what they mean, and the appropriate action that needs to be taken.⁸
- **Taking medication:** Explain their medication clearly, what it is for, when to take it, and the importance of adherence.
- **Hyperglycaemia and hypoglycaemia** (if taking sulphonylurea or insulin): The signs and symptoms and the action that needs to be taken if the patient starts to feel them.
- **Complications:** Explain the possible complications that can occur with diabetes; eye, foot, kidney, heart, and nerve problems, but explain that good blood sugar control can help to prevent these.

2. Lifestyle change

⁸ In most settings MSF does not advocate for home glucose monitoring as this tends to be unsustainable; but in some contexts it can be considered for patients on insulin (with approval of HA).

This is an important part of diabetes care. Changing lifestyle is difficult, but small changes are hugely beneficial. Discuss with the patient what he/she can do and how to do it; decide on targets and a timeline.

- **Smoking cessation:** Discuss the importance of the patient stopping smoking and how it will reduce the risk of vascular complications.
- **Physical activity:** any activity that causes slight breathlessness or light sweat reduces cardiovascular risk and helps weight loss; advise walking 30 minutes 5 times per week. Physical housework and gardening count.
- **Eat healthy and regular meals** – diet guidance as above.
- **Weight management:** Check BMI and if > 25 kg/m², advise 5-10% weight loss reduces cardiovascular risk and helps blood sugar control.
- **Daily routine:** Patients need to get into a daily routine of taking their medication and checking their feet. This will take time, but once it becomes a habit, patients will find their diabetes much easier to manage.
- **Be prepared:** To pre-empt hypoglycaemia, patients taking a sulphonylurea or insulin should always carry a sugary snack or drink (e.g. five candies; a small can of Coke).
- **Follow up appointments:** Patients need to understand the importance of the follow-up visits and attend them regularly.

Remember this is a large amount of information for a patient to take in on their initial visit; try to share this information progressively over several visits to avoid overwhelming the patient (see patient education and support). Reassure the patient that it will take time for them to get used to their diagnosis and taking their medication, but that they are able to come back to the clinic if they have any further questions or concerns or forget anything. Having a family member or friend present during the patient education can be very beneficial.

3. Monitoring and cardiovascular risk management

All adults and all children >10 years of age, with diabetes for 5+ years, should undergo monitoring as follows:

REVIEW LIFESTYLE	Every visit	Discuss: blood sugar monitoring, adherence to medication, any episodes of hypo and hyperglycaemia, foot care, diet, exercise, smoking.
	First visit and 6-month review	Calculate BMI
CARDIOVASCULAR RISK MANAGEMENT		
BLOOD PRESSURE	Every visit	Target BP: <140/90mmHg. Individualised targets e.g. <150/90 are acceptable in the elderly. Patients with established diabetic complications e.g. eye/renal disease benefit from tighter BP control (<130/80). Start ACEi unless contraindicated.
LIPIDS	First visit or as soon as possible on follow up	Begin cholesterol-lowering treatment with atorvastatin 40mg daily if age >40 years and/or known cardiovascular disease: a) macrovascular disease: history of heart attack, angina, peripheral arterial disease, stroke, transient ischaemic attack b) microvascular disease: retinopathy, nephropathy, neuropathy Cholesterol testing is not mandatory
ASPIRIN	First visit or as soon as possible on follow up	Aspirin 75mg daily IF history of macrovascular disease NOT for primary prevention
DIAGNOSE AND MANAGE COMPLICATIONS		
NEPHROPATHY	First visit and 6-	Check kidney function, if feasible. If rising creatinine OR proteinuria

	month review	(including trace protein) present on 3 occasions without evidence of UTI, this indicates nephropathy. Start ACE inhibitor .		
RETINOPATHY	First visit and 6-month review	Check eyes: ask about poor night vision, visual impairment. Check visual acuity, look for cataract. See eye-screening guide below ⁹ .		
DIABETIC FOOT	First visit and 6-month review	Check feet: See diabetic foot screening guide below. Refer to a chiropodist (or whoever is providing this service) 6 monthly if available.		
AUTONOMIC NEUROPATHY	First visit and 6-month review	Ask about: bloating/nausea/ vomiting after meals, sudden diarrhoea at night, erectile dysfunction, lack of hypoglycaemia awareness. These symptoms may also be caused by drug treatment and by associated vascular disease. Manage by improving blood sugar control, lifestyle changes and adjusting medications. See hypoglycaemia guide.		
BLOOD SUGAR CONTROL				
BLOOD SUGAR TARGETS	Every visit and at least every 3 months. For HbA1C every 6 months – 1 year for stable patients is O.K.	Fasting glucose	Random glucose	HbA1C (best if available)
		75 – 150 mg/dL (4.2 – 8.3 mmol/L)	75 -180 mg/dL (4.2-10.1 mmol/L)	7 - 8 % but individualize (53 - 64 mmol/mol)

4. Blood sugar control in diabetes

Aims of diabetes control: To avoid hyperglycaemic symptoms, to achieve near-normal glycaemic values, to avoid complications and unacceptable weight gain, and to avoid hypoglycaemia.

4.1 Blood sugar control in type 2 diabetes

- In addition to lifestyle changes, medication is usually needed to control blood sugar. Medication requirements tend to increase with time. 10-15% of people with type 2 diabetes may require insulin.
- Adjust medication doses based on a minimum of two above-target readings, or if complications develop, rather than on a single reading. Before **adjusting doses**, check patient **adherence**.
- Ask about symptoms of hyper- and hypoglycaemia and if present, seek a cause.
- **Hyperglycaemia** may be caused by inadequate treatment, non-adherence/missed doses, doses poorly timed with meals, inappropriate diet, infection or illness, drugs e.g. beta blockers, thiazide diuretics, corticosteroids, combined oral contraceptives, progesterone, pseudoephedrine, niacin, antipsychotics, phenytoin, thyroxin. Lack of access or inability to afford treatment is a key causative factor. See diabetic emergencies in section C for details on management.
- **Hypoglycaemia** may be caused by over-treatment, missed meals, doses poorly timed with meals, autonomic neuropathy leading to poor awareness of hypoglycaemia, exercise, alcohol, renal or liver impairment, beta blockers, ACE inhibitors, aspirin and NSAIDs, sulphonamides, quinine. Hypoglycaemia due to alcohol may last up to 24 hours.
- **Blood sugar targets:**

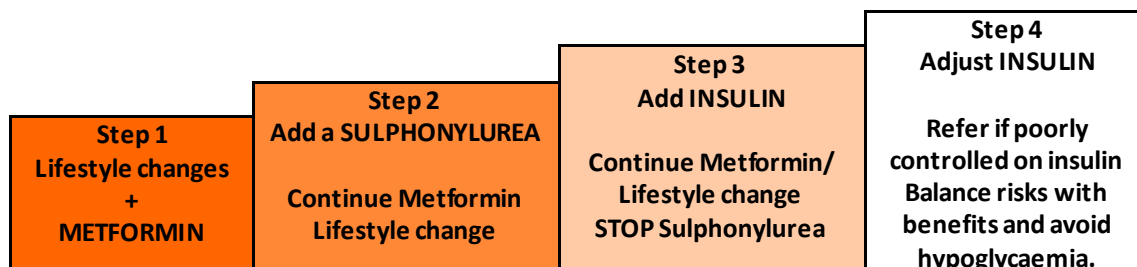
TARGET	PATIENT CATEGORY	HBA1C	EQUIVALENT BLOOD GLUCOSE AVERAGE OVER 24 HOURS
STRICTER	Young people (< 65 years) and/or with short disease duration, longer life expectancy and lower risk of hypos; Pregnant women; Children < 18	7%	150-mg/dL (8.3mmol/L)
MODIFIED	Older people > 65 years (usually Type 2) and/or patients with significant	8%	180 mg/dL (10.1 mmol/L)

⁹ If laser eye treatment is accessible and affordable to patients, all patients should be referred for annual diabetic retinopathy screening (see below).

	morbidity: cardiovascular disease, advanced microvascular or macrovascular complications, cognitive impairment, risk of hypos/falls or end-stage illness.		
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Pharmacological therapy

Early initiation of Metformin reduces cardiovascular risk. If patients have mildly elevated fasting blood sugar (126 – 150 mg/dL or 1.7-8.3mmol/L), lifestyle changes alone are appropriate. Decide in consultation the patient; discuss motivation to change. If fasting blood sugar rises above 150mg/dL, start Metformin.



DRUG (CLASS)	DOSE	SIDE EFFECTS/ COMMENTS
Metformin (Biguanide)	Start at 500 mg with breakfast; increase slowly to a maximum of 3000 mg/ day in 2-3 divided doses with each meal (most patients require 2000mg/day). Where possible, monitor renal and liver function every year (although absence of monitoring facilities is not a contra-indication to starting Metformin)	Reduces cardiovascular complications. Side effects: gastrointestinal effects are common and are reduced by dividing the dose and increasing slowly. Rarely causes lactic acidosis (when severely dehydrated / unwell) Contraindicated: <ul style="list-style-type: none"> Absolute: Hepatic or renal failure: ALT or AST > 3 x normal limit; creatinine > 2 mg/dL or > 175 µmol/L, or GFR<45ml/min). Relative: Impaired hepatic / renal function (creatinine 1.4 -2.0 mg/dL or 123-175 µmol/L or GFR 45-60 ml/min; LFTs raised but <3x normal limit: reduce dose by 50% and recheck after one month and stop if threshold for absolute contraindication is reached Caution in B12 deficiency, patients on anti-TB meds (Bedaquiline, Linezolid) with normal hepatorenal function → monitor LFTs and U&Es every 3 months. Stop if possible before contrast media or anaesthetics.
Glibenclamide (Sulphonylurea – 2nd choice)	Start at 2.5 mg with breakfast. Increase by 2.5 mg per week to a maximum of 15 mg daily as required.	Side effects: May cause hypoglycaemia and weight gain. Warn patients about hypoglycaemia, which may be prolonged for many hours. Contraindicated in ketosis, lactation, porphyria. Caution renal or hepatic impairment (see 'Metformin' for thresholds), elderly, Ramadan or other fasting periods; stop during surgery, 1 st trimester pregnancy, breastfeeding, trauma.
Gliclazide (Sulphonylurea –	Start at 40 mg daily. Increase weekly according to response up to 160 mg	Side effects: May cause hypoglycaemia and weight gain. Warn patients about hypoglycaemia.

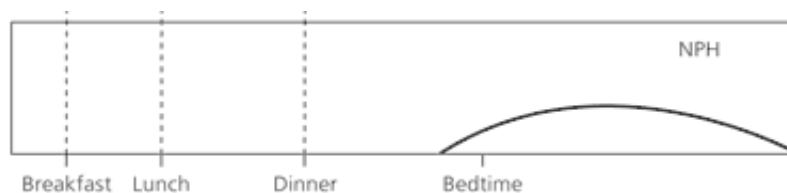
1st choice if available)	as a single dose, with breakfast. If higher doses required, divide into twice daily up to a maximum of 320 mg per day.	Contraindicated in ketosis, lactation, porphyria. Caution renal or hepatic impairment (see 'Metformin' for thresholds), elderly, Ramadan or other fasting periods; stop during surgery, 1 st trimester of pregnancy and trauma.
Rapid-acting human insulin	Onset of action: 30 minutes; Maximal action: 2 to 4 hours; Duration of action: 4 to 6 hours (according to the dose). Indication: management of acute hyperglycaemia.	Side effects: Local: transient oedema, bruising, lipodystrophy at injection sites; rarely pain. Hypoglycaemia in overdose. Caution: insulin requirements may be decreased with hepatic and renal impairment. Compensatory response to hypoglycaemia may be impaired in renal impairment. Requirements may be increased by infection, stress, accidental or surgical trauma and during puberty. Increase monitoring during these periods is recommended.
NPH insulin (intermediate-acting insulin)	Onset of action: 1-2 hours; Maximal action: 4 to 12 hours Duration of action: 14 to 18 hours (according to the dose; may be longer in some patients). Indication: In Type 2 Diabetes when oral hypoglycaemic drugs do not provide adequate glucose control or are contraindicated.	Pregnancy and breastfeeding: insulin requirements may alter and doses should be frequently monitored. Doses generally need to be increased during the 2 nd and 3 rd trimester. Hypoglycaemic effects enhanced by: Beta blockers, MAOIs, alcohol, fibrates; possibly ACEi, anabolic steroids and testosterone. Hypoglycaemic effects reduced by: Corticosteroids, diazoxide, loop diuretics (e.g furosemide), thiazide diuretics, oestrogens and progesterones.

Insulin in type 2 diabetes

If fasting glucose is not well controlled (< 150 mg/dL or < 8.3mmol/L) at the maximum tolerated doses of Metformin and Sulphonylurea, discuss initiating insulin with the patient and provide education.

Single injection of NPH:

- Continue the maximum dose of Metformin; stop the Sulphonylurea
- Start with a **single evening injection of NPH/Isophane** (intermediate acting insulin) of **0.2 units/kg at bedtime**
- **NPH onset of action:** 1-2 hours. Duration of maximal action: 4-12 hours. Total duration of action: 16-18 hours (may be longer in some individuals).



Dose adjustment: If the patient has a glucometer, ask them to record **three pre-meal and one bedtime glucose** level per day (see annex 5). Once stable, this may be reduced to testing before each injection and testing a pre-breakfast level several times per week. Otherwise, perform FRB at each clinic visit.

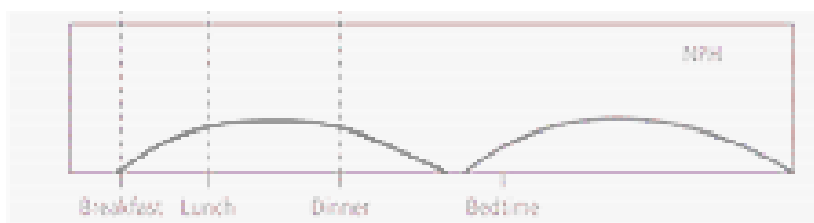
FASTING GLUCOSE	ACTION
Low: < 75 mg/dL (< 4.2 mmol/L)	Treat for hypoglycaemia. Refer to the doctor for review. Reduce the dose by 4 units (see diabetic emergencies in section C for immediate management).
At target: 75-150 mg/dL (4.2–8.3 mmol/L)	Ask about symptoms of hypoglycaemia. If present - reduce the dose by 2 units in the evening If not - maintain the same dose.
High: 151-500 mg/dL (8.4 – 27.8 mmol/L)¹⁰	If ≥ 200 mg/dL (11 mmol/L), check for ketones and ask about symptoms of hyperglycaemia. If either is present, treat urgently for hyperglycaemia (see section on diabetic emergencies in section C). If not, increase total dose by 2-4 units; review in 1 week.
Very high: >500 mg/dL (27.8 mmol/L)	See diabetic emergencies in section C for details on management.

BEFORE ADJUSTING INSULIN DOSES, look for a reason for the abnormality.

Single-dose NPH nocte can be increased up to a maximum of **0.6 units/kg/day** until target HbA1c is achieved. However, if the patient starts to have hypoglycaemic episodes, change to a twice daily regimen.

Twice daily NPH injections

Convert the current insulin dose into two doses: **2/3 in the morning and 1/3 in the evening** 12 hours apart. E.g. If the patient was taking 30 units at bedtime (0.6 units/kg in 50 kg woman), divide this into 20 units in the morning and 10 units in the evening.



- Patients with glucometers should record **three pre-meal and one pre-bed blood sugar**, until stable. This may be reduced to testing before each injection, once stable. If patient does not have a glucometer, (s)he should still note episodes of hypo- or hyperglycaemic symptoms, together with the timing of symptoms.
- Insulin dose should only be adjusted by the health worker. Adjust one insulin dose at a time (either the morning or evening dose) according to the Insulin Adjustment Table above, and review weekly until stable.
- If the pre-breakfast blood sugar reading is abnormal, adjust the evening NPH dose
- If the pre-lunch, pre-dinner, or pre-bedtime readings are abnormal, adjust the morning NPH dose.
- Three meals per day at regular times and two snacks (mid-morning and pre-bed) help to maintain good blood sugar control and avoid hypos.

If the patient still has not achieved their target HbA1c, despite careful adjustment, counselling, and patient adherence, consider switching to a mixed insulin regime as for diabetes type 1 (below).

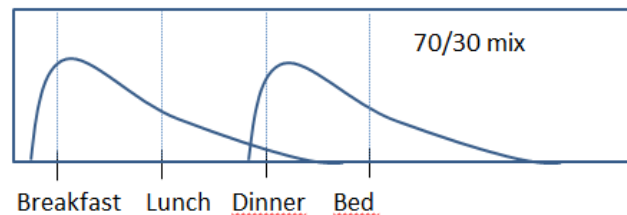
¹⁰ The morning pre-breakfast glucose reflects the action of the evening insulin dose (either NPH or Biphasic insulin) overnight – adjust the evening dose based on this reading. Persistent high morning sugars may reflect the “**dawn phenomenon**”, a rebound hyperglycaemia in response to an overnight hypoglycaemia. If suspected, ask the patient to record several readings at 2 am. A snack at bedtime will reduce overnight hypoglycaemia.

4.2 Blood sugar control in type 1 diabetes (or type 2 diabetes not controlled on NPH)

Type 1 diabetes requires insulin therapy from diagnosis. After initial stabilisation a “honeymoon period” often occurs when the insulin requirements are initially low. After a few months, the insulin requirements usually increase.

Fixed-combination mixed insulin (biphasic)

- Fixed combination of NPH (intermediate acting insulin) 70% and short-acting insulin 30%: **Biphasic insulin 70/30**. NPH provides basal insulin action while short-acting insulin provides extra insulin to cover meal times.
- Start with **0.5 units/kg /day divided in two doses** 12 hours apart: 2/3 in the morning 30 minutes before the evening meal and 1/3 in the evening 30 minutes before the evening meal. (If changing from NPH insulin, maintain the same total daily dose when changing to mixed Insulin.)
 - During puberty – adolescents are likely to require 1.5 – 2 units/kg/day
- Short acting insulin onset of action: 30 minutes; Maximal action: 24 hours; Duration of action: 4-6 hours depending on the dose.



- It is essential for the patient to **eat at the same time** that the Biphasic insulin is given to avoid serious hypoglycaemia. While it is important to adapt to the patient’s home circumstances, three meals at regular times and a mid-morning and pre-bed snack will enable best sugar control, and minimise hypos. If the patient does not have access to morning and evening meals, use NPH regimen instead (as for type 2 DM).
- Patients should record three pre-meal and one pre-bed blood sugar, until stable. This may be reduced to pre-injection and pre-lunch, once stable. If patient does not have a glucometer, (s)he should still note episodes of hypo- or hyperglycaemic symptoms, together with the timing of symptoms.
- Only the health worker should adjust the Insulin dose. Only adjust one insulin dose at a time and review weekly until stable.
- Adjust either the morning or the evening Biphasic insulin dose according to Insulin Adjustment Table.
- If the pre-breakfast blood sugar reading is abnormal, adjust the evening Biphasic insulin dose.
- If the pre-lunch, pre-dinner, or pre-bedtime readings are abnormal, adjust the morning insulin dose.
- Be aware of the dawn phenomenon and seek other reasons for the abnormality in glucose levels.

Individualised mixed Insulin regimens

In cases where patient remains poorly controlled on fixed-combination mixed Insulin (not achieving target HbA1c, hypos, or erratic FBGs), a basal bolus regimen can be introduced (NPH insulin morning and night, with rapid-acting Insulin bolus prior to each meal). This should only be considered if:

- Patients highly motivated and very high treatment literacy

- Evaluation by nurse / adherence officer suggests that patient is capable of long-term adherence
- Patient has access to home glucose monitoring
- The prescribing doctor has experience of initiating basal-bolus regimens (or seeks advice from NCD advisor or paediatrician)
- Benefits of better control are believed to greatly outweigh the risks from this complex regimen (e.g. hypoglycaemia due to accidental injection of fast acting insulin instead of NPH).

Initially, calculate the total number of units of mixed insulin that the patient receives each day, and give the same total as ½ NPH Insulin (split into morning and evening doses) and ½ rapid acting Insulin (split into doses prior to each meal). Patients should continue to record three pre-meal and one pre-bed blood sugars. If all readings remain high, increase an NPH Insulin dose according to the Insulin Adjustment Table above (increasing evening dose if morning FBGs are highest, and adjusting the morning dose if evening FBGs are higher). If some readings are fine, but one (or more) is elevated, increase the rapid-acting insulin dose that precedes the elevated FBG reading. Only alter one insulin dose at a time. Ideally this should be done in consultation with a specialist.

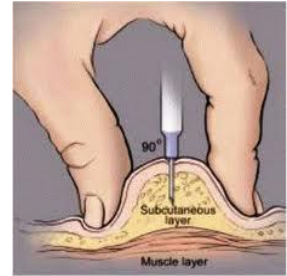
5. Education for patients on insulin therapy

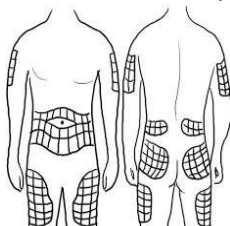
This requires one or more counselling sessions to determine if the patient is ready to start self-injecting and understands the risk and management of hypoglycaemia. Involve family/carer if possible and provide an information leaflet appropriate to the local setting. Ensure that the patient education and lifestyle changes listed above have been covered and now focus specifically on:

1. **Monitoring blood glucose:** If the patient is on rapid-acting or mixed insulin, or has recurrent hypoglycaemic episodes, provide the patient with a glucometer, glucometer strips, lancets, and a sharps bin (jar with a lid), and show them how to use it. Ask them to practice using it in front of you to ensure they have the right technique and disposing of the sharp safely. Explain that when taking the blood sugar, they should take the blood from different finger tips each time. Explain when patients should take their blood sugar and that they should always record it in their record book (provided by the clinic). Explain to the patient a normal, low, and high blood sugar reading and what action must be taken for each reading.
2. **Insulin:** Explain what insulin is, how it works, and its relationship with food intake. Explain the doses of insulin and why they may differ.
3. **Storage of insulin:** Explain that the vial they are using can be kept in a fridge or at room temperature until they have finished it, or until it has been open for 28 days, and then it must be discarded. If not refrigerated, Insulin should be kept in the shade in the coolest part of the house (maximum daytime temperature 37 degrees, maximum night-time temperature 25 degrees; unopened vials can be kept in a pot of cool water). Patients may require a travel letter to take the insulin home.
4. **Drawing up of insulin:** Provide the patient with their insulin and insulin syringe. Explain to them how to read the insulin needle and how to draw up the insulin, with no air in the syringe. Practice giving them different doses and asking them to draw up the dose for you using water for injection.
5. **Injection technique:** Explain to the patient how to administer the insulin.
 - a. Wash hands

- b. Check your vial of insulin has been open less than 28 days and mix it by rolling the vial of insulin between your palms
- c. Remove the cap from the needle and place the needle into the vial
- d. Draw up the appropriate dose and check there is no air in there
- e. Find an appropriate site to inject the insulin, see image opposite and pinch a bit of skin between your thumb and forefinger
- f. Place needle into pinched skin at a 90 degree angle and inject insulin. Leave needle in place for 10 seconds before removal
- g. Remove and dispose of the needle into the sharps bin.

Note: Change injection sites regularly to avoid unsightly lipodystrophy and reduced absorption.



6. **Meal plan:** Provide specific advice for each patient based on home/work circumstances and target weight loss.
7. **Hypoglycaemia:** Explain the symptoms of hypoglycaemia and that action must be taken as soon as these symptoms are felt; blood sugar should be taken and a sugary drink or snack should be eaten (five candies/150ml Coke, and follow with a normal meal otherwise hypo will quickly reoccur). It is important to always be prepared for a hypo and patients should always have a sugary snack or drink with them at all times, especially while driving. It is important not to drive if blood sugar is below $< 90 \text{ mg/dL}$ (5 mmol/L). Explain that the most common reasons for hypoglycaemia are: late or missed meal, extra or unplanned exercise, too much insulin or tablets, alcohol (especially on an empty stomach), hot weather, and not drinking enough.
 
8. **Sick day rules:** Explain to the patient how infections will affect their diabetes, causing their blood sugar to increase even if they are not eating or vomiting, and they must follow the instructions below:
 - Never stop taking their insulin
 - Check blood sugar levels every 2-3 hour
 - Drink 2-3 litres of non-sugary drinks between meals
 - Try to eat even if you don't feel like it – bread, crackers, plain biscuits, milky drinks
 - Avoid spicy food
 - Seek medical help if blood sugar is persistently $> 300 \text{ mg/dL}$ (16 mmol/L), if they cannot keep drinking and becomes thirsty, if persistent vomiting, if drowsy, or breathing is deep and rapid.
9. **Exercise:** eat a snack before exercising to avoid hypoglycaemia.
10. **Alcohol:** If culturally appropriate. Drink minimal amounts of alcohol with food only. Double pre-bed snack if you have had alcohol and eat a larger breakfast. Hypoglycaemia may persist for 24 hours.

6. Follow-up

Monthly	If medication doses were adjusted or if blood sugar is poorly controlled (> 200 but $< 500 \text{ mg/DL}$ or $> 11.1 - 27.8 \text{ mmol/L}$ and $\text{HbA1c} > 8.0\%$).
Three monthly	If the fasting blood sugar is $< 200 \text{ mg/dL}$ (11.1 mmol/L) or HbA1c is $< 8.0\%$ – check

Annual review	FBG and BP at each visit. For diabetic complications.
Admit to hospital	If the blood sugar is > 500 mg/dL(27 mmol/L) if the patient is symptomatic or ketotic.

Advice for diabetic patients who are fasting

For the majority of Type 2 diabetics who are normally well controlled and otherwise well, fasting is safe and can lead to an overall improvement in glycaemic control during fasting. **Type 1 diabetics should be advised not to fast.** Patients considering fasting should have an assessment 1–2 months prior to determine how good their sugar control, assess their risks and provide advice. Fasting is contraindicated in patients with other serious medical conditions e.g. significant kidney disease, heart disease, current infections, poorly controlled diabetes or those who are pregnant. Elderly patients or those living alone are also considered to be high risk. Patients with Hba1c of <8.0% may choose to fast. If Hba1c is >8.0% patients may choose not to fast. Those who are fasting should be educated on how to recognise the symptoms of hyper and hypoglycaemia and what to do if this occurs

Advice for patients;

- Patients should try to avoid eating large meals during the break of fast but should have two to three smaller meals instead
- At the break of fast, individuals should be advised to eat something sugary or containing more simple carbohydrates e.g. white bread, white rice and baked goods
- Ensure adequate fluid intake during break of fast
- Just prior to the fast it is better to eat a meal that is rich in complex carbohydrates as this will be broken down more slowly. E.g. – brown rice, beans, peas, lentils and potatoes
- Advise patients that they should not self-reduce or omit doses of medicine
- Sugars should be monitored regularly throughout the day and the fast should be stopped if hypoglycaemia occurs
- Post-fasting patients should revert back to their original medication regimen

Diabetic drugs and fasting

Metformin	Sulfonylureas (gliclazide/glibenclamide)	Insulin
<ul style="list-style-type: none"> • The risk of hypoglycaemia is very low • If metformin is being taken 3 times daily, <ul style="list-style-type: none"> ○ 2/3 of the daily dose should be taken with the main meal at break of fast ○ 1/3 of the daily 	<ul style="list-style-type: none"> • There is a moderate-high risk of hypoglycaemia • The total 24-hour dose should be halved • If taking once daily then take this (half normal dose) just prior to the meal at the break of fast/sunset meal • If taking twice daily then the pre-fast/morning meal dose 	<ul style="list-style-type: none"> • Patients should be advised not to fast • If they chose to fast then consider changing twice daily premixed intermediate acting insulin to a once daily long (or intermediate) acting insulin in the evening with short acting insulin with meals

<p>dose should be taken with the pre-dawn/fast meal</p> <ul style="list-style-type: none"> Adjustment is not needed for people taking metformin once or twice daily 	<p>and the sunset meal/evening dose are halved</p>	<ul style="list-style-type: none"> Usual dose should be taken with sunset meal and half usual dose with pre-fast/morning meal
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Hypertension treatment in diabetes

BLOOD PRESSURE (MMHG)	ACTION	
115/75 - 139/89	Lifestyle intervention	
140/90 - 179/109	No history of cardiovascular disease*	History of cardiovascular disease*
	<p>If a fixed-dose combination protocol is being used – see page 75</p> <ol style="list-style-type: none"> ACEi: (e.g. enalapril 5 mg) in the morning (ARB (e.g. losartan 50 mg) if not tolerated) CCB: (e.g. amlodipine 5 mg) Diuretic: (e.g. hydrochlorothiazide 25mg) Beta-blocker (e.g. bisoprolol 5 mg) 	<p>If a fixed-dose combination protocol is being used – see page 75</p> <ol style="list-style-type: none"> ACEi (e.g. enalapril 5 mg) (ARB (e.g. losartan 50 mg) if not tolerated) + Beta-blocker (e.g. bisoprolol 2.5mg) - slowly introduce to max tolerated dose CCB (e.g. amlodipine 5 mg) Diuretic (e.g. hydrochlorothiazide 25mg)
	<ul style="list-style-type: none"> *Cardiovascular disease: history of heart attack, angina, peripheral arterial disease, stroke, transient ischaemic attack or cardiac failure of presumed CV aetiology. Review every 4 weeks. Increase the dose of the first medication until the target (<140/90) is reached or side effects occur. Add a second agent and increase slowly in the same way until the target is reached or side effects occur. Check creatinine before starting ACEi and 2 weeks after initiation of ACEi or diuretic if existing renal or cardiac disease or elderly. In younger patients without cardiac/renal disease take a baseline creatinine and re-check at next follow up visit. Stop if creatinine increases > 30% after initiation 	
> 180/110	<ul style="list-style-type: none"> If NO signs of end organ damage and patient well – continue treatment as above If SIGNS OF END ORGAN DAMAGE OR PATIENT UNWELL – see hypertensive emergency in section 3 – emergency management 	

Diabetic foot screening

Key patient education messages

- Examine the feet daily looking for redness, irritation, or wounds – use a mirror.
- Wear well-fitting, closed-in shoes with socks if possible. Check shoes don't contain small stones etc. before putting them on. Ideally shoes should be made from micro-cellular rubber, especially if the patient has neuropathy.

- Protect feet from extreme heat or cold. Don't use hot water bottles or hot water to warm up cold feet.
- Don't walk in bare feet, even at home.
- Wash feet and use moisturiser (any oil will work) daily; dry carefully between toes. Cut nails regularly (straight across, not arched, and not too short).
- Visit nurse or doctor annually for foot examination. Attend to small injuries promptly.
- Stop smoking.

Screening for the high risk diabetic foot

1. History of ulcer or amputation: yes/no
2. Deformity or absent pedal pulse: yes/no
3. Current wound (active ulcer, in-grown toenail, callus, blister, or fissure): yes/no
4. Neuropathy (absent sensation at four out of ten sites examined by Monofilament on either foot): yes/no

If "no" to all questions, review in 6 months.

If "yes" to ANY of the above questions on EITHER foot, this patient has a high-risk diabetic foot:

1. Wound management¹¹ - assess any wounds:

- a. Size, depth, and location
- b. Colour: Black skin is necrotic tissue
- c. Odour: An infected wound will smell
- d. Slough or pus: Meaning there is an infection
- e. Is their local pain?
 - If infected use antibiotics as early as possible and admit for IV antibiotics if the wound is deep, osteomyelitis is suspected, if cellulitis is extensive, or if the patient is systemically unwell.
 - Clean and dress the wound and note when the next dressing change is due.
 - Rest the foot and "off-load" (reduce pressure on the affected areas).
 - Note all findings in the patients file to ensure that if the wound isn't seen by the same healthcare worker, it is still possible to identify if the wound shows signs of improvement or deterioration.

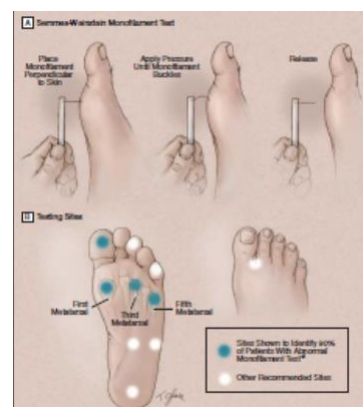
2. **Neuropathic pain:** Amitriptyline 12.5-50 mg at night may be useful. Increase the dose every 4-6 weeks as needed. Side effects include: dry mouth, drowsiness, constipation, urinary retention, and visual disturbance. Amitriptyline is contra-indicated in patients with known cardiac disease – Gabapentin can be considered (with HA approval).

3. Refer for chiropody and review in 6 months.

Neuropathy screening by monofilament

Neuropathy screening is important not only for identifying a 'high-risk diabetic foot'; it also demonstrated chronic poor glycaemic control, thus indicating the need for optimisation of anti-diabetic medication. The procedure:

1. Show the monofilament to the patient and demonstrate by touching their arm
2. Ask the patient to close his/her eyes and say "yes" each time



¹¹ See: "Best Practice Guidelines: Wound Management in Diabetic Foot Ulcers", in the OCA Medical Treasury

- he/she feels the touch of the monofilament and where they feel it on their foot.
3. Touch the monofilament to the skin of the foot with enough pressure to form a “C” shape.
 4. Evaluate 10 sites per foot. Avoid areas with very hard skin where sensation will be reduced. Do NOT use needle (test for sensation to TOUCH, not pain) or cotton wool (too light, may overdiagnose neuropathy). Lack of sensation at 4 out of 10 sites on either foot = neuropathy.

Diabetic eye check

If reliable referral options are available for screening and laser treatment for diabetic retinopathy, patients should undergo annual ophthalmology review.

As laser treatment is usually not available in MSF settings, it is still worth checking visual acuity annually since deteriorating visual acuity could be a sign of poor glycaemic control, which should prompt a review of treatment. The procedure is:

1. Ask the patient about visual disturbance, night blindness, and examine for cataract.
2. Use a 3 metre small Snellen Chart (use the illiterate tumbling E-chart for patients who cannot read). If the patient wears glasses or contacts for distant vision they should leave them on. Place the patient three metres from the chart. Ask the patient to cover one eye and read the letters out loud to you, starting with the top (biggest) line. The smallest line successfully read (with maximum of two errors) corresponds to the visual acuity for that eye. Mark as e.g. VA Left 3/12 (i.e. at three metres, using the left eye, the patient read the line marked on the chart as 12 with a maximum of two errors¹².) Repeat with the opposite eye covered. If using the tumbling E-chart, the patient should indicate in which direction each “E” is pointing.
3. If the patient cannot read any of the lines, test the number of fingers he/she can see. While you cover one of his/her eyes, hold up the fingers of your other hand about ½ metre from his/her face. Ask the patient how many fingers he/she can see (repeating twice more while holding up different numbers of fingers). If unable to count fingers, test light/dark differentiation by shining a light up to the eye with the other eye covered. Repeat for the other eye.

Gestational diabetes (GDM)

- Placental hormones increase insulin resistance during pregnancy. If the pancreas cannot counter balance these hormones, diabetes occurs.
- **Symptoms:** asymptomatic, excess fatigue, polyuria, polydipsia, or headache.
- **Results in risk of significant maternal and foetal/neonatal complications**, including an increased risk of developing diabetes in the future for both mother and baby.
- **If diabetes is detected in the first trimester it is NOT considered gestational but pre-existing.**
- **Screen all women at increased risk (between 24-28 weeks):** women who are overweight; age >35 years; have a family history of diabetes; and/or a history of delivering a macrosomic baby (>4 kg). In high prevalence areas, such as the Middle East, screen all women for gestational diabetes using an **oral glucose tolerance test**.
 - Note that glycosuria can be normal in pregnancy; so it is suggestive but not diagnostic of GDM.
- **Treatment:**
 - Once GDM is diagnosed, introduce a **strict diet** for 2 weeks.

¹² Visual Acuity is usually expressed as Distance from Chart/ Number of the Smallest Line Read. It is expressed as 6/ number of metres at which you should see this line if you had perfect vision.. Perfect vision is 6/6 in metres (20/20 in feet).

- **If fasting sugars remain >126mg/dl (7nmol/L) or there are any foetal or maternal complications – start insulin straight away. Insulin 70/30 0.5 units/kg/day** divided into **two doses**: 2/3 in the morning 15 minutes before meals and 1/3 in the evening 15 minutes before dinner. Continue the strict diet.
- **If fasting sugars are <126mg/dl (7nmol/L) advise diet + metformin with close monitoring.** If sugars are still uncontrolled, commence insulin.
- If insulin is not tolerated or patient not willing to use it, start metformin unless contraindicated.
- If metformin is not sufficient and insulin not tolerated or patient not willing to use it, glibenclamide can be used with close monitoring.
- Add **folic acid 5mg** daily.
- Advise **150 minutes of physical activity** per week in 4-5 sessions.
- **During delivery**, encourage fluid intake and monitor blood sugars of diet-controlled GDM patients and start insulin if readings are >150 mg/dL. (8.3nmol/L) Start an insulin sliding scale and continuous fluid infusion.
- **Post-partum**, women should breastfeed immediately after delivery to avoid neonatal hypoglycaemia. If the mother has been using sulphonylureas or Insulin, monitor the infant's blood sugar every 4 hours for the first 48 hours, or longer if there have been hypos. Treat hypos with immediate breast feed, dextrose water, or dextrose IV if severe <36 mg/dL (2 mmol/L).
- **Recheck** the mother's fasting blood glucose for diabetes 6 weeks post-partum and every year thereafter because she has a high risk of developing type 2 diabetes.
- Women who are known to have diabetes and become pregnant should be given a glucometer (if available) for home monitoring, and should try to achieve strict blood sugar control. She should continue her normal treatment (but stop sulphonylureas in 1st trimester), but may need to adjust treatment to achieve control.

Diabetes and HIV

Chronic inflammation and ART in HIV increases the risk of developing diabetes. HIV-mediated disease may aggravate complications of diabetes: HIV-related cardiovascular disease and cardiomyopathy, nephropathy, neuropathy, CMV retinopathy, increased insulin resistance, and increased infection risk due to immunosuppression.

- HIV positive patients should be screened for diabetes annually
- Metformin is the first line oral anti-hypoglycaemic agent. May worsen lipotrophy. Caution in renal impairment as ART may increase risk of lactic acidosis. GIT side effects are more common.
- Add a sulphonylurea as second-line, although these are less effective in the presence of insulin resistance
- Atorvastatin: If patient is taking a PI, start at 10mg dose and increase to maximum of 40 mg as needed only if LFT monitoring available. Higher doses are O.K. if taking NNRTIs.
- PI-based regimes should be avoided where possible in patients at high risk of developing diabetes, e.g. those with a history of gestational diabetes, a positive family history of diabetes, or impaired glucose tolerance on screening. PIs increase insulin resistance and reduce insulin secretion. Indinavir should be avoided. Seek advice from HIV advisor.

Diabetes and tuberculosis

- Diabetes increases risk of developing active TB and is associated with increased rates of smear positivity and symptoms if glycaemic control is poor. Diabetes-related comorbidities negatively influence TB treatment outcomes. Good glycaemic control reduces impact of diabetes on TB.

- In settings with **high diabetes prevalence**, e.g. the Middle East, **screen newly diagnosed TB patients aged over 18 years for diabetes** using HbA1c if available, or fasting glucose; be aware that hyperglycaemia in the setting of TB may be transient so repeat (and may require repeated glucose testing). Two tests should always be done for diagnosis if patient is asymptomatic. If negative, repeat 1 month after initiating TB treatment.
- Have a **high suspicion for TB in any diabetic** patient who presents with 2 weeks of cough, night sweats, and/or weight loss. Screen according to local protocols.
- **TB drugs** may exacerbate diabetes complications or interact with medications used to treat diabetes. Monitor closely because patients with (any degree of) diabetic nephropathy are at much greater risk of TB drug toxicity. Ethambutol is associated with retinopathy and Isoniazid with neuropathy, which may be prevented with pyridoxine. **Rifampicin** may reduce BP lowering effect of Enalapril and Losartan; it may reduce glucose-lowering effect of Sulphonylureas; it may reduce lipid-lowering effect of Atorvastatin. Monitor BP, glycaemia, and lipids three monthly.
- Be aware that statins and anti-TB drugs (Linezolid and Bedaquiline) are potentially hepatotoxicity. This is particularly a problem for patients on Metformin, who are consequently at higher risk of lactic acidosis. Monitor LFTs every 3 months; if levels of liver enzymes are increasing, stop Statin, and reduce Metformin dose by 50% and recheck at 3 months, stopping Metformin then if required.
- In general, monitor renal function more closely when patients are taking both anti-diabetic and anti-TB drugs e.g. every 3 months or after dose changes.

4. Hypothyroidism and hyperthyroidism

Hypothyroidism

Background

Hypothyroidism affects 1-2% of the population worldwide. Almost one third of the world's population live in areas of iodine deficiency which may lead to thyroid dysfunction. Autoimmune disease is another important cause of hypothyroidism. Maternal hypothyroidism is associated with congenital hypothyroidism in the newborn. If left untreated, the condition is associated with impaired cardiac function, an increased risk for cardiovascular disease. In extreme cases if left untreated can be fatal. Normalising thyroid hormone levels reverses cardiovascular abnormalities and reduces morbidity; it is important to initiate treatment early.

Causes: iodine deficiency, idiopathic hypothyroidism, primary hypothyroidism, Hashimoto's thyroiditis, post-partum thyroiditis, secondary to pituitary disease, irradiation or surgical removal of thyroid gland, invasive fibrous thyroiditis, drug therapy e.g. lithium. Hypothyroidism is ten times more common in women than men.

Clinical features

These are nonspecific and may be confused with other conditions, especially in the elderly.

Symptoms: fatigue, depression, daytime sleepiness, weight gain, bloating, hair thinning, dry skin, constipation, excessive sensitivity to cold, muscle weakness, subfertility, irregular or heavy periods, cognitive impairment in the elderly.

Signs: Weight gain, bradycardia, hair thinning, cool dry skin, facial puffiness (myxoedema facies). Some patients with hypothyroidism have goitre, but in others no goitre is present.

Investigations

Have a low threshold for testing in the following risk groups: history of or first-degree relative with autoimmune disorders (e.g. diabetes), first-degree relative with hypothyroidism, elderly, pregnant or post-partum women, history of thyroid surgery or upper chest irradiation, patients with goitre.

Diagnosis of hypothyroidism is based on a raised thyroid stimulating hormone (TSH), TSH has a 30% diurnal variation. If TSH is raised, repeat the TSH level, and request T4 at that time.

Management

Triage

Any patient with tachycardia, bradycardia, palpitations, chest pain, or dyspnoea should be transferred to the treatment room, ABCs assessed, and treatment initiated with urgent doctor review.

Treatment

Treatment is with L-thyroxine. Treatment is usually recommended only in patients who are symptomatic where the TSH is ≥ 10 mU/L.

SYMPTOMS	TSH	T4	TREAT WITH LEVOTHYROXINE
YES OR NO	≥ 10 mU/L	low	Yes
YES	≥ 10 mU/L	normal	Yes
NO	≥ 4.5 and < 10 mU/L	normal	Check TSH in 3 months Treat if TSH ≥ 10 mU/L, symptoms develop or planning a pregnancy Monitor TSH yearly if TSH is persistently raised but < 10 mU/l
YES OR NO	< 4.5 mU/L	low	No. Needs referral. Secondary cause needs Ix

- Start Levothyroxine at 1.6 mcg/kg body weight (usually 50-100 mcg) daily.
- In patients over 60 years or with ischaemic heart disease, start at a low dose and titrate slowly: start at 25 mcg daily, increasing every 3-6 weeks until euthyroid.
- Usual maintenance dose is 100-200 mcg daily.

Once levothyroxine has been started, it may take months for symptoms to resolve.

Assessment and monitoring

- Aim: Improve symptoms and TSH in lower range: 0.4-2.5 mU/L
- Repeat TSH 6-8 weeks after initiation of treatment or after any dose change
- Once stable, TSH should be checked once a year
- Avoid TSH ≤ 0.1 mU/L. A TSH of 0.1-0.4 mU/l acceptable in younger patients but not those > 60 years. Reduce dose of levothyroxine if TSH is too low
- Older people may need a dose reduction with time, as their metabolism and body weight changes.
- If patients fail to improve clinically, consider other autoimmune causes of their symptoms.

Pregnancy

- If a woman with established hypothyroidism becomes pregnant, (increase total dose by approximately 30%). Check TSH every 4 weeks in the first trimester and then once per trimester if stable. Aim: TSH 0.4-2.0 mU/L.
- Treat subclinical hypothyroidism in a woman planning to conceive or who has just become pregnant.

Hypothyroidism and HIV/TB

HIV: Subclinical hypothyroidism and isolated low T4 seem to be more common in patients with HIV than in the general population and is associated with use of antiretroviral drugs including Stavudine. Overt hypothyroidism has a similar prevalence to that of the general population. Onset of hyperthyroidism has been associated with Immune Reconstitution Syndrome and may cause weight loss. Check TSH and free T4 in HIV patients with symptoms of thyroid disease.

TB: Increased rates of hypothyroidism have been associated with MDR-TB treatment with p-aminosalicylic acid (PAS), ethionamide and prothionamide. Check TSH in all patients on MDR-TB treatment which includes these drugs.

Hyperthyroidism

Background and clinical features

Thyrotoxicosis is a disease caused by excessive concentrations of free thyroid hormones (most often T4). Many of the clinical features of thyrotoxicosis relate to sympathetic overactivity, causing tremor, tachycardia, and sweating producing weight loss, fatigue and heat intolerance. The level of catecholamines is normal but the excess thyroid hormones seem to potentiate the action of the catecholamines. Hyperthyroidism is extremely common, affecting perhaps 2 to 5% of all females at some time in their lives. The vast majority of cases are caused by intrinsic thyroid disease; a pituitary cause is extremely rare.

Investigations

High levels of free thyroid hormones in combination with low levels of TSH, indicates hyperthyroidism due to autonomous activity of the thyroid.

Management

- Beta blockers should be considered in all patients with significant hyperthyroidism. Beta blockers ameliorate many of the acute symptoms of hyperthyroidism – e.g. tachycardia, tremor, restlessness - within 1-2 days of starting therapy but do not affect the underlying disease. Propranolol is used customarily but other non-selective beta blockers are equally useful; atenolol requires only daily administration and may increase compliance. If initiated, beta blockers should be continued until the patient is rendered euthyroid by other means of treatment. Beta blockers are contra-indicated in patients with brittle asthma should be used with caution in patients with heart failure
- Carbimazole is prescribed to treat hyperthyroidism, initially 20 mg per day, increasing to 40mg after 4 weeks if required. Treatment then follows a gradual dose titration regime to 10 mg /day (the lowest dose that controls symptoms). Symptomatic improvement is often detected within 3-4 weeks and normal T3 and T4 values are achievable within 2-3 months. Treatment is usually continued for 18 months. Over 50% relapse within 2 years with a small continuing relapse rate thereafter. Most relapses occur within 4 years.

Thyrotoxic crisis (Thyroid storm)

This is a rare but life-threatening complication of thyrotoxicosis caused by excessive release of thyroid hormone. More than 2/3 of the cases are female and it can occur at any age. If left untreated it has a 90% mortality rate. Patients may have a pre-existing diagnosis of hyperthyroidism or this may be the initial presentation.

The diagnosis is clinical and usually most of the following signs/symptoms are present:

- 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, diarrhoea, jaundice and abdominal pain
- Neurological symptoms - anxiety, altered behaviour, seizures/coma

Once recognised – treatment should be started immediately – see emergency section for details.

Medications Used for Thyroid Conditions



DRUG (CLASS)	DOSE	SIDE EFFECTS/ COMMENTS
<p>LEVOTHYROXINE</p>	<p>Start Levothyroxine at 50-100 mcg per day (approximately 1.6 mg/kg daily).</p> <ul style="list-style-type: none"> In patients over 60 years or with ischaemic heart disease, start at a low dose and titrate slowly. Start at 25 mcg daily, increasing every 3-6 weeks until euthyroid. <p>Levothyroxine should be taken at least 30 minutes before breakfast, caffeine-containing liquids (e.g. coffee, tea) or other medication. Usual maintenance dose: 100-200 mcg once daily.</p>	<p>Reduces cardiovascular complications.</p> <p>Side effects: usually only at excess doses; diarrhoea, vomiting, anginal pain, arrhythmias, palpitation, tachycardia, tremor, restlessness, excitability, insomnia; headache, flushing, sweating, fever, heat intolerance, weight-loss, muscle cramp, and muscular weakness; hypersensitivity reactions including rash, pruritus and oedema</p> <p>Cautions: panhypopituitarism or predisposition to adrenal insufficiency (initiate corticosteroid therapy before starting levothyroxine), elderly, cardiovascular disorders, long-standing hypothyroidism, diabetes insipidus, diabetes mellitus (dose of antidiabetic drugs including insulin may need to be increased).</p> <p>Contraindicated: thyrotoxicosis</p> <p>Pregnancy: may cross placenta; either too much or too little maternal thyroid hormone is harmful to the foetus. See “pregnancy” below.</p>
<p>CARBIMAZOLE</p>	<p>Start with 20 mg and increase after 4 weeks to 40mg if required. Once stable, reduce to minimum dose that controls symptoms (normally 10 / 20 mg /day). Treatment is normally required for 12-18 month.</p>	<p>Side effects: Rashes and pruritus are common but they can be treated with antihistamines</p> <p>Cautions: In children, seek specialist advice before starting. Patient should be asked to report symptoms and signs suggestive of infection, especially sore throat, as this may indicate agranulocytosis. A white blood cell count should be performed if there is any clinical evidence of infection, and Carbimazole should be stopped promptly if there is clinical or laboratory evidence of neutropenia.</p> <p>Contraindicated: Breastfeeding</p> <p>Pregnancy: crosses placenta, avoid in 1st trimester (seek specialist advice), in 2nd /3rd trimester give lowest dose possible.</p>

5. Epilepsy

Background

Epilepsy is a chronic disorder, the hallmark of which is recurrent, unprovoked seizures. Recurrent seizures occur as a result of spontaneous paroxysmal discharges of neurons due to a genetically determined or acquired brain disorder. Epilepsy affects 40 million people worldwide. Incidence is higher in low-income countries than elsewhere due to higher rates of infection that cause brain injury as well as higher rates of traumatic head injury. It is often under-diagnosed and inadequately managed and may be associated with significant stigma.

Causes of seizures

Most **seizures** are not due to epilepsy. A seizure is an event. Acute seizures may occur as part of an infectious illness or a metabolic imbalance. Causes of seizures include: febrile seizures, meningitis, cerebral malaria, shigellosis, eclampsia, hypoglycaemia, hyponatraemia, alcohol withdrawal, drug effects.

Epilepsy, on the other hand, is a condition characterised by **recurrent** seizures – hence a diagnosis of epilepsy should never be based on a single seizure. In 70% of cases of epilepsy, no cause is found and the epilepsy is denoted as ‘idiopathic’. In 30%, a cause can be identified, including:

- Previous intra-cerebral infection: neurocysticercosis, tuberculoma, schistosomiasis, paragonimiasis, toxoplasmosis, hydatid cyst, toxocariasis, cerebral malaria, cerebral amoebiasis, syphilitic gumma, HIV, meningitis, or encephalitis
- Brain injury – violent or accidental head injury e.g. road traffic accident or antenatal brain injury; unknown
- Inherited, metabolic, and degenerative disorders (e.g. inborn errors of metabolism)
- Brain tumour or metastases
- Cerebrovascular disease

There are also a number of conditions that cause **attacks that can be mistaken for seizures**: syncope (including arrhythmias), TIA and CVA, sleep disorders, drop attacks, and migraine can all cause sudden collapse, sometimes associated with abnormal movements, which must be differentiated from seizures. Stress and emotional states can induce psychogenic non-epileptic seizures (pseudoseizures), which can easily be confused with epilepsy. It can be difficult to distinguish pseudoseizures from seizures but a careful history may help.

Types of seizures

Some seizures are **generalised** (affecting the whole cerebral cortex), resulting in immediate alteration of consciousness. This may take the form of an absence seizure, myoclonic jerking, generalised tonic-clonic seizures.

Many seizures are **focal** (involving only part of the cerebral cortex) resulting in localised symptoms such as twitching of one part of the body. Consciousness may not be affected, but often seizures that start focally do become generalised, resulting in an altered state of consciousness.

It is important to be aware that people with epilepsy may face significant stigma. It may well be ascribed to spirit possession or mental illness. A person with epilepsy can be ostracised by their community- loss of work, marriage prospects etc. Making the diagnosis of epilepsy thus carries the risks of stigma and inappropriate treatment, and should never be made after a single seizure episode.

Clinical features

History of seizure

A clear history from the patient and an eye witness to the attack gives the most important diagnostic information and is key to diagnosis, together with medication history, past medical history, and family history.

ASK THE PATIENT:

1. What were you doing at the time? Being in an upright position is a potential trigger for postural hypotension.
2. Any warnings symptoms? Dizziness or *visual* warnings are unusual in epileptic seizures.
3. Any loss of consciousness? Definite loss of consciousness excludes simple falls or TIA. Tongue biting or incontinence
4. What happened afterwards?
5. Do they take any medications, alcohol or drugs and any recent change?
6. Any witness to the event?
7. What time did it happen?
8. How long did it last and how did you feel afterwards?
9. Any previous history of seizures?

ASK THE WITNESS:

1. What was the person doing at the time?
2. Did you notice anything, or did the person complain of anything before it happened?
3. Did they lose consciousness, become unresponsive, or seem unaware that you were there? How long for?
4. Were they still, or did they twitch, jerk or move around? Did their head turn to one side, if so, which? Did they twitch or move more on one side of the body than the other?
5. What happened after the event? Were they confused, nauseated or aggressive? Was their speech altered? Did they know who you were and where they were? Was there incontinence, vomiting, biting the inside of their mouth or tongue?
6. Did anyone try to take the patient's pulse?

- There may be an identifiable trigger of the seizure: sleep deprivation, fevers or other illnesses, flashing bright lights or patterns, alcohol or drug use, stress, menstrual cycle (women) or other hormonal changes, low blood sugar, specific foods, excess caffeine or other products.
- There may be a warning ('aura') at the start of the seizure, such as seeing flashing lights, or jerking movements in one part of the body. If this settles without alteration of consciousness, this is considered to be a focal seizure without impairment of consciousness.
- Often a focal seizure will evolve into a state of impaired consciousness (focal seizure with impairment of consciousness. Typically, the patient will appear to be awake but not in contact with others (absence state). They will not respond to questions, and may show automatisms such as grimacing, repeating words. Alternatively, the focal seizure may evolve into any other generalised seizure type (below)
- Occasionally, the patient may enter immediately into a state of altered consciousness, without a warning (aura) – this is referred to as a generalised seizure. This may be an absence state (as above); generalised tonic-clonic seizure (sudden loss of consciousness with jerking tonic-clonic movement of all four limbs, sometime tongue-biting and incontinence of urine or faeces); clonic seizure (rhythmic jerking movements of arms, neck and face); myoclonic seizures (sudden jerks of one limb); tonic seizures (sudden muscle stiffening) or atonic seizures (sudden loss of control of muscles).
- After a seizure affecting consciousness, the patient may be confused, drowsy, fail to remember the onset, have a headache, myalgia, and a tendency to sleep.

Examination and investigations

- After a first seizure, examine cardiac and neurological systems, including fundi. Look for raised intracranial pressure, assess mental state. In children, carry out a developmental examination.
- **Blood** biochemistry: electrolytes, glucose, and calcium
- **ECG** is recommended in adults to exclude non-seizure phenomena of cardiac origin
- **Electroencephalography (EEG)** is not needed routinely to diagnose epilepsy and a normal EEG does not out-rule epilepsy. EEG can support the classification of seizure type/syndrome when there is doubt.

If seizure appears focal, look for a **treatable underlying cause**, particularly infection. MRI is best (CT second choice) if an intracranial cause is suspected. MRI is also recommended in children who develop epilepsy under the age of two or in patients of any age whose seizures continue despite first-line medications

Management of epilepsy

Patient education for self-management

Explaining epilepsy: Provide the patient with information on what epilepsy is, how it is treated, and how - with the medication and information you are giving them - they should be able to live a normal life. Allow the patient to talk about any fears they may have regarding their condition and provide them with the information below.

Reducing the risk of seizures: Provide the patient with a seizure diary and ask them to write down the date, time, and possible trigger of each seizure they have. This will help the patient learn what triggers their epilepsy, and avoid that trigger. Encourage them also to reduce alcohol intake; find a way of ensuring they take their medication as prescribed; attend follow up appointments to ensure they do not run out of medication.

Safety: Inform the patient he/she may be at risk of further seizures and possible injury. Avoid high risk situations: cycling on busy roads, working at heights, being near open fires/flames, swimming alone, taking baths (shower is safer), standing too close to pavement/platform edges, operating dangerous machinery, working alone, driving.

First Aid for convulsive seizures (teach to friends and family): Protect the person from injury (remove harmful objects from nearby), cushion their head, place in the recovery position once the seizure has finished, and stay with them until the recovery is complete. Don't: restrain the person OR put anything in the person's mouth OR move them unless they are in danger OR give them anything to eat or drink until they are fully recovered

Medication and adherence: Explain to the patient that they are likely to be on medication for the rest of their life (although AEDs can sometimes be discontinued if the patient remains seizure-free for 2 years). Explain the medication prescribed to the patient and when and how to take it, the possible side effects. and the importance of adhering to their medication.

When to seek medical attention: Ensure the patient understands the importance of attending all follow-up appointments and when to seek medical attention, for example if their seizures become more frequent. Following a first seizure, provide information to patient and family about how to recognise a seizure, first aid, and the importance of reporting a further attack to a doctor.

Women of childbearing age: All women of childbearing age with epilepsy should take folic acid 5mg daily to reduce the risk of congenital malformations. See below for detailed advice regarding contraception and advice to be given to women if planning a pregnancy.

Pharmacological treatment

- **Start anti-epileptic drugs (AEDs) after a second epileptic seizure.** Initiate AEDs in discussion with patient and carer/family after a full discussion of risks and benefits. Take into account the patient's predominant seizure type, prognosis, and lifestyle. See table below for choice of AED.
- Start AED after **first** unprovoked tonic-clonic seizure if the patient has had a history of previous myoclonic, absence or focal seizure OR has positive EEG findings or a structural brain disorder or if the patient/family finds the risk of a repeat seizure unacceptable.
- **Provoked seizures: metabolic disturbances or drugs:** correct or withdraw the provoking factor; **alcohol or substance misuse:** refer to addiction support services if available; **acute brain injury, neurosurgery or concussive convulsions:** no need for long-term AEDs.

Anti-epileptic drugs by predominant seizure type (using 2017 ILAE classification)

CLASSIFICATION				AED 1 ST LINE	AED 2 ND LINE	CONSIDER	AVOID – MAY WORSEN
Focal onset	Aware	Motor onset Non-motor onset	Focal to bilateral tonic-clonic	Carbamazepine	Sodium valproate Levetiracetam	Phenytoin Phenobarbital	
	Impaired awareness						
Generalized onset	Motor	Tonic-clonic Other motor		Sodium valproate*	Levetiracetam	Carbamazepine Phenytoin Phenobarbital	
	Non-motor	Absences		Sodium valproate*			Carbamazepine Phenytoin
Unknown onset	Motor	Tonic-clonic Other motor – epileptic spasms	Unclassified	Sodium valproate*	Levetiracetam		Carbamazepine Phenytoin
	Non-motor	Behaviour arrest		Sodium valproate*	Levetiracetam	Phenobarbital	Carbamazepine Phenytoin

- **Women of childbearing age: Women of childbearing age with epilepsy should have seizures controlled as well as possible with the minimum dose of antiepileptic drug taken in monotherapy, wherever possible. Levetiracetam is the drug of choice if available. If not available, Carbamazepine is an option. Antiepileptic drug polytherapy should be avoided. Sodium Valproate should be avoided if possible. All women of childbearing age with Epilepsy should take Folic acid 5mg daily.**
- **Treatment sustainability is essential so ensure that drugs being started are likely to be available longer term to the patient**
- If seizure appears focal, look for a treatable underlying cause, particularly infectious. If available use CT, or better MRI
- Persist with a first line drug until it has been used at its maximum dose before considering a change.
- Re-evaluate the diagnosis of epilepsy if events/attacks continue despite an optimal dose of first-line AED.
- **Changing AED:** introduce the new drug at its starting dose and slowly increase to its mid-range, then start to slowly decrease the dose of the old drug.
- Combination therapy should be considered when treatment with two first line AEDs has failed or improved control occurs during the process of phased substitution.
- The choice of drug combination should match the patient's seizure type(s) and should be limited to 2 or maximum 3 AEDs.
- Measurement of AED blood levels is not needed routinely. It may be useful in adjustment of phenytoin dose, assessment of adherence or toxicity or if metabolism may change e.g. during pregnancy, if unexplained loss of seizure control.
- **Stopping AEDs:** consider in patient's seizure-free for 2 years. Ideally stopping AEDs is done under specialist supervision. Discuss risks and benefits with patient and carer/family. Withdraw slowly over 3 months. If taking barbiturates or benzodiazepines, withdraw over 6 months. If seizures recur at home, ask patient to reverse the last dose reduction and seek medical care.

ANTI-EPILEPTIC DRUG	DOSE	SIDE EFFECTS
Carbamazepine	<p>Child: initially 5 mg/kg once daily or in 2 divided doses, increase every 2 weeks up to 10 to 20 mg/kg/day in 2 to 4 divided doses</p> <p>Adult: initially 100 to 200 mg once daily or in 2 divided doses, then increase by 100 to 200 mg increments every 2 weeks up to 800 to 1200 mg/day in 2 to 4 divided doses.</p>	Allergic skin reactions, including urticaria, which may be severe. Accommodation disorders, for example blurred vision, diplopia, ataxia and nausea. Particularly at the start of treatment, or if the initial dose is too high, certain types of adverse reaction occur very commonly or commonly.
Levetiracetam	<p>1. Monotherapy of focal seizures: Adult and child > 16 years:: initially 250 mg once daily increased after 1–2 weeks to 250 mg twice daily; thereafter, increased according to response in steps of 250 mg twice daily every 2 weeks; max. 1.5 g twice daily.</p> <p>2. Adjunctive therapy of focal seizures: Adult and child over 12 years, weight > 50 kg, initially 250 mg twice daily, increased by 500 mg twice daily every 2–4 weeks; max. 1.5 g twice daily; Child > 6 months, weight < 50 kg, initially 10 mg/kg once daily, increased by max. 10 mg/kg twice daily every 2 weeks; max. 30 mg/kg twice daily; Child 1–6 months, initially 7 mg/kg once daily, increased by max. 7 mg/kg twice daily every 2 weeks; max. 21 mg/kg twice daily.</p> <p>3. Adjunctive therapy in myoclonic or tonic-clonic seizures: Adult and child over 12 years, weight > 50 kg, initially 250 mg twice daily, increased by 500 mg twice daily every 2–4 weeks; max. 1.5 g twice daily; Child 12–18 years, weight <50 kg, initially 10 mg/kg once daily, increased by max. 10 mg/kg twice daily every 2 weeks; max. 30 mg/kg twice daily</p>	<p>Gastrointestinal side effects, cough, nasopharyngitis, vertigo, drowsiness, ataxia, convulsion, dizziness, headache, tremor, malaise, aggression, depression, insomnia, anxiety, irritability, rash; <i>less commonly</i> weight changes, paraesthesia, agitation, confusion, psychosis, suicidal ideation or rare suicide, haematopoietic complications including anaemia and agranulocytosis, myalgia, blurred vision, diplopia, alopecia, eczema, pruritus; <i>rarely</i> pancreatitis, hepatic failure, dyskinesia, hyponatremia, toxic epidermal necrolysis, Stevens-Johnson syndrome, erythema multiforme.</p> <p>In severe hepatic impairment, halve the dose. In renal impairment adjust dose according to eGFR if available, maximum 2 g per day in mild, 1.5 g per day in moderate and 1 g per day in severe renal impairment.</p> <p>Pregnancy: recommended in women of childbearing age. Women taking other anti-epileptic drugs who wish to become pregnant should be slowly switched to Levetiracetam and started on Folic Acid 5 mg daily.</p> <p>Breastfeeding: Not easily transferred in breast milk. Infants should be monitored for sedation, feeding difficulties, adequate weight gain, and developmental milestones.</p>

Phenobarbital	<p>Child: initial dose of 3 to 4 mg/kg once daily or in 2 divided doses, increase to 8 mg/kg/day if needed. Adult: initial dose of 2 mg/kg once daily at bedtime (up to 100 mg maximum) then increase gradually if necessary, to maximum dose of 6 mg/kg/day divided in 2 to 3 doses.</p> <p>Status Epilepticus: Neonates and children under 12 years: one dose of 20 mg/kg (max. 1 g). If necessary, a second dose of 10 mg/kg may be administered 15 to 30 minutes after the first dose (if administered by IV infusion) or 60 minutes after the first dose (if administered by IM injection). Children over 12 years and adults: one dose of 10mg/kg (max.1g). If necessary, a second dose of 5 to 10 mg/kg may be administered 15 to 30 minutes after the first dose. <i>For administration by IV infusion:</i> Dilute the required dose in a 100ml pouch of 0.9% sodium chloride or 5% glucose for patients weighing 20 kg or more and in 5 ml/kg of 0.9% sodium chloride or 5% glucose for children weighing less than 20 kg. Administer over at least 20 minutes. Do not administer more than 1mg/kg/minute. If the required dose is less than 1 ml, use a 1 ml syringe graduated 0.01 ml. <i>For administration by IM injection:</i> May be used undiluted. If the required dose is less than 1 ml, use 1 ml syringe graduated 0.01 ml.</p>	<p>Drowsiness, lethargy and mental depression. In addition, allergic skin reactions and hyperkinesia. Do not administer in patients with severe respiratory depression.</p> <p>Do not administer by SC route (risk of necrosis). Administer with caution in the elderly, children and patients with respiratory insufficiency. May cause:</p> <ul style="list-style-type: none"> • dose dependant respiratory depression (enhanced by diazepam), drowsiness; cutaneous and allergic reactions, sometimes severe. • hypotension, apnoea, laryngospasm, shock, especially if administered too rapidly by IV route. <p>Monitor respiration and blood pressure closely during and after administration. Ensure that respiratory support (Ambu bag via face mask or intubation) and IV solutions for fluid replacement are ready at hand.</p> <p>Avoid combination with central nervous system depressants (opioid analgesics, sedatives, H1 antihistamines, etc.).</p> <p>Pregnancy and breast-feeding: risks linked to status epilepticus appear greater than risks linked to phenobarbital. Do not mix with other drugs in the same syringe or infusion bag.</p> <p>Phenobarbital is subject to international controls: follow national regulations.</p>
Phenytoin	<p>Child: 3 to 8 mg/kg/day in 2 to 3 divided doses. Adult: 2 to 6mg/kg/day in 2 to 3 divided doses; do not exceed 500 to 600 mg/day</p>	<p>Hypersensitivity reactions including skin rash. Drowsiness, ataxia and slurred speech common, dose related. In children, coarsening of facial features, gingival hyperplasia and hirsutism rare. Some haemopoetic complications including anaemias (usually respond to folic acid). Motor twitchings, dyskinesias, tremor and mental confusion rare.</p>
Sodium valproate	<p>Child under 20 kg: 20 mg/kg/day in 2 divided doses– Child over 20kg: initially 400mg (irrespective of weight) in 2 divided doses, then increase the dose gradually until the optimal dose is reached, usually 20 to 30 mg/kg/day in 2 divided doses. Adult: initially 600mg/day in 2 divided doses, then increase by 200mg every 3 days until the optimal dose is reached, usually 1 to 2 g/day in 2 divided doses (20 to 30 mg/kg/day)</p>	<p>Sedation and tremor. Transient hair loss, sometimes dose related. Regrowth normally begins within 6 months. Weight gain. Gastric disorders frequently at the start of treatment. Occasionally, hyperactivity, aggression and behavioural deterioration. Severe liver damage is rare. Most at risk are aged under 3 years. Transient liver enzymes increase common, particularly at the beginning of therapy. Encephalopathy and pancreatitis rare. Blood dyscrasias may occur frequently; revers on drug discontinuation. Associated with amenorrhoea and irregular periods. Sodium valproate is associated with a higher risk of foetal malformations if taken in pregnancy.</p>
Diazepam	<p>Benzodiazepine for use in the management of acute seizures. Rectally: Child: 0.5 mg/kg, maximum 10 mg Adult: 10 mg stat IV or IO Use: Dilute 10 mg (2 ml) of Diazepam in 8 ml of 5% glucose or 0.9% sodium chloride. Child: 0.3 mg/kg over 2 or 3 minutes if means of ventilation are available (Ambu bag and mask). Adult: 10 mg. If seizure continues after 1st dose, repeat dose after 5 minutes if IV dose or 10 minutes if oral/IO. If seizure continues after 2nd dose, treat as status epilepticus</p>	<p>May cause: a feeling of inebriation, drowsiness (administer with caution when driving or operating machinery); dependence and tolerance when used for more than 10-15 days. At the end of treatment, reduce doses gradually to avoid withdrawal syndrome or rebound effect.</p> <p>In the event of overdose: ataxia, muscular weakness, hypotension, confusion, lethargy, respiratory depression, coma.</p> <p>Reduce the dose by one half in elderly patients and in patients with renal or hepatic impairment. – risk of increased sedation when combined with alcohol and drugs acting on the central nervous system: opioid analgesics, neuroleptics (chlorpromazine, haloperidol, etc.), anti-histamines (chlorphenamine, promethazine), antidepressants (clomipramine, fluoxetine, etc.), phenobarbital, etc.</p>

Assessment and monitoring

- Record seizure frequency and type; review seizure diary if available.
- Give information on common, avoidable triggers, and advise patients about seizure prevention. Consider other precipitating factors for break-through seizures (lifestyle, diet, alcohol intake, non-adherence, comorbidity, and other medications).
- Check patient understanding of medication dose and frequency, and monitor their adherence. Adjust dosages based on efficacy and tolerability.
- Assess medication side effects, especially drowsiness/concentration/visual/weight/hair loss/headache/ataxia/agitation/tremor/menstrual disturbance/gum swelling etc.

Special circumstances

HIV/TB: Patients on ART or treatment for TB should be treated with Levetiracetam where available, since it has the fewest interactions. When not available, Sodium Valproate is the best alternative.

Women of childbearing age: Women of childbearing age with epilepsy should have seizures controlled as well as possible with the minimum dose of antiepileptic drug taken in monotherapy, wherever possible. Levetiracetam is the drug of choice, if available. If not available, Carbamazepine is an alternative⁵⁸. Anti-epileptic drug, polytherapy, should be avoided. Sodium Valproate should be avoided, if possible. All women of childbearing age with epilepsy should take folic acid 5mg daily.

Pregnancy: Discuss pregnancy planning with women of childbearing age. With pre-conception planning and good seizure control, 95% of women with epilepsy have successful pregnancy outcomes. Advise women to inform their doctor before starting to try to conceive, commence folic acid 5 mgs daily, if not already taking this, and seek specialist advice to optimise treatment. Treatment should be optimised before contraception is stopped. Aim for seizure control with the minimum dose of a drug taken in monotherapy. Some AEDs are associated with congenital malformations such as neural tube defects. If possible, use Levetiracetam. AED, polytherapy, should be avoided. Sodium Valproate should be avoided, if possible. A child born to a woman taking enzyme-inducing AEDs in pregnancy should be given 1 mg of Vitamin K IM at birth.

Breast feeding: Breast feeding is safe and appropriate for women with epilepsy on phenytoin, carbamazepine, and valproic acid as these AEDs are not secreted to any significant extent in breast milk. Phenobarbitone in breast milk may cause neonatal drowsiness and apathy. Close monitoring is advised. Although levetiracetam is secreted into breast milk, neonatal concentrations are low. Breastfeeding is probably acceptable in full-term neonates, but close clinical monitoring is advisable. In low-income countries risks and benefits of breast feeding should be balanced.

Menopause: Discuss menopause with women before its onset as the frequency of seizures may change (↑ or ↓) and the dose of AEDs may need adjustment. **Osteoporosis risk** is increased with phenytoin, carbamazepine, phenobarbital and valproate. Consider calcium and Vit D supplementation in at risk patients.

Contraception counselling: All women of childbearing age with epilepsy should take folic acid 5mg daily regardless of whether they are planning a pregnancy or not, and should be encouraged to use contraception. Many AEDs interact with oral hormonal contraception. **Levonorgestrel** intra-uterine device or **depo Provera** are good options for women with epilepsy. **The combined oral contraceptive pill (COCP):** If taking an **enzyme-inducing AED** (Carbamazepine, Phenobarbital, Phenytoin), the COCP should contain 50 mcg or more of oestrogen daily. A combination of COCPs can be prescribed to ensure the oestrogen dose is at least 50 mcg (e.g. levonorgestrel/ethinyloestradiol 30mg pill, two daily). If breakthrough bleeding occurs this suggests that this method is ineffective. Women who are not taking an enzyme inducing AED can be prescribed the COCP.

6. Cardiovascular disease and hypertension

Angina and ischaemic heart disease (IHD)

Background

Angina is a term used for chest pain caused by reduced blood flow to the heart muscle. Angina is most commonly a symptom of coronary artery disease. Angina is typically described as squeezing, pressure, heaviness, tightness, or pain in the chest.

Clinical features

Suspect angina if chest pain brought on by activity, eating, cold, or emotion. Often described as a tight band (belt) around chest/heaviness/burning or choking sensation/ patient may indicate pain by placing hand on sternum. Pain may go up to jaw, back, or down left arm. May be associated with breathlessness, nausea, sweating, and palpitations. Pain goes away within a few minutes of resting. May present as breathlessness alone or decreased exercise tolerance.

Note that women, elderly patients, and patients with diabetes are more likely to present with atypical symptoms (pain in neck or arm, nocturnal pain, breathlessness without pain).

Investigations

Exclude acute MI with ECG (if available) – refer to hospital if in doubt.

- Exercise ECG can help diagnose suspected angina, but may be normal between attacks; if unavailable do 'trial of treatment'.
- Check for anaemia, thyrotoxicosis, CXR if suspected pulmonary oedema or in a high TB prevalence area.

Management *(adapted from PCI field guide 2014)*

For symptom relief of IHD keep moving up the following steps until symptoms controlled

1. **GTN (glyceryl trinitrate) 0.5mg sublingual** when pain occurs OR take before taking part in activity likely to cause pain. Side effects: flushing, headache/light headedness
2. Attacks occurring more than once a week, **add Beta-blocker e.g. bisoprolol** start at 2.5mg and increase to max of 10mg od. Never in asthma – can use calcium channel blocker if B-blocker contraindicated
3. If still getting regular pain add a **non-rate limiting calcium channel blocker e.g. amlodipine** (avoid verapamil/diltiazem – may cause heart failure)
4. If still getting pain add a **long acting nitrate e.g. isosorbide dinitrate** – start at 5mg three times a day increasing to max 40mg three times a day)

Hypertension¹³

Background

Hypertension is one of the most important and preventable causes of cardiovascular disease, including stroke, and renovascular disease; treatment reduces the risk of cardio- and renovascular death and disability. Most people with hypertension have no symptoms; however if left untreated, progressive rise in blood pressure and risk of complications is expected.

Primary or essential hypertension accounts for 90% of cases - there is no known cause. Incidence increases with age. There may be a family history of hypertension.

Secondary hypertension accounts for 10% of cases; resulting from conditions such as renal disease, adrenal gland tumours, some medications, illicit drug use (e.g. cocaine and amphetamines), alcohol misuse.

Diagnosis of hypertension

Make sure the patient is seated, relaxed, has not smoked in the last hour and does not talk (talking makes blood pressure rise). Try to put the cuff onto the bare arm - one layer of clothing is acceptable but more makes the reading less accurate. Use the correct size cuff to avoid over- or underestimating the blood pressure - upper arm circumference >33cm requires a large cuff with a bladder (part that fills with air) 12x40cm (standard cuff bladder 12x26cm).

- If the first blood pressure measurement is >140/90, repeat >1 minute later.
- If still >140/90 on repeat, or if the second measurement is substantially different from the first, take a third measurement after the person has sat quietly for 30 minutes.
- If blood pressure remains >140/90, repeat measurements on 2 further occasions to confirm the diagnosis - for example, once a week for two more weeks.
- Use the average value of the measurements to confirm a diagnosis of hypertension:

Clinical staging of hypertension	
Blood pressure	Clinical stage
< 140/90	Normal – recheck BP in 5 years or sooner if clinically indicated
140/90 – 159/99	Stage 1
160/100 – 179/109	Stage 2
>180/110	Stage 3 - severe hypertension (See emergency management section for further details on treatment)

NOTE: if either the systolic or diastolic is elevated, treat according to the higher number; for example, a person with blood pressure 165/115 is in stage 3 (>180/110)

Initial assessment

- Assess for other cardiovascular disease risk factors
- Assess for end organ damage
- Consider secondary hypertension (especially if the person is <40 years)

¹³ This section does NOT apply to pregnant women: in pregnancy BP 140/90 or more can be a sign of pre-eclampsia which can be fatal: follow MSF Obstetric guideline for this

- Ask about smoking, alcohol intake, diet and exercise
- Record medical history and medications
- Record family history of hypertension or other diseases
- Check pulse - an irregularly irregular pulse suggests atrial fibrillation
- Check weight and height to determine BMI
- Complete cardiovascular examination - check for signs of congestive heart failure

Investigations

- Screen for diabetes - see diabetes section for diagnostic thresholds
- Renal function and urine dip for protein; if proteinuria present, ensure no urinary tract infection and repeat on 2 occasions; diagnose chronic kidney disease if positive
- If high suspicion of inflammatory cause (e.g. vasculitis), check CRP or ESR (not both)
- If palpitations, irregular pulse, arrhythmia and/or left ventricular hypertrophy suspected, check ECG (if available; not routinely)

Management of confirmed hypertension

Patient education and self-management

Advise

- **smoking cessation**
- reduced alcohol intake, if relevant
- salt intake <6g/day - salt is a major cause of hypertension
- weight control - if BMI >25m², lose 5-10% of body weight
- a low-fat, low-sugar diet
- exercise 2.5 hours/week, with activity that causes a light sweat; walking is encouraged.
- If on medication, verify that the person understands when and how to take them.
- If on medication, explain common adverse effects are and when to seek medical advice.
- Encourage attendance of follow up appointments.
- Explain the progressive nature of hypertension, with potentially increasing need for medication.

Pharmacological therapy

The following patients should be initiated on treatment:

- stage 2 or 3 hypertension
- stage 1 hypertension with
 - known cardiovascular disease
 - diabetes (any type)
 - chronic kidney disease (any category).

Target blood pressure is <140/90.

Principles of drug treatment

MSF encourages fixed-dose combination treatment to simplify management with the aim of reducing pill burden, potential adverse effects and titration steps while achieving better control; the majority of people will need 2 or more drugs to reach target.

Fixed-dose combination: telmisartan 40mg + amlodipine 5mg; begin with 1 tablet, increase to 2 tablets maximum as needed to achieve target <140/90; see flowchart on page 75.¹⁴

If individual drugs are used, 2 drugs at lower doses can be used (rather than increasing a drug to maximum dose before adding another agent). Comorbidities should be considered as shown:

Guide for prescribing antihypertensive drugs		
Condition / comorbid conditions	Medication classes	Exceptions / notes
Hypertension (isolated) and after haemorrhagic stroke	Diuretic Calcium channel blocker ACE inhibitor Beta blocker Spironolactone	Women of childbearing age – avoid diuretic and ACE inhibitor unless on reliable contraception
Hypertension and diabetes +/- chronic kidney disease	ACE inhibitor - 1st line Calcium channel blocker Diuretic Beta blocker	If ACE inhibitor not tolerated, try an angiotensin II receptor blocker
Hypertension and cardiovascular disease (heart failure / post MI / ischaemic heart disease) +/- diabetes and/or chronic kidney disease	ACE inhibitor - 1st line Beta blocker Diuretic Calcium channel blocker	Beta blocker contraindicated in asthma Patients should be on both ACE inhibitor and beta blocker to maximal tolerated dose

Additional medication

- If the person has known cardiovascular disease, diabetes (any type) and/or chronic kidney disease, follow the cholesterol-lowering and secondary prevention points below.
- **Do NOT offer aspirin** if no known cardiovascular disease (no evidence of benefit).

Individual antihypertensive medication initiation and adverse effects		
Drug	Dose	Side effects/Contraindications
DIURETIC e.g. hydrochlorothiazide - Avoid loop diuretics (e.g. furosemide) since they are less effective	Start at usual dose 12.5-25mg daily	Urinary frequency, electrolyte imbalance, gout Diabetes may get worse Avoid in women of childbearing age unless they have reliable contraception
ACE INHIBITOR (ACEi) e.g. Enalapril	Start at 5mg, increase to maximum of 40mg daily as needed / tolerated	Cough may start at any time, can take months to settle – if patient cannot tolerate use angiotensin II receptor blocker if available (see below) Renal impairment (rare) – check creatinine, if available, prior to initiation Contraindicated in aortic stenosis, renal artery stenosis, previous hypersensitivity Contraindicated in pregnancy
ANGIOTENSIN II RECEPTOR BLOCKER	Start 50mg once daily, (25mg in elderly) increase gradually to max 100mg	Caution: renal artery stenosis, mitral and or aortic stenosis or HOCM Contraindicated in pregnancy and breastfeeding

¹⁴Alternative fixed-dose combinations may be selected based on local protocols and/or availability, including telmisartan + hydrochlorothiazide, lisinopril + amlodipine, lisinopril + hydrochlorothiazide; corresponding changes in the flowchart protocol should be made and reviewed with the NCD Advisor.

(ARB) e.g. losartan		
CALCIUM CHANNEL BLOCKER e.g. amlodipine	Start at 10mg unless frail/old (start at 5mg) - usual dose 10mg daily	Ankle swelling
BETA BLOCKER e.g. bisoprolol	Start at 2.5mg and increase every 2-4 weeks to 10mg daily - usual dose 10mg daily	Lethargy, erectile dysfunction – common NEVER use if history of severe asthma (may trigger attack), uncontrolled heart failure, bradycardia, 2 nd and 3 rd degree AV block. Safe in COPD
Spirolactone (Can be very helpful in treatment resistant hypertension)	dose 25mg daily	Hyperkalaemia - should only be started where potassium can be monitored regularly

Assessment and monitoring

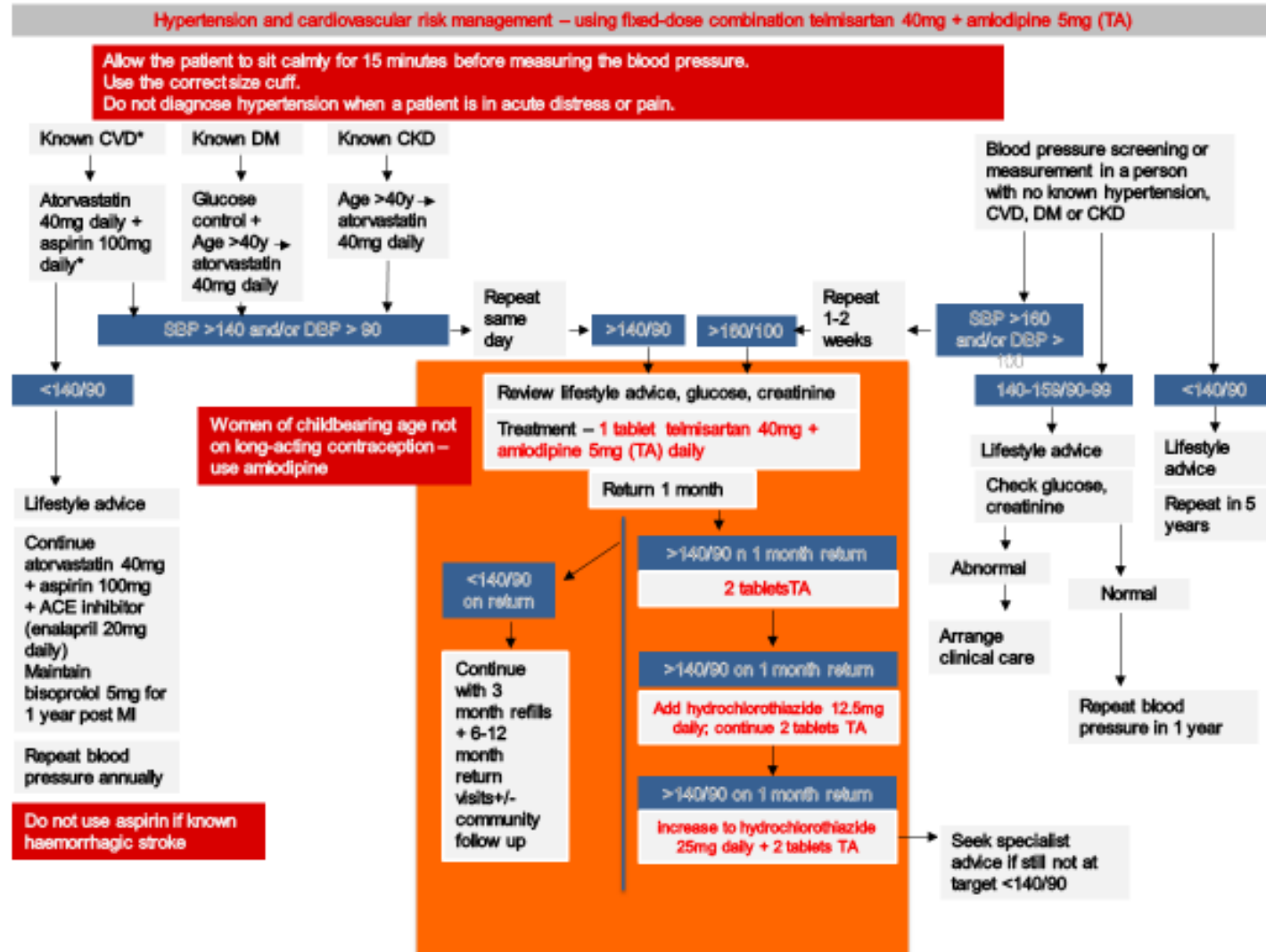
- Review 4-6 weeks after initiating a new antihypertensive or altering dose (it may take up to 6 weeks for maximal antihypertensive effect). Always verify adherence prior to changing dosage or adding medication.
- Once BP is well controlled at target <140/90, the person can return for review every 6-12 months:
 - Diet and lifestyle as above.
 - Blood pressure – measure every 4-6 weeks until stable at target (e.g. without medication changes for 3 months); once stable at target, measure every 6-12 months.
 - At each review, ask if dizziness on standing or any falls (suggests postural hypotension; may need to reduce BP drugs).
 - Examination: check pulse for atrial fibrillation and for signs of heart failure.
 - Medication: check adherence (how often are doses missed?) and ask about adverse effects – symptoms may affect adherence, e.g. erectile dysfunction.

Highest-risk categories eligible for cholesterol lowering

MSF identifies highest-risk categories for cardiovascular complications and prioritizes them for cholesterol-lowering treatment.

- Offer **atorvastatin 40mg daily** to people with
 - **known cardiovascular disease** (history of myocardial infarction, stroke, etc.)
 - **diabetes and age >40 years**
 - **high-risk chronic kidney disease** (if categorization possible, 3bA2 and higher) **and age >40 years**.
- Note that people in these categories who are also on protease inhibitors for HIV treatment should start with atorvastatin 10mg daily and increase to 20mg as tolerated.
- **Cholesterol testing is not required** given the standard dose of atorvastatin.

Hypertension and cardiovascular risk management using fixed-dose combination telmisartan 40mg + amlodipine 5mg



Secondary prevention of CVD

People with known cardiovascular disease require the following to reduce risk of further events, even if asymptomatic:

For ALL with known CARDIOVASCULAR DISEASE (except possible haemorrhagic stroke)

- **Lifestyle:** advise smoking cessation and reduced alcohol and caffeinated drinks intake at every visit
- **Diet:** advise reduced salt intake to <6g/day, and a low-fat¹⁵, low-sugar diet for all
- **Weight:** if BMI >25m², advise loss of 5-10% of body weight
- **Exercise:** advise 2.5 hours/week, with activity that causes a light sweat
- **Aspirin 75mg-100mg once daily;** clopidogrel can be used if aspirin hypersensitivity; neither aspirin nor clopidogrel should be used if increased bleeding risk
 - Antiplatelet therapy after TIA / stroke – aspirin 300mg for 14 days, then continue clopidogrel 75mg or aspirin 75mg lifelong
 - Antiplatelet therapy after MI (either NSTEMI or STEMI with PCI) – continue both clopidogrel 75mg daily **and** aspirin 75-100mg daily for 12 months then continue aspirin alone lifelong
- **Blood pressure control:** see above
- **Cholesterol lowering:** give atorvastatin 40mg; cholesterol testing is not required; review possible adverse effects; if statins are not available, encourage dietary modification

For angina, myocardial infarction, heart failure, peripheral arterial disease, treat as above and add

- **ACE inhibitor** (e.g. enalapril 20mg daily) - start with low dose (5mg) and increase at 2 weekly intervals to maximum tolerated dose; monitor blood pressure and clinical signs of adverse effects at each dose increase; angiotensin receptor blockers (ARBs) can be used if ACE not tolerated (due to cough)
- **Beta blocker** (e.g. bisoprolol 10mg) - start at 2.5mg and increase slowly (at monthly intervals) to maximum tolerated dose; contraindicated in asthma but not COPD; after myocardial infarction, use for first 12 months only (no benefit beyond this) unless heart failure (continue lifelong) or needed for angina control

After suspected HAEMORRHAGIC STROKE:

- **Lifestyle and diabetes screening, blood pressure control;** prescribe thiazide diuretic and ACE inhibitor prevent further strokes
- **Do NOT offer aspirin** (increased risk of further event) or statins (no benefit) Worldwide, 80% of strokes are thrombotic; so if unsure whether the stroke is haemorrhagic or thrombotic, it is better to treat as thrombotic - see stroke section for more details

¹⁵ The ideal diet for cardiovascular health is a Mediterranean style diet with mainly plant-based foods: fruit, vegetables, whole grains, legumes and nuts and pulses; replace unhealthy fats (butter, palm oil) with healthier oils, e.g. olive oil, sunflower oil if available; use herbs and spices instead of salt; limit red meat to a few times per month; eat oily fish twice a week and lean meat, e.g. poultry, or vegetarian meal at other times.

Congestive heart failure

Background

Congestive Heart failure occurs when the heart is unable to pump sufficiently to provide adequate blood flow to other organs, such as the brain, liver, and kidneys. Causes: Ischaemic heart disease, valvular heart disease including rheumatic heart disease, untreated congenital heart disease, chronic anaemia, hypertension, atrial fibrillation, cardiomyopathy including alcoholic cardiomyopathy, thyrotoxicosis. Early identification is crucial to reduce mortality and morbidity. Echocardiogram is the gold standard investigation for heart failure, with a majority showing reduced ejection fraction. About 25% of patients with heart failure will have a normal ejection fraction, which is typically due to long-standing hypertension that leads to myocardial stiffening and reduced filling capacity. The symptoms and signs are the same for both types of heart failure.

Clinical features

Symptoms and signs

Main symptom is breathlessness with activity or when lying flat (caused by fluid in lungs).

Other symptoms include:

- Persistent coughing or wheezing
- Build-up of excess fluid in body tissues (oedema)
- Unusual fatigue
- Lack of appetite or nausea
- Increased heart rate

Examination

Look for:

- Tachycardia, gallop rhythm, raised JVP
- Cardiac murmurs (rheumatic or congenital heart disease).
- Oedema: ankles may swell in right heart failure; may have ascites if severe.
- Fine crepitations especially in lower zones of the lungs. Wheeze may be present.

Investigations

Echocardiogram is the gold standard test, but is not widely available in MSF settings.

- Electrocardiogram
- Chest x-ray may show an enlarged heart (cardiomegaly) or pulmonary oedema and can help exclude other diseases that cause breathlessness, especially COPD, TB, lung cancer
- Blood tests for anaemia, renal failure, diabetes, and thyroid disease

Management

Patient education and self-management

Give smoking cessation advice, reduce alcohol intake if excessive, and restrict salt in diet.

Explain the condition to the patient and the importance of taking medication and when to seek help if symptoms worsen.

Pharmacological treatment

- **For symptom relief, diuretics: furosemide** 40mg daily, increasing if needed to achieve response with adequate urine output (ideally, with monitoring of potassium and renal function). In severe disease, add **spironolactone** (start with 25mg once daily and increase to 50mg once daily if needed).

- All patients should be on maximum tolerated dose of **ACE inhibitor and beta-blocker**, if no contra-indications.

Manage **underlying cause** if possible:

- if anaemic, transfuse or give IV iron if available. Give oral iron if no access to either.
- If diabetic, try to improve glucose control.
- if atrial fibrillation, give an ACE inhibitor (e.g. enalapril) and treat as described in the 'Atrial fibrillation' section below.
- if hypertensive, follow advice above in hypertension with heart failure section.

Assessment and monitoring

Review 3-6 monthly or more frequently if required.

- Lifestyle advice as above. For secondary prevention: see risk factor reduction section
- Review symptoms and check for tachycardia, raised JVP, peripheral oedema and lung crepitations
- Check weight. Increase in weight may indicate fluid retention/oedema
- Encourage gentle aerobic exercise: tailor to patient's functional ability. Monitor renal function 3 monthly in patients on long-term diuretics. Patients on high-dose Frusemide may become potassium-depleted, and may require dietary supplementation (e.g. Bananas or Potassium tablets if available). In potassium-depleted patients on a combination of Spironolactone and Frusemide, try reducing the Frusemide and increasing the Spironolactone (Spironolactone is potassium-sparing).

Chronic atrial fibrillation

Atrial fibrillation is the most common sustained cardiac arrhythmia. If left untreated, atrial fibrillation is a significant risk factor for stroke and other morbidities. Men are more commonly affected than women and the prevalence increases with age.

Causes of atrial fibrillation (AF)

- Hypertension
- Ischaemic heart disease
- Valvular heart disease
- Congenital heart disease
- Cardiomyopathy
- Thyrotoxicosis
- Excess alcohol intake and exposure to other stimulants
- Viral infections
- Stress due to pneumonia, surgery or other illnesses

Symptoms and signs

- May cause no symptoms: irregular pulse found when checking as part of routine clinical assessment
- Very rapid (usually around 120bpm) irregular pulse and patient may have symptoms and feel unwell: lightheaded, breathless or chest pain or heart failure (= fast AF – treat as above)
- Differentiate from ventricular tachycardia, which may cause similar symptoms but pulse rate usually around 140 and rhythm regular.

Investigations

- ECG is very helpful to confirm diagnosis
- Check thyroid function
- Check for co-morbidities and cardiovascular risk factors: fasting glucose, cholesterol, renal function

Management of stable atrial fibrillation

Anticoagulation (see below) may need to be considered - refer new cases of AF to a specialist if available, or discuss with Medical Coordinator and/or NCD Advisor.

Note that atrial flutter and paroxysmal atrial fibrillation (time in both AF and normal rhythm) should be treated as AF.

The aim of treatment is to prevent complications, particularly stroke, and alleviate symptoms.

- **Rate control:** prevent fast AF using B-blocker (e.g. bisoprolol - start low dose and increase slowly to 10mg daily) but not in severe asthma (use Digoxin), aiming for a pulse <100.
- **Assess stroke risk:** calculate 'CHA2DS2 – VASc' score to help decide if the patient should be started on anticoagulation long term.

CHA2DS2-VASc score calculator

FEATURE	SCORE
Congestive Heart Failure	1
Hypertension	1
Age >75 years	2
Age between 65 and 74 years	1
Stroke/TIA/TE	2
Vascular disease (previous MI, peripheral arterial disease or aortic plaque)	1
Diabetes mellitus	1
Female	1

- If **CHA2DS2 - VASc score = 2 or more**, the patient is at high risk of stroke and can benefit from warfarin or NOAC.
- **First, calculate Bleeding risk using HAS-BLED Score:** If score ≥ 3 , the patient would be at significant risk of bleeding if receiving Warfarin or NOAC. Try to correct potential reversible risk factors e.g. uncontrolled hypertension, alcohol intake; if this is not possible, Warfarin or NOAC should not be given unless an experienced clinician advises that the benefits outweigh the likely risks.

HAS-BLED Calculator for bleeding risk for those with atrial fibrillation

FEATURE	SCORE IF PRESENT
Hypertension (Systolic ≥ 160 mmHg)	1
Abnormal renal function	1
Abnormal liver function	1
Age ≥ 65 years	1
Stroke in past	1
Bleeding	1
Labile INRs	1
Taking other drugs as well	1
Alcohol intake at same time	1

- If **CHA2DS2 - VASc score 2 or more, and HAS-BLED score is 2 or less, refer for Warfarin or NOAC initiation.** If there is no specialist to initiate anticoagulation therapy but INR monitoring is available, Warfarin can be initiated by the MSF MD (Medco / NCD advisor can give guidance). See Annex 7 (Warfarin Initiation). If monitoring is not available, do not give Warfarin but NOAC could still be considered
- If **CHA2DS2 - VASc score is 1 or 0, or HAS-BLED score is 3 or more, do not give Warfarin or NOAC.**

Assessment and monitoring

If on Warfarin, check INR regularly (see Annex 7).

Review every 6 months once stable:

- Ask about symptoms, medication adherence, side effects
- Check blood pressure, pulse rate, examine for and treat comorbidities.

Stroke and transient ischaemic attack (TIA)

Clinical features

- Acute stroke: Acute loss of function persisting or progressing at time of assessment. Acute onset of: asymmetrical facial weakness, asymmetrical arm weakness, speech disturbance or visual field defect make stroke likely.
- TIA: History of acute loss of function (as described above) that lasted <24 hours, and has completely resolved at the time of assessment.

Causes of Stroke

Globally the causes are as follows:

- Cerebral infarction (84%)
- Primary intracerebral haemorrhage (10%)
- Subarachnoid haemorrhage (6%)

However, there is substantial regional variation in the proportion of strokes attributable to each of these categories; for example in Ethiopia, up to 50% of strokes may be haemorrhagic.

See Emergency Management section for more details on diagnosing and managing stroke.

Ongoing management when condition is stable

- Stroke can instantly change the life of a patient and of their family, it may put huge financial pressures on a family if the individual affected was the main provider. Depression is very common in patients who have had strokes and should be screened for regularly
- Where available, allied health professionals e.g. physiotherapy, occupational therapy and speech and language therapy can help improve the patient's quality of life and their chances of returning to their baseline functioning
- Counsel family about risks of complications: pressure sores, contractures, swallowing difficulty, aspiration pneumonia.
- Counsel on lifestyle change: abstaining from alcohol and tobacco, limiting dietary sodium, reducing weight if appropriate, exercising regularly; the need for lifelong treatment with medication: Statin, antihypertensive medication, antiplatelet agent etc; the need for regular review: BP, pulse, weight, lifestyle review, monitoring of lipids, glucose, renal function, medication review.
- If AF is present, offer treatment including Warfarin/NOAC if indicated (see section on AF and Annex 7).

Management of suspected TIAs

Note that during the acute phase, manage as if a stroke. TIA is diagnosed if symptoms resolve (retrospectively).

- Exclude atrial fibrillation: check pulse and carry out ECG.
- Patient is at high CVD and stroke risk. Treat according to "Secondary prevention of CVD" (above).
 - **Antiplatelets** – after TIA, give **aspirin 300mg od for 2 weeks** (if not contraindicated) then **continue with clopidogrel 75mg or aspirin 75mg lifelong**
- Counsel on lifestyle change: abstaining from alcohol and tobacco, limiting dietary sodium, reducing weight if appropriate, exercising regularly.

Peripheral arterial disease *(adapted from PCI Field guide)*

- Symptoms: Easily missed! Ask about claudication pain: pain in the calves on walking, worse if walks fast or up a hill. Relieved within a few minutes of resting.
- Examination: Absent or weak leg/foot pulses (suggestive but not diagnostic) and cool, pale feet. Capillary refill >3 seconds. Ulcers may be present. Loss of hair on lateral part of lower leg.
- Treatment: Walk to the point of pain and a little beyond, as this encourages new blood supply to develop. To prevent further damage: see “secondary prevention of CVD” above. All patients need to be on aspirin and a statin unless contraindicated.
- Refer if critical ischaemia (pain at rest/ulcers/gangrene).
- Refer if persistent symptoms despite above measures

Deep venous thrombosis and pulmonary embolus

These are not chronic diseases as such, but are more frequently seen in patients with CVD.

Deep venous thrombosis

All suspected DVTs should have a Wells score calculated. If Well’s score is ≥ 2 urgent referral for Doppler scanning and anticoagulation should be arranged. If referral for assessment and anticoagulation is not available, Enoxaparin can be initiated by the MSF MD with subsequent transition to oral Warfarin or NOAC/DOAC (contact the Medco/NCD advisor for guidance if required).

FACTOR	POINTS
active cancer (treatment within last six months or palliative)	1
calf swelling ≥ 3 cm compared to asymptomatic calf (measured 10 cm below tibial tuberosity)	1
collateral superficial veins (non-varicose)	1
pitting oedema (confined to symptomatic leg)	1
swelling of entire leg	1
localised tenderness along distribution of deep venous system	1
paralysis, paresis, or recent cast immobilisation of lower extremities	1
recently bedridden ≥ 3 days, or surgery under regional / general anaesthetic in last 12 weeks	1
previously documented deep-vein thrombosis	1
alternative diagnosis at least as likely as DVT	-2

Clinical features of pulmonary embolism

Symptoms include: Acute or gradual onset chest pain, SOB, haemoptysis. If symptoms and a recent history of DVT or PE, recent surgery/ lower limb fracture/immobility (within the last 30 days)/ cancer (active or treated within the last 6 months) or known coagulopathy, should be treated as a suspected PE and referred to hospital acutely. However, the first priority is to exclude cardiac ischaemia.

Clinical signs include: tachycardia (heart rate > 100 bpm most predictive; respiratory rate > 16 rpm is most common sign). Refer to emergency management section for advice on treatment.

Medications used in cardiovascular disease

DRUG (CLASS)	DOSE	SIDE EFFECTS/ COMMENTS
Hydrochlorothiazide (thiazide diuretic)	By mouth, 12.5mg-25mg (in one or two doses)	Antihypertensive medication. Side effects: gastrointestinal disturbance, orthostatic hypotension, hypokalaemia hyponatraemia, hypoglycaemia, hyperuricaemia, gout, polyuria. Cautions: metabolic syndrome/diabetes, pregnancy, hypercalcaemia, hypokalaemia. Contraindicated: Gout, oliguria/anuria, severe electrolyte abnormalities.
Bisoprolol (beta blocker) Alternative: atenolol	By mouth, 1.25mg-10mg (in the morning) Atenolol dose 25-50mg for hypertension up to 100mg for arrhythmia as/angina	Antihypertensive medication. Indicated in MI/angina, heart failure Side effects: gastrointestinal disturbance, bradycardia, bronchospasm, heart failure, headache, weakness, vasoconstriction, cold peripheries, erectile dysfunction. Cautions: metabolic syndrome/diabetes, COPD, physically active patients, diabetes (monitor glucose) Contraindicated: asthma, 2 nd or 3 rd degree AV block, acute cardiac failure, bradycardia. Pregnancy: safe in pregnancy and breastfeeding Atenolol – more present in breast milk than bisoprolol so use bisoprolol if possible
Labetalol (beta blocker)	20 mg iv injection over 1 minute, then 20-80mg every 10 minutes. Max total dose = 200mg.	Antihypertensive medication. For use in management of hypertensive emergency. Side effects, cautions and contraindications: see bisoprolol.
Amlodipine (calcium channel blocker)	By mouth, 5-10mg in the morning	Antihypertensive medication. Side effects: lower limb oedema, headache, fatigue, nausea, abdominal pain, vertigo. Cautions: women of child bearing age, heart failure, liver failure. Contraindicated: pregnancy and breastfeeding, hypersensitivity
Enalapril (angiotensin converting enzyme inhibitor)	By mouth, 20-40mg (in one or two divided doses)	Antihypertensive medication. Side effects: hypotension, renal failure, dry cough, angioedema, pruritis, urticarial rhinitis, sinusitis, angina. Cautions: women of childbearing age, peripheral arterial disease (monitor renal function). Contraindicated: pregnancy and breastfeeding, hyperkalaemia, bilateral renal artery stenosis hepatic or renal failure (creatinine > 2 mg/dL or > 175 µmol/L). If creatinine is 1.4 -2.0 mg/dL (123-175 µmol/L) recheck one month after starting Metformin and stop if creatinine increased by 30%.
Losartan (angiotensin II receptor blocker)	By mouth, start 50mg once daily, (25mg in elderly) increase gradually to max 100mg	Side effects: usually mild; dizziness, particularly if hypovolemic; hyperkalaemia; angioedema. Caution: renal artery stenosis, mitral and or aortic valve stenosis or HOCM, women of childbearing age. Contraindicated in pregnancy and breastfeeding
Telmisartan 40mg + amlodipine 5mg (fixed-dose combination)	Fixed-dose combination protocol: ½ tablet up to 2 tablets as required for control	As with losartan (angiotensin II receptor blocker) and amlodipine (calcium channel blocker) above Other fixed-dose combinations may be chosen based on local availability
Atorvastatin (statin – HMG coA reductase inhibitor) Alternative: simvastatin	By mouth, 40mg in the evening; use 10-20mg if concomitant HIV protease inhibitor For primary and	Lipid regulating drug. Reduces cardiovascular risk. Side effects: myalgia (common), myositis, rhabdomyolysis, hepatitis, jaundice, rare pancreatitis or hepatic failure, gastrointestinal disturbance, sleep disturbance, headache, depression, fatigue, peripheral neuropathy, sexual dysfunction, hypersensitivity, hyperglycaemia (monitor glucose in diabetics). Cautions: liver disease, high alcohol intake, risk factors for myopathy or rhabdomyolysis. Contraindicated: active liver disease (check LFTs before initiation – if

	secondary prevention of CVD	aminotransferases > 3x normal limit, do not start statin, recheck LFTs after 3months; if no progression, it is safe to start statin), pregnancy (stop 3 months before trying to conceive), breastfeeding
Acetylsalicylic acid (aspirin) (anti-platelet)	By mouth, 75-100mg with food	Secondary prevention of thrombotic stroke or cardiovascular disease. Side effects: bronchospasm, gastro-intestinal irritation or haemorrhage, other haemorrhage. Cautions: asthma, uncontrolled hypertension, previous peptic ulceration, renal impairment, G6PD deficiency. Contraindicated: children < 16 years, active peptic ulceration, haemophilia or other bleeding disorders, history of hypersensitivity to aspirin or other NSAIDs, severe hepatic or renal impairment Pregnancy: use with caution during 3 rd trimester, high doses may cause closure of ductus arteriosus in utero and persistent pulmonary hypertension of the new born, kernicterus in jaundiced neonate. Avoid in breastfeeding.
Clopidogrel (anti-platelet)	By mouth, 75mg daily	Secondary prevention of thrombotic stroke or cardiovascular disease; for 12 months post coronary artery stenting. Side effects: dyspepsia, abdominal pain, diarrhoea; bleeding disorders (including gastro-intestinal and intracranial); constipation, gastric and duodenal ulcers, headache, dizziness, paraesthesia, blood disorders, rash, and pruritus; rare pancreatitis, hepatitis, vasculitis. Cautions: renal and hepatic impairment, patients at risk of increased bleeding from trauma, surgery, or other conditions; use of drugs that increase risk of bleeding; discontinue 7 days before elective surgery if antiplatelet effect not desirable; history of hypersensitivity reactions. Do not use together with omeprazole – may reduce effectiveness (other PPI's can be used). Contraindicated: active bleeding
Hydralazine (vasodilator)	Slow intravenous injection: 5–10mg diluted with 10ml sodium chloride 0.9%; may be repeated after 20–30 minutes	Antihypertensive for use in hypertensive emergency or pre-eclampsia. Side effects: tachycardia, palpitations, flushing, hypotension, fluid retention, gastro-intestinal disturbances; headache, dizziness; systemic lupus erythematosus-like syndrome, rare arthralgia, myalgia, nasal congestion, dyspnoea, agitation, blood disorders, abnormal liver function, jaundice, renal impairment Cautions: reduce dose in hepatic impairment or severe renal impairment, coronary artery disease, cerebrovascular disease Contraindicated: SLE, severe tachycardia, or heart failure, acute ischaemia, dissecting aortic aneurysm; acute porphyria Pregnancy: may cause neonatal thrombocytopenia. May use in breastfeeding.
Methyldopa	By mouth, 250mg 2-3x daily, maximum 3g/day.	For use in hypertensive emergency. Side effects: gastro-intestinal disturbances, dry mouth; bradycardia, exacerbation of angina, postural hypotension, oedema; headache, dizziness, hepatitis, pancreatitis; blood disorders; hypersensitivity; rashes; nasal congestion, impotence, decreased libido, amenorrhoea; Cautions: reduce dose in renal or liver impairment, history of depression; Contraindicated: active liver disease, depression, pheochromocytoma; acute porphyria. Pregnancy and breastfeeding: may use.
Glyceryl trinitrate (GTN) (short acting nitrate)	Sublingually, 0.3–1mg, repeated as required	For use in acute angina or angina prevention pre-activity. Side effects: tachycardia (bradycardia possible); throbbing headache, dizziness; nausea, vomiting, heartburn, flushing, syncope Cautions: severe hepatic or renal impairment, hypothyroidism; malnutrition; hypothermia; recent history of myocardial infarction; heart failure due to obstruction; hypoxemia, risk angle-closure glaucoma. Contraindicated: hypersensitivity; hypotension, hypovolaemia; hypertrophic cardiomyopathy; aortic or mitral stenosis; mitral; toxic pulmonary oedema; raised intracranial pressure, severe anaemia. Pregnancy and breastfeeding: may use
Isosorbide dinitrate (intermediate-acting nitrate)	By mouth, 5mg twice daily, max 40mg tds	Prevention and treatment of angina. Side effects, Cautions, Contraindicated: see glyceryl trinitrate Pregnancy: may cross placenta- avoid unless benefit outweighs risk
Furosemide (loop diuretic)	By mouth. For oedema, start 40mg mane; maintenance 20–120mg daily; Resistant high BP, 40–80mg daily	Acute or symptomatic chronic heart failure. Side effects: mild gastro-intestinal disturbances, pancreatitis, hepatic encephalopathy, postural hypotension, hyperglycaemia, acute urinary retention, electrolyte disturbances, metabolic alkalosis, blood disorders, visual disturbances, tinnitus and deafness, hypersensitivity. Cautions: correct hypovolaemia and hypotension before use, monitor electrolytes exacerbate diabetes, ensure there is urinary output before using. Contraindicated: severe hypokalaemia, hyponatraemia or anuria, comatose associated with liver cirrhosis, drug-induced renal failure. Avoid in pregnancy.
Spironolactone (diuretic-aldosterone antagonist)	By mouth. Initially 25mg once daily, increased according to response to maximum 50mg once daily	For severe heart failure with oedema in addition to other treatments. As a 4 th agent for resistant hypertension Side effects: gastro-intestinal disturbances, hepatotoxicity, malaise, confusion, drowsiness, dizziness, breast, menstrual, libido or hair growth disturbances, hyperkalaemia (discontinue) and hyponatraemia, acute renal failure, hyperuricaemia, blood disorders, leg cramps, rash. Cautions: monitor electrolytes in elderly. Monitor potassium and creatinine 1 week after initiation and after any dose increase; then every 3 months; acute porphyria. Contraindicated: hyperkalaemia; anuria; Addison's disease Pregnancy: only if benefit outweighs risk; may use in breast feeding (small amounts in milk).
Digoxin (cardiac glycoside)	By mouth; start with 0.5mg then use doses of	For rate control in symptomatic atrial fibrillation/flutter; may take hours to work. Side effects: gastrointestinal disturbance; arrhythmias, conduction disturbances; dizziness; blurred or yellow vision; rash, depression; anorexia, intestinal ischaemia and necrosis,

	0.125mg-0.25mg if no response after 6-8hrs. Maximum dose 1.5mg over 24 hours	psychosis, confusion, headache; Cautions: reduce dose in renal impairment/elderly; recent myocardial infarction; thyroid disease; severe respiratory disease; hypokalaemia, hypomagnesaemia, hypercalcaemia, and hypoxia (risk of digitalis toxicity); monitor serum electrolytes and renal function; Contraindicated: conduction block; supraventricular arrhythmias with accessory conducting pathways e.g. Wolff-Parkinson-White syndrome; VT or VF; hypertrophic cardiomyopathy; myocarditis; pericarditis. Pregnancy and breastfeeding: may need to adjust dose in pregnancy. May use in breastfeeding.
Warfarin (coumarin – vitamin K antagonist)	By mouth. 5–10mg on the first day (elderly patients 2mg); subsequent doses depend upon INR monitoring Usual daily maintenance dose 3–9mg	Should be initiated by specialist. For stroke prevention in atrial fibrillation; treatment/prevention in PE or DVT; mechanical prosthetic heart valves. Side effects: haemorrhage; nausea, vomiting, diarrhoea, jaundice, hepatic dysfunction, pancreatitis, pyrexia, alopecia, purpura, rash, skin necrosis Cautions: mild-moderate hepatic or renal impairment, monitor INR more often if severe renal impairment; conditions/drugs which increase bleeding risk, e.g. gastro-intestinal bleeding, peptic ulcer, recent surgery, recent ischaemic stroke, postpartum; uncontrolled hypertension; avoid cranberry/ grapefruit juice; Contraindicated: severe hepatic impairment; haemorrhagic stroke; significant bleeding; avoid use within 48 hours postpartum. Pregnancy: avoid in pregnancy; warn women of childbearing age and assess carefully risk/benefit of use. Safe for use in breast-feeding.

Special considerations for HIV and TB

Patients with HIV are at greater cardiovascular risk due to chronic inflammation associated with HIV infection. These patients represent a particularly vulnerable group, with a much higher risk of acute myocardial infarction, atrial fibrillation, and sudden cardiac death. Furthermore, the metabolic side effects of ARVs may exacerbate this risk. Management of patients with known CVD should focus on (1) immediate initiation of ART if not already done and (2) secondary prevention of cardiovascular events through aggressive control of modifiable risk factors. Educate and encourage lifestyle changes (smoking, diet, exercise). Estimate the underlying risk of CVD and consider ARV modification if 10 year risk \geq 20%: replace Ritonavir with another PI known to cause less hyperlipidaemia e.g. Saquinavir. Replace Stavudine, Zidovudine or Abacavir with Tenofovir, which carries less risk of cardiovascular events.

ARV drug interactions with drugs used in cardiovascular disease:

- NRTIs – no clinically significant interaction suspected
- NNRTIs may interact and require careful monitoring- Efavirenz (with Atorvastatin, Warfarin - risk of bleeding, Clopidogrel, Ag2antagonists, Ca-channel blockers); Nevirapine (with Atorvastatin, Warfarin, Clopidogrel, Ca-channel blockers) . E.g. amlodipine drug concentration increased so lower doses should be used and blood pressure monitored
- PIs may interact and require careful monitoring: (ARBs, Ca-channel blockers, B-blockers, Warfarin (risk of bleeding), Clopidogrel, Digoxin). Thiazide diuretics are not recommended; Indapamide, Chlorthalidone may be used if available. PIs interact with statins: start with low dose statin (e.g. Atorvastatin 20mg).

Patients with TB: Rifampicin may reduce BP lowering effect of ACEi and ARBs and may reduce lipid-lowering effect of Statins. Monitor BP lipids more often. Statins and anti-TB drugs both cause hepatotoxicity - monitor LFTs more often. Rifampicin will interact with Warfarin.

7. Chronic kidney disease

There is increasing recognition that chronic kidney disease (CKD) is a common problem among NCD patients, in some cases caused by hypertensive, atherosclerotic and/or age-related vascular disease. Other causes include diabetic nephropathy, glomerulonephritis, chronic pyelonephritis, renal stone disease, polycystic kidney disease and interstitial nephritis (idiopathic or drug-related).

Diabetic nephropathy can cause nephrotic syndrome, characterised by oedema, low serum albumin (<30g/L), proteinuria (urine albumin/creatinine ratio >2000 mg/g) and hypercholesterolaemia. Other causes of nephrotic syndrome include glomerulonephritis, minimal change nephropathy, idiopathic membranous nephropathy and renal amyloidosis.

CKD requires creatinine measurement which is defined by 1) reduced estimated glomerular filtration rate (eGFR) – a measure of kidney function; and 2) albuminuria – the degree of urine albumin excretion influences prognosis. eGFR is calculated using creatinine, which remains normal until 80% of renal function has been lost. Albuminuria is measured with a spot urine sample if lab capacity permits; urine dipstick albumin is more feasible in most MSF settings.

Clinical features

Most cases of CKD are asymptomatic. Some specific features may be found with

- Nephrotic syndrome – oedema with or without frothy urine;
- Glomerulonephritis – visible haematuria;
- Renal stone disease – severe flank pain;
- Polycystic kidney disease – palpable enlarged kidneys.

In advanced CKD, symptoms can include fatigue, appetite loss, nausea, itching, restless legs, breathlessness and orthopnoea. Physical exam can show pallor, other signs of anaemia, asterixis, uraemic foetor, nodular prurigo, pericardial friction rub and/or signs of fluid overload (eg, rales, oedema). Pulmonary oedema, grand mal seizures and/or cardiac tamponade can occur, requiring emergency care.

Assessment

Screening for patients with hypertension and/or diabetes

- Creatinine and dipstick for protein every year

When creatinine is detected outside the normal range

1. Recheck age
2. Repeat serum creatinine after 3 months and recheck for proteinuria
3. Calculate eGFR using an electronic calculator
 - First choice is CKD-EPI (eg, QXMD app)
 - If not possible, use Cockcroft-Gault calculation for creatinine clearance:
Creatinine clearance = $\frac{((140 - \text{age}) \times \text{weight})}{(72 \times \text{serum creatinine})} \times 0.85$ if female
4. Address cardiovascular risk factors (hypertension, smoking) and co-morbid conditions

Obtain USS KUB if

- Clinical suspicion of urinary tract obstruction (such as pain consistent with obstruction, polyuria, palpable bladder)
- Haematuria
- eGFR <30 ml/min/1.73m²
- Albuminuria >300 mg/g (if measured)

- Accelerated deterioration of renal function (sustained fall in eGFR of 25% or by 15 ml/min/1.73m² annually)
- Patient with repeated symptoms of pyelonephritis
- Palpable enlarged kidneys

Classification of CKD by eGFR and albuminuria

- Patients are classified using the chart below (KDIGO 2012) to estimate risk of progression and other adverse outcomes such as mortality:
 - No CKD – **green**
 - Moderately increased risk of adverse outcomes – **yellow**
 - High risk – **orange**
 - Very high risk – **red**

Prognosis of CKD by GFR and albuminuria category

Prognosis of CKD by GFR and Albuminuria Categories: KDIGO 2012				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-300 mg/g 3-30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/ 1.73 m ²) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60-89			
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	<15			

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk.

Management

If estimated GFR is between 30 and 90 and / or albuminuria between 30 and 300 (yellow-red, moderate-very high risk):

- Review all medications and adjust doses where necessary
- Optimise BP control (target <140/90): ACEi first line - up to 10 mg enalapril twice a day
- Optimise diabetes control
- If not on cholesterol-lowering medication, give atorvastatin 40mg daily
- Dietary advice: how to avoid salt; ensure cholesterol has been checked
- Consider a glucometer for all patients on insulin with evidence of renal impairment
- Advise patients of preference for paracetamol over NSAIDs when simple analgesia required (very important, as patients obtain medications from other providers, neighbours etc.; especially emphasise to not use NSAIDs with intercurrent illness).

If estimated GFR is 30 or less, or Albuminuria >300 (red, very high risk):

1. Arrange USS KUB & request urine culture and microscopy in addition to the tests above
2. Review patient with results:
 - a. Refer on to Urologist if evidence of obstruction (then likely also nephrology involvement pending outcome of urology referral)
 - b. All others refer directly to nephrologist.

Follow-up investigations

Using CKD classification above:

1. No CKD (green) – usual review
2. Moderately-increased risk (yellow) – repeat creatinine and albuminuria once a year
3. High risk (orange) – repeat creatinine, albuminuria and potassium every 6 months; and haemoglobin once a year
4. Very high-risk (red) – repeat creatinine, albuminuria and potassium every 3 months; and haemoglobin every 6 months

Medications in chronic kidney disease**Diabetic medications**

- Glibenclamide – if eGFR category G3a up to G5, discontinue (can replace with gliclazide if available)
- Metformin – if eGFR category G3b (30-44), limit dose to maximum 1000 mg/day – if eGFR category G4 / G5 (<30), discontinue

Antihypertensive medications

- ACEI (eg, enalapril) or ARB (eg, valsartan) are first line therapy in the following groups:
 - Diabetic patients with albuminuria categories A2 / A3
 - Hypertensive patients with albuminuria category A3
 - All patients (with or without HT) in albuminuria category A3 with urine dipstick result 3+ or higher (albumin/creatinine ratio >700 mg/g)
- If the patient is already on an ACEI or ARB, continue it and monitor potassium according to the follow up investigations schedule above
- If the patient is not yet on an ACEI or ARB, introduce one at low dose (eg, enalapril 5 mg twice a day) if potassium <5.0
- Repeat K and eGFR 1-2 weeks after ACEI or ARB initiation or dose change
 - Discontinue ACEI or ARB if potassium rises to 6.0 or above
 - Discontinue ACEI or ARB if eGFR falls by >25%, without other explanation
- Do not combine ACEI with ARB for any patient
- Suspend ACEI or ARB in the event of significant acute systemic illness or trauma
- Other antihypertensive medications can be prescribed as described in section 6 of these guidelines

Cholesterol-lowering medication

- Offer atorvastatin 20 mg to all patients with high or very high risk CKD who are not already taking a statin

Iron supplementation

- Iron can be given empirically for anaemia – start oral FeSO₄ if Hb <100g/L

Nephrotic syndrome medications

- In addition to advice on oedema management (eg, elevation of legs when at rest); furosemide 20-120 mg daily may be given
- For non-diabetic patients, if secondary care is not possible, a steroid trial can be considered:
 - Prednisolone 60 mg daily for 30 days in adults (60 mg/m³ for children)
 - Peptic ulcer prophylaxis with a proton pump inhibitor or H2 blocker should be given
 - If the urine albumin/creatinine ratio does not fall by >50% after 30 days, withdraw the prednisolone by rapid taper
 - If the urine albumin/creatinine ratio does fall by >50% after 30 days, continue prednisolone until 6 months after achieving remission; then taper dose at monthly intervals until discontinued

Additional considerations for referrals

If referral possibilities permit:

- Urology evaluation and treatment –
 - Signs of obstructive uropathy and hydronephrosis on ultrasound
 - Visible haematuria
- Nephrology –
 - Diagnosis and treatment of nephrotic range proteinuria / nephrotic syndrome
 - Potential erythropoietin therapy need – if Hb < 80g/L or <100g/L with symptoms / unstable angina; and eGFR <30; and no improvement after 30 days of oral iron supplementation; may need to evaluate for other causes of anaemia on referral (eg, folic acid or B12 deficiency or primary haematological disease)
 - Potential dialysis need – eGFR <10 (G5); eGFR <20 (G4 / G5) and clinical features of advanced CKD; accelerated progression and eGFR <30 (G4); severe acute kidney injury (serum creatinine >500)

8. Cancer

At present, cancer care is only provided in pilot projects in MSF. The focus on (1) prevention measures that can be integrated into primary care (2) identifying and managing suspected Cervical and Breast Ca, (3) identifying and managing HIV related cancers, (4) identifying and referring other suspected lesions where facilities are available (5) palliative care.

There are **three AIDS-defining** cancers, Kaposi's sarcoma (KS), non-Hodgkin's lymphoma and invasive cervical carcinoma. With increasing access to ART the incidence of these has significantly reduced.

Recommended interventions for pilot cancer projects¹⁶ :

All cancers	Education on tobacco hazards, value of HPV and HBV vaccination and importance of seeking early treatment for common cancers; palliative care including, at a minimum, opioids for pain relief
Tobacco-related cancers (oral, lung, and oesophagus)	Smoking cessation advice and services (mostly without pharmacological therapies)
Liver cancer	HBV vaccination including birth dose (primary health clinic or mobile outreach)
Breast cancer	Clinical breast examination (possibly FNA) and treatment for early-stage cancer (Specialised cancer centre or unit, can be at district general hospital level)
Colorectal cancer	Emergency surgery for obstruction (district general hospital)
Cervical cancer	School-based HPV immunisation; opportunistic screening through visual inspection or HPV DNA testing; treat precancerous lesions; treat early-stage cancer; (primary health clinic or district general hospital)
Childhood cancers	Treat selected cancers in paediatric cancer units or hospitals

The Access Campaign publication "Options for MSF operational response to the cancer epidemic" outlines the key programmatic components of provision of care for these cancers¹⁷

¹⁶ Gelbrandt et al 2015: Table 3: Essential cancer intervention package recommended by DCP-3

¹⁷ Reddy A. Options for MSF operational response to the cancer epidemic. Access Campaign 2012

9. Palliative Care

When patients have a terminal illness where a cure is no longer possible and all medical treatments have been exhausted, it is important to consider and discuss end of life care with patients and their relatives. This is not just patients with cancer but anyone with a terminal prognosis e.g. end stage COPD, heart or renal failure. The aim of palliative care is to control a person's physical symptoms, ease their suffering and address any social, psychological and spiritual needs. Communication is the cornerstone of good palliative care and should involve a team which includes a number of health, allied health and non-medical professionals.

Identifying patients who are in need of palliative care is the first crucial step. The 'surprise question' has been a widely used starting point for identification of patients in need of palliative care: the clinician screens by asking him/herself, 'Would I be surprised if this patient died in the next 12 months?' If the answer is, 'No', the patient should be assessed for palliative care. Although this is a rather crude assessment, it is simple and can trigger health care workers to think about supporting patients with end of life care at an earlier stage.

The main components of palliative care are;

- Assessing and managing physical symptoms
- Assessing and managing psychological needs
- Assessing social needs
- Assessing religious or spiritual needs
- Addressing needs of family and carers
- Assessing prognosis – being able to recognise when a patient is in a terminal phase and provide adequate support and symptom control as needed

Whilst these components are not discussed in detail in these guidelines, guidance of how to assess the needs of patients in the terminal stages of an illness and examples of how to manage their physical symptoms is included in Annex 8.

10. Psychiatry

Patients in the humanitarian setting can present with severe and chronic psychiatric disorders including psychosis, bipolar disorder, depression, and anxiety. These disorders are a major cause of suffering and disability worldwide. Patients with these disorders might present acutely or have been previously diagnosed and treated in another setting and now in need of treatment. People seen in healthcare settings in difficult contexts might also present in severely agitated states and/or with physical problems and other complaints related to an acute stress reaction or PTSD (post-traumatic stress disorder). Interventions should include psychoeducation, medication when indicated, and counselling, if available. For further guidance, refer to the *mhGAP Intervention Guide, version 2¹⁸*, and the *mhGAP Humanitarian Intervention Guide (mhGAP-HIG)¹⁹*.

Agitated and/or aggressive behaviours

There can be many reasons for patients being agitated and aggressive and out of control. It is always important to first rule out a medical condition that could be causing the symptoms as well as the possibility of drug or alcohol intoxication or withdrawal.

- Medical conditions that can cause delirium and behavioural disturbance include; hypo or hyperglycaemia, electrolyte disturbance, malaria, sepsis, hypoxia, meningitis (particularly TB meningitis), stroke, head trauma
- People who are recently displaced and/or have been in a conflict situation might experience severe anxiety causing agitation
- Agitation and aggressive behaviours can often be present in the initial presentation of a psychotic patient. Anti-psychotic medication alone is not immediately effective in reducing these symptoms. The addition of diazepam in the first 2 – 3 weeks of treatment for psychosis is helpful in reducing agitation and aggression and enhancing care of the patient in the home environment.

Management

Be calm and attempt to calm the patient. Ask the patient how you can help him. Do not be verbally or physically aggressive. Involve a supportive caretaker with permission from the patient; keeping in mind he might not be able to give permission due to his disrupted state.

1. Obtain a history and define precipitants of the symptoms. Treat underlying medical causes.
2. If patient remains agitated not due to medical causes, then proceed with a combination of anti-psychotic medication and diazepam. Attempt to use oral medication. If not possible, then IM.

Do not use IV medication:

- a) Haloperidol 2 – 2.5 mg hourly p.o./i.m. up to 5 dosages. Especially effective for agitation due to psychosis and mania.
- b) Diazepam 10 mg p.o./i.m. every 4 – 6 hours, maximum 60 mg/day. Especially effective for alcohol/drug intoxication/withdrawal. Oral diazepam is more effective than intramuscular. Avoid with respiratory depression. Use 2 – 3 weeks as can be addictive. Can be helpful in initial weeks of treating psychosis prior to anti-psychotic being fully effective. Always taper diazepam; do not stop abruptly.

¹⁸ mhGAP Intervention Guide Version 2.0, World Health Organization, 2016.

¹⁹ mhGAP Humanitarian Intervention Guide (mhGAP-HIG), World Health Organization, 2015.

Psychosis

Clinical features

Psychosis consists of a complex of symptoms including distorted thoughts and perceptions as well as disturbed emotions and behaviours. Symptoms include:

1. Hallucinations: sensory perceptions not based on an external stimulus, i.e. auditory hallucinations being most common but can also involve visual, olfactory, tactile, or gustatory sensations.
2. Delusions: fixed, false beliefs not shared by others of the same culture, i.e. paranoid delusions being most common.
3. Disorganized speech and behaviours: flight of ideas, disordered thinking, agitation, excitement, inactivity or hyperactivity

Diagnosis

1. Ask the patient about symptoms and when the symptoms began, and if he/she has had similar symptoms in the past. Ask if he/she has any medical conditions. Ask about suicidal ideation/plans. Keep in mind that patients who are psychotic often think nothing is wrong.
2. Do a mental state exam and assess (see below)
3. With a psychotic patient it is usually necessary to involve a family member in the assessment. Ask the patient for permission to do this keeping in mind that he/she might not be able to grant this permission.
4. Ask a family member when symptom began, and is there a previous history of a similar episode? Is there a history of substance or alcohol use? Does the patient have a medical condition or is taking medications? Is there a family history of psychiatric illness?
5. Do a physical exam and rule out medical causes suggesting delirium, i.e. cerebral malaria, TB, hypoglycaemia, infection, dehydration and treat if present. Consider delirium when there is an altered and/or fluctuating level of consciousness and disorientation.
6. If there are no medical illnesses causing symptoms, then diagnosis of psychosis can be made if the patient has 2 or more psychotic symptoms, i.e. delusions, hallucinations, disorganized speech and behaviour.

Mental State Exam (MSE)	
Component of assessment	What to assess
1. Appearance	Clothing/dress, hygiene/self-care, posture gait, any distinctive features or evidence of self harm
2. Behaviour	Eye contact, rapport, facial expression, body language, psychomotor activity e.g. slow or increased, agitated/calm or aggressive
3. Speech	Rate of speech (fast vs slow), quantity of speech – eg. Few words or lots of speech, tone of speech – e.g. monotonous, volume of speech – e.g. loud or quiet, fluency e.g. clear/articulate or slurred
4. Mood & Affect	Mood – how the patient tells you they are feeling e.g. low, sad, anxious, angry, elated Affect – this is reflection of how the patient feels in their behaviour e.g. sad, agitated, euphoric
5. Thought	Thought form e.g. fast, slow, incoherent. Content – abnormal beliefs/delusions, obsessions, violent, suicidal thoughts Thought possession – thought that ideas can be inserted, withdrawn or broadcasted into/from someone's mind
6. Perception	Hallucinations – see, hear or smell something that is not actually there
7. Cognition	Is patient orientated, test attention and concentration and short-term memory
8. Insight	Is the patient able to understand that what they are thinking or feeling is abnormal? What do they think is causing it and do they want help?

Treatment and management of psychosis

Involve a caretaker who can be supportive of the patient with adherence to medication, daily care, and re-initiation of social, educational and occupational activities. In general outpatient treatment is preferred if a supportive family environment is available. Hospitalization can be isolating, removing the family from his community environment.

Anti-psychotic medication:

- This needs to be immediately initiated when a patient is diagnosed with psychosis.
- START LOW, GO SLOW. PRESCRIBE ONE ANTI-PSYCHOTIC.
- Begin with a low dose within the therapeutic range which can be slowly increased to the lowest effective dosage.
It can take several days or weeks for anti-psychotic medication to be effective.
- Try the medication at a typically effective dose for at least 4- 6 weeks before considering it ineffective.
- Anti-psychotic medications that are usually available in MSF projects are listed in the following table.
- Haloperidol is a high potency anti-psychotic and can be effective at low dosages. It can cause extrapyramidal side effects (EPS)
- Risperidone is a second-generation anti-psychotic, also high potency, and has fewer side effects.
- It is recommended to begin treatment with either haloperidol or risperidone.
- The advantage of chlorpromazine is that it is more sedating than haloperidol or risperidone although it is low-potency and high dosages are often necessary.

Treatment of extra-pyramidal side effects

1. Attempt to reduce the dosage of the anti-psychotic
2. Treat with an anticholinergic medication biperiden or trihexyphenidyl as in following table.
3. If an anti-cholinergic medication is not available then use: promethazine 25 mg (3 – 4) times daily.

Psycho-education

1. Patient and family require education that symptoms are due to a mental health condition that has caused an imbalance of chemicals within the brain. With medication and other measures, the patient can get better.
2. Do not argue with cultural beliefs such as the patient being possessed by an evil spirit. Simply add to this explanation with the above explanation.
3. The patient needs to adhere to the daily regimen of medication.
4. He/she also requires adequate sleep, a healthy lifestyle, abstaining from alcohol and drugs, and a stress-free environment.
5. Caretakers and other family members should not argue with delusions or false experiences, such as hearing voices.
6. As the patient improves, he/she should be encouraged to engage in previous life activities. Counselling can be of benefit at this point, if available in the project.

Ongoing management

1. Close follow-up is recommended until medication becomes effective.
2. When the patient has a significant decrease in symptoms and is resuming life activities, appointments can be less frequent such as monthly or quarterly.
3. For a first episode, acute psychosis (symptoms less than 3-months), continue treatment for 3-months after symptom free.

4. For a chronic psychosis, such as schizophrenia, continue treatment for several years, although dosage can be reduced to lowest effective dosage.
5. When discontinuing any psychiatric medication, gradually and slowly reduce dosage.

Women who are pregnant or breastfeeding and develop psychosis require treatment with anti-psychotic medication.

- Consult a psychiatric specialist if available
- Consider low dose oral haloperidol or chlorpromazine

Post-partum psychosis:

- Usually occurs from few days to weeks after delivery
- Is a psychiatric emergency and needs urgent assessment and treatment as above
- Symptoms include mania, depression, hallucinations, delusions and confusion
- Risk is much higher in women with a pre-existing diagnosis of bipolar, schizophrenia or any other psychotic disorder but can occur in women with no history of mental illness

Mood disorders

Bipolar disorder

Bipolar disorder is characterized by fluctuating periods of mania consisting of elevated mood and increased energy and activity and at other times of depression with lowering of mood and decreased energy and activity. Characteristically there is recovery between episodes. Bipolar disorder can be diagnosed in people who only experience mania.

Mania in the context of bipolar disorder

Mania is diagnosed when there are several of the following symptoms present for 1 week or longer that significantly interfere in the patient's functioning in life:

- elevated or irritable mood
- decreased need for sleep
- increased activity
- feeling of increased energy
- talkativeness or rapid speech
- impulsive or reckless behaviours including excessive spending and indiscriminate sexual behaviours
- easily distracted
- grandiose delusions

Treatment of mania

1. If patient is taking an anti-depressant, stop the anti-depressant.
2. Treatment can be with either an anti-psychotic medication (following the protocol for psychosis or begin treatment) or with a mood stabilizer. However, anti-psychotic medication can produce a more rapid response than a mood stabilizer. It is recommended to begin treatment with an anti-psychotic in the field.
3. When manic symptoms recede, treatment can be initiated with a mood stabilizer and eventual tapering of the anti-psychotic.
4. Mood stabilizers include: sodium valproate, carbamazepine, and lithium. Lithium requires monitoring of kidney, thyroid, and cardiac functions and lithium blood levels and should be managed by a psychiatrist-specialist who has an available laboratory for monitoring.
5. A benzodiazepine such as diazepam can be used short term (2 – 3 weeks) for agitation.
6. Continue maintenance treatment for at least 2-years after remission of last bipolar episode

For women who are pregnant or planning a pregnancy or of child bearing age: avoid lithium, sodium valproate, carbamazepine due to possibility of malformations in the foetus. Consult a specialist.
For patients with HIV/AIDS who are on antiretroviral treatment: use sodium valproate due to drug-drug interactions with carbamazepine.

Depression in the context of bipolar disorder

If the patient has a history of mania and now has symptoms of a persistent depressed mood and/or markedly diminished interest in or pleasure from activities then the patient is now in the depressed phase of bipolar disorder. Proceed as follows:

1. Ask about other symptoms of depression including: hopelessness, feelings of worthlessness or excessive guilt, disturbed sleep, change in appetite, fatigue or loss of energy, reduced concentration, agitation or restlessness, talking or moving more slowly, suicidal thoughts or acts.

2. Ask about a previous history of mania. If present, diagnose bipolar disorder depression and begin treatment with a mood stabilizer.
3. An anti-depressant can be prescribed (see: depression) only if patient is taking a mood stabilizer.
4. If patient develops mania while on the anti-depressant, stop the anti-depressant.
5. Consult a specialist if available.

Depression

Depression affects more than 350 million people and it is the leading cause of disability worldwide in terms of total years lost due to disability (WHO).²⁰ A depressive episode can appear after a stressful situation or spontaneously.²¹ More than 80% of patients with depression have a medical comorbidity.²²

Clinical features

- Diagnosis is clinical. Depression should be suspected in patients who repeatedly present at the health care facility with multiple physical complaints without apparent medical cause.
- Diagnostic criteria of moderate-severe depression:
 1. One of the following core symptoms for at least 2-weeks:
 - Persistently depressed mood
 - Markedly diminished interest in or pleasure in normally pleasurable activities
 2. And several of the following additional symptoms for at least 2 weeks
 - Disturbed sleep: not sleeping or sleeping too much
 - Disturbed appetite: not eating or eating too much
 - Feelings of worthlessness or excessive guilt
 - Fatigue or loss of energy
 - Decreased concentration
 - Psychomotor agitation
 - Moving or talking slowly
 - Suicidal ideation or plans
 3. Negative impact on functionality including: work, relationships, home, school.

Diagnosis

- Ask about a precipitant for the depressive symptoms such as: displacement, conflict, loss of a loved one, physical injury.
- Ask about prior episodes and family history of psychiatric disorders.
- Ask about prior episode of manic symptoms: if yes, go to Bipolar Disorder-Depression. Do not prescribe an anti-depressant unless the patient is receiving a mood stabilizer.
- Rule out a medical illness with physical exam and appropriate laboratory investigations, i.e. anaemia, malnutrition, hypothyroidism, stroke, medication side-effects.
- Assess psychosocial situation and support system.
- Ask about alcohol/substance use.
- Ask about suicide ideation, plan, past and present attempts according to the **Suicide Risk Assessment**. **Keep in mind: asking about suicide does not stimulate suicidal behaviour in the patient. Research has shown that patients feel relieved and cared about when questioned about suicidal intention.**

²⁰ http://www.who.int/mental_health/management/depression/wfmh_paper_depression_wmhd_2012.pdf

²¹ Post, RM. Transduction of psychosocial stress into the neurobiology of recurrent affective disorder. *Am J Psychiatry*. 1992; 149:999-1010.

²² Klinkman, M. The role of algorithms in the detection and treatment of depression in primary care. *J Clin Psychiatry*. 2003; 64 Suppl 2:19-23.

Suicide risk assessment

This needs to be performed with all patients who have depressive symptoms. Questions about suicide should be integrated within the general history taking. For example, if a patient says she feels like going to sleep and not waking up, this is an opportune time to question further about suicidal thoughts and plans.

Questions assessing for suicide risk:

1. Do you feel that you do not want to live anymore?
2. Do you have thoughts about ending your life?
3. Do you have a plan and the means to carry out the plan?
4. Do you have a prior history of acts of self-harm?
5. If an answer to questions 2, 3, 4 is positive, the patient is a suicide risk, and is of imminent risk if agitated, distressed, violent, or non-communicative.

Risk and imminent risk of suicide

1. For risk or imminent risk of suicide: involve a close relative or friend in the treatment plan.
2. Instruct the carer that the patient should not be left alone.
3. Remove the means to commit suicide if patient has a plan.
4. Begin treatment including referral for counselling.
5. Arrange close follow-up.

Treatment and management

Patients with moderate-severe depression require intervention consisting of psycho-education and counselling and consideration of anti-depressant medication. To diagnose moderate-severe depression, a person should be experiencing one of the core symptoms of depression, several other symptoms, and markedly diminished functioning in his/her life. If the patient is experiencing depressive symptoms in reaction to a recent loss or disruptive life event, then proceed with psychoeducation and follow-up in 2-3 weeks before considering other interventions.

Psycho-education

Key messages to the person and the carers:

- Depression is a very common condition that can happen to anybody.
- The occurrence of depression does not mean that the person is weak or lazy.
- The negative attitudes of others (e.g. "You should be stronger", "Pull yourself together") may relate to the fact that depression is not a visible condition (unlike a fracture or a wound) and the false idea that people can easily control their depression by their will.
- People with depression tend to have unrealistically negative opinions about themselves, their life and their future. Their current situation may be very difficult, but depression can cause unjustified thoughts of hopelessness and worthlessness. These views are likely to improve once the depression improves.
- Even if it is difficult, the person should try to do as many of the following as possible, as they can all help to improve mood:
 - Try to start again (or continue) activities that were previously pleasurable.
 - Try to maintain regular sleeping and waking times.
 - Try to exercise regularly, such as taking walks.
 - Try to eat regularly despite changes in appetite.
 - Try to spend time with trusted friends and family.
 - Try to participate in community and other social activities as much as possible.
- The person should be aware of thoughts of self-harm or suicide. If they notice these thoughts, they should not act on them, but should tell a trusted person and come back for help immediately.

In case of any major loss explain that:

- It is normal to grieve for any major loss. One can grieve for a person, a place, or property or the loss of one's own health and wellbeing. Grief has both mental and physical effects.
- People grieve in different ways. Some people show strong emotions while others do not. Crying does not mean one is weak. People who do not cry may feel the emotional pain just as deeply but have other ways of expressing it.
- In most cases, grief will diminish over time. One may think that the sadness, yearning or pain one feels will never go away, but in most cases, these feelings lessen over time. Sometimes a person may feel fine for a while, then something reminds them of the loss and they may feel as bad as they did at first. There is no right or wrong way to feel grief. Sometimes one might feel very sad, other times numb, and at other times one might be able to enjoy oneself.
- These experiences usually become less intense and less frequent over time.
- In case of the loss of a loved one, discuss and support culturally appropriate adjustment and/or mourning processes. Ask if appropriate mourning ceremonies/rituals have happened or been planned. If this is not the case, discuss the obstacles and how to address them.

Pharmacological therapy

Consider antidepressants for adults with moderate-severe depression.

- **First option:** SSRI (selective serotonin reuptake inhibitor): fluoxetine and paroxetine
- **Second option:** tricyclic antidepressant (TCA): amitriptyline
- Close follow-up and adherence to treatment is important. If patient is planning to re-locate or cannot return for follow-up appointments, do not initiate treatment with an anti-depressant.
- Explain to the patient and family that:
 - Antidepressants are not addictive.
 - It is very important to take the medication every day as prescribed.
 - It can take time, as long as 4 – 6 weeks, for the anti-depressant to be effective.
 - Some side-effects may be experienced within the first few days but they usually resolve.
 - Antidepressant medication usually needs to be continued for 9 - 12 months after the resolution of symptoms.
 - Medications should only be stopped with physician supervision and not stopped because the person has experienced improvement.

WARNING: STOP ANTI-DEPRESSANT IF PATIENT DEVELOPS MANIA

Follow-up

First follow-up should be within 1 week and then close follow-up depending on patient response.

1. Is the patient adherent to the medication?
2. Is the patient improving?
3. Are there side effects?
4. Is the patient attending counselling sessions?
5. Involve support system and encourage daily activities and healthy living.
6. If no response after 6-weeks, increase dosage. If still not response in 4 – 6 weeks, increase dosage and monitor for response and side effects. If with increased dosage and still no response, consult a specialist.
7. If patient is improving follow monthly or as needed.

Special circumstances

Pregnancy: Avoid antidepressants as first line but if psychosocial interventions are not effective or not available start low dose of antidepressant. Safest to use are fluoxetine or sertraline.

Breastfeeding: Use paroxetine, citalopram or sertraline; avoid long lasting antidepressants as fluoxetine.

Children under 12 years: Do not use medication except under supervision of a specialist

Adolescents 12 years or more: Never use medication as first line treatment. If psychosocial interventions are not effective medication can be used in low dose and monitoring the risk of suicide in the beginning of the treatment. First line: fluoxetine 10 mg daily.

Older adults: Avoid amitriptyline; use lower dosages of SSRIs

People with cardiovascular disease: Do not prescribe amitriptyline

Adults with thoughts or plans of suicide: Prescribe fluoxetine or paroxetine; do not prescribe amitriptyline.

Anxiety and stress related disorders

In humanitarian settings beneficiaries are exposed to potentially traumatic events. These events can precipitate a wide range of emotional, cognitive, behavioural, and somatic reactions. Whereas the majority of people re-equilibrate, others can present to health centres with acute stress reactions, or more persistent symptoms suggestive of a post-traumatic stress disorder or an anxiety disorder.

Diagnostic timeline

Acute Stress Rx

Bereavement reaction

Depression

Psychosis

Post-traumatic stress disorder

Bereavement reaction

Depression

Psychosis

Post-traumatic stress disorder

Generalized Anxiety disorder

Depression

Psychosis

First month of SX

After 1-month

After 6- month

Acute stress reaction

Clinical features

Acute stress reaction is diagnosed when a person meets the following criteria:

1. A potentially traumatic event has occurred in the past month
2. Symptoms began after the event.
3. The person has difficulty with daily functioning or is seeking help for the symptoms.

Symptoms include

- Anxiety about threats related to the traumatic event
- Sleep problems
- Concentration problems
- Recurring frightening dreams, flashbacks, or intrusive memories related to the event
- Being jumpy or on edge
- Feeling shocked, dazed or numb or inability to feel anything
- Any disturbing emotions (tearfulness, anger, sadness) or thoughts

- Changes of behaviour such as: aggression, social isolation and withdrawal, regression in children, risk taking behaviours
- Hyperventilation
- Medically unexplained physical complaints such as: palpitations, dizziness, headaches, generalized aches and pain, dissociative symptoms relating to the body (unexplained paralysis, mutism, pseudoseizures)

Diagnosis

1. Ask if the person has experienced a potentially traumatic event and how much time has passed since the event
2. Rule out a medical condition
3. If the person has experienced a major loss, then go to above steps for major loss.
4. Check for other mental conditions, such as depression, psychosis, **substance use** and consider PTSD if more than 1-month has passed since the event.

Treatment

1. Provide psychological first aid: listening, linking with services, normalizing the patient's response to an abnormal event, advice on relaxation and calming, support coping mechanisms.
2. Sleep disturbances – advise on good sleep hygiene:
 - Regular times for going to bed and waking up
 - Avoidance of caffeine, nicotine, alcohol before bedtime
 - For severe insomnia that interferes with daily functioning: consider diazepam 5 mg at bedtime for 7 days or promethazine 25-50 mg at bedtime.
3. Follow-up in 2 – 3 weeks if symptoms do not improve.

Post-traumatic stress disorder

Clinical features

Post-traumatic stress disorder is diagnosed when a specific group of symptoms persists for more than a month after a potentially traumatic event. Keep in mind that a potentially traumatic event can also trigger a psychosis or depression or substance use. Criteria for a PTSD include:

1. Re-experiencing of the event: This can occur through nightmares, flashbacks or intrusive memories accompanied by intense fear or horror. In children, the re-experiencing can occur through re-enactments of the traumatic event in play or through nightmares.
2. Avoidance symptoms: These involve deliberate avoidance of thoughts, memories, activities, or places that remind the person of the event.
3. Hyperarousal symptoms: These include excessive concern and alertness to danger or reacting strongly to loud noises or unexpected movements. The person might describe himself as being “jumpy” or “on edge.”
4. Considerable difficulty in daily functioning.

Diagnosis

1. Ask if the person has experienced or witnessed a potentially traumatic event and if this event occurred more than 1-month ago. The event can include physical or sexual violence (including domestic violence), witnessing of atrocity, or major accidents or injuries.
2. Ask if the person is now having the above symptoms with interference of daily functioning. If all of the above symptoms are present for 1-month following the traumatic event, then PTSD is the likely diagnosis.
3. Assess for other mental health conditions and rule out and treat any medical problems.

Treatment

1. Provide psychoeducation on PTSD.
 - Explain what PTSD is and that many people recover from PTSD without treatment.
 - Advise that the person continues daily activities as much as possible.
 - Encourage talking to supportive friends and family, whatever is comfortable for the patient.
 - Encourage relaxing and pleasurable activities.
 - Advise not to use alcohol or drugs to cope with symptoms.
2. Refer for counselling if available.
3. For persistent symptoms that do not respond to lifestyle interventions and counselling, consider the SSRI anti-depressant paroxetine per above protocol for depression.

Generalised anxiety disorder (GAD):

Anxiety is described as a feeling of apprehension, fear, or worry. Patients with an anxiety disorder characteristically present anxiety which is constant and all-consuming. It causes self-imposed isolation or emotional withdrawal and prevents certain normal activities like going outside or interacting with other people.

Clinical features

GAD is defined as a period of at least six months with uncontrolled worry, nervousness, and apprehension about everyday events and problems. It is common for patients to experience physical symptoms such as dizziness, difficulty breathing, palpitations, chest pain or discomfort. Other common symptoms include: Trouble falling or staying asleep, muscle tension, irritability, trouble concentrating, getting tired easily, restlessness or feeling “keyed up” or on edge, trembling, shortness of breath, fast heartbeat, dry mouth, dizziness, nausea.

ICD-10 criteria include:

1. At least 4 symptoms of anxiety should be present.
2. At least one symptom should include palpitations or pounding heart or accelerated heart rate, sweating, trembling or shaking, or dry mouth (not due to dehydration or medication).
3. The symptoms do not meet the criteria for another psychiatric disorder.
4. Physical disorders or substance use disorders have been ruled out.

Diagnosis

1. Screening questions:
 - a. During the past 4 weeks have you been bothered by feeling worried, tense or anxious most of the time?
 - b. Are you frequently tense, irritable and having trouble sleeping?
2. Do a careful physical exam and rule out medical diseases such as hyperthyroidism, cardiopulmonary problems, traumatic brain injury, medication side effects, and drug use.
3. Rule out other mental disorders such as depression or PTSD.
4. Ask about family history of anxiety, personal history of anxiety or a mood disorder, past or recent stressful or traumatic life events, and chronic medical illness.

Treatment and management

There are 3 main treatments to be considered for GAD: psychoeducation and self-help interventions, counselling, and pharmacotherapy. The type of treatment depends on the preference of the patient and the severity of severity of the disorder. For mild impairment, psychoeducation self-help interventions can be effective. For moderate-severe disorders, consider counselling and pharmacotherapy.

1. Psychoeducation and self-help:
 - Explain that symptoms are due to anxiety and reassure the person that he/she does not have a medical condition. Often patients with GAD fear that they have a fatal illness and are dying.
 - Show understanding that the anxiety is real and a cause of the symptoms.
 - Do not minimize the person's distress or tell him/her to stop worrying.
 - At the same time, provide reassurance about unrealistic fears.
 - Recommend and encourage relaxation techniques such as deep breathing, meditation, positive imagery and progressive muscle relaxation.
 - Encourage physical exercise.
 - Encourage spending time with supportive others.
 - Validate and support coping skills.
2. Counselling: Counselling, when available, can be help patients in coping with and controlling anxiety.
3. Pharmacotherapy: Medication alone does not cure but can be effective in relieving symptoms of GAD.
 - First-line treatment is a SSRI such as paroxetine. The dosing of the SSRIs used in the treatment of GAD is similar to that used in the treatment of depression. See above protocol for the treatment of depression.
 - Benzodiazepines can be used short term, 2 – 3 weeks, but should be avoided for longer periods due to being addictive.

Medications used in psychiatric disease

MEDICATION	DOSING	SIDE EFFECTS	CONTRAINDICATIONS/CAUTIONS
Haloperidol 5 mg tab	Start 2.5 – 5 mg daily and increase as needed to a maximum daily dosage of 20 mg; give in 2 divided dosages	EPS including acute dystonic reactions, akathisia, rigidity, slurring of speech; other common S/E: dizziness, blurred vision, dry mouth, urinary retention, constipation, tardive dyskinesia after long term use neuroleptic malignant syndrome (NMS-rare)	Caution in patients with kidney, liver, or cardiac disease including long QT syndrome or taking QT prolonging medications.
Risperidone 2 mg tab	Start 1 mg daily and increase to 2 – 6 mg daily, maximum daily dosage 8 mg; give in 2 divided dosages	sedation, dizziness, tachycardia, EPS, elevated prolactin, metabolic effects (elevated lipids, insulin resistance, weight gain, orthostatic hypotension)	Caution in patients with cardiac disease.
Chlorpromazine 25 mg tab	Start 25 – 50 mg daily and increase to 75-300 mg daily divided in 2 or 3 dosages; up to 1000 mg daily might be needed in severe cases.	sedation, dizziness, blurred vision, dry mouth, urinary retention, constipation, tachycardia, orthostatic hypotension, syncope, EPS, photosensitivity, weight gain, NMS, jaundice, agranulocytosis	Caution in patients with respiratory disease, kidney disease, liver disease, glaucoma, urinary retention, cardiac disease, long QT syndrome or taking QT prolonging medications
Biperiden 2 mg tab	Start 2 mg daily and increase to 4 – 12 mg daily in two divided dosages	Sedation, confusion, memory disturbance, tachycardia, dry mouth, urinary retention and constipation, angle closure glaucoma (rare)	Caution in patients with cardiac, liver, or kidney disease. Caution when combining with other anti-cholinergic medications.
Trihexyphenidyl 2 mg tab	Start 2 mg daily and increase to 4 – 12 mg daily in 3 – 4 divided dosages		Avoid with pregnancy and breastfeeding, if possible
Sodium valproate 200mg / 500mg tablets	Start 500 mg daily; increase slowly to 1000 – 2000 mg daily in split dosages or entire dose at bedtime; (maximum dosage: 60 mg/kg/day)	Sedation, headache, tremor, ataxia, nausea, vomiting, diarrhea, weight gain, transient hair loss, leukopenia, thrombocytopenia, drowsiness, confusion, liver failure, haemorrhagic pancreatitis,	Caution in patients with suspected or underlying liver disease.
Carbamazepine	Start 200 mg daily; increase by 200 mg weekly to 400 – 600 mg daily in two divided dosages (maximum 1200 mg daily)	Sedation, confusion, dizziness, ataxia, double vision, nausea, diarrhoea, benign leukopenia, hepatotoxicity, cardiac conduction delay, low sodium levels, severe rash (Stevens-Johnson Syndrome)	Contraindicated in patients with history of blood disorders, kidney, liver, or cardiac disease
Fluoxetine 20 mg capsule (SSRI)	Start 20 mg every other day for 1 week; if tolerated increase to 20 mg daily for 6 weeks; if no response can increase to 40 mg (maximum dosage 80 mg)	Sedation, insomnia, akathisia, restlessness, headache, dizziness, gastrointestinal disturbances, change in appetite, sexual dysfunction	Caution in persons with history of seizures. Caution in patients who use aspirin or other non-steroidal anti-inflammatory drugs (NSAID); may increase levels of antipsychotics and beta blockers; Avoid in combination with warfarin
Paroxetine 20 mg tab (SSRI)	Start 10 mg daily; if tolerated can increase to 20 mg daily for 6 weeks; maximum dosage 40 mg.	Sedation, insomnia, weight gain, dizziness, sexual dysfunction, gastrointestinal disturbances	Caution in patients with hepatic or renal disease. Caution in persons with history of seizures. Caution in discontinuation; recommend slow tapering Caution in patients who use NSAIDs Avoid in combination with warfarin
Amitriptyline 25 mg (TCA)	Start 25 mg at bedtime; increase by 25 – 50 mg per week to 100 – 150 mg daily (maximum 300 mg)	Sedation, orthostatic hypotension, blurred vision, difficulty urinating, nausea, weight gain, sexual dysfunction, ECG changes (QTc prolongation), cardiac arrhythmia, increased risk of seizure	Avoid in persons with cardiac disease, history of seizure, urinary retention Avoid in persons who are at risk of suicide

Section C - Emergency Management

Management of Acute exacerbation of Asthma in CHILDREN (<16 years)		
Assess severity of exacerbation		
Mild/moderate	Severe	Life Threatening
<p>Alert & can walk and speak whole sentences in one breath</p> <p>Young children can crawl and vocalise</p> <p>Pulse and respiratory rate normal for age</p> <p>No respiratory distress/ mild abdominal excursion</p> <p>O2 Saturation > 94%</p> <p>Peak flow 50-75% predicted</p>	<p>Any of: unable to speak in full sentences, lethargic, visibly breathless, moderate respiratory distress (subcostal or intercostal recession, use of accessory neck muscles, tracheal tug) tachycardic, tachypnoeic.</p> <p>O2 Sats 90-94%</p> <p>PEFR 33-50% predicted</p>	<p>Any of: can't talk/vocalise, drowsy, confused, exhausted, coma, cyanosis, severe distress/poor respiratory effort, silent chest, hypotension, bradycardia.</p> <p>O2 Saturation <90%</p> <p>PEFR <33% predicted.</p>
Management of Exacerbation		
<p>1. Oxygen via non-rebreathe mask if patient breathless or oxygen sats <95% - aim for sats 95%</p>		
<p>2. Salbutamol</p>		
<p>Inhaler via spacer over 10 minutes:</p> <ul style="list-style-type: none"> ➤ 6+ years: 6-12 puffs (1 puff at a time) ➤ 0-5 years: 4-6 puffs with facemask (normal breathing via spacer) ➤ If patient cannot breathe through spacer, start nebulised Salbutamol <p>< 1 year unlikely to be asthma</p> <p>Reassess after 10 minutes and repeat dose every 20 minutes for first hour if needed</p>	<p>If SaO2 is $\geq 95\%$, inhaler via spacer (+/- facemask) over 10 minutes. Shake inhaler before each puff.</p> <ul style="list-style-type: none"> ➤ 6+ years: 12 puffs; 0-5 years: 6 puffs <p>If patient cannot breathe through spacer, start nebulised Salbutamol.</p> <p>Oxygen driven if SaO2 is < 95%.</p> <ul style="list-style-type: none"> ➤ 6+ years: 5mg; 0-5 years: 2.5 mg <p>Repeat every 20 minutes for one hour (total 3 times), or sooner if needed</p>	<p>Continuous nebulisation.</p> <ul style="list-style-type: none"> ➤ 6+ years: 2 x 5mg nebulises; ➤ 0-5 years: 2 x 2.5 mg nebulises <p>Oxygen driven if SaO2 is < 95%.</p> <p>Notify senior staff and arrange transfer to higher level care if available</p> <p>Continuous nebuliser until dyspnoea improves, then consider changing to inhaler or intermittent nebulisers.</p>
<p>3. Re-assess and add Ipratropium Bromide only if response poor – repeat every 4-6 hours</p> <ul style="list-style-type: none"> ➤ 6+ years: 8 puffs (160 mcg) via inhaler with spacer (21mcg/actuation) every 20 mins for 1st hour ➤ 0-5 years: 4 puffs (80 mcg) via inhaler with spacer + facemask (21mcg/actuation) every 20 mins for 1st hour <p>OR if requiring nebuliser, add Ipratropium nebuliser to nebulised salbutamol every 20 minutes for first hour:</p> <p>6+ years: 0.5 mg nebuliser; 0-5 years: 0.25mg nebuliser</p>		
<p>4. Steroids - in all cases of severe / life threatening asthma, or in mild / moderate asthma if no / insufficient response to initial bronchodilator treatment</p> <p>Oral Prednisolone for 5 days or until better: 20mg/ day (0-5 years), 40mg/day (6+ years)</p> <p>OR, if oral route not possible;</p> <p>Hydrocortisone IV initial dose 8-10mg/kg (maximum 300 mg) then 4-5 mg/kg every 6 hours on Day 1, then every 12 hours on Day 2, then once only on Day 3 – convert to oral prednisolone as soon as can take oral treatment</p>		
<p>5. IV drugs – only for severe/life threatening asthma not responding to above treatment</p> <p>Magnesium sulphate 0.1-0.2 mmol/kg IV over 20 minutes – preferred option if available; avoid in children < 2 years.</p>		
<p>6. Antibiotics: indicated if clear evidence of infection (fever, productive cough) - see green book</p>		
<p>7. Reassess after 1 hour of starting treatment -Repeat vital signs + pulse oximetry</p>		
<p>Stable</p> <p>Dyspnoea resolved</p> <p>Observe for one hour and then discharge home.</p>	<p>Persisting Mild/Moderate signs:</p> <p>Admit to hospital</p>	<p>Persisting Severe or Life-threatening signs: Transfer to ICU/ High dependency unit if available. Consider intubation/ventilation if expertise/equipment available.</p> <p>Continue salbutamol: 10 mg via nebuliser 2-4 hourly or more often, for 24 hours then review. 2 hourly vital signs</p>
<p>8. Discharge and Follow Up</p> <ul style="list-style-type: none"> ➤ Prednisolone: 2 mg/kg (max 50 mg) on Day 1 then 1 mg/kg Days 2 - 5; Beclometasone via spacer: 200 mcg daily (increase baseline dose if taking regularly) ➤ Salbutamol: 4 puffs 4 hourly for 24 hours then reduce to twice daily. ➤ Antibiotics: As above ➤ Ensure parents/carer aware of how to use inhaler and spacer and know signs of early deterioration and when to return if worsening ➤ Arrange follow-up 2-3 days after discharge 		

Management of Acute exacerbation of Asthma in ADULTS (>16 years)

Assess severity of exacerbation

Mild/moderate	Severe	Life Threatening
<p>Can walk and speak whole sentences in one breath Pulse < 110 bpm Respiratory rate < 25 rpm O2 Sats > 94% Peak flow 50-75% predicted</p>	<p>Any of: unable to speak in full sentences visibly breathless, respiratory rate > 25 rpm pulse > 110 bpm Oxygen saturation 90-94% PEFr 33-50% predicted.</p>	<p>Any of: can't talk, drowsy, confused, exhausted, coma, cyanosis, poor respiratory effort, silent chest, hypotension, bradycardia. Oxygen saturation less than 90% PEFr < 33% predicted.</p>

Management of Exacerbation

1. Oxygen via non-rebreathe mask if patient breathless or oxygen sats < 95% - aim for sats 95%		
2. Salbutamol		
<p>6-12 puffs of inhaler via spacer over 10 minutes.</p> <p>Reassess after 10 minutes and repeat 10 Salbutamol puffs every 20 minutes for the first hour if needed.</p> <p>Normal breathing via a spacer is as effective as individual puffs.</p>	<p>If SaO₂ is ≥ 95%, give 6-12 puffs of inhaler via spacer over 10 minutes. Shake inhaler before each puff.</p> <p>If SaO₂ is < 95%, give 5 mg of nebulised Salbutamol oxygen driven nebuliser.</p> <p>If SaO₂ is ≥ 95% but patient cannot breathe through spacer, use air-driven nebuliser.</p> <p>Repeat every 20 minutes for one hour or sooner if needed.</p>	<p>2 x 5 mg Salbutamol via continuous nebulisation</p> <p>If SaO₂ is < 95%, give via oxygen driven nebuliser.</p> <p>Notify senior staff and arrange transfer to higher level care if available</p> <p>Continue Salbutamol until dyspnoea improves, then consider changing to inhaler with spacer or intermittent nebulisation.</p>
3. Re-assess and add Ipratropium Bromide only if response poor – repeat every 4-6 hours		
<ul style="list-style-type: none"> ➤ Add Ipratropium Bromide 8 puffs (160 mcg) via inhaler with spacer (21mcg/ actuation) every 20 minutes for first hour ➤ OR if requiring nebuliser, give 0.5 mg Ipratropium Bromide nebule added to nebulised salbutamol every 20 minutes for first hour. 		
4. Steroids - in all cases of severe / life threatening asthma, or in mild / moderate asthma if no / insufficient response to initial bronchodilator treatment		
<ul style="list-style-type: none"> ➤ Oral Prednisolone 40 mg ➤ OR if oral route is not possible hydrocortisone 100 mg IV every 6 hours until patient can take oral prednisolone 		
5. IV drugs – only for severe/life threatening asthma not responding to above treatment		
Magnesium sulphate: 2g IV over 20 minutes		
6. Antibiotics: are indicated where there is clear evidence of infection (fever, productive cough) – see green book		
7. Reassess after 1 hour of starting treatment - Repeat vital signs + pulse oximetry		
<p>Stable: dyspnoea resolved</p> <p>Observe for one hour and then discharge home</p>	<p>Persisting Mild/Moderate signs: Admit to hospital</p>	<p>Persisting Severe or Life-threatening signs: Transfer to ICU/ High dependency unit if available. Consider intubation/ventilation if expertise/equipment available</p> <p>Salbutamol 10 mg via nebuliser 2-4 hourly or more often, for 24 hours then review. 2 hourly vital signs and alert doctor if deteriorating.</p>
8. Discharge and Follow Up		
<ul style="list-style-type: none"> ➤ Salbutamol: 4 puffs 4 hourly for 24 hours then reduce to twice daily. Advise patient if needing more than 4 hourly – they will need to return to clinic for assessment ➤ Prednisolone: 30- 40 mg orally for 5 days or until better. Beclomethasone via spacer: 400mcg daily (or increase baseline dose if already taking regularly) ➤ Antibiotics: As above ➤ Arrange follow-up – 1 week if mild exacerbation/well, 2-3 days if moderate/severe exacerbations 		

Management of Acute Exacerbation of COPD

Exacerbations are characterised by acute worsening of COPD symptoms

- Shortness of breath
- Increased quantity of phlegm and change in colour

Normally triggered by infections (viral or bacterial) or environmental pollutants

Vital signs; pulse, BP, respiratory rate, oxygen saturations, temperature

Respiratory Distress?;

Use of accessory muscles
Colour (cyanosis most worrying)
Able to talk?
Level of consciousness

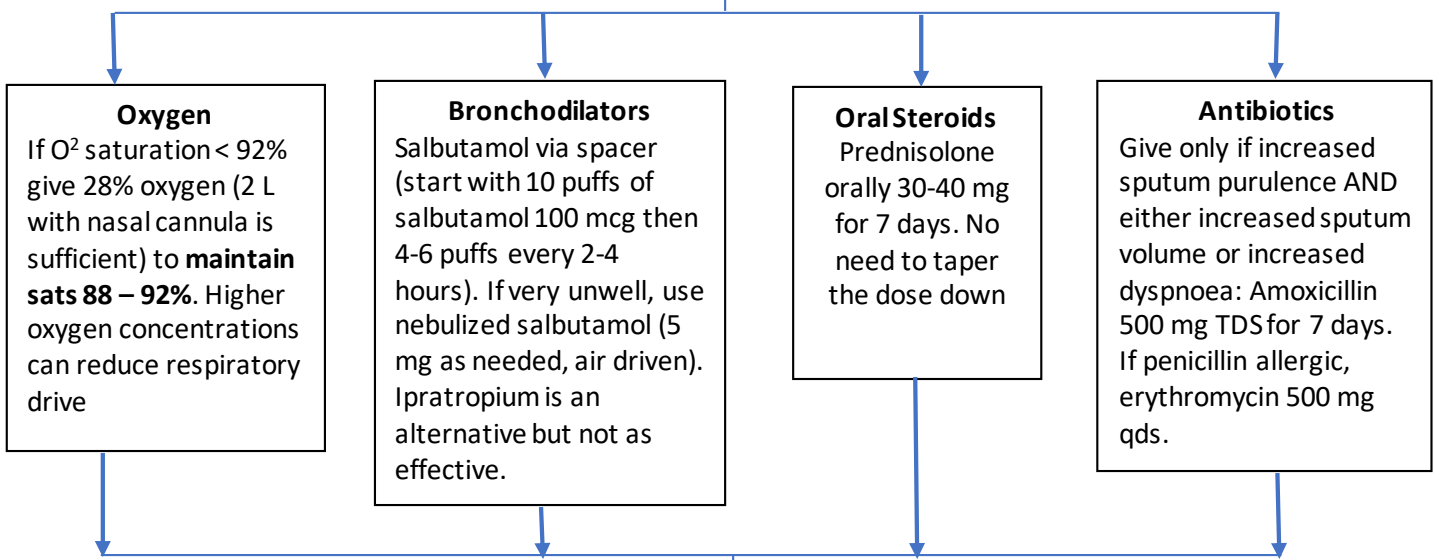
Peripheral oedema? (heart failure)

Assess Severity

Pulse >100bpm
Respiratory rate > 20 bpm
Oxygen saturations < 92%
Use of accessory muscles
Inability to complete sentences
Cyanosis
Decreased level of consciousness

Move immediately to treatment room and doctor to treat immediately

Initial Treatment of Exacerbation of COPD



Oxygen

If O₂ saturation < 92% give 28% oxygen (2 L with nasal cannula is sufficient) to **maintain sats 88 – 92%**. Higher oxygen concentrations can reduce respiratory drive

Bronchodilators

Salbutamol via spacer (start with 10 puffs of salbutamol 100 mcg then 4-6 puffs every 2-4 hours). If very unwell, use nebulized salbutamol (5 mg as needed, air driven). Ipratropium is an alternative but not as effective.

Oral Steroids

Prednisolone orally 30-40 mg for 7 days. No need to taper the dose down

Antibiotics

Give only if increased sputum purulence AND either increased sputum volume or increased dyspnoea: Amoxicillin 500 mg TDS for 7 days. If penicillin allergic, erythromycin 500 mg qds.

If patient not improved after one nebulised salbutamol, severe underlying COPD, respiratory distress, impaired level of consciousness, old age or insufficient home support - ADMIT TO HOSPITAL

Oxygen

Sit upright and continue Oxygen as directed above

Bronchodilators

Nebulised salbutamol 5mg driven by air, not oxygen. Repeat 1-4 hourly. Add nebulised ipratropium bromide 500 µg (maximum qds) if there is poor response to initial therapy.

Steroids

Prednisolone 40 mg p.o. once daily for 7 days. Hydrocortisone 200 mg IV ONLY if the patient is unable to take p.o., then convert to oral Prednisolone to complete 7 days of treatment

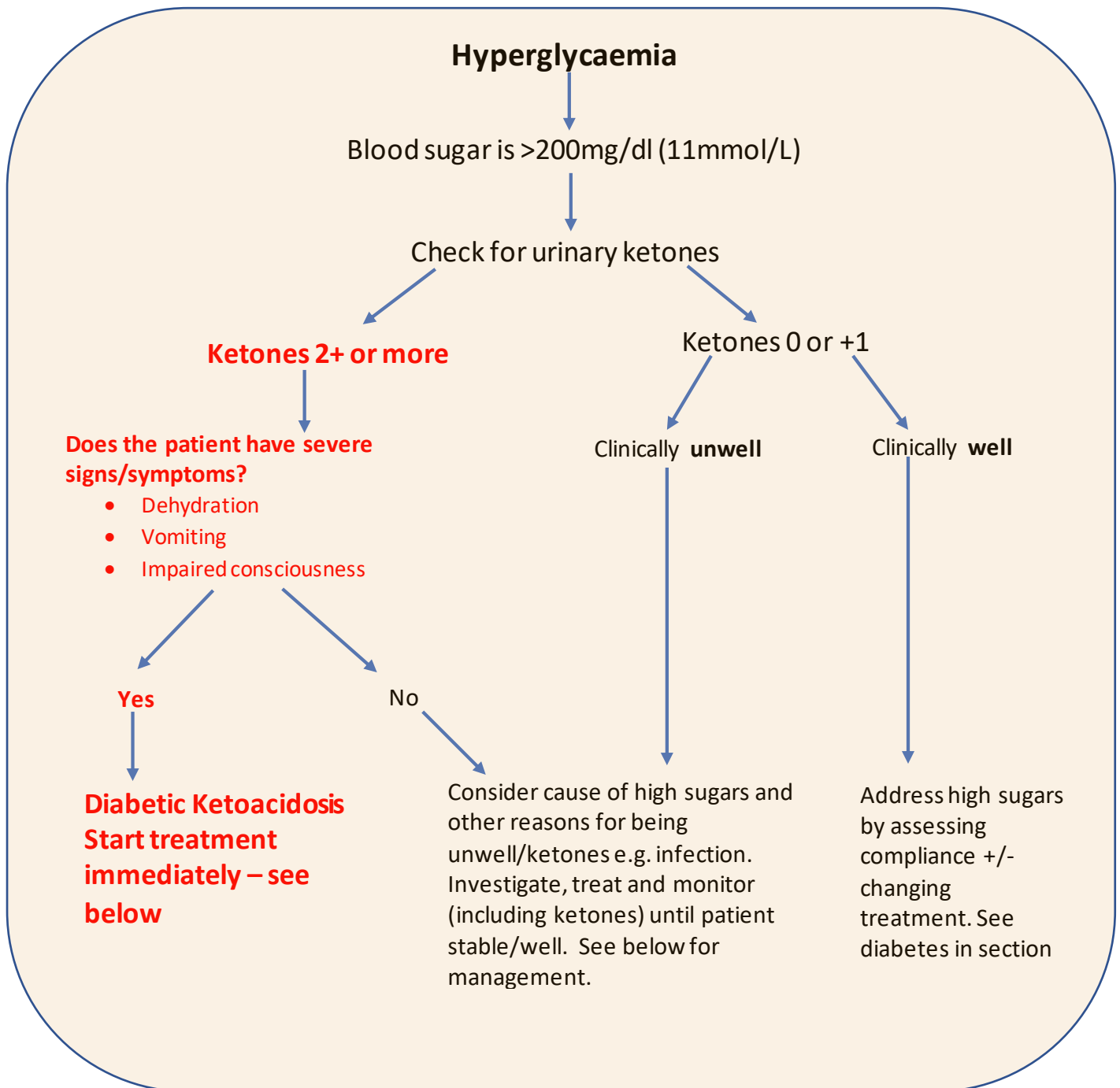
Antibiotics

If sputum purulence is increased, **co-amoxiclav 625mg tds p.o.** IV antibiotics are not necessary unless severe pneumonia clinically or on chest X-ray. + Chest physio if available

Discharge home when wheeze has resolved, normal respiratory rate and can mobilise around ward

Diabetic Emergencies

- Any diabetic patient who feels unwell should have their blood sugar checked.
- Patients with signs or symptoms of hyperglycaemia or hypoglycaemia, chest pain, breathlessness, BP >180/110, fasting glucose > 200mg/dL (11mmol/L) or <75mg/dL (4.2mmol/L) should be moved to a treatment room to be assessed by a Doctor.



Management of Diabetic Ketoacidosis (DKA) in Adults and Children

	Adults/Child >15 years	Children <15years												
Immediate Treatment/ Resuscitation	<p>DO NOT DELAY STARTING TREATMENT. DO NOT TRANSFER PATIENT UNTIL STABLE</p> <p>Intravenous/Intraosseous access urgently and start IV fluids</p> <p>If IV or IO fluids not available – rehydrate orally via NG tube or oral sips if not available</p> <p>Place a urinary catheter and carefully monitor the fluid balance</p> <p>Give oxygen if necessary</p>													
Essential investigations	<p>Blood glucose, urinary ketones</p> <p>If available – FBC, blood glucose, electrolytes, urea and creatinine, HbA1c bicarbonate, haemoglobin and white cell count.</p> <p>Venous or arterial pH should also be measured if available.</p> <p>Rapid tests for malaria/pregnancy (if appropriate), urine dipstick for infection</p>													
1. Fluids	<p>1L of 0.9% sodium chloride (NaCl) over 1 hour if systolic BP >90</p> <p>If systolic BP <90/shock give repeated boluses of 500ml over 10-15mins</p> <p>Reassess then if shock resolved follow with;</p> <p>1L over 1 hr then 1L over 2 hr then 1L over 4 hr then 1L over 6 hr then 1L over 8 hr = approx 6L fluid over 24 hours</p>	<p>IF decreased peripheral perfusion without signs of shock – 10ml/kg in 1 hour</p> <p>IF signs of shock: 10ml/kg bolus of 0.9% NaCl over 15-30mins (Ringer’s Lactate can also be used)</p> <p>Repeat until signs of shock resolve (max 3 times)</p> <p>Then continue with careful rehydration over 48 hours.</p> <p>The following infusion rates are calculated for maintenance + 10% dehydration</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Weight of Child (Kg)</th> <th style="width: 40%;">Rate of fluid ml/kg/hr</th> </tr> </thead> <tbody> <tr> <td>4 – 9</td> <td>6</td> </tr> <tr> <td>10 – 19</td> <td>5</td> </tr> <tr> <td>20 – 39</td> <td>4</td> </tr> <tr> <td>40 – 59</td> <td>3.5</td> </tr> <tr> <td>60 – 80</td> <td>3</td> </tr> </tbody> </table>	Weight of Child (Kg)	Rate of fluid ml/kg/hr	4 – 9	6	10 – 19	5	20 – 39	4	40 – 59	3.5	60 – 80	3
Weight of Child (Kg)	Rate of fluid ml/kg/hr													
4 – 9	6													
10 – 19	5													
20 – 39	4													
40 – 59	3.5													
60 – 80	3													
2. Insulin	<ul style="list-style-type: none"> • Rapid acting insulin should be started ASAP at 0.1units/kg/hour • This can either be set up as an insulin infusion (50 units of rapid acting insulin added to 49.5mls of 0.9% sodium chloride to give 1unit/ml solution) or given IM/deep subcutaneous hourly • Aim is to reduce glucose by 60-70mg/dL (3-4mmol/L) per hour (faster may lead to cerebral oedema). If glucose is falling faster than this decrease insulin to 0.05units/kg/hr (but not lower), if needed increase glucose concentration in fluid. • Check blood sugar every hour followed by insulin SC/IM and adjust dose/infusion rate if needed as follows; <ul style="list-style-type: none"> ○ Blood glucose >200mg/dL (11.1 mmol/L): increase insulin by 2units/hr in adults or by 0.05units/kg for children <15years ○ Blood glucose 90 – 200mg/dL (5 – 11.1mmol/L): Repeat same dose of insulin. Replace NaCl with NaCl/10%glucose (take a new 1000ml pouch, remove 200ml of NaCl and throw it away, replace with 200ml of 50% dextrose +/- KCL as below) ○ Blood glucose <90mg/dL (5mmol/L): Stop insulin. Give 50ml Glucose 10% IV (in children <15yrs give 5ml/kg of 10% dextrose IV). Replace NaCl with NaCl/10% glucose as above • Continue insulin in this way until patient is well, blood glucose is <200mg/dL (11mmol/L), no urinary ketones, they are asymptomatic, eating and drinking normally and passing urine well. <ul style="list-style-type: none"> ○ Insulin can then be changed to twice daily regimen (see diabetes in section B) and titrated gradually to achieve target blood sugar level 													
3. Potassium	<ul style="list-style-type: none"> • Ideally potassium should be measured and if potassium is <5.0 mEq/l then 20mmol of potassium chloride (KCL) added to each litre of fluid (except the first litre/or boluses) once shock has resolved (20mmol KCL = 15ml of 10% KCL). • If potassium is >5.0 mEq/L then do not add KCL to fluids but re-check in 2hrs as potassium levels can fall quickly • If potassium measurement is unavailable then KCL should still be added to each bag of fluid (as above) if the patient is passing urine. • ECG can be helpful if potassium can't be measured. Hypokalaemia changes = flattening of the T wave, widening of the QT interval and the appearance of U waves indicate. Hyperkalaemia changes = tall, peaked, symmetrical T waves and shortening of the QT interval 													
4. Antibiotics	<ul style="list-style-type: none"> • Infection is an important cause of DKA in both adults and children. Strongly consider empiric broad spectrum antibiotics e.g. ceftriaxone if infection is suspected (+/- antimalarial treatment) • These can be discontinued after 48 hours if there is no evidence of sepsis/infection. 													
5. Monitoring	<p>Record hourly: heart rate, blood pressure, respiratory rate, level of consciousness, glucose meter reading. Monitor urine ketones in every sample of urine passed. Record fluid intake, insulin therapy and urine output • Repeat blood urea and electrolytes every 2-4 hours if possible</p>													
6. Other	<p>Consider thromboprophylaxis if available and patient at high risk. Prevent cerebral oedema (usually due to vigorous rehydration) and look for signs; headache, slowing of heart rate, rising BP, change in neurological status/neurological signs, decreasing oxygen saturation. Consider NG tube if patient drowsy or vomiting. DO NOT use IV bicarbonate</p>													

Management of patients with high sugars – NOT DKA	
Assessment	<p>As per flow chart above;</p> <ul style="list-style-type: none"> • Patient is unwell but does not have severe symptoms • Ketones 0 or 1+ (<2+) • OR Ketones +2 but NO severe symptoms
Management	<ul style="list-style-type: none"> • Encourage patient to drink 500ml non-sugary drink (10ml/kg in children <15yrs) over 1 hour then re-check sugar • Look for infection and treat as appropriate • If glucose still >200mg/dL (11mmol/L) AND unwell give 2 units of short acting insulin (Actrapid) subcutaneously (0.05units/kg in children <15). Continue oral fluids and re-check sugar in 1 hour. Re-check urinary ketones • If patient is now well or stabilised: <ul style="list-style-type: none"> ○ If patient was on insulin prior to this episode, increase baseline total insulin dose by: <ul style="list-style-type: none"> ○ 2 units (0.05units/kg in children <15) if previous total dose was <20units / day ○ 4 units (0.05units/kg in children <15) if previous total dose was >20units / day ○ if patient was not on insulin, consider increasing dose of oral hypoglycaemic drugs • If sugar level persistently >200mg/dL (11mmol/L) and patient remains unwell/severe symptoms – consider treating as DKA as above

Management of Hypoglycaemia	
Blood sugar <75mg/dL (4mmol/L) with or without symptoms	
Conscious Patient Able to drink safely	Unconscious Patient Unable to drink safely
<ul style="list-style-type: none"> • Give 15g of simple sugar = 200mls of fruit juice (non-diet) cola or fizzy sweet drink OR 25ml of 50% dextrose by mouth • Re-check sugar in 10mins <ul style="list-style-type: none"> ○ IF still <75mg/dL (4.2mmol/L) then repeat above and re-check in 10mins ○ IF >75mg/dL (4.2mmol/L) give the next meal or snack that is due or a source of slow-release carbohydrate (2 biscuits, bread or fruit). Re-check in 1 hour • Look for a cause – e.g. too much insulin (incorrect dose or type or recent weight loss, missed or delayed meal, alcohol, extra or unplanned exercise, other medications) 	<ul style="list-style-type: none"> • IV access and give 25ml of 50% Dextrose followed by a flush of NaCl (children <15yrs give 2ml/kg of 10% Dextrose IV/IO) • Recheck in 10mins • IF still <75mg/dL (4.2mmol/L) and unconscious or unable to drink, repeat as above • If still <75mg/dL (4.2mmol/L) but lucid and able to drink, give 200ml of sugary drink or 25ml of 50% dextrose by mouth. Recheck in 10mins • IF >75mg/dL (4.2mmol/L) give the next meal or snack that is due or a source of slow-release carbohydrate (see opposite) • IF >75mg/dL (4.2mmol/L) and consciousness is still impaired, start an IV infusion of 10% Dextrose 1L over 2 hours <ul style="list-style-type: none"> ○ children <15yrs: <ul style="list-style-type: none"> ○ 4-9kg: 6ml/kg/hr ○ 10-19kg: 5ml/kg/hr ○ 20-39kg: 4ml/kg/hr ○ 40-59kg: 3.5ml/kg/hr ○ 60-80kg: 3ml/kg/hr ○ Recheck in 1 hour and stop when conscious and able to drink safely

ACUTE MANAGEMENT OF PATIENT WITH A SEIZURE

- Most seizures are brief and self-limiting and stop within 5-10mins
- If seizure lasts > 5mins or repeated (≥ 3 in 1 hour) – transfer to treatment room immediately and get doctors assessment
- Check blood glucose, electrolytes and calcium
- Get history from patient +/- witness
- Look for and if possible treat cause e.g. metabolic/infectious/febrile seizure
- If seizure continues use table below (AED = anti-epileptic drug)

STAGES	GENERAL MEASURES	EMERGENCY AED THERAPY
1 (0-10 minutes) Pre-hospital	Protect from injury, Place the patient in 'recovery position' to maintain the airway. Loosen clothing, remove eye glasses. Most seizures are quickly self-limiting. If generalized seizures last more than 5 minutes, use rectally.	<u>Diazepam rectally if available (see below)</u> Child: 0.5 mg/kg, maximum 10 mg. Adult: 10 mg If seizure continues for 10 minutes after 1st dose, repeat the dose and transfer to hospital. If 2 appropriate doses fail to stop the seizure, further doses are unlikely to work and increase the risk of respiratory depression.
2 (0-30 minutes) Early Status Epilepticus	Hospital care: assessment and management need to occur at the same time. Assess and manage ABCs-Start high flow oxygen Check capillary blood glucose Establish IV access and start regular monitoring (see below) History – duration of seizure, any pre-hospital treatment, significant past history including history of seizures, focal features, fever, use of anticonvulsant medication. Emergency investigations: Blood - glucose, electrolytes, calcium, full blood count (and magnesium and blood clotting, AED drug levels and if available). Consider Chest X-Ray if aspiration is suspected. Brain scan, lumbar puncture as appropriate to the clinical situation.	If the patient has not yet had diazepam give: <u>Diazepam IV/IO</u> IV is preferable but PR can be used if rapid IV access cannot be achieved. Dilute 10 mg (2 ml) of Diazepam in 8 ml of 5% glucose or 0.9% sodium chloride. Child: 0.3 mg/kg over 2 or 3 minutes only if means of ventilation are available (Ambu bag and mask). Otherwise, rectal dose as above. Adult: 10 mg. If seizure continues after 1st dose, repeat dose after 5 minutes if IV dose or 10 minutes if oral/IO. If seizure continues after 2nd dose, treat as status epilepticus: Glucose Child: 5 ml/kg of 10% Glucose slowly Adult: 50 ml of 50% Glucose with NaCl flush (And IV Thiamine (250 mg) if alcohol abuse or malnutrition suspected, if available). Continue usual AED medication if already on treatment. Any recent dose reduction should be reversed
3 (0-60 minutes) Established Status Epilepticus	Try to establish aetiology and consider the possibility of non-epileptic status. Alert anaesthetist if available Identify and treat medical complications	If seizure continues after 2 doses of diazepam, give: <u>Phenobarbital IV /IM</u> 200 mg in 1 ml ampoule (200 mg/ml) for IV perfusion or deep IM injection in the absence of venous access. DO NOT GIVE BY DIRECT RAPID IV INJECTION. Child under 12 years and neonates: 20 mg/kg (max. 1 g). If necessary, a second dose of 10 mg/kg may be administered 15 to 30 minutes after the first dose if given IV or 60 minutes after the first dose if given IM. Children over 12 years and adults: 10 mg/kg (max. 1 g). If necessary, a second dose of 5 to 10 mg/kg may be administered 15 to 30 minutes after the first dose. For IV use: Patients weighing ≥ 20 kg or more, dilute the required dose in a 100 ml pouch of 0.9% sodium chloride or 5% glucose. Children weighing <20 kg, dilute the dose in 5 ml/kg of 0.9% sodium chloride or 5% glucose. Administer over at least 20 minutes. (no more than 1 mg/kg/minute) If required dose is less than 1 ml, use a 1 ml syringe graduated 0.01 ml. For IM use: May be used undiluted. If the required dose is less than 1 ml, use a 1 ml syringe graduated 0.01 ml.
4 (30-90 minutes after the initial therapy) Refractory Status Epilepticus	Transfer to ICU if available under care of senior staff confident with airway management. Establish intensive care and EEG monitoring if available. Initiate long-term, maintenance AED therapy	Rapid Sequence Induction of Anaesthesia (with intubation) using: Propofol. Only attempt this if experienced anaesthetist present. Child: 2.5mg/kg stat followed by infusion at 1-3mg/kg/hr for no longer than 48 hours. Beware of potential hypotension Adult: 1–2 mg/kg bolus, then 2–10 mg/kg/hour titrated to effect

Monitoring: neurological observations (level of consciousness, pupil size, pulse, blood pressure and temperature). Repeat ECG, blood biochemistry, blood gases, clotting, full blood count and drug levels as required. EEG monitoring in refractory status, if available.

Diazepam rectally: Use a syringe without needle or 2-3 cm of CH 8 nasogastric tube attached to tip of syringe.

Once the seizure has stopped, look for a cause, evaluate the risk of recurrence and keep diazepam and glucose available in case patient seizes again. Consider Pyridoxine (100 mg IV) in young infants with seizures refractory to standard anticonvulsants

Management of Acute Coronary Syndromes (ACS)

ACS is a spectrum comprising ST elevation MI (STEMI), non ST elevation MI (NSTEMI) or unstable angina. There is either infarction or ischaemia in ACS. They are treated the same way

There are numerous causes for chest pain so a good history and exam needs to be done to help confirm the diagnosis.

A

AIRWAY

B

BREATHING – give **oxygen** and check O₂ sats and respiratory rate

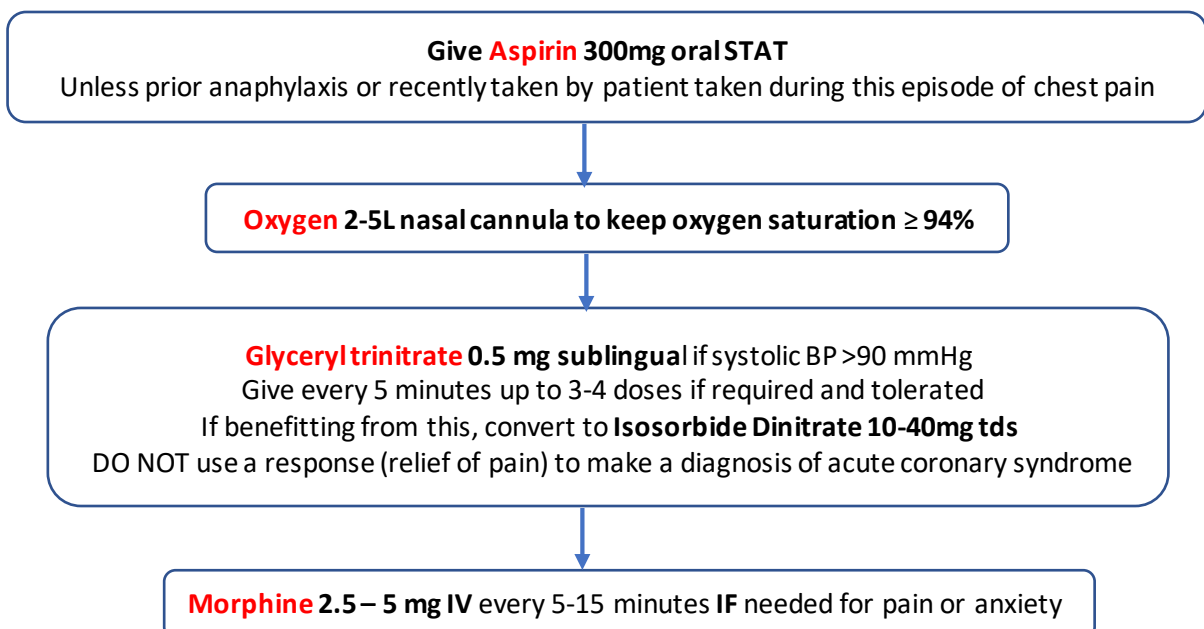
C

CIRCULATION: BP, pulses, IV access (& draw bloods), heart monitor/ECG

Initial Assessment and Emergency Care

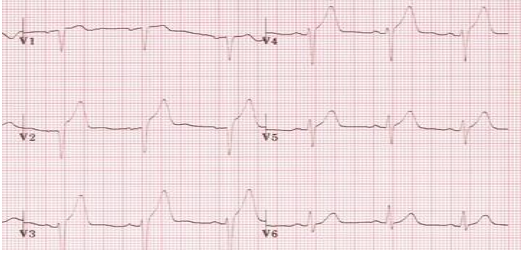
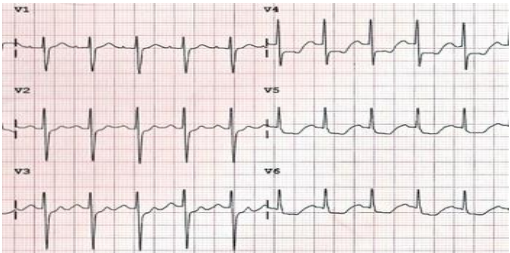
HISTORY OF CHEST PAIN	EXAMINATION OF PATIENT WITH CHEST PAIN
<p>Chest pain description; Classic cardiac pain is diffuse, central, dull ache/squeeze lasting >15 minutes. Associated with radiation to 1 or 2 arms and the jaw.</p> <p>Associated Symptoms; sweateness, nausea and vomiting or dizziness.</p> <p>Presentation may be atypical; in women, older adults and diabetic patients.</p> <p>Review of CVD risk factors—smoking, hypertension, diabetes, prior CVD.</p> <p>Consider other life threatening non-ischaemic causes of chest pain e.g. acute aortic dissection, pulmonary embolus, oesophageal rupture.</p>	<p>Cardiovascular exam – look for haemodynamic compromise and signs of left ventricular failure. ECG (if available) and repeat every 15mins (first ECG often not diagnostic). Document in notes any ischemic changes.</p> <p>Respiratory exam - if possible do CXR if heart failure suspected</p>

Immediate Treatment of Suspected ACS (ongoing during assessment above)



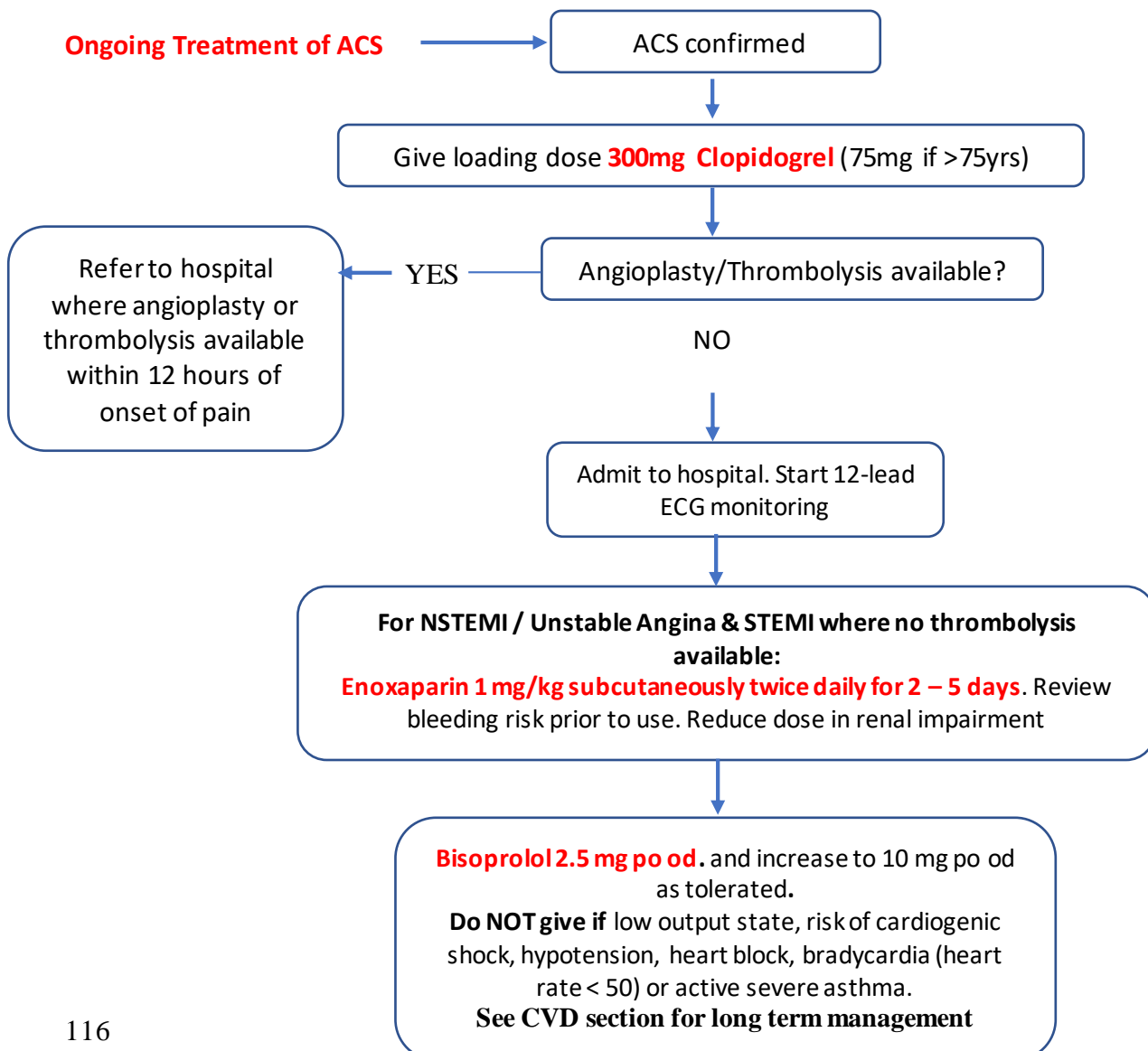
Diagnosis of ACS confirmed if one or both of;

- **Chest pain consistent with cardiac event on history** and related symptoms suggestive of ischaemia
- **ECG changes** suggestive of new ischaemia or development of pathological q-wave changes (if ECG not available or normal – still treat as ACS if there is a strong clinical suspicion)

ST Elevation MI	Non-ST Elevation MI
 <p>ST segment elevations ≥ 1 mm (0.1 mV) in two anatomically contiguous leads or ≥ 2 mm (0.2 mV) in leads V2 and V3 OR new left bundle branch block and presentation consistent with ACS.</p>	 <p>ST segment depressions or deep T wave inversions without Q waves or possibly no ECG changes.</p>

If ACS is low probability (i.e. does not meet the diagnostic criteria above) and the patient is stable, admit to hospital if possible, perform ECG twice daily to check for evolving changes, but do not give further treatment. Discharge after 24-48 hours if there are no new ECG changes and the patient remains stable.

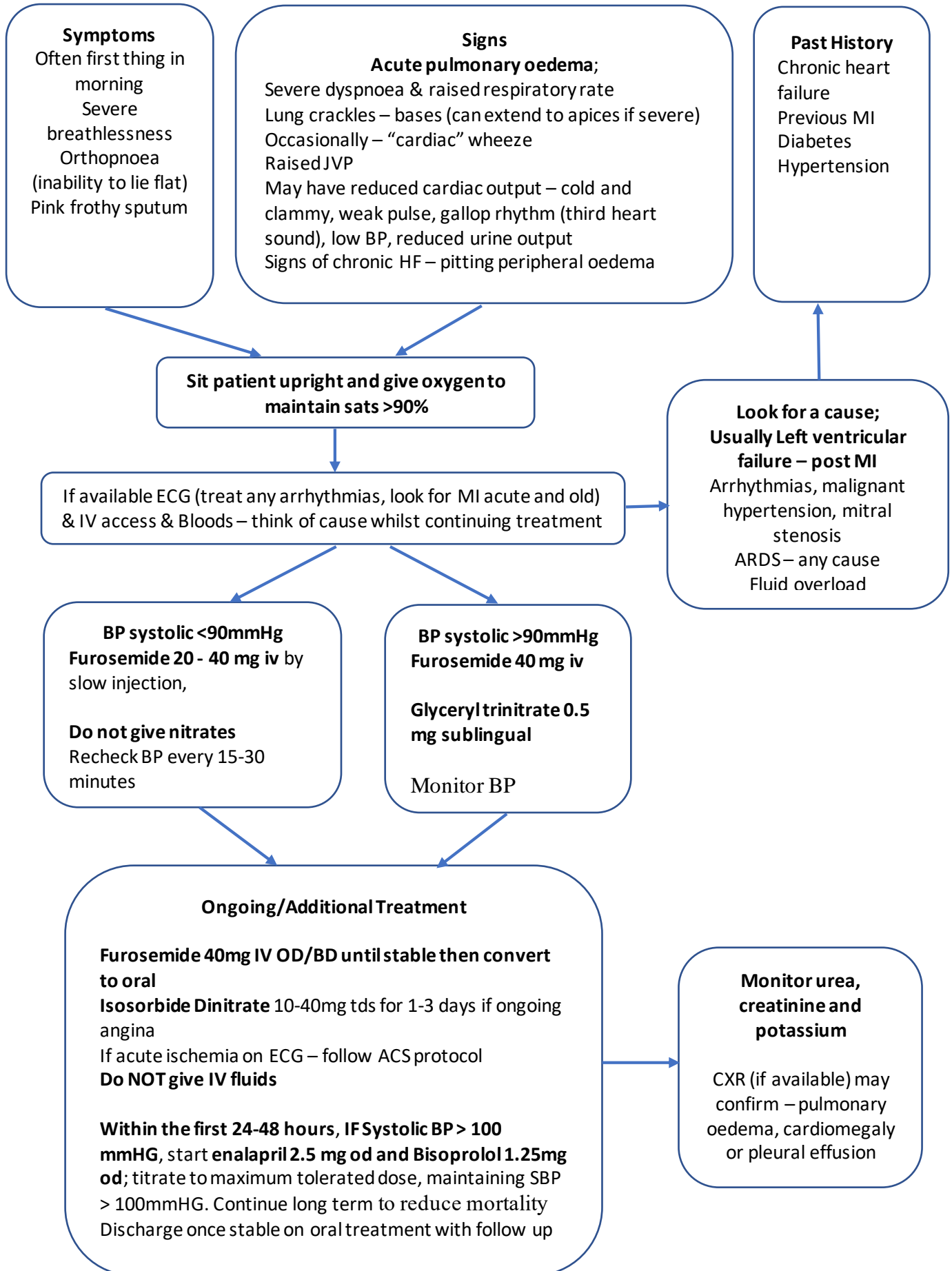
Ongoing Treatment of ACS



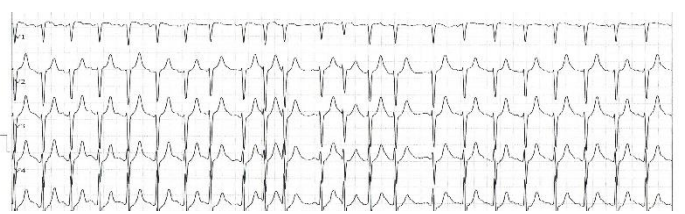
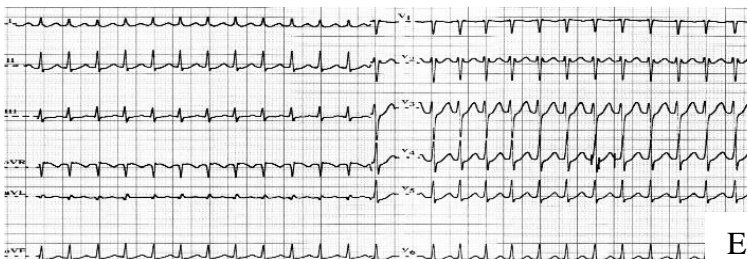
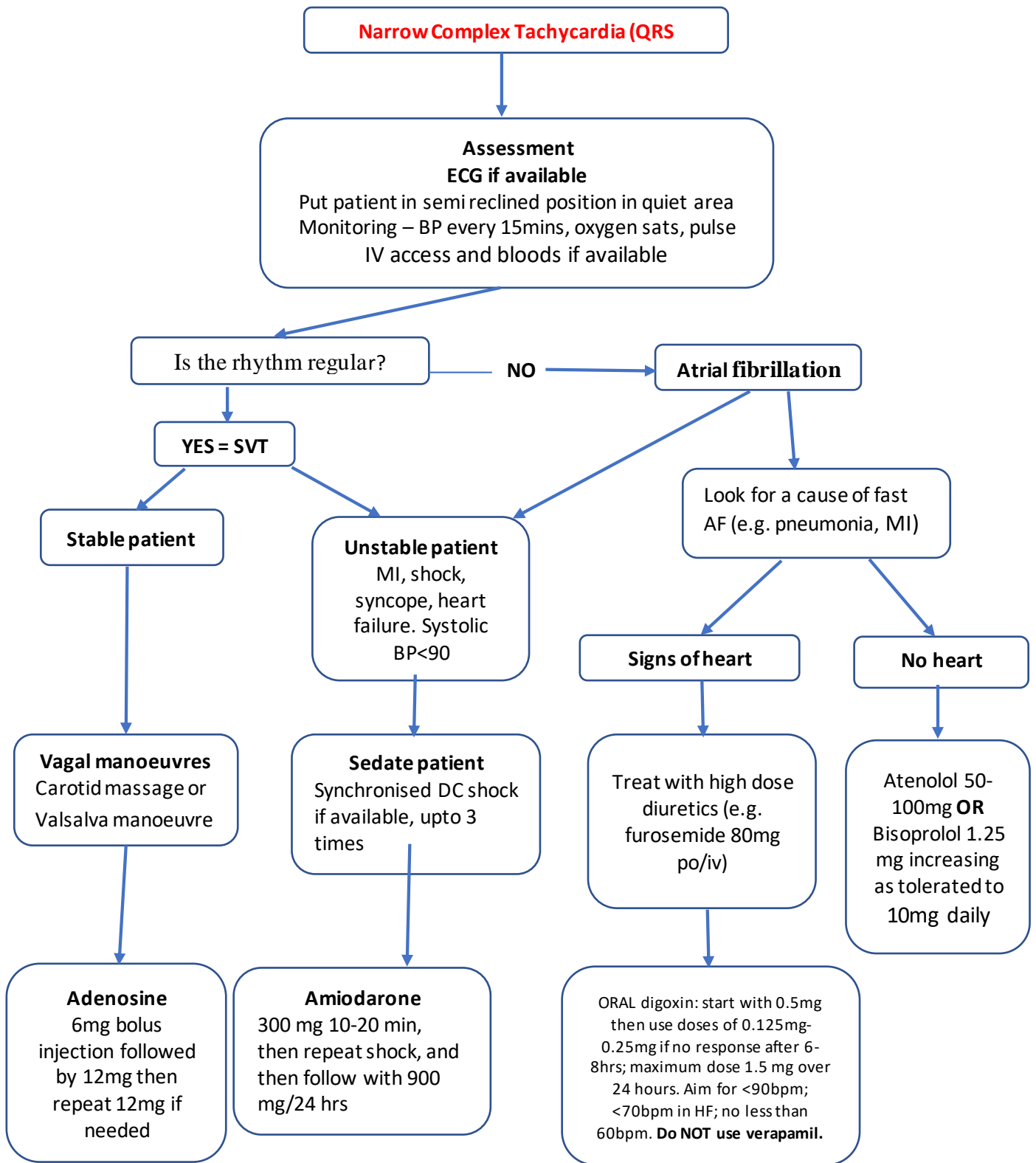
Complications of ACS and their Treatments

Ongoing or recurrent ischaemia/infarction	Dysrhythmias	Circulatory compromise	Pericarditis	Evolving ECG changes
<p>Exclude musculoskeletal pain and pericarditis Plus ECG changes: Differentiate new changes from resolving/evolving changes as the heart recovers from the MI</p> <p style="text-align: center;">↓</p> <p>Continue or restart enoxaparin until the patient's clinical condition and ECG changes improve</p> <p style="text-align: center;">↓</p> <p>Increase the dose of Bisoprolol</p> <p style="text-align: center;">↓</p> <p>Add or continue isosorbide dinitrate</p>	<p>Complete heart block - develops early in the post-MI period Often transient and resolves spontaneously after 2-3 days</p> <p style="text-align: center;">↓</p> <p>Keep the patient on bed rest Stop Bisoprolol if heart block develops but do not withhold Bisoprolol to 'prevent' heart block Give atropine only if there is significant bradycardia</p> <p>VT/VF is the major cause of sudden death in the post-infarct period The most vulnerable time is the first 48 hours after onset of symptoms Patients require supervision and should not be left alone for at least 48 hours Give Bisoprolol which is cardioprotective to all patients with acute MI Do NOT give other prophylactic anti-arrhythmics, such as lignocaine, which have been shown to increase mortality Do NOT attempt to treat ventricular ectopic beats If VT is diagnosed on ECG - treat according to 'emergency management of arrhythmias'</p>	<p>Cardiogenic shock: this has a very poor prognosis</p> <p>Pulmonary oedema:</p> <p style="text-align: center;">↓</p> <p>Treat as per heart failure protocol</p>	<p>May be seen in 12-20% of patients after MI</p> <p style="text-align: center;">↓</p> <p>Continue Aspirin but avoid other NSAIDs for 7-10 days after acute MI: give paracetamol</p>	<p>STEMI: Q waves develop after several hours; ST changes may resolve, or may persist (fixed ST elevation); Persistent ST elevation does NOT always signify an LV aneurysm</p> <p>ST depression is usually transient and should resolve as ischaemia improves. Persistent anterior ST depression: Consider posterior STEMI (dominant R wave in V1). Persistent lateral ST depression: Consider LV strain pattern (tall high voltage QRS complexes)</p> <p>T wave inversion: After infarction, T waves often deepen and sharpen. May remain inverted or may return to normal.</p>

Acute Management of Heart Failure (HF)

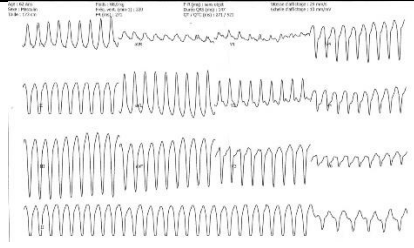
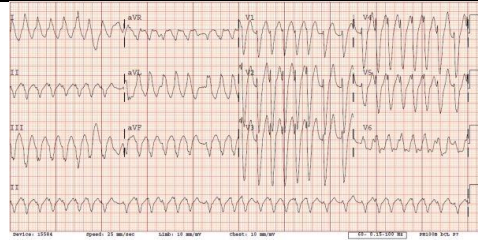
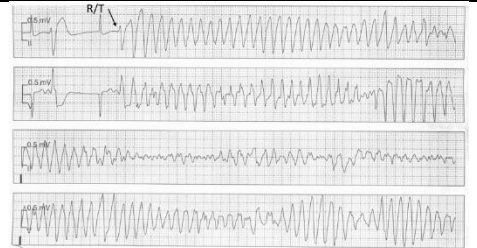


Emergency Management of Arrhythmias



EC ECG showing Atrial Fibrillation – AF (irregular)

Management of other arrhythmias

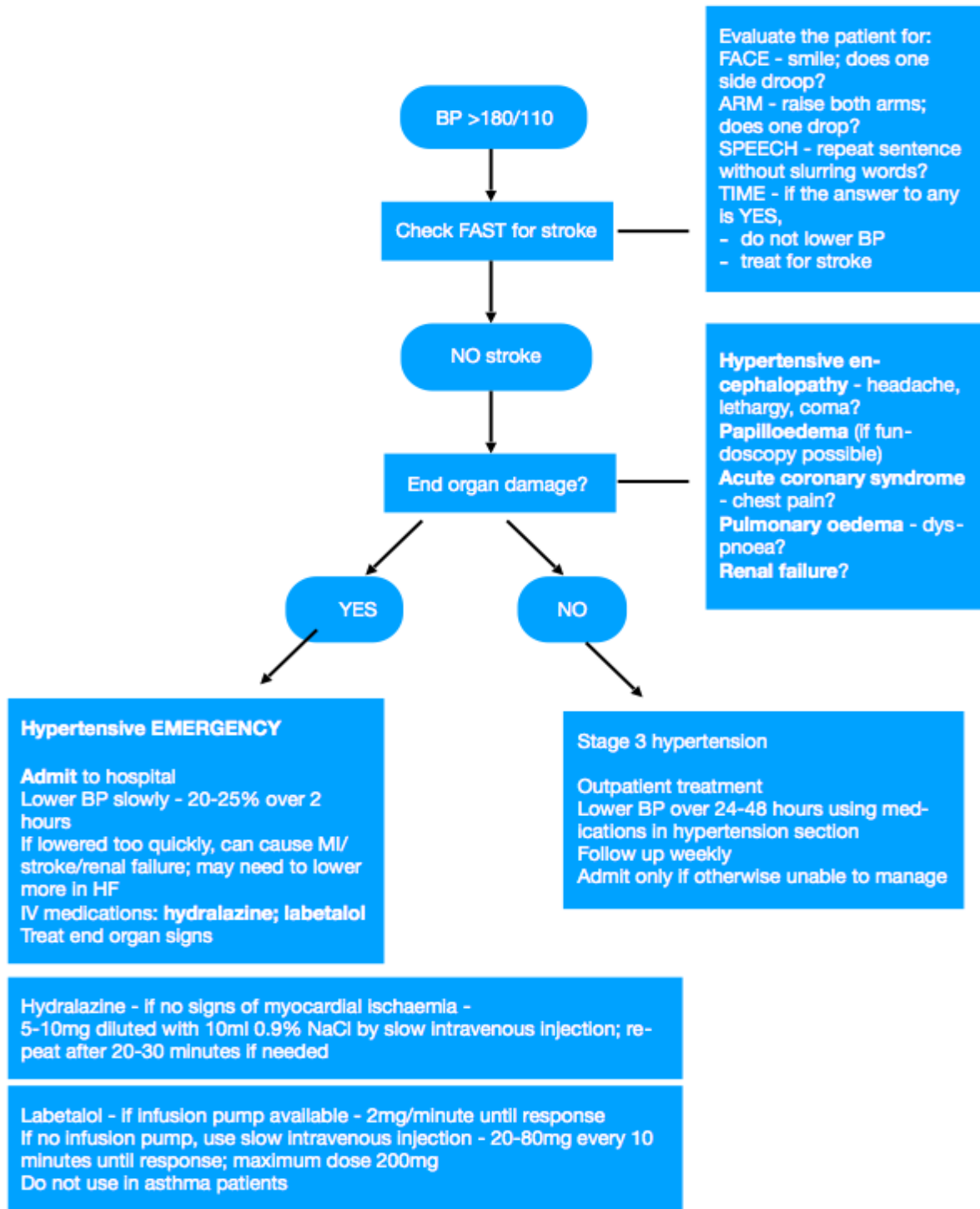
Management of broad QRS (>0.12ms) Tachycardia		
Regular: Ventricular tachycardia	Irregular: Atrial fibrillation with left bundle branch block	Irregular: Polymorphic VT
		
Treatment		
Give Amiodarone 300mg over 20min and then 900 mg/24h	Same as AF	Magnesium 2g in 10 min

Emergency Management of Bradyarrhythmia's (Heart rate <60 and symptomatic)
<ul style="list-style-type: none"> Place in quiet area and semi-reclined position 12 lead ECG if available Monitor BP, pulse, O2 sats IV line and take bloods if available Identify and treat reversible causes (e.g. drugs, electrolyte abnormalities)
Treatment
Only needed if persistent bradyarrhythmia causing hypotension, altered mental status, shock, acute chest pain or acute heart failure
Give atropine : 0.5mg bolus, repeat until maximum dose: 3mg. <div style="text-align: center; margin-top: 10px;"> ↓ </div> If atropine ineffective : Epinephrine IV infusion: 2-10µg/kg/min <div style="text-align: center; margin-top: 10px;"> ↓ </div> Seek specialist help - consider others treatments: Dopamine IV infusion: 2-10µg/kg/min

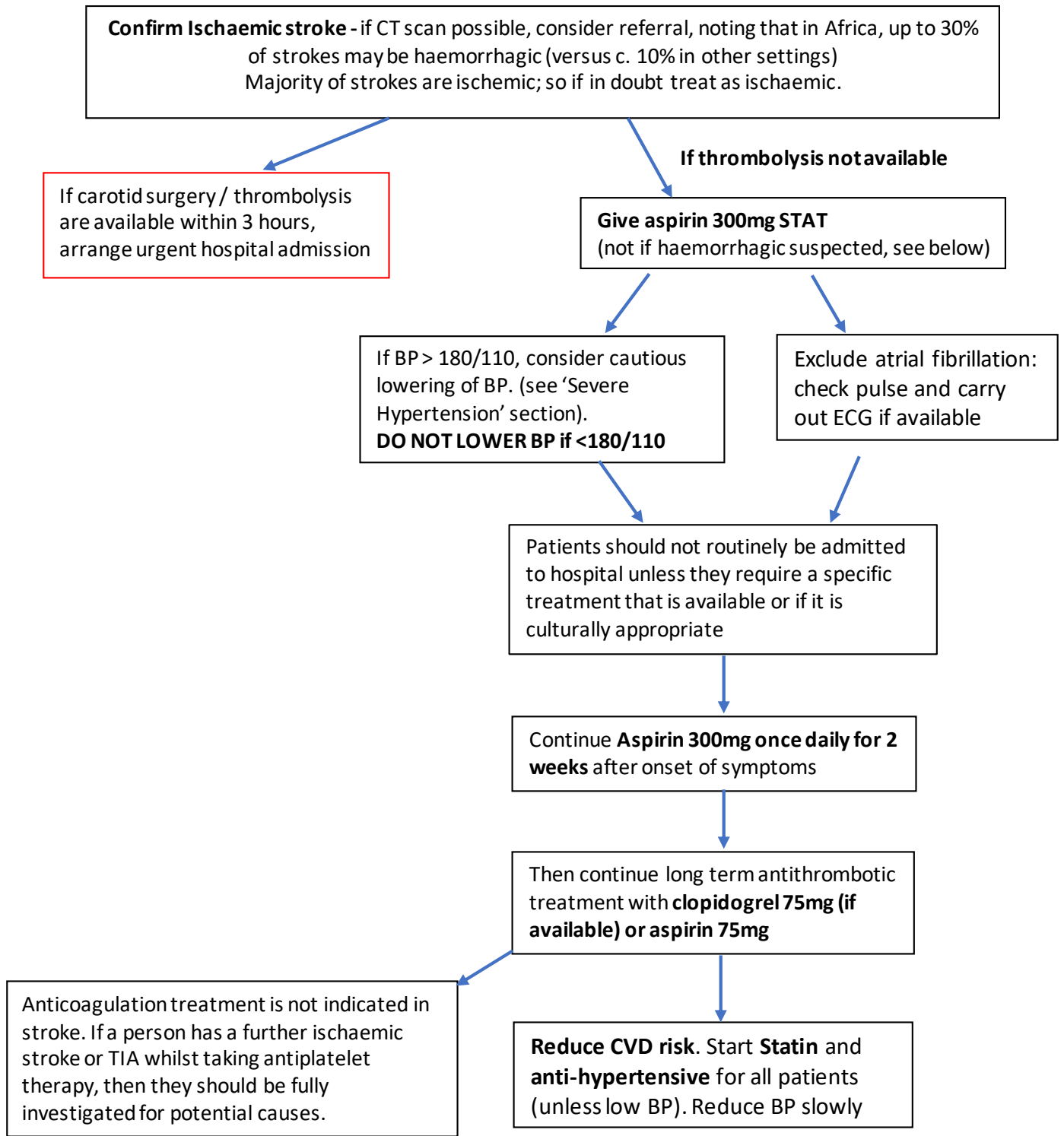
Blood pressure >180/110 / Stage 3 hypertension management

For a patient with blood pressure >180/110, a hypertensive emergency must be ruled in or out:

- evaluate immediately for any signs of stroke or end organ damage that constitute a hypertensive emergency
- if no signs of hypertensive emergency, repeat the blood pressure at least 3 times over 30 minutes while the patient rests; query pain status or other stressors that may affect blood pressure but do not constitute an emergency; note that patients can remain relatively asymptomatic
- if blood pressure remains >180/110 after repeat readings, outpatient management can be done.

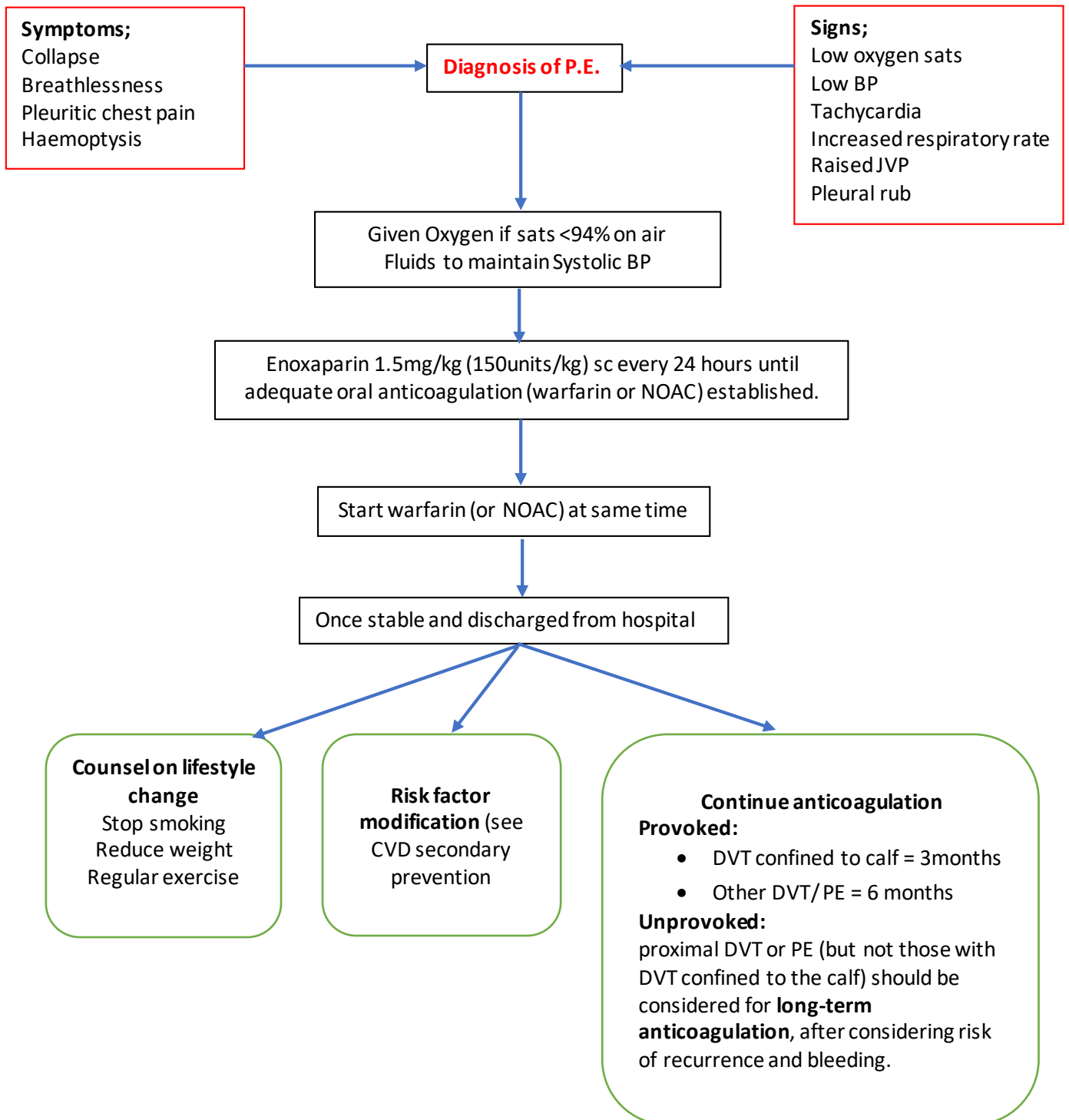


Acute Management of Ischaemic Stroke



Differentiating Ischemic and Haemorrhagic Stroke	
Haemorrhagic Stroke	Ischemic stroke
Gradually worsening deficit; headache, vomiting, uncosciousness	Sudden onset with fluctuating course and occasional improvements
No previous history of diabetes, CVD or smoking	History of diabetes, CVD or smoking
Age <40	Age >40
Heavy alcohol consumption	
Taking medication that increases bleeding risk	

Emergency Management of Pulmonary Embolus (P.E.)



Emergency Management of Thyrotoxic Crisis (Thyroid Storm)

Symptoms and Signs of Thyrotoxic Crisis

- 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, diarrhoea, jaundice and abdominal pain
- Neurological symptoms - anxiety, altered behaviour, seizures/coma

Investigations

Diagnosis is normally clinical
If available FBC/U&E/LFT/TFT's and ECG for arrhythmia may be useful

Treatment

- **Patients will require urgent supportive care** as an inpatient, including fluid resuscitation and then careful management of fluid balance and electrolytes
- **Give paracetamol** 1g PO/NG/IV immediately
- **Steroids** – IV hydrocortisone (100mg every 6 hours) if available or prednisolone 60-80mg/day PO/NG for adults
- **Beta-blocker** – propranolol (can be given IV if available) or bisoprolol PO/NG – slowly titrate to avoid cardiovascular collapse
- **Carbimazole** – 15 – 40mg/day P.O. – can be given via NG tube if needed
- **Potassium iodide** (stops release of preformed thyroid hormone) – if available - 5–10 drops (1ml) of Lugol's solution orally every 6–8 hours

Once clinically improved patients will need to taper dose of steroids and need follow up and treatment as per hyperthyroid management.

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Annex 1: Example of NCD service SOPs

MSF OCA Irbid NCD service SOPs

1. At reception, who should be referred to the MSF nurse for screening?

Patients who meet the socio-economic criteria, and have one or more of the following, should be referred to the nurse for screening:

- Known COPD
- Known Asthma
- Known Cardiovascular disease (including Hypertension / previous Stroke / Ischaemic Heart Disease / Peripheral Vascular Disease / Cardiac Failure / Arrhythmias)
- Known Diabetes (Type 1 or Type 2) or Hypothyroidism
- Chronic or recurrent shortness of breath (exertion, at rest or at night)
- Chronic or recurrent cough / sputum production
- Chronic or recurrent chest pain or palpitations
- Chronic swelling of the legs
- Chronic polyuria and polydipsia
- Other chronic unexplained symptoms

2. Who should be included in the NCD programme after medical review?

Patients with the following diagnoses should be included in the NCD programme:

- COPD & Asthma
- Cardiovascular disease (including Hypertension / previous Stroke / Ischaemic Heart Disease / Peripheral Vascular Disease / Cardiac Failure / Arrhythmias)
- Diabetes (Type 1 or Type 2)
- Hypothyroidism.

Patients who do not meet these criteria should be offered appropriate management (+/- referral) then discharged → record as “Screened Negative” in the ‘Diagnosis’ section of the patient file.

3. Who is eligible for 3 month appointments?

All new patients are seen monthly (or more often, according to MD decision). Appointment frequency can be reduced to 3 monthly when the patient fulfils the following criteria:

- On NCD medication for > 6 months, with no change in dose the last 3 months.
- Age > 18
- If hypertensive, BP < 150/100
- If diabetic, HbA1c < 8%
- No history of selling medication

4. What to do when patients miss appointments?

- Any patient missing a scheduled appointment is recorded in the “Missed Appointment register”.
- Every morning, the receptionist should phone patients who missed appointments on the previous day. If the patient
 - Says that they would still like an appointment, they should be rebooked and their file should be put back to its normal location
 - Says that they are leaving our service (e.g. changing region), they should be coded as **‘Voluntary Exit’** on the file, and the file should be returned to the data entry operator who will transfer it to the archive.
 - Is uncontactable, the file should be placed in the missed appointments draw and their name should be highlighted in the missed appointments register
- Every morning, the receptionist should phone any patient who is highlighted in the register as having missed an appointment > 1 month previously. If the patient:
 - Says that they would still like an appointment, they should be rebooked and their file should be put back to its normal location
 - Says that they are leaving our service (e.g. changing region), they should be coded as **‘Voluntary Exit’** on the file, and the file should be returned to the data entry operator who will transfer it to the archive
 - Has died (i.e. the phone is answered by a relative, who gives this information), they should be coded as **“dead”** on the file, and the file should be returned to the data entry operator who will transfer it to the archive.
 - Is uncontactable, they should be coded as **‘defaulter’** on the file, and the file should be returned to the data entry operator who will transfer it to the archive

Annex 2 WHO standard NCD kit for emergencies

#	Description	Strength	Formulation	Packaging	revised Quantity (unit) July 2016
BASIC module 1a - medicines					
1	Acetylsalicylic acid	100mg	tabs	1	22,000
2	Amlodipine	5 mg (as maleate, mesylate or besylate)	tabs	1	15,000
3	Beclomethasone	250 mcg inhaler/dose, 200 doses	inhaler/dose, 200 doses	1	500
4	Bisoprolol	5mg	tabs	1	15,000
5	Carbamazepine	100mg	tabs	1	3,200
6	Enalapril	5 mg (as hydrogen maleate)	tabs	1	15,000
7	Fluoxetine	20mg	tabs	1	5,000
8	Furosemide	40mg	tabs	1	4,000
9	Glibenclamide	5 mg	tabs	1	26,000
10	Glyceryl trinitrate	5 mg	(sublingual) tab	1	2,900
10a	Isosorbide Dinitrate	5 mg	(sublingual) tab	1	11,800
11	Hydrochlorothiazide	25mg	tabs	1	12,000
12	Levotyrosine sodium	100 mg (sodium salt)	tabs	1	4,100
13	Metformin	500mg	tabs	1	60,000
14	Prednisolone	5mg	tabs	1	7,700
15	Risperidone	2mg	tabs	1	400
16	Salbutamol metered dose inhaler (aerosol)	100 mcg (as sulfate)/200 doses	oral inh.	1	1,500
17	Sodium Valproate	500mg	tab. (enteric coated)	1	1,900
18	Sodium Valproate	200mg	scored tabs	1	3,200
BASIC module 1b- Insulin / glucagon + syringes 1U100 (cold chain)					
19	Human Insulin NPH	100 IU/ml, 10 ml	vial	1	60
20	Human Insulin Mix 70/30	100IU/ml, 10 ml	vial	1	200
21	Human Insulin R	100 IU/ml, 10 ml	vial	1	60
22	Glucagon	1 mg/ mL	amp	1	20
23	Insulin syringes, 3 pieces, IU-100			1 sealed bag of 100	100
BASIC module -1c Renewable					
24	Adhesive tape zinc oxide 2.5 cm x 5 mt			unit	300
25	Blood Glucose strips			unit	25,000
26	Lancet, blood, ster, disp,			Box of 200	125
27	Cotton wool 500gr			unit	5
28	Examination latex non sterile gloves size large			Box of 100	1
29	Examination latex non sterile gloves size small			Box of 100	1
30	Examination latex non sterile gloves size medium			Box of 100	3
31	Urine test strips for ketones, glucose and protein			Box of 100	10
32	Swab alcohol pads			Box 100	1
X	resealable bag for medicines (minigrip) 10X5cm			box 500	1
BASIC module 1d - Equipment					
33	Glucometer, with displayed unit "mg/dL", with 3 batteries (3V, type CR 2032)			Unit	3
34	Peak flow meter with disposable mouth pcs			Unit	2
35	Stethoscope complete binaural.			Unit	5
36	Upper arm blood pressure sphygmomanometer for adult (aneroid) with 1 spare cuff for adult in the package.			Unit	3
37	Diagnostic set, combined Otoloscope & Ophthalmoscope, composed of a wide-angle viewing lens, magnification 3x, works with 2 AA-batteries and reusable auricular tips, with 6 matching batteries			Unit	3
38	Body tape measure (Figure Finder tape)			Unit	3
39	Pen flashlight prefocus or portable torch lamp			Unit	3
40	Thermometer clinical, ampit or pen typedigital, 32-43°C			Unit	5

Annex 3: Example of NCD Clinical SOPs*

MSF Field Guide 2016	ASTHMA: Acute exacerbations: MANAGEMENT	ADULTS 16 years and older
ASSESS SEVERITY		
<p>Always assess: Ability to speak/Pulse/Blood pressure/Respiratory rate</p> <p>If possible, assess: Peak flow/Oxygen saturations</p> <p style="text-align: center;">Do <u>not</u> delay treatment to get a chest x-ray</p>		
MODERATE EXACERBATION	SEVERE EXACERBATION	LIFE THREATENING EXACERBATION
Speaks whole sentences in 1 breath Pulse less than 110 Respiratory rate less than 25 Increasing symptoms but not meeting criteria for severe/life threatening asthma Peak flow 50-75% expected Usually only inhaled salbutamol and oral steroids needed (2 & 3 below)	Talks in short phrases: can't complete sentences in 1 breath Respiratory rate more than 25/minute Pulse more than 110/minute Peak flow 33-50% predicted	Can't talk/feeble respiratory effort Cyanosed Bradycardia Hypotension Exhaustion/confusion/coma Peak flow less than 33% predicted Oxygen saturations less than 92% ▶▶ Get help NOW! ◀◀
MANAGEMENT OF ACUTE EXACERBATION		
<ol style="list-style-type: none"> 1. High flow OXYGEN via face mask 2. Short acting beta-agonist: SALBUTAMOL (ventolin) EITHER: Inhaler and spacer (preferred option): Give 10 puffs SALBUTAMOL over 10-15 minutes. Before every single puff shake the inhaler well. Always use a spacer. OR: Nebuliser: SALBUTAMOL 10mg nebulised via oxygen (if available). Add IPRATROPIUM in severe/life threatening asthma. Do not use ipratropium alone unless salbutamol not available. Repeat inhalers/nebulisers as often as needed until improves (respiratory rate decreases, BP normal, can talk in whole sentences without needing to take a breath). Pulse often remains high: side effect of salbutamol. 3. Oral steroids: PREDNISOLONE 40-50mg by mouth. Intravenous hydrocortisone is an alternative (hydrocortisone 100mg iv. Repeat 6 hourly until able to take oral steroids). Do NOT use intramuscular steroids (less effective). 4. Intravenous drugs: only if life threatening asthma not responding to nebulisers (limited benefit). MAGNESIUM SULFATE (1.2-2g intravenously over 20mins) (preferred option) AMINOPHYLLINE: Only if life threatening AND no improvement with nebulisers AND magnesium sulfate not available. Loading dose: 5mg/kg over more than 20 minutes. NEVER GIVE LOADING DOSE if on oral theophylline. Then infuse 0.5mg/kg/hour (you must weigh the patient). Stop as soon as improving. Risk of arrhythmias. SALBUTAMOL 250mcg by slow intravenous injection diluted to at least 50mcg/ml. 5. Antibiotics: <u>not</u> indicated unless clear evidence of infection (fever, productive cough). 		
ONCE STABLE		
Moderate asthma: manage at home	Severe/life threatening asthma: admit	
SALBUTAMOL Via spacer: 2-4 puffs 4-6 hourly for 24 hours then reduce to twice daily.	SALBUTAMOL 4-6 puffs via spacer or 10mg via nebuliser 2-4 hourly or more for 24 hours then review.	
PREDNISOLONE: 30-40mg orally for 3 days then stop (no need to reduce slowly with short courses)		
START INHALED STEROIDS: Beclomethasone via spacer: 2 puffs of 100mcg twice daily		
ANTIBIOTICS: <u>Only</u> if clear evidence of infection (fever, productive cough, consolidation on xray)		
FOLLOW UP: 1 week later	FOLLOW UP: 3-7 days later	
Before discharge ensure patient:	<ul style="list-style-type: none"> • Knows how to use their inhalers and how to take prednisolone • Knows signs of early deterioration and when to return for follow up. 	
Based on BTS/SIGN Asthma Guidelines 2014, BNF 2014, WHO Essential Medicines List (2015), MSF Greenlist 2016. See Copyright and Disclaimer on page 1.		

Annex 4: Asthma self-management chart



Every day asthma care:

My personal best peak flow is:

My preventer inhaler
(insert name/colour):

I need to take my preventer inhaler every day
even when I feel well

I take puff(s) in the morning

And puff(s) at night.

My reliever inhaler
(insert name/colour):

I take my reliever inhaler only if I need to

I take puff(s) of my reliever inhaler, if any
of these things happen:

- I'm wheezing
- My chest feels tight
- I'm finding it hard to breathe
- I'm coughing.

Other medicines I take for my asthma every
day:

With this daily routine I should expect/aim to
have no symptoms.



When I feel worse:

- My symptoms are coming back (wheeze, tightness in my chest, feeling breathless, cough)
- I am waking up at night
- My symptoms are interfering with my usual day-to-day activities
- I am using my reliever inhaler times a week or more
- My peak flow drops to below

This is what I can do straight away to get on
top of my asthma:

1 If I haven't been using my preventer inhaler,
start using it regularly again or:

Increase my preventer inhaler dose to
 puffs times a day until my symptoms
have gone and my peak flow is back to normal

Take my reliever inhaler as needed (up to
 puffs every four hours)

If I don't improve within 48 hours make an
urgent appointment to see my GP or asthma
nurse.

2 If I have been given prednisolone tablets
(steroid tablets) to keep at home:

Take mg of prednisolone tablets (which is x
5mg) immediately and again every morning for
days or until I am fully better.

URGENT! Seek medical attention



In an asthma attack:

My reliever inhaler is not helping or I need it
more than every hours
I find it difficult to walk or talk
I find it difficult to breathe
I'm wheezing a lot or I have a very tight chest or
I'm coughing a lot
My peak flow is below

THIS IS AN EMERGENCY TAKE ACTION NOW

- 1 Sit up straight – don't lie down. Try to keep calm
- 2 Take one puff of my reliever inhaler every 30 to 60 seconds up to a maximum of 10 puffs
- 3 Seek medical attention

Annex 6: Standard NCD database

New patient data variables

NEXT FOLLOW-UP	Date_V1_Planned
	Lab_request
ADMISSION_REFER RALS	REFERRED_f-up
ADMISSION_MEDS AT	NEW_Med_Tot (enter manually)
	OLD_Med_Tot (enter manually)
ADMISSION_MEDS Acute complications	Acute_complications
	CVD_Risk_Score (%)
ADMISSION_MEDS AT	CUR_DIAG
	Date of initial Dx
	MH_other
	MH_COPD
	MH_Asthma
	MH_CVD
	MH_HTN
	MH_HIV
	MH_TB completed / cured
	MH_TB Active
ADMISSION_MEDIC AL	MH_Hypothyroid
	MH_Diab II
	MH_Diab I
	Proteinuria (-/+/+/+/+++)
HISTORY_CURRENT DIAGNOSIS	Ketonuria
	ALT
	Creatinine
	Total cholesterol
	HbA1c
	BG Random (mmol/L)
	BG Fasting (mmol/L)
	Spirometry
	Dia BP (mmHg)
	Sys BP (mmHg)
ADMISSION_VITAL SIGNS AT	HR
	BMI (kg/m ²)
Lifestyle	Weight (kg)
	Height (cm)
Patient details	N (occasions / month of 1+ visits)
	# cig/day
	Address
	Locality
	Mobile_No
	Date of Birth
	Gender
	Name
	Date_Adm
	ID
PATIENT	ID

Follow-up data variables

Next f-up	Planned_f-up date
New diagnosis	Comments
medications	New diagnosis
referrals	Current meds from today
History and exam	Referred_Lab
	Referred_f-up
	Abnormal foot exam?
	Visual acuity - R
	Visual acuity - L
	Peripheral oedema
	Irregular heart beat
	Pleural effusions
	General Reduced Air Entry
	Hospitalised since last visit?
Symptoms of hyperglycaemia	Symptoms of hyperglycaemia
	Seizures
Symptoms of hypoglycaemia	Leg swelling
	Fainting / syncope
Symptoms of hypertension	Palpitations
	Cough
Symptoms of heart failure	Claudication
	Angina
Symptoms of other NCDs	Dyspnoea
	Pregnant?
Symptoms of other NCDs	Proteinuria (-/+/+/+/+++)
	ALT
Symptoms of other NCDs	Creatinine
	Total cholesterol
Symptoms of other NCDs	HbA1c
	Ketonuria
Symptoms of other NCDs	Spirometry
	BG Random (mmol/L)
Symptoms of other NCDs	BG Fasting (mmol/L)
	Dia BP (mmHg)
Symptoms of other NCDs	Sys BP (mmHg)
	HR
Symptoms of other NCDs	BMI (kg/m ²)
	Weight (kg)
vital signs-lab	DATE_Visit
	ID

Annex 7: Warfarin initiation and monitoring^{23, 24}

Initiating warfarin

This can be initiated following discussion with and advice from the MTL or MedCo. Where **rapid anticoagulation** is required (e.g. acute venous thromboembolism) Warfarin is usually started in the hospital setting. Five to ten milligrams is the usual starting dose. In cases where **rapid anticoagulation is not required** (e.g. prevention of stroke in patients with Atrial fibrillation), Warfarin can be commenced in the primary care or non-acute setting.

Before Starting Warfarin, Contraindications to Warfarin should be checked. These include:

- haemorrhagic stroke,
- pregnancy
- severe renal or hepatic impairment.

Caution should be exercised in patients with the following history:

- peptic ulcer,
- recent surgery,
- recent ischaemic stroke,
- concomitant use of drugs that increase risk of bleeding,
- severe hypertension
- bacterial endocarditis.

Check list for patient advice at initial consultation

- Social supports and ability to adhere to prescribing advice should be considered at initiation.
- Ensure the patient understands the indication for warfarin, the target INR and the duration of treatment
- Counsel on the importance of compliance with medication taken at the same time each day usually in the evening. Advise on the importance of monitoring and achieving target INR
- Clear instructions should be given to patients on what dose to take and when the return visit for INR is scheduled.
- Advise on interactions with food and medications including herbs and supplements (see below). Patients should be advised to moderate their alcohol intake and that a large intake irregularly is most harmful to INR control
- Female patients of childbearing age should be advised regarding contraceptive methods and the issue of teratogenicity should be addressed
- Signs and symptoms of over anticoagulation and under anticoagulation need to be stressed. Advise on action if bleeding/adverse reaction occurs

Starting Treatment

- A slow loading regimen (2mg -5mg) is safe in patients who do not need rapid anticoagulation and achieves therapeutic anticoagulation in the majority of patients within 3-4 weeks⁶⁰. This helps to reduce the risk of overcoagulation and bleeding.

²³ Keeling D, Baglin T, Tait C et al. Guidelines on oral anticoagulation with warfarin-fourth edition. British Journal of Haematology, 2011;154, 311-324

²⁴ Irish College of General Practitioners, Quality in Practice Committee: Anticoagulation in General Practice/Primary Care Part1: Warfarin. Revised: 2014. Available from: file: <http://www.icgp.ie/go/library/catalogue/item/C3B049AE-BEE4-F383-246DAF072339569B>. Access date [March 19th 2016]

Extra care (and therefore a lower starting dose) should be taken with patients that are at increased risk of side effects with Warfarin (aged over 65, weight <45 kgs, congestive cardiac failure, mild to moderate renal failure or medications known to potentiate oral anticoagulation (see below))

- The INR rises without clinical anticoagulant effect for the first two days of treatment. The dose should be gradually increased with INR every day or alternate days until the target is reached for two consecutive values.
- Weekly INRs should follow until good control is established. During the maintenance phase it may take 4-5 days for dose changes to be reflected in the INR. INR should be repeated at 1-4 weekly intervals depending on stability of result. If results remain stable for three months then repeat INR testing can be gradually extended up to every 12 weeks.
- The INR should be performed more frequently– 2-3 times a week if new medications, intercurrent illness or significant diet change are a factor. If a drug with known interaction with warfarin is prescribed then the INR should be checked after 3-5 days.

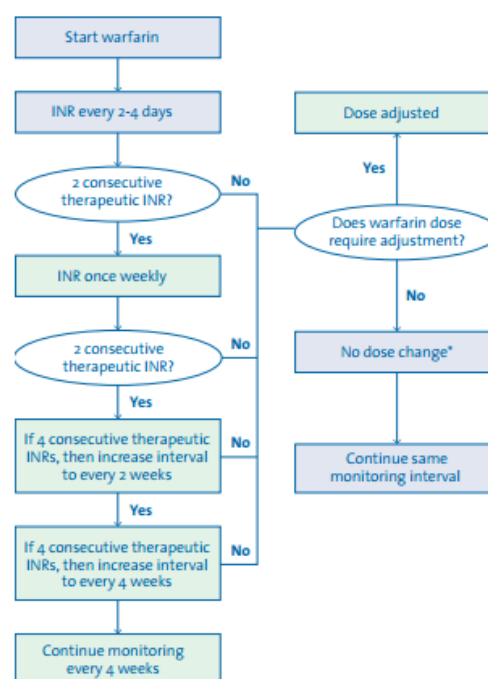
Common Indications for Oral Anticoagulation and Target INR

COMMON INDICATIONS FOR ORAL ANTICOAGULATION	TARGET INR (RANGE +/- 0.5)
Venous Thromboembolism	2.5
Atrial fibrillation with a high risk of cardio-embolic stroke	2.5
Mechanical prosthetic heart valve*	3.5
Recurrence of venous thromboembolism whilst on warfarin	3.5

*Varies between 2.5 and 3.5 depending on type of valve. Follow advice of the specialist.

Follow up visits

- Check compliance (ensure correct dosage is being taken and patient understands the dosage).
- Enquire about concerns with medication and adverse events.
- Dosage, INR and interval for repetition of INR should be clearly documented in notes and patient held booklet
- Increase frequency of INR (every 2-4 days) if any of the following happens: non-therapeutic INR, intercurrent illness, medication change (including herbal), significant diet change
- Do NOT change the dose when the INR is not therapeutic if patient non-compliant (forgot doses or took too many doses); Inadequate number of days before previous dose change; Binge alcohol use (will transiently elevate INR)



INR intervention (Refer to flowchart on previous page for timing of next INR)

- **If INR ≤ 1.5** - Give one time top-up equal to 20% of weekly dose and increase weekly dose by 10-20%.
- **INR > 1.5 but $<$ therapeutic range** - No change in dose. If two consecutive INRs are low, increase the weekly dose by 10-20%.
- **INR in therapeutic range** - No change in dose
- **INR $>$ therapeutic range but < 5.0** - Lower weekly dose (10-20%) or consider omitting one single dose. Increase the frequency of INR monitoring and resume therapy at 10-20% lower weekly dose when INR therapeutic.
- **Note:** If the INR is only minimally elevated (0.1 - 0.4 above upper limit of the therapeutic range), dose reduction may not be necessary

The risk of bleeding increases significantly with an INR > 5.0 . In the case of an elevated INR :

- Check if there is an obvious cause for the fluctuation e.g. compliance, new medication, alcohol consumption, change in diet, intercurrent illness and correct this underlying cause first.
- **If INR is >5 but it is <8** and no bleeding then stop warfarin for one to two doses and restart at a lower maintenance dose. Recheck INR in 2-4 days.
- **If the INR is >8.0 with no or minor bleeding** stop warfarin, monitor INR daily and restart when INR <5 . Oral Vitamin K at a dose of 1-5mgs should be administered. The effect of a single dose of Vitamin K can be expected within 8-24 hours.
- **In the case of life threatening bleeding** refer to hospital for IV Vitamin K and further management

Important drug and dietary Interactions with Warfarin

MEDICATIONS			
Increased bleeding risk due to increased effect of warfarin: \uparrow INR			Decreased effect warfarin \downarrow INR
Analgesics • acetaminophen ¹ • aspirin (high dose) • salicylates, topical • tramadol	Anticonvulsants e.g. • phenytoin (early on) • sodium valproate	Antihyperlipidemics • ezetimibe • fenofibrate • fluvastatin • gemfibrozil • rosuvastatin	Antibiotics e.g. • rifampicin
Antiarrhythmics • amiodarone • propafenone	Antidepressants e.g. • duloxetine • venlafaxine • SSRI - fluoxetine - fluvoxamine - paroxetine - sertraline - citalopram	Other • allopurinol • cimetidine • corticosteroids (oral) • proton pump inhibitors (PPI) - isolated case reports with all PPIs • thyroid supplements	Antidepressant • trazodone
Antibiotics e.g. • amoxicillin • cephalosporins (some) • isoniazid • fluoroquinolones ² • macrolides ³ • metronidazole • sulfonamides • telithromycin • tetracyclines ⁴	Antifungals e.g. • Fluconazole • Itraconazole • ketoconazole • miconazole (oral, vaginal) • voriconazole		Antiepileptics e.g. • carbamazepine • phenobarbitone • primidone • phenytoin (later on)
Increased bleeding risk due to non-warfarin mechanisms			Other • antithyroid agents • cholestyramine
Analgesics • aspirin • cox II inhibitors • nonsteroidal anti-inflammatory drugs	Anticoagulants/Antiplatelet agents • Antidepressants - selective serotonin reuptake inhibitors		

Annex 8 - Assessing Palliative Care Needs and Symptom Control^{62,63}

Adapted African Palliative Outcomes Scale; from PIH Rwanda

Questions for patient:	
Q1. Please rate your pain during the last 3 days	0 (no pain) – 5 (worst/overwhelming pain)
Q2a. Have any other symptoms (e.g., nausea, coughing, or constipation) been affecting how you feel in the last 3 days?	0 (no, not at all) – 5 (overwhelmingly)
Q2b. If so, please rate each symptom during the last 3 days: Dyspnea? Nausea or vomiting? Constipation? Diarrhea? Others? (specify)	0 (no, not at all) – 5 (overwhelmingly) 0 (no, not at all) – 5 (overwhelmingly) 0 (no, not at all) – 5 (overwhelmingly) 0 (no, not at all) – 5 (overwhelmingly) 0 (no, not at all) – 5 (overwhelmingly)
Q3. Have you been feeling worried about your illness in the past 3 days?	0 (no, not at all) – 5 (overwhelming worry)
Q4. Over the past 3 days, have you been able to share how you are feeling with your family or friends?	0 (no, not at all) – 5 (yes, I've talked freely)
Q5. Over the past 3 days, have you felt that life was worthwhile?	0 (no, not at all) – 5 (yes, all the time)
Q6. Over the past 3 days, have you felt at peace?	0 (no, not at all) – 5 (yes, all the time)
Q7. Over the past 3 days, have you had enough help and advice for your family to plan for the future?	0 (no, not at all) – 5 (as much as wanted)
Questions for family caregiver:	
Q8. Over the past 3 days, how much information have you and your family been given?	0 (none) – 5 (as much as wanted) N/A
Q9. Over the past 3 days, how confident has the family felt caring for the patient?	0 (not at all) – 5 (very confident) N/A
Q10. Has the family been feeling worried about the patient over the last 3 days?	0 (not at all) – 5 (severe worry) N/A

Essential pain medications; from PIH Rwanda

Symptom	Medication	Dose	Notes
Mild pain/ fever reducers (non-opiates)	Acetaminophen/ paracetamol	Adult: 0.5-1 gram every 4 to 6 hours. Not to exceed 4 grams in 1 day Child: 10-15 mg/ kg (maximum 90 mg/kg/day divided every 4-6 hours)	Use maximum 2 grams per day in patients with enlarged livers or known liver disease. Very toxic to liver in overdose.
	Ibuprofen	Adult: 400-800 mg every 6-8 hours (maximum dose 2.4 gm/day) Child: 10 mg/kg every 6-8 hours	Particularly effective in bone pain. Anti- inflammatory at higher doses. Can cause digestive upset and gastrointestinal bleeding. Do not use in renal failure. Decrease doses in patients with severe liver failure. Prolonged prescription requires cimetidine or omepra- zole for gastrointestinal prophylaxis.
	Diclofenac	Adult: 25-75 mg every 12 hours	Same as ibuprofen, but less expensive for long-term use, with simpler dosing.
Moderate to severe pain	Morphine, liquid preparation	Adult: 2.5-10 mg every 4 hours. May give double dose at bedtime. No maximum dose. Titrate to patient comfort. Child: 0.15 mg/ kg-0.3 mg/kg every 4 hours. Titrate as with adults.	Dose increases may be limited by oversedation. Should decrease the dose or increase the dosing interval in case of any renal failure. Constipation is a common problem and all patients should be placed on a bowel regimen prophylactically (see TABLE 2.5).
Neuropathic pain (burning pains or shooting)	Amitriptyline	Adult: 10-25 mg by mouth daily. Child: 0.1 mg/kg once a day at bed- time. Increase as needed by 0.2-0.4 mg/kg every 2-3 days to a maximum of 2mg/kg/day	Dose should be titrated upward every week to effect. May take weeks to work. Maximum dose in adults is 100 mg per day. Side effects include initial drowsiness, postural hypoten- sion, dry mouth, mild tachycardia, constipa- tion. Life-threatening cardiac toxicity with overdose.
	Phenytoin	Adult: 100 mg twice per day ini- tially, increase up to 400 mg twice per day if needed Child: 2.5-5 mg/ kg twice per day (maximum 200 mg twice per day)	Can use instead of, or in addition to, amitrip- tyline if neuropathic pain persists. Avoid if on anti-retrovirals due to drug interactions.

Symptom	Medication	Dose	Notes
Muscle spasms	Diazepam	Adult: 2.5-10 mg by mouth 2 to 3 times per day Child: 0.05 mg/kg-0.1 mg/kg 3 to 4 times per day (maximum 0.8 mg/kg/day)	Drowsiness, ataxia.
Pain from swelling, inflammation, or neuropathy	Prednisolone	Adult: 20-80 mg by mouth daily Child: 1 mg/kg x 1-2x/day by mouth	May also improve nausea, fatigue, and appetite. Particularly helpful in the case of malignant lesions causing localized swelling in the muscle or bone. The dose should be decreased gradually over a period of 2-3 weeks and then stopped to avoid side effects.

Essential Pain Medications - continued

Treatment	Dose
Glycerin suppository	Adult: 4 gm suppository per rectum daily Child (≤ 40 kg): 2 gm suppository per rectum daily
Lactulose syrup	Adult: 15-45 ml 2-3 times per day orally, maintain 30-90 ml/day Child (≤ 40 kg): 7.5 ml 1 time per day orally
Bisacodyl	Adult: 10 mg once or twice daily, orally or per rectum Child (≤ 40 kg): 0.3 mg/kg once daily by mouth. Maximum dose: 10 mg. Can also be given per rectum
Naloxone	Adult: 1-2 mg every 8 hours. Should only be given orally for this indication

Treatment for constipation; from PIH Rwanda

Medications for nausea/vomiting treatment; from PIH Rwanda

Cause of nausea	Therapy
Liver failure, renal failure, metabolic derangement, drug side effect, or bacterial infection (nausea due to a toxin or inflammatory mediator)	Haloperidol Adult: 0.5-1 mg 2-4 times per day given orally, IV, or SC, around the clock or as needed Child (≤ 40 kg): 0.025-0.05 mg/kg/day in 2-3 divided doses. Increase by 0.25-0.5 mg/day every 5-7 days as needed to maximum dose 0.15 mg/kg/day
	Promethazine Adult: 12.5-25 mg every 4 hours orally, IV, IM, or by rectum Child (≤ 40 kg): 0.25-1 mg/kg 4 times a day orally, IV, IM, or by rectum. Maximum dose: 25 mg per dose
	Dexamethasone Adult: 8-20 mg once a day in the morning or 4-10 mg 2 times per day IV or IM, around the clock or as needed Child (≤ 40 kg): 0.5-1 mg/kg 2 times per day IV or SC around the clock or as needed. Maximum dose: 10 mg 2 times per day
Increased intracranial pressure, bowel obstruction, or distension of liver or of hollow viscus due to neoplasm	Dexamethasone Adult: 4-10 mg 2 times per day IV or IM, around the clock or as needed Child (≤ 40 kg): 0.5-1 mg/kg 2 times per day IV or SC around the clock or as needed. Maximum dose: 10 mg 2 times per day
Anxiety	Diazepam Adult: 2.5-10 mg 3 times per day, orally, IV, or SC, around the clock or as needed Child (≤ 40 kg): 0.05-0.1 mg/kg/day divided 3-4 times per day (maximum 0.8 mg/kg/day)
Gastroparesis	Metoclopramide Adult: 10 mg, 4 times per day, orally, IV, or SC, around the clock or as needed. Child: 0.1-0.2 mg/kg/dose 4 times per day, orally, IV or SC, around the clock or as needed
Stimulation of vestibular apparatus	Chlorpheniramine Adult: 4 mg orally every 4 hours, around the clock or as needed Child (≤ 40 kg): 1-2 mg by mouth every 4-6 hours. Maximum dose: 6 mg/day for 2-5 yo, 12 mg/day for 6-11 yo, around the clock or as needed
	Promethazine Adult: 12.5-25 mg every 4 hours orally, IV, IM, or by rectum Child: 0.25-1 mg/kg 4 times a day orally, IV, IM, or by rectum. Maximum dose: 25 mg
Adjuvants for nausea/vomiting of any cause	Chlorpheniramine Adult: 4 mg orally every 4 hours, around the clock or as needed Child (≤ 40 kg): 1-2 mg by mouth every 4-6 hours. Maximum dose: 6 mg/day for 2-5 yo, 12 mg/day for 6-11 yo, around the clock or as needed

