

IMAI first-level
learning programme
for health workers
working at health
centres in limited
resource settings

Participant Training Manual:

Uganda Integrated Non- Communicable Disease Chronic Care

Protocols 1-3:

- Cardiovascular risk-based management of hypertension, diabetes and other risk factors to reduce heart attacks and strokes*
- management of asthma and chronic obstructive pulmonary disease*
- management of rheumatic heart disease*

This training is based on the Chronic Care guideline module developed to operationalize the WHO Package of Essential Noncommunicable Disease (PEN) Interventions and Global HEARTS for first level health workers, using the WHO Integrated Management of Adolescent and Adult Illness (IMAI) chronic care approach

**Draft
June 2019**

Integrated Management
of Adolescent and Adult
Illness (IMAI)

The IMAI first-level learning programme for health workers working at health centres in limited resource settings is based on the draft guideline module, *Uganda Integrated Noncommunicable (NCD) Disease Chronic Care: Cardiovascular risk-based management of hypertension, diabetes and other risk factors to reduce strokes, heart attacks and hypertensive heart failure; management of asthma and COPD; and management of rheumatic heart disease.*

Produced by the IMAI-IMCI Alliance (a US NGO) and supported by WHO AFRO Department of Noncommunicable Diseases.

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Introduction

The prevalence of chronic, noncommunicable disease is increasing worldwide. Cardiovascular diseases, diabetes, and chronic respiratory diseases are three such diseases that continue to effect communities globally, increasing years lived with disability and reducing productivity and overall health status for a long period of time. Chronic diseases will continue to rise with continued globalization, urbanization, and aging populations, necessitating comprehensive frontline healthcare that can address the complex prevention, screening, treatment, and education needs of these patients.

This training course is based on guidelines, *Integrated Noncommunicable Disease (NCD) Chronic Care: Cardiovascular risk-based management of hypertension, diabetes and other risk factors to reduce heart attacks and strokes; management of asthma and COPD; and secondary prevention of rheumatic heart disease* which were developed to simplify and operationalize the WHO PEN Interventions and incorporates the WHO-CDC HEARTS initiative in low-resource settings. The goal of the guidelines and associated training materials is to empower frontline healthcare workers to provide comprehensive chronic disease care at the health centre level with support from the district hospital and linkages with the community level, ensuring care close to where the patient lives.

The Chronic Care guideline manual includes three sections:

- Protocol 1: Clinical algorithm for cardiovascular risk-based management of hypertension, diabetes and other risk factors to reduce heart attacks and strokes, as well as secondary prevention after myocardial infarction, angina, stroke or transient ischaemic attack (TIA)
- Protocol 2: Clinical algorithm for chronic respiratory diseases, specifically asthma and chronic obstructive pulmonary disease (COPD)
- Protocol 3: Clinical algorithm for secondary prophylaxis for rheumatic fever/ rheumatic heart disease (RHD) and chronic care management at the health centre.

This draft training participant manual focuses on Protocol 1&2 but the incorporation of all 3 protocols is in development for training. The training for auxiliary staff and lay providers is also available for this program. The training course includes a facilitator guide and participant manual as well as guidance on course direction and organizing the practical skill sessions. Training is done in parallel with all of the cadres on the NCD chronic care team. If the complete training is done which includes the NCD updated Acute Care training (updated to include screening/early detection of select NCDs-hypertension, diabetes, breast cancer, cervical cancer and cardiovascular (CVD) risk assessment), the course duration is 5 days with practical skills sessions and implementation planning (see Table 1 below).

Table 1: Sample agenda for parallel training courses for NCD training in health centre clinical teams using WHO IMAI-PEN Acute Care and Integrated NCD Chronic Care

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6 (half day)
Training for Clinicians (doctors, clinical officers, medical assistants)	Emergency management/ Acute Care/NCD screening <ul style="list-style-type: none"> Management of emergency NCD-related conditions prior to referral Manage common acute conditions in OPD- when to suspect diabetes, CVD CVD risk assessment -calculate BMI, measure BP, fingerstick glucose Diabetes screening Breast/cervical cancer screening/ early disease detection 	Chronic Care <ul style="list-style-type: none"> Introduction to chronic care General principles of good chronic care Use the 5 A's Protocol 1: CVD/HTN/DM <ul style="list-style-type: none"> Sequence of care Triage CVD and risk factors Assess Practical Sessions	Chronic Care- Protocol 1: CVD/HTN/DM continued <ul style="list-style-type: none"> Provide specific therapy- HTN, diabetes; primary/secondary prophylaxis Manage comorbidities and complications Patient education and support NCD Patient Card: Diabetes, hypertension or elevated cardiovascular risk Practical Sessions	Chronic Care- Finish Protocol 1 Protocol 2: Asthma/COPD <ul style="list-style-type: none"> Sequence of care Assess Provide specific therapy Manage complications Patient education and support NCD Patient Card: Asthma and COPD Practical Sessions	Chronic Care- Finish Protocol 2 Start Protocol 3: RHD- 2nd prophylaxis <ul style="list-style-type: none"> Assess symptoms, refer as needed Give Benzathine injection IM Schedule follow-up NCD patient Card: RF/RHD NCD Implementation Planning -for the whole clinical team Review	Patient Monitoring -for select members of clinical team/ data managers
Training for nurses (same curriculum, separate classroom)	Emergency management/ Acute Care/NCD screening	Acute Care continued (half day)/ Chronic Care- Protocol 1: CVD/HTN/DM Practical Sessions	Chronic Care- Protocol 1: CVD/HTN/DM continued Practical Sessions	Chronic Care- Finish Protocol 1 and start Protocol 2: Asthma/COPD Practical Sessions	Chronic Care- Finish Protocol 2 and start Protocol 3: RHD- 2nd prophylaxis NCD Implementation Planning -for the whole clinical team Review	Patient Monitoring -for select members of clinical team/ data managers
Training for Auxiliary Staff/CHW/ Expert patient lay provider	Cardiovascular disease risk screening	Cardiovascular disease risk screening Practical Sessions	Triage & Support the Clinical Team Patient education and support Practical Sessions	Chronic Care- Protocol 2: Asthma/COPD patient education and support Practical Sessions	Chronic Care- Protocol 3: RHD- 2nd prophylaxis NCD Implementation Planning -for the whole clinical team Review	Patient Monitoring -for select members of clinical team/ data managers

The WHO Integrated Management of Adolescent and Adult Illness (IMAI) has produced guideline modules covering Chronic HIV care with ARV Therapy, Acute care (including NCD updates to the management of opportunistic infections and when to suspect HIV, linking to testing and counselling), and Palliative Care (symptom management at home), and General Principles of Good Chronic Care to district hospital care with the IMAI District Clinician Manual. Each module can be used alone or as an integrated package. The pocket-size guideline modules are intended to be used both as learning aids (during this training course) and as job aids (for reference during clinical care).

Target groups for this chronic care training course

This course is intended for first-level facility health workers who work in a district outpatient clinic or in peripheral health centres and clinics, in rural or urban areas, in resource-constrained settings. This five day training course including prevention, screening, management, and counselling of hypertension, diabetes, asthma and COPD.

Clinical training in the use of these simplified guidelines aims to provide an efficient introduction to chronic disease care. This will allow key tasks to be shifted from doctors to nurses, clinical officers, medical aids, and other multipurpose health workers in a clinical team. The goal is effective care based on a comprehensive chronic care model.

Medical officers or doctors can also go through this course more rapidly for an introduction to chronic disease care and to make them thoroughly familiar with the care provided by others on the clinical team, which they will need to supervise. This course would then need to be followed by more advanced training.

A separate training module is in development to address NCD screening, education and support counselling for prevention, disease education and medication adherence, and heart healthy lifestyle. These guidelines have been designed so they can be implemented by patients and other lay providers working on the clinical team. An important source for the increase in human resources required to rapidly expand access to chronic care can come from patients and other community members who both join clinical teams and support treatment and other care in the community.

Materials needed for the course:

1. Integrated Noncommunicable Disease (NCD) Chronic Care guideline module
2. IMAI-PEN Acute Care guideline manual
3. Participant training manual for the integrated NCD chronic care clinical training course (this manual)
5. Participant training manual for the integrated NCD chronic care auxiliary staff training course
6. Facilitator guides for both the clinical and auxiliary courses

Other training tools:

1. CVD risk and DM screening form
2. NCD patient monitoring cards
3. Wall charts- Country or region specific CVD risk charts, Screening for CVD risk/DM

Chapter 1: Chronic Care

Learning Objectives:

1. Recognize the difference between acute and chronic care.
2. Understand the general principles of good chronic care.

Comprehensive care for people living with chronic diseases requires both clinical care based at the health facility and home-based care involving the patient, family and friends, community health workers, other community-based caregivers, traditional healers, and community-based organizations, NGOs and FBOs. This course concentrates on clinical care, which is an important component of comprehensive care but not the only one. The IMAI-PEN Chronic Care Manual prepares lay providers, nursing assistants, or nurses to provide patient education, prevention and screening support, disease treatment, and support within the clinical team. Some of the communication and patient education material can also be used for community treatment preparedness and other training that occurs in the community.

1.1 Acute Exacerbations, Chronic Management, and Prevention

To improve the comprehensive care at health centres and the district or hospital outpatient clinic, it is important to be able to provide both good acute and chronic care and prevention at the health facilities, linked with home-based care.

Class Activity

Think about the care that you provide now in your health centre. Is it mostly acute care or chronic care? Discuss what happens in your clinic for acute care and for chronic. How do they differ?

Most care that we deliver is usually acute care. Acute care includes the management of the common illnesses that are problems for adolescents and adults. These include common bacterial infections, skin, neurological, and mental health problems. In countries with a high prevalence of chronic diseases, more and more of these acute problems are due to periodic worsening of their ongoing disease; if we only care for the patient during episodes of acute illness, then we are only providing acute care -- we are not yet providing good chronic care.

Because most health care systems developed in response to acute problems, they are designed to address urgent health care needs and to diagnose, relieve symptoms, and anticipate a cure. Health care for chronic conditions is different from

health care for acute problems. Chronic care is health care which manages long term conditions. The aim of chronic care is to control symptoms, prevent disease progression and complications and maintain a quality of life close to level of patient's baseline functioning.

Aim of chronic care

1. control symptoms
2. prevent disease progression and complications
3. maintain quality of life

To better manage chronic conditions such as hypertension, diabetes, asthma, and COPD, health care needs to be organized and delivered in a different way. Acute care will always be necessary (even chronic conditions have acute episodes, *acute on chronic*), but at the same time health care must be able to prevent, detect, and care for long-term health problems.

1.2 Introduction to the General Principles of Good Chronic Care

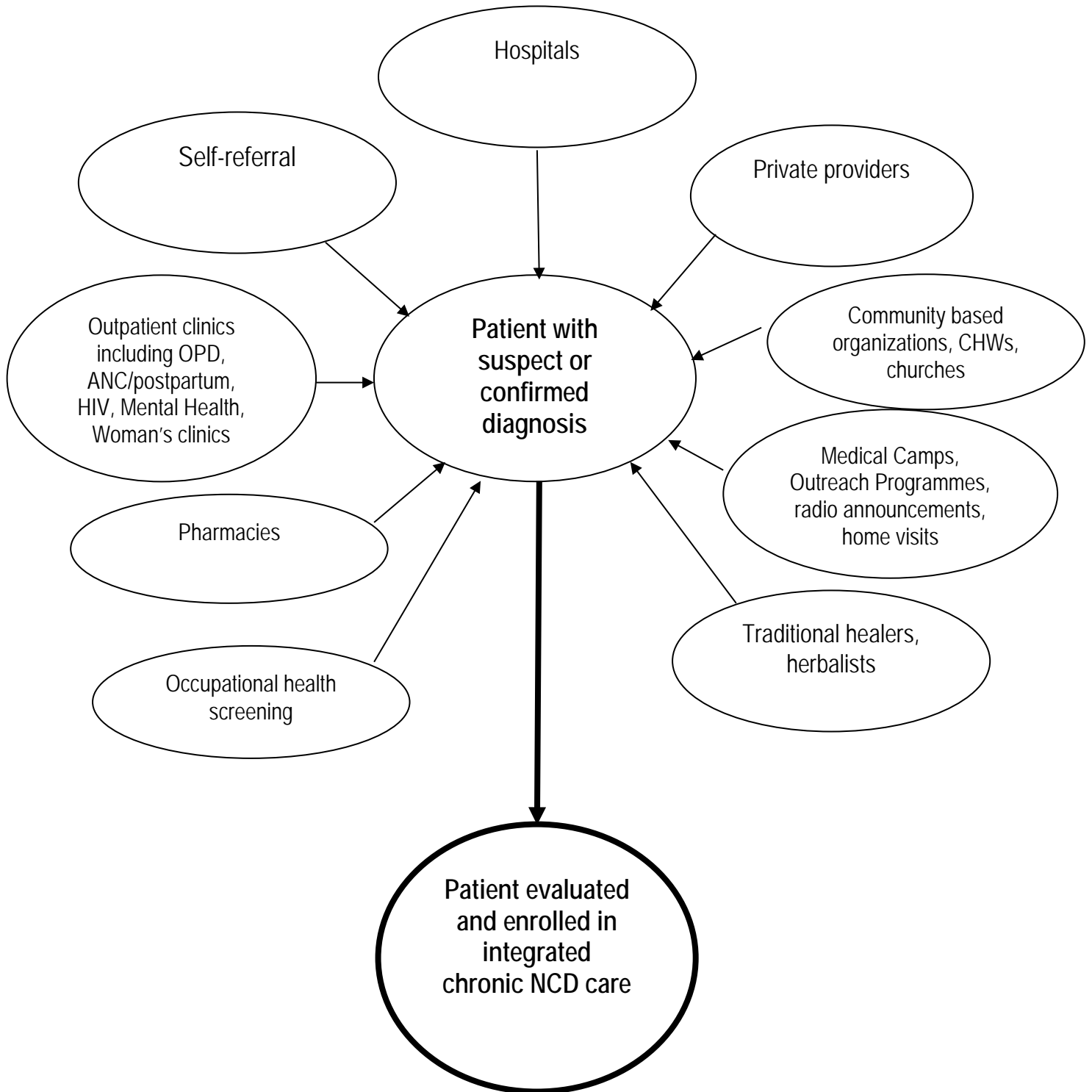
Good chronic care recognizes the fact that the patient must understand and learn to manage his or her own chronic condition. Chronic diseases require much education and support to give patients the skills for **self-care** (manage their own condition). Although the clinical team and others at home and in the community can help, it is the patient that needs to learn to cope with their disease, to learn to practice healthy living to limit disease progression, and to understand disease management and what to do in case it worsens. This requires education and support, but the results for the patient are important.

The following principles can be used in managing many diseases or risk conditions, including hypertension, diabetes, asthma, and COPD. We will learn about these gradually throughout this course.

1. Develop a treatment partnership with your patient.
2. Focus on your patient's concerns and priorities.
3. Use the 5 As: **Assess, Advise, Agree, Assist and Arrange**.
4. Support patient self-management and family support.
5. Organise proactive follow-up.
6. Involve "expert patients," peer educators and support staff in your health facility.
7. Link the patient to community-based resources and support.
8. Use written information—registers, treatment plan, treatment cards and written information for patients—to document, monitor and remind.
9. Work as a clinical team.
10. Assure continuity of care.

Entry points into chronic care for patients with elevated cardiovascular disease risk, hypertension, diabetes mellitus, asthma, and COPD

Patients with chronic disease can be entered into the healthcare system via a number of different routes, outlined in the diagram below:



The principles of good chronic care can be used for every health worker-patient interaction.

A general principle of good chronic care:

1. Develop a treatment partnership with your patient

What is a partnership?

- **A partnership is an agreement between two or more people to work together in an agreed way toward an agreed goal.**

For good chronic care, the partnership occurs between the health worker (or clinical team) and the patient. In a partnership both parties share responsibility for the agreement. Each partner knows what role he or she plays in the partnership. Partners treat each other with respect. One partner does not have all the power.

Examples of a partnership:

- Doctor and nurse working in the operation theatre
- Football team
- Cook and waiter working in a restaurant
- A Couple

Examples that are NOT a partnership:

- Mother and young child
- Health worker and sick infant
- Teacher and young students
- Police and criminals
- Officer and recruits in the army

A general principle of good chronic care:

2. Focus on your patient's concerns and priorities

Often we focus only on the obvious signs or symptoms of illness and may miss the real reason that the patient came to the clinic. It is important to find out why the patient has come and make sure that this is addressed.

A general principle of good chronic care:

3. Use the 5A's – Assess, Advise, Agree, Assist, Arrange

The 5 As are a key part of the good chronic care. They are a series of steps that the HW may use in and when caring for patients with chronic conditions.

1. ASSESS

Currently most of you are familiar with the process of assessing for the patient's symptoms and signs, classifying (or diagnosing) the illness, and deciding what treatments to recommend. Assess includes asking what the problem is, listening to the answer, asking further questions, then examining the patient by looking, listening (for example, to hear a wheeze) and feeling, as appropriate for the patient's symptoms.

In acute care, we usually assume that the patient's goal for the visit is treatment for their main symptoms. It is common to skip over assessing behavioural risk factors or to ask about how the patient is managing their chronic condition. Sometimes we even miss the real reason the patient came to the clinic.

Example of Assess: Do you have any problems or concerns that you would like to address today?

2. ADVISE

This includes recommending the treatments to the patient, educating the patient, and preparing the patient for self-management. It is important to discuss the options, not to just tell the patient what to do. It is also important to evaluate how ready the patient is to adopt the treatment and to ask checking questions to make sure that they have understood.

Example of Advise: Your blood pressure is very high. This puts you at high risk for cardiovascular disease, problems such as heart attack or stroke. I would like to start you on a medication called bendroflumethiazide for your blood pressure. It is a diuretic, a water pill, so it is better to take it once a day in the day time. Do you have any questions about what I just told you?

3. AGREE

Agree means that the patient understands, wants and agrees to the treatment plan. **This is a step we often skip!**

It may be logical to skip this step during emergency care for trauma or a very sick patient. They have come for care and are too sick for a discussion or to make a choice. For young children needing acute care, we try to tell them what is happening but we often do not ask for their agreement (and would still treat them even if they screamed "no" which they often do).

However, most care is not an emergency and we are learning about how best to provide care for adults. For chronic care, AGREE is the key step in the process since it is the basis for forming a partnership with the patient and supporting good patient self- management.

Example of Agree: Ok, so we agree that you would start the medicine and follow-up here in 1 week for a blood pressure check?

4. ASSIST

This includes treatments (medication and other treatments), advice and counselling, but also help that you can provide the patient in terms of skills to carry out the treatments or to overcome barriers. An important way to assist the patient is to get other help, by linking to available support in the community or to peer support groups, or involving someone to help support them in their treatment.

Usually we (and the patients) focus only on the pills or the injection. There is much more that is needed than this for good chronic care, especially for diseases that require life-long treatment.

Even the best plans for treatment often run into problems. When the patient returns, they may need more assistance to solve problems and overcome obstacles.

We often assist the patient only with treatments and skip other ways of assisting that may be as important.

Example of Assist: I see, you stopped taking your medicine in the morning because you feel ok at that time and you need to get to work. Is there an alarm on your phone that you can use to remind you to take your medicine?

Another example- If facility has written files, HW can call patients who missed their appointment at the end of the month.

5. ARRANGE

A definite follow-up, scheduling a group appointment, arranging how the medication can be picked up on the next visit, and recording what happened on the visit are all parts of arrange.

Example of Arrange: I would like you to meet with our Health Educator who will give you some strategies on how to help improve your cardiovascular disease risk.

Class activity

Stop here to discuss with the group how you already use the 5 As and to consider how they could help you both in your patient encounters and as a clinical team. Discuss adherence, its barriers and problem-solving that occurs with patients in your clinics.

A general principle of good chronic care:

4. Support patient self-management

Whenever talking about how the patient can have his/her needs met and who can support him/her, health workers should always try to leave the patient as much in charge of his or her own care as possible. This is very important for adolescents and adults. A patient with a chronic condition has a vital role in the management of his/her own care. This is called **SELF- MANAGEMENT**.

Self-management means the patient is taking responsibility for his or her own health care.

→ **Self-management recognizes that the patient takes responsibility for the daily treatment of their condition.**

The patient takes responsibility for taking medication. Every day he or she makes choices about their diet, exercise, and other lifestyle issues that protect or damage their health. When the patient living with a chronic disease makes choices to protect their health, this is often called *positive living*.

The care team helps the patient understand their options and the consequences of their decisions. The **patient** is the one who, on a daily basis, makes lifestyle choices and chooses to follow the plan of care.

The **patient** is responsible for doing what the care team recommends.

Patients need to be educated, motivated and supported to take care of themselves. This gives them a better sense of control and makes them feel better about their situation. It has been shown that this approach makes them more successful in caring for themselves.

Promoting self-management includes developing a relationship between the care team and the patient that the patient trusts and believes in.

→ **Combining acute care, chronic care, palliative care/symptom management, and prevention.**

If the patient is found to have a chronic disease, he or she should be offered chronic care. Chronic care is in addition to acute care for any illness they have today or when they return for regular follow-up.

During the later stages of the disease, patients also need palliative care or symptom management, so that suffering can be managed well. Note that palliative care includes managing symptoms during both acute and chronic illness, it is not just for end-of-life care!

Prevention needs to be integrated throughout both acute and chronic care. Lifestyle modifications, including healthy diet and exercise, are essential to prevent many

non-communicable diseases from occurring and to prevent patients with the disease from getting worse. This will be discussed further in Chapter 7.

A general principle of good chronic care:

5. Organize proactive follow-up

Proactive care involves anticipating patient's needs, arranging follow-up, and supporting self-management. Proactive follow-up is when the health care provider plans ahead to ensure the patient is routinely follow-up and their disease and functional status can be evaluated and compared to previous levels. This type of proactive care does not mean waiting around for things to get worse, instead it regularly monitors patients to ensure that their disease is well controlled, their health and functional status is maximized, and that patients receive adequate treatment and support to prevent acute episodes of worsening of their chronic disease.

A general principle of good chronic care:

6. Involve “expert patients, peer educators, and support staff in your health facility

Expert patients or clients, peer educators (e.g. adolescent peers, peer mothers), and support staff such as community health workers and health educators are a valuable asset in chronic disease management. Because these types of diseases require continuous self-management by the patient, educating the patient is essential to ensure they are knowledgeable about their disease and how it can progress, the consequences of not complying with treatment, and how best they can self-manage their disease. Patient education and support is also crucial to empower patients to take control of their health; the development of self-belief and the feeling that they are in control of their health is built through ongoing supportive relationships with these staff members.

A general principle of good chronic care:

7. Link the patient to the community-based resources and support

Patients with chronic diseases required continued support to ensure they are managing their disease correctly and remaining in optimal health. Community-based resources, such as patient support groups, are excellent ways for patients to express the anxieties and challenges they face while living with their disease and receive suggestions and coping strategies from people who are in similar situations.

Additionally, being linked to community focal points, such as the community health worker, is important to ensure the patient is able to seek help or advice whenever necessary. Other potential linkages include:

- Link to social empowerment
- Form groups to buy medicines

A general principle of good chronic care:

8. Use written information – registers, treatment plan, treatment cards, and written information for patients – to document, monitor, and remind

Written information for providers, such as registers and treatment cards, are important for the continuous monitoring of patients with chronic diseases. By documenting their vital signs, functional status, and disease level on every visit, you are able to make comparisons of how they are today versus during previous encounters and see *how their disease is progressing over time*. Additionally, documentation allows the health care provider to make treatment modification decisions by comparing whether their current symptoms are better or worse than the last visit and how well or unwell their current medications are working.

Written information for patients is also important. Providing them with information about potential disease progression and treatment plan allows them to educate themselves on their disease status and know what to expect in case it worsens. These written messages should be locally adapted and include local language and pictures when possible. As discussed above, patient education is crucial to foster empowerment and effective self-management.

A general principle of good chronic care:

9. Work as a clinical team

Providing good chronic care requires teamwork. To be able to deliver long term treatment and support, we need to form a clinical team that includes a nursing assistant, nurse, clinical officer, and a medical officer (MO) or doctor. This team may work together differently depending on where they are located.

In the district outpatient clinic, the whole clinical team can work together in the same clinic. They can consult with each other easily every day. The MO needs to be familiar with the IMAI Chronic Care Manual but also may utilise national guidelines or other specialty resources for senior clinicians, and trained by other courses. The MO will need additional training to be able to supervise, consult, review cases, and to

take on overall clinical responsibility for the chronic disease care delivered by the clinical team (mentoring and support).

At a health centre without a doctor or medical officer, the nurse and clinical officer will need to stay in contact with the MO on their clinical team, by referral and back-referral and by regular communication. To allow access to treatment through health centre-based clinical teams outside the district towns, it will be necessary to consult by mobile phone, landline or radio when problems arise. It will also be important to arrange for visits by the MO to the health centre. These are essential to reduce the number of referrals. Although some referrals are essential, referral needs to be kept to a reasonable proportion of cases to be practical.

A general principle of good chronic care:

10. Assure continuity of care

Continuity of care refers to the provision of stable and uninterrupted care for patients throughout the span of their disease. This is especially important in patients with chronic diseases who often suffer from the effects of their disease for a lifetime.

Continuity of care prevents hospitalizations, reduces health care costs, and can prolong the life of patients. It ensures that patients receive continuous support and treatment, resulting in comprehensive disease management and the development of a treatment partnership with their health care providers.

Summary

- Chronic care is health care that manages long-term conditions.
- The aim of chronic care is control symptoms, prevent disease progression and complications, and maintain quality of life.
- Using the 5 A's (Assess, Advise, Agree, Assist, Arrange) is useful for developing a strong health worker-patient partnership.
- It is important for the health worker to encourage self-management to support the patient to manage his/her own condition.
- Patient support groups are a good example of linking a patient to community-based resources.
- Continuity of care refers to the provision of stable and uninterrupted care for patients throughout the span of their disease.

Assessment questions: Chronic Care

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. What are the 5 A's (circle all that apply):
 - a. Ask
 - b. Arrange
 - c. Accept
 - d. Assess
 - e. Assist
 - f. Advise
 - g. Agree
2. Chronic care is health care that manages long-term conditions. True or False
3. Chronic NCD care counselling can be done by all members of the health care team. True or False
4. Self- Management is when a patient with a chronic condition has a vital role in the management of his/her own care. True or False
5. The chronic care relationship between the health worker and patient is one where the health worker tells the patient what he or she must do even if the patient does not agree to the treatment plan. True or False
6. The aim of chronic care is (circle all that apply):
 - a. to control symptoms
 - b. to cure the problem
 - c. to prevent disease progression
 - d. to prevent complications
 - e. to maintain quality of life.
7. Scheduled follow-up visits are important for continuity of care in chronic NCD care. True or False
8. Referring the patient to the medical officer at the district hospital is an example of community-based linkages. True or False
9. Good chronic care means understanding the disease and its progression not your patient's concerns for the visit. True or False
10. Patients may enrol into integrated NCD care from the following (circle all that apply):
 - a. Self
 - b. Hospital
 - c. ANC clinic
 - d. Community based organizations
 - e. Private providers

Chapter 2: Sequence of Care: Triage the patient

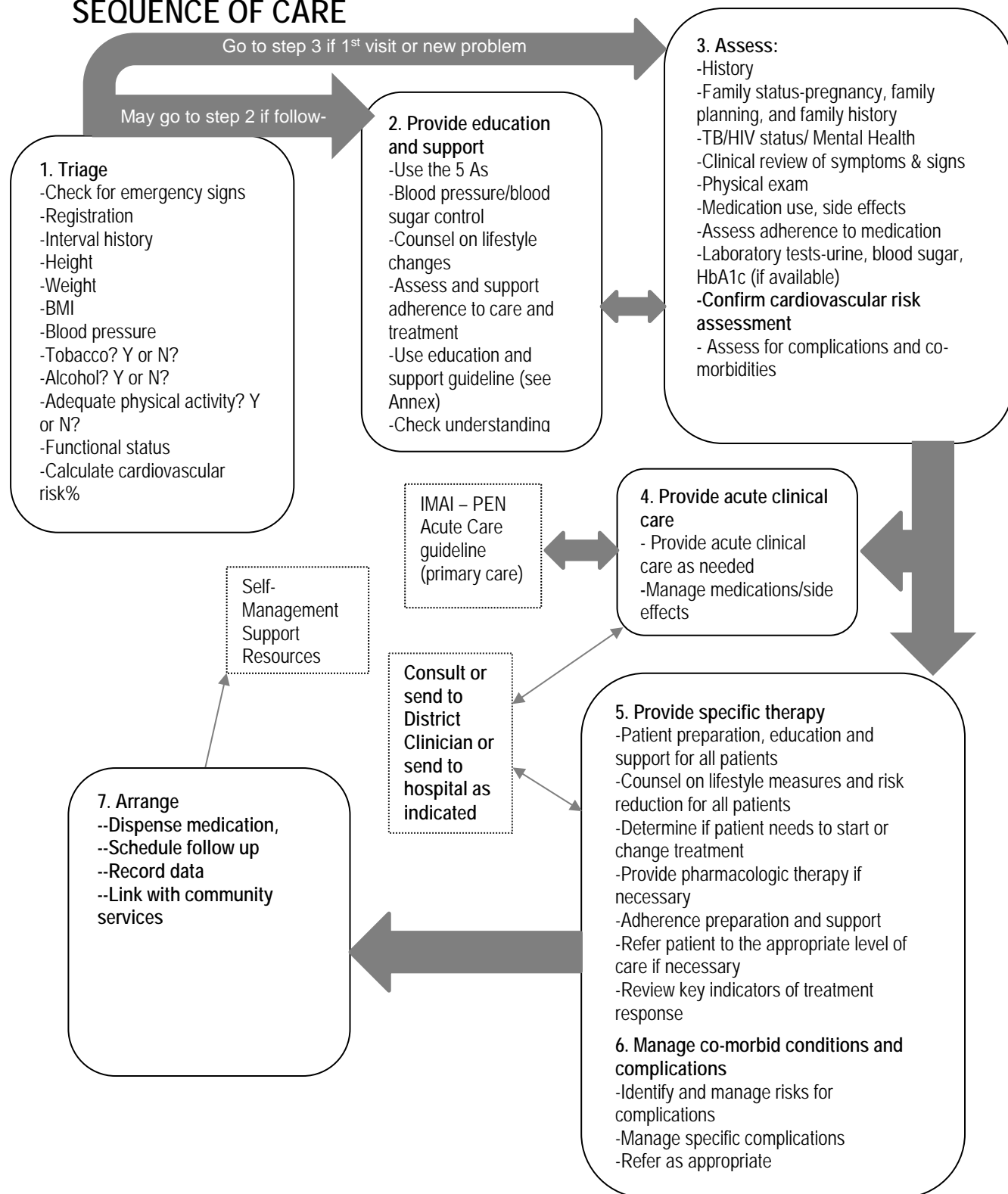
Learning Objectives:

1. Understand the sequence of care for the clinical assessment and management of elevated cardiovascular disease risk, hypertension or diabetes.
2. Triage patients who have enrolled in chronic care.
3. Learn how to calculate body mass index (BMI).
4. Measure blood pressure correctly.

2.1 Introduction to the Sequence of Care

The sequence of care provides an overview to the clinical algorithm to assess and manage cardiovascular disease risk, including hypertension and diabetes. This algorithm is not only for the clinical health worker. It links the interaction between the entire clinical team-the clerk, triage worker, clinical health worker and counsellor or health educator.

SEQUENCE OF CARE



2.2 Triage

Triage is the assignment of degrees of urgency to patients. This takes place when patients first enter the health centre in order to determine who should receive care first.

This is the initial encounter with the patient, and as such, there are many screening questions and measurements that are completed at this stage to obtain a more comprehensive picture of the person seeking care. It is important that the health worker be able to support the triage worker to triage patients who come to chronic care.

Steps for triage are as follows:

- 1. Check for emergency signs—See IMAI Acute Care for management steps, first stabilise and refer if needed.** If the triage worker observes any of the following signs, s/he should call the health worker for help.
 - Airway- obstructed (noisy)
 - Breathing
 - Circulation
 - Unconscious/ Convulsing
 - Pain
- 2. Greet the patient**
- 3. If new patient, register patient**
- 4. If follow-up, retrieve patient record/file**
- 5. Measure weight**
 - Record in patient record
- 6. Measure height**
 - Record in patient record
- 7. Calculate body mass index**
 - Record in patient record
- 8. Measure blood pressure (and blood sugar if diabetic and fingerstick glucose available)**
 - Record in patient record
- 9. Ask patient if he/she has smoked in the past 12 months**
 - Record 'Yes' or "No' to smoking in patient record. If he or she says "no," to smoking, ask whether there is any other form of tobacco use. If the person says that he or she Quit in last year, still record "Yes" and add quit date.

10. Ask patient if he/she uses alcohol in past 30 days

If yes, how often and record number of units per day.*

11. Ask patient how much physical activity they do

- Patient should complete at least 30 minutes of physical activity 5 days a week or 2.5 hours/week
- Physical activity includes work around the house, active jobs, and all types of exercise
- Record if patient meets criteria or not in patient record.*

12. Determine reason for visit

- Ask patient why they came to see you and what they are hoping to get out of the visit

13. For new patients, ask about any concerns they have

- This may refer to concerns about their health specifically, or any wider concerns pertaining to their life in general or the workings of healthcare system

14. For follow-up, take interval history → see box p.21

- The interval history is the history since the patient was last seen by a healthcare professional
- The aim of taking an interval history is to find out if the patient's condition has improved, worsened, or stayed the same since the last visit
- This interval history should always be compared to previous health status to see whether or not the disease is well controlled

15. Determine functional status

- Functional status is how well a person is able to complete their activities of daily living. A person may be fully functional or living with some impairment
- Record the following letter whether the patient is able to:
 - i. Work, go to school, do housework, harvest, or play (if child) **(W)**
 - ii. Ambulatory (able to walk around) but is not able to work **(A)**
 - iii. Bedridden **(B)**

*One unit (drink) = half pint beer/lager (5% alcohol), 100 ml of wine (10% alcohol), spirits 25 ml (40% alcohol).

One of the big distinctions between a chronic and acute model of care is long-term follow-up. Once a patient is enrolled in the integrated NCD chronic care clinic, he or she will need to plan to come back to the same clinic for long-term follow-up of their condition. Based on the severity of the condition, the health worker will need to determine the frequency of follow-ups e.g. 3 months, 6 months or annually if a patient has low CVD risk. For follow-up visits, the patient may come for a blood pressure

check after starting a new medication or the health worker would like to evaluate him after trying lifestyle management for treatment of diabetes for 6 weeks. In many instances, the health worker will have the patient follow-up to meet other members of the clinical team for lifestyle counselling, adherence support or for a BP check and will not need to see clinician at each visit.

For all follow-up visits:

- 1. Ask whether their medication has changed since the last visit**
 - a. Having a complete picture of what they are taking and the potential side effects is essential for a correct diagnosis
- 2. Ask them if they have any additional concerns or problems today**
 - a. This is an important step to ensure that nothing is missed and all of the patient's needs are being met
- 3. Decide if the patient needs to see a clinician this visit**
 - a. A patient should see the clinician if:
 - i. It is their first ever visit
 - ii. They are attending a scheduled clinical visit
 - iii. They are presenting with any new symptoms

If there is no reason for the patient to see the clinical health worker (HW), then the patient may be sent for education and support counselling after triage (Step 2 of Sequence of Care—see **Chapter7**). If the patient is supposed to see the clinical HW this visit or if there are new problems or concerns, have patient wait in queue to see the clinician next (Step 3 of Sequence of Care, Assess—next chapter)

ACTIVITY

With a partner, practice the triage steps with one person acting as the patient and one performing triage. Switch roles when you are done.

2.3 How to calculate body mass index (BMI)

The body mass index or BMI is a measure of body fat based on height and weight. There are smartphone applications that can be downloaded which does this BMI calculation electronically by plugging in the height and weight variables or it can be calculated with a calculator.

1. Measure weight in kg. Record on the patient card.
2. Measure height in cm. Record on the patient card.
3. Now use the BMI table (see Integrated NCD chronic care manual) following formula:

BMI= $\frac{\text{weight in kg}}{\text{height X height in meters}}$
 OR
 $[\text{weight (kg)/ height (cm)/ height (cm)}] \times 10,000$

Example:
 The HW measures the patient at 70 kg and 180 cm tall.

BMI= 70 kg/1.8/1.8= 21.6 OR

BMI=70 kg/180 cm/180 cm X 10,000=21.6

Record this number on the patient card.

BMI Categories	BMI
Underweight	Below 18.5
Normal weight	18.5-24.9
Overweight	25-29.9
Obese	30 and above

Note: BMI correlates with body fatness but is not an exact measure of body fat. Factors such as muscle mass, age, gender, ethnicity can influence BMI. For example, athletes may have a high BMI because of increased muscle mass. On average women have greater amounts of total body fat than men with the same BMI. We will discuss management of overweight and obesity in **Chapter 7**. As discussed in this chapter, another measure of obesity, called central or abdominal obesity, can be determined through the measurement of waist circumference or waist-hip ratio.

EXERCISE

1. Calculate your own BMI.
2. Calculate the BMI for the following people:
 - a. 42 year-old with height 157 cm and weight 66 kg
 - b. 30 year-old with height 182 cm and weight 77 kg
 - c. 60 year-old with height 178 cm and weight 96 kg

2.4 How to measure blood pressure correctly

Materials needed:

1. stethoscope
2. BP cuff with sphygmomanometer (digital cuffs are recommended for nonclinical health workers)
3. cuffs of different adult sizes (standard, small or large or extra-large/thigh)

Steps:

1. Position patient seated in comfortable position on chair or lying down. If the patient is anxious, wait a few minutes.
2. Have patient flex arm at level of heart.
3. Support the arm while placing cuff on it either with your arm or use a side table. The cuff should be the proper size and not be placed over the patient's clothes. The length of the cuff bladder should be approximately 80% of the circumference of the patient's upper arm.

Example for sizing*:	
Arm circumference	Adult cuff size
22 to 26 cm	Small
27 to 34 cm	Standard
35 to 44 cm	Large
45 to 52 cm	Extra-large or "adult thigh" size

**These sizes are approximate. It is important to look at the cuff manufacturer's directions as to exact cuff sizing.*

4. Example, a large or an extra-large cuff should be used if the arm circumference is >33 cm. If a large enough cuff is not available, you can use a standard cuff on mid forearm and use the radial pulse.
5. Wrap the cuff securely around upper arm about 2 fingers above the antecubital fossa (bend in arm) [insert illustration].
6. Place the stethoscope on the arm over the artery in the antecubital fossa below cuff's edge with the earpieces in your ear.
7. Close the pressure valve on the rubber inflating bulb.
8. Inflate the cuff to 210 mmHg by pumping the bulb quickly (or until the pulse at the wrist disappears).

9. Deflate the cuff slowly at a rate of 2-3 mm Hg per second while looking at the sphygmomanometer. The first faint, tapping or knocking sound is the **systolic blood pressure**. Observe the number on the dial.
10. Continue to let the air out slowly. When the sounds disappear—this is the **diastolic blood pressure**. Observe the number on the dial.
11. Record the BP. Ideally, at least 2 measurements should be taken and wait at least 2 minute between measurements.
12. Blood pressure over 180 systolic or 110 diastolic warrants immediate attention. If only the systolic or only the diastolic blood pressure is raised, the HW should manage according to the higher number. This manual will discuss management steps for severe hypertension.

Note: An automated electronic BP device, if available, is preferred since it provides more reproducible results. During the skill sessions, we will demonstrate and practice measuring blood pressure on each other.

Summary

- The sequence of care provides an overview to the clinical algorithm to assess and manage cardiovascular disease risk, including hypertension and diabetes and demonstrates the interaction between the entire health centre team.
- *Triage* is the assignment of degrees of urgency to patients. This takes place when patients first enter the health centre in order to determine who should receive care first.
- During triage, after determining that there are no emergency signs, the health worker will take steps such as registering the patient, measuring BP, calculate BMI and ask about problems and determine if patient needs a clinical visit before patient sees the health worker or counsellor.
- When a patient is enrolled in the integrated NCD chronic care clinic, he or she will need to plan to come back to the same clinic for long-term follow-up of their condition. Based on the severity of the condition, the health worker will need to determine the frequency of follow-ups
- The body mass index or BMI is a measure of body fat based on height and weight.
- For BP measurement, it is important that the patient is comfortable and seated or lying down.

Assessment questions: Triage

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. Triage is the first step in the sequence of care for chronic care patients. True or False
2. Triage, assessment and treatment are the only steps in the sequence of care. True or False
3. Triage can only be done by a clinician. True or False
4. The first step in Triage is to ensure that there are no emergency signs. True or False
5. BMI is a measure of obesity and is an important CVD risk factor. True or False
6. Waist circumference or waist-hip ratio can provide information on central obesity. True or False
7. 45 year-old with BMI of 28 is classified as the following:
 - a. Underweight
 - b. Normal weight
 - c. Overweight
 - d. Obese
8. The size of the blood pressure cuff does not matter for accurate BP measurement. True or False
9. For a chronic care visit, patients should see the clinical health worker if (circle all that apply):
 - a. They are attending a scheduled clinical visit.
 - b. They have a new problem.
 - c. They are here to discuss lifestyle modifications for their diabetes.
 - d. It is their 1st visit to the health centre.

Chapter 3: Assess: Confirm the total cardiovascular disease (CVD) risk

Learning Objectives:

1. Recognise cardiovascular disease.
2. Learn modifiable and nonmodifiable CVD risk factors.
3. Recognise hypertension and diabetes
4. Confirm cardiovascular disease risk using WHO/ISH Risk Prediction Charts

3.1 Cardiovascular disease

Cardiovascular disease (CVD) encompasses angina, heart attack, stroke, transient ischaemic attack (TIA), and peripheral vascular disease (PVD).

1. Heart attack or myocardial infarction

Heart attack occurs when a blood vessel that carries blood to the heart is blocked. If there is a blockage, the heart can be injured and lead to decreased heart function or death from cardiac arrest.

Symptoms of a heart attack:

- Chest pain- generally located at centre of chest, may be a discomfort or severe and sudden chest tightness
- Pain can radiate to the left arm, jaw or neck
- There may be associated sweating, nausea, vomiting or difficulty breathing
- Pain may last more than 30 minutes and not be relieved by pain medicine or rest

Heart attack is an emergency and immediate attention and referral to the district hospital is needed

2. Angina

If the blood supply to the heart is decreased, angina, chest pain or pressure, can occur.

Symptoms of angina:

- Chest pain or pressure that may start after exertion e.g. walking uphill, exercise or stress and be relieved by rest or nitrate medicines
- Pain can radiate to left arm, jaw or neck

Angina can lead to a heart attack in the future if not managed.

3. Stroke

Ischaemic stroke occurs when blood to the brain is blocked. If it bursts (ruptures), it is called a haemorrhagic stroke. Massive stroke can lead to permanent disability and death. Symptoms for both types of strokes are similar and include the following:

- Weakness or numbness on one side of the body
- Loss of function in arm or leg or both
- Loss or reduced vision on one side
- Difficulty speaking, slurred or slow speech, facial drooping on one side
- Mental confusion

Stroke is an emergency and immediate attention and referral to the district hospital will be needed

4. Transient ischaemic attack (TIA)

TIA, also called mini-stroke, is similar to a stroke and occurs when the blood vessel to the brain is blocked for a short time. Symptoms are:

- Usually last a few minutes and disappear *in less than 24 hours*
- Sudden weakness or numbness or paralysis, typically on one side
- Dimming or loss of vision
- Difficulty or slurring of speech
- Confusion

It is a warning sign that a stroke may happen in future.

5. Heart failure (HF)

Heart failure is a condition where the heart is not able to pump blood the way it should. When the heart is not pumping properly it can lead to the following:

- Blood and fluid to back up into the lungs (pulmonary oedema) which can cause shortness of breath
- Back up of fluid in feet, ankles and legs (oedema)
- Tiredness or weakness
- Weight gain from fluid retention

Causes of heart failure include: coronary artery disease, hypertension, diabetes, rheumatic heart disease (see protocol 3). More information on heart failure will be available in future modules.

3.2 Cardiovascular disease risk factors

To prevent and manage CVD, it is essential to treat underlying risk factors. Risk factors which contribute to the development of cardiovascular disease include both modifiable and nonmodifiable risk factors. **Modifiable** risk factors are ones that can be changed or treated.

Nonmodifiable CVD Risk Factors	Modifiable Risk Factors
Age Gender Prior heart attack, stroke, angina or TIA Family history of CVD- in 1st degree relative e.g parent, brother, sister have premature CVD (if occurred before 55 years in males and before 65 years in female)	Tobacco use Unhealthy diet Physical inactivity Raised blood pressure Raised blood cholesterol Diabetes Overweight and obesity

3.3 Confirm total cardiovascular disease risk

Estimating a person's cardiovascular risk involves estimating the likelihood of having a heart attack or stroke in 10 years based on individual risk factors. Risk charts have been developed by WHO regions to calculate the CVD risk based on total effect of many risk factors, including:

- Age
- Gender
- Smoking status
- Systolic blood pressure
- Total cholesterol (or BMI)
- Presence or absence of diabetes

Newer, country specific WHO charts are in development. If available, this will allow the health worker to use BMI as a variable in place of total blood cholesterol if not known.

Step 1- Ask about prior history of cardiovascular disease or chronic kidney disease.

Ask--Does the patient have a history of diagnosed angina, myocardial infarction, or stroke? Does the patient have diagnosed chronic kidney disease? For the purpose of assessing CVD risk, this is not based on current symptoms but a prior diagnosis of these conditions. Asking about medications may also help the HW determine if patient has been diagnosed with any of these conditions.

If YES→discuss with medical officer at health centre or district hospital regarding ongoing CVD management. ***This person is at high risk for CVD recurrence and the charts are not needed.***

If NO → Go to step 2 to calculate CVD risk using the WHO/ISH risk charts relevant to the WHO subregion¹ or country CVD risk charts

Step 2- Before using the chart to estimate the risk, do you have the following information about the patient.

1. Age
2. Gender
3. Systolic blood pressure
4. Smoker or non-smoker—has the patient been smoking in the last year?
5. BMI

These 5 pieces of information would have been obtained during triage and should already be recorded on the patient card. If the blood pressure was $\geq 140/90$, the patient may likely have hypertension which will elevate the CVD risk on the charts.

What may not be confirmed is whether or not the person has diabetes. *Ask the patient if she or he has been diagnosed with diabetes or takes medicines for diabetes. If no prior diagnosis of diabetes or not known, review the fasting blood glucose (FBG) results if available and determine whether or not the patient has diabetes.*

Perhaps the patient may have been referred for elevated glucose. In triage if not known, the patient should have been sent for fasting blood glucose (FBG) before coming to see you. *If FBG results not obtained and patient does not have a prior diabetes diagnosis, the BMI, non-lab-based, country charts may be used.*

Diabetes

Diabetes occurs when the level of sugar (glucose) in the blood is higher than normal.

Diagnosis of diabetes*:

Fasting** blood glucose (FBG) ≥ 7.0 mmol/l (126 mg/ dl)

Or

Random blood glucose (RBG) ≥ 11.1 mmol/l (200 mg/ dl)

Or

HbA1c $\geq 6.5\%$ (48 mmol/l)

Or

2-hour plasma glucose (oral glucose tolerance test)*** ≥ 11.1 mmol/l (200 mg/ dl)

*Two tests are recommended to confirm the diagnosis unless the patient has symptoms of diabetes-see below. Point of care device (glucometer) may be used (see section on how to do

¹ Prevention of Cardiovascular Diseases: Pocket Guidelines for Assessment and Management of Cardiovascular risk, 2007. Available at http://www.who.int/cardiovascular_diseases/guidelines/Pocket_GL_information/en/

fingerstick below). Also, if blood glucose testing not available, a urine test for sugar may be used for screening, and if positive, the patient should be referred for confirmatory blood glucose test.

**Fasting means that the patient has had no food or drink (except water) for 10 hours before the test

***Blood glucose is measured 2 hours after patient has ingested a 75 g oral load of glucose

In diabetes, the blood glucose is high because the glucose does not get transported inside the cells and remains in the blood. This is due to a problem with insulin.

Insulin

Insulin is a hormone made by the pancreas. When you eat your food is broken into sugars in your digestive tract and is absorbed into your blood stream; there are several different types of sugars but the main one is called glucose. When your blood glucose levels rise after you eat your insulin levels should rise as well.

Insulin acts on the cells in your body causing them to take in glucose from the blood stream. The cells can then use this glucose as energy or store it as glycogen or fat to use as energy later.

When there is problem with impaired insulin PRODUCTION by the pancreas, it is called **Type 1 diabetes** and is an autoimmune. It usually first appears in infancy or childhood. As a result, ALL patients with Type 1 diabetes require insulin therapy, as their bodies cannot produce enough on their own, and therefore they have difficulties with blood glucose regulation.

When the problem is with insulin RESISTANCE and the body does not respond to the insulin produced by the pancreas, it is called **Type 2 diabetes**. Type 2 diabetes usually develops in adults, but can also appear in children and adolescents who are obese. Initially, Type 2 diabetes is usually treated with oral agents, but often patients will progress and require insulin therapy

Risk Factors for Type 2 Diabetes

Type 2 diabetes is more likely to develop in people with the following characteristics:

- Overweight or Obese
- Over the age of 40 (but it can develop in younger people as well)
- A first-degree relative with type 2 diabetes
- A waist measuring more than 80 cm in women or 94cm in men
- Intermediate hyperglycaemia (or pre-diabetes) or impaired glucose tolerance
 - When you're blood glucose levels are higher than normal but not yet high enough to cause diabetes (FBG 6.1 to <7)

Prevalence of Diabetes in the African region:

The high blood glucose mortality rate in the African region (AFRO) is 111.3 per 100,000; 110.9 for females and 111.1 for males. The 2014 prevalence of diabetes in AFRO was 7.1%, roughly 25 million people.¹

Symptoms of Diabetes

Diabetes commonly presents with any of the 4 following symptoms:

- Increased thirst (polydipsia)
- Increased urination (polyuria)
- Unexplained weight loss
- Tiredness

These symptoms can come on gradually, and as such, patients may get used to them and not realize that there is a problem.

Other symptoms of diabetes can include:

- Frequent infections
- Blurred vision

Additionally, someone with diabetes may not have any symptoms, demonstrating the need for regular screening even if they are feeling well.

Step 3- Select the appropriate chart depending on the presence or absence of diabetes (or use the BMI chart)

Step 4- Select male or female table

Step 5- Select smoker or non-smoker boxes

Step 6- Select age group boxes

- If age 40-49 years, select age group box 40
- If age 50-59 years, select age group box 50
- If 60-69 years, select age group box 60
- If <40 years, select age group box 40

Step 7- Within this box, find the nearest cell where the person's systolic blood pressure and total blood cholesterol cross.

- Use the person's most recent cholesterol result. If in mg/dl divide by 38 to convert to mmol/l
- If cholesterol assay cannot be done, use BMI charts.

Hypertension

Hypertension is the medical term for high blood pressure; blood pressure is the pressure in your blood vessels (arteries). Hypertension is:
BP \geq 140/90 mmHg in an adult

SBP stands for *Systolic Blood Pressure*, it is the pressure of the arteries when the heart muscle contracts.

DBP stands for *Diastolic Blood Pressure*, it is the pressure of the arteries when the heart muscle is resting and filling with blood.

Causes of Hypertension

Essential or Primary Hypertension occurs when the cause of hypertension is unknown; this happens in most cases. It tends to be familial or genetic. Slight narrowing of the arteries is thought to increase the resistance to blood flow within them, however the cause of the slight narrowing is unclear.

Secondary Hypertension is when high blood pressure is caused by another conditions, for example kidney problems and hormone problems.

Risk factors for Hypertension

Hypertension is more common in people who have certain characteristics and lifestyle factors, including:

- Diabetes
- African or Indian origin
- Family history of high blood pressure
- Overweight
- High salt intake
- Inactive lifestyle
- Increased consumption of caffeinated drinks (including coffee and tea), stimulants
- Increased consumption of alcohol
- Unhealthy diet low in fruits and vegetables
- Tobacco use
- Older adults
- Poor stress management

Symptoms of Hypertension

The majority of people with high blood pressure have *no symptoms* at all. This is why routine screening is necessary, even in people who feel well. Sometimes people feel headache or dizziness.

Cases of extremely high blood pressure can complain of:

- Severe headaches
- Anxiety
- Shortness of breath
- Nosebleeds

Prevalence of Hypertension

The African region has the highest prevalence of hypertension in the world with 46% of adults aged 25 and over. This prevalence in men (48%) is slightly higher than that of women (45%).¹

However, these symptoms are not specific to hypertension and dangerously high blood pressure can also be asymptomatic.

STEP 8: Record the CVD risk percent on the patient monitoring card as:

Note that CVD risk could be higher than what is estimated by the charts in the following situations:

1. family history of premature coronary heart disease (CHD) or stroke in a first degree relative (male<55, female <65)
2. obesity (includes central obesity)
3. already on antihypertensive therapy
4. premature menopause
5. approaching the next age category or systolic blood pressure category
6. raised pulse rate
7. sedentary lifestyle
8. raised triglyceride level (>2.0 mmol/l or 180 mg/dl)
9. low HDL cholesterol level (<1 mmol/l or 40 mg/dl in males, <1.3 mmol/l or 50 mg/dl in females)
10. raised levels of C-reactive protein, fibrinogen, homocysteine, apolipoprotein B or Lp(a), or fasting glycaemia or impaired glucose tolerance
11. microalbuminuria (increases the 5-year risk of diabetic by about 5%)
12. socioeconomic deprivation

Class Activity

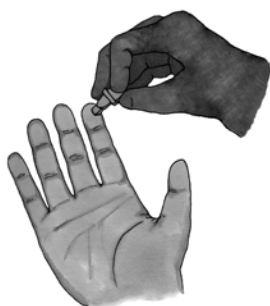
Use the WHO/ISH Risk Prediction chart for the African region E (**inside cover of the Integrated Chronic Care module**) to determine the CVD risk for the following patients:

1. 52 year-old male smoker with diabetes and SBP 145. Total cholesterol is 5.
2. 41 year-old male, non-smoker without diabetes and BP 160/90. Cholesterol unknown. BMI 26.
3. 55 year-old male who is a smoker with history of hypertension and heart attack with BP 160/100 and cholesterol unknown.
4. 60 year-old female who does not smoke, does not have diabetes and her systolic BP is 118. BMI 21.
5. 40 year-old male with history of diabetes, smoker, cholesterol 6.0 and SBP 160.
6. 58 year-old woman with no history of diabetes, non-smoker, cholesterol 4.0, and SBP is 180.

Additional skills that will be practiced during skill stations:

How to perform Fingertick Test

1. Identify the finger for the stick: the best locations are the 3rd and 4th finger of the non-dominant hand
2. Clean fingertip with alcohol wipe
3. Wipe dry with clean gauze or allow to air dry
4. Using a sterile lancet, make a skin puncture off to the side of the center of the finger
5. Wipe away the first drop of blood (it tends to contain excess tissue fluid)
6. If necessary, apply pressure to the surrounding tissue until another drop of blood appears
7. Place testing strip in glucometer, bring strip to the side of the drop of blood to allow the target area to fill with blood
8. Clean patient's finger and bandage if necessary
9. Read blood glucose level from glucometer and record



Summary

- Cardiovascular disease includes angina, myocardial infarction, transient ischaemic attack and stroke.
- Risk factors for these CVDs are the same and include modifiable and nonmodifiable risk factors.
- The WHO/ISH risk prediction charts allow for the 10 year estimation of a person's likelihood of having a myocardial infarction or stroke based on individual risk factors.
- An individual with prior cardiovascular disease (history of heart attack or stroke) has very high CVD risk and a % risk calculation is not needed.
- In order to calculate risk, the HW should know the patient's age, gender, systolic blood pressure, presence or absence of diabetes, if smoker, and cholesterol, if available. If cholesterol not available, use the population mean for cholesterol. In future, BMI may be used if cholesterol not available or not known.

Assessment questions: CVD Risk Assessment

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. Cardiovascular disease risk factors that are nonmodifiable include (circle all that apply):
 - a. Family history of CVD in 1st degree relative
 - b. Tobacco use
 - c. Diet
 - d. Gender
 - e. Obesity
 - f. Age

2. Symptoms of chest pain or pressure that occur after exertion, improve with rest and does not last more than 30 minutes is called:
 - a. Myocardial infarction
 - b. Angina
 - c. Stroke
 - d. Transient ischaemic attack

3. Which of the following patients has elevated blood pressure (circle all that apply):
 - a. 30 year-old woman no other medical problems with blood pressure 118/70
 - b. 50 year-old man with diabetes with blood pressure 125/72.
 - c. 40 year-old man with prior cardiovascular disease and BP 135/80
 - d. 45 year-old woman with blood pressure 160/95

4. What are modifiable risk factors that increase the risk for cardiovascular disease (circle all that apply):
 - a. Family history of CVD in 1st degree relative
 - b. Tobacco use
 - c. Diet
 - d. Gender
 - e. Obesity
 - f. Age

5. Symptoms of diabetes include the following (circle all that apply):
 - a. Increased thirst
 - b. Increased urination
 - c. Weight loss
 - d. Chest pain
 - e. Blurry vision
 - f. Shortness of breath

6. A patient with a history of a heart attack should be categorized as having a CVD risk of 20%. True or False

7. If blood flow to the brain is blocked, the following may occur:
 - a. Myocardial infarction
 - b. Angina
 - c. Stroke
 - d. Aneurysm

8. If blood flow to the heart is blocked, the following may occur:
 - a. Myocardial infarction
 - b. Aneurysm
 - c. Stroke
 - d. Transient ischaemic attack

9. Symptoms of stroke include the following (circle all that apply):
 - a. One-sided leg weakness
 - b. Chest pain
 - c. Jaw numbness
 - d. Difficult speaking
 - e. Left arm paralysis

10. Fasting blood glucose greater than which value would lead to the diagnosis of diabetes:
 - a. 5.0 mmol/l
 - b. 7.0 mmol/l
 - c. 6.5%
 - d. 5.8%

Chapter 4: Assess

Learning Objectives:

1. Practice a complete assessment and pertinent physical exam.
2. Understand the aim of the clinical assessment: identify patient's goal, acute problems, complications, medication adherence and lifestyle risk factors.
3. Understand why it is important to ask about family status, HIV status, and TB status for integrated chronic care.
4. Learn the laboratory support that is needed for chronic NCD care.
5. Learn how to do a comprehensive foot exam.

4.1 Assess

After assessing the CVD risk, it is important to complete the assessment and physical exam to determine the severity of hypertension or diabetes or other problems and to identify complications or co-morbidities. The aim of the clinical assessment is to

- Determine the patient's goal for the visit (why did you come to the clinic today?)
- Evaluate the patient's clinical status and identify:
 - Any acute problems
 - Any lifestyle risk factors.
 - Any problems with medication adherence or side effects
 - Any chronic complications

4.2 Determine the patient's goal for the visit

Ask the patient "Why did you come to the clinic today?" to determine the reason for the visit and establish what needs to be accomplished in order to meet their needs.

While a patient may come to the clinic for one reason, such as a scheduled follow-up, they may also have additional issues for which they were hoping to get help. It cannot be assumed that what you are expecting to treat the patient for is their only problem; asking the patient what they hope to accomplish this visit helps to ensure they get what they get their needs met as well, building the patient's trust in the provider-patient relationship enables future chronic disease management.

4.3 Evaluate patient's clinical status

A patient's clinical status is evaluation through history taking and examination.

4.4 Taking a medical history

For the first visit:

- Ask about medical history (any medical problems). ASK specifically, *have you ever been told by a health worker that you have the following* (if yes, ask what medications they take for the condition):
 - heart attack, angina, any other heart disease
 - stroke, transient ischemic attack
 - diabetes
 - hypertension
 - kidney disease
- What medications do you take (including traditional remedies or vitamins)?
- Do you have any allergies to medications?
- If YES to smoking or tobacco use during triage, ASK:
 - How often do you smoke or use tobacco in the past year? Daily? Weekly? Socially? If smoking, how many cigarettes do you take in a day?
 - Have you been exposed to secondhand (passive) tobacco smoke in the last 12 months?
- If YES to alcohol consumption during triage, ASK:
 - How often do you drink alcohol?
 - How much alcohol do you drink -- e.g. 1 bottle of beer, 1 glass of wine?
 - If concern for harmful or hazardous use of alcohol, see Annex A10 in the Chronic Care guideline module.
- Ask about physical activity:
 - Do you engage in physical activity?
 - What types of physical activity do you have on a daily basis? This can include work related activities or exercise.

For all visits:

- How have you been?
- Are there any problems or concerns that you have?
- Have you had any of the following? **If yes**, ask for how long:
 - Excessive urination, excessive thirst or drinking of water, excessive hunger, weight loss? (indicates diabetes is out of control)
 - Nocturia?
 - Headache?
 - Visual changes – e.g. blurry vision?
 - Tiredness?
 - Palpitations or chest pain or chest tightness? **If yes**, ask the patient to point to the pain and ask more questions to determine if this could be angina or possible MI. See IMAI-PEN Acute Care for initial management and referral.

- | |
|---|
| <ul style="list-style-type: none">➤ Do you get the pain in the centre of the chest or left chest or left arm?➤ Do you get pain in your chest when you walk uphill or hurry➤ Do you slow down if you get the chest pain while walking? |
|---|

- Does the pain go away if you stand still or if you take a tablet under the tongue?
- Does the pain go away in less than 10 minutes?
- Have you ever had severe chest pain across the front of your chest lasting for 30 minutes or more?
- Any other symptoms such as nausea, vomiting, sweating, shortness of breath?
- If YES, refer patient. If current symptoms, see IMAI Acute Care for treatment prior to referral.

- Fever?
- Cough?
- Dizziness?
- Shortness of breath?
- Tingling, numb or painful feet or legs?
 - **If yes**, ask for signs of claudication: does the pain start after walking a certain distance and is relieved with rest?
- Weakness/numbness on one side of body. If YES, ASK:

- Is this current? If not, when did this occur and how long did it last?
- Did you have difficulty in talking?

If yes to any of these question, this could be TIA or stroke. See Acute Care for initial management and for referral.

- Swelling in feet or lower legs? Face or eyes?
- Poor wound healing?
- Any other pain?
 - **If yes**, where?
- Sexual problems (Inability to maintain erection)?
- Have you needed urgent medical care or hospitalised?
 - **If yes**, ask for record, diagnosis and treatment.
- Check medications on patient card. Ask if the list is correct or if there has been any changes or additions to your medicines. ASK:
 - How do you take your medicines?
 - Assess adherence if already on treatment
 - What problems have you had taking your medicines?
- Are you taking any other drugs (traditional remedies, illicit drugs, etc)?
- Have you been feeling sad or unhappy or have you lost interest in your normal activities recently?
 - Assess for depression in all patients who admit to/report being sad or having lost interest in usual activities.
- What else do you want to talk about?

Class Activity:

Practice the clinical assessment with a partner. Questions for discussion:

1. How long did it take?
2. What areas were difficult to ask about?
3. Identify which problems on the list above that would cause you to be more concerned about an acute issue that may need referral.

4.4 Assessing family status

This is an additional component of history taking required to assess a patient's risk for disease or complications of disease, as well as for disclosure and family support.

For all patients:

- Ask about family history (parent, brother or sister):
 - Hypertension
 - Diabetes or kidney disease
 - Premature cardiovascular disease- heart problems such as angina, heart attack and stroke or TIA
 - Pre-mature if in a mother or sister before 65 years OR in a father or brother before 55 years
 - Cancers e.g. breast cancer

For women of childbearing age:

- Determine pregnancy status
 - *Pregnant women need to be referred to higher level care*
- Determine breastfeeding status in postpartum women
- Assess family planning use
 - Offer contraception if desired

IMPORTANT CONSIDERATIONS:

- Consult pharmacological guidelines before prescribing medications to pregnant or breastfeeding women
- Metformin is generally considered safe in pregnant or breastfeeding women
- Breastfeeding mothers on insulin need regular monitoring of blood glucose
 - At least twice per day until stable
 - Then once per week once stable
- Pregnant women should NOT take ACE-inhibitors

4.5 Review tuberculosis (TB), HIV status and mental health

- *Ask patient about their HIV status.* Advise on repeat testing as per national HIV guidelines if patient has negative or unknown HIV status.

It is important to know what ARVs your patient is taking. Some ARVs can interfere with blood glucose control. Also with longer life expectancies as well as metabolic disturbances that occur with HIV/ART, patients with HIV/ART may be at increased risk of developing high blood glucose, high cholesterol, insulin resistance, fatty liver, increased abdominal fat and increased risk of diabetes and cardiovascular disease. Awareness of HIV status is part of good integrated chronic care.

Diabetes, in particular, is also an important risk factor for TB and may affect the presentation of TB and the patient's response to treatment. TB may also worsen glycaemic control in people with diabetes.

- *Assess the patient's TB status.* Suspect tuberculosis if the patient complains of the following symptoms:
 - if cough >2 weeks, can be productive of sputum or non-productive (ask about colour, quantity and if blood in sputum) or if HIV+ and has any cough
 - persistent fever
 - unexplained weight loss
 - suspicious or enlarged lymph nodes
 - night sweats
- **If TB suspected → Send 3 sputums for AFB or use GenExpert. Refer if not producing sputums or if suspicious lymph nodes**
- If sputums are positive or if negative but still suspect TB, follow national guidelines for TB diagnosis and treatment plan
- With chronic conditions, it is important to ask about mental health. Depression can cause problems with adherence to the treatment plan as well as independently increase the risk for cardiovascular disease
- Use Annex A17 to assess for depression

4.6 Look, Listen, Feel

This step is the clinical examination portion of the assessment. The basic steps are summarized as follows:

LOOK for:

- Pallor.
 - *If pale, check haemoglobin.*
- Yellow eyes or skin (jaundice)
- Facial or periorbital oedema (swelling of face)

LOOK and FEEL:

- Leg or feet swelling (oedema)
 - Is it pitting?
 - How extensive (up to ankle, up to knees)?
- Palpate apex beat for heaving and displacement

- Examine abdomen
 - Is it large (ascites)?
 - Or tender (liver)?

LISTEN and FEEL:

- Listen to heart (for rhythm and heart murmurs). If loud murmur, ask about RHD dx or congenital heart disease, consider referral to district clinician.
- Listen for crackles in the lungs (on one or both sides)

If diabetes, also:

- Look for dental problems in the mouth including inflamed gums and teeth with cavities.
- Look for thrush in the mouth- thrush is caused by a candida fungus. It looks like a white patch in the mouth and the patient will usually tell you it is painful. Recurrent thrush can occur with diabetes or also by other conditions that weaken the immune system such as infections such as HIV or cancer.
- Check feet, for appearance including ulcers, pulses, sensation, and signs of infection.
 - Patients with diabetes may develop loss of protective sensation over time and do not realize that damage has occurred to their feet which can lead to limb threatening complications. Foot care education is therefore important (See **Section A14**). Also, it is important to examine the feet. A comprehensive foot exam can be done 3 minutes and include history, examination and education.²
 - *To inspect feet and footwear:* First, make sure footwear is supportive and not too tight. Look for discoloration, calluses, skin breakdown, ulcers, wounds, fissures or macerations, problems with the nails. Make sure to examine in between toes.
 - *To look for sensory loss:* If available, test with 10-g monofilament for sensory loss on the pressure points of feet (see illustration and box below-this will be practiced during the practical sessions). The 128 Hz tuning fork may also be used and helps in assessing vibratory perception.

² Miller, Carter et al. How to do a 3-minute diabetic foot exam. J Fam Pract. 2014 November; 63(11): 646-649, 653-656



How to perform the Monofilament Test

1. Remove the patient's shoes and socks exposing the soles of the patient's feet in good lighting
2. Using your hand, demonstrate to the patient that the monofilament is flexible and not sharp
3. Demonstrate the monofilament on the patient's hand so they know what to expect
4. Instruct the patient to close their eyes and respond "Yes" when they feel the monofilament on their foot
5. Starting with the great toe, place the monofilament perpendicular on the skin and press in until the filament bends, hold for one second and then release
6. Continue for all additional points on the foot as per the diagram (including the heel)
7. An abnormal result test result is if the patient cannot feel the monofilament on any area in the foot

Additional review:

- Review weight trend over time and BMI calculation
 - If weight loss, ask about food availability and intake
 - May also indicate poor diabetes control
 - If weight gain or overweight/obese, ask about eating patterns and level of physical activity. See section on comorbidities in next chapter.
- Review blood pressure
- Review urine and blood test results (discussed further below)

4.7 Laboratory tests and other diagnostics

Minimum tests for first and annual follow-up visit for all patients (CVD assessment, hypertension or diabetes)	On every follow up visit for diabetes
<ul style="list-style-type: none"> • Fasting blood glucose * • Urine dipstick**** • Total blood cholesterol** (or lipid profile if available) • Serum creatinine and potassium prior to start of ACE*** <p>For diabetics:</p> <ul style="list-style-type: none"> • Haemoglobin A1c (every 6 months) • Serum creatinine and potassium*** 	<ul style="list-style-type: none"> • Check fasting* or casual (random) blood glucose

*Fasting is preferable to casual (random) blood glucose for scheduled visits.

** For some tests, samples may need to be sent to a higher level facility. If not available at the health centre, consideration should be given for referral for comprehensive assessment once a year. Note: monitoring blood cholesterol on statin treatment is not mandatory. If unable to recheck annually, recheck periodically, if feasible, to assess risk.

***Ideally, serum creatinine and potassium would be checked at baseline and annually. At minimum, it should be sent annually in DM and prior to start of ACE inhibitors.

**** For DM, microalbuminuria dipstick, if available, can be used to calculate albumin to creatinine ratio and serum creatinine (GFR calculation) for chronic kidney disease (CKD) screening. CKD is defined by GFR<60 ml/min/1.73m² or the presence of moderate or severe albuminuria (albumin-creatinine ratio of $\geq 30\text{mg}/\text{mmol}$)

Additional lab or investigations

Woman of childbearing age (15-49 years) if pregnancy status uncertain	Pregnancy test
Eye examination- REFER for dilated pupil retinal exam	Diabetics: at diagnosis and every year

In order to identify complications early, it is important for the health worker to be systematic in their assessments. This includes asking pertinent questions during regular follow-up, physical exam, and careful review of all laboratory tests and other diagnostics (such as visual acuity). In addition to their own evaluation, they should arrange referral for comprehensive assessment including:

- Ophthalmologic evaluation to evaluate for diabetic retinopathy and other problems related to chronic hyperglycaemia (see Chapter 6)
- Specialist evaluation for patients with history of prior CVD such as MI or stroke or chronic kidney disease
- Timely referral for new problems that may be a sign of complication, e.g. overt proteinuria in a patient with hypertension, new ulcer in diabetic

Summary

- A comprehensive integrated NCD chronic care assessment and physical exam requires history-taking, including a targeted review of systems and physical examination and laboratory testing.
- NCDs pose risk factors and have increasingly higher associations with HIV and TB and their management; it is therefore important to assess status.
- Laboratory testing for diabetics at the first visit include fasting or random blood glucose, urine protein and ketones, HbA1c if available, serum creatinine and potassium, total cholesterol and referral for ophthalmologic evaluation.
- Family status includes asking about family history of cardiovascular disease in 1st degree relative as well as asking a woman who is of childbearing years if she is pregnant or breastfeeding or needs family planning.
- Premature cardiovascular disease in 1st degree relatives means that a parent or brother or sister had angina, MI, stroke or TIA before 55 years in males and 65 years for females.
- Pregnant women need to be referred to a higher level of care.

Assessment questions: Assess

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. The recommended amount of physical activity (through exercise, walking or work) that one should have for a heart healthy lifestyle is:
 - a. 30 minutes two times a week
 - b. 15 minutes daily
 - c. 1 hour once a week
 - d. 30 minutes 5 times a week
2. Health workers should not ask patients about their alcohol intake as that is not part of a cardiovascular disease risk evaluation and may be intrusive. True or False
3. Asking a woman about pregnancy or breastfeeding is important because (circle all that apply):
 - a. NCD management may have more complications which is why assessment by a clinician is needed or, if a new diagnosis, this may be a pregnancy-related problem
 - b. It is important to know what medicines are safe for her and her baby
 - c. Angiotensin converting enzyme (ACE) inhibitors are the only safe antihypertensives to prescribe
 - d. If she is on insulin, more intensive monitoring may be needed.

4. Premature cardiovascular disease in a 1st degree relative means that a brother or father had angina, MI, stroke or TIA before what age:
 - a. 35 years
 - b. 45 years
 - c. 55 years
 - d. 65 years

5. Ophthalmologic referral should be done how often if possible for diabetics (circle all that apply):
 - a. Once
 - b. At initial diagnosis
 - c. Every year
 - d. Every 4 years

6. List the laboratory tests that should happen annually and at every visit:
For Hypertension:

For Diabetes:

7. A foot monofilament exam helps to assess sensory loss in diabetics. True or False

8. A comprehensive foot exam can be done in 3 minutes. True or False

Chapter 5: Management of CVD risk and DM

Learning Objectives:

1. Recognise and refer for “acute on chronic” problems that are urgent.
2. Provide initial management of acute problem before referral.
3. Understand potential complications and comorbidities for cardiovascular disease and/or diabetes

5.1 Provide Acute Clinical Care and Refer as Needed

All patients presenting with an acute illness, or acute exacerbation of their chronic disease, “acute on chronic,” require immediate treatment of this acute episode prior to addressing regular chronic disease management. All patients should be assessed and managed using the IMAI-PEN Acute Care guideline module. If the patient is severely ill, provide pre-referral treatments and refer him/her urgently to the hospital.

Severe illnesses that require urgent referral include:

- Hypertensive emergency
 - **BP > 200 mmHg systolic OR >120 mmHg diastolic**
OR
 - **BP > 180mmHg systolic OR >110 mmHg diastolic with symptoms consistent with evidence of end organ damage**
 - Severe headache, chest pain, shortness of breath, visual changes, altered mentation, reduced urine output, papilloedema (swelling of the optic disc from increased intracranial pressure), focal neurologic problem/weakness
 - See page 15 of IMAI-PEN Acute Care
- New chest pain or change in severity of chest pain
 - See page 14
- Symptoms of cardiac failure (shortness of breath, difficulty breathing, leg swelling) or heaving cardiac apex
 - See page 13
- Symptoms of transient ischemic attack or stroke
 - See pages 54-56
- Random blood glucose ≥ 18 mmol/l (or > 324 mg/dl)
 - See page 81
- Diabetes with severe infection and/or foot ulcers
- Severe leg pain (symptoms of claudication; signs of peripheral vascular disease (PVD))

Patients should also be referred if they have co-morbidities or conditions that cannot be handled at the primary care level. They require prompt referral to the next level of care for assessment by a district clinician or medical officer.

Conditions that require prompt referral for assessment by clinician include:

- Young patients (≤ 40 years) with BP $\geq 140/90$
 - Looking for causes of secondary hypertension
- Known (not acute) heart disease, stroke, kidney disease for assessment if this has not been done previously
- Kidney problems or failure (nephropathy)
- Cardiac murmurs
- Raised BP $\geq 140/90$ ($\geq 130/80$ in diabetics) while on treatment with 2 or 3 antihypertensive medications
- Pregnant women with diabetes or hypertension
- Any proteinuria
- Newly diagnosed diabetes with urine ketones 2+ or in lean persons of < 30 years
- Total cholesterol $> 8\text{mmol/l}$ (310 mg/dl)
- Diabetes with poor control despite maximal metformin with or without sulphonylurea
- Diabetes with recent deterioration of vision or no eye exam in 2 years
- High cardiovascular risk (especially if $> 30\%$ if no reduction after 6 months treatment)
- Dementia

Many acute and chronic complications of hypertension and diabetes can be indicative of end organ damage; immediate investigation is required to ensure the damage does not progress and function is not permanently lost.

REVIEW Figure 5 in the NCD chronic care module –pg 22-23.

5.2 Provide Specific therapy

5.2.1 Use cardiovascular risk assessment tables to guide treatment

REVIEW TABLE 5.1 in guideline module.

5.2.2 Essential components of treatment of hypertension

Treatment for hypertension includes non-pharmacological or lifestyle measures, as well as pharmacological treatment (medications).

5.2.3 Non-pharmacologic therapy for hypertension

Non-pharmacological therapy includes counselling and lifestyle modifications (complete details under the education and support section). The patient needs to understand what hypertension is in order to promote awareness and self-management, including compliance with lifestyle modifications.

Lifestyle modification is an essential component of the comprehensive chronic care of patients with hypertension. These interventions have been shown to improve outcomes with better BP control and less cardiovascular complications. As discussed previously, patients should be educated on: following a heart healthy diet, increasing physical activity, tobacco cessation, and reducing harmful alcohol use.

5.2.4 Pharmacologic therapy for hypertension

The aim of anti-hypertensive medication is to reduce blood pressure to ideal levels. These **target blood pressure levels** are:

- < 140/90 in general
- < 130/80 in diabetics or those with history of cardiovascular disease (heart attack or stroke), renal disease or CVD risk \geq 30% if able to lower blood pressure without signs of hypotension

The **treatment flowchart for hypertension** outlines the steps to follow to determine which anti-hypertensive is most appropriate for your patient.

First, determine treatment regimen then modify based on response:

First visit: In addition to lifestyle measures, first-line treatment should include a **thiazide diuretic, calcium channel blocker, or angiotensin-converting enzyme (ACE) inhibitor. Consider ACE 1st if diabetic with high blood pressure.**

- **Re-assess at 1 month:** If the target BP not reached within 1 month,
 - **First assess patient adherence**
 - **Next,** the dosage should be increased.
- **Re-assess monthly:** If BP target still not met,

- **First, assess adherence**
- **Next**, maximize dose as patient tolerates and/or add a second medication from different class. If persistent BP $\geq 160/100$ or high CVD risk with persistent BP $\geq 130/80$, start on 2nd agent sooner (do not wait to maximize 1st agent).
- Continue to reassess and intensify dose of second medication until BP target is met
- Once BP at target, encourage patient adherence to medications and lifestyle measures. Advise patient to follow-up as scheduled or sooner if medication side effects or problems or elevated BP (if able to self-monitor). If BP target not met and patient has been taking medications as prescribed, CONSULT with district clinician.

Each type of antihypertensive medication has different indications and contraindications. **REVIEW** medication options for patients with hypertension-see Table p.28. in guideline module.

A patient should be referred to the district clinician/medical officer in hospital outpatients if:

- **BP $\geq 140/90$ in people <40 years** (to exclude secondary hypertension)
- Resistant hypertension: unable to reach target blood pressure while on treatment with 2 or 3 medications

5.2.5 Essential components of treatment of diabetes

As with hypertension, diabetic patients can be managed with both non-pharmacological therapy and pharmacological therapy.

5.2.6 Non-pharmacological therapy for diabetes

Non-pharmacological therapy comprises education and counselling to ensure the patient understands their diagnosis and adopts positive lifestyle modifications.

Lifestyle modifications are an essential part of comprehensive diabetes care and have been shown to improve outcomes and prevent complications. Patients should be educated about their disease, a heart healthy diet, increased physical activity, tobacco cessation, and reducing harmful use of alcohol. Additionally, diabetics require counselling about proper foot care to prevent wounds and ulcers (complete details under the education and support section).

5.2.7 Pharmacological therapy for diabetes

Type 2 Diabetes treatment flow chart

All asymptomatic patients (they do NOT have excessive urination, thirst, weight loss, or poor eyesight) presenting with a high blood sugar (≥ 7.0 mmol/l) should be treated with lifestyle modifications (heart healthy diet, increases physical activity, smoking cessation, and alcohol reduction) for 6 weeks. Should this fail to bring their blood sugar levels back down to normal, they can then be started on oral glucose lowering agents.

REVIEW the Treatment flowchart in 5.3.2 of NCD chronic care module.

Oral glucose lowering (hypoglycemic) agents (OHAs)

The choice of oral hypoglycaemic agents (OHA) will depend on the patient's characteristics, lifestyle, degree of glycaemic control, and access to drugs.

Metformin should be used as a first-line agent in patients with type 2 diabetes who are not controlled by diet only and who do not have any contraindications (liver disease, renal insufficiency, hypoxia).

Patients with contraindications to metformin or who are not meeting glycaemic targets may start a sulfonylurea.

Some patients, especially the elderly may develop attacks of hypoglycaemia when on OHAs. Patients on OHAs must be advised on the symptoms and the treatment of hypoglycaemia (see the education and support section) and should be monitored regularly to ensure safety of treatment.

Sulfonylurea oral glucose lowering agents with starting and escalating doses

Medication	Starting dose	Next dose if glucose target not met	Next dose if glucose target not met	Next dose if glucose target not met	Next dose if glucose target not met	Range of daily dosage (mg)
glibenclamide	2.5 mg	5 mg	10 mg	12.5 mg	15 mg	2.5-15
glipizide						2.5-20
gliquidone						15-180
gliclazide controlled release	30 mg	60 mg	80 mg	160	320	30-320
glimepiride						1-6

CONSULT with district clinician if diabetes patient:

- Continues to have fasting glucose >14 mmol/l on metformin and sulfonylurea.
- Has any severe infection and/or foot ulcers
- Has recent deterioration of vision or no eye exam in 2 years

Follow up and monitoring of patients on pharmacological treatment should be every 3 months for patients with diabetes if stable.

- If a new medication has been added or a dose changed, follow-up should be within 1 month if possible.

Insulin therapy

Insulin is the treatment of choice in young people with diabetes mellitus. It is however increasingly being used, either in combination with OHAs or as a monotherapy in the management of older people with diabetes, so as to achieve optimum treatment targets.

Patients who are identified as in need of initiation of long-term insulin therapy may need to be referred to secondary level of care but then can be managed at the 1st level health centre.

Patients on insulin therapy who attend chronic care for follow up and monitoring must be advised on the following:

- Risks of hypoglycaemia associated with exercise, change in dietary pattern (e.g. skipping meals, fasting) and sickness particularly associated with vomiting and diarrhoea. Risks of hypoglycaemia should also be discussed with patients on long-acting sulphonylureas.
- Symptoms of hypoglycaemia include: irritability, shakiness, excessive sweating, hunger, headache and cold clammy hands, dizziness, blurry vision and can progress to confusion and unconsciousness.
 - Advise patients on what to do should they experience symptoms suggestive of hypoglycaemia: eat sugar or sweets immediately, if at health centre, test blood sugar with fingerstick:
 - If glucose <3 mmol/L (54mg/dl), give D50 (50% dextrose/glucose) 25-50 ml IV
 - If IV glucose not available, give sugar water by mouth or NG tube (4 level teaspoons sugar in 200 ml clean water)
- Insulin storage and injection techniques
 - Insulin currently in use by the persons with diabetes **does not need to be stored in the refrigerator**. However, unused insulin should be stored properly in dark place at room temperature if refrigerator not available.
 - The injection sites commonly used are the abdomen, the outer thigh, and buttocks. One area should be used as the site for the day and then rotated.
 - For example: the abdomen may be used in the morning and then the thigh the next day.

Patients require insulin if they:	Patients usually do NOT require insulin if they:
- Develop diabetes when they are young <ul style="list-style-type: none"> • Usually < 25 years old • Patients between 25-35 years of age are also more likely to require insulin therapy 	- Are older, usually > 35 years when they are diagnosed with diabetes <ul style="list-style-type: none"> - Are asymptomatic or have mild symptoms of hyperglycaemia - Have little or no weight loss - Have mildly elevated blood glucose often < 15.0 mmol/l

<ul style="list-style-type: none"> - Have severe symptoms of hyperglycaemia (excessive thirst, excessive urination, significant weight loss) on initial presentation - Have high blood glucose levels, usually > 15mmol/l - Have ketones in the urine - Are severely dehydrated - Have concomitant severe infection - Are pregnant - Have contra-indications to using oral hypoglycaemic agents (liver disease, allergy to the drugs, have medical conditions requiring tight control of glucose such as kidney disease) - Peri-operative period especially major or emergency surgery 	<ul style="list-style-type: none"> - Have no ketones in the urine - Are not dehydrated
---	--

A doctor or medical officer should always be consulted prior to starting insulin

5.2.8 Review key indicators of treatment response or disease severity

The goal of treatment of patients with hypertension is for control of blood pressure.

The goal of treatment of patients with diabetes is to achieve as near normal blood glucose as possible, as well as to control blood pressure and reduce blood lipids (cholesterol) where necessary.

Achieving these goals reduce and/or delay the risk of developing complications associated with these conditions.

The desirable targets for optimal control for blood glucose, blood pressure, body weight and lipids are as follows:

Desirable targets for optimal control for blood glucose, blood pressure, body weight and lipids.

Indicator	When to Check	Optimum Targets
Blood pressure in nondiabetic	Every visit	SBP< 140; DBP <90
Blood pressure in diabetic or patients with CVD risk ≥30% or PCVD	Every visit	SBP < 130; DBP< 80
BMI	Every visit	BMI- 18.5-24.9
Fasting blood glucose in diabetics	Initial and annual for all Diabetics- every scheduled visit. If not scheduled, then	FBG: 4-7 mmol/l (70-126 mg/dl) RBG: <10 mmol/l (<180 mg/dl) 2 hours after a meal

	do casual (random) blood glucose	
HB A1C in diabetics	6 monthly (if available)	< 7.0 % (consider tighter control <6.5% in certain patients)
Lipids	Annually (if available)	Total cholesterol <5 mmol/l (190 mg/dl); LDL < 2.6mmol/l (100 mg/dl); HDL > 1.1 mmol/l (40 mg/dl); triglycerides < 1.7mmol/l (150 mg/dl)
Physical activity	Every visit	30 minutes X 5 days/week or 150 minutes per week
Tobacco use	Every visit	Smoking cessation

Additionally, urine results should also be reviewed.

- If ketones 2+, provide initial emergency treatment and refer- see Acute Care pg. 81
- If proteinuria, consider ACE Inhibitor.
 - Referral for comprehensive assessment and laboratory tests will likely be needed (serum creatinine, potassium)

At each visit, health care workers must look at results and review the trends of tests and observations that are taken. Reviewing the results over time allows you to monitor disease progression and see if the patient is on a positive or negative track, and then adjust management/medications accordingly.

In patients who do not achieve treatment targets of blood pressure, lipid and weight and/or develop complications such as chronic kidney disease, initial evaluation and management should be done at the level of chronic care, with the patient subsequently referred to a higher care facility for modification of management (counselling and drug therapy).

REVIEW Section 5.4 in NCD chronic care module- Pharmacological treatment for primary and secondary prevention of cardiovascular disease

Summary

- Severe hypertension, hypertensive emergency, which warrants immediate management and referral is for
 - BP > 200 mmHg systolic OR >120 mmHg diastolic
OR
 - BP > 180mmHg systolic OR >110 mmHg diastolic with symptoms consistent with evidence of end organ damage
- Symptoms of acute chest pain or signs of stroke should prompt immediate referral.
- Target blood pressure levels are:
 - General population <140/90
 - < 130/80 in diabetics or those with renal disease or CVD risk > 30%, if able to lower blood pressure without signs of hypotension
- Metformin should be used as a first-line agent in patients with type 2 diabetes who are not controlled by diet only and who do not have any contraindications (liver disease, renal insufficiency, hypoxia).
- Physical activity target for a heart healthy lifestyle is 150 minutes per week.
- Smoking cessation should be encouraged in all patients.

Assessment questions:

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. Which of the following patients should be referred to the district hospital (circle all that apply):
 - a. 25 year-old man who is short of breath after running 5 km.
 - b. 44 year-old man with shortness of breath after walking up a hill and leg swelling.
 - c. 52 year old woman with BP 148/92.
 - d. 60 year-old man with shortness of breath, sweating and left-sided chest pain not getting relief with rest.
 - e. 48 year-old woman with BP 210/100.
2. Insulin is the first-line medication choice for diabetics. True or False
3. Follow-up for patients with CVD risk $\geq 30\%$ should occur every 12 months. True or False
4. Which of the following patients should be started on antihypertensives in addition to lifestyle management (circle all that apply):
 - a. 56 year-old man with CVD risk 40% and BP 146/94
 - b. 41 year-old man with CVD risk $<10\%$ and BP 146/94 at initial visit
 - c. 46 year-old man with CVD risk 10- $<20\%$ and BP 118/78
 - d. 50 year-old woman with CVD risk 20- $<30\%$ and BP 164/98
 - e. 60 year-old diabetic woman with CVD risk 20- $<30\%$ and persistent BP 138/82.
5. Thiazide diuretics are a good 1st-line antihypertensive for patients who are <55 years with hypertension. True or False
6. ACE-inhibitors are not recommended in women who are pregnant. True or False
7. Contraindications to metformin include the following (circle all that apply):
 - a. Overweight
 - b. Liver failure
 - c. Hypoxia
 - d. Severe renal disease
8. Sulfonylurea such as glibenclamide may be used in addition to metformin if glucose targets are not being met with metformin alone. True or False

Chapter 6: Recognize and Manage Co-morbid Conditions and Complications

6.1 Consequences of hypertension and diabetes

Consequences of hypertension

High blood pressure is a problem as it is a risk factor for developing cardiovascular disease (for example heart attack or stroke) and can result in kidney damage. High blood pressure also strains the heart, which has to pump against higher than normal pressures and can lead to blood vessel damage. The higher the blood pressure, the higher the risk for cardiovascular disease, however high blood pressure is just one of several risk factors that contributes to cardiovascular disease.

Consequences of Diabetes

Having higher than normal sugar in the blood can lead to a number of complications, both in the short and long term, and also due to treatment.

Short Term Complications

In the short term, very high blood sugar can lead to dehydration and drowsiness. Untreated diabetes can also cause a condition called *Diabetic Ketoacidosis (DKA)*. This is where your cells are not getting enough glucose (either because of not eating enough food or not having enough insulin) and thus turn to burning fat for energy; fat burning makes a by-product called ketones which can poison the body if their levels get too high. This condition can happen to anyone with diabetes but is more common in people with Type 1 Diabetes because their bodies do not make any insulin.

Symptoms of DKA include:

- Feeling very thirsty
- Frequent urination
- Nausea, vomiting, or abdominal pain
- Tiredness
- Confusion
- Difficulty breathing
- Fruity odour on breath.

DKA is a serious condition that requires rapid treatment; it may lead to coma and even death if it goes untreated. Treatment for DKA will be discussed in detail in the acute management section of this manual.

Long Term Complications

Higher than normal glucose levels is damaging to blood vessels over long periods of time. This can lead to damage to blood vessels in any organ, resulting to a wide variety of complications detailed in the table below.

Organ Damaged	Complication
Blood vessels	<ul style="list-style-type: none">• Hardening of the arteries → cardiovascular disease: hypertension, angina, stroke, poor circulation
Kidney	<ul style="list-style-type: none">• Chronic kidney disease → kidney does not filter blood as well as it used to, eventually requiring hemodialysis or renal transplantation
Eye	<ul style="list-style-type: none">• Impaired vision → due to damage to retinal arteries in back of eye
Feet	<ul style="list-style-type: none">• Altered sensation → due to poor circulation and nerve damage• Ulceration → poor wound healing due to poor circulation and nerve damage
Penis	<ul style="list-style-type: none">• Impotence → due to poor circulation and nerve problems

Proper management and keeping blood glucose levels as close to normal as possible reduce the risk for long-term complications including complications.

Complications due to Treatment

Hypoglycemia is when blood sugar levels become too low, less than 4 mmol/L. Hypoglycemia can occur when a patient has taken too much diabetes medication, has missed a meal, or has taken part in unplanned physical activity. This is more common in diabetics who take insulin as they are at risk of taking too much and reducing their glucose below the normal level, however it can also occur with diabetics who take some types of tablets.

Symptoms of hypoglycemia include:

- Sweating
- Confusion
- Anxiety
- Trembling
- Mood changes.

Treatment for hypoglycemia will be discussed in detail in the acute management section of this manual.

6.2 Recognize and manage complications

Chronic diseases can lead to a number of complications if not properly managed. It is important that patients are made aware of these potential consequences to motivate self-management and adherence to treatment.

Complications in hypertension and diabetes can be similar, examples include:

- Cardiovascular (angina, heart failure, claudication, stroke)
- Kidney disease (nephropathy)
- Eye complications.

Other complications may be more specific to diabetes, for example:

- Diabetic foot and ulceration (deformities and chronic wounds)
- Gastrointestinal complications (recurrent constipation or diarrhoea, vomiting)
- Skin complications (recurrent boils or rashes)
- Neurological problems (reduced sensation in extremities due to nerve damage or burning sensation due to diabetic neuropathy)

For each visit, assess the patient by clinical review of symptoms (ask and look) and signs that may suggest organ/system complications.

- Always ask and record whether patient is a smoker – smoking worsens many of the complications. Support patients who are smokers to stop the habit through education and counselling.
- Always review previous records including blood pressure, blood glucose, urine (and HbA1c where available) results in the past; complications are more likely in patients with poor control of diabetes and/or hypertension.
- Routine, proper assessments in addition to annual laboratory information as well as appropriate referral to specialists e.g. ophthalmologist for comprehensive eye examination will also help in identifying complications early.

REVIEW the complications in the NCD chronic care module in more detail if time permits. If not, show participants where they may find this information.

6.3 Co-morbid conditions

Co-morbid conditions are additional conditions that are occurring at the same time as hypertension or diabetes. The two main co-morbid conditions that need to be addressed are obesity and dyslipidaemia.

Obesity and overweight

Obesity is classified by a Body Mass Index (BMI), a formula based on the patient's height and weight.

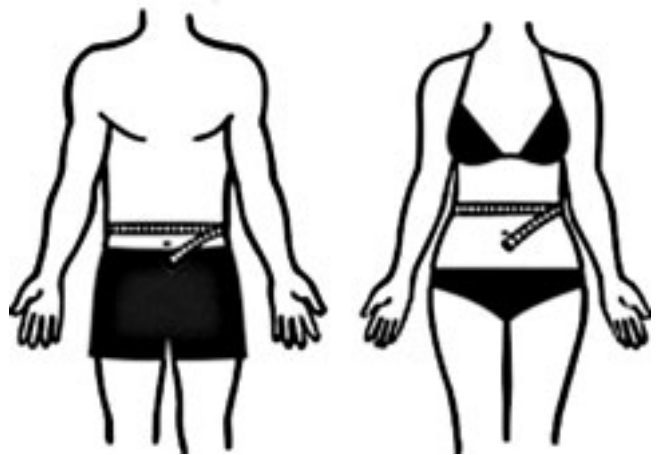
BMI provides surrogate information on the total body fat. Obesity and overweight can increase levels of blood glucose, cholesterol and blood pressure. For a person who is overweight or obese by BMI, it is important to also measure waist circumference which is a marker of central obesity. Waist circumference (WC), waist-hip ratio, and waist-height measures are useful to measure abdominal fat which is considered to be better than BMI for estimating cardiovascular disease risk.

Central obesity is increased fat around the centre of the body (abdominal obesity). Central obesity is associated with increased risk of cardiovascular disease, decreased glucose tolerance (contributes to diabetes), reduced insulin sensitivity (contributes to diabetes), and adverse lipid profiles (contributes to cardiovascular disease). Because of this increased disease risk, central fat needs to be reduced through consumption of heart healthy foods and increased physical activity.

Central fat distribution is determined by measuring waist circumference³:

- A higher than normal waist circumferences is $\geq 88\text{cm}$ in women or $\geq 102\text{ cm}$ in men
- Waist circumference (WC) should be measured midway between the lower rib margin and the iliac crest

→ If elevated, advise weight loss through reduction in food/caloric intake and increasing physical activity



How to measure waist circumference

1. Ask patient to stand with feet close together, arms at the side and body weight evenly distributed.
2. Tell the patient to be relaxed and take measurement at end of natural breath.
3. Measure at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, at a level parallel to the floor.
4. Use a stretch-resistant tape that is wrapped snugly around the patient, but not to the point that the tape is constricting.
5. Repeat measurement twice; if the measurements are within 1 cm of one another, calculate the average.
6. Repeat measurement if the difference between the two measurements exceeds 1 cm.

Waist-hip ratio (WHR) is calculated at the waist measurement divided by hip measurement ($W \div H$). Obesity is defined as WHR >0.9 in men and >0.85 in women.

³ Image from: <http://www.cancer.org.au/content/Preventing%20cancer/lifestyle%20factsheets/measure.jpg>

Additional advice for patients with obesity

Obesity is associated with increased risk of morbidity and mortality, and thus, supporting patients to lose weight is an essential part of chronic disease management.

Both BMI and WC should be measured and used to infer disease risk, as per the following table.

	BMI	Obesity class	Disease risk (relative to normal weight and waist circumference)	
			Men < 100 cm Women < 90 cm	Men ≥ 100 cm Women ≥ 90 cm
Underweight	<18.5			
Normal	18.5-24.9			
Overweight (Pre-obesity)	25.0-29.9		Increased	High
Obesity	30.0-34.9	I	High	Very high
	35.0-39.9	II	Very high	Very high
Extreme obesity	>40.0	III	Extremely high	Extremely high

If patient is overweight or obese advise weight loss through reducing food/caloric intake and increasing physical activity:

- A team based approach is best for weight loss programs
 - Counsel the patient regarding diagnosis and diet/activity advice
 - Follow with an additional consultation with another member of the team to provide further education on diet and physical activity tailored to the patient. This could be done by auxiliary staff, a nutritionist or a lay provider.
- Discuss a weight loss goal
 - If BMI > 30, a reasonable goal would be losing 5% of original weight over one year.
- Explain energy intake (calories) and energy expenditure (physical activity)
- Follow healthy diet (see above)
 - Limit foods and drinks with high amounts of free sugar (sugar-sweetened beverages, sugary snacks and candies)
- Trim excess calories
 - Reduce portion sizes, eliminate bread, eliminate extra snacks, choose calorie-free beverages

Dyslipidaemia

Dyslipidaemia is the elevation of cholesterol or triglyceride levels in the bloodstream, or a low high-density lipoprotein (HDL or 'good' cholesterol) level, that contributes to the build-up of cholesterol and fats in the artery walls. Any level of total blood cholesterol 5.0 mmol/l (190 mg/dl) and above increases the risk for cardiovascular diseases such as heart attacks and strokes.

Total cholesterol and/or a lipid profile should be checked annually (if available) for patients with diabetes or hypertension or elevated CVD risk.

- All patients with elevated cholesterol should be advised on lipid lowering diet.
- All individuals with total cholesterol ≥ 8 mmol/l (320 mg/dl) should be counselled on lifestyle measures and started on a statin
 - e.g. atorvastatin 5-40 mg orally at bedtime
- Give a statin to individuals with high cardiovascular risk (>30%) and diabetics over 40 years.

6.4 Arrange

Medications and explanations

All consultations should conclude with answering any questions the patient may have, dispensing of medications according to the treatment plan, and explaining how to use the medications provided. The healthcare provider needs to ensure that the patient understands:

How to take the medication

- The reason for the medications
- The difference between medicines if on multiple medications
- The appropriate dosage and how many times a day to take the medicine
- The importance of keeping an adequate supply of medications and to return to the health centre before the medicines run out
- The need to take the medicines regularly even if the patient feels well
- What to do for common side effects of medicines and when to seek care

The patient should always be provided with a written treatment plan that they can refer to should they have any questions. This written plan should also include instructions and contact details for what to do and whom to contact in the event of a deterioration in their condition.

Record keeping

The healthcare provider must ensure that the clinical encounter is recorded in the patient record book or clinic registration system; this allows accurate monitoring of the disease and the patient's progress overtime.

Routine follow-up should be arranged as follows:

- Every 3-months for stable patients
- Every 1-month for unstable patients (patients with a new diagnosis or started on a new medication)

Additional support

The patient should always be put in touch with additional resources should they be available, such as:

- Community support groups
- Contact details/location of their community health worker
- Peer educators

Summary

- For each visit, assess the patient by clinical review (ask and look) of symptoms and signs that may suggest organ/system complications.
- Complications in hypertension and diabetes can be similar, such as cardiovascular disease (angina, heart failure, claudication, stroke), kidney disease (nephropathy), and eye complications.
- Other complications may be more specific to diabetes, for example:
 - Diabetic foot and ulceration (deformities and chronic wounds)
 - Gastrointestinal complications (recurrent constipation or diarrhoea, vomiting)
 - Skin complications (recurrent boils or rashes)
- Foot problems can arise in diabetics who have reduced sensation in their feet from walking barefoot or improper footwear. If unable to heal properly, these problems can progress into long lasting open wounds or ulcers.
- Re-enforce good self-care practices with patients including daily inspection of feet and use of appropriate foot wear.
- Co-morbid conditions are additional conditions that are occurring at the same time as hypertension or diabetes, such as obesity and dyslipidaemia.
- Patients with elevated cholesterol should be advised on lipid lowering diet, and patients with total cholesterol ≥ 8 mmol/l (320 mg/dl) or with CVD risk $\geq 30\%$, a statin should be started.

Assessment questions:

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. Which of the following patients should be started on statin (circle all that apply):
 - a. 48 year-old diabetic with CVD risk <10%.
 - b. 29 year-old diabetic with CVD risk <10%.
 - c. 41 year-old woman with CVD risk \geq 30%.
 - d. 50 year-old man with CVD risk <10% and total cholesterol 9 mmol/l.
 - e. 52 year-old man with CVD risk 10-20% and total cholesterol of 4 mmol/l.
2. Comorbid conditions that can occur with hypertension or diabetes includes obesity and dyslipidaemia. True or False
3. Diabetic neuropathy can improve with good glucose control. True or False.
4. What actions should be taken with a diabetic patient who may complain of swelling in hands or fatigue:
 - a. Check the urine
 - b. Check pulse
 - c. Refer patient immediately
 - d. Give an antibiotic.
5. If a patient with history of hypertensive heart failure comes to health centre and complains of acute shortness of breath and leg swelling, give IV furosemide and refer. True or False
6. Recordkeeping allows for accurate monitoring of patient's disease and progress over time. True or False
7. Patients who was just started on BP medicine should be asked to return in 3 months for follow-up. True or False.

Chapter 7: Provide Education and Support

Education and support are essential in caring for patients with chronic diseases. It promotes the development of the doctor-patient treatment partnership and patient self-management.

All members of the clinical team can provide education and support, from the doctors or nurses through to the peer educators and expert patients. A clinical health worker (doctor or nurse) should provide counselling during the patient's first visit so that patients are made fully aware of their new diagnosis and can have all their questions answered. Counselling should continue to be provided by any team member at every subsequent interaction; the aim is to continuously encourage the patient to properly manage his/her condition and live a healthy lifestyle. The topics that should be discussed vary based on the needs and diagnosis of the person, and can be selected accordingly from the following themes.

Lifestyle Interventions

Healthy lifestyle changes are made of 3 components:

1. Consuming a heart healthy diet
2. Increasing physical activity
3. Reducing risk by stopping tobacco use and avoiding the harmful use of alcohol

REVIEW Annex A1-A3

Discuss how using the 5A's can help with patient education and support. ASK: What the participant have found to be helpful in providing this information to patients.

Heart healthy diet for patients with diabetes

All members of the primary health care team must have knowledge about appropriate dietary requirements for patients with diabetes based on locally available foods. To achieve ideal weight loss, an appropriate diet, tailored to what food is locally available, should be prescribed together with an appropriate level of physical activity. The diet should be individualised, based on traditional eating patterns, and be palatable and affordable.

Simple, explained, and written dietary instructions should be provided to the patient.

Discuss the diabetic plate-half plate is vegetables, in other half is protein, small amount of fruit, small amount matoke

Additional principles for patients with diabetes to follow include:

- Overweight patients should reduce weight by reducing food/caloric intake and increasing physical activity
- Dietary restrictions should be moderate yet provide a balanced nutrition
- Patients should eat at least three meals a day
 - They should avoid binge eating.
- All patients should have diets with low glycaemic-index foods e.g. beans, lentils, oats, and unsweetened fruit
 - Things that should be AVOIDED: fatty meats, deep-fried foods, use of fat for cooking, salt
- Sugar and honey in foods and drinks should also be avoided, including sweet drinks like sodas
- Meals should have a high content of complex carbohydrates (starches), fibre and vegetables.
 - A limited number of fruits per day should be encouraged
- Food quantities should be estimated in volumes using available household items, such as cups, or be countable, such as number of fruits or slices of yam or bread
- Alcohol should be avoided
- Sweeteners are not essential but may be used without concern for their safety
- Increasingly, diabetes diet and drinks are becoming available, but these may be unaffordable and are not essential.

Physical activity

All patients should engage in regular physical activity for at least 150 minutes per week (or 30 minutes 5 days per week). Physical activity should be progressively increased to moderate levels such as brisk walking

Additional considerations for physical activity in patients with diabetes

- Advise to wear proper footwear when exercising to prevent injury to the foot
- If they are on any blood sugar lowering medications, it is important to carry sugar or sweets when they are exercising to prevent blood sugar from dropping too much

Decrease risk from tobacco and harmful use of alcohol

Patients should be educated on the long-term health risks of tobacco and harmful alcohol use. Tobacco use is dose-linked in terms of hypertension, heart attack and stroke so even having a patient cut down will lower their risk if not able to quit right away. The problems related to tobacco use include but are not limited to: COPD, lung cancer, cardiovascular disease, stroke, liver disease, and other cancers.

Patients should be supported to completely stop tobacco use and avoid excessive consumption of alcohol. Key messages by healthcare providers should include:

- Encourage all non-smokers not to start smoking
- Strongly advise all smokers to stop smoking and support them in their efforts- Use 5 As.
- Individuals who use other forms of tobacco should be advised to quit

- People should not be advised to start taking alcohol for health reasons
- Advise patients not to use alcohol when additional risks are present, such as
 - Driving or operating machinery
 - Pregnant or breast feeding
 - Taking medications that interact with alcohol
 - Having medical conditions made worse by alcohol
 - Having difficulties controlling drinking

REVIEW A9 and A10.

Patient Education about Chronic Disease Diagnosis

Note that the patient may have multiple diagnoses, necessitating education about multiple topics- see A11 and A12.

Patient Preparation, Education, and Support for Treatment

The purpose of this type of counselling is to ensure that the patient acknowledges that they have a chronic condition and that self-management is essential to treatment, and to help them gain the skills for self-management.

REVIEW A13-16.

7.1 Patient preparation, education, and support for treatment

Patient preparation, education, and support are essential to ensure compliance with treatment and lifestyle modifications and effective self-management.

It is important for the patient to identify/acknowledge that they have hypertension and/or diabetes and that enrolment into chronic care means that they will need to come for regular follow-up, not just for new symptoms or problems. Patients need to be made aware of the potential complications of chronic diseases and the role continued management plays in preventing these complications.

A decision should be made on who else should know and why (e.g. family member, employer, responsible adult, school). This disclosure may be helpful with adherence to treatment or lifestyle changes by garnering support from people who are close to the patient and can help him/her with the process.

Patient education is one of the cornerstones of management together with diet, physical activity and pharmacotherapy, and is critical in improving the outcome. Building the provider-patient partnership and encouraging effective self-management is essential for success.

Counsel using the 5 A's to prepare and support adherence to treatment.

Assess:

- Patient's goal for today's visit

- Understanding of hypertension and/or diabetes treatment plan(s)
 - Meal planning
 - Decreased salt diet if hypertensive
 - Low sugar diet if diabetic, carrying snacks to prevent hypoglycaemia
 - Weight loss if overweight
 - Increased physical activity and exercise
 - Medications and how they are taken
 - Cessation of smoking and other uses of tobacco
 - Alcohol use and reduction plan

Advise:

- Hypertension and/or diabetes is a progressive condition and can lead to serious complications if BP or blood sugars are not controlled.
- Lifestyle changes are important both for current management and to prevent complications

Agree:

- Establish that the patient is willing and motivated to follow the treatment plan of diet changes, increased physical activity and medications prescribed
 - Has the patient demonstrated ability to keep appointments, to adhere to other medications?
 - Has the patient disclosed his or her disease to others? If not, encourage him or her to do so.

Assist:

- Help the patient develop the resources / support / arrangements needed for adherence:
 - Ability to come for the required schedule of follow-up every 3 months once stable target blood pressure is achieved.
 - Earlier follow-ups e.g. 1 month may be required with starting an initial medication or if not at target goal yet.
 - Discuss how the patient will do this. (Do you live close to here? If not, how will you manage to come for the scheduled appointments?)
 - Home and work situations that permit the appropriate meal planning, physical activity and exercise.
 - Maintain a patient log book which includes BP, blood sugar measurements, and treatment plan
 - Discuss adherence to medications.
 - Are there problems in remembering to take the medicines?
 - Discuss strategies to help remember to take the pills: pill boxes, alarms, and family support.
 - In prescribing medications, single daily dose regimen is preferable.
- If medication side effects:
 - On hypertension medications, does the patient complain of feeling dizzy?

- If signs of postural hypotension, reduce the medication dosage or change medication class if not at BP target.
 - On diabetic medications, does the patient feel shaky, sweaty or clammy?
 - Encourage them to carry sugar snacks and to eat meals regularly while on medication.
- **Keep a record of discussion/plan to facilitate follow up**

Arrange:

- Follow up visits
- Ensure the patient knows how to get help between visits if problems arise
- Connect with community health worker/expert patient support in the community as available.

EXERCISE

Review How to fill out NCD Patient Card: Diabetes, Hypertension or Elevated Cardiovascular Risk.
 Divide participants and have them practice filling the patient card with the case scenarios.

Summary

- Healthy lifestyle changes include consuming a heart healthy diet, increasing physical activity, and reducing risk by stopping tobacco use and avoiding the harmful use of alcohol.
- Heart healthy diet for all patients includes reducing salt intake, eating 5 servings of fruits and vegetables per day and limiting fatty foods.
- Patients should be given simple and written dietary instructions specific to their dietary goals.
- Waist circumference (WC), waist-hip ratio, and waist-height measures are useful to measure abdominal fat which is considered to be better than BMI for estimating cardiovascular disease risk.
- A team based approach is best for weight loss programs.
- Use the 5 As to support alcohol reduction and tobacco cessation.
- Empower diabetic patients to have a broad knowledge of diabetes and the consequences of the disease and the right attitude and resources to provide self-care.
- Patient preparation, education, and support are essential to ensure compliance with treatment and lifestyle modifications and effective self-management.

Assessment questions:

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. Heart healthy lifestyle includes all of the following (circle all that apply):
 - a. Stop smoking.
 - b. Adequate physical activity of 150 minutes per week.
 - c. Consuming 4 glasses of red wine daily.
 - d. Eating 5 servings of fruits and vegetables daily.
 - e. Eating less than 1 teaspoon of salt per day.
2. Smoking cessation counselling is only important for patients with high cardiovascular disease risk. True or False
3. The 5 As can be used for all patient encounters. True or False
4. Dietary instructions are easy to remember and do not need to be written down for the patient. True or False
5. Barriers to adherence should be discussed with patients who are having problems with treatment adherence. True or False

PROTOCOL 2

Chapter 8: Introduction to chronic respiratory diseases and sequence of Care: Triage the patient

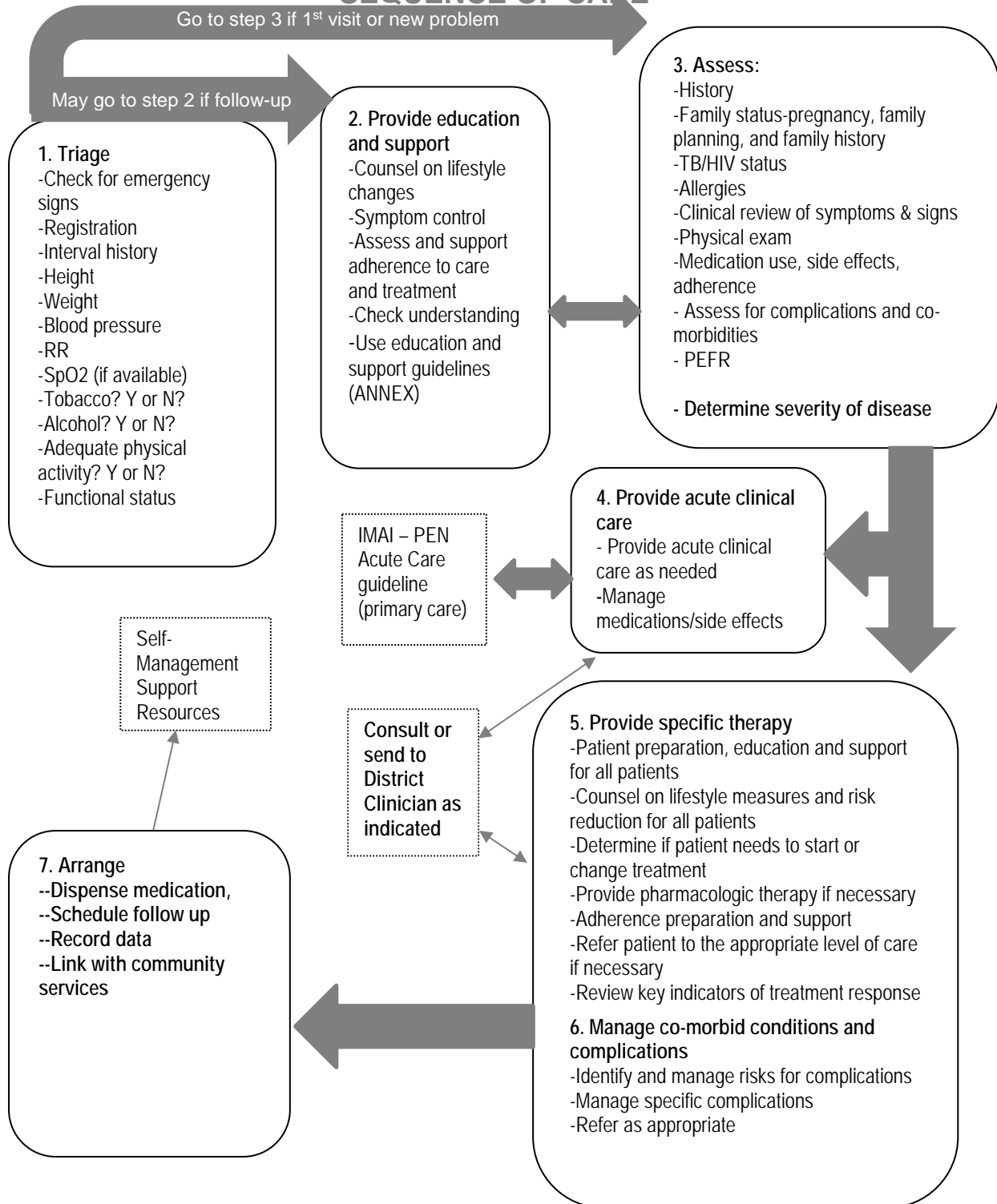
Learning Objectives:

1. Introduction to chronic respiratory diseases
2. Understand the sequence of care for the clinical assessment and management of asthma and COPD
3. Triage patients who have enrolled in chronic care.
4. Learn how to calculate body mass index (BMI).
5. Measure blood pressure correctly.

8.1 Introduction to the Sequence of Care

The sequence of care provides an overview to the clinical algorithm to assess and manage cardiovascular disease risk, including hypertension and diabetes. This algorithm is not only for the clinical health worker. It links the interaction between the entire clinical team-the clerk, triage worker, clinical health worker and counsellor or health educator.

SEQUENCE OF CARE



8.2 Introduction to chronic respiratory diseases

Chronic respiratory diseases are problems that affect the airways and other structures of the lung. Common respiratory problems include chronic obstructive pulmonary disease (COPD), asthma, respiratory allergies, pulmonary hypertension, cardiac problems and occupational lung disease. Respiratory symptoms are among the major causes for patients to seek health care consultation. Because of their chronic nature, these conditions evolve slowly and provide opportunity for prevention. Risk factors include tobacco smoke, air pollution, dust and occupational chemicals, and cooking on internal fires.

Symptoms that are common to many of the chronic respiratory disease include cough, problems with breathing including shortness of breath, stridor, wheezing, bleeding from respiratory passage leading to haemoptysis, pain and sputum production. Shortness of breath, cough, and chest pain may occur alone or in combination. It is therefore important to look at the spectrum of signs and symptoms to determine the cause. The differential diagnosis table on page 68 can facilitate with the common clinical signs that are involved with various respiratory problems. This Protocol 2 will focus on the two of the most common chronic respiratory diseases that affect people globally: asthma and chronic obstructive pulmonary disease (COPD). The next several sections will focus on the approach and care of these patients. Care for these patients requires a long-term and systematic approach. Treatment should focus on improving symptoms and increase quality of life.

Triage

1. Triage

- Check for emergency signs
- Registration
- Interval history
- Height
- Weight
- Blood pressure
- RR
- SpO2 (if available)
- Tobacco? Y or N?
- Alcohol? Y or N?
- Adequate physical activity? Y or N?
- Functional status

As described in Chapter 2, we learned that *triage* is the assignment of degrees of urgency to patients and is where the initial encounter with the patient takes place.

As with all patients, it is important to make sure that patients who come to the clinic for respiratory problems do not have any emergency signs-Remember to check the ABCs 1st through the Quick Check! For any patient with respiratory distress, call for help, and clinical staff should initiate emergency treatment.

Follow the Sequence of Care to triage the patient. Most of the steps for triage have been explained in Protocol 1. Here are additional steps to take for patients who come into the clinic with respiratory symptoms.

8.3 How to determine respiratory rate

A person's respiratory rate is the rate at which a person breathes. In order to determine the respiratory rate, count the number of times the chest rises in 1 minute. In adults, the normal respiratory rate is 12-20 breaths per minute at rest. The rate is considered abnormal if less than 12 or above 25 and can indicate that the patient may be sick. For example, the rate can increase when a person is having problems with their breathing or with fever and can decrease with neurological problems or toxins. Be aware that other conditions such as pain and anxiety may also increase the respiratory rate.

Note: During the skill sessions, we will demonstrate and practice triaging patients with respiratory problems.

8.4 How to measure oxygen saturation (SpO₂)

A pulse oximeter measures oxygen saturation of haemoglobin in the blood by comparing absorbance of light at different wavelengths across a translucent part of the body. Pulse oximetry is very easy to use, and is the best method available for detecting and monitoring **hypoxemia (low oxygen saturation)**.

Remember, the respiratory rate increases if the patient has difficulty breathing or is not getting enough oxygen. A pulse oximeter helps quantify the oxygen saturation. If it is low i.e. <90%, the person is not getting enough oxygen and needs treatment with oxygen. If not available at health facility, the patient should be referred immediately. Be aware that patients who are in respiratory distress and not getting enough oxygen may also become very agitated, combative, confused, or lethargic. Patient's oxygen saturation may not be accurate or difficult to assess if haemoglobin level is low e.g. anaemia and if poor perfusion.



Exercise

- Your facilitator will demonstrate how to use a pulse oximeter and count respiratory rate.
- You should practice using the pulse oximeter on yourself and your colleagues so that you understand how to use it.
- Also, you should practice counting the respiratory rate on stable patients first so you can quickly recognize the difference between normal and abnormal respiratory rates.

Summary

- The sequence of care provides an overview to the clinical algorithm to assess and manage asthma and chronic obstructive pulmonary disease.
- During triage, after determining that there are no emergency signs, the triage worker will take steps such as registering the patient, check respiratory rate and ask about problems before patient sees the health worker or counsellor.
- When a patient is enrolled in the integrated NCD chronic care clinic, he or she will need to plan to come back to the same clinic for long-term follow-up of their condition. Based on the severity of the condition, the health worker will need to determine the frequency of follow-ups
- Some risk factors for chronic disease and its complications are asked about during triage-tobacco use, physical activity and alcohol use. It is therefore important not to skip these questions.
- The respiratory rate can be determined by counting the number of time the chest rises in 1 minute. The normal respiratory rate is 12-20 breaths per minute.
- Pulse oximeter is very easy to use, and is the best method available for detecting and monitoring hypoxemia (low oxygen saturation).

Assessment questions: Triage

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. Patient who is having difficulty in breathing with a respiratory rate of 30 should wait to see the clinical officer in the NCD clinic. True or False
2. Pulse oximeter allows for the measurement of the following:
 - a. Rate of breaths per minute
 - b. Volume and rate of airflow in/out of the lungs
 - c. Systolic and diastolic blood pressure
 - d. Oxygen saturation of haemoglobin in the blood
 - e. Pulse rate and rhythm
3. Triage allows for a quick assessment of patients when they arrive at the health centre to determine the reason for the visit. True or False
4. The sequence of care provides an overview to the clinical algorithm for asthma and COPD and allows for roles to be shared across different health worker cadres. True or False
5. Chronic respiratory diseases are problems with the structures of the lung and the airways. True or False
6. Risk factors for chronic respiratory diseases are not preventable because they are due to indoor and outdoor pollution. True or False
7. Respiratory symptoms are among the major causes for patients to seek health care consultation. True or False
8. Chronic respiratory disease are difficult to cure. Treatment should focus on improving symptoms and increasing quality of life. True or False

Chapter 9: Assess

Learning Objectives:

1. Practice a complete assessment and pertinent physical exam.
2. Understand the aim of the clinical assessment: identify patient's goal, acute problems, complications, medication adherence and lifestyle risk factors.
3. Understand why it is important to ask about family status, HIV status, and TB status for integrated chronic care.
4. Learn the laboratory support that is needed for chronic NCD care.

9.1 Clinical assessment for chronic respiratory disease

3. Assess:

- History
- Family status-pregnancy, family planning, and family history
- TB/HIV status
- Allergies
- Clinical review of symptoms & signs
- Physical exam
- Medication use, side effects, adherence
- Assess for complications and co-morbidities
- PEFr

- Determine severity of disease

The aim of the clinical assessment is to

- Determine the patient's goal for the visit (why did you come to the clinic today?)
- Evaluate patient's clinical status (wellness) and determine the diagnosis
- Identify any acute problems
- Identify any complications, including recent hospitalizations
- Determine the severity of symptoms
- Identify any triggers or risk factors that may be worsening their disease- this includes tobacco use and environmental exposures

9.2 The first visit

For any chronic respiratory disease, it is important to ask about:

- Symptoms and their duration
 - **ASK:** *Do you have cough or difficulty in breathing or a feeling that it is hard to catch your breath (shortness of breath)? For how long? If not all the time, do you notice that it is worse at certain times of the day e.g. night or in morning? Have you also had chest tightness or wheezing?*
Note: Sometimes respiratory symptoms may be episodic or intermittent.
- Associated symptoms
 - **ASK:** *Have you had any of these symptoms in addition to your cough (or difficulty in breathing): fevers (feeling hot), nasal discharge, postnasal drip, sneezing, weight loss, leg swelling, reflux symptoms (sour taste, in mouth, heartburn), presence/absence of sputum production, colour of sputum, blood in sputum, chest pain-characterize. If yes to any of these symptoms, also ask about duration.*
- Temporal
 - **ASK:** *Do you notice that your symptoms are worse during certain seasons or are they present all year around?*
- Ask about specific triggers
 - **DISCUSS/ ASK:** *Sometimes these symptoms are related to something you are allergic to or become worse after you are sick. Have you noticed that your symptoms are worse with certain weather, around dust or animals, at work or at home or after a cold or other respiratory infection? Do you find that the symptoms are worse if you are more active e.g. walking?*
- New medications
 - **ASK:** *What medications/ herbals do you take? Have you been started on any new medications recently?* Note: angiotensin converting enzyme (ACE) inhibitors (can cause cough), beta-blockers (can worsen asthma)

There are many potential causes for chronic respiratory symptoms. See the differential diagnosis table in Protocol 2 in the module to review possible diagnoses for the patient's symptoms.

Summary of ASK- specific questions to ask for asthma and/or COPD at the first visit for a patient with cough, shortness of breath:

- What brought you into the clinic today?
- Is it a single symptom such as shortness of breath or combined with cough and chest pain?
- When did the symptoms begin? Did the symptoms begin gradually or suddenly?
- How severe are the symptoms?
- What makes the symptoms worse?
- What makes the symptoms better?

If shortness of breath, also ask:

- Is the difficulty breathing only with exercise or at rest as well?
- Is it affected by body position (upright or lying down or lying on one side or the other)?
- Is the breathing noisy?
- Does the chest feel tight?
- Is there fever or chills?
- Is there cough?

If cough, also ask:

- Is fever present?
- Is the cough dry or is mucus produced?
- If mucus is produced
 - What is the colour (green, yellow, white)?
 - What is the quantity (scanty, profuse)?
 - Is it blood-stained?
- Is there gross blood?
- When is the cough most likely to occur (especially at night or in the morning on arising)?
- Are there any aggravating factors (exertion, particular seasons, particular environments such as the workplace, specific positions, exposure to dust, pollens, or other allergens or irritants such as smoke)?
- Has there been a recent upper respiratory infection or sinus infection?
- Is there a prior history of similar cough?

If chest pain, also ask:

- Where is the pain?
- What is the quality of the pain?
- Has there been any chest trauma?
- Does the pain radiate anywhere? To the jaw, arm, or back?
- How rapidly is it progressing (minutes, hours, days, weeks)?
- What makes it worse (e.g. exercise, taking a deep breath)?
- What makes it better (e.g. certain positions, non-steroidal medications)?
- Does it resolve spontaneously or with antacid medications (may suggest oesophageal spasm)?
- Have you had any limitation in daily activities due to your symptoms?
- Do you have other symptoms such as sneezing, fevers/chills, nausea, vomiting, diarrhoea, muscle aches, headache, weight loss, feel that heart beat is irregular, leg oedema, reflux symptoms (sour taste, in mouth, heartburn)?
- Do you have other medical problems? Have you had or ever been told that you have- asthma, COPD, TB, HIV, hypertension, diabetes, heart or kidney problems, history of lung infections or cancer? Or anyone in your family that as asthma, COPD, heart problem or cancer such as lung cancer?
- Have you needed urgent medical care? **If yes**, ask for record, diagnosis and treatment.
- Which medications or traditional remedies are you taking?

- Have you smoked or use tobacco in the past 12 months? If no, ask if the patient ever smoked or used tobacco or is exposed to tobacco smoke at home. *This is especially important to ask again for respiratory problems even if the patient said “no” during triage.*
- For women of child bearing potential
 - Determine pregnancy status; pregnant women may need to be referred to higher level of care.
 - Determine breastfeeding status in postpartum women,
 - Assess family planning use; offer contraception if desired
- What usual physical activities are you doing?
- Feeling sad/unhappy, loss of interest in normal activities?
- What else do you want to talk about?

9.3 Exclude Tuberculosis

For any patient who comes in for a chronic respiratory problem such as cough in addition to asking about a history of tuberculosis, it is important to make sure to rule out tuberculosis (TB) from the diagnosis first. In these patients, a sputum smear examination should be obtained and sent as per national guidelines.

Suspect TB if:

- cough greater than 2-3 weeks
- cough is productive or non-productive of sputum→initially patients may complain of increased sputum in the morning, but then it progresses and may become blood-streaked or frank haemoptysis (coughing up blood). Some patients report no sputum at all.
- fever
- fatigue→ some patients may complain that they noticed feeling more tired over past few months. While this may also occur with other conditions, it is important to rule out TB with a patient who has cough and fatigue.
- night sweats
- weight loss
- may have history of exposure to someone who was sick for a long time or someone with known TB
- any unusual lymph nodes on their body that has not gone away

9.4 Confirm the diagnosis and decide whether the patient has asthma or COPD

Asthma

Asthma is an **inflammatory** disease of the airways causing **reversible** airways obstruction and characterized by recurrent acute attacks (exacerbations). The inflammation also causes an associated increase in the existing bronchial **hyper-responsiveness** to a variety of stimuli.

Key features

- **Recurrent** episodes of cough and shortness of breath often associated with noisy breathing (wheezing) and chest tightness.
- Symptoms may be **worse at night** and interfere with sleep
- Onset is common in childhood or early adulthood but can occur at any age
- Episodes commonly occur in response to **specific exposures**, such as pollen or other allergens, acute respiratory infections (commonly viral), dust, exercise, or cold air. Environmental allergens such as domestic mites, animals (cats, dogs), cockroaches, fungi and molds, tobacco smoke (active or passive) and indoor and outdoor pollution. Examples of indoor pollution include biomass smoke e.g cooking with firewood, charcoal as well as indoor exposure to chemicals or allergens in the workplace (occupational asthma). Examples of outdoor pollution include emissions from vehicles, incinerators and open fires. A few asthma patients have their attack precipitated by exercise (exercise-induced asthma).
- **Look, Listen, Feel**
- Physical examination for patients with chronic respiratory problems should be approached in the same way. First, look at the patient, then listen and examine the patient.
- -Do they seem comfortable? Some patients with shortness of breath sit leaning forward to breathe better.
- -Does the patient appear acutely or chronically ill?
- -Is the patient too short of breath to speak in full sentences?
- -Does the patient respond to questions appropriately?
- -Is there confusion or disorientation?

•
LOOK:

- Ask patient to remove their shirt for an exam
- Inspect the chest for air movement and excursion, difficulty taking deep breaths
- Look for intercostal retractions
- Look for work of breathing
 - count respiratory rate (if >25, concern for respiratory distress)
 - look for nasal flaring
 - look for chest indrawing or use of accessory muscles while breathing (neck muscles, belly breathing)
 - look for tripodding (position where person leaning forward and supporting body with hands on knees or another surface due to respiratory distress)
 - cyanosis (darkening of mucus membranes)
- Look for digital clubbing, a sign of chronic hypoxemia
- Look for pallor. **If pale**, check haemoglobin.
- Drowsiness or problems with speaking (danger sign)

LISTEN AND FEEL:

- Listen to the lungs on both sides and assess for wheezing/ ronchi, or crackles
- Check the weight and review trend: Look for evidence of weight loss and wasting (especially important in severe COPD and TB). If weight loss, ask about food availability and intake.

Diagnosis of Asthma

- Characteristic symptoms- dry cough worse at night/early morning, chest tightness and wheezing
- Confirm with tests of lung function for reversibility and variability if available (see below)

Chronic obstructive pulmonary disease (COPD)

COPD is characterized by **airflow limitation** that is **not fully reversible**. The airflow limitation is usually **progressive** and associated with an abnormal inflammatory response to noxious particles or gases in the lung. The most common inhaled toxin is cigarette smoke, but smoke from indoor biomass fuel consumption, air pollution, chronic uncontrolled asthma and pulmonary infections also play a role. Some host factors like low birth weight, old age and genetic disorders like alpha1- anti-trypsin deficiency may cause COPD.

Key clinical features

- Symptoms of **chronic cough** and progressive **shortness of breath, with or without sputum production**
 - **Exposure history** such as cigarette smoking (common), workplace chemicals and dust (irritants, fumes, vapours), indoor/ outdoor air pollution (e.g. biomass fuel used for cooking/heating), second hand tobacco smoke exposure
 - Decreased exercise tolerance

Look, Listen, Feel

- Physical examination is same as the respiratory examination done for asthma
- Patients often have a fast respiratory rate, and breath sounds are usually reduced throughout all lung fields on chest auscultation.
- At advanced stages, patients may use accessory muscles to breathe, have signs of heart failure (e.g. elevated JVP, liver enlargement and bilateral leg oedema)

Diagnosis of COPD

- Characteristic symptoms- cough, increased sputum production in morning, progressive, breathlessness
- Confirm with tests of lung function if able

Laboratory tests and other diagnostics

- Measure Peak Expiratory Flow rate (PEFR)
- Measure SpO₂ (if available)
- If pallor, measure haemoglobin

Tests of lung function for asthma and COPD can facilitate in the diagnosis and to monitor the patient's condition over time. These tests measure the amount of air the patient can inhale and exhale and if the lungs are delivering enough oxygen to their

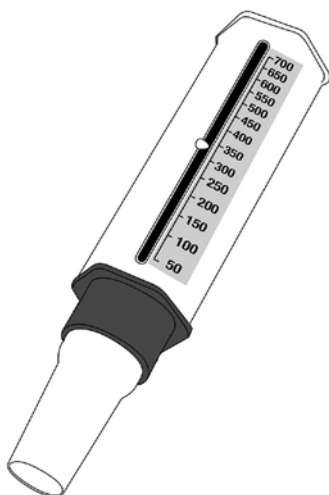
blood and may not be routinely available at the health facility. Spirometry will provide more comprehensive results of lung function than the peak flow measurement. A peak flow meter is an inexpensive, portable, handheld device that can measure how well air moves out of the lungs. If neither available, patients in whom you suspect to have these conditions can be tried with initial treatment to see if improvement. If no improvement or if the condition is severe, refer for further consultation.

How to measure peak expiratory flow rate (PEFR):

Need-peak flow meter and cardboard disposable (or plastic reusable) mouthpiece

1. Fit mouthpiece to end of peak flow meter and set marker at zero level
2. Ask patient to stand
3. Ask patient to exhale completely
4. Then ask patient to inhale as deeply as possible
5. Instruct patient to place Peak Flow Monitor (PFM) to his/her lips, creating a seal
6. Instruct patient then to blow out into the device as forcefully and as quickly as possible, with the goal to raise the PFM dial as high as possible. Record the result in litres per minute (l/min). Repeat 2 more times and record the best of three readings.

It may help to demonstrate for the patient, if you have a clean mouthpiece available. Do not reuse PFM mouthpieces for different patients.



To aid in the diagnosis of asthma or COPD

- Measure the PEF before inhalation of salbutamol (PEF before bronchodilator)
- Give 2 puffs of salbutamol metered-dose inhaler (MDI) or with a spacer
- Measure PEF again in 15 minutes (PEF after bronchodilator)
 - if the PEF improves by 20%, a diagnosis of asthma is very probable
 - if the PEF improves by less than 20%, a diagnosis of COPD is more likely

About spirometry

- Spirometry measures the amount (volume) and speed (flow) of air that can inhaled and exhaled. It determines the measurement of forced expiratory volume in 1 second (FEV1) and forced vital capacity (FVC)). Spirometry is the most accurate means of quantifying the degree of airways obstruction in the chronic management of COPD and asthma.
 - Reversibility of airflow obstruction is defined as either an increase in FEV1 $\geq 12\%$ from baseline AND ≥ 200 ml after inhalation of a short-acting bronchodilator such as salbutamol and is suggestive of asthma Results demonstrating fixed airflow obstruction with an FEV1/FVC $< 70\%$ after inhalation of short-acting bronchodilator is suggestive of COPD. Severity of airflow obstruction is based on FEV1 (% predicted).

Summary of features that differentiate asthma and COPD*:

Ask	ASTHMA	COPD
Previous history	- previous diagnosis of asthma	-previous diagnosis of COPD
Onset of symptoms	- common in childhood or early adulthood but can occur at any age	- in middle age or later (usually after age 40-45)
History	- seasonal allergies, hay fever, eczema/skin rash - clear, identifiable triggers of symptoms (see above)	- heavy smoking history i.e. >20 cigarettes/day for >15 years -work history; history of heavy and prolonged exposure to burning fossil fuels in an enclosed space, or high exposure to dust or occupational fumes -exposure to cooking (in poorly ventilated areas)
Symptoms	-intermittent; periods of no symptoms (asymptomatic) in between - can be worse at night or early morning - triggered by respiratory infection, exercise, weather changes, seasonal allergies or stress -responds to salbutamol or other bronchodilators	-worsened slowly over a long period time i.e. progressive -may have history of daily or frequent cough and sputum production starting before shortness of breath -symptoms that are persistent with limited asymptomatic periods - repeated episodes of severe bronchitis

*consider that asthma and COPD can co-exist

9.5 Determine the severity at each visit.

Classification of the severity of the condition applies to patients before initiation of controller medication. It is used to assign the patient to a starting treatment step. After starting long-term treatment the classification will be according to the level of control.

- Do you have cough, wheeze, tight chest or shortness of breath 3 or more times a week?
- Do your symptoms wake you at night (1 or more times a week)?
- Do you stop exercising because of your symptoms (in the past 3 months)?
- Do you ever miss work or school because of your symptoms (in the past 3 months)?
- Do you use your beta agonist inhaler (salbutamol) more than 3 times a week (except one dose/day for exercise)?

*If “yes” to one or more questions, asthma or COPD may not be under control.⁴

Determine the stage of the disease by using the appropriate table:

ASTHMA SEVERITY

SEVERITY	SYMPTOMS	LIMITATIONS	INHALER USE	PEFR
Intermittent	< Weekly -Nocturnal symptoms <2X/mo	No limitation in daily activities.	Inhalers used < 1 time per week.	> 80% predicted or personal best
Mild Persistent	Weekly -Nocturnal symptoms >2X/mo	Minor limitation in daily activities.	Inhalers used 1 or more times per week, but not every day.	> 80% predicted or personal best.
Moderate Persistent	Daily -Nocturnal symptoms weekly	Some limitation in daily activities.	Inhalers used daily.	60 – 80% predicted or personal best.
Severe Persistent	Continuous, more often at night	Extremely limited in daily activities.	Inhalers used several times per day.	< 60% predicted or personal best.

Determine peak flow rate as percentage of personal best (or predicted)

Predicted normal values have been calculated for women and men of different ages and heights and can be found through table of normal values or determined from PEF calculator. Another option is to determine the percentage based on the patient’s own normal or baseline when the patient has no or minimal symptoms.

⁴ 30 second asthma quiz- modified from:

<http://pert.ucalgary.ca/asthma/30%20Second%20Test%20for%20Control.pdf>

Example:

Patient's baseline or best peak flow is 460 l/min

Today patient is complaining of symptoms and her best PEF is 360 l/min

What is her PEF%?

$360/460 = 0.78$ or 78%

What does this mean?

From the asthma severity table, we note that she would be categorized as "moderate persistent." It would be important to note how long she has had the symptoms. Has it been going on daily for the past month or did she recently have a viral infection and her asthma symptoms got worse?

Another easy way to interpret peak flow rate are the three zones of measurement based on traffic light colors: green, yellow and red. This traffic light is also very useful in educating patient on their asthma and recognizing changes from their "normal."

Green Zone:

80-100% of the patient's "normal" peak flow rate

This means that all is clear to **go** or proceed and that the patient's asthma is under reasonably good control.

Yellow Zone:

50-80% of the patient's "normal" peak flow rate

This signals **caution**. The patient's airways are narrowing and symptoms could get worse. Patient will require extra treatment.

Red Zone:

<50% of patient's normal peak flow rate

This is a **stop** signal or alert. Immediate action must be taken as severe airway narrowing is likely occurring. Reliever medications should be taken right away and patient needs immediate treatment.

COPD SEVERITY⁵

STAGE	DESCRIPTION
Mild	Short of breath when hurrying on level ground, or walking up a slight hill.
Moderate	Walks slower than people of the same age on the level of ground because of breathlessness, or has to stop for breath when walking at own pace on the level.
Severe	Stop for breath after walking about 100 meters or after a few minutes on level ground.
Very Severe	Too breathless to leave the house or breathless when dressing or undressing.

⁵ Questions are from MRC questionnaire, cited in NICE COPD guideline at <http://guidance.nice.org.uk/CG101>. The relationship of symptoms to COPD severity (defined by FEV1) is approximate.

Summary

- The aim of the clinical assessment is to determine the patient's goal for the visit, evaluate clinical status and diagnose the condition, identify acute problems or complications, and determine severity of condition.
- For any patient who comes in for a chronic respiratory problem such as cough in addition to asking about a history of tuberculosis, it is important to make sure to first rule out tuberculosis (TB) from the diagnosis.
- Pregnant women with asthma or COPD may need to be referred to a higher level of care.
- Asthma is characterized by airway inflammation, hyperresponsiveness and reversible limitation (narrowing).
- Asthma is diagnosed by history of characteristic symptoms and can be confirmed with tests of lung function for reversibility.
- COPD is characterized by progressive limitation in airflow and symptoms include chronic cough, breathlessness, increased amount of sputum, wheeze, and decreased exercise tolerance.
- COPD is diagnosed by history of characteristic symptoms and should be confirmed with tests of lung function if possible.
- Tests of lung function measure the amount of air the patient can inhale and exhale and if the lungs are delivering enough oxygen.
- A peak flow meter is an inexpensive, handheld device that can measure how well air moves out of the lungs.
- Tests of lung function measure the amount of air the patient can inhale and exhale and if the lungs are delivering enough oxygen.
- The severity of the asthma should be determined based on symptoms and peak expiratory flow and can be categorized as intermittent, mild persistent, moderate persistent, or severe persistent.
- COPD severity can be characterized by symptoms based on activity limitation (and spirometry) and categorized as mild, moderate, severe, or very severe.

Assessment questions: Assess

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

- 1) Asthma and COPD should only be diagnosed after a comprehensive test for lung function. True or False
- 2) It is important to exclude tuberculosis in any patient who comes in with a history of chronic cough. True or False
- 3) The aim of the clinical assessment is to (circle all that apply):
 - a. Diagnose the patient
 - b. Determine the patient's goal for the visit
 - c. Identify acute problems
 - d. Perform PEFr for the patient
 - e. Determine the severity of the condition
- 4) Asthma is characterized by (circle all that apply):
 - a. Progressive limitation
 - b. Airway hyperresponsiveness
 - c. Airway inflammation
 - d. Reversible airway obstruction
 - e. Wheezing
- 5) COPD is characterized by (circle all that apply):
 - a. Progressive limitation
 - b. Decreased exercises tolerance
 - c. Chronic cough and sputum production
 - d. Reversible airway obstruction
- 6) The diagnosis of both asthma and COPD are based on a history of characteristic symptoms and can be confirmed by tests of lung function. True or False
- 7) All asthma patients should be referred to the next level for spirometry. True or False
- 8) Asthma severity can be classified as the following (circle all that apply):
 - a. Mild intermittent
 - b. Intermittent
 - c. Mild Persistent
 - d. Moderate Persistent
 - e. Severe Persistent
- 9) COPD severity can be determined based on activity limitation based on the patient's symptoms. True or False
- 10) A 25 year-old male comes to the health centre for follow-up of his asthma. He says that he feels well. His baseline PEF is 600 l/min. Today his best PEF is 480 l/min. What is his PEFr %?
 - a. 20%
 - b. 80%
 - c. 100%
 - d. 60%

Chapter 10: Management of asthma and COPD

Learning Objectives:

1. Recognise and refer for “acute on chronic” problems that are urgent.
2. Provide initial management of acute problem before referral.
3. Manage chronic care patients with asthma or COPD
4. Understand potential complications and comorbidities

10.1 Provide Acute Clinical Care and Refer as Needed

If any of the following signs and symptoms are present, consider the patient to be in **severe respiratory distress**:

- very fast (>25) or very slow respiratory rate (<12)
- use of accessory muscles to breathe (neck, intercostal, or abdominal)
- inability to speak in full sentences due to respiratory distress
- central cyanosis (bluish discoloration around lips and mucous membranes)
- respiratory distress with depressed level of consciousness (confusion, lethargy, agitation)
- SpO₂ less than 90%.

Patients who present with these Quick Check signs e.g. Airway, Breathing, Circulation (ABCs) signs should be given emergency treatment as per IMAI-PEN Acute Care guidelines before transfer to the next level of care-see page 10.

Patients with co-morbid conditions such as heart failure or those with severe symptoms or those who are pregnant must be referred to the next level of care.

10.2 Provide Specific therapy

Asthma

The components of asthma management include:

1. Routine monitoring of symptoms and lung function
2. Patient education-this involves a good health worker-patient relationship in order to educate the patient on asthma self-management, including information about the disease, the treatment, possible side effects of treatment and awareness of signs/symptoms of an asthma attack
3. Controlling environmental factors and comorbid (concurrent) conditions
4. Pharmacological treatment

Patient education:

Patient education can take the form of discussions, demonstrations, written materials, group classes, videos, etc. The education sessions should address the following topics:

- The differences between the “reliever” and “controller” medications
- How to take the treatment correctly
- Appropriate use of devices- inhaler, spacer
- Avoidance of risk factors e.g. stop smoking
- Monitor status (symptoms and lung function)
- Seek medical care as appropriate

Treat based on asthma severity

- Non-pharmacological: Avoidance of identified triggers (things that precipitate an attack).
- Pharmacological management: Treatment involves administration of reliever and or controller medication.

Selecting Treatment

Is based on the principles of

- Regular anti-inflammatory medication for persistent asthma i.e. inhaled steroids
- Inhaled therapy is preferred because:
 - It delivers drug directly to the lung where it is needed
 - Small doses of medicine can reduce risk of side effects as compared to oral medicines with systemic side effects

About the drugs:

- There are 3 principal ways of delivering inhalation/ aerosolized medications
 - Pressurized Metered Dose Inhalers (MDIs)
 - Dry Powder Inhalers (DPIs)
 - Nebulizers- machine or oxygen delivered
- Salbutamol is a bronchodilator (opens the airway) and is a **quick-acting reliever** drug. This medication is more effective if inhaled into the lungs, not by pill. Other reliever drugs include ipratropium and epinephrine/adrenaline.
- Beclometasone (inhaled) and prednisolone (tablets) are anti-inflammatory medicines and are the **controller or preventer drugs**. Both of these medicines are examples of steroids. Other steroids include injectable hydrocortisone, budesonide and fluticasone. Other controller medications include long acting beta-2 agonists (LABA) which are combined with

inhaled steroids such as salmeterol-fluticasone or formoterol-budesonide and leukotriene receptor antagonists such as Montelukast (pill).

The latter two medicines are not on the Uganda national formulary currently. It may be necessary to advise patients to purchase more effective medications that are not on the national formulary to control moderate or severe persistent asthma.

Side effects include:

- Salbutamol- tachycardia, tremors, hypokalaemia (rare)
- Beclomethasone-mild sore throat, hoarseness, occasional thrush; Advise patient to use spacer and to rinse out mouth after using inhaled corticosteroid.
- Systemic corticosteroid (prednisolone)- long-term-infections, diabetes, osteoporosis, high blood pressure, acute adrenal insufficiency if suddenly stopped

Consider referral if:

- Asthma remains poorly controlled despite on-going treatment. Ensure that patient following treatment plan and is using the correct inhalation technique.
- If diagnosis of asthma remains uncertain.
- If suspect asthma secondary to aspirin intolerance and/or non-steroid anti-inflammatory medicines. These medicines should be stopped.
- If regular oral prednisolone is required to maintain control

Stepwise chronic asthma management

The treatment of asthma proceeds in a stepwise manner, with medications increased as the severity of the condition increases. Initiate treatment according to baseline severity and then increase or decrease treatment following treatment response and assessment of asthma control. Check inhaler technique.

Step	Treatment
Step 1	Inhaled salbutamol one to two puffs (100-200mcg) repeated every four to 6 hours as needed (prn)
Step 2	Inhaled salbutamol prn and add low-dose inhaled beclomethasone, starting with 50-100mcg twice daily for adults. -If patients previously received inhaled corticosteroids, may start 100 twice daily.

Step 3	Same as step 2 but give higher doses of inhaled beclomethasone, 200mcg or 400mcg twice daily
Step 4	Add long-acting beta agonist (or leukotriene antagonist), if available
Step 5	Add oral prednisolone but in lowest dose possible to control symptoms (0.5 mg/kg/day; nearly always <10 mg daily); reassess weekly and taper when patient stable for 1 week

EXERCISE

Read the case scenario and decide what to do next.

1. 31 year-old woman with intermittent asthma on salbutamol with increased night-time cough for past month. She has been using the inhaler weekly.	
2. 20 year-old man who smokes with cough that is worse at night for the last 2-3 months. He denies fevers, chills, weight loss but has had occasional wheezing. TB was excluded and his peak flow measurement showed reversibility.	
3. 40 year-old woman with daily cough/wheeze that is worse at night. On salbutamol and low dose beclomethasone. She has not been able to go to work because of her symptoms since she must be active there. She has been using her inhaler daily.	
4. 37 year-old woman who developed asthma in pregnancy. She is no longer pregnant but still has intermittent symptoms. She comes to the health centre today saying that she has been having problems with cough and wheezing all night and does not have her inhaler anymore. When you see her, she is coughing and wheezing but her respiratory rate is normal.	
5. 28 year-old woman with moderate persistent asthma, on salbutamol and high dose inhaled beclomethasone. She reports having minimal symptoms in last 4 months. She has been taking medicines as prescribed to her and has not needed her reliever inhaler.	

Monitoring

ASK for all follow-up visits:

- How have you been?
- What problems have you developed
- Have you needed urgent medical care? **If yes**, ask for record, diagnosis and treatment.
- Ask about symptom control
- How often do you use the salbutamol inhaler during the week to treat difficulty breathing (goal <2 times per week)? How do you use the inhaler?
- Assess adherence. Ask about any problems with the medicines.

Perform peak flow and assess asthma control

Ongoing follow-up of the patient is essential to maintain control and establish the lowest step and dose of treatment to minimize cost and side effects.

Asthma

If:	And:	Then:
Moderate or severe acute asthma attack now		Manage according to Acute Exacerbation (7.4)
Asthma not in control	Patient is compliant with current treatment plan	Increase regimen by 1 step and refer to hospital for add-on treatment
	Patient not compliant with current treatment plan	Give further patient education. Continue present treatment plan if only mild wheezing.
Sustained asthma control	Symptoms in control for less than 3 months	Continue present treatment plan (this may include a scheduled reduction in treatments)
	Symptoms in control for more than 3 months and no prednisone for 6 months	Decrease by 1 step or refer non-urgently to hospital for revised treatment plan

- Patients should be seen every 1 to 3 months after the initial visit and every 3 months thereafter.
- Patients should follow-up sooner (after 1 week) after an asthma attack

Stepping up treatment

- Sustained step up-continue to step up if asthma is poorly controlled (at least 2-3 months)
 - Important to first check adherence, correct inhaler technique, correct diagnosis
- Short-term step up- may be for 1-2 weeks due to patient having a viral infection or an allergen

Stepping down asthma treatment

- Consider step-down after good control maintained for 3 months

If patient is having an acute attack, decide on severity and action plan

ASTHMA attack

SYMPTOMS	CLASSIFY	TREATMENT
<p>Severe Wheezing <u>and</u></p> <ul style="list-style-type: none"> • Severe respiratory distress • RR > 25 breaths/minute • HR ≥110 beats/min • Inability to complete sentence in 1 breath <p>Very severe</p> <ul style="list-style-type: none"> • Altered consciousness • Exhaustion • Arrhythmia • Hypotension • Cyanosis • Silent chest • Poor respiratory effort. • SpO2 <92% on pulse oximeter, if available 	<p>Severe asthma attack</p>	<ul style="list-style-type: none"> • Salbutamol MDI with spacer 4 puffs every 20 minutes for 1 hour (if able) or by nebulizer 5 mg/ml given every 20 minutes for 1 hour (using 20-25% of vial at each administration) or by continuous nebulisation • Prednisolone 30-40 mg for 5 days • Oxygen (2 L/minute at minimum, if available) and if oxygen saturation < 90% • Reassess continuously (15-30 minutes) • If no response- increase frequency of salbutamol or by continuous nebulization at 5-10 mg per hour (see IMAI DCM QC- give salbutamol) • Refer to District Hospital if failing to respond to treatment or if very severe exacerbation (altered conscious level, exhaustion, SpO2<92%)
<p>Moderate Wheezing</p> <p><u>Or</u></p> <p>Severe Wheezing without Severe Respiratory Distress</p>	<p>Moderate asthma attack</p>	<ul style="list-style-type: none"> • 2-4 puffs salbutamol every 20 minutes for 1st hour and single dose of oral prednisone (0.5-1mg/kg/day), then reassess. • If response (disappearance of clinical signs), then monitor for 1 hour and continue treatment at home • If no or incomplete response, then treat as severe attack

Stepwise chronic COPD management

Management goals for treatment of COPD include:

- Relief of symptoms
- To improve health status with minimal limitation in daily activities; if this is not possible, to aim to get patients back to their baseline
- Prevention of disease progression
- Avoid risk factors (especially tobacco)
- To prevent and treat complications
- To prevent and treat exacerbations

Treatment

The table that follows provides an example of an approach to the management of COPD. The treatment of COPD proceeds in a stepwise manner, with medications increased as the severity of the condition increases. Decide on appropriate treatment by comparing patient's history, current symptoms, and treatment level, using the Table below.

Chronic COPD treatment according to severity

SEVERITY	TREATMENT
1. Mild	<ul style="list-style-type: none">• Inhaled salbutamol as needed one puff to two puffs(100-200mcg) repeated every 4 to 6 hours) or ipratropium (20-40 mcg up to 4 times daily) as needed
2. Moderate	<ul style="list-style-type: none">• Inhaled salbutamol or ipratropium as needed• Add long-acting beta agonist (salmeterol or formoterol), if available
3. Severe	<ul style="list-style-type: none">• Inhaled Salbutamol or ipratropium as needed• Add long-acting beta agonist (salmeterol or formoterol) if available AND beclomethasone (400mcg twice daily) OR ipratropium 4 times daily
4. Very Severe	<ul style="list-style-type: none">• Inhaled Salbutamol or ipratropium as needed• Add long-acting beta agonist (salmeterol or formoterol) if available AND beclomethasone (400mcg twice daily) OR ipratropium 4 times daily AND beclomethasone (400 mcg twice daily)• Maintenance oral prednisolone is <u>NOT</u> normally recommended• CONSULT or REFER to district clinician

Chronic COPD management is determined by the following factors:

- symptoms of breathlessness or exercise limitation
- frequency of exacerbations
- severity of airflow obstruction
- presence of complications.

In the management of COPD, inhaled salbutamol or ipratropium as needed are used as reliever medications in all categories. All patients should be counselled to stop

smoking and avoid indoor air pollution. Give pneumococcal and annual influenza vaccinations. *Refer for specialist care for severe or very severe COPD (for example, to consider long-term home oxygen therapy and treatment of right heart failure in very severe disease).*

Commonly used inhaled medications include:

- Short-acting bronchodilators, such as salbutamol metered-dose inhaler or ipratropium MDI.
- *Long-acting bronchodilators, include long-acting beta-agonists (LABA, e.g. formoterol or salmeterol) or long-acting muscarinic antagonist (LAMA, e.g. tiotropium).* Regular dose ipratropium (2 puffs 4 times daily) could be substituted for LAMA.

Monitoring

COPD patients should have regular reviews every 3-6 months and more frequently when treatment has been changed or COPD is not well controlled or less frequently if stable. Inhaler technique should be reassessed at every visit.

Consider referral for specialist advice when:

- COPD remains poorly controlled,
- When the diagnosis of COPD is uncertain,
- When exacerbations are increasing in frequency and severity despite increased treatment.
- When symptoms are becoming progressively worse despite therapy, or if patient begin developing significant constitutional symptoms (weight loss, change in mental status)

COPD Attacks (exacerbations)

COPD attacks present with increased shortness of breath and possibly more purulent sputum (increase in the volume and change in colour).

- Refer if symptoms/signs suggesting severe deterioration- severe respiratory distress, right heart failure, otherwise management includes the following
 - Give higher dose salbutamol and ipratropium.
 - Give prednisolone 30 mg/day for 7–14 days.
 - If sputum more purulent compared to baseline, and:
 - if has no evidence of pneumonia, treat as per above guidance.
 - if has evidence of pneumonia, give oral antibiotic⁶
 - Refer if not responding to above treatment

⁶ Follow national guidelines.

If patient is having an acute attack, decide on severity and action plan

COPD attack

SYMPTOMS/SIGNS	CLASSIFY	TREATMENT
<p>One or more of the following signs: NEW or WORSE of <u>one</u> or more of the following:</p> <ul style="list-style-type: none"> ▪ Very fast breathing (RR>25 breaths/minute) ▪ Confusion, agitation or lethargy associated with breathlessness ▪ Not able to walk unaided ▪ Temperature less than 35°C ▪ Oedema of both ankles ▪ Speaks only in single words or not at all ▪ Haemoptysis more than 50 ml ▪ Pleuritic chest pain ▪ Persistently worsening oxygen saturation 	<p>COPD with SEVERE DETERIORATION</p>	<ul style="list-style-type: none"> • Antibiotics-consider amoxicillin, erythromycin or doxycycline • Start prednisone pre-referral • Salbutamol in high doses from metered dose inhaler and spacer (e.g. 4 puffs every 20min for 1 hour) or by nebulizer • Add ipratropium, if available • Oxygen, if available, by mask • Refer URGENTLY to hospital
<p>None of the above but</p> <p>Increased shortness of breath and possible increase in the volume and colour of sputum</p>	<p>COPD with MODERATE DETERIORATION</p>	<ul style="list-style-type: none"> • Antibiotics-consider amoxicillin, erythromycin or doxycycline • Oral prednisolone 30-40 mg for 7 days • Salbutamol in high doses from metered dose inhaler and spacer (e.g. 4 puffs every 20 minutes for 1 hour) or by nebulizer • Go up a step in treatment- add or increase dose • Oxygen, if available, by mask • Refer to District Hospital if not responding
<ul style="list-style-type: none"> • Increased sputum production <u>or</u> • Sputum colour becomes yellow or green (colour change) <u>or</u> • Fever (37.5° C or above) 	<p>ACUTE INFECTION in COPD</p>	<ul style="list-style-type: none"> • Give appropriate oral antibiotics • Give routine follow-up care for known COPD (check regimen, adherence with treatment plan) • If smoking, counsel to stop smoking-see Annex A7-Protocol 1. • Follow-up in 1 week. • Advise on worsening symptoms when to return immediately
<p>None of the above</p>	<p>'STABLE' COPD</p>	<ul style="list-style-type: none"> • No new treatment If smoking, counsel to stop smoking-see Annex A7-Protocol1.Give routine follow-up care for known COPD (check regimen, compliance with treatment plan)

EXERCISE

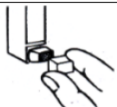





Classify COPD stage. What treatment would you recommend?

1. 50 year-old woman with daily cough with increased sputum production. She notices that she gets breathless when she walks with her friend who is the same age. She is not working outside but does cook daily for her family of 6.	
2. 46 year-old man who has been smoking since he was 18 years. He has noticed increased breathless when he has to walk quickly or go uphill.	
3. 61 year-old man who is taking salbutamol for his COPD. He says that he is having hard time breathing all the time. He says that it is hard to sleep at night due to his breathing.	
4. 40 year-old woman with cough and breathlessness after walking 100 meters.	
5. 73 year-old woman with a history of COPD, breathlessness, unable to speak in full sentences and RR 30. Her daughter says that she has been coughing a lot, productive of green sputum.	

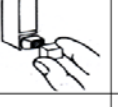

Note: The facilitator will demonstrate inhaler technique during the practical sessions.

How to use inhaler

Metered-dose inhaler without spacer:

1.		Remove the cap.
2.		Shake the inhaler.
3.		Breathe out slowly and steadily.
4.		Put the inhaler in your mouth - seal the lips around the inhaler.
5.		Press the canister once to release a dose of medicine while you breathe in very slowly and as deeply as possible.
6.		Hold your breath for 10 seconds before you breathe out slowly and steadily.

Metered-dose inhaler with spacer with mouthpiece:

1.		Remove the cap.
2.		Shake the inhaler and insert it into the base of the spacer.
3.		Breathe out slowly and steadily
4.		Hold the mouthpiece of the spacer in your mouth - seal your lips around it.
5.		Press the canister to release the correct number of puffs into the spacer (1 to 15 puffs, depending on treatment plan).
6.		Breathe in through your mouth as slowly and deeply as possible.
7.		Hold your breath for 10 seconds before you breathe out slowly and steadily (? breathe in again without pressing canister).

EXERCISE

How to fill out NCD patient card for asthma/COPD

REVIEW the steps to fill out the patient card for asthma/COPD. Practice filling out the card with the patient case scenarios.

Summary

- Very fast respiratory rate (or very slow), use of accessory muscles to breathe, central cyanosis, inability to speak, and SpO₂ are signs of severe respiratory distress.
- Management of asthma includes routine monitoring, patient education, controlling environmental factors (triggers) and pharmacologic treatment.
- The mainstay of asthma treatment are the quick-acting reliever drugs and the controller drugs.
- Inhaled therapy is preferred because the drug is delivered directly to the lung where it is needed.
- Asthma patients should be seen in chronic care every 1 to 3 months after the initial visit and every 3 months thereafter.
- Treatment of asthma may be stepped up (sustained step up or short-term step up) based on asthma control.
- The goals for COPD management include symptom relief, improvement of health status as close to baseline as possible, avoidance of risk factors and prevention of disease progression.
- Similar to asthma, the treatment of COPD proceeds in a stepwise manner with medications increased as the severity of the condition increases.
- In the management of COPD, inhaled salbutamol or ipratropium as needed are used as reliever medications in all categories.
- Refer patients for COPD “attack” if symptoms/signs suggesting severe deterioration- severe respiratory distress, right heart failure, otherwise management includes the following: antibiotics, prednisone, salbutamol, ipratropium, and oxygen.
- For moderate COPD attack without severe deterioration, patients may be given higher dose of salbutamol and ipratropium, oral prednisolone, and oral antibiotics.

Assessment questions:

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

- 1) Oral Salbutamol (tablet) is a useful treatment for asthma patients. True or False
- 2) For asthma and COPD, inhaled medications are effective because they go into the lungs directly to work. True or False
- 3) The goal of asthma treatment is (circle all that apply):
 - a. Relieve/control symptoms
 - b. Prevent attacks
 - c. Cure asthma
 - d. Educate patients to avoid/control triggers
- 4) Refer patients if they have which of the following signs (circle all that apply):
 - a. Respiratory rate of 16
 - b. Use of accessory muscles to breathe
 - c. Bluish discoloration of lips and mucous membranes
 - d. SpO₂ of 98%
 - e. Difficulty in speaking due to breathlessness
- 5) Salbutamol opens the airways and is a quick-acting reliever drug. True or False
- 6) Both inhaled salbutamol and ipratropium are useful in the treatment of COPD. True or False
- 7) Patients with COPD should follow-up annually for monitoring. True or False
- 8) Patients should be told to follow-up 1 week after an asthma attack. True or False
- 9) 45 year-old woman with mild persistent asthma who is taking salbutamol as needed for wheeze. She is complaining of cough and wheeze at night requiring more frequent salbutamol use. The next step in treating this patient is which of the following (circle all that apply)?
 - a. Increase dose of inhaled salbutamol
 - b. Start inhaled beclomethasone
 - c. Start oral prednisolone
 - d. Start oral salbutamol
- 10) 59 year-old man with mild COPD. What would be an appropriate initial treatment regimen (circle all that apply)?
 - a. Start oral prednisone
 - b. Start inhaled salbutamol
 - c. Counsel to stop smoking
 - d. Start inhaled ipratropium

11.1 Acute Rheumatic Fever

A study estimated that there were globally 33.4 million cases of rheumatic heart disease, with an incidence of 30.4 per 1000 in Mozambique and 62 per 1000 in Kenya.

The diagnosis of ARF will not be made at first level, but it is important to be familiar with the symptoms so that you may have a high index of suspicion to identify suspicious cases and refer for early investigation and management.

Diagnosing Acute Rheumatic Fever Acute — ARF can present with several different clinical findings within weeks of a group A streptococcal (GAS) tonsillopharyngitis (or streptococcal pyoderma in patients from tropical regions). The possible major and minor manifestations are reviewed below. These manifestations are used for diagnosis.

Primary prevention of ARF. Remember that active management of bacterial pharyngitis (which may be due to Group A Streptococcus) will prevent the development of Acute Rheumatic Fever. ARF has become very uncommon in many countries due to early effective treatment of bacterial pharyngitis.

The clinical manifestations and diagnosis of ARF are reviewed below.

The Revised Jones diagnostic Criteria for Acute Rheumatic Fever

Evidence of preceding Strep Group A infection

PLUS either

- 2 major criteria or
- 1 major and 2 minor criteria

The five major manifestations (and percent of patients with each) are:

1. Carditis and valvulitis – may be clinical or subclinical – (50 - 70%)
2. Arthritis - usually migratory polyarthritis predominantly involving the large joints – (35 - 66%)
3. Central nervous system involvement (e.g. Sydenham chorea) – (10 - 30%)
4. Subcutaneous nodules – (0 – 10%)
5. Erythema marginatum – (<6%)

The four minor manifestations are:

1. Arthralgia
2. Fever
3. Elevated acute phase reactants (erythrocyte sedimentation rate [ESR], C-reactive protein [CRP])
4. Prolonged PR interval on electrocardiogram

Laboratory findings include leucocytosis and mild normochromic, normocytic anaemia of chronic inflammation

11.2 Goals of the monthly visit for prophylaxis for Rheumatic fever/Rheumatic heart disease

1. Assess symptoms
 - Identify any acute problems
 - Recognize deterioration of the patient's cardiac condition
 - Recognize recurrence of acute rheumatic fever or acute sore throat, suspect streptococcal pharyngitis
2. Refer as needed
3. Give secondary prophylaxis
4. In women of childbearing age, counsel on the risk of pregnancy if the patient has valvular disease and offer contraception
5. Schedule follow-up
6. Check understanding

11.3. Assess signs and symptoms

If any acute problem, first do acute assessment (use IMAI-PEN Acute Care).

For all patients:

ASK:	LOOK, LISTEN
<ul style="list-style-type: none"> • Shortness of breath? • Swelling of lower extremities? • Sore joints? • Fever? • Excessive clumsiness and altered handwriting? • Sore throat? • Any other problem? 	<p>Measure BP, pulse, weight</p> <p>If shortness of breath or lower extremity oedema</p> <ul style="list-style-type: none"> • Auscultate heart for heart murmur or irregular rhythm • Auscultate lungs for crackles <p>If complains of sore joints-</p> <ul style="list-style-type: none"> • Feel ankles, knees, hips, wrists, elbows, shoulders for: <ul style="list-style-type: none"> ○ Redness ○ Warmth ○ Swelling ○ Tenderness <p>If reports fever-</p> <ul style="list-style-type: none"> • Measure temperature <p>If sore throat-</p>

	<ul style="list-style-type: none"> Assess and treat suspect streptococcal pharyngitis (see Acute Care)
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Assess the patient for recurrence of Acute Rheumatic Fever and also for development of Congestive Cardiac Failure (increased heart and respiratory rate, pitting pedal oedema, decreased effort tolerance, basal crepitations) pg 68 Chronic NCD IMAI-PEN manual for the differential diagnosis of pulmonary oedema.

Always check for anaemia and treat as needed. See pg 22 Acute Care. Anaemia adds strain to the heart and may precipitate congestive cardiac failure in Rheumatic Heart Disease.

11.4: Rheumatic heart disease

11.5 Acute Exacerbations, Chronic Management, and Prevention

Rheumatic heart disease occurs when the heart valves are damaged as a result of Acute Rheumatic Fever. This may be as a result of a single episode of ARF or may be due to recurrent ARF. This emphasises the need for secondary prophylaxis with Benzathine Penicillin after initial diagnosis of ARF to prevent further damage to the heart.

11.6 Secondary Prevention of Acute Rheumatic Fever

Give Benzathine Penicillin injection intramuscularly.

Benzathine Penicillin every 4 weeks and dose according to weight:

- >30 kg 1.2 million units intramuscularly
- < 30 kg 600 000 units intramuscularly

For penicillin allergic patients, give erythromycin 250 mg orally twice daily instead.

WHO recommends that in resolved carditis, secondary prophylaxis should be given for 10 years until at least age 25, but in moderate to severe RHD or previous surgery that it should be lifelong.

11.7 If any signs suggesting recurrent rheumatic fever or new/ worsening heart failure or new atrial fibrillation, refer urgently to hospital

Signs and symptoms suggesting new or worsening heart failure	Signs and symptoms suggesting recurrent acute rheumatic fever	Signs suggesting new atrial fibrillation
<ul style="list-style-type: none"> • Chest pain or discomfort • Fatigue • Crackles/crepitations on auscultation • Shortness of breath, may be worse when lying down • Swelling of lower extremities • Acute increase in weight 	<ul style="list-style-type: none"> • Fever • Joint pain and swelling - usually the large joints; “migratory”- more than one joint involved, new joint becomes painful as others improve • Rapid heart rate – out of proportion to fever • New heart murmur or pericardial friction rub • Fatigue, new shortness of breath • Abnormal movements- involuntary, uncoordinated, purposeless 	<ul style="list-style-type: none"> • Irregular heart rate

Support chronic care at your facility following the cardiology plan.

Patients may be on chronic anti-failure therapy including diuretics (furosemide, spironolactone), ACE inhibitors (captopril, enalapril) or anticoagulation (warfarin to be monitored with regular INR).

Consult with your referral unit should you have any concerns.

Give Infective Endocarditis prophylaxis

Advise patients that they are at risk of developing infective endocarditis and should always ensure that they take adequate antibiotics before any invasive dental or other procedure.

Assess Family Status

Advise female patients that pregnancy and delivery worsen most valve lesions. Assess pregnancy status and advise female patients to use reliable contraception.

Ensure that you fill out the NCD patient card: rheumatic fever/ rheumatic health disease prophylaxis and care

Refer to card on page 103 IMAI PEN NCD manual.

Ensure that the patient has a reliable supply of the medications prescribed by the cardiologist or district clinician and that they keep their follow up dates at the specialist clinic.

Each month:

- Review all patient cards even if the patient is absent.
- Trace patients from clinic who have missed prophylaxis **every** month.

Summary

- Acute Rheumatic Fever is preventable with effective diagnosis and management of acute bacterial pharyngitis.
- Early detection of Acute Rheumatic Fever is important with active diagnosis and Secondary Prophylaxis using monthly intramuscular Benzathine Penicillin.
- Educate patients on their disease, the importance of adherence to treatment and the signs and symptoms of disease progression or complication.
- Use the 5 As to support chronic patient self-management.
- Empower diabetic patients to have a broad knowledge of RHD and the consequences of the disease and the right attitude and resources to provide self-care.
- Patient preparation, education, and support are essential to ensure compliance with treatment and lifestyle modifications and effective self-management.

Assessment questions: ARF/RHD

Answer all the questions on this page. Write your responses in the given spaces. If you have a problem, ask a facilitator for help.

1. The diagnosis of acute rheumatic fever (ARF) needs to be determined based on echocardiogram results. True or False
2. Acute rheumatic fever occurs 2 to 4 weeks after infection of throat with group A *Streptococcus*(GAS). True or False
3. Primary prevention is the :
 - a. Treatment of ARF with anti-inflammatory medicines such as aspirin
 - b. Treatment of GAS pharyngitis (throat infection) with benzathine penicillin
 - c. *Streptococcus* vaccine
 - d. Treatment of rheumatic heart disease with diuretic such as furosemide
4. Secondary prevention includes:
 - a. Treatment of ARF with anti-inflammatory medicines such as aspirin
 - b. *Streptococcus* vaccine
 - c. Treatment with benzathine penicillin to prevent recurrent GAS infection to prevent progression of cardiac disease
 - d. Treatment of rheumatic heart disease with diuretic such as furosemide
5. List 5 major manifestations of acute rheumatic fever:
6. Very common presentation of ARF is:
 - a. Fever and joint pain in the large joints
 - b. Skin rash
 - c. Fever and sore throat
 - d. Involuntary movements that can lead to clumsiness
7. Rheumatic heart disease is the most common long term sequela of acute rheumatic fever. True or False
8. You see a 36 year-old patient at the health centre who was diagnosed with RHD at the hospital and referred back to you. She is 55 kg and on furosemide and enalapril. Patient's record show that Echocardiogram done on 10/2017 shows mod MR, mitral valve thickening, EF 50%. Patient has symptoms of shortness of breath, worse when lying flat and fatigue. She has been placed on a surgical waiting list for mitral valve repair. What should you do next (circle all that apply)?
 - a. Start anticoagulation
 - b. Monitor patient for worsening symptoms
 - c. Give secondary prophylaxis

- d. Record echo findings on patient card
 - e. Schedule follow-up visits
9. Oral health is important because they are at high risk of developing recurrent ARF. True or False
10. Patients with RF and carditis should receive prophylaxis for at least 10 years from initial acute attack. True or False
11. For patients with RHD, oral antibiotics should be given prior to dental and invasive surgical procedures as prophylaxis for infective endocarditis. True or False
12. Patients with RHD and confirmed penicillin allergy should be offered which medication for secondary prevention of recurrent ARF.
- a. Warfarin 5 mg daily
 - b. Benzathine penicillin 1.2 million units every month
 - c. Atenolol 25 mg daily
 - d. Erythromycin 250 mg twice daily
13. For patients with RHD and mild mitral regurgitation (MR), follow-up to a specialist should occur annually at minimum. True or False
14. Target INR with patients with RHD and atrial fibrillation on warfarin is:
- a. INR 1-2
 - b. INR 2-3
 - c. INR 3-4
 - d. INR 4-5
15. Education and support to patients around RHD should include the following (circle all that apply):
- a. Explanation of acute rheumatic fever and rheumatic heart disease
 - b. Advice that patient should take benzathine penicillin each month to prevent syphilis
 - c. Importance of secondary prevention with benzathine penicillin to prevent recurrent ARF
 - d. Education on signs and symptoms of heart failure
 - e. Understanding that patient will need to follow-up every month for IM injections/monitoring and 6-12 months for specialist review