REPUBLIC OF RWANDA

MINISTRY OF HEALTH

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National guideline for management of Non Communicable Diseases(NCDs)

Edition 2016

RWANDA BIOMEDICAL CENTER

A Healthy People. A Wealthy Nation

PREFACE OF THE HON. MINISTER OF HEALTH

> *"… the world stands at a … crossroads in the movement to confront the rapidly growing burden of non-communicable diseases such as heart disease, cancer, diabetes, and respiratory disease. We now face the challenge of equipping health systems with the means to adequately prevent, treat and monitor this group of complex chronic conditions… the complexity of this task is enormous and its urgency fierce, but there is no question of whether we possess the tool to meet it head on. History will judge us by our efforts to meet the challenge."*
> *Dr. Agnes Binagwaho, Rwanda Minister of Health, March 2012*[1]

Non-Communicable Diseases (NCDs) are a worldwide epidemic. Particularly, the most common diseases - Cardiovascular diseases, Chronic Obstructive Pulmonary Diseases (COPD), Chronic Kidney Diseases, Cancer, Diabetes, injuries and disabilities, EMT, oral, eye greatly contribute to the morbidity and mortality accounting for around 60% of all deaths worldwide. The disease pattern is also changing from infectious to chronic in Rwanda like other developing countries due to the epidemiological transition. The burden of infectious diseases is still preeminent; but in addition, the problem of NCDs is creating new challenges for our public health system.

Rwanda MOH plans to continue to prevalent infectious conditions, as well as to reach the next frontier through expansion of access to care for Non-Communicable Diseases (NCDs) which are a recognized and significant cause of morbidity and mortality around the world, including the developing countries. This represents a significant advancement in Rwanda health care services provision. It is in the wake of NCDs burden worldwide that all health care stakeholders,

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[1] Agnes Binagwaho, "Meeting the Challenge of NCD: We Cannot Wait," *Global Heart* 7, no. 1 (March 1, 2012): 1–2, doi:10.1016/j.gheart.2012.01.004

individuals and organizations are called upon to play an active role in improving the quality of life in Rwanda.

The National Guidelines 2015 for prevention and management of NCDs have been developed in accordance with the international standards by a recognized team of experts. The guidelines reported weredeveloped and validated by a Technical Working Group composed by general practitioners and specialists with extensive experience in both urban and rural areas.

Dr Patrick NDIMUBANZI

Hon. Minister of State in Charge of Public Health and Primary Health Care

ACKNOWLEDGEMENTS

The Ministry of Health and the Rwanda Biomedical Center would like to express its gratitude to all organizations and individuals who contributed to the development of the National guidelines for Non-Communicable Diseases. Without the tireless support from all diverse stakeholders, these guidelines would not have been developed.

The Ministry of Health and the Rwanda Biomedical Center wishes to take this opportunity to thank the Non-Communicable Diseases Technical Working Group and all its partners for their worthwhile ideas namely: the Rwandan national teaching hospitals and professional associations, the World Health Organization, the United States Centers for Disease Control, Partners In Health, Family Health International, Handicap International, and civil society organizations.

We are heavily indebted to many other partners and actors in the health sector that made valuable contributions to the development of this policy. Please accept our sincere thanks

Dr Marie Aimee MUHIMPUNDU

Head of NCDs division RBC

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PART 1: Cardiology

1 HEART FAILURE GUIDELINES

1.1 Guiding Principles

This plan emphasizes a systematic approach, which will help you:

1. Establish that the patient has heart failure

- Heart failure (HF) is often confused with other volume overload syndromes. i.e. Just because a patient was given lasix at a prior hospitalization DOES NOT mean s/he has heart failure.
- You can only diagnose HF after collecting and considering the patient's history, vital signs, physical exam, labs, and imaging data.
- It can be 2-3 clinic visits before you can establish a firm diagnosis of HF.

2. Identify the type of heart failure

If there is clear evidence of HF then the patient's history, vital signs, PE, labs, CXR, and ECHO should be used to narrow the diagnosis to a distinct type of HF.

SYSTEMATIC APPROACH

This guide takes you through the following framework for each patient visit:

1. History
2. Vital Signs
3. Physical Exam
4. Lab Review
5. Chest Radiography*
6. Echocardiography*
7. Impression
8. Plan
9. Post-Surgical Care*
10. Anti-Coagulation Management*

* Additions that are unique to heart failure

It's possible to know that the patient has HF but still be unsure of the exact type. *i.e. Cardiomyopathy, hypertensive, RHD, congenital.*

It's possible to manage heart failure symptoms and optimize treatment while simultaneously searching for the most precise diagnosis.

Patients can have overlapping types of heart failure. i.e. Patients with RHD affecting the aortic valve may also have dilated cardiomyopathy.

3. Establish a Heart Failure Class 1-4

a. Determine who needs to be emergently referred to the district hospital.
b. Determine if current therapy is appropriate or if dose escalation is needed.

1.2 The Patient Visit

This guide helps you ask the same questions in the same order to understand: 1. Is this HF? 2. What type of HF? 3. How sick is the patient? (NYHA Class I-IV)

PATIENT BACKGROUND

Review the following information before the patient visit, if available:

- How was the patient referred to the heart failure clinic?
- Has a diagnosis been confirmed? If so, was the diagnosis made clinically or based on imaging information: CXR, echocardiography?
- Is the type of heart failure known?
- Is the patient's ejection fraction known?
- Establish up-front complications and co-morbidities that might affect management.

1.2.1 HISTORY

1.2.1.1 Clinical History

1.2.1.1.1 Exercise Tolerance

- Ask the patient the following questions:
- Do you feel more tired?
- How far can you walk before needing to rest?

1.2.1.1.2 Volume Overload

Ask the patient the following questions:

Pulmonary edema

- Are you short of breath when you're resting? If not, how far can you walk before you are short of breath?
- Is it worse when lying flat or sitting upright?
- Do you wake up in the middle of the night gasping for air?

Ascites

- Is your abdomen is getting bigger?
- Are you eating a smaller amount of food because you feel full or nauseous soon after you start eating?

Nocturia

- Do you need to urinate during the night?
- If so, how many times do you get up to urinatein one night?

Lower extremity edema

- Do you have leg swelling?
- Have you noticed that the swelling has moved closer to the knees or above the knees recently?
- Do you feel like the skin on your legs is tighter?

1.2.1.1.3 Heart Rate

Ask the patient the following question to know if they are experiencing palpitations:

Palpitations

- Do you feel like you have an animal or bird in your chest?

1.2.1.1.4 Cardiac Output

Ask the following questions:

- Do you feel more forgetful?
- Are you lightheaded or dizzy, especially when changing positions from sitting to standing?
- Are you peeing less?

1.2.1.1.5 Co-Morbidities

1. Find out if the patient has any of the following co-morbidities:

❑ HIV
❑ TB or a history of TB
❑ Pregnant or a history of pregnancy
❑ Diabetes
❑ Hypertension

HF MIMICKERS

- Renal failure
- Liver failure
- Low serum albumin due to malnutrition, cancer, TB, HIV, or other severe illness.

1.2.1.1.6 Medications

Listen for drugs that cause volume depletion or acute kidney injury, increase the serum potassium, or suppress the heart rate.

- Ask the patient what medications they are taking
- Ask if they are taking or have taken any of the following medicines now or in the past:

  - ❑ ***Lasix***
    - If the patient is symptomatic, this may suggest the need for intravenous therapy.
    - Excessive diuresis may cause volume depletion and reduce blood flow to the kidneys.

  - ❑ ***B-Blockers***
    - May mask tachycardia if a patient is in a heart failure exacerbation.

  - ❑ ***Ace-Inhibitors***
    - May cause or worsen acute renal injury. If the patient is taking, you will need to check the urine output and creatinine.

1.2.1.2 Social History

1. Ask about the following:

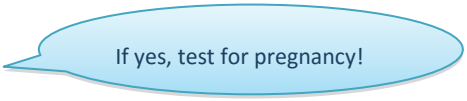
Alcohol

- How many drinks do you have each day, week?
- How many years have you been drinking alcohol?

Tobacco

- Do you smoke or chew tobacco?
- How many cigarettes do you smoke every day?
- How many years have you smoked?

Pregnancy



- Are you pregnant now? Do you think that there is a chance that you might be pregnant?
- Do you have any children? If yes, wh en did you last deliver?
- How many children do you have? How many times have you been pregnant?

Diet

- Do you like to add salt to your food?
- Has your diet changed for any reason?

Sexual History/HIV Risk Factors

- Are you sexually active now? Do you have sex with more than one partner?
- Do you use condoms?
- Have you ever been tested for HIV? When was the last time you were tested?

1.2.1.3 Family History

1. Ask about the family history:

- Has anyone in your family been told they have a problem with their heart?
- Does anyone have the same symptoms as you do (i.e. dyspnea, fatigue, edema)?

1.2.2 VITAL SIGNS

Always review vital signs before the physical exam. They will almost always help you understand if a patient is sick and if they should be referred to the district hospital.

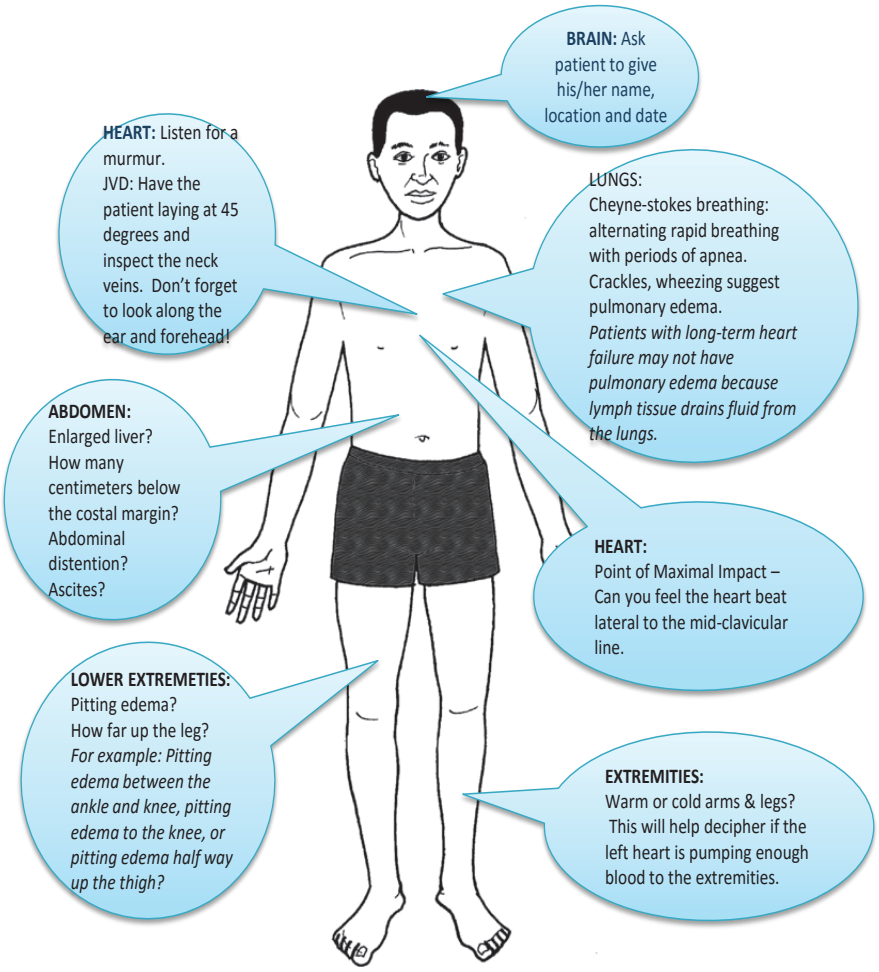
VITAL SIGN	Notes
Heart Rate	***Tachycardia:*** May indicate that patient is trying to support cardiac output with a high heart rate. ***Bradycardia:*** Could indicate heart block or a high beta-blocker dose.
Blood Pressure	***High blood pressure:*** May suggest a large, thick heart ***Low blood pressure:*** Suggests a thin, dilated heart.
Respiratory Rate	Look at the patient. If she/he cannot sit comfortably and speaks in broken sentences this is very suggestive of Class IV symptoms and the patient should be hospitalized.
O2 Saturation	An O2 saturation below 92% suggests that the patient has fluid in the alveoli. Interpret in the context of the patient's other VS. O2 sat 85-90% may be normal in a patient with congenital heart disease who is comfortable with otherwise stable VS.
Weight	Very helpful! Comparing a patient's current weight to earlier values can help estimate the degree of a patient's volume overload.
Temperature	Very important! A patient with a fever or signs of an infection SHOULD NOT GET LASIX!

1.2.3 PHYSICAL EXAM

How to check for heart Failure

1. Observe the patient. If they are sitting upright, trying to stay still, and unable to hold a conversation because they are trying to catch their breath, these are signs of NYHA Class IV HF.
2. Conduct a head to toe evaluation of the left heart.
3. Conduct a head to toe evaluation of the right heart.

Right Heart ***Left Heart***



1.2.4 LAB REVIEW

LAB	Notes
NFS	**HB/Hct:** Anemia can cause or worsen heart failure **WBC:** Very important to identify a patient who has an infection. HF patients with an infection SHOULD NOT BE DIURESED! **Platelets:** If very low could identify patients who are a bleeding risk.
Urea	Elevated urea can suggest that there is decreased cardiac output to the kidneys (less blood reaches the kidneys so less urea gets excreted in the urine).
Creatinine	Very, very important! Patients with underlying chronic renal failure may develop heart failure. Decreased cardiac output can cause less blood to flow to the kidneys and result in acute renal injury. Excessive furosemide use can cause volume depletion and decreased blood flow to the kidneys and result in acute renal injury. ACE-Inhibitors reduce the blood flow through the kidney and may result in acute renal injury. Co-morbidities like HTN, DM, and HIV can damage the kidneys and cause renal failure.
Bilirubin, SGOT/SGPT	Mild elevations may suggest that pressure and fluid are building up in the liver.
Electrolytes	**Sodium:** If it is <135 then could suggest volume overload. **Potassium:** Often low in patients on lasix. Heart failure patients with low potassium are much more vulnerable to fatal heart rhythms than patients without heart failure. **Bicarbonate:** Acidosis can mean that not enough blood and O2 are being delivered to the tissues so they respond by making lactic acid.

1.2.4.1.1 Chest Radiography

Radiographic Finding	Clinical Interpretation
Enlarged cardiac silhouette	Cardiomyopathy or pericardial effusion
Blunting of costovertebral angle	Pleural effusion
Bilateral interstitial infiltrates	Pulmonary edema

1.2.4.1.2 Echocardiography

Echocardiographic Finding	Clinical Interpretation
Enlarged left and/or right ventricles	Cardiomyopathy
Valvularvegetation (mitral / aortic)	RHD or endocarditis
Mitral Stenosis	RHD
Pericardial effusion	Tuberculous pericarditis

Please refer to the echocardiographic curriculum for greater detail

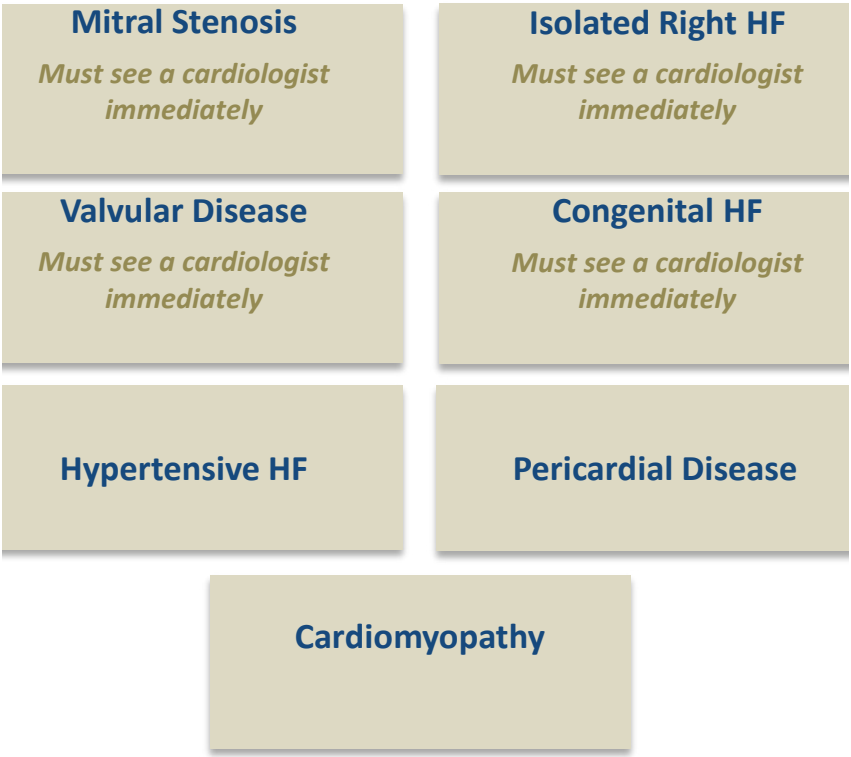
1.2.5 IMPRESSION

1.2.5.1 Diagnosis

Remember that other diseases cause volume overload. The DH nurse must confirm that the patient's clinical presentation is consistent with heart failure. Based on the information gathered decide if:

Patient DOES NOT have Heart Failure	Patient DOES have Heart Failure
Stop	*Continue*

Based on the information gathered, decide what type of heart failure the patient has:


Mitral Stenosis
Must see a cardiologist immediately
Isolated Right HF
Must see a cardiologist immediately
Valvular Disease
Must see a cardiologist immediately
Congenital HF
Must see a cardiologist immediately
Hypertensive HF
Pericardial Disease
Cardiomyopathy

1.2.5.1.1 NYHA Class

The NYHA Class helps you understand how sick the patient is. Specifically it tells you who is stable enough to continue outpatient management and who should be evaluated by a physician in the hospital.

CAUTION!! Take note of these situations where standard therapies are contraindicated, before proceeding!

1.2.6 PLAN

CONDITIONS THAT REQURE DIFFERENT MANAGEMENT	
Pregnancy	Never use ACE-Inhibitors, or Coumadin in pregnant women. Labetalol is the preferred beta-blocker for pregnant women. Avoid atenolol due to risk of low birth weight. All women of reproductive age should be referred for family planning.
Creatinine	Check creatinine. If it doubles or is > 200 µmol/L, then stop ACE-Inhibitors, spironolactone, digoxin. Consider reducing or holding furosemide.
Tachycardia	Sinus rhythm – NYHA 3-4 Do not start a beta-blocker. This will drop cardiac output

CONDITIONS THAT REQURE DIFFERENT MANAGEMENT	
	abruptly. Consider if patient needs referral to District Hospital. If referral is not necessary, continue with outpatient management.
	Atrial fibrillation – NYHA 3-4 Cautiously give 1 dose beta-blocker and transfer to district hospital.
Bradycardia – Hr< 60	Do not start a beta-blocker. This will induce heart block. Consider if patient needs referral to District Hospital. If referral is not necessary, continue with outpatient management.
Hyperkalemia	If potassium > 5.5 mEq/L, stop ACE-Inhibitors and spironolactone and treat hyperkalemia. Consider if patient needs referral to District Hospital. If referral is not necessary, continue with outpatient management.

1.2.6.1 Emergencies

Inability to lie flat, dyspnea at rest, SBP < 80 or > 180, pulse < 40 or > 120, oxygen saturation < 90%, respiratory rate > 24

Decompensated(SBP > 80, warm extremities, not confused, good urine output)

- Volume Overload: Lasix 40 IV x 1. If no improvement in 30 minutes, give 80 IV x1
- Do not initiate beta-blockers unless patient has RHD
- Check urea/Cr, potassium, CBC, other electrolytes
- If SBP > 180, lower BP with ACE-Inhibitor, hydralazine, or calcium channel blocker
- TRANSFER TO DISTRICT HOSPITAL

Decompensated and Cardiogenic Shock (SBP > 80, warm extremities, not confused, good urine output)

- Use 1-3 above.
- Add digoxin 0.125 mcg to therapy above to improve contractility
- TRANSFER TO DISTRICT HOSPITAL

1.2.6.2 Volume Status Management

- Hypovolemia: Decrease or stop furosemide.
- Euvolemia: Maintain furosemide.
- Hypervolemia:

NYHA 1 or 2: Start or increase oral furosemide.

NYHA 3 or 4: This is an emergency! See above.

Initial Dose (Adult)	Dose Adjustment				Maximum Dose
	Hypovolemia	**Euvolemia**	**Moderate Hypervolemia**	**Severe Hypervolemia**	
20 - 40 mg 1x/day	Stop all diuretics, consider giving fluid.	May attempt to decrease dose unless starting or increasing B-blockers	Double current dose or add second agent	Admit and give IV diuresis	120 mg 2x/day

1.2.6.3 Blood Pressure Management

Low Ejection Fraction < 40%

1. Titrate the following in a step-wise fashion until the SBP is 90-100:
    1. ACE-Inhibitors and/or Beta-blockers: 1st Line
    2. Hydralazine &IsosorbideDinitrate: 2nd Line
    3. Spironolactone: 3rd Line

Normal Ejection Fraction > 40%

2. Use the following medications to reduce the SBP to <140:
    1. ACE-Inhibitors: 1st Line*
    2. If unable to use ACE-i, reduce blood pressure as you would with patients who do not have heart failure.

1.2.6.4 Atrial Fibrillation Management

Most important in RHD & cardiomyopathy

1. If HR > 90 and SBP > 100, start beta-blocker
2. If HR > 90 and SBP < 100, start digoxin
3. Use aspirin to help prevent stroke

Most important for cardiomyopathy

1.2.6.5 Medications with Mortality Benefit

The patient should be on 2 of the following classes of drugs:

1. ACE-Inhibitors – 1st choice
2. Beta-blockers: 1st choice

If patient has contraindications to ACE-Inhibitors and/or Beta-blockers try the following:

3. Hydralazine &IsosorbideDinitrate: 2nd choice
4. Spironolactone: 3rd choice

Beta-Blocker			
	Starting Dose	**Dose Change**	**Target Dose**
Carvedilol	3.125-6.25 mg 2x/day	***3.125-6.25 mg 2x/day***	***25 mg 2x/day***
Atenolol*	12.5 mg 1x/day	12.5 mg 1x/day	50 mg 1x/day
ACE-inhibitor			

	Starting Dose	Dose Change	Target Dose
Lisinopril	5 mg 1x/day	***5 mg 1x/day***	***20 mg 1x/day***
Captopril	12.5 mg 3x/day	12.5 mg 3x/day	50 mg 3x/day
Enalapril	2.5 mg 2x/day	2.5 mg 2x/day	10–20 mg 2x/day
Hydralazine/isosorbidedinitrate (Contraind to B-Blocker or Ace-Inhibitor)			
	Starting Dose	**Dose Change**	**Target Dose**
Hydralazine	25 mg 3x/day	***25 mg 3x/day***	***50 mg 3x/day***
Isosorbide	10 mg 3x/day	10 mg 3x/day	30 mg 3x/day
Beta-Blocker			
	Starting Dose	**Dose Change**	**Target Dose**
Spironolactone	12.5-25 mg 1x/day	***12.5 mg 1x/day***	***25 mg 1x/day***

1.2.6.6 Anti-Platelet Management

Use Aspirin 100mg in any patient with cardiomyopathy, RHD, atrial fibrillation, any valvular or congenital heart disease.

1.2.6.7 Additional Targeted Therapy for specific types of HF

Patients with these conditions should be evaluated by a cardiologist within 6 months.

1.2.6.7.1 Mitral Stenosis

1st Line: Beta-blocker, Titrate to goal HR = 50 - 60 and SBP ≥ 90.

It is ok to start a beta-blocker in a decompensated patient.

2nd Line: Digoxin can be used in patients with SBP < 90 who need heart rate lowered.

If patient has atrial fibrillation then manage per section 8.4 and section 10

Provide Secondary Penicillin Prophylaxis (see below). If patient has an allergic reaction -> give epinephrine 1 amp (0.3mg IM) and call the physician!

Female 15- 49: Refer for family planning

Close follow-up for surgical planning

Secondary Penicillin Prophylaxis			
Preparation	**Route**	**Pediatric dosing (<15 yo or < 20kg)**	**Adult**
Benzathine Penicillin G	IM	600,000 units every 4 wks	1.2 million units every 4 wks
Penicillin V	Oral	250mg 2x/day	500mg 2x/day

1.2.6.7.2 Valvular Heart Disease (not RHD)/Congenital/Right Heart Disease

- Unless there is an obvious cause of patient's valvular disease, treat as RHD.
- Evaluate for TB.
- Check a CXR to make sure that a patient does not have isolated right heart disease from pulmonary disease
- Provide Penicillin Prophylaxis
- Female 15 - 49: Refer for family planning
- Close follow-up for surgical planning

1.2.6.8 Routine Investigations

FIRST VISIT	EVERY VISIT	EVERY 3-6 MONTHS	ANNUALLY
❑ Echocardiography ❑ Chest X-Ray ❑ Creatinine & potassium (if available) ❑ Random blood glucose & HbA1c (if available) ❑ Pregnancy Test	❑ Creatinine & Potassium ❑ *** ❑ if diuretics or ACE-Inhibitors changed at the last visit. ❑ ***	❑ Creatinine ❑ *** ❑ If taking diuretics, even if no changes made at the last visit. ❑ ***	❑ Echocardiography ❑ *** ❑ If there has been a significant clinical change. ❑ ***

1.2.6.9 Follow-Up

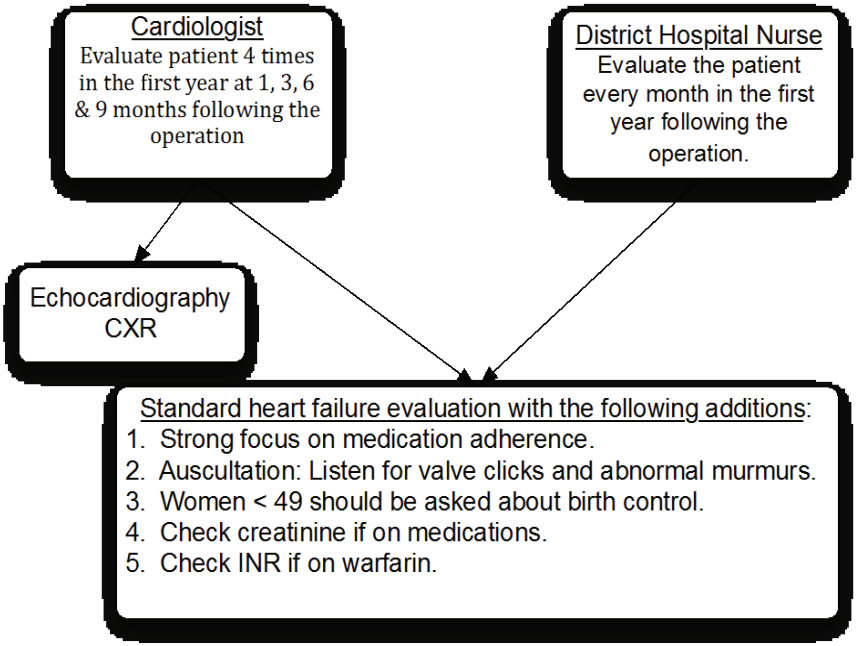
	CLASS I OR II HEART FAILURE, EUVOLEMIA	BORDERLINE SYMPTOMS (CLASS II-III), HYPERVOLEMIA, NEW RENAL FAILURE,
Medication Change	Return in 2-4 weeks	Return in 1-2 weeks
Ace-Inhibitor Change	Check creatinine & potassium in 2-4 weeks	*Check creatinine & potassium in 1-2 weeks*
No Medication Change	Return in 3-4 months	Return in 2-4 weeks

1.2.7 EDUCATION

SYMPTOM MONITORING	
Hypervolemia:	Teach patients to double furosemide dose and come to clinc.
Hypovolemia:	Teach patient how to recognize symptoms and instruct patient to stop furosemide and come to clinic.
Hypotension:	If patient lightheaded, instruct to stop BP meds and come to clinic.
DIET	
Salt:	Instruct patient not to add salt to food.

1.2.8 POST-SURGICAL CARE

1.2.8.1 Early Follow-Up



1. If any of the following are suspected, call the cardiologist and refer to the district hospital:

- New Heart Failure
- Sternal Wound Infection and Dehiscence
- Pericardial Tamponade
- Endocarditis
- New Arrhythmia

2. All post-surgical RHD should be on penicillin prophylaxis.

1.2.8.2 Late Follow-up

Every 3-4 months in the District Hospital

1. Notify the cardiologist and transfer patients to the district hospital for the following problems:

- Fever (>38 °C) in a patient with a prosthetic heart valve: Concerning for endocarditis
- New murmur is a patient with a mechanical heart: Concerning for valve thrombosis or valve dehiscence

1.2.9 ANTI-COAGULATION MANAGEMENT

Warfarin

1. Refer patient to the district hospital to start warfarin for the following:

Indications	GOAL INR	DURATION OF THERAPY
PROSTHETIC VALVES		
Bioprosthetic Tricuspid Valve	2.5 – 3.0	***3 months***
Mechanical Aortic Valve	2.5 – 3.0	Lifelong
Mechanical Mitral Valve	3.0 – 3.5	Lifelong
Mechanical Tricuspid Valve	3.0 – 3.5	Lifelong
OTHER INDICATIONS		
Mitral stenosis and atrial fibrillation	2.0 – 2.5	Lifelong
Ventricular thrombosis	2.0 – 2.5	Lifelong
Deep vein thrombosis	2.0 – 2.5	3 months

INR	ACTION
Greater than 5	Hospitalize
Greater than goal, but less than 5	Decrease warfarin by 0.5 mg – 1.0 mg
At goal	Continue current dose
Less than goal, but greater than 1.5	Increase warfarin by 0.5mg – 1.0mg
Less than 1.5	Hospitalize

2 HYPERTENSION GUIDELINES

2.1 Guiding principles

THE INITIAL VISIT

The initial visit plan emphasizes a systematic approach, which will help you:

1. **Establish that the patient has hypertension**

Patients get mistakenly labeled with hypertension during periods of acute stress (i.e. infection) or when treated with certain medications.

Symptoms, risk factors, and physical exam findings raise suspicion for severe hypertension, but do not play a role in the diagnosis.

A diagnosis of hypertension is only made when:

- Systolic blood pressure>=140 mmHg OR
- Diastolic blood pressure >= 90 mmHg

Blood pressure needs to be elevated on two separate visits.

SYSTEMATIC APPROACH

This guide takes you through the following framework for each patient visit:

1. History
2. Vital Signs
3. Physical Exam
4. Lab Review
5. Impression
6. Plan

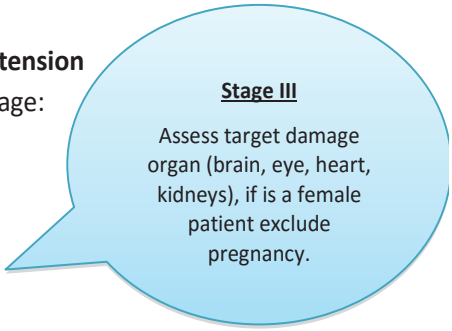
2. **Identify the cause of elevated blood pressure**

Decide whether the patient has essential or secondary hypertension(especially in young persons and children assess secondary cause).

3. **Assess the stage of hypertension**

a. Determine the patient's stage:

- I: 140/90 – 159/99
- II: 160/100 – 179/109
- III: > 180/110



THE FOLLOW-UP VISIT

The follow-up visit emphasizeson a systematic approach, which will help you:

1. Establish or confirm that the patient has hypertension
2. Identify or confirm the stage of hypertension
3. Assess medication compliance and hypertension control
4. Life style modification

2.2 The Initial Visit

This section emphasizes a systematic approach, which will help answer the following basic questions: 1. Isthis hypertension? 2. What caused the hypertension? 3. How severe is the hypertension?

PATIENT BACKGROUND

Review the following information before the patient visit, if available:

- How was the patient referred to the hypertension clinic?
- Is the diagnosis suspected or confirmed?
- Has the patient been started on anti-hypertensive treatment already?
- Has the patient co-morbidities?

2.2.1 HISTORY

2.2.1.1 Clinical History

2.2.1.1.1 Hypertensive urgency and Emergency

Urgency means that the patient has raised BP of more than 180/110 mmHg without associated organ damage, also find out if the patient has experienced any of the following emergency signs:

❑ Acute dyspnea	❑ Chest pain	❑ Headaches
❑ Vision Changes	❑ Flank pain	❑ Hematuria

2. If the patient has these symptoms, call the physician and initiate transfer. However you should complete the patient's workup(complete file, FBC, blood sugar, creatinine, potassium level, pregnant test if women child bearing age) and begin treatment before transferring.

2.2.1.1.2 Essential Hypertension

Generally asymptomatic

Determine if patient has symptoms that might suggest secondary hypertension.

2.2.1.1.3 Secondary Hypertension

Ask the patient the questions related to the following:

- Kidney Disease: Swelling, micturition frequency
- Anxiety: assess the causes of stress
- Pain: assess if the patient has pain
- Endocrinopathy: assess tremors, palpitations, weight loss?
- Cushing's: the face or abdomen larger while arms and legs are thinner?

2.2.1.1.4 Complications

Find out if the patient has experienced any of the following signs of end-organ damage:

Brain – Stroke

- Have you experienced any weakness on one side of the body?
- Have you ever had problems walking or speaking?

Eyes – Retinal Damage

- Is your vision blurred? or decrease sight

Heart – Left Ventricular Hypertrophy

- Do you become more tired than usual with daily activities?
- Are you short of breath laying flat or do you wake up in the night short of breath?

Kidney – Hypertensive Nephropathy

- Has a doctor or nurse ever told you that you have a problem with your kidneys?

2.2.1.1.5 Co-Morbidities

Find out if the patient has any of the following co-morbidities:

❑ HIV	❑ Kidney Disease
❑ Diabetes	❑ Pregnant or a history of pregnancy

2.2.1.1.6 Medications

Ask the patient if they are taking or have taken any of the following medicines now or in the past:

Medications that cause hypertension

- ❑ Oestrogens (Family Planning)
- ❑ Steroids(prednisolone)
- ❑ Amitriptyline
- ❑ Ibuprofen, diclofenac

Medications that treat hypertension

- ❑ Ace-Inhibitors(for example captopril)
- ❑ ARBs(Angiotensine Receptor Blockers: lozartan)
- ❑ HCTZ
- ❑ Calcium Channel Blockers
- ❑ Beta-blockers
- ❑ Hydralazine
- ❑ Methyldopa

2.2.1.2 Social History

Ask about the following:

Tobacco/Alcohol

- Do you drink alcoholic beverages? If so, how many per day or week?
- Do you smoke cigarettes? If so, how many every day or week?

Diet

- Do you add salt to your food?
- What foods do you eat most (i.e. vegetables, carbohydrates, protein)?

Socio-economic Situation

- Would it be difficult for you to come to the clinic 4 times a year?
- Are there people at home who can help you with treatment?

2.2.1.3 Family history

Ask about the family history:

Hypertension:

- Has anyone in your family been told they have hypertension?
- Has anyone in your family been told they have a problem with their heart?

2.2.2 VITAL SIGNS

Always review vital signs before the physical exam. They will almost always help you understand if a patient is sick and will provide important information about whether the patient should be referred to the district hospital.

Vital Signs	Notes
TEMPERATURE	Infection can increase or lower blood pressure!
HEART RATE	**Tachycardia:** May indicate that the patient has a secondary cause or complication of hypertension.
BLOOD PRESSURE	Should be done at initial visit and all follow-up visits.
RESPIRATORY RATE	RR > 24 may signal complications of hypertension like pulmonary edema.
O2 SATURATION	O2 Sat < 90% may signal pulmonary edema
WEIGHT	Should be done at initial visit and all follow-up visits. Increasing weights may signal fluid retention.

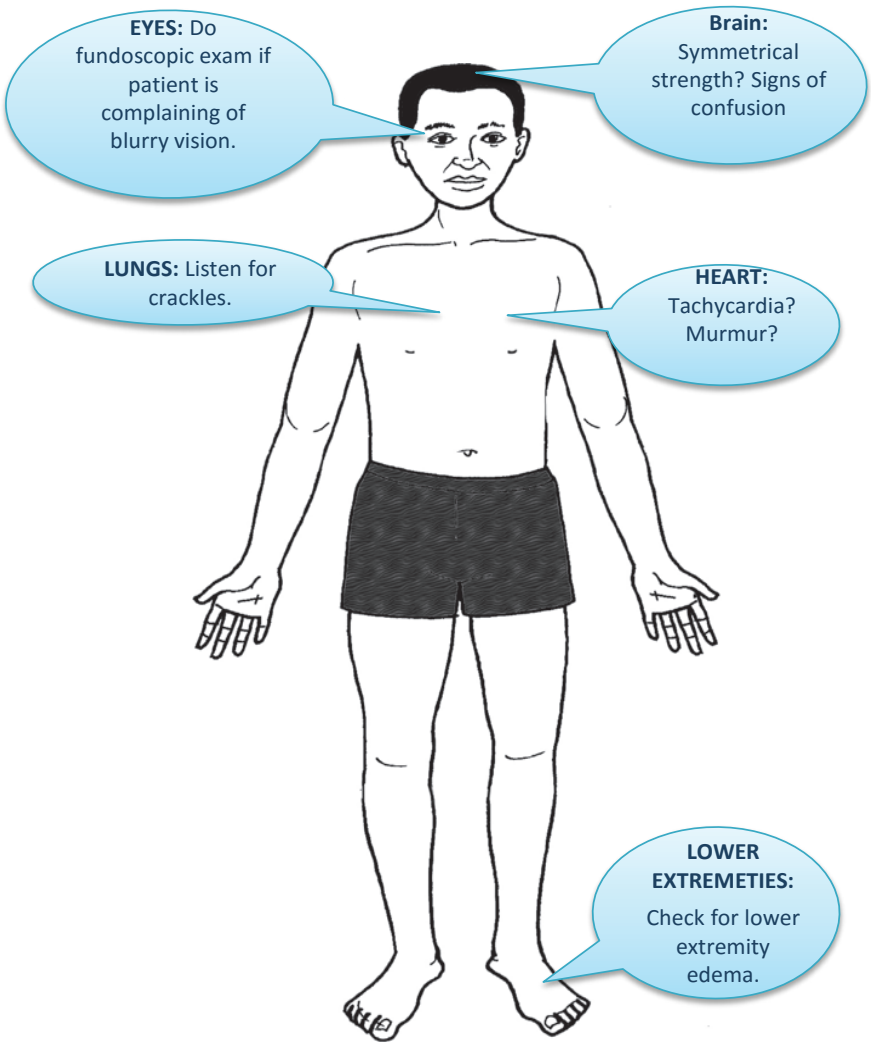
Blood Pressure Techniques

Stethoscope and cuffs

Patient: Seated for ten minutes
Arm: Same level of the heart
Cuff: lower edge 2-3 cm above brachial artery
Cuff:covers 40% of arm circumference

2.2.3 PHYSICAL EXAM

Observe the patient. Sometimes it is possible to determine severe side effects of hypertensive emergency simply by observation. Then check the following:



2.2.4 LAB REVIEW

LAB	WHEN	Notes
Fingerstick Blood Glucose (FBG)	Initial Visit	Diabetes and hypertension often exist together.
Creatinine	Initial Visit Every Year	Progressive renal failure is both a cause and consequence of hypertension. Ace-Inhibitors: Can cause acute renal failure. Cr > 150 umol/L is a risk factor for stage I HTN.
Urine Dipstick	Initial Visit	Protein in the urine is a risk factor in stage I HTN.
HIV	Initial Visit	HIV and ARVs can damage kidneys and cause hypertension.
Pregnancy Test	Initial Visit and as Indicated	The consequences of hypertension in pregnant women are grave.
NFS	Only as indicated	WBC: Infection may cause a high or low blood pressure!
Electrolytes	Only as indicated	Potassium: Low or high value could suggest a secondary cause of hypertension.

2.2.5 IMPRESSION

If patient has already been diagnosed and treated for hypertension, skip to par 2.2.6

2.2.5.1 Diagnosis

If the BP is between 140/80 – 160/89 mmHg (Stage1), you must ask the patient to return for afollow-up visit before you candiagnose hypertension.

Use the following boxes to guide your decision:

HYPERTENSION CONFIRMED IF	HYPERTENSION CONFIRMED IF ON 2 VISITS	NOT HYPERTENSION
BP> 160/100 mmHg	**BP> 140/90**	**BP< 140/90 mmHg**
	BP< 159/99 mmHg	
Go to "Type of Hypertension"	*Schedule follow up visit or go to Type of Hypertension*	*Stop hypertension workup*

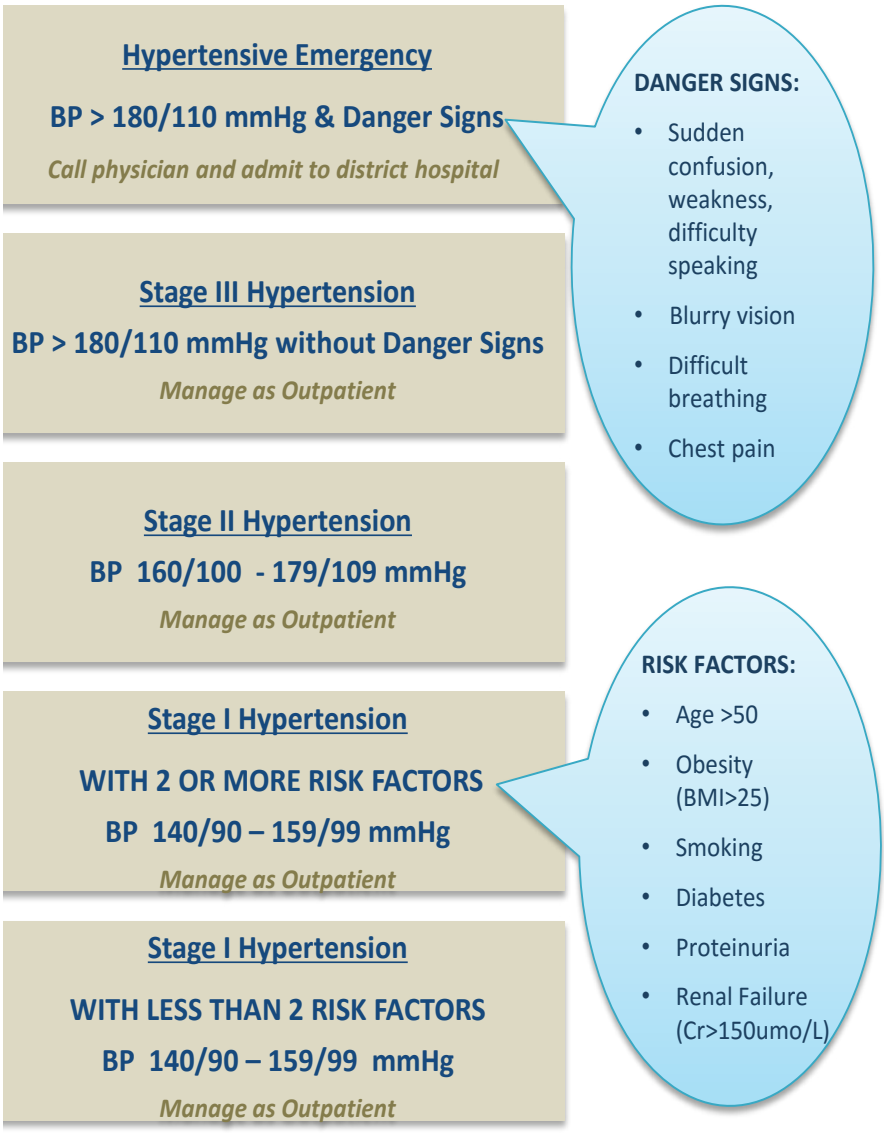
2.2.5.2 Type of Hypertension

Based on the information gathered in the exam, decide whether the patient has.

Essential or "Lone" Hypertension	Secondary Hypertension

2.2.5.3 Hypertension stage and danger sign

To know whether the patient should be transferred to the district hospital or started on treatment, choose the appropriate next step below by considering thehypertension stageand danger signs.


Hypertensive Emergency
BP > 180/110 mmHg & Danger Signs
Call physician and admit to district hospital
Stage III Hypertension
BP > 180/110 mmHg without Danger Signs
Manage as Outpatient
Stage II Hypertension
BP 160/100 - 179/109 mmHg
Manage as Outpatient
Stage I Hypertension
WITH 2 OR MORE RISK FACTORS
BP 140/90 – 159/99 mmHg
Manage as Outpatient
Stage I Hypertension
WITH LESS THAN 2 RISK FACTORS
BP 140/90 – 159/99 mmHg
Manage as Outpatient
DANGER SIGNS:
• Sudden confusion, weakness, difficulty speaking
• Blurry vision
• Difficult breathing
• Chest pain
RISK FACTORS:
• Age >50
• Obesity (BMI>25)
• Smoking
• Diabetes
• Proteinuria
• Renal Failure (Cr>150umo/L)

2.2.6 PLAN

CAUTION!! Take note of these situations where standard therapies are contraindicated, before proceeding!

CONDITIONS THAT REQURE DIFFERENT MANAGEMENT	
Pregnancy	Ace-Inhibitors, Atenolol, and HCTZ should not be used in pregnant women. Refer all pregnant women to the pre-natal visit.
Renal Failure	Remember that acute kidney injury and chronic kidney disease are managed differently! ACE-Inhibitors (Ace-I) ○ If Cr > 200umol/L, then ACE-I are contraindicated ○ If Cr increases by 50% hold ACE-I. Re-check Cr within 1 month.
Bradycardia – Hr< 60	Do not start a beta-blocker. This will induce heart block. Consider admission to District Hospital. If referral is not necessary, continue with outpatient management.
Hyperkalemia	If potassium > 5.5 mEq/L, stop ACE-Inhibitors and spironolactone and treat hyperkalemia. Consider admission to District Hospital. If referral is not necessary, continue with outpatient management.
Hypokalemia	Hold furosemide if KCl< 3.0. Consider admission to hospital for potassium repletion.
HIV Positive	Be sure to refer to ID clinic because patient may need ARVs changed.

2.2.6.1 Hypertensive Emergency

BP > 180/110 with evidence to damage to brain, eye, heart, kidneys or fetus

1. Give medication every 30 minutes

2. Call physician and admit to hospital

3. Check blood pressure every thirty minutes until transfer

*****DO NOT LOWER THE BLOOD PRESSURE MORE THAN 25%*****

Medication	Dosing	Notes
Captopril	25 mg orally	Contraindicated in pregnancy and renal failure (Cr≥µmol/L)
Nifedipine (immediate release)	10 mg orally	
Hydralazine	25 mg orally or 20mg IV	
Furosemide	40 mg orally or 20mg IV	If evidence of pulmonary congestion

2.2.6.2 Treat essential Hypertension

STAGE 1 (BP 140/90 – 159/99) WITHOUT RISK FACTORS

Encourage lifestyle modifications

If unable to achieve a blood pressure < 140/90 in 12 months, start one antihypertensive

Monitor every 3 months

STAGE 1 (BP 140/90 – 159/99) WITH RISK FACTORS:

- Encourage lifestyle modifications
- If unable to achieve a blood pressure <140/90 in 3 months, start one antihypertensive
- Monitor every 3 months

Lifestyle Modifications:
- Salt Reduction
- Weight Loss (if BMII > 25)+Physical exercise
- Smoking Cessation
- Alcohol Cessation

STAGE 2 (BP 160/100 – 179/109):

Start two hypertensive medications

Encourage lifestyle modifications

Follow-up in 1 month

STAGE 3 (BP > 180/110) without danger signs:

- Start two anti-hypertensive drugs immediately.
- Encourage lifestyle modifications.
- Follow-up in 2 weeks

	Medication	**Starting Dose**	Notes
1st Line (Thiazide diuretics)	**HCTZ**	12.5mg oral 1x/day	Can cause dehydration and hypokalemia. Contraindicated in pregnancy!
2nd Line (Calcium channel Blockers)	**Amlodipine**	5mg oral 1x/day	Can cause lower extremity edema and worsen volume overload. Can cause dizziness/lightheadedness. Safe in pregnancy.
	Nifedipine (Sustained Release)	20mg oral 2x/day	
3rd Line (ACE-Inhibitors)	**Lisinopril**	10mg oral 1x/day	Can cause acute kidney injury, hyperkalemia, angioedema, cough Contraindicated in pregnancy!
	Captopril	12.5mg oral 3x/day	
4th Line (Beta-blockers)	**Atenolol**	12.5mg oral 1x/day	Contraindicated if HR < 60 bpm Atenolol should not be used in pregnancy. Carvedilol is safe in

	Carvedilol	6.25mg oral 2x/day	pregnancy.
5th Line	**Hydralazine**	25mg oral 3x/day	Headaches are common. Safe in pregnancy.

2.2.6.2.1 Hypertension with complications

Diabetes:

ACE-Inhibitors are first line.

Proteinuria:

ACE-Inhibitors are first line.

Cardiomyopathy:

Ace-Inhibitors, Beta-blockers, Spironolactone are preferred.

Chronic Renal Failure:

- 1st Line: Furosemide, Amlodipine or Nifedipine
- 2nd Line: Beta-blockers and hydralazine

ACE-INHIBITORS

In the short term, ACE-Inhibitors decrease blood flow to the kidneys. If you start an ACE-Inhibitor or increase the dose **you must check a creatinine within 30 days.**

2.2.6.2.2 Hypertension in pregnancy

Chronic Hypertension: Less than 20 weeks gestation

Treat according to 'essential hypertension' guidelines. Calcium-Channel Blockers, Hydralazine, Carvedilol, and Methyldopa are options.

- **Preeclampsia**: 140/90 to 150/99 mmHg & greater than 20 weeks gestation. Refer to ophthalmologist if worsening vision or abnormal fundoscopic exam.
- **Severe Preeclampsia**: > 160/100 mmHg & greater than 20 weeks gestation. Call physician immediately and admit to hospital. Give hydralazine 10 IV while waiting on transfer.
- **Eclampsia**: Patient having seizures. Call physician to help with immediate delivery of the baby. Give magnesium 2g IV if physician not available.

2.2.7 ROUTINE INVESTIGATIONS

FIRST VISIT	EVERY VISIT	EVERY 3-6 MONTHS	AT LEAST ONCE
❑ Creatinine & Potassium ❑ Random blood glucose ❑ & HbA1c (if available) ❑ Pregnancy Test	❑ Creatinine & Potassium ❑ *** ❑ if diuretics or ACE-Inhibitors changed at the last visit. ❑ ***	❑ Creatinine ❑ ❑ *** ❑ If taking diuretics, even if no changes made at the last visit. ❑ ***	❑ Echocardiography ❑ *** ❑ ONLY FOR PATIENTS WITH: ❑ SBP > 180 or ❑ DBP > 11 ❑ ***

2.2.8 FOLLOW-UP SCHEDULE

	Stage 1 HTN	Stage 2 or 3 HTN
Medication Change	Return in 4-6 weeks	Return in 2-4 weeks
Ace-Inhibitor Change	Check creatinine & potassium in 2-4 weeks	Check creatinine & potassium in 1-2 weeks
No Medication Change	Return in 3-4 months	Return in 2-4 weeks

2.2.9 EDUCATION

SYMPTOM MONITORING	
Asymptomatic:	Teach patients that hypertension usually does not cause symptoms.
Emergency Symptoms:	Instruct patient that if they experience blurry vision, chest pain, or shortness of breath related to hypertension this is an emergency.
MEDICATION	
Medication Effect:	Explain that lower blood pressure won't make the patient feel better. It will prevent complications like HF, CKD, and stroke.
Goal:	Do not stop medication once control is achieved. You must continue taking medication to keep BP low.
DIET	
Diet Counseling:	Advise patients not to add salt to food.

2.3 The Follow-up Patient Visit

This section emphasizes a systematic approach, which will helpyou: 1. Confirm that the patient has hypertension; 2.Assess medication adherence; and 3. Assess blood pressure control.

1. History (See2.2.1)

2. Vital Signs (See2.2.2)

3. Physical Exam (See 2.2.3)

4. Lab Review (See 2.2.4)

Use the same information from the initial visit for HISTORY, VITAL SIGNS, PHYSICAL EXAM and LAB REVIEW in the follow up visit.

2.3.1 IMPRESSION

2.3.1.1 Medication Adherence

Evaluate the patient's ability to follow the treatment plan from last visit.

2.3.1.2 Blood Pressure Control

Review the patient's recorded blood pressure last visit.

Good Control

Blood Pressure < 140/80

NO TITRATION

Fair Control

Blood Pressure 140/90 – 159/99

ONE TITRATION

Poor Control

Blood Pressure >160/100 – 179/109

TWO TITRATIONS

Very Poor Control

Blood Pressure >180/110 WITHOUT organ damage

TWO TITRATIONS

Emergency

Blood Pressure > 180/110 WITH organ damage

HOSPITAL ADMISSION

2.3.2 PLAN

*****IMPORTANT*****

BEFORE CHANGES ARE MADE TO HYPERTENSION THERAPY

PLEASE CONSIDER THE FOLLOWING FROM THE INITIAL VISIT

CONDITIONS THAT REQUIRE DIFFERENT MANAGMENT

See par 1.2.6 Above

EMERGENCIES

See Par 1.2..6.1 Above

2.3.2.1 Hypertensive therapy

Determine the patient's quality of control and the number of titrations required. Use the chart below to guide medication changes.

	Medication	**Titration Dose**	Maximum Dose	Notes
1st Line (Thiazide diuretics)	**HCTZ**	12.5mg oral 1x/day	25mg oral 1x/day	Can cause dehydration and hypokalemia. Contraindicated in pregnancy!
2nd Line (Calcium channel Blockers)	**Amlodipine**	5mg oral 1x/day	10mg oral 1x/day	Can cause lower extremity edema and worsen volume overload. Can cause dizziness/lightheadedness. Safe in pregnancy.
	Nifedipine (Sustained Release)	20mg oral 2x/day	60mg oral 2x/day	
3rd Line (ACE-Inhibitors)	**Lisinopril**	10mg oral 1x/day	40mg oral 1x/day	Can cause acute kidney injury, hyperkalemia, angioedema, cough Contraindicated in pregnancy!
	Captopril	12.5-25mg oral 3x/day	50mg oral 3x/day	
4th Line (Beta-blockers)	**Atenolol**	12.5-25mg oral 1x/day	100mg oral 1x/day	Contraindicated if HR < 60 bpm Atenolol should not be used in pregnancy. Carvedilol is safe in pregnancy.
	Carvedilol	6.2512.5mg oral 2x/day	25mg oral 2x/day	
5th Line	**Hydralazine**	25mg oral 3x/day	100mg oral 3x/day	Headaches are common. Safe in pregnancy.

IMPORTANT

AFTER CHANGES ARE MADE TO HYPERTENSION THERAPY

PLEASE CONSIDER THE FOLLOWING FROM THE INITIAL VISIT

HYPERTENSION WITH COMPLICATIONS

See par 1.2.6.2.1 Above

HYPERTENSION IN PREGNANCY

See par 1.2.6.2.2. Above

ROUTINE INVESTIGATIONS

See par 1.2.7 Above

FOLLOW-UP

See par 1.2.8 Above

EDUCATION

See par 1.2.9 Above

2.4 Summary table

Type of patients	Diagnosis confirmation	Management of cases without risk factors/danger signs	Management of cases with risk factors/danger signs
Not Hypertension **<140/90**	Hypertension not diagnosed	Encourage lifestyle modifications	Encourage lifestyle modifications
Stage 1 Hypertension : **140/90 – 159/99**	Schedule a 2nd follow up visit to confirm Hypertension	Manage as outpatient - Encourage lifestyle modifications. If unable to achieve a blood pressure < 140/90 in 12 months, start one antihypertensive. Monitor every 3 months	Manage as outpatient - Encourage lifestyle modifications. If unable to achieve a blood pressure <140/90 in 3 months, start one antihypertensive. Monitor every 3 months
Stage 2 Hypertension : **160/100 – 179/109**	Hypertension confirmed at first measurement	Manage as outpatient - Encourage lifestyle modifications, Start two antihypertensive immediately. Follow-up in 1 month	Manage as outpatient - Encourage lifestyle modifications, Start two antihypertensive immediately. Follow-up in 1 month
Stage 3 Hypertension Emergency: **> 180/110**	Hypertension confirmed at first measurement	Manage as outpatient – Encourage lifestyle modification, Start two hypertensive immediately. Follow up in 1 month	Call physician and admit to district hospital. Medications every 30 mn. Check blood pressure every thirty minutes until transfer. Encourage life style modifications. Follow up in 2 weeks. ***DO NOT LOWER THE BLOOD PRESSURE MORE THAN 25%***

2.5 Children Hypertension Guidelines:

Definition

Hypertension is defined as systolic and/or diastolic blood pressure ≥ the 95th percentile for gender, age and height percentile on at least three consecutive occasions.

A sustained blood pressure of > 115/80 is abnormal in children between 6 weeks and 6 years of age.

Stage 1 hypertension*:*

SBP or DBP from 95th to 99th percentile + 5 mm Hg

In adolescents if BP>140/90 mmHg, even < 95th percentile

Stage 2 hypertension*: SBP or DBP greater than 99th percentile + 5 mm Hg*

Hypertensive urgencyis defined as a significant elevation of blood pressure without accompanying end organ damage.

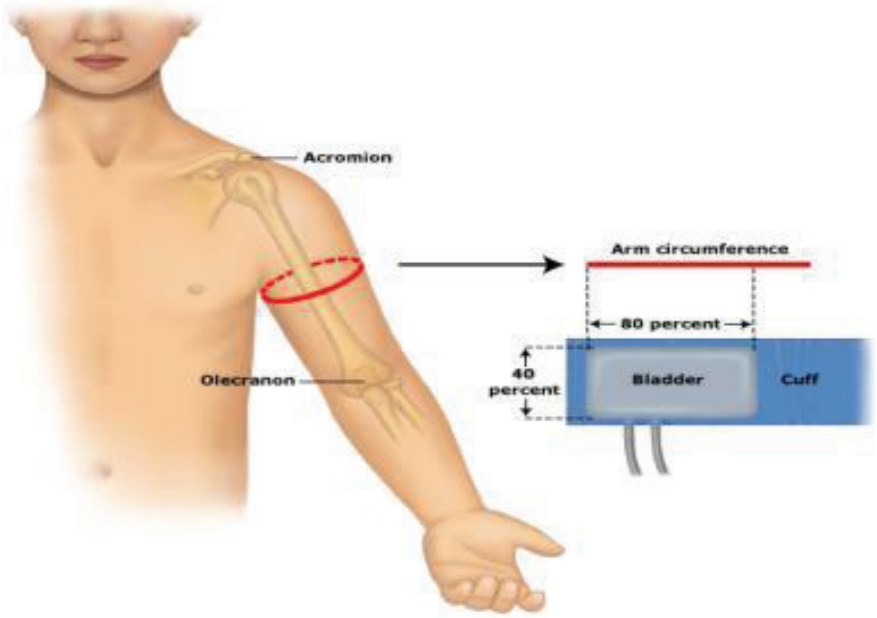
- *Signs of complications are:* Encephalopathy, convulsions, retinal haemorrhages or blindness

Causes

Generally**,** severe hypertension suggests renal disease

Accurate measurement of BP:

- Use the widest cuff that can be applied to the upper arm
- The cuff bladder must encircle at least 80% of the upper arm and should cover at least 75% of the distance between the elbow and the shoulder joints
- It is better to use a cuff that is slightly too large than one that is too small (see below)



Most common causes of secondary hypertension by age

New born:

- Renal abnormalities
- Coarctation of the aorta
- Renal artery stenosis
- Renal artery or vein thrombosis

First year:

- Coarctation of the aorta
- Renal vascular disease
- Tumor (Neuroblastoma…)
- Medications (steroids…)

1-6 years:

- Renal vascular diseases
- Renal parenchymal diseases (glomerulonephritis, hemolytic-uremic syndrome…)
- Coarctation of the aorta
- Medications (steroids)
- Essential hypertension
- Tumor

6-15 years:

- Renal vascular diseases
- Renal parenchymal diseases (glomerulonephritis, hemolytic-uremic syndrome…)
- Essential hypertension
- Coarctation of the aorta
- Endocrine causes
- Nutritional causes (obesity)
- Tumor (pheochromocytoma)

Signs and symptoms:

- Oedema, haematuria, proteinuria
- Headache, convulsions, coma and visual symptoms
- Acute heart failure and pulmonary oedema
- Acute respiratory distress,
- Some children may be asymptomatic

Blood pressure in children correlates with body size and increases with age:

Age of child	95th Percentile of Systolic and Diastolic Blood Pressure	
	First 12 hours	First week
newborn prem	65/45 mmHg	80/50 mmHg
newborn fullterm	80/50 mmHg	100/70 mmHg
	Systolic mmHg	Diastolic mmHg
6 weeks–6 years	115	80
8 years	120	82
9 years	125	84
10 years	130	86
12 years	135	88
14 years	140	90

95th percentile of systolic and diastolic BP in relation to the height ofchild:

Height cm	Systolic mmHg	Diastolic mmHg
100	114	70
110	116	72
120	118	74
130	120	74
140	125	75
150	130	75
160	135 (131)	77
170	140 (133)	80
180	145 (135)	83

Diagnosis:

- Clinical
- Investigations: FBC, urinalysis, urea, creatinin, Electrolytes (Na+, K+)proteinuria, renal ultrasound + doppler,
- ECG
- Echocardiogram, fundoscopy

Note: Investigations should be based on etiology.

Management:

Non-pharmacological management:

- Lifestyle modification for patients with mild hypertension
- Treatment is specific to the type of hypertension

2.5.1 Acute hypertension:

Definition: Is hypertension of sudden onset

Causes:

- Diseases of the kidneys, arteries, heart or endocrine system
- Pregnancy

Signs and Symptoms:

- Oedema, haematuria, proteinuria, respiratory distress, cyanosis and apnoea **of acute onset**

Diagnosis:

- Clinical
- Investigation: see above

Management:

Non-pharmacological treatment

- Admit patient to pediatric high dependency unit
- Monitor BP every 60 minutes for 24 hours
- Insert peripheral line for drugs
- Bed rest
- Control fluid intake and output (restriction)
- Restrict dietary sodium
- Manage end organ effects

Pharmacological treatment:

- Do not combine drugs of the same class
- Fusemide, IV, 1–2 mg/kg as a bolus slowly over 5 minutes
- If oliguric, maximum dose: 5 mg/kg/dose
- Nifedipine 0.25-0.5mg/kg (max: 10mg) sublingual. May be repeated 6 hours later, thereafter every 12 hours OR amlodipine, oral, 0.2 mg/kg/dose daily. OR
- **Hydralazin**0.2-0.6mg/kg/dose. The dose can be repeated every 4 hours.
- Refer the patient to a specialist

Recommendations:

- For acute or chronic hypertension blood pressure needs to be lowered cautiously
- Aim to reduce the SBP slowly over the next 24 - 48 hours
- Do not decrease BP to < 95th percentile in first 24 hours
- Advise a change in lifestyle
- Institute and monitor a weight reduction programme for obese individuals
- Regular aerobic exercise is recommended in essential hypertension
- Dietary advice
- Limit salt and saturated fat intake
- Increase dietary fiber intake

2.5.2 CHRONIC HYPERTENSION

Definition: Chronic hypertension is a condition where your blood pressure (BP) is usually higher than normal, over a long time. Two types, essential and secondary.

Stages:

- Prehypertension: This is a stage used to identify people who are at risk of getting hypertension, patient has SBP of 120 to 139 mmHg, or a DBP of 80 to 89 mmHg, or both
- Stage I: Patient has SBP of 140 to 159 mmHg, or a DBP of 90 to 99 mmHg, or both
- Stage II: Patient has SBP higher than or equal to 160 mmHg, or a DBP higher than or equal to 100 mmHg, or both

Causes:

- Diseases or problems with thyroid gland, adrenal glands, or kidneys
- Abusing drugs such as amphetamines, cocaine, and nicotine
- Being around certain chemicals, such as lead or mercury
- Drinking alcohol, using too much salt
- Medicines, such as steroids, birth control pills,

Signs and symptoms:

- Blurring of vision or loss of vision
- Chest pain
- Dizziness or fainting
- Mild to severe headache
- Sudden unexplained body weakness
- Breathing difficulties

Diagnosis:

- Clinical
- Investigations

- Urine tests strips for protein, blood.
- Blood urea, creatinine and electrolytes
- Chest X-ray, ECG and abdominal ultrasound focus on kidneys.

Management:

Similar to management of hypertension in adult

Pharmacological management:

- Diuretics:
    - Hydrochlorthiazide, oral, 0.5–1 mg/kg/dose once daily .*May cause hypokalaemia.*

OR

    - Frusemide, oral, 0.5–1.5 mg/kg/dose 12–24 hourly Max 6 mg/kg/day. *May cause hypokalaemia.*

OR

    - Spironolactone, oral, 1–3 mg/kg/day 12–24 hourly.*May cause hyperkalaemia.*

- Vasodilators:
    - Hydralazine, oral, 1–6 mg/kg/daily dose 8-12 hourly Max 200 mg/day (Causes tachycardia and fluid retention)
- ***α-blocker:*** indicated to patients with phaeochromocytoma-associated hypertension.
    - Prazosin, oral, 0.1–0.3 mg/kg/day 8–12 hourly Maximum 0.4 mg/kg/day.

Recommendations

- *Urgently refer s*evere hypertension in for specific diagnosis and treatment
- *Refer a*ll children with acute and chronic hypertension for specific diagnosis, planning of treatment and long-term follow-up
- *Treat p*ersistent cough with ACE inhibitor

3 ACQUIRED HEART DISEASE GUIDELINES

3.1 Acute Rheumatic Fever

Definition

This is an acute, systemic connective tissue disease in children related to an immune reaction to untreated group A Beta haemolytic streptococcus infection of the upper respiratory tract. The initial attack of acute rheumatic fever occurs in most cases between the ages of 3 and 15 years.

Cause

Auto-immune disease

Signs and symptoms (Revised Jones Criteria)

Major manifestations	**Minormanifestations**	**Group A Strep(GAS) Infection**
Carditis	Fever	GAS on throat swab (culture)
Arthritis	Arthralgia	Raised AntistreptolysinOtitre (ASOT)
Sydenham's Chorea	Prolonged P-R interval on ECG	Raised Antideoxyribonuclease B (Anti-DNase B)
Erythema marginatum	Raised ESR or CRP	
Subcutaneous nodules		

Criteria for ARF diagnosis according to WHO

- The first episode of ARF can be confirmed if:
- 2 MAJOR, or 1 MAJOR and 2 MINOR manifestations are present plus there is evidence of preceding Group A streptococcal infection.
- Recurrent ARF (with no RHD) can be confirmed if
- 2 MAJOR, or 1 MAJOR and 2 MINOR manifestations are present plus there is evidence of preceding Group A streptococcal infection.
- Recurrent ARF (with existing RHD) can be confirmed if
- 2 MINOR manifestations are present plus there is evidence of preceding Group A streptococcal infection.

Complication

Rheumatic heart disease

Investigations

- Throat swab for culture (positive throat culture of group A Streptoccocal infection)
- Raised ASOT/ASLO antibodies titre (Anti-streptolysin-0-titre – ASOT of 1:300)
- Anti DNase B
- FBC/ ESR/CRP
- Chest x-ray – features of cardiomegaly
- ECG
- Echocardiogram

Management

Persons with symptoms of ARF should be hospitalized to ensure accurate diagnosis, and to receive clinical care and education about preventing further episodes of ARF.

The diagnosis should include an initial echocardiogram used to help identify and measure heart valve damage.

Long-term preventative management should be organized before discharge.

All cases of ARF should receive:

- A single injection of Benzathine penicillin G (Extencilline):25,000–50,000 units/kg/dose, maximum 1.2 mega units dose

Or

- Oral Penicillin (Pen V) 25–50mg/kg/day in divided 3 doses for 10 days Or (Erythromycin 30-50mg/kg/day divided in 3 doses if penicillin allergy)

Symptomatic Treatment

Arthritis and fever

- Aspirin 75‑100mg/kg/day in 4‑6 divided doses. Continue treatment until fever and joint inflammation are controlled and then gradually reduced over a 2-week period. Add an antacid to reduce risk of gastric irritation
- Prednisolone 1-2mg OD for 2 weeks then taper for 2 weeks with good response begin
- Aspirin in the 3rd week and continue until 8th week tapering in the final 2 weeks

Chorea

- Most mild-moderate cases do not need medication
- Provide calm and supportive environment (prevent accidental self-harm)
- For severe cases: Carbamazepine per os

- <6 years: 10-20mg/kg/day divided in 3 doses
- 6-12 years: 400-800mg/day divided in 3 doses
- >12 years: 200mg x 2/day

OR

Valproic acid 20-30mg/kg/day divided in 2 doses; Duration: 2 weeks

Carditis

- Bed rest if in cardiac failure
- Anti-failure medication as above
- Anti-coagulation medication if atrial fibrillation is present
- Management plan when the acute episode is controlled administer the first dose of secondary prophylaxis
- Register the individual with the local health authority or RHD Program
- Provide disease education for the person with ARF and the family
- Understanding of ARF and RHD and risks of ARF recurrence
- Importance of regular secondary prophylaxis and medical review
- Recognizing own signs and symptoms of ARF and RHD
- Risks associated with future RHD (e.g. pregnancy, surgery and high level of aftercare)
- Importance of dental health
- Include an ARF diagnosis alert on computer systems and/or medical files (if applicable)
- Refer to local health facility for ongoing management
- Arrange dental review (and provide advice about endocarditis prevention)

Long-term Management

- Regular secondary prophylaxis (Recommended Secondary Prophylaxis Regimen)
- Regular medical review
- Regular dental review
- Echocardiogram (if available) following each episode of ARF, and routine echocardiogram:
- Every 2 years for children (sooner if there is evidence of cardiac symptoms)

Secondary prophylaxis

- Prevents the occurrence of GAS infections which can lead to recurrent ARF
- Reduces the severity of RHD (and can result in cure of RHD after many years)
- Helps prevent death from severe RHD
- Secondary prophylaxis is indicated for people who have:
- ARF confirmed by the Jones Criteria
- RHD confirmed on echocardiogram
- ARF or RHD not confirmed, but highly suspected
- Dosage
- Benzathine Penicillin G IM every 4 weeks
- 1,200,000 units for ALL people ≥30kg
- 600,000 units for children <30kg
- Penicillin V if injections not tolerated or contraindicated
- 250mg oral, twice-daily for all children
- Erythromycin if proven allergy to Penicillin: 250mg oral, twice-daily for ALL people.

Table 1: Recommended duration of Secondary Prophylaxis

Disease Classification	Duration of Secondary Prophylaxis
ARF with No proven carditis	Minimum of 5 years after last ARF, or Until age 18 years (whichever is longer)
Mild-moderate RHD (or healed carditis)	Minimum 10 years after last ARF, or - Until age 25 years (whichever is longer)
Severe RHD and following Cardiac Surgery for RHD	Continue medication for life

3.2 Rheumatic Heart Disease

Definition

It is an inflammatory damage of the heart valves, as a complication of acute rheumatic fever. The mitral valve is the most commonly involved valve, although any valve may be affected.

Types of valvular lesions

- Mitral regurgitation/stenosis
- Aortic regurgitation/stenosis
- Tricuspid regurgitation
- Mixed regurgitation and stenosis
- Multivalvular heart diseases

Signs and symptoms

- May be asymptomatic when minor lesions
- Heart murmurs over affected valve

Complications

- Congestive cardiac failure with pulmonary oedema
- Bacterial endocarditis

Investigations

- Chest x-ray
- ECG
- Echocardiography

Management

- Treat underlying complication, e.g., heart failure, pulmonary oedema
- Continue prophylaxis against recurrent rheumatic fever
- Ensure oral hygiene
- Endocarditis prophylaxis if dental procedures, urinary tract instrumentation, and GIT manipulations

Procedure done above the diaphragm

- Amoxicillin 50mg/kg (Max 2gr) 1 hour before the procedure

Or

- Erythromycin 50mg/kg (max 1.5gr) – if allergic toPenicillins

Below the diaphragm

- Ampicillin 50mg/kg IV or IM (max 2gr) withGentamycine, 2mg/kg (max 120mg) 30minutes before the procedure

Then

- Amoxycillin per os 25mg/kg (max1gr) 6 hours after the procedure

Ensure good follow up by cardiologist

3.3 Cardiomyopathy

3.3.1 DILATED CARDYOMIOPATHY

Definition:

Dilated cardiomyopathy refers to a group of conditions of diverse etiology in which both ventricles are dilated with reduced contractility.

Classification

Classification based on the predominant structural and functional abnormalities

- Dilated Cardiomyopathy: primarily systolic dysfunction
- Hypertrophic Cardiomyopathy: primarily diastolic dysfunction
- Restrictive Cardiomyopathy: primarily diastolic but often combined with systolic dysfunction

Causes

- Infections (e.g. Viral+++, Rickettsia, Chagas disease)
- Neuromuscular disorders (e.g. Duchenne dystrophy, Becker dystrophy)
- Endocrine, metabolic and nutritional (e.g. hyperthyroidism, Fatty acid oxidation disorders, beriberi, kwashiorkor)
- Diseases of coronary arteries (e.g. Kawasaki, Aberrant Left Coronary Artery - ALCAPA)
- Autoimmune diseases (e.g. Rheumatic carditis, juvenile rheumatoid arthritis, systemic lupus erythematosus, dermatomyositis, systemic lupus erythematosus)
- Drugs toxicity (e.g. doxorubicin, cyclophosphamide, IPECA)
- Hematologic diseases (e.g. anemia, Sickle cell anemia, hypereosinophilic syndrome Löffler syndrome)

Signs and symptoms

See signs of congestive heart failure

Diagnosis

- ECG: proeminent P wave, LV or RV hypertrophy, nonspecific T-wave abnormalities
- Chest X-ray: cardiomegaly, pulmonary edema
- Echocardiogram: confirm diagnosis and shows LA and LV dilation, poor contractility
- FBC, Urea and creatinine, Electrolytes (Na, K)
- Myocardial biopsy, PCR

Management

- Treatment: (Refer to principles and medication of congestive heart failure)

3.3.2 HYPERTROPHIC CARDIOMYOPATHY

Causes

- Left ventricle obstruction (Coartation of aorta, hypertension, aortic stenosis)
- Secondary (infants of diabetic mothers, corticosteroids in premature infants)
- Metabolic (Glycogen storage disease type II (Pompe disease)
- Familiar hypertrophic cardiomyopathy
- Syndroms (Beckwith - Wiedmansyndrom, Friedereich, ataxia)

Signs and Symptoms

- Weakness
- Fatigue
- Dyspnea on effort
- Palpitations
- Angina pectoris
- Dizziness and syncope
- Increased risk of sudden death

Diagnosis

- ECG: LV hypertrophy
- Chest X-ray: Mild cardiomegaly
- Echocardiogram: LV hypertrophy, ventricular outflow tract gradient
- Doppler flow studies may demonstrate diastolic dysfunction before the development of hypertrophy

Management

- Prohibit competitive sports and strenuous physical activities
- Propranolol 0.5 -1mg/kg/day devised in 3 doses or Atenolol
- Implantable cardioverter-defibrillator if documented arrhythmias or a history of unexplained syncope
- Open heart surgery for septal myotomy: rarely indicated

3.3.3 RESTRICTIVE CARDIOMYOPATHY

Definition

Restrictive cardiomyopathy refers to a group of disorders in which the heart chambers are unable to properly fill with blood because of stiffness in the heart muscle. Its prognosis is poor, and clinical deterioration can be rapid.

Causes

- Idiopathic, Systemic disease (scleroderma, amyloidosis, or
- sarcoidosis)
- Mucopolysaccharidosis
- Hypereosinophilic syndrome; malignancies
- Radiation therapy
- Isolated non compaction of the left ventricular myocardium

Signs and symptoms

- Dyspnea
- Edema and ascites
- Hepatomegaly with increased venous pressure
- Pulmonary congestion

Complications

- Arrhythmias
- Mitral regurgitation
- Progressive heart failure
- Tricuspid regurgitation

Investigations

- ECG: Prominent P waves, ST segment depression, T-wave inversion
- Chest X-ray: mild to moderate cardiomegaly
- Echocardiogram: markedly enlarged atria and small to normalsized ventricles with often preserved systolic function but highly abnormal diastolic function

Management

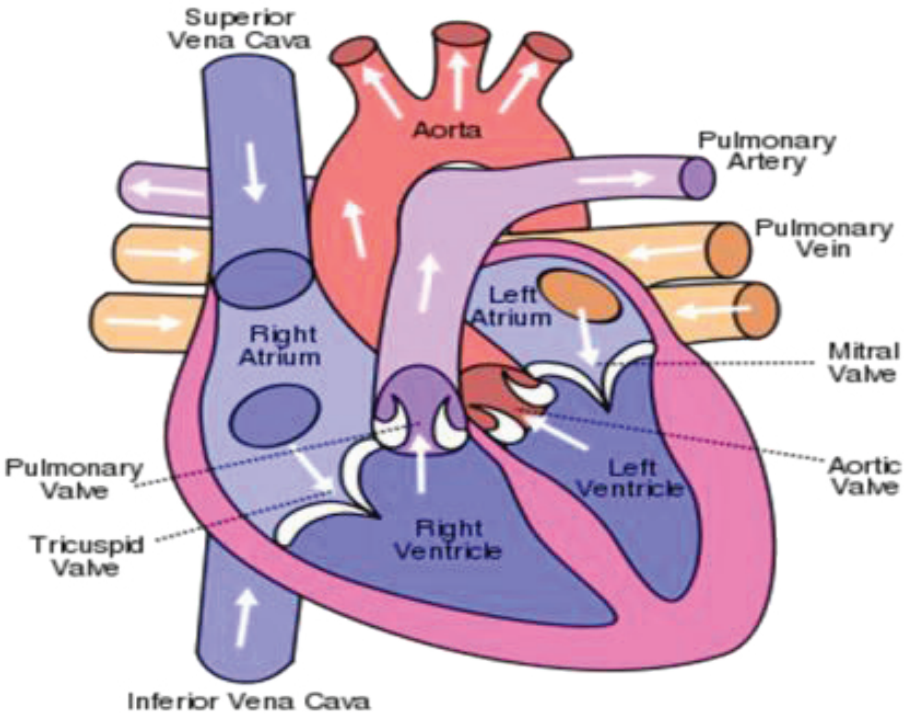
- Lasix 2mg/kg divided in 2 doses
- Aldactone 1-2mg/kg devised in 2 doses
- Antiarrhythmic agents / biventricular pacing are used as required
- Aspirin or Warfarin in case of non compaction LV with an increased risk of mural thrombosis and stroke
- Cardiac transplantation where possible and indicated

4 CARDIAC SURGERY AND POST-OP MANAGEMENT GUIDELINES

4.1 Cardiac surgery indications, complications and follow up

Common Congenital Heart Defects For Surgery

- Ventriculo-septal defect (VSD): a defect between the two ventricles
- Atrio-septal defect (ASD): a hole between the two atria
- Atrioventricular septal defect (AVSD)
- Patent ductus arteriosous (PDA): communication between the aorta and the pulmonary artery
- Tetralogy of Fallot: Several defects including a VSD, pulmonary hypoplasia and stenosis
- Coarctation of aorta
- Pulmonary valve stenosis
- Aortic valve stenosis



Acquired cardio-vasculaires diseases

- Rheumatic Heart Diseases
- MR, MS, AoR…
- Coronary diseases and other vascular diseases
- Atherosclerotic diseases, aneurysm, dissection…
- Degenerative heart diseases
- Arrythmias(Heart Block, AF…)

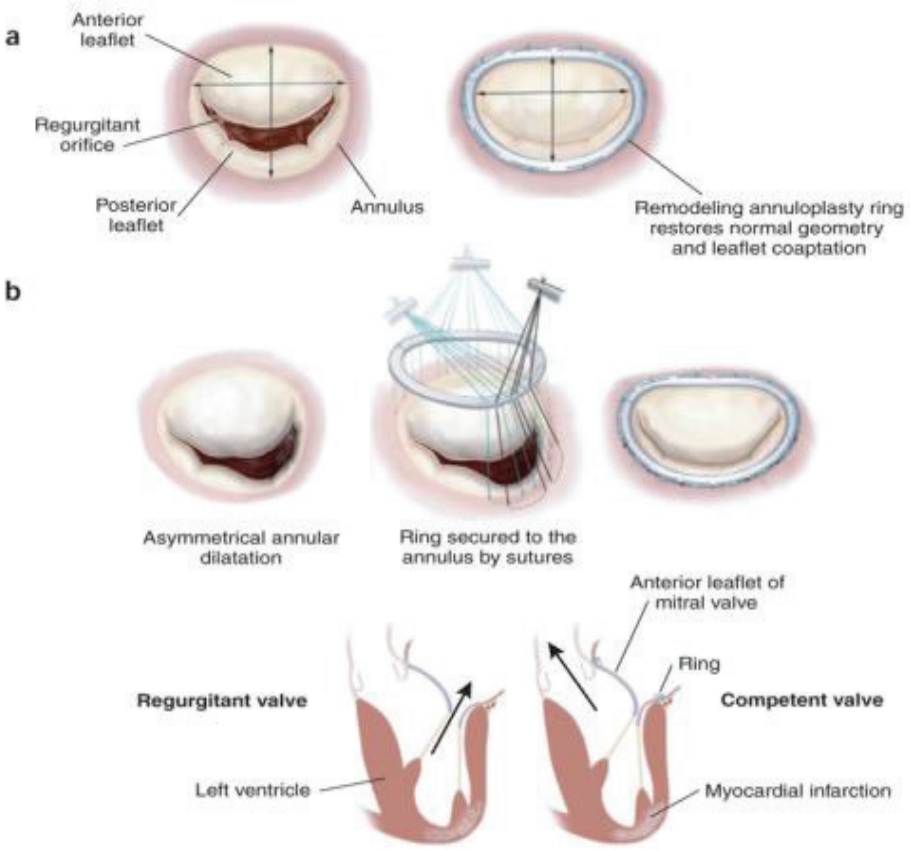
4.2 Types of cardiac Interventions and valve types

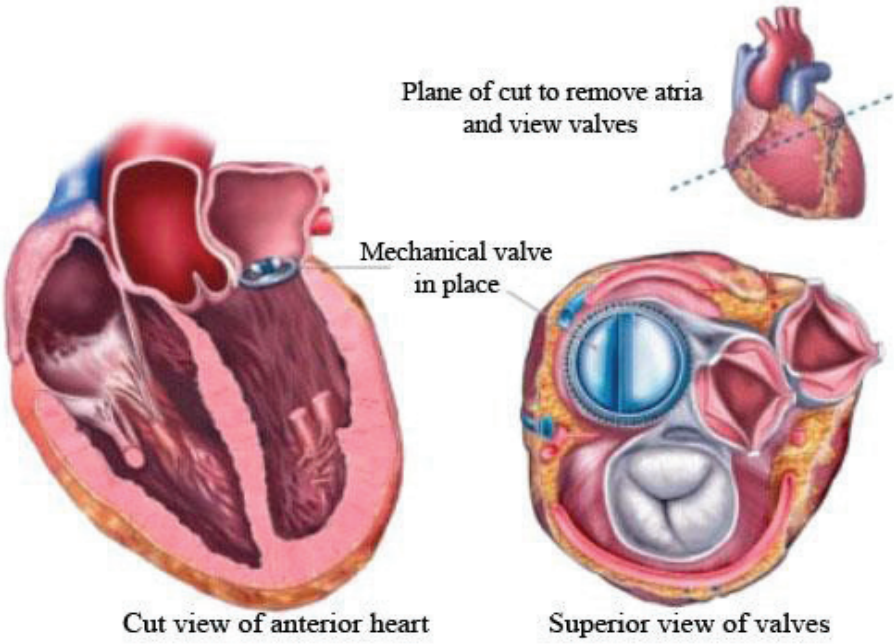
Types of cardiac interventions

- Open heart surgery with or without Cardio-pulmonary bypass (congenital and acquired heart diseases including valve surgery)
- Closed heart surgery (PDA ligation, coarctation repair…)
- Catheterization (balloon valvuloplasty, device and stent implantation…)

Types of Valve Surgery

- Valve Repair = Fixing the damaged heart valve (either making it open better or close better) without having to put any foreign material into the heart.
- Valve Replacement = Introducing a prosthetic valve to take the place of the damaged valve
- Mechanical
- Made of metal: Lasts a long time, Requires anticoagulation (warfarin) management for life to prevent clot formation and valve thrombosis(death)
- Bioprosthetic
- Made of tissue (pig or cow) Does not last very long (3-10 years) and most patients will require a second operation. No anticoagulation required


a
Anterior leaflet
Regurgitant orifice
Posterior leaflet
Annulus
Remodeling annuloplasty ring restores normal geometry and leaflet coaptation
b
Asymmetrical annular dilatation
Ring secured to the annulus by sutures
Anterior leaflet of mitral valve
Ring
Regurgitant valve
Competent valve
Left ventricle
Myocardial infarction



The following factors need to be considered:

- Age, sex
- Nature and severity of lesion
- Risks related to anticogalution (warfarin) & pregnancy
- Follow-up: anticoagulation issues including availability and proximity of tests and medications, education level, compliance to follow up, social problems…
- Patient preference and informed consent?? Number of children? Contraception?

4.2.1 POSTOPERATIVE COMPLICATIONS

- Major bleeding: needing re-intervention
- Arrhythmias (A-V block…): needing temporary or permanent pacemaker !!
- Heart failure: needing heart failure management
- Inflammation:
- Pericardial effusion
- Pleural effusion
- Infections:
- wound infection, mediastinitis
- Infective endocarditis
- Others: depending of the type of surgery (pneumothorax, cheloid scar…)
- Wound infection, post op period

Figure 1: Wound infection, post op period

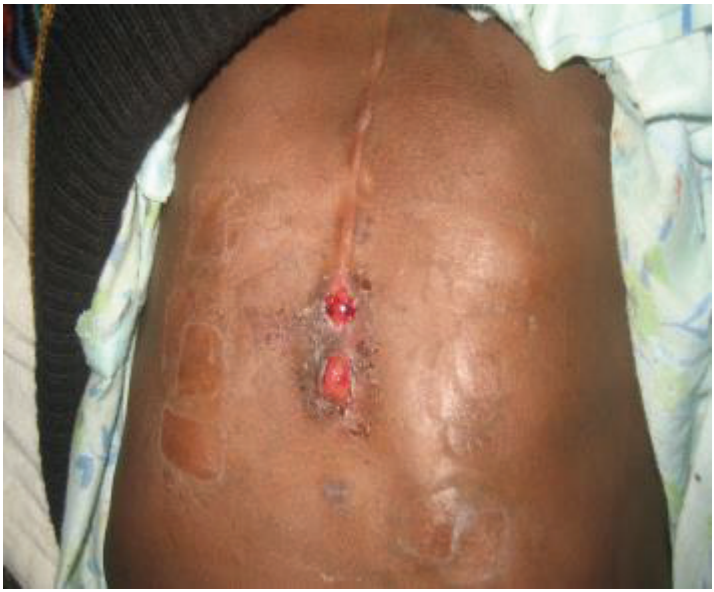


Figure 2: Pericardial Effusion (tamponade)

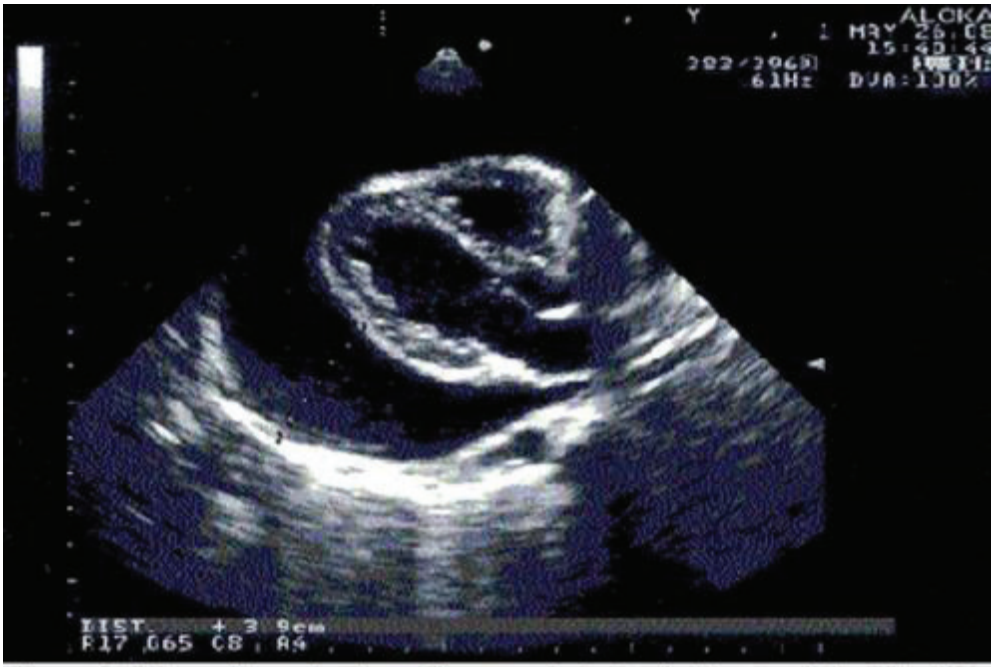


Figure-2: Echocardiograph, signs of tamponade (swinging heart and diastolic right ventricular collapse) and pericardial fluid 3.9 cm in size were found.

Figure 3: Pericardial effusion

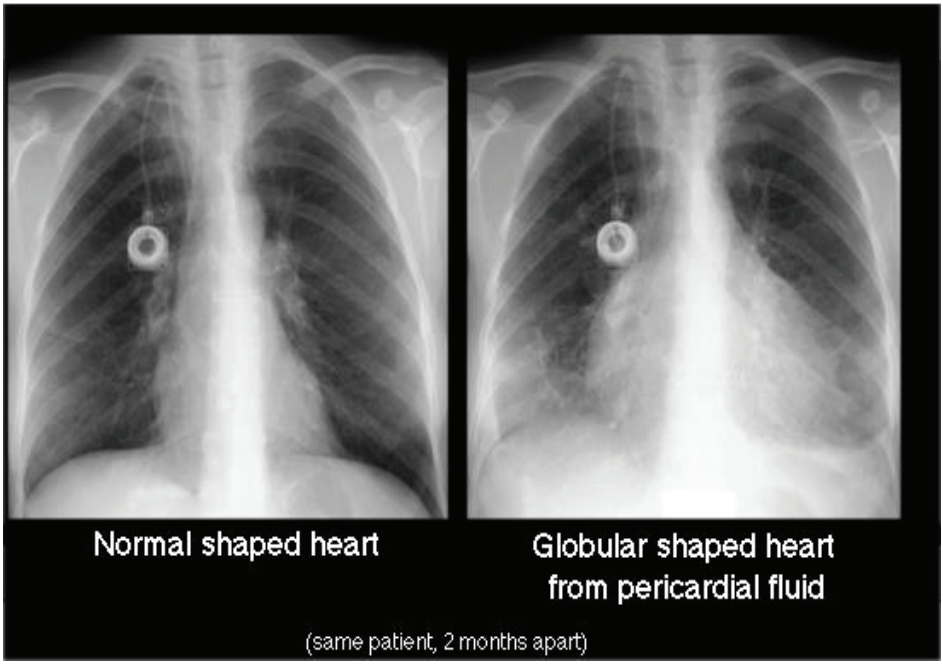
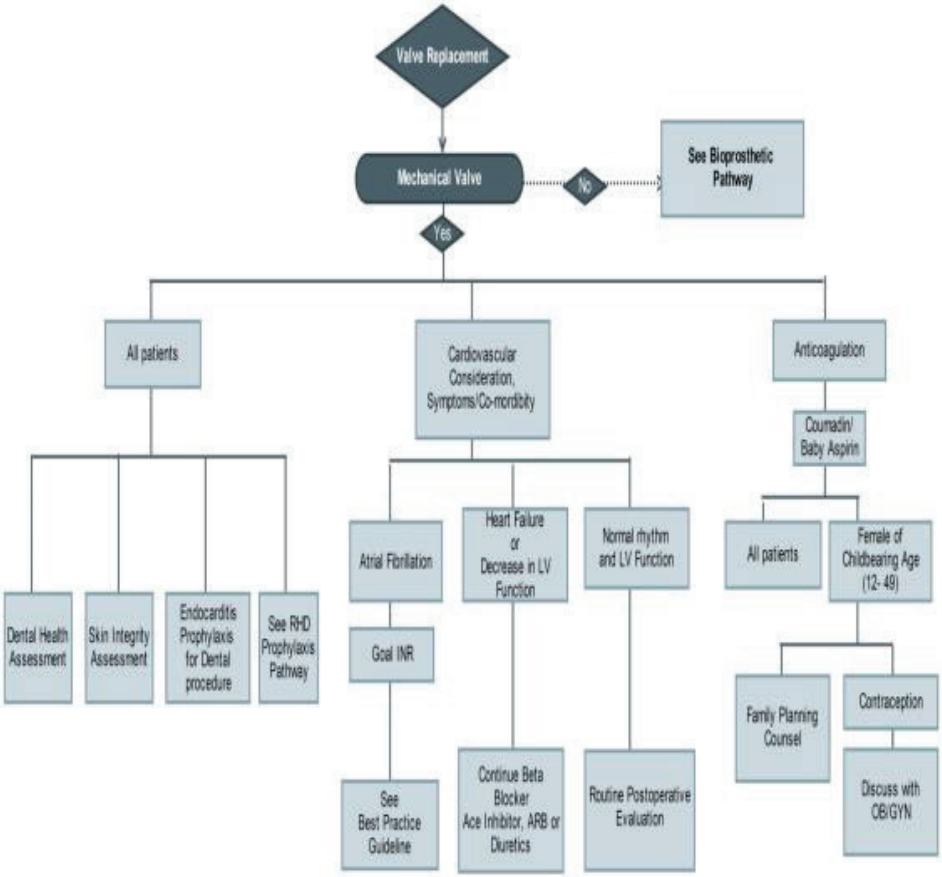


Figure 4: Mechanical Valve Replacement Postoperative Care Pathway in Rwanda



4.3 Post-operative follow–up guidelines

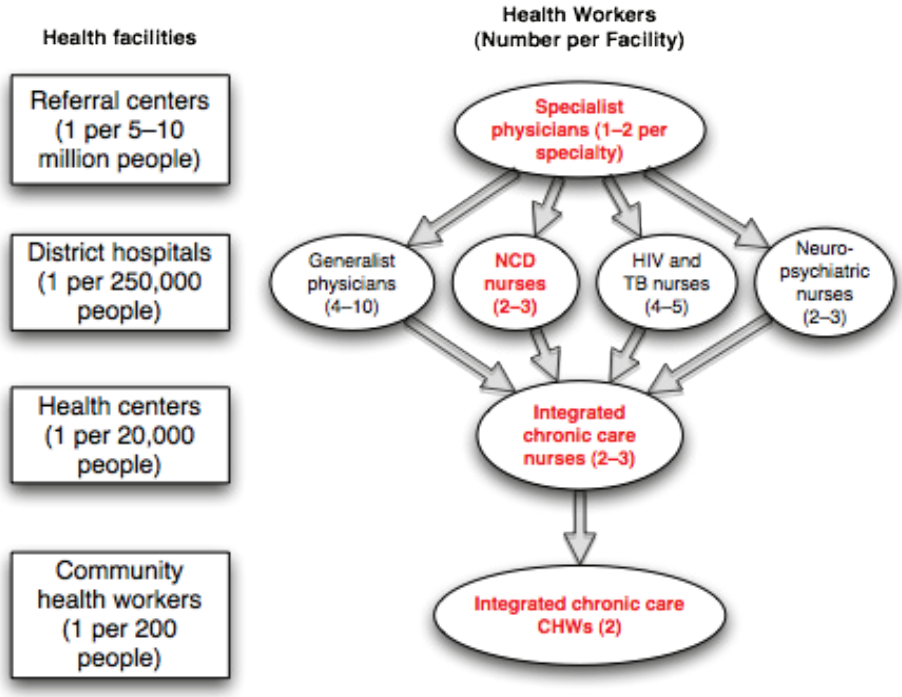
The cardiac surgery post-operative follow up

- Should be done by trained Medical Doctors and Nurses in Teaching and District Hospitals
- Regular supervision by Cardiologists, National Nurse Coordinator and NCD Division/CVD Unit via outreach program and communication (RHD registry, cell phones, emails….).
- A web based national database should be developed for pre and post-operative patients follow-up.
- Required basic equipment and drugs:
- Laboratory equipment for INR or Portable INR machines & strips
- Warfarin (Coumadin)
- Heart Failure medication
- Echocardiography and ECG machine

Follow-up pathway

- Referral hospitals: Absolute review by cardiologist the first three months, appointment are determined by cardiologist.
- District Hospital: By trained medical doctors and nurses and supervised by cardiologists.
- Health centers: By trained nurses for secondary prophylaxis and dispensation of essential medications

Figure 5: Integrated cardiac patients follow-up



4.3.1.1 WARFARIN (Coumadin) Management

4.3.1.1.1 Major Uses of Warfarin

Prevention of embolism associated with:

- Mechanical prosthetic heart valves
- Atrial fibrillation
- Thromboembolic disorders

Treatment of pulmonary embolism and deep vein thrombosis (DVT)

Table 2: Target INR Values

Mitral Mechanical Valve	2.5 - 3.5
Aortic Mechanical Valve	2.0 - 3.0
Tricuspid Mechanical Valve	2.5 - 3.0
Mitral Tissue Valve	2.0 - 3.0 for 6 weeks
Mitral Valve Repair	2.0 - 3.0 for 6 weeks
Tricuspid Tissue Valve	2.0 - 3.0 for 6 weeks
Tricuspid Repair	2.0 - 3.0 for 6 weeks
LV Thrombus	2.0 - 3.0
Aortic Tissue Valve	Aspirin (100 mg/day)
Atrial Fibrillation	2.0 – 3.0

4.3.1.1.2 Initiation of Coumadin

Impact of single dose is delayed 36 to 72 hours

- Result of clearance of normal clotting factors

Time to full Anticoagulant Effect: 5 - 7 days (may see partial response as early as 2 days)

- LONGER if vitamin K is present (healthy)
- SHORTER if vitamin K is inhibited (sick, antibiotics)

4.3.1.1.3 Initiation of Coumadin Therapy

Initial doses usually range between 2 - 5mg daily. Consider lower starting doses in elderly patients, patients with hepatic impairment and/or congestion secondary to heart failure, poor nutrition. Loading dose is not required

Dose adjustments should be made no sooner than every 4-5 days

No need for rapid dose titration when initiating therapy due to long half-life (36-42 hours). Bleeding risk with over-anticoagulation

4.3.1.1.4 Monitoring and Dosage Adjustment

- Prior to therapy initiation, obtain PT/INR
- Monitor every 1 – 3 days while targeting goal or after dosage adjustments
- Once stable, INR should be monitored every month

> Note: If there are changes to diet, medications or disease status, more frequent monitoring is indicated

- For sub-therapeutic INR, dose increases should be based on previous response to therapy
- Adjustments should be made with every effort not to **over-anticoagulate**
- Based on prior doses and INR trends

Factors Impacting INR & Dose

- Inaccuracy in PT testing
- Changes in Vitamin K intake (diet)
- Changes in Vitamin K or Warfarin absorption (GI factors, diarrhea, drug effects)
- Changes in warfarin metabolism (liver disease, drug effects)
- Changes in Vitamin K-dependent coagulation factor synthesis or metabolism (liver disease, drug effects, other medical conditions
- Drug interactions

Compliance Issues – VERY IMPORTANT TO ASSESS AT EACH VISIT**!**

Disease Interactions

❑ Disease State	❑ Effect
❑ Congestive Heart Failure ❑ Leads to hepatic congestion and inhibits metabolism of warfarin	❑ Increased anticoagulant effect
❑ Hypothyroidism ❑ Decreases vitamin K catabolism	❑ Decreased anticoagulant effect
❑ Hyperthydroidism ❑ Increases vitamin K catabolism	❑ Increased anticoagulant effect
❑ Hepatic Failure ❑ Decreases production of clotting factors.	❑ Increased anticoagulant effect

❑ Drug Interactions
❑ Drugs
❑ Acetaminophen – amiodarone - azole antifungals,
❑ barbiturates - cephalosporins - ethanol
❑ Fluoroquinolones - statins – metronidazole
❑ Non-steroidal anti-inflammatory agents (NSAIDS),
❑ Penicillins - rifampin – sulfonamides- tetracyclines
❑ Tramadol
❑
❑ Food Interactions
❑ Intake of vitamin K rich foods should be consistent
❑ Leafy green vegetables most common source of dietary Vitamin K!!! do not need to be eliminated from diet

❑ Dosage Titration for High INR

- Risk of bleeding increases with INR > 5
- First, stop warfarin and check INR daily.
- Second, consider need for Vitamin K
- Decision based on intrinsic bleeding risk or active bleeding
- Third, do not give more Vitamin K than necessary: Risk reducing INR too far/too quickly and causing a clot + valve thrombosis.

Note: Prescription of Vit K to be discussed with Cardiologist or Physician

Management of High INR

INR Value	Action
Above goal but < 5 without clinically significant bleeding	Hold next dose, consider restarting at lower dose
INR > 5 but < 9 without bleeding or bleeding risk factors	Hold 1-2 doses, start at lower dose when INR in therapeutic range.
INR > 5 but < 9 with bleeding risk factors	Hold next dose and give Vitamin K 1-2mg PO or 0.5 – 1mg IV over 60min
INR > 9 without clinically significant bleeding	Hold warfarin, give Vitamin K 3-5mg PO or 1mg IV over 60min. INR should lower in 24-48 hours. May repeat Vitamin K as necessary.
Major INR elevation (> 20) or serious bleeding	Vitamin K 5-10mg IV over 60min. Also consider FFP 10–15 mL/kg or Prothrombin Complex Concentrate (PCC) 25–50 IU/kg

INR Value	Action
Life-threatening bleed	PCC and Vitamin K 10mg IV over 60min. Repeat according to INR.

Instructions for administration of IV Vitamin K

- Dilute in 50 ml of normal saline or dextrose solution and administer over 60 minutes.
- Monitor vital signs every 15 minutes until infusion is given, then every 30 minutes x 2.
- Note:
- IV Vitamin K is never given IV push.
- Vit. K administration should be guided by Cardiologist or Physician

4.3.1.2 Anticoagulation in Pregnancy

- Choice of therapeutic agent is based on full assessment of risk versus benefit
- What is level of mother's thromboembolic risk?
- Valve type
- Position
- Valve thrombosis history
- Patient preferences or capacity
- What is the risk of therapeutic agent to newborn?

>> Proven teratogenicity of Coumadin during the 1st trimester

Recommendations

Mechanical valves:

- Low molecular weight heparin (LMWH): Enoxaparin(Lovenox) OR unfractionated heparin (UFH) until the 13th week – then warfarin until patient is close to delivery
- FBC(Plat) to be monitored

Note: to be done under supervision of adult Cardiologist and Obstetrician &Gynecologist

- Avoid unplanned pregnancy :
- Recommend systematic contraception (to discuss with Obs&Gyn - Norplan®)
- Concern in young girls
- If pregnancy diagnosed early and LWMH not available: recommendation to continue with warfarin up to term

4.3.1.3 General Information on Alere INRatio®2 PT/INR Monitoring System

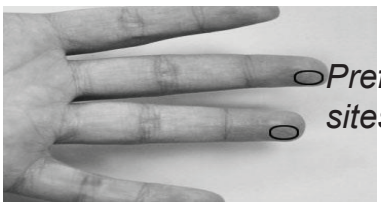
1) Keep the test strips and monitor at room temperature.

2) Verify the strip code each time a test is run.

3) Once the foil pouch is opened, use the test strip within

10 minutes and insert the test strip right side up so the word "INRATIO" on the strip is readable.

4) Warm the hand prior to finger stick to improve circulation and sample collection.



Stick the finger after the monitor says to apply the sample, not before.

5) Keep the monitor on a solid level surface and do not move it once blood has been added.

6) The test runs on 15ul of capillary whole blood. We use the term “hanging drop” to describe the amount of blood you should use.

Note: more than a typical glucose meter, which requires about 3-5ul.

7) To obtain a sufficient sample, apply gentle continuous pressure to the finger and avoid “milking”. Apply the one drop sample to the strip within 15 seconds, the quicker the better.

8) Do NOT wipe the first drop. Place the first drop of blood on the target area all at one time.

Never “double dip” by putting some blood on the target area, then adding more.

9) If you “miss the target area” or a bubble appears, do not try to scrape, shovel, or finger paint the blood into the target area. Repeat the test with a new strip, using a sample collected from another finger.

10) For callused hands and difficult sticks, use the non-dominant hand.

If you get an error code or "unexpected" result:

- (i.e.: An INR too high or too low for a patient that is usually "in range,"
- or an INR result that does not reflect the clinical assessment of the patient)

a) Repeat the test with a new test strip, using a sample collected from another finger.

b) The patient should be thoroughly questioned regarding their dosing compliance, changes in other medications or diet.

c) If the result is very high (i.e. an INR ≥ than 5.0, or whatever INR value the user protocol has set as a 'take action' value), or unexpectedly low, and it repeats that way on the second test, it would be advisable to draw a blue top tube for a lab test or refer for a second opinion.

d) If an error code repeats itself twice, call the Nurse Coordinator or the Cardiologist in charge.

PART 2: Chronic Respiratory Disease (CRD)

5 CHRONIC RESPIRATORY DISEASE (CRD) GUIDELINES

5.1 Guiding Principles

THE INITIAL VISIT

The initial visit plan emphasizes on a systematic approach, which will help you to assess asthma and Chronic Obstructive Pulmonary Diseases.

1. Establish that the patient has asthma or COPD

- Many conditions other than asthma and COPD thatcause cough, dyspnea, & wheezing.
- A diagnosis of asthma or COPD is only made after other causes of cough, dyspnea, & wheezing have been ruled out.
- A diagnosis of asthma or COPD expose patients at greater risk for other causes of cough, dyspnea, & wheezing.

2**. Classify asthma severity**

- Intermittent
- Persistent-Mild
- Persistent-Moderate
- Persistent-Severe (Asthma Attack)

SYSTEMATIC APPROACH

This guide takes you through the following framework for each patient visit:

1. History
2. Vital Signs
3. Physical Exam
4. Lab Review
5. Plan

3. **Use the "step system" to titrate therapy**

- The "step system" will guide the initiation, the addition, titration or discontinuation of medications.
- It will clarify the difference between abortive and controller medications.

THE FOLLOW-UP VISIT

The follow-up visit emphasizes a systematic approach, which will help you:

- Identify or confirm the severity of asthma or COPD
- Use the "step system" for optimal respiratory control

5.2 The Initial Visit

This section emphasizes a systematic approach, which will help answer the following basic questions: 1.Isthis asthma/COPD or another cause of chronic cough? 2. How severe is the asthma/COPD? 3. Is the patient at the correct treatment "step?"

PATIENT BACKGROUND

Review the following information at the patient's visit, if available:

- How was the patient referred to the CRD clinic?
- Is the diagnosis suspected or confirmed?
- Has the patient been started on any inhalers already?

5.2.1 HISTORY

5.2.1.1 Clinical History

5.2.1.1.1 Asthma or COPD emergency

1. Find out if the patient has any of the following emergency signs:

- ❑ Acute dyspnea
- ❑ Unable to speak in full sentences
- ❑ Restless or confused
- ❑ Shortness of breath not relieved with salbutamol
- ❑ Tachypnea (rapid breathing)or bradypnea
- ❑ Tachycardia
- ❑ Bradycardia
- ❑ Hypoxia< 92%

If the patient has these symptoms, call the physician and initiate transfer. However, you should complete the patient's workup and begin treatment before the transfer.

5.2.1.1.2 Asthma or COPD not yet diagnosed

Determine if patient has symptoms that might suggest a cause other than asthma or COPD.

Generalized Symptoms

- ❑ Fever -> Bronchitis/PNA, TB, Cancer
- ❑ Night Sweats & Weight Loss -> TB, Cancer

Cough

- ❑ Productive (yellow, green sputum) -> bronchitis, PNA
- ❑ Large volume purulence (thick, white pus) -> bronchiectasis
- ❑ Hemoptysis -> tuberculosis
- ❑ Persistent & dry -> COPD, allergic rhinitis, HF, ACE-I (lisinopril, captopril), TB
- ❑ Worse lying flat -> reflux

❑ Episodic & dry -> ASTHMA

Dyspnea

❑ Sudden onset -> bronchitis/PNA, pulmonary embolism
❑ Progressive -> COPD, TB, anemia, HF
❑ Episodic -> ASHTMA

Other Symptoms

❑ Itchy, watery, red eyes, post-nasal drip -> allergic rhinitis
❑ Edema, Ascites -> HF
❑ Heartburn -> reflux

5.2.1.1.3 Asthma or COPD has been diagnosed

Triggers

❑ Smoke exposure from indoor stoves?
❑ Symptoms occur during or after exercise?
❑ Is patient under chronic stress or depressed?
❑ Is there evidence of respiratory infections?
❑ Is there any climate change or environmental risk factors (dusts,pollen,insects, new weather …)

Symptom Frequency (cough, dyspnea, wheezing)

❑ Once per week
❑ Several times per week
❑ Daily

Nighttime Awakening Frequency (from cough, dyspnea, wheezing)

❑ < 2 times per month
❑ Several times per month
❑ Several times per week

Salbutamol Use

❑ Less than 2 days per week
❑ More than 2 days per week
❑ Daily

Prior Exacerbations – Hospitalized in the past year?

❑ Yes
❑ No

5.2.1.1.4 Co-Morbidities

1. Find out if the patient has any of the following co-morbidities:

❑ HIV ❑ History of TB ❑ Heart Failure

❑ Reflux ❑ Allergies

5.2.1.1.5 Medications

Medications used to treat asthma

❑ Salbutamol
❑ How frequently does patient use a salbutamol inhaler?
❑ How correctly does the patient use salbutamol inhaler?
❑ Does it relieve symptoms?
❑ Beclamethasone
❑ Theophylline
❑ Prednisolone

Medications used to treat other causes of cough, dyspnea, & wheezing

❑ Antibiotics
❑ TB chemotherapy
❑ HF medications (beta-blockers, furosemide, spironolactone)

- ❑ Proton Pump Inhibitors (omeprazole, lansoprazole,esomeprazole….)
- ❑ Other drugs : anti histaminic, anti-helminthic drugs

Medications that cause cough

- ❑ ACE-Inhibitors (lisinopril or captopril)

5.2.1.2 Social History

5.2.1.2.1 Tobacco/Alcohol

- Do you drink alcoholic beverages? If so, how many per day or week?
- Do you smoke cigarettes? If so, how many packs every day or week?

5.2.1.2.2 In-door Pollutants

- Do you use an indoor stove?
- If so, how long have you cooked with an indoor stove?

5.2.1.2.3 Weather

- Are your symptoms worse according to the weather change?

5.2.1.2.4 Exercise

- Do symptoms worsen after you work in the field or walk up a mountain?

5.2.1.3 Family History

- Has anyone in your family had a problem with allergies, asthma or another problem with breathing?

5.2.2 VITAL SIGNS

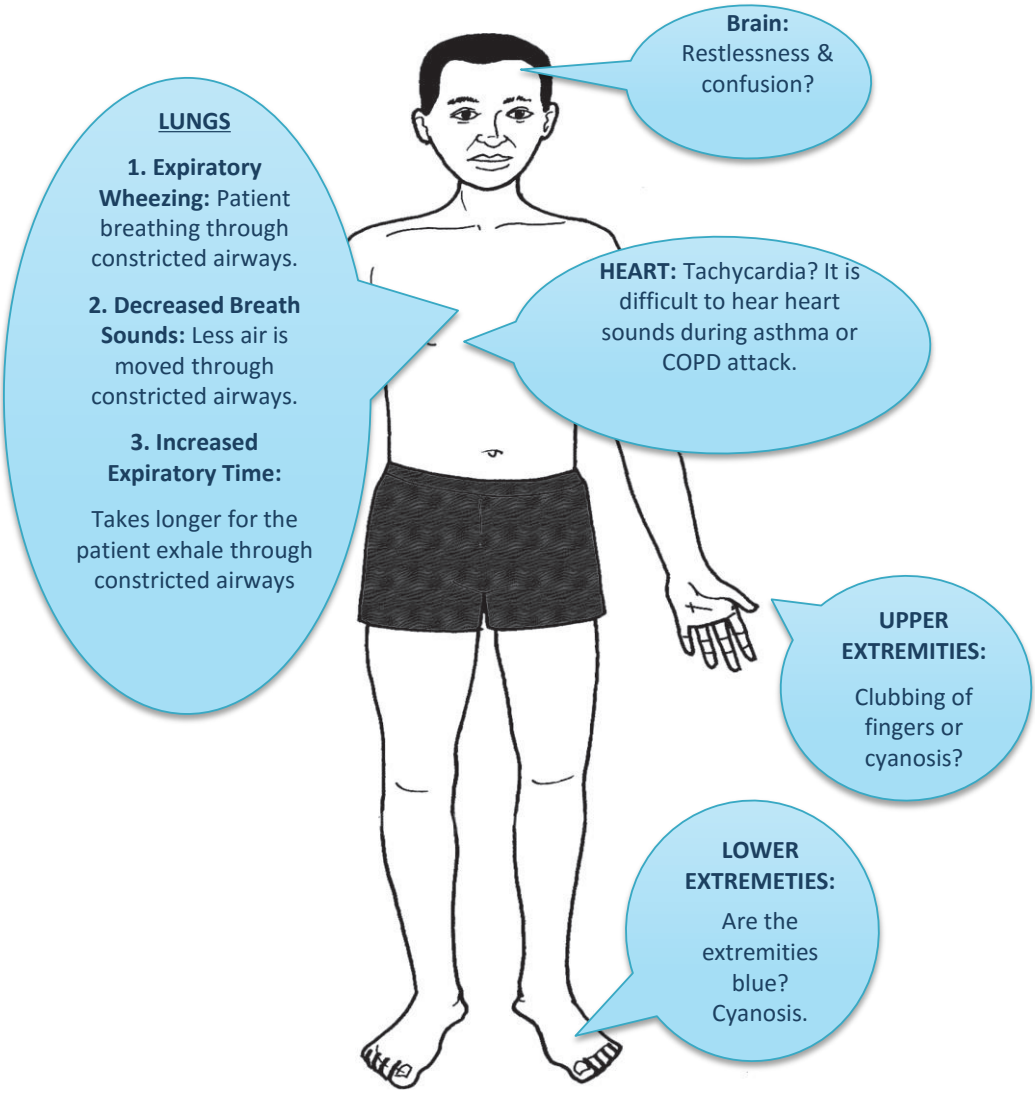
Always review vital signs before the physical exam. They will almost always help you understand if a patient is sick and will provide important information about whether the patient should be referred to the district hospital.

VITAL SIGN	Notes
Temperature	Infection can trigger an asthma or COPD attack!
Heart Rate	**Tachycardia**is a compensatory mechanism that Indicates O2 exchange in the lungs is impaired & the heart is trying to deliver more oxygen to the body.
Blood Pressure	Should be taken at initial visit and all follow-up visits.
Respiratory Rate	RR > 24 may signal an asthma or COPD attack!
O2 Saturation	O2 Sat < 90% may signal an asthma or COPD attack!

Note: remember to weight the patient as some obese people may have difficulty in breathing(like sleep apnea)

5.2.3 PHYSICAL EXAM

Observe the patient. Sometimes it is possible to determine that a patient is in respiratory distress by observation. Danger signs include respiratory rate > 30, speaking in broken sentences, cyanosis, and sitting in the tripod position.


Brain:
Restlessness & confusion?
LUNGS
1. Expiratory Wheezing: Patient breathing through constricted airways.
2. Decreased Breath Sounds: Less air is moved through constricted airways.
3. Increased Expiratory Time:
Takes longer for the patient exhale through constricted airways
HEART: Tachycardia? It is difficult to hear heart sounds during asthma or COPD attack.
UPPER EXTREMITIES:
Clubbing of fingers or cyanosis?
LOWER EXTREMETIES:
Are the extremities blue? Cyanosis.

5.2.4 LABORATORY TESTS

LAB	**WHEN**	Notes
Creatinine	Initial visit and as indicated	Renal failure may cause volume overload, which can lead to dyspnea, cough, and wheezing.
HIV	Initial Visit	HIV puts patients at increased risk of TB and other respiratory infections.
Pregnancy Test	Women in child bearing age out contraception methods	Women may experience worsening of asthma symptoms during pregnancy.
NFS	Only as indicated	WBC: Infection may trigger an asthma or COPD attack! HB/HCT: Anemia causes dyspnea and fatigue. Low Platelets: Helps identify patients at risk for bleeding.
Gaz and electrolytes	Only as indicated	Bicarbonate: Acidosis means that CO2 is accumulating in the body. This is a danger sign! That may push to refer

5.2.5 CHEST RADIOGRAPHY

Chest X-Ray findings in case of asthma or COPD

- Often normal but one or more of the following findings may be observed:
    - ✓ Hyperinflated lungs
    - ✓ Flattening of hemidiaphragm
    - ✓ You may find lung infiltrates in case of infection as a triggering factor
    - ✓ Bronchial thickening
    - ✓ Atelectasis
    - ✓ Signs of pneumothorax

5.2.6 ECHOCARDIOGRAPHY

Echocardiography can help to differentiate respiratory from cardiac disease.

Echocardiographic Finding	Clinical Interpretation
Enlarged left and/or right ventricles	Cardiomyopathy
Valvularvegetations (mitral / aortic)	RHD or endocarditis
Mitral Stenosis	RHD
Pericardial effusion	Tuberculous pericarditis

Please refer to the echocardiographic curriculum for greater detail

5.2.7 IMPRESSION

If patient has already been diagnosed and treated for asthma or COPD, go to par 5.2.8

5.2.7.1 Diagnosis

Exclude and treat patients with other cause of cough, wheezing, and dyspnea before labeling a patient with a diagnosis of asthma or COPD.

Identify and treat conditions that mimic asthma	
HIV	Check HIV if patient has never been tested.
Pneumonia (HIV+, productive cough, fever, sweats, weight loss)	Treat for pneumonia. If patient has danger signs (speaking in broken sentences, confusion, RR>30): ○ Refer to district hospital for IV antibiotics. ○ Do a sputum smear for TB x 3. ○ Do a CXR If patient has risk factors for TB (without danger signs). ○ Do a sputum smear for TB x 3.
Anemia	Check HB/HCT and treat with iron and albendazole.
Heart Failure	Refer to heart failure clinic for further evaluation.
Chronic cough without other symptoms	Treat patient for: ○ Gastroesophageal reflux disease GERD: Omeprazole or cimetidine for 2-4 weeks. If no response, treat triple therapy for H. pylori. ○ Allergies: Nasal steroids or anti-histamines (chlorpheniramine). ○ Helminths (Strongyloides): Anti-helminthic (albendazole)

There is low suspicion for the above conditions:

ASTHMA

COPD

5.2.7.2 Classify Asthma

Intermittent

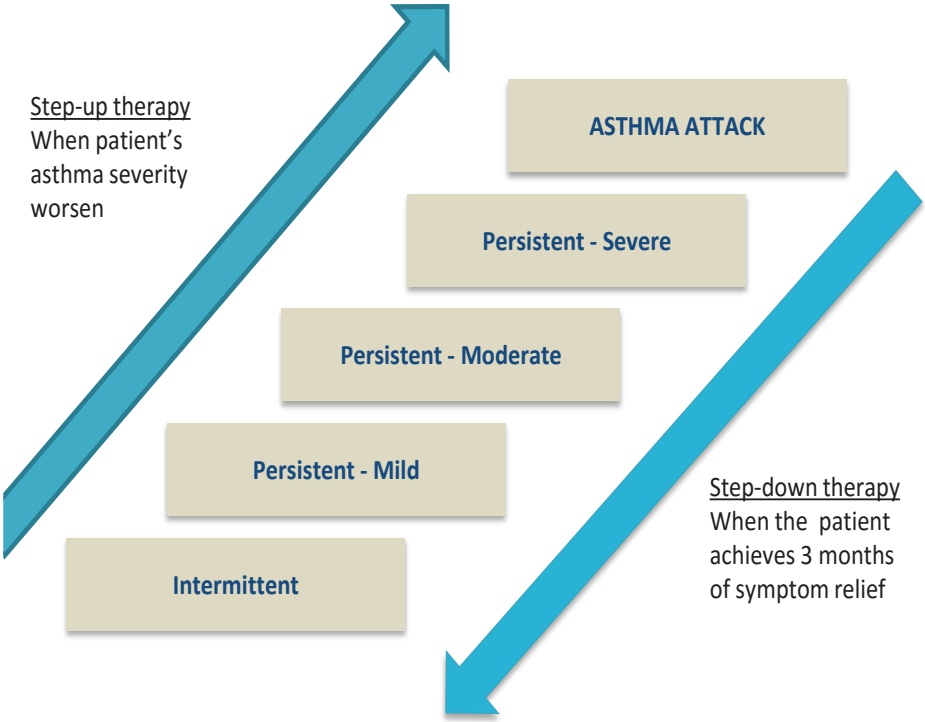
Other causes should be excluded because asthma is over-diagnosed at this stage

Persistent - Mild

Persistent - Moderate

Persistent - Severe

5.2.7.3 Use the step method



5.2.8 PLAN

5.2.8.1 Respiratory emergency

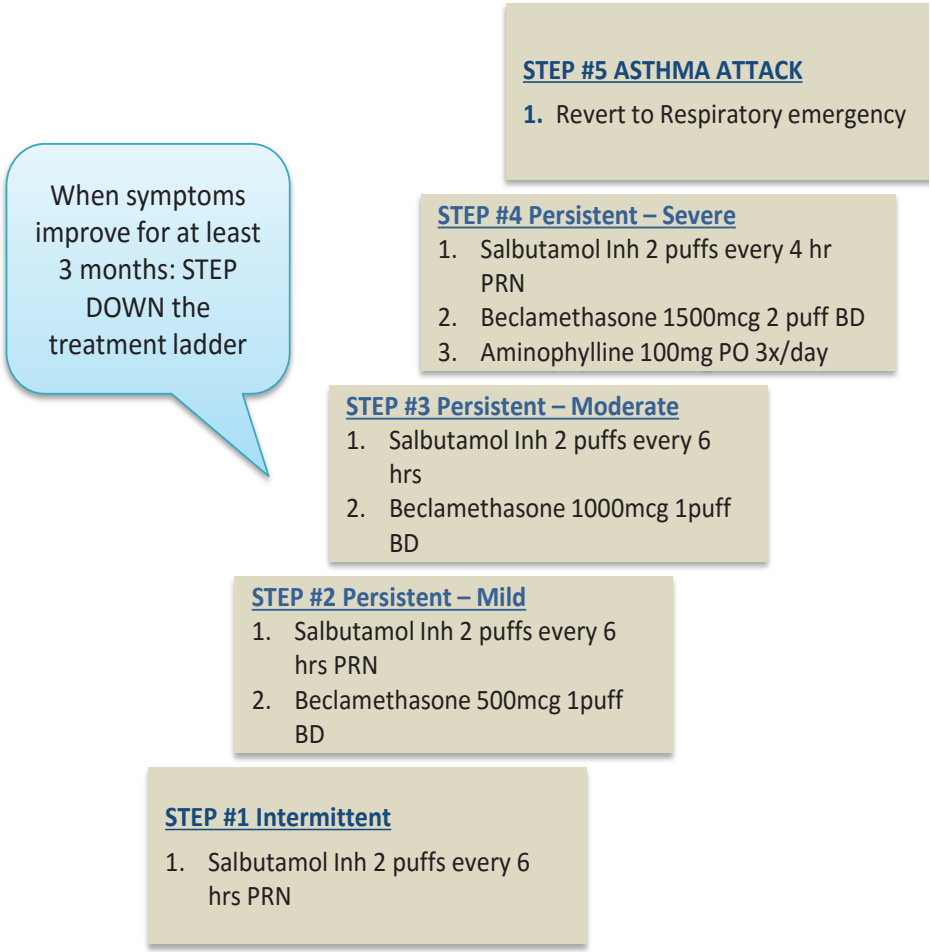
If patient is having an asthma attack then classify severity based on IUATLD guidelines below.

Symptoms	Minor Attack	Moderate Attack	Severe Attack	Imminent Respiratory Failure
Dyspnea	With effort	While talking	All the time	All the time
Ability to Speak	In complete sentences	In short sentences	Words	Unable to speak
State of Consciousness	Normal	Normal or restless	Restless	Drowsy or confused
Respiratory Rate	20-25/min	25-30/min	>30/min	>30/min
Heart Rate	<100	100-120	>120	Bradycardia

- Position upright, give continuous salbutamol nebulizer, administer I.V hydrocortisone 100 mg or prednisolone po 60mg if I.V not available.
- Oxygen by facial mask 6l/min if O2 saturation is <92% RA
- If symptoms uncontrolled after 30 minutes -> magnesium 2g IV x 1.
- Give amoxicillin 500mg PO x 1 if pneumonia suspected.
- Give furosemide 40mg IV x 1 if HF suspected.
- Call physician and admit to hospital.
- Intubation if decreased level of consciousness , exhaustion, silent chest, acidemia, cyanosis.
- Directed therapy if the triggering factor is evident: e.g antibiotics in case of infection,…

***COPD exacerbation managed the same way ***

5.2.8.2 Use the step method to treat asthma



5.2.8.3 COPD Management

Treat like persistent, severe asthma without aminophylline

- Salbutamol 2 puffs every 4 hrs as needed
- Beclamethasone 1,500 mcg BD scheduled

If suspicion of infection:

- Doxycycline 100mg PO 2x/day for 7 days or
-
- Macrolides (erythromycin or clarithromycin 500 mg BID x 7 days

Provide counseling on smoking cessation

5.2.8.4 Bronchiectasis

Treat like persistent, severe asthma without aminophylline

- Salbutamol 2 puffs every 4 hr as needed
- Beclamethasone 1,500 mcg BD scheduled

If suspicion of infection:

- Doxycycline 100mg PO 2x/day for 7 days or
- Macrolides (erythromycin or clarithromycin 500 mg BID x 7 days
- Advise patient to stay well hydrated, which will help thin secretions.
- Refer for respiratory physiotherapy
- Prescribe PPIs (omeprazole 20mg BID) for gastro esophageal reflux disease (GERD)

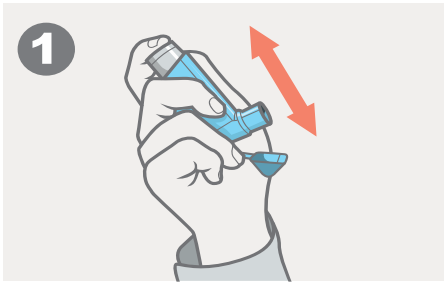
5.2.9 FOLLOW-UP SCHEDULE

	ASTHMA Step 1 or 2	ASTHMA Step 3 or Above
Medication Change	Return in 4-6 weeks	Return in 1-2 weeks
No Medication Change	Return in 3-4 months	NA

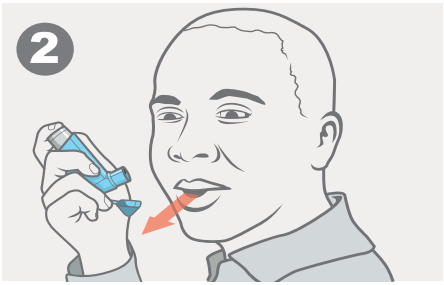
5.2.10 EDUCATION

INHALER USE	
Symptoms:	Teach patients recognize signs of worsening asthma: cough, wheezing, difficulty breathing.
HOME INHALER TITRATION	
Beclamethasone:	Beclamethasone: Explain that it is ok to increase the dose (i.e. number of puffs), but the frequency should remain the same.
Salbutamol:	Salbutamol: Patients can use this more frequently for symptom relief.
Return to Clinic:	If the patient changes any medication then instruct him or her to return to clinic.
INHALER USE	
Instruct patients on proper inhaler use	SEE BELOW!

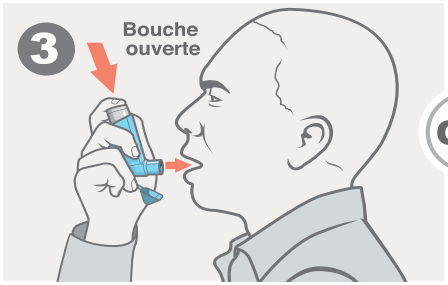
POMPE



Retirez le capuchon et agiter.

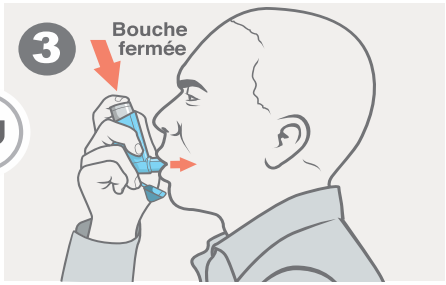


Expirez doucement.



Commencez à inspirer tout en appuyant. Inspirez doucement et profondément, et retenez votre souffle.

OU

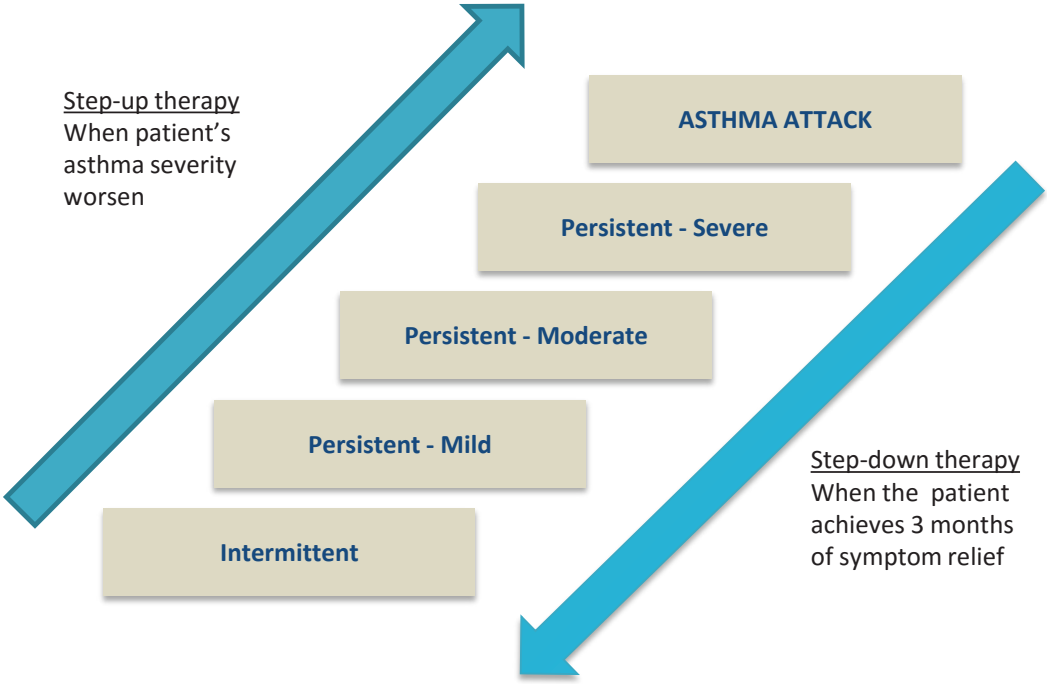


Placez la pompe entre vos lèvres tout en appuyant. Inspirez doucement et profondément, et retenez votre souffle.

5.2.11 MEDICATION ADHERENCE

Evaluate the patient's ability to follow the treatment plan from last visit.

5.2.12 IDENTIFY THE TREATMENT STEP



*****Once the correct treatment step is identified check section 5.2.8 and develop a treatment plan*****

Summary table: Annex 1

	CHECK LIST SYMTOMS						
Asthma severity:	**Dyspnea**	**Ability to Speak**	**State of Consciousness**	**Respiratory Rate**	**Heart Rate**	**Protocol**	**Treatment**
Intermittent	With effort	In complete sentences	Normal	20-25/min	<100	Other causes should be excluded because asthma is over-diagnosed at this stage	Salbutamol Inh 2 puffs every 6 hrs PRN
rsistent-Mild	While talking	In short sentences	Normal or restless	25-30/min	100-120	Call a physician and admit to the hospital!	Salbutamol Inh 2 puffs every 6 hrs PRN, Beclamethasone 500mcg 1puff BD
Persistent-Moderate	All the time	Words	Restless	>30/min	>120	Call a physician and admit to the hospital!	Salbutamol Inh 2 puffs every 6 hrs, Beclamethasone 1000mcg 1puff BD
Persistent-Severe	All the time	Unable to speak	Drowsy or confused	>30/min	Bradycardia	Call a physician and admit to the hospital!	Salbutamol Inh 2 puffs every 4 hr PRN, Beclamethasone 1500mcg 2 puff BD, Aminophylline 100mg PO 3x/day
sthma Attack	All the time	Unable to speak	Drowsy or confused	>30/min	Bradycardia	Call a physician and admit to the hospital!	Position upright, give continuous albuterol nebulizer, high dose and prednisolone 60mg PO x 1. If symptoms uncontrolled after 30 minutes -> magnesium 2g IV x 1. Give amoxicillin 500mg PO x 1 if pneumonia suspected. Give furosemide 40mg IV x 1 if HF suspected. Call physician and admit to the hospital

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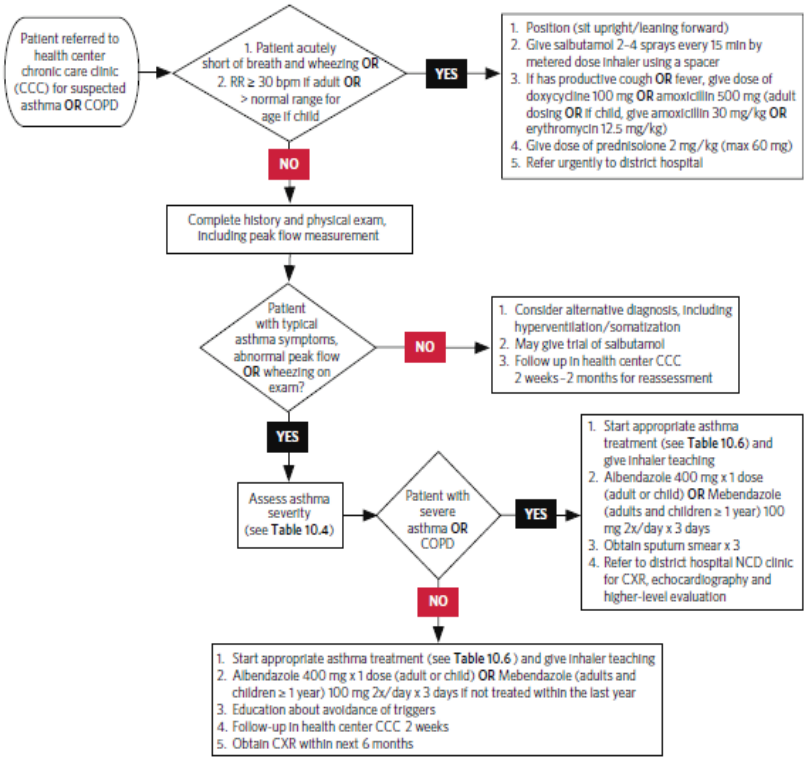
Initial Management of Asthma or COPD at Integrated Chronic Care Clinics



PART 3: Diabetes

6 DIABETES GUIDELINES

6.1 Guiding principles

THE INITIAL VISIT

The initial visit plan emphasizes a systematic approach, which will help you to:

1. Establish that the patient has diabetes

- Symptoms, risk factors, and physical exam findings raise suspicion for diabetes, but do not play a role in the diagnosis of diabetes.
- A diagnosis of diabetes is only made when:
- Fasting blood glucose: > 126mg/dL on two different visits
- Random blood glucose: > 200mg/dL on a single visit
- HbA1c > 6.5% on two different visits

2. Identify the type of diabetes

- The patient's history, complications, and response to treatment helps you make this judgment.
- Patients can have overlapping types of diabetes (i.e. malnutrition may cause a type of diabetes that has features of type 1 & 2 disease)

3. Assess the severity of hyperglycemia and complicating conditions

- If a patient has hyperglycemia without diabetic complications then oral agents should be started.

SYSTEMATIC APPROACH

This guide takes you through the following framework for each patient visit:

1. History
2. Vital Signs
3. Physical Exam
4. Lab Review
5. Impression
6. Plan

- If a patient has hyperglycemia with evidence of organ damage (advanced renal failure or diabetic foot ulcer) or patient is pregnant then immediate insulin therapy is required.
- If a patient's initial presentation for diabetes is DKA or HONKC then immediate insulin therapy may be required.

THE FOLLOW-UP VISIT

The follow-up visit emphasizes a systematic approach, which will help you to:

1. Establish or confirm that the patient has diabetes

2. Identify or confirm the type of diabetes

3. Assess glucose control

- This will clarify whether current therapy should be continued or if titration is needed.
- For patients with poor glycemic control titrate medications or insulin.
- If poor glycemic control despite maximum oral therapy, then transition the patient to insulin.

6.2 The Initial Visit

This section emphasizes a systematic approach, which will help answer the following basic questions: 1. is this diabetes? 2. What type of diabetes? 3. What is the extent of hyperglycemia and complicating conditions?

PATIENT BACKGROUND

Review the following information before the patient visit, if available:

- How was the patient referred to the diabetes clinic?
- Is the diagnosis suspected or confirmed?
- Does the patient have type I or II diabetes?
- Has the patient been started on treatment (oral hypoglycemic or insulin)?

6.2.1 HISTORY

6.2.1.1 Clinical history

6.2.1.1.1 DKA or HONKC EMERGENCY

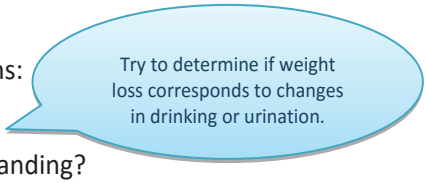
Find out if the patient has experienced any of the following emergency signs:

❑ Seizure	❑ Confusion	❑ Coma
❑ Intolerance to food/water	❑ Nausea or vomiting	❑ Severe abdominal pain

If the patient has these symptoms, call the physician and initiate transfer. However you should complete the patient's workup and begin treatment before the transfer.

6.2.1.1.2 Hyperglycemia

1. Ask the patient the following questions:



- Weight loss: Have you lost weight?
- **Dehydration:**Are you dizzy when standing?
- **Dehydration:**Are you urinating more than you are drinking?
- **Polyuria:** Do you need to urinate during the night?
- **Polydipsia:**Are you drinking more than usual?

2. Ask a family member the following questions:

- **Confusion:** Has patient been confused or behaving differently?
- **Fruity smelling breath:** Have you noticed a change in patient's breath?

6.2.1.1.3 Hypoglycemia

1. Find out if the patient has experienced any of the following signs:

❑ Confusion	❑ Drowsiness	❑ Dizziness
❑ Nausea	❑ Sweats (cold)	❑ Tremors or Seizures
❑ Agitation		❑ Coma
❑ Blurred vision		

6.2.1.1.4 Complications

Find out if the patient has experienced any of the following signs of **small vessel (microvascular)** complications:

Retinopathy

- Has your vision gotten worse?
- Do you have blurry or double vision?

Neuropathy

- Do you have numbness or tingling in your hands or feet?
- Have you ever felt like your hands or feet were being stuck with needles?
- Do you have wounds on your legs that won't heal?

Nephropathy

- Has a doctor or nurse ever told you that you have a problem with your kidneys?

2. Find out if the patient has experienced any of the following signs of **large vessel** complications:

Transient Ischemic Attack

- Have you felt sudden weakness on one side of your body that resolved immediately?
- Have you had an episode where you had difficulty finding words?

Coronary Artery Disease

- Do you have chest pain that gets worse with or without exertion?
- Have had a heart attack?

Peripheral Vascular or neuropathy Disease

- Do your legs ache after walking?
- Do you realize a non-healing wound in your feet?
- Do you experience an erectile problem(loss of libido)

6.2.1.1.5 Co-Morbidities

1. Find out if the patient has any of the following co-morbidities:

❑ HIV ❑ Kidney Disease ❑ Liver Disease

❑ Hypertension

6.2.1.1.6 Medications

1. Ask the patient if he/she is taking or have taken any of the following medicines now or in the past:

- ❑ ***Metformin***
- ❑ ***Sulfonylurea***
- ❑ ***Insulin***

Check for hypoglycemic symptoms.

- Are you taking or have you taken NPH, regular, or mixte?
- If yes, how many times a day?
- How is insulin stored?
- Do you inject insulin before or after meals?

❑ ***Medications that may increase blood glucose***

Are you taking or have you taken steroids or protease inhibitors etc?

❑ ***Ace-Inhibitors***

May cause or worsen acute renal injury!

If patient is taking, urine output and creatinine will need to be checked as part of the visit

6.2.1.2 Social History

1. Ask about the following:

Diet

- How many meals do you eat in a day?
- What foods do you eat most (i.e. vegetables, carbohydrates, protein)?
- Has your diet changed for any reason?

Social Situation

- Would it be difficult for you to come to the clinic 4 times a year?
- How would you get to the clinic 4 times per year?
- Do you people at home who can help you with treatment?

6.2.1.3 Family History

If yes, test for pregnancy!

Pregnancy

Are you pregnant now?Is there a chance that you might be pregnant?

- Do you have any children? If yes, when did you last deliver?
- How many children do you have? How many times have you been pregnant?
- Have delivered a baby of >= 4kg (fetal macrosomy)
- Have you been told or treated for gestational diabetes?

Ask about the family history:

Diabetes:

- Has anyone in your family has or had diabetes?

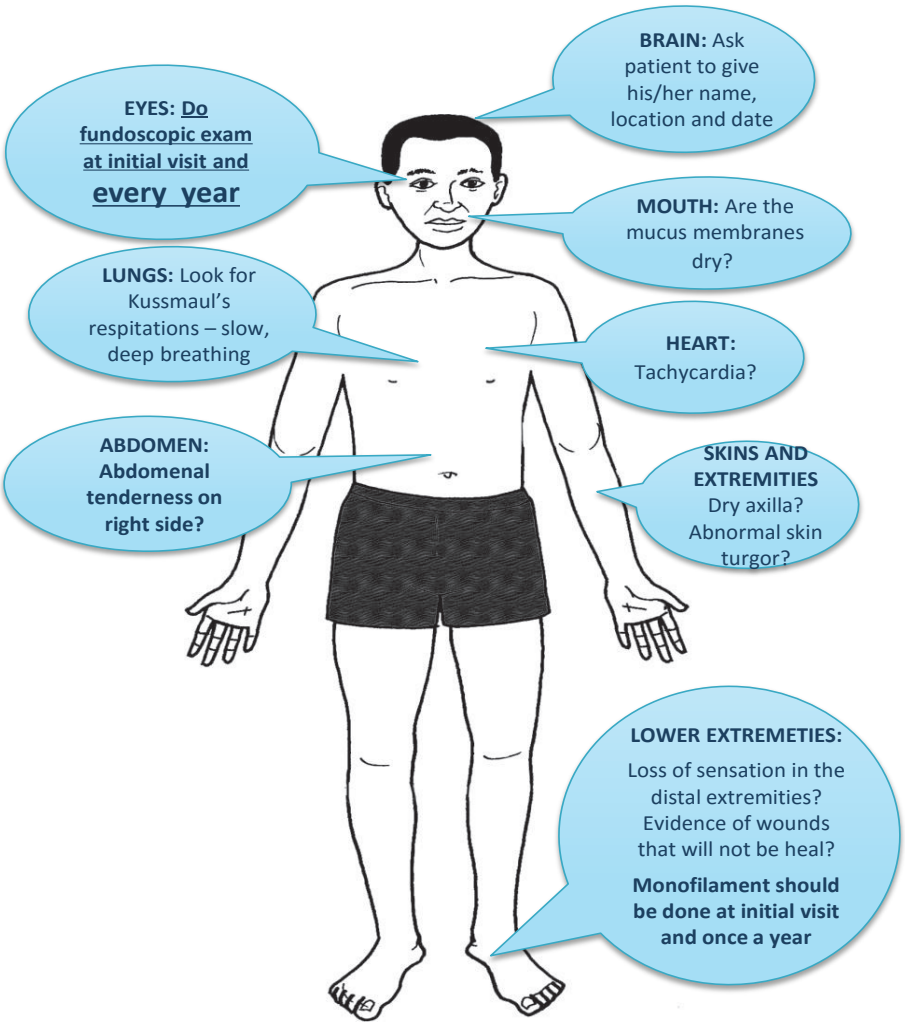
6.2.2 VITAL SIGNS

Always review vitals signs before the physical exam. They are essential andhelps you to understand if a patient is sick and will provide important information about whether the patient should be referred to the district hospital.

VITAL SIGN	Notes
Temperature	Infection can worsen hyperglycemia!
Heart Rate	***Tachycardia:*** May indicate that patient is dehydrated or in diabetic ketoacidosis.
Blood Pressure	Should be done at initial visit and all follow-up visits. ***Low blood pressure:*** Signals emergency in a patient with hypoglycemia or hyperglycemia. ***High blood pressure:*** There is a notable association between high blood pressure and diabetes.
Respiratory Rate	Slow deep, deep breathing (Kussmaul's respirations) is a sign of DKA (diabetic ketoacidosis).
O2 Saturation	Low oxygen saturations should be regarded as an emergency in patient's with hyperglycemia or hypoglycemia
Weight	Should be done at initial visit and all follow-up visits. It will serve as a baseline for future measurements.

6.2.3 PHYSICAL EXAM

Observe the patient. Sometimes it is possible to determine that a patient has severe hypoglycemia or DKA simply by observation. Then check the following:



6.2.4 LAB REVIEW

LAB	**WHEN**	Notes
Fingerstick Blood Glucose (FBG)	Every Visit	
HbA1c	Initial Visit Every 6 Months	Used to diagnose diabetes and give an assessment of glycemic control. Goal 7.5 – 8.0%
Creatinine	Initial Visit Every Year	Progressive renal failure is a direct consequence of diabetes. Ace-Inhibitors: May need to check creatinine if patient is on an ACE-Inhibitor. Co-morbidities like HTN and HIV can damage the kidneys and cause renal failure.
Urine Dipstick	Initial Visit Every 6 months	Assesses for protein in the urine.
NFS	Only as indicated	HB/Hct: Anemia can mimic dehydration. WBC: Very important to identify a patient who has an infection. Infection may worsen hyperglycemia! Platelets: If very low could identify patients who are a bleeding risk.
Urea	Only as indicated	Elevated urea can suggest dehydration (less blood reaches the kidneys so less urea gets excreted in the urine).

LAB	**WHEN**	Notes
Bilirubin, SGOT/SGPT	Only as indicated	Liver failure could make glycemic control more difficult and put the patient at risk for hypoglycemia.
Electrolytes	Only as indicated	Sodium: Difficult to interpret in diabetes. Potassium: Often low in patients with DKA. Bicarbonate: Acidosis is an ominous consequence of DKA.

6.2.5 IMPRESSION

If patient has already been diagnosed and treated for diabetes, go to par 6.2.6

6.2.5.1 Diagnosis – 1st visit

Consider the Fingerstick Blood Glucose (FBG) to know if you are able to diagnose diabetes during this visit, or if the patient must return. If the FBG is 126-200mg/dL, you must ask the patient to return for afollow-up visit before you candiagnose diabetes. Use the following boxes to guide your decision:

DIABETES CONFIRMED IF

FBG: *> 200mg/dL*

Skip to "Type of Diabetes"

NOT DIABETES IF

FBG: *< 126mg/dL*

Stop diabetes workup

DIABETES LIKELY IF

FBG: *126-200mg/dL*

OR

HbA1c: *> 6.5%*

Schedule follow-up visit

6.2.5.2 Diagnosis – 2nd or return visit

Use the following boxes to determine if the patient has diabetes:

DIABETES CONFIRMED IF TWO VISITS OF

FBG: **>** *126mg/dL*

OR

HbA1c: *> 6.5%*

Continue

NOT DIABETES IF

FBG: *< 126mg/dL*

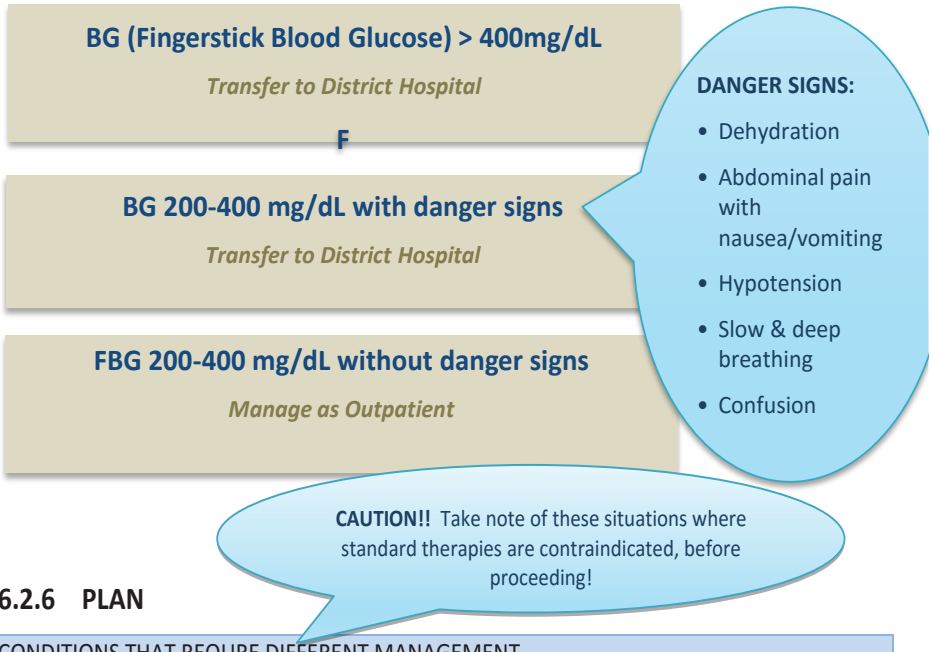
Stop diabetes workup

6.2.5.3 Type of Diabetes

Based on the information gathered in the exam, decide whether the patient has:

6.2.5.4 Determining Next Steps

To know whether the patient should be transferred to the district hospital or started on treatment, choose the appropriate next step below by considering their glucose control and danger signs:



6.2.6 PLAN

CONDITIONS THAT REQURE DIFFERENT MANAGEMENT	
Pregnancy	Pregnant women should be started on insulin immediately. They should NOT be on oral agents (glibenclamide or metformin) or ace-Inhibitors. All women of reproductive age should be referred for family planning.
Renal Failure	Stop metformin and sulfonylurea if creatinine doubles or > 150 µmol/L Decrease insulin by 25% if Creatinine doubles or > 150 µmol/L and patient has evidence of hypoglycemia ACE-Inhibitors (Ace-i) If Cr > 200umol/L, then ACE-I are contraindicated If Cr increases by 50% hold ACE-I. Re-check Cr within 1 month.
Liver Failure	If patient has evidence of hypoglycemia, then decrease patient's insulin by 25%.
HIV Positive	Be sure to refer to ID clinic because patient may need ARVs changed.

6.2.6.1 Emergencies

DKA or Random Blood Glucose > 400

- Bolus 1 liter normal saline.
- Give regular insulin 10 units.
- Check FBG every hour.
- Repeat insulin 10 units for FBC >300mg/dL until transfer to the district hospital.

Hypoglycemia (Adults)

- Give by oral route of rapid sugar(juices, soda,banana…)
- Give IV glucose 50% solution(if a patient is unable to follow command)
- Check FBGevery 1-2 hours.
- Repeat IV glucose 50% for FBG < 70 , transfer patient to the district hospital if hypoglycemia is persisting after 30 minutes of initial management

6.2.6.2 Insulin Therapy

If not indicated, go to Oral Therapy.

Indications for insulin:

- Type 1 or malnutrition type diabetes
- DKA or glucose >400mg/dL
- Type 2 DM patients already on maximum oral therapy
- Pregnancy
- Renal (>150mmol/L)
- Children < 18 years old

If indicated:

- Stop glibenclamide.
- Continue metformin unless creatinine > 150umol/L.
- Transfer to district hospital to start insulin.

If no indication for insulin, use oral therapy.
Be sure to check creatinine before starting oral agents!

6.2.6.3 Oral Therapy

- BMI >25kg/m2: Metformin *500mg PO BD*
- BMI <25kg/m2: Glibenclamide 5mg in the morning

6.2.6.4 Complications

Hypertension

- If BP >140/90 then an ACE-Inhibitor is the first choice.

Retinopathy

- Refer to ophthalmologist if worsening vision or abnormal fundoscopic exam.

Nephropathy

- If 2+ proteinuria detected on dipstick, an ACE-Inhibitor is the first choice.

Neuropathy & LE Wounds

- Give amitriptyline 25mg oral nightly.
- Provide wound care as needed.
- Monofilament test annually

ACE-INHIBITORS

In the short term, ACE-Inhibitors decrease blood flow to the kidneys. If you start an ACE-Inhibitor or increase the dose **you must check a creatinine within 30 days.**

6.2.7 ROUTINE INVESTIGATIONS

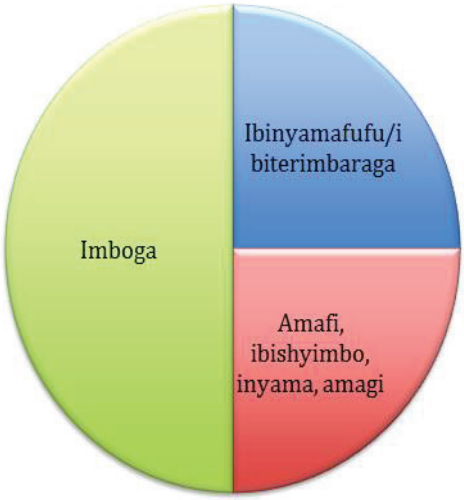
EVERY VISIT	EVERY 6 MONTHS	ANNUALLY	EVERY YEAR
❑ Random or Fasting Fingerstick	❑ HbA1c	❑ Monofilament Test	❑ Refer for Ophthalmologic Exam
❑ Weight and BP	❑ Urine Protein with Dipstick	❑ Creatinine	
❑ Foot Exam		❑	

6.2.8 FOLLOW-UP SCHEDULE

	Good Glycemic Control	**Poor Glycemic Control**
Oral medication started or changed	NA	Return in 2-4 weeks
Insulin started or changed	NA	Return in 1-2 weeks
No Medication Change	Return in 3 months	NA

6.2.9 EDUCATION

SYMPTOM MONITORING	
Hypoglycemia:	Teach patients to recognize symptoms and routinely carry containing snacks or drinks with them.
Hyperglycemia:	Instruct patient to return to the hospital with worsening symptoms.
INSULIN	
Storage:	Make sure that patients have a way to safely store insulin.
Administration:	Review proper technique.
Timing:	1. Fingerstick, 2. Insulin, 3. Eat
Monitoring:	Two to three weeks after initiation or insulin adjustment Alternate pre-breakfast & pre-dinner FBG with pre-lunch and pre-bedtime FBG. Remind patient to bring glucose monitoring chart to clinic. Explain that good control is established when the patient is monitoring urine glucose twice a day. If 2 positive urine glucose measurements, then revert back to FBG.
DIET	
Diet Counseling:	Help patient obtain social services if needed. REVIEW WHAT FOODS THE PATIENT SHOULD EAT TO MAINTAIN A HEALTHY DIET:



6.3 The Follow-up Patient Visit

This section emphasizes a systematic approach, which will helpyou: 1.Assess medication adherence; and 2. Assess glucose control.

1. History (See 6.2.1)

2. Vital Signs (See 1.1.1)

3. Physical Exam (See 1.1.1)

4. Lab Review (See 6.2.4)

Use the same information from the initial visit for HISTORY, VITAL SIGNS, PHYSICAL EXAM and LAB REVIEW in the follow up visit.

6.3.1 MANAGEMENT OF DIABETES

6.3.1.1 Medication Adherence

Evaluate the patient's ability to follow the treatment plan from last visit.

6.3.1.2 Glycemic Control

Review the fingersticks recorded since last visit.

Good Control

- >50% pre-meal or pre-bedtime: FBG 150-180mg/dL or HbA1c 7.5-8.0%
- No medication/insulin changes required

Poor Control

- >50% pre-meal or pre-bedtime: FBG >185mg/dL or HbA1c > 8.0%
- Medication/Insulin titrations required

Emergency

- DKA or random blood glucose > 400mg/DL
- Requires emergency attention!

6.3.2 PLAN

*****IMPORTANT*****

BEFORE CHANGES ARE MADE TO INSULIN OR ORAL THERAPY

PLEASE CONSIDER THE FOLLOWING FROM THE INITIAL VISIT

CONDITIONS THAT REQUIRE DIFFERENT MANAGMENT

See par 3.2.6

EMERGENCIES

See par 3.2.6.1

6.3.2.1 Insulin Therapy

If not indicated go to Oral Therapy below

1. Transfer insulin naïve patients to the hospital to initiate insulin if any of the following conditions are present:

- Type 1 or malnutrition type diabetes
- DKA or glucose >400mg/dL
- Type 2 DM patients who fail max oral therapy
- Pregnancy
- Renal
- Children < 18 years old

2. Manage patients currently taking insulin as follows:

Good Control

- Maintain insulin dose
- Monitor blood glucose with twice daily urine dipsticks

Poor Control

- Increase total insulin by 15-20%
- Monitor with twice daily fingersticks for 2 weeks
- Patients should follow-up

Hypoglycemia

- Decrease total insulin by 15-20%
- Instruct patient to carry sugary drink

6.3.2.2 Management of type 2 Diabetes (Oral Therapy)

Lifestyle measures:	• **Healthy Diet** • **weight control**	• **physical Activity**	***Avoid/Decrease alcohol intake**

First line:

In addition to lifestyle modification start:

STEP	METFORMIN		GLIBENCLAMIDE	
	7 AM	**7 PM**	**7 AM**	**7 PM**
1	500 mg	—	5 mg	—
2	500 mg	500 mg	5 mg	5 mg
3	1000 mg	500 mg	10 mg	5 mg
4	1000 mg	1000 mg	10 mg	10 mg
5	Add glibenclamide		Add metformin	

* Glimepiride is alternative of Glibenclamide when there is frequent hypoglycemia with Glibenclamide

1 or 2 mg given orally once daily with breakfast or the first major meal of the day. The dose may be increased by 1-2 mg in 1-2 weeks' interval up to 4 mg maximum based on blood sugar response and is given once daily).

Good Control

- Continue current therapy, no monitoring required.

Poor Control

- Titrate to Metformin 1000mg BD &glibenclamide 10mg OD in the morning.
- If already on maximum therapy then switch to second line.

Second line:

1. when to switch:

If despite adequate titration doses of medication, blood glucose targets are not being attained after 6 months at the most (HbA1C should fall at least by 1% or persistent hyperglycemia of more than 180mg/dl in the past 3 months).

• Check the patient's adherence (understanding of medical and self-management, reinforcement of lifestyle factors influencing health and fitness targets).

• Exclude other conditions that can disturb glycemic control (e.g. steroids).

2. What to switch

In addition to lifestyle measures, adherence to medication and dose optimization add	
Preferred regimens	Vildagliptin (50mg) + Metformine (850 or 1000mg)
Dosage	Twice/day

Third line

In addition to lifestyle measures, adherence to medication and dose optimization.	
Preferred	Metformine (if tolerated) + Basal (long acting) Insulin. Add Prandial (short acting) with time if required*

GUIDE TO START AND ADJUST BASAL (LONG ACTING)INSULIN
1. Start basal insulin 10 units morning OR bed time and Continue Metiformine *Bedtime insulin dosing if FBG is high(Pre breakfast) *Morning insulin if Blood glucose level high(Pre dinner).
2.Titration:Adjust the basal insulin dose to achieve target(fix the Fasting first) * Increase by 2 units every 3 days until the glycemic control is achieved. * If FBG is > 6mmol/l but < 8mmol/l for 3 consecutive days;No change *If FBG is 4-6 mmol/l on any day decrease insulin dose by 2 units * If FBG is <4 mmol/l on any day decrease insulin dose by 4 units.
3. Intensification:Once daily to twice daily basal insulin *When:* *If evening pre prandial BGL is high(180mg/dl) *After 3 months if HBA1c > target despite FBG and predinner BGL at target *How:* *Halve the current once daily insulin dose and give the dose twice a day(pre breakfast and pre dinner) *Monitor pre dinner BGL and FBG versus target

6.5 Type 1 Diabetes.

Type 1 diabetes is the most common autoimmune disorder in childhood and adolescence. Both genetic and environmental factors are important in determining an individual's risk, however the mechanisms are not fully understood.

Onset can be at any age after the neonatal period, but it is most common in childhood and adolescence.

6.5.1 Presentation of type 1 Diabetes

Clinical presentation of diabetes can vary from non-emergency presentations (e.g. polydipsia, polyuria, weight loss, enuresis) to severe dehydration, shock and diabetic ketoacidosis

Symptoms and Signs

More Common	**Less Common**	**Severe (Diabetic ketoacidosis)**	
Weight loss	Excessive hunger	Frequent vomiting and acute abdominal pain	
Polyuria – in younger children bedwetting is common	Blurred vision	Flushed cheeks	Acetone smell on breath
Excessive thirst	Mood changes	Dehydration with continuing polyuria	
Tiredness - not wanting to work or play	Skin infections	Decreased level of consciousness	
	Oral or vaginal thrush	Kussmaul respiration (deep, rapid, sighing)	
	Abdominal pain	Coma	Shock

Treatment of diabetes consists of

- lifelong insulin dependency with multiple injections per day
- a healthy eating plan
- regular physical activity.

6.5.6 INSULIN TREATMENT

All children with type 1 diabetes and some children with other forms of diabetes require insulin. The aim is to replace insulin as physiologically as possible so that blood glucose levels are within the target range avoiding hypoglycaemia and sustained hyperglycaemia. Prolonged under-insulinisation results in chronic hyperglycaemia which increases the risk of stunted growth and diabetes complications, including diabetic ketoacidosis.

Comprehensive diabetes management includes insulin treatment, blood glucose monitoring, nutritional management, physical activity, education, rules for sick days, and psychosocial support (see subsequent sections).

Types of Insulin.

- Short-acting (regular/soluble) - e.g. Actrapid, Humulin R, Insuman Rapid
- Intermediate-acting - NPH insulin – e.g. Humulin NPH, Protaphane, Insulatard
- Pre-mixed short-acting (regular) and intermediate-acting (NPH) insulins – usually in the combination 30/70 or 25/7

Partial Remission or Honeymoon Phase in Type 1 Diabetes

- Insulin requirements can decrease transiently following initiation of insulin treatment.
- This has been defined as insulin requirements of less than 0.5 units per kg of body weight per day with an HbA1c < 7% (53 mmol/mol).
- Ketoacidosis at presentation and at a young age reduce the likelihood of a remission phase.
- It is important to advise the family of the transient nature of the honeymoon phase to avoid the false hope that the diabetes is spontaneously disappearing.

Insulin Action

INSULIN TYPE	PREPARATIONS	ONSET OF ACTION	PEAK OF ACTION	DURATION OF ACTION	WHEN TO GIVE
Rapid-acting	Aspart, Glulisine, Lispro	15-30 minutes	1-2 hours	3-5 hours	immediately prior to meal
Short-acting (regular)	Actrapid, Humulin R, Insuman Rapid	30-60 minutes	2-4 hours	5-8 hours	30 minutes prior to meal
Intermediate-acting	Humulin NPH, Protaphane, Insulatard,	2-4 hours	4-10 hours	12-24 hours	30 minutes prior to meal
Long-acting	Detemir	1-2 hours	6-12 hours	20-24 hours	once or twice daily
	Glargine	2-4 hours	relativelyp eakless	24 hours or less	once or twice daily
Mixed	Rapid/long-acting mix or Short/long-acting mix 30/70 or 25/75	30 minutes	4-12 hours	8-24 hours	30 minutes prior to meal

The two most common regimens used are:

- Twice-daily insulin using both short-acting and also intermediate-acting insulin. (If these insulins are not always available, pre-mixed insulin can be used as an alternative regimen).

  Basal bolus regimen (the preferred option) - with short-acting insulin given with main meals (usually three times per day) and intermediate-acting insulin given once or twice daily (evening, or morning and evening

6.5.6.1 Guideline on insulin dosage

Initiating therapy in a child not in DKA

Day 1

Give short-acting (regular) insulin (0.1 U/kg) every second hour until blood glucose is < 11 mmol/l, then every 4-6 hours. If hourly monitoring of blood glucose cannot be provided, begin with half the above dose.

Day 2 (from morning/breakfast):

Total daily dose 0.5-0.75U/kg/day.

a) TWO INJECTIONS PER DAY

- A starting point is to give two-thirds of the total daily insulin in the morning before breakfast and one-third before the evening meal
- On this regimen, at the start, approximately one-third of the insulin dose may be short-acting (regular) insulin and approximately two-thirds may be intermediate-acting insulin, although these ratios change with greater age and maturity of the young person.

For example: For a 36 kg child who is started on 0.5 U/kg/day, the total daily dose is 18 Units. Two-thirds of this is given in the morning (before breakfast) – (12 Units), and one-third before the evening meal – 6 Units. At each injection, 1/3 is short-acting and 2/3 is intermediate-acting.

Therefore the doses, for this 36 kg child, would be:

	Short-acting	*Intermediate-acting*
Before breakfast		*4 Units 8 Units*
Before evening meal	*2 Units*	*4 Units*

For mixed insulin, always think of the components separately (i.e. 10 units of mix 70/30 equals 3 units of short-acting (regular) and 7 units of intermediate-acting (NPH)), and adjust doses as above.

b) <u>BASAL-BOLUS REGIMEN – also called Multiple Daily Injections (MDI)</u>

- This is the preferred option if doctors and nurses have experience with this method, and frequent blood glucose monitoring is available.
- A starting point is:
    - If short-acting (regular) and intermediate-acting insulin is used, give:
        - 70% of the total daily dose as short-acting (regular) insulin (divided up between 3-4 pre-meal boluses)
        - 30% of the total daily dose as a single evening injection of intermediate-acting insulin
    - If short-acting (regular) and long-acting analogue insulins are used, give:

    ▪ 50% of the total daily dose as short-acting (regular) insulin (divided up between 3-4 pre-meal boluses)

    ▪ 50% of the total daily dose as a single evening injection of long-acting analogue insulin. (Sometimes this dose does not last for 24 hours and then

can be split into two doses morning and evening).

Subsequently, doses can be adjusted daily according to blood glucose levels.

It is important to note that:

- The level of blood glucose can rise in the early morning ("dawn phenomenon") and so care should taken if increasing the evening intermediate/long-acting dose as hypoglycaemia can occur in the middle of the night and this can be dangerous.
- insulin requirements can decrease for a time during the "honeymoon period" before rising again.
- The total daily dose required will generally increase as the child grows, and once puberty ensues a higher dose per kg per day is often needed.

6.5.6.2 Insulin requirements

- During the partial remission phase, the total daily insulin dose is often < 0.5 IU/kg/day
- Prepubertal children (outside the partial remission phase) usually require 0.7-1.0 IU/kg/day.
- During puberty, requirements may rise substantially above 1 and even up to 2 U/kg/day.

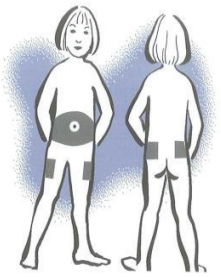
The ''correct'' dose of insulin is that which achieves the best attainable glycaemic control for an individual child or adolescent without causing obvious hypoglycaemia problems, and resulting in a harmonious growth according to children's weight and height charts.

Mixing Insulins in the same syringe:

Short-acting insulin or rapid-acting analogues can be combined with intermediate-acting insulins (e.g. NPH) in the same syringe. Begin by injecting air into both bottles. The short-acting insulin is generally drawn into the syringe first. If the intermediate-acting insulin is a "cloudy" insulin, mix by tipping the vial/bottle up and down 10 – 20 times. Do not shake the insulin as this damages the insulin. The doses can be adapted every day according to food intake, physical activity, and blood glucose readings. Long-acting analogues (Lantus, Levemir) should not be mixed with any other insulin.

Injection sites:

Recommended sites for insulin injection



Recommended sites for insulin injection 1

Recommended sites for insulin injection 2

6.5.7 DIABETIC KETO ACIDOSIS

Children and adolescents with DKA should be managed in centres experienced in its treatment and where vital signs, neurological status and laboratory results can be monitored frequently.

6.5.7.1 Emergency assessment

- Perform a clinical evaluation to confirm the diagnosis and determine its cause.
- Look for evidence of infection.
- Weigh the patient and use this weight for calculations.
- Assess clinical severity of dehydration.
- Assess level of consciousness (Glasgow coma scale).
- Obtain a blood sample for laboratory measurement of serum or plasma glucose, electrolytes (including bicarbonate or total carbon dioxide [TCO2]), blood urea nitrogen, creatinine, osmolality, venous (or arterial in critically ill patient) pH, pCO2, haemoglobin and haematocrit or blood count, calcium, phosphorus, and magnesium concentrations. The cause of a high white blood cell count is more often stress than infection.
- Perform a urinalysis or blood test for ketones (or point-of-care measurement on a fingerprick blood sample using a bedside meter if available).
- Obtain appropriate specimens for culture (blood, urine, throat), if there is clinical evidence of infection. If laboratory measurement of serum potassium is delayed, perform an electrocar-diogram for baseline assessment of potassium status

6.5.7.2 Supportive measures

- Secure the airway and empty the stomach by continuous nasogastric suction to prevent pulmonary aspiration in the unconscious or severely obtunded patient.
- A peripheral intravenous catheter should be placed for convenient and painless repetitive blood sampling.
- A cardiac monitor should be used for continuous electrocardiographic monitoring to assess T-waves for evidence of hyperkalemia or hypokalemia.
- Give oxygen to patients with severe circulatory impairment or shock.
- Give antibiotics to febrile patients after obtaining appropriate cultures of body fluids.
- Catheterize the bladder if the child is unconscious or unable to void on demand (e.g. infants and very ill young children).

6.5.7.3 Fluids and salt replacement

- For patients who are severely volume depleted but not in shock, volume expansion (resuscitation) should begin immediately with 0.9% saline to restore the peripheral circulation.
- The volume and rate of admin indicated, the volume administered typically is 10 ml/kg/h over 1-2 hours, and may be repeated if administration depends on circulatory status and, where it is clinically necessary, to assure a stable circulatory status.
- In the rare patient with DKA who presents in shock or severe circulatory collapse, rapidly restore circulatory volume with isotonic saline in 20 ml/kg bolus infused as quickly as possible through a large bore cannula. Repeat if necessary, with careful reassessment after each bolus

- Intraosseous access should be considered after multiple attempts to gain IV access have failed.
- Fluid management (deficit replacement) should be with 0.9% saline for at least 4-6 hours Thereafter, deficit replacement should be with a solution that has a tonicity equal to or greater than 0.45% saline with added potassium chloride, potassium phosphate or potassium acetate (see Potassium replacement).The rate of fluid (IV and oral) should be calculated to rehydrate evenly over 48 Hrs

Weight (kg)	Infusion rate (ml/kg/h)
4 - 9	6
10 - 19	5
20 - 39	4
40 - 59	3.5
60 - 80	3

6.5.7.4 Insulin therapy

- Start insulin infusion 1-2 hours after starting fluid replacement therapy; i.e. after the patient has received initial volume expansion.
- Correction of insulin deficiency
- Dose: 0.1 unit/kg/hour (e.g. dilute 50 units Regular [soluble] insulin in 50 ml normal saline, 1 unit = 1 ml).
- Route of administration IV.
- An IV bolus is unnecessary and should not be used at the start of therapy.
- The dose of insulin should usually remain at 0.1 unit/kg/h at least until resolution of DKA (pH > 7.30, bicarbonate > 15 mmol/l and/or closure of the anion gap), which invariably takes longer than normalisation of blood glucose concentrations.
- If the patient demonstrates marked sensitivity to insulin (e.g. some young children with DKA and patients with HHS (hyperglycaemic hyperosmolar state), the dose may be decreased to 0.05 unit/kg/h, or less, provided that metabolic acidosis continues to resolve.
- During initial volume expansion the plasma glucose concentration falls steeply. Thereafter, the plasma glucose concentration typically decreases at a rate of 2-5 mmol/l/h, depending on the timing and amount of glucose administration.
- To prevent an unduly rapid decrease in plasma glucose concentration and hypo-glycaemia, 5% glucose should be added to the IV fluid (e.g. 5% glucose in 0.45% saline) when the plasma glucose falls to approximately 14-17 mmol/l (250-300 mg/dl), or sooner if the rate of fall is precipitous.
- It may be necessary to use 10% or even 12.5% dextrose to prevent hypoglycaemia, while continuing to infuse insulin to correct the metabolic acidosis.

- If blood glucose falls very rapidly (> 5 mmol/l/h, 90 mg/dl/h) after initial fluid expansion, consider adding glucose even before plasma glucose has decreased to 17 mmol/l (300 mg/dl).

6.5.7.5 Potassium replacement

- Replacement therapy is required regardless of the serum potassium concentration.
- If the patient is hypokalemic, start potassium replacement at the time of initial volume expansion and before starting insulin therapy. Otherwise, start replacing potassium after initial volume expansion and concurrent with starting insulin therapy. If the patient is hyperkalemic, defer potassium replacement therapy until urine output is documented.
- If immediate serum potassium measurements are unavailable, an ECG may help to determine whether the child has hyperkalemia or hypokalemia. Flattening of the T wave, widening of the QT interval, and the appearance of U waves indicate hypokalemia. Tall, peaked, symmetrical, T waves and shortening of the QT interval are signs of hyperkalemia.
- The starting potassium concentration in the infusate should be 40 mmol/l. Subsequent potassium replacement therapy should be based on serum po-tassium measurements.
- If potassium is given with the initial rapid volume expansion, a concentration of 20 mmol/l should be used.
- Potassium replacement should continue throughout IV fluid therapy. Potassium may be given either as potassium phosphate or potassium acetate in preference to all potassium given as potassium chloride (to reduce risk of hyperchloremic acidosis).

- Potassium phosphate may be used together with potassium chloride or acetate; e.g. 20 mmol/l potassium chloride and 20 mmol/l potassium phosphate or 20 mmol/l potassium phosphate and 20 mmol/l potassium acetate.
- The maximum recommended rate of intravenous potassium replacement is usually 0.5 mmol/kg/h If hypokalemia persists despite a maximum rate of potassium replacement, then the rate of insulin infusion can be reduced.

6.5.7.6 Acidosis

- Bicarbonate administration should not be routinely administered, but in the rare case who presents in a critical condition with severe acidaemia and a state of shock, it may be appropriate to use bicarbonate.
- If bicarbonate is considered necessary, cautiously give 1-2 mmol/kg over 60 minutes.

6.5.7.7 Introduction of oral fluids and transition to subcutaneous insulin injections

- Oral fluids should be introduced only when substantial clinical improvement has occurred (mild acidosis/ketosis may still be present).
- When oral fluid is tolerated, IV fluid should be reduced.
- To prevent rebound hyperglycaemia the first SC injection should be given 15-30 minutes (with rapid-acting insulin) or 1-2 hours (with Regular insulin) before stopping the insulin infusion to allow sufficient time for the insulin to be absorbed. With intermediate- or long-acting insulin, the overlap should be longer and the rate of IV insulin gradually decreased. For example, for the patient on a basal-bolus insulin

regimen, the first dose of basal insulin may be administered in the evening and the insulin infusion is stopped the next morning

6.5.7.8. Cerebral oedema

1. Warning signs and symptoms of cerebral oedema include:

- Headache and slowing of heart rate.
- Change in neurological status (restlessness, irritability, increased drowsiness, incontinence).
- Specific neurological signs (e.g. unreactive pupils, cranial nerve palsies).
- Rising blood pressure.
- Decreased oxygen saturation.

2. Treatment of cerebral oedema

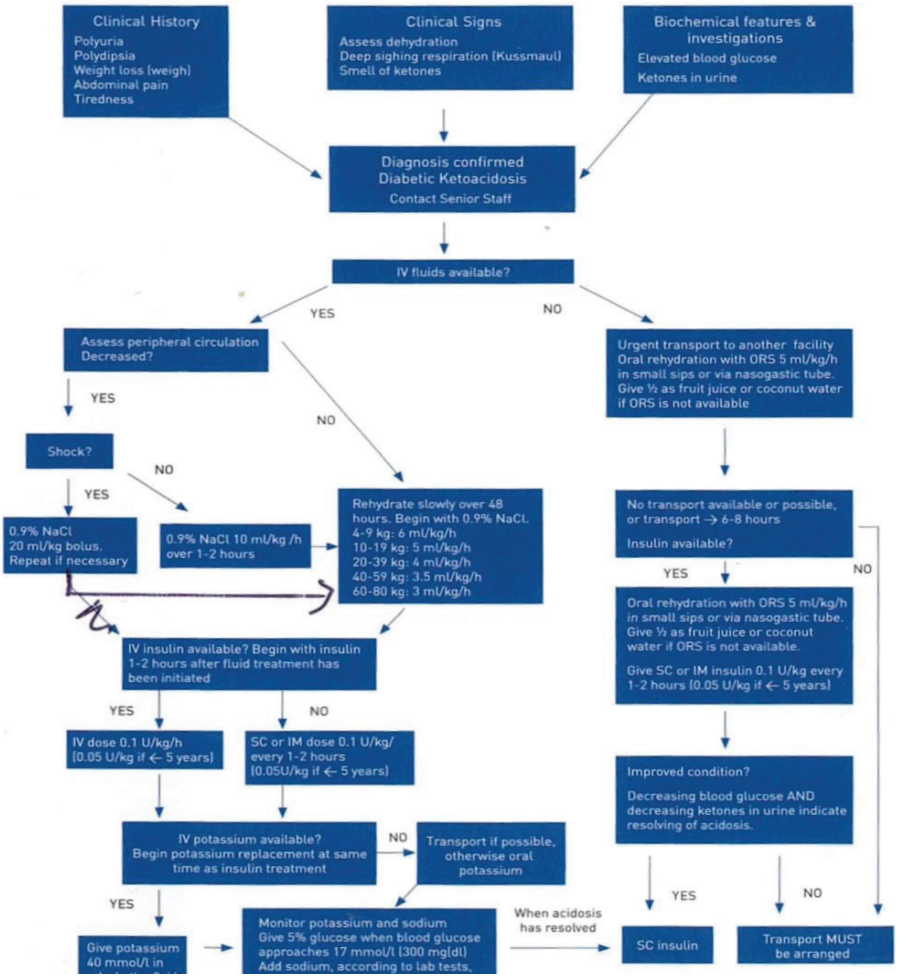
- Initiate treatment as soon as the condition is suspected.
- Reduce the rate of fluid administration by one-third.
- Give mannitol 0.5-1 g/kg IV over 20 minutes and repeat if there is no initial response in 30 minutes to 2 hours.
- Hypertonic saline (3%), 5 ml/kg over 30 minutes, may be an alternative to mannitol, especially if there is no initial response to mannitol.
- Mannitol or hypertonic saline should be available at the bedside.
- Elevate the head of the bed.
- Intubation may be necessary for the patient with impending respiratory failure, but aggressive hyperventilation (to a $pCO_2 < 2.9$ kPa [22 mm Hg]) has been associated with poor outcome and is not recommended.
- After treatment for cerebral oedema has been started, a cranial CT scan should be obtained to rule out other possible intracerebral causes of

neurologic dete-rioration (~ 10% of cases), especially thrombosis or haemorrhage, which may benefit from specific therapy.

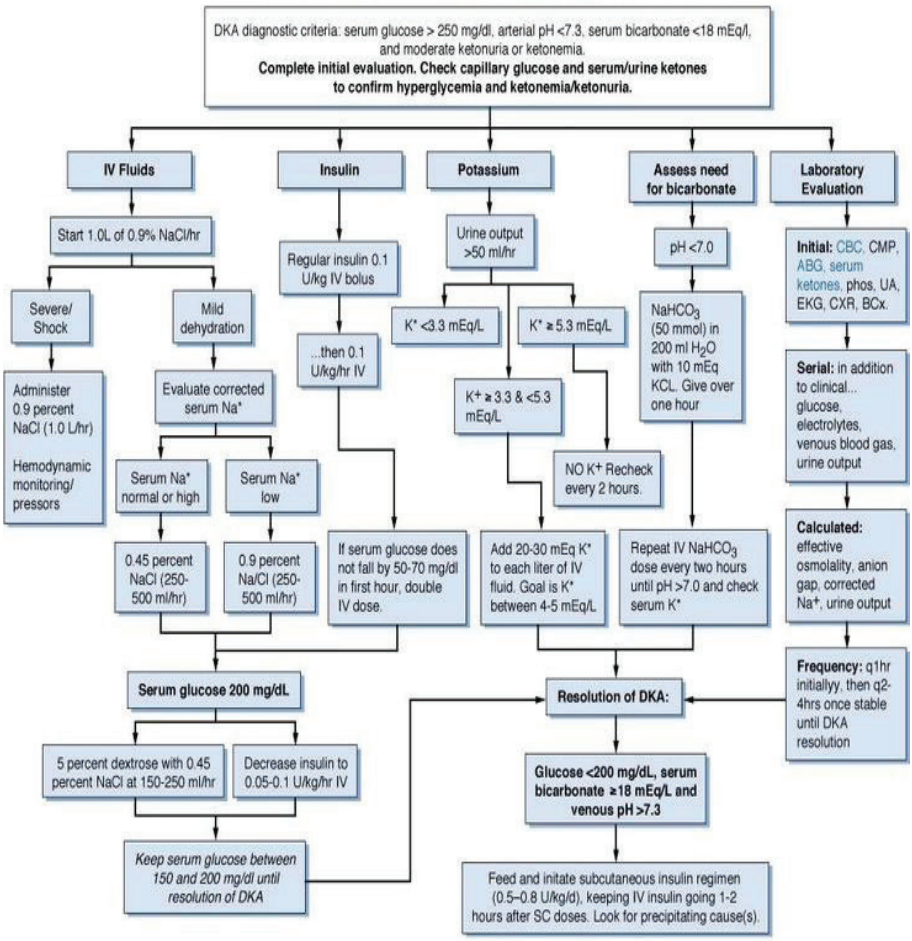
6.5.7.9 Clinical and biochemical monitoring should include:

- Hourly (or more frequently as indicated) vital signs (heart rate, respiratory rate, blood pressure).
- Hourly (or more frequently as indicated) neurological observations (Glasgow coma score) for warning signs and symptoms of cerebral oedema.
- Amount of administered insulin.
- Hourly (or more frequently as indicated) accurate fluid input (including all oral fluid) and output.
- Capillary blood glucose concentration should be measured hourly.
- Laboratory tests: serum electrolytes, glucose, blood urea nitrogen, calcium, magnesium, phosphorus, haematocrit, and blood gases should be repeated two to four hourly, or more frequently, as clinically indicated, in more severe cases.
- Urine ketones until cleared or blood β-hydroxybutyrate concentrations (either capillary or serum), if available, every 2 hours

Figure 2
DKA Management – Limited Care



DIABETIC KETOACIDOSIS (DKA), TREATMENT



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Kitabchi AE, Umpierrez GE, Miles JM, Fisher JN. Hyperglycemic crises in adult patients with diabetes. Diabetes Care. 2009 Jul;32(7): 1335-43.
Trachetenbarg DE. Diabetic ketoacidosis. Am Fam Physician. 2005 May 1;71(9): 1705-14.

PART 5: Chronic Kidney diseases

7 CHRONIC KIDNEY DISEASE GUIDELINES

7.1 Guiding Principle

The Initial Visit

1 **Establish that the patient has chronic kidney disease**

- Progression to end stage chronic kidney disease can often be prevented or delayed through early detection and treatment.
- The diagnosis of chronic kidney disease should be established based on proper history taking, clinical signs and symptoms and paraclinical investigation.

2. Identify the risk factors

The patient's history can help Identifying risk factor for chronic renal disease.

- Patients with other chronic disease such as hypertension, Diabetes and HIV are vulnerable to chronic renal disease.
- Nephrotic syndrome, acute kidney injury and chronic nephrotoxic agents like NSAIDs,gentamycine can cause chronic kidney disease
- History of use of Herbes medications

3. Assess the stage of chronic kidney disease

- Among patients with chronic kidney disease, the stage of disease should be based on their level of creatinine which reflects the kidney function or based on the GFR calculated according to Gault Cockroft formula.

The Follow-up visit

The follow up visit emphasizes a systemic approach which will help you:

- Confirm that patient has chronic kidney disease
- Define progression of chronic kidney disease by using eGFR
- Review the referral criteria

Review of initial management and patient education

7.2 The Initial Visit

7.2.1 CLINICAL HISTORY

Find out if the patient has the following symptoms

- Swelling of the body (Oedema)
- Rapid weight gain
- Changes in urine output
- Changes in urine color
- Fatigue
- Inability to concentrate and confusion
- Anorexia, nausea, Vomiting
- Shortness of breath, cough

7.2.2 MEDICATIONS

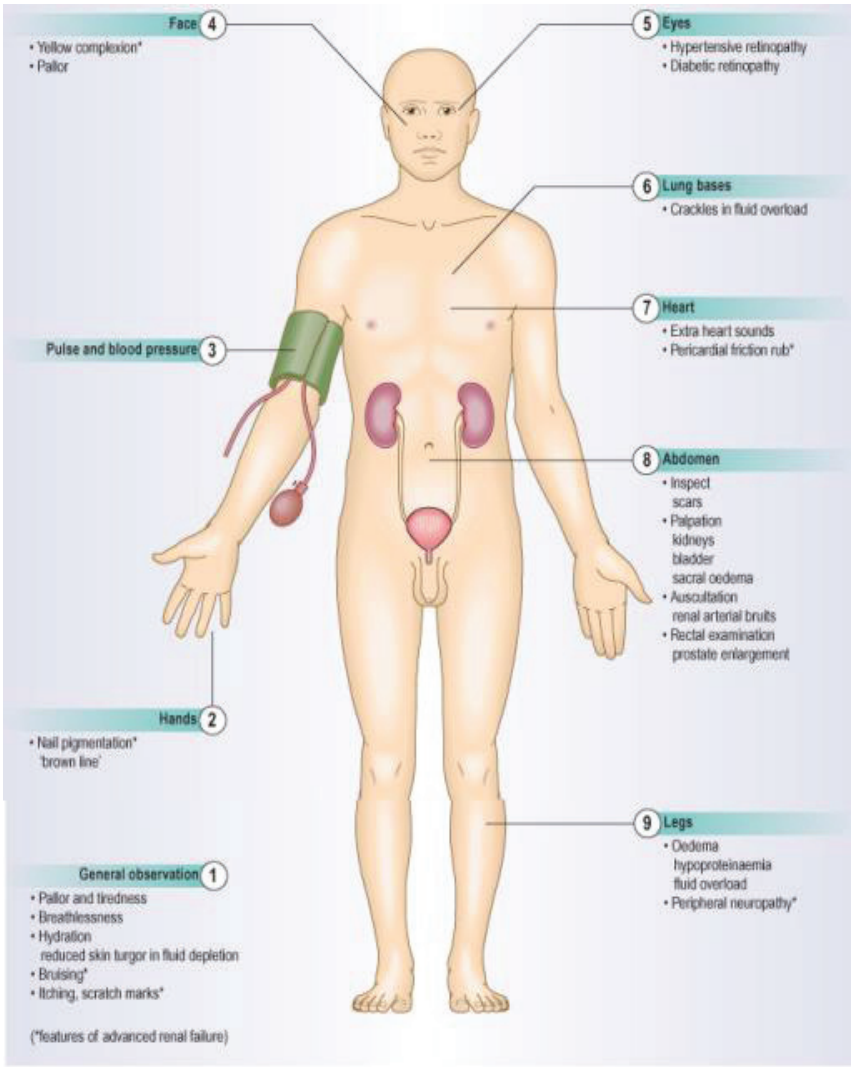
Nephrotoxic drugs such as NSAID, Tenofovir, Gentamycin and iodinated contrast agents should be avoided in patients with chronic kidney disease.

7.2.3 VITAL SIGNS

Vital Signs	Considerations
Blood Pressure	○ High Blood pressure is very common in Chronic kidney Disease patients
Oxygen Saturation Respiratory rate Pulse	○ These parameters can be impaired because of pulmonary edema, pleural effusion (as a result of hypervolemia) which may lead to hypoxia
Temperature	○ CKD patients are prone to infections

7.2.4 PHYSICAL EXAMS

While performing a systemic physical examination, the following signs may attract your attention and orient you to the management of CKD.



SIGNS	CAUSE
Fatigue and confusion	○ Anemia, insomnia, uremia, malnutrition ○ Fluid overload
Pruritus	○ Dryness of the skin ○ Hyperphosphatemia ○ Anemia
Dyspnea	○ Pulmonary oedema ○ Pleural effusion ○ Metabolic acidosis ○ Anemia ○ Aspiration ○ Other pulmonary diseases
Delirium(confusion)	○ Metabolic imbalance ○ Hypoxia, Hypercapnia ○ Medications
Pain	○ Bone pain due to secondary hyperparathyroidism ○ Diabetic Neuropathy ○ Calciphylaxis (Patients on hemodialysis)

SIGNS	CAUSE
Anorexia, Vomiting	○ Nausea ○ Gastroparesis diabetic ○ Uremic gastritis
Swelling of the feet and ankle	○ Fluid overload ○ Low oncotic pressure due to proteinuria and malnutrition ○ Heart failure comorbidity
Dry Mouth	○ Intravascular volume depletion(Can exist with oedema)
Cough	○ Pulmonary oedema ○ Aspiration ○ Pulmonary pathology cormobidity

7.2.5 SCREENING OF CHRONIC KIDNEY DISEASES

- Urine test for protein**uria**
- Blood test for creatinine

7.2.5.1

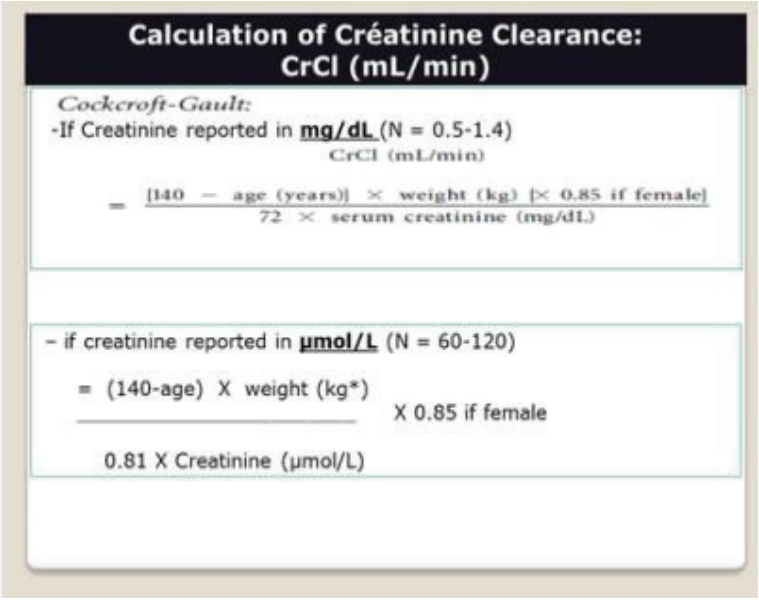
7.2.5.2 Screening for chronic kidney disease with urine dipstick (positive proteinuria is 2+)

URINE DIPSTICK RESULT	**24 HR URINE PROTEIN**	**DIPSTICK MAY BE SUGGESTIVE OF:(ideally urine of less than 4hours)**
2+	0.5-2gm	Proteinuria
3+	2-5gm	Nephrotic range
4+	7gm	Nephrotic range


Microscopic urinalysis
POSITIVE
Findings consistent with renal disease (Table 5)
NEGATIVE
NEGATIVE
3+ to 4+ protein on dipstick test
Trace to 2+ protein on dipstick test
NEGATIVE
Repeat urinalysis 2 to 3 times in next month
POSITIVE
Quantify proteinuria: 24-hour urine collection; urine protein/creatinine ratio
Transient proteinuria
Urine protein excretion <2 g per day
Urine protein excretion >2 g per day
Creatinine clearance
Creatinine clearance
Normal
Reduced
Normal
Reduced
Age <30 years
Symptomatic proteinuria
Symptomatic proteinuria
Yes
No
Obvious underlying cause
Cause unclear
Obvious cause
Work-up for orthostatic proteinuria
NEGATIVE
Isolated proteinuria
POSITIVE
Reassure; no follow-up needed
Reassure; blood pressure measurement and urinalysis every 1 to 2 years
Blood pressure measurement, urinalysis and renal function testing every 6 months
Treat underlying disease and follow up every month until stable or creatinine clearance improving
Consider nephrology consultation; consider indicated testing (Table 6)
Treat underlying disease; monthly blood pressure measurement, urinalysis and renal function testing; consider nephrology consultation
Nephrology consultation; consider indicated testing (Table 6)

7.2.5.3 Measuring creatinine clearance estimate using by cock croft –gault equation

- Creatinine depends on age, weight and sex.
- In a patient with stable creatinine, we can use the following formula to estimate the creatinine clearance.



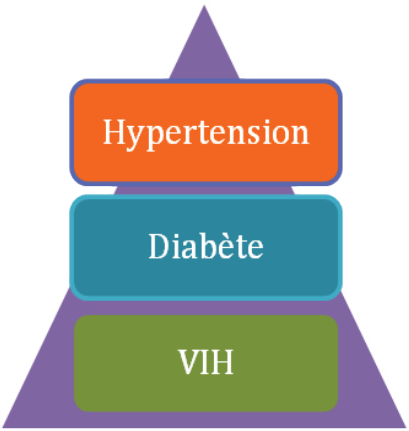
Interpretation

- ≥ 90 ml/min = Normal
- 60-89 ml/min = Mild Renal Failure
- 30-59 ml/min = Moderate Renal failure
- 15 - 29 ml/min = Severe Renal Failure
- <15ml/min= End stage renal failure

7.2.6 LABORATORYAND IMAGING REVIEW

LAB/Imaging REQUEST	WHEN
CREATININE	○ Initial visit; ○ 6 months then yearly; ○ It can be checked at any visit if patients presents signs and symptoms
URINE DIPSTICK FOR PROTEIN	○ Every visit
UREA	○ Initial visit ○ 6months the yearly
HEMOGLOBIN	○ Every 6 months ○ It can be checked at any visit if signs of anemia(palor,fatigue)
HIV	○ Initial visit
GLYCEMIA	○ Initial visit
POTASSIUM	○ Every visit(especially when on ACEI treatment , oliguria,anuria)
HEPATITIS B AND C SCREENING	○ Initial visit
Renal ultrasound, renal structure (cortex and medullar)	○ where available

7.2.7 COMMON CAUSES OF CHRONIC KIDNEY DISEASES



Hypertension:

Screening of proteinuria should be done to all patients with BP>160/100mmHg.

Creatinine is measured to patients with proteinuria>2+

Diabetes:

All patients diagnosed with Diabetes should do Urine dipstick for proteinuria 2 times per year and creatinine should be done annually.

HIV:

- HIV causes renal failure through damage to the glomerulus. This is defined as HIV- associated nephropathy (HIVAN)
- Higher rates are associated with advanced HIV disease with low CD4 Count and it often improves with ARVs treatment.
- Therefore ,Screen all HIV patients for proteinuria.
- Those with chronic renal failure should be started on ARVs regardless of the CD4 count.

7.2.7.1 Other causes of chronic renal failure are:

- Untreated or poorly treated acute renal failure (acute kidney injury) like renaldehydration (renal hypo perfusion)
- Chronic use of nephrotoxic agents
- Urinary truck infection or obstruction
- Viral Hepatitis B and C

A proper management of risk factors could prevent progression to chronic kidney diseases: in patients with diabetes Mellitus, hypertension, HIV, chronic use of NSAIDs, history of acute renal injury

7.2.8 STAGES OF RENAL DYSFUNCTION ACCORDING TO CREATININE LEVELS(USED IN MANAGEMENT)

STAGE	**DEGREE OF DYSFUNCTION**	**CUTOFF CREATININE LEVEL(ADULTS)**	**CREATININE CUTOFF IN CHILDREN**
CKD 1&2	MILD RENAL DISFUCTION	○ <100 Mmol/l ○ <1.1mg/dl	Normal to <2x normal creatinine for age
CKD3	MODERATE RENAL DISFUNCTION	○ 100-199mmol/l ○ 1.1-2.3mg/dl	Normal to <2x normal creatinine for age.
CKD 4&5	SEVERE RENAL DISFUNCTION	○ >200mmol/l ○ >2.3mg/dl	>x2 Normal creatinine for age

7.2.9 PLAN

7.2.9.1 Initial management

The cause identification and early treatment conduct to success outcome are:

- Lower Blood Pressure;
- High BP is very common in CKD
- Keep blood pressure below 130/80 mmHg
- Treat proteinuria
- ACE-inhibitor should be used as agent of choice in patients with CKD stage 1, 2 and 3(creatinine<200mmol/l) and proteinuria.
- Monitor potassium levelin patients on ACE-inhibitors to avoid hyperkalemia.
- Diet restriction
- Sodium(Na) intake should be restricted if high pressure or retaining fluid
- Potassium intake should be restricted if olguria or anuria(for example sweet banana).

CHRONIC KIDNEY DISEASE 3	CHRONIC KIDNEY DISEASE4 AND 5
Start Iron supplements Start low dose of ACE-inhibitor if creatinine<200 Monitor creatinine in 4 weeks and when indicated.	○ Palliative care ○ Start Iron supplements ○ Stop ACE-inhibitor ○ Start Furosemide ○ Monitor creatinine ○ Monitor electrolytes include potassium,calcium level,phosphate.

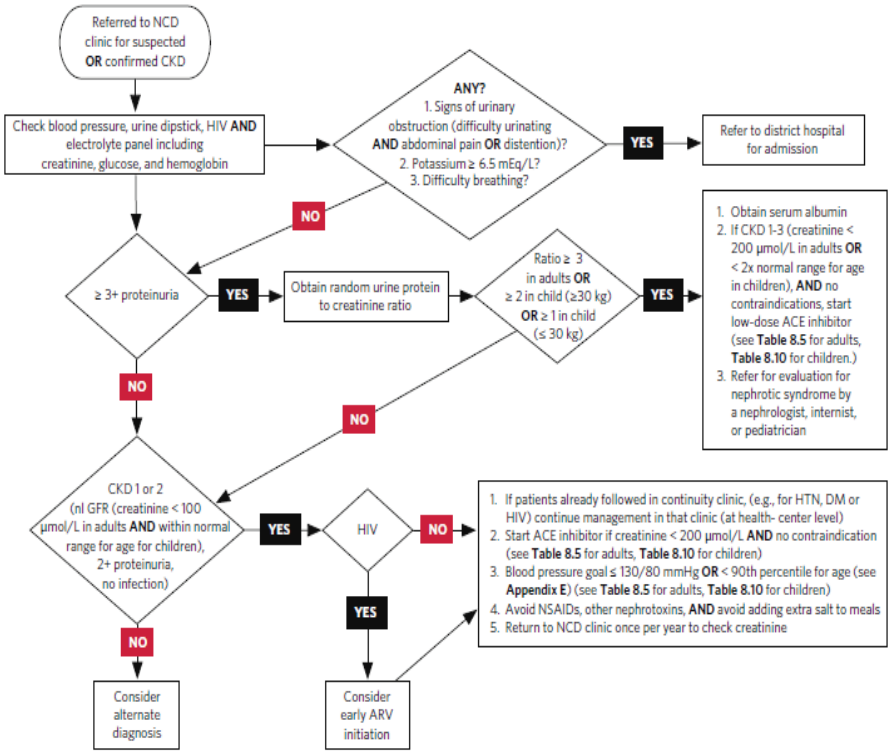
Note: after initial assessment and management a renal patient has to consult a nephrologist for diagnosis, further management and establishing prognosis.

7.2.9.2 Follow-up care

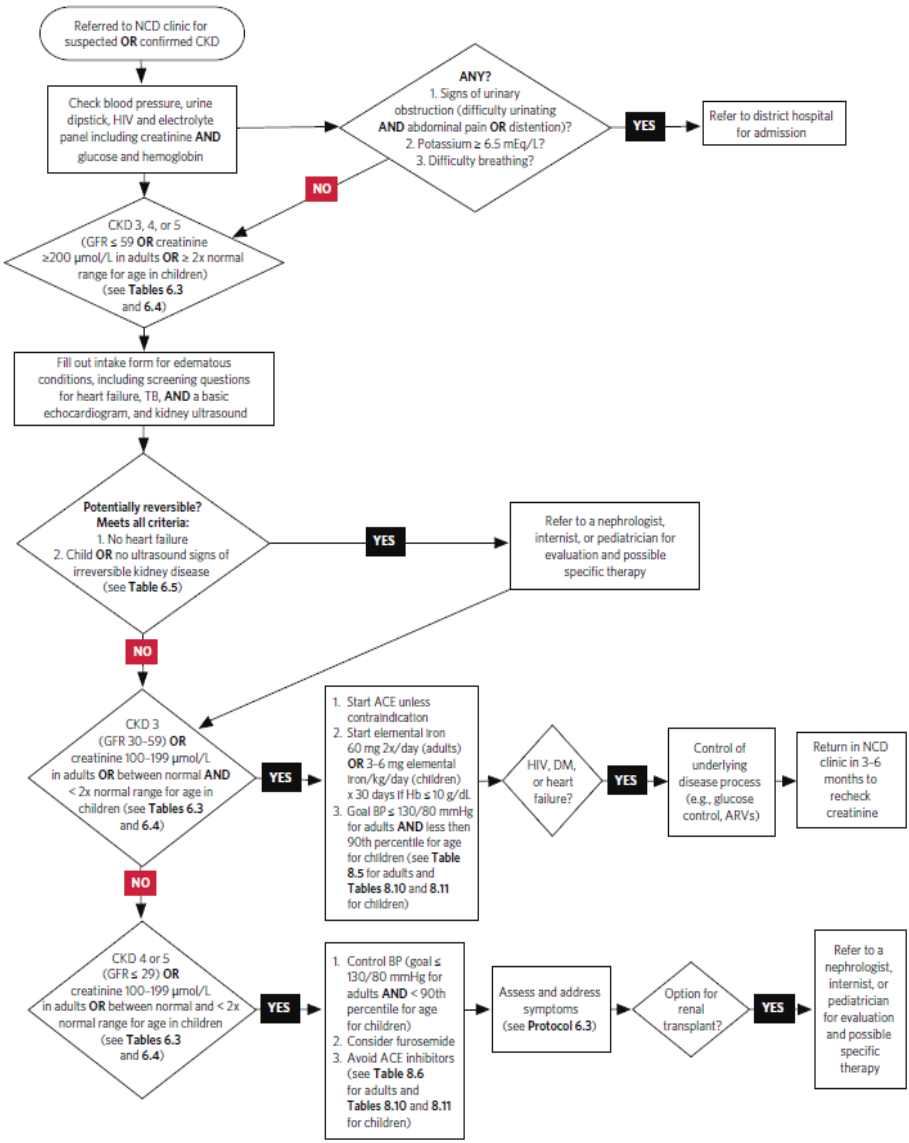
- Define accelerated progression of CKD as:
- Sustained decrease in GFR of 25% or more and a change in GFR category within12 months or a sustained decrease in GFR of 15 ml/min/1.73 m2 per year.
- Take the following steps to identify the rate of progression of CKD:
- Obtain a minimum of 3 GFR estimations over a period of less than 90 days.
- In people with a new finding of reduced GFR, repeat within 2 weeks to exclude causes of acute deterioration of GFR.

CHRONIC KIDNEY DISEASE3	**CHRONIC KIDNEY DISEASE 4 and 5**
○ Ferrous sulfate 200mg x3/day 30 days(If HB<10mg/dl) ○ ACE-I if creatinine<200 (Keep BP below 130/80mm/Hg) ○ Furosemide 40mg/day or increase accordingly	○ Avoid ACE-inhibitor ○ Ferrous sulfate 200mgx3/day ○ Furosemide(High dose) ○ Palliative care

Initial evaluation of CKD stage 1 and stage 2



Initial evaluation of CKD stage 3,4 and 5



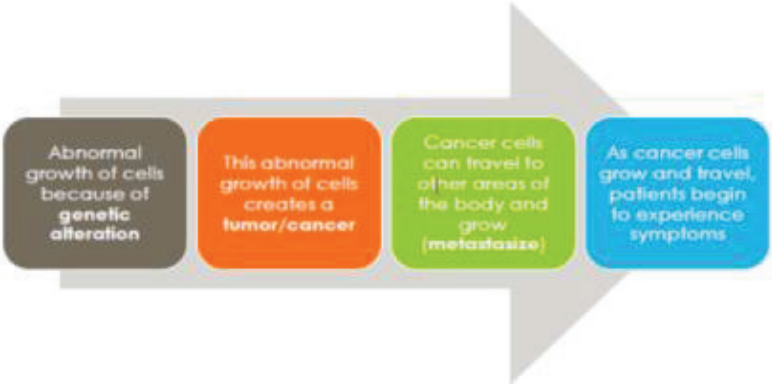
PART 6: Cancer

8 CANCER GUIDELINES

8.1 Introduction

8.1.1 WHAT IS CANCER?

Cancer refers to any one of a large number of diseases (more than 100) characterized by the development of abnormal cells that divide uncontrollably and have the ability to infiltrate and destroy normal body tissue. The abnormal growth of cells can results in tumor ("solid" cancers) formation. Such cancers then have the potential to spread throughout the body, which is a process known as metastasis. However not all cancers present necessarily as tumorssuch as leukemias and some lymphomas ("liquid" cancers).



8.1.2 RISK FACTORS AND CAUSES

It is usually not possible to know exactly why one person develops cancer and another doesn't. The direct causes are not known for the majority of cancers. But research has shown that certain patient characteristics and behavior, called risk factors, may increase a person's chances to develop cancer.

The most common risk factors for cancer include aging, tobacco, alcohol, unhealthy diet, lack of physical activityradiation exposure, chemicals and other substances, some viruses and bacteria, certain hormones, family history of cancer, or being overweight.

8.1.3 CANCER SERVICE PROVISION BY LEVEL OF HEALTH CARE.

HEALTH CARE LEVEL	PERSONNEL REQUIRED	SERVICES OFFERED
Community Service	-Community health worker	-Community awareness on cancer prevention and early detection. -IEC/BCC ,community mobilization -Home based palliative care -Referral and linkage
Health Center	-Nurse -Social Worker -Community Health Officer	-Community awareness on cancer prevention and early detection. -IEC/BCC, communityMobilization -clinical examination -screening services -Screening of cervical lesions using VIA - Cryotherapy

HEALTH CARE LEVEL	PERSONNEL REQUIRED	SERVICES OFFERED
		-Referral for screened positiveclients for furthermanagement -Centre for outreach - Palliative care -Research
District Hospital	-Nurse - Medical Officer - Social Worker -Community Health Officer	-IEC/BCC -Screening e.g. with VIA for cervicalcancer. -Diagnosis using imagingmodalities, -Staging and biopsy forsuspected cancer -Referral for Cancer management -Palliative care -Coordination/M&E -Research - Cancer Registry
Provincial Hospital	- Nurse -Medical Officer -Family Physician	Same as DH Services plus -Surgery -Chemotherapy

HEALTH CARE LEVEL	PERSONNEL REQUIRED	SERVICES OFFERED
	-Physician (Internist) -Pathologists- -Gynaecologist -Surgeon Peadiatrician	-Research
Referral Hospital	-Nurse -Medical Officer -Physician (Internist) - Pathologists - Gynecologist -Surgeons - Pediatrician -Radio-oncologist -Medical oncologist -Clinical Pharmacist	Same as DH Services plus -Surgery -Chemotherapy -Research -Pathologic interpretation

8.2 Signs and symptoms

There are no common symptoms or signs for all cancers; at early stage most of cancers are asymptomatic. When they become symptomatic, each cancer can present with different symptoms according to the type and stage.

However, the following symptoms and signs should alert every clinician to suspect a possible cancer and make appropriate investigations and referral. Those symptoms are:

- Difficulty urinating (weak stream): ***Prostate cancer***
- Persistent vomiting, nausea, early satiety:***Stomach or pancreatic cancer; CML***
- Difficulty defecating or blood in stool →***Colon or rectal cancer***
- Persistent headache, change in mental function, focal weakness:***Brain tumor***

The systemic signs include

- Unexplained loss of weight or loss of appetite.
- Persistent fatigue, nausea, or vomiting.
- Persistent low-grade fever, either constant or intermittent.
- Repeated infection
- Painless mass
- Unexplained abdominal or bone pain

8.3 Principles screening, diagnosis and treatment

8.3.1 PRINCIPLES OF CANCER SCREENING

In Rwanda the most feasible cancers to screen are cervical and breast cancers. Screening tests are performed on people who have no physical signs of the disease being tested. The goal of cancer screening is to detect tumors at an early enough stage so that they can be curable when treated.

8.3.2 PRINCIPLES OF DIAGNOSIS AND STAGING

Early diagnosis, during the first stages of cancer development, leads to high chancesof recovery and success of treatment. The diagnosis of cancer is mostly confirmed by biopsy, and imaging techniques are used for cancer staging.

8.3.3 PRINCIPLES OF TREATMENT

Curing cancer requires eliminating all cancer cells. The major modalities include curative and palliative treatment depending on the stage of the diseases. They can be:

- Surgery (for local and local-regional disease)
- Radiation therapy (for local and local-regional disease)
- Chemotherapy (for systemic disease)

Other important methods include

- Hormonal therapy (for selected cancers, eg, prostate, breast, endometrium)
- Immunotherapy (, interferon's, and other biologic response modifiers and tumor vaccines
- Differentiating drugs such as retinoids
- Targeted drugs that exploit the growing knowledge of cellular and molecular biology(monoclonal antibodies)

Overall treatment should be coordinated among multidisciplinary team such us radiation oncologist, surgeon, and medical oncologist, where appropriate.

8.3.4 HOW TO USE THIS GUIDELINE AT HC AND DH LEVEL

This cancer diseases guideline is useful for any health care provider. It is aiming to provide basic information related to cancer diseases in general and focuses on some major cancers which are emerging in Rwanda such as Breast and cervical cancer etc. It aims also to raise awareness ofhealth care providers particularly at health center and district hospital levels about cancer screening and early suspicion for early referral, diagnostic and management.

8.4 Major emerging cancers in Rwanda

PEDIATRIC CANCERS	OVERLAPPING	ADULT CANCERS
-Wilm's tumor -Acute Lymphoblastic Leukemia -Burkitt'sLypmhoma -Rhabdo-myosarcoma -Osteosarcoma -Neuroblastoma	-Lymphomas -Chronic myeloid Leukemia	-Breast -Cervical -Liver -Stomach -Acute Myeloid Leukemia

8.4.1 NEPHROBLASTOMA (WILMS' TUMOR)

Definition

Wilms tumor (also called Wilms' tumor or nephroblastoma) is a type of cancer that starts in the kidneys. It is the most common type of kidney cancer in children. It is named after Max Wilms, a German doctor who wrote one of the first medical articles about the disease in 1899.

Overview

- Wilms'tumoristhe most common cancer in children that starts in the kidneys. About 9 of 10 kidney cancers in children are Wilms tumors.
- Fourth most common childhood cancer
- 2/3 of cases in children under age 5 years, 95% in patients under age 10 years
- Can have other associated abnormalities, particularly of the genitourinary tract
- Most Wilms tumors are unilateral, which means they affect only one kidney. About 5% of children with Wilms tumors have bilateral disease (tumors in both kidneys).

Signs and symptoms

Wilms tumors can be hard to find early because they can often grow quite large without causing any symptoms. Children may look healthy and play normally. The most common signs are:

- Swelling or a hard mass in the abdomen (belly): This is often the first sign of a Wilms tumor. It's usually not painful, but it might cause belly pain in some children.
- Less common: Blood in urine and/or hypertension, constipation

Diagnosis

Laboratory tests

- Renal function: urea, creatinine, urinalysis
- Screening NFS (check for anemia), SGOT/SGPT, HIV
- Coagulation studies (associated von Willebrand's disease in 8%)

Imaging tests

- Ultrasound is first tool – can show mass, associated hydronephrosis
- Abdominal CT useful to determine nature and extent of mass, lesions in opposite kidney (seen in 7%)
- Chest x-ray to rule out lung metastases

Pathology tests

- Diagnosis made by pathologic examination of tissue obtained during surgical resection
- Do NOT perform needle aspiration – risk of tumor rupture, peritoneal spillage
- Goal is complete surgical resection with pathology from operative specimen.

Staging of Wilms' tumor

Staging is based on the results of the physical exam and imaging tests (ultrasound, CT scans, etc.) as well as the results of surgery, if performed) to remove the tumor. The final staging is performed after surgery and can range from stage 1 to stage 5.

Treatment

Overall, about 9 of 10 children with Wilms tumor are cured. Most children will get more than one type of treatment with the main types of treatment for Wilms tumor being: **Surgery, Chemotherapy and Radiation therapy.**

Key recommendations:

a) At Health center level

- If abdominal mass is clinically suspected refer immediately to the DH

b) At District hospital level

- If abdominal mass is clinically confirmed refer to the referral hospital offering cancer services for diagnosis

8.4.2 LYMPHOMAS

Definition

Lymphomas are malignant tumours of the lymphoreticular system and are classified into **Hodgkin's lymphoma** (named after Dr. Thomas Hodgkin, who first recognized it) and Non-**Hodgkin'slymphoma (NHL).** These types of lymphoma differ in how they behave, spread, and respond to treatment. Doctors can usually tell the difference between them by looking at the cancer cells under a microscope or by using sensitive lab tests.

They are 2 main types of NHL according to the cells of origin: B-cell Lymphoma and T-cell Lymphoma. **Burkitt's Lymphoma** is a B-cell lymphoma and rapidly growing tumor of childhood.

Risk factors

They are many risk factors for lymphomas, some are modifiable and others not (Age, Ethnicity, gender,etc.). Below are some modifiable risk factors

- Exposure to certain chemicals (benzene, insecticides, etc.)
- Radiation exposure (atomic bomb, nuclear reactor accidents, etc.)
- Auto-immune diseases
- **Certain infections:** Human T-cell lymphoma virus (HTLV-1), **Epstein-Barr virus (EBV)** for BurtkittLumphoma, Human Herpes Virus 8 (HHV8), **Human Immunodeficiency Virus (HIV)**, Helicobacter pylori, Campylobacter jejuni, Hepatitis C virus (HCV) and Malaria

Signs and Symptoms

Lymphoma can cause many different signs and symptoms, depending on where it is in the body. In some cases it might not cause any symptoms until it grows quite large. Common signs and symptoms include:

- Enlarged lymph nodes
- Swollen abdomen (due to enlarged lymph nodes in the abdomen)
- Chest pain or pressure (due to enlarged lymph nodes in the chest)

- Shortness of breath or cough (due to enlarged lymph nodes in the chest)
- Fever, Drenching night sweats (enough to soak clothing and sheets)
- Fatigue (extreme tiredness, from low red blood cell counts: hemolytic anemia)
- Unexplained weight loss
- Severe or frequent infections (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)

Diagnosis

Pathology: Biopsies can be taken through Excisional or incisional biopsy or core needle biopsy. The final diagnosis cannot be done based on fine needle aspiration (FNA)

Blood tests: Full blood count, serology for risk factor infections

Imaging tests: Chest x-ray, Ultrasound, CT scan.

Treatment

The main types of treatment for lymphomas are:

- Chemotherapy
- Immunotherapy
- Targeted therapy
- Radiation
- Stem cell transplant
- In rare cases, surgery is also used.

Key recommendations

a**) Health center level**

- Symptoms such as fever, night sweats and lymphadenopathy can mimic tuberculosis
- If the patient presents with the symptoms above and a negatived TB smear exam, refer to the DH for further examination

b) District hospital level

- If GeneXpert for TB is negative, perform lymph node biopsy if available (refer for biopsy, if not available)

8.4.3 LEUKEMIAS

Definition

Leukemia is a cancer of the early blood-forming cells. Most often, leukemia is a cancer of the white blood cells, but some leukemias start in other blood cell types. Leukemia is often described as being either **acute** (fast growing) or **chronic** (slow growing). Different types of leukemia have different treatment options and outlooks.

Four main types

- Acute myeloid (or myelogenous) leukemia (AML)Chronic myeloid (or myelogenous) leukemia (CML)
- Acute lymphocytic (or lymphoblastic) leukemia (ALL)
- Chronic lymphocytic leukemia (CLL**)**

Leukemia is the most common cancer in children and adolescents, accounting for almost 1 out of 3 cancers. Most childhood leukemias are acute lymphocytic leukemia (ALL). Most of the remaining cases are acute myeloid leukemia (AML). Chronic leukemias are rare in children.

Risk factors and causes

There exists many risk factors for leukemias, the most frequent are listed below:

- Cigarette smoking
- Exposure to chemicals: Most Benzene also present in cigarette smoking
- Certain viral infections: human T-cell lymphoma/leukemia virus-1 (HTLV-1), Epstein-Barr virus (EBV)

- Some chemotherapy drugs used for long time
- Radiation exposure: Atomic bombs, nuclear radiations, x-rays
- Certain genetic syndromes (down syndrome, Trisomy 21, Fanconi disease)

Signs and Symptoms

Leukemias may cause many signs and symptoms

- **Problems caused by low blood cell counts**: Feeling tired, Feeling weak, Feeling dizzy or lightheaded, Shortness of breath, Fever, Infections that don't go away or keep coming back, Bruising easily, Bleeding such as frequent or severe nosebleeds and bleeding gums
- **Swelling in the abdomen:** Invasion of the spleen, abdominal lymph nodes
- Enlarged lymph nodes, Thymus
- Bone or joint pain

Diagnosis

Certain signs and symptoms can suggest that a person might have acute lymphocytic leukemia, but tests are needed to confirm the diagnosis.

- **Bone marrow tests**: Bone marrow aspiration and biopsy for various tests
- **Lymph node biopsy:** Rarely needed as bone marrow biopsy is usually adequate

Other tests can be informative:

- **Blood tests:** Complete blood count (CBC) and blood cell exam (peripheral blood smear), Blood chemistry and coagulation tests
- **Imaging tests:** X-ray, CT scan, Ultrasound, MRI scan, Gallium and bone scans
- **Genetic tests:** to diagnoses some chromosomal abnormalities.

Treatment

There various treatments for leukemia depending on their type and stages. The main types of treatment used for leukemias are:

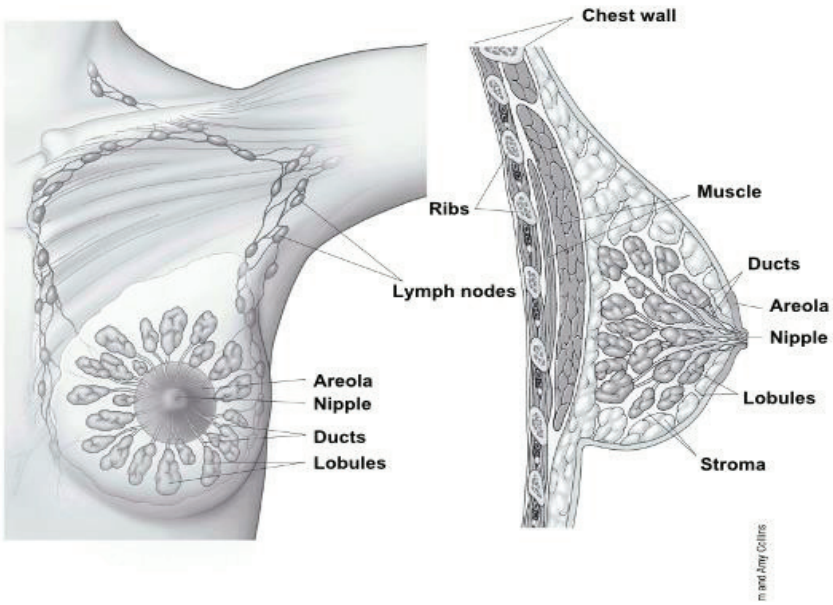
- Chemotherapy
- Targeted therapies
- Stem cell transplant
- Other treatments such as surgery, radiation therapy, or monoclonal antibodies, may be used in special circumstances.

8.4.4 BREAST CANCER

Definition

Breast cancer is a malignant tumor that starts in the cells of the breast.

Anatomy of breast



Most breast cancers begin in the cells that line the ducts (ductal cancers). Some begin in the cells that line the lobules (lobular cancers), while a small number start in other tissues

Benign breast lumps

Most breast lumps are not cancerous (benign). Still, some may need to be biopsied (sampled and viewed under a microscope) to prove they are not cancer.

Fibrosis and cysts**:** Fibrosis is the formation of scar-like (fibrous) tissue, and cysts are fluid-filled sacs. These conditions are most often diagnosed by a doctor based on symptoms, such as breast lumps, swelling, and tenderness or pain. These symptoms tend to be worse just before a woman's menstrual period is about to begin.

Fibroadenomas and intraductalpapillomas**:** Benign breast tumors such as fibroadenomas or intraductalpapillomas are abnormal growths, but they are not cancerous and do not spread outside the breast to other organs. They are not life threatening. Still, some benign breast conditions are important because women with these conditions have a higher risk of developing breast cancer.

Causes and risk factors of breast cancer

Non-modifiable Risk factors

- **Gender:** female
- **Aging:** The risk of developing breast cancer increases as the person gets older
- **Genetic risk factors:** About 5% to 10% of breast cancer cases are thought to be hereditary.
- **Family history of breast cancer**: Breast cancer risk is higher among women whose close blood relatives have this disease.
- **Race and ethnicity**: White or Caucasian
- **Certain benign breast conditions:** Fibrosis, cysts, fibroadenomas

- **Previous chest radiation:** Due to prior radiation treatment of other conditions

Lifestyle-related factors

- **Not Having children:** Women who have had no children or who had their first child after age 30 have a slightly higher breast cancer risk overall.
- **Oral contraceptives:** The risk is slightly increased
- **Hormone therapy after menopause**: Hormone therapy with estrogen (often combined with progesterone)
- **NotBreastfeeding:** Some studies suggest that breastfeeding may slightly lower breast cancer risk
- **Drinking alcohol:** The use of alcohol is clearly linked to an increased risk of developing breast cancer. The risk increases with the amount and frequency of alcohol consumed.
- **Being overweight or obese**: Being overweight or obese increases breast cancer risk.
- **No Physical activity:** Evidence is growing that physical inactivity increases breast cancer risk
- **Tobacco smoke:** The risk is increased in smokers

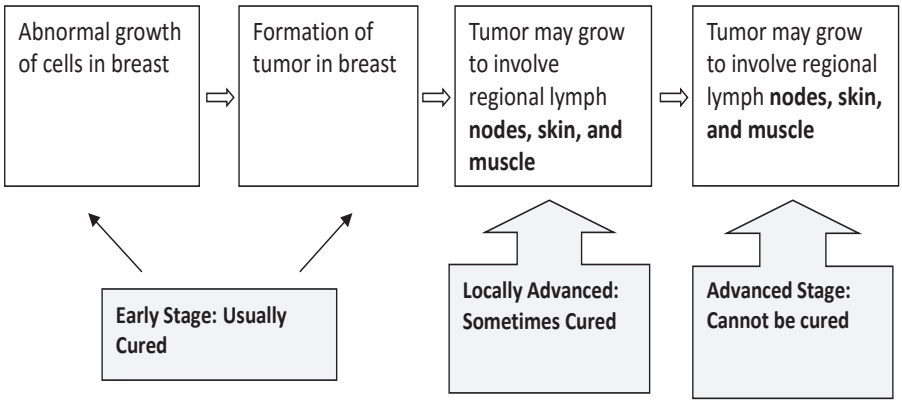
Signs and symptoms

The most common symptom of breast cancer is a new lump or mass. A painless, hard mass that has irregular edges is more likely to be cancerous, but breast cancers can be tender, soft, or rounded. They can even be painful. For this reason, it is important to have any breast mass or lump or breast change checked by a health care professional experienced in diagnosing breast diseases. Possible symptoms of breast cancer include:

- Swelling of all or part of a breast (even if no distinct lump is felt)
- Skin irritation or dimpling

- Breast or nipple pain
- Nipple retraction (turning inward)
- Redness, scaliness, or thickening of the nipple or breast skin
- Nipple discharge (other than breast milk)

Figure 6: Breast Cancer Progression and Spread



Diagnosis

Imaging tests:Mammograms, Breast ultrasound, CT scan and MRI of the breast

Pathology**:** A biopsy is done when mammograms, other imaging tests, or the physical exam finds a breast change (or abnormality) that is possibly cancer. A biopsy is the only way to tell if cancer is really present. Biopsy can be done through **Fine needle aspiration biopsy, Core needle biopsy, Surgical (open) biopsy.**

Treatment

The treatment of breast cancer depends on the type and stage of the disease, the main types of treatment for breast cancer are:

- Surgery
- Radiation therapy

- Chemotherapy
- Hormone therapy
- Targeted therapy
- Bone-directed therapy (for bone metastases)

Practical approach to handle a patient with breast concern at the level of health center and district hospital.

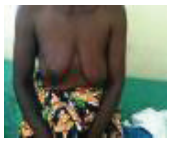
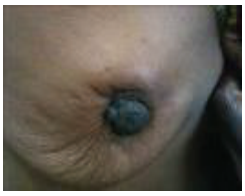
Questions to ask a patient with a breast concern

- How long has she had the problem?
- Does she have any other symptoms? (e.g. pain, nipple discharge, fevers)
- Has she been pregnant before?
- Is she pregnant or breastfeeding? Are symptoms related to menstrual cycle?
- Does she have any personal history of breast cancer?
- Has she had this problem before or had treatment for this or other breast problems?
- Does she have any family history of breast cancer?

Clinical Breast Exam

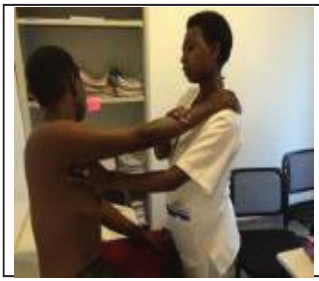
Step 1: Visual inspection: GOAL: Identify any visible abnormalities or asymmetry or nipple retraction

1. Patient should be naked from waist up
2. Patient sitting up, hands on hips and pushing into hips
3. The patient has to raise her arms up and press her hands together over her head
4. Pay attention to the size, form, symmetry of the breast tissue, color and changes on the skin, condition of the nipple and nipple discharge

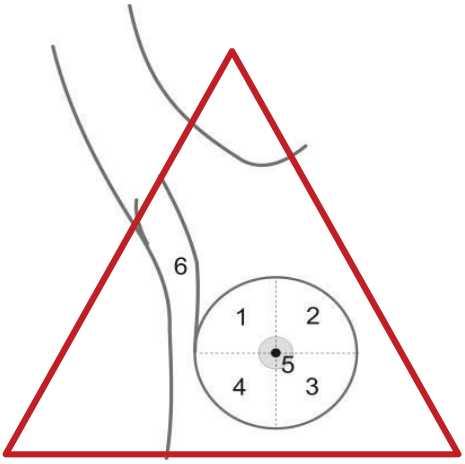




Step 2: Nodal Examination (while sitting): GOAL: Identify any enlarged lymph nodes

1. Cervical nodes
2. Supra/infraclavicularnodes
3. Axillary nodes: Have the patient relax her arm, for example by resting it on your shoulder



Quadrants of the Breast



1.Upper outer quadrant

2.Upper inner quadrant

3.Lower inner quadrant

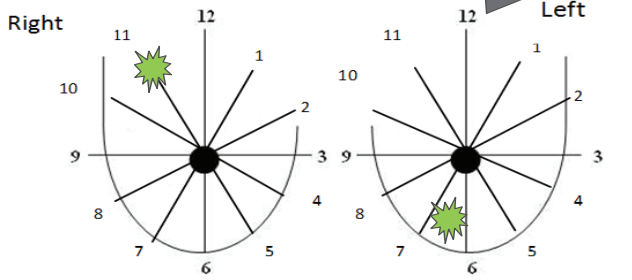
4.Lower outer quadrant

5.Nipple-areola area

6.Axillary (underarm) quadrant

Using a Clock Face

How would you describe the location of these tumors?



Step 3: Breast Palpation (lying) :GOAL: Identify any abnormal masses, tenderness, or nipple discharge

1. Place hand of side examining above head to flatten breast tissue over chest wall

2. Palpate with pads of middle three fingers

3. Use 3 levels of pressure (light, middle, deeper)over each area, in circular motion

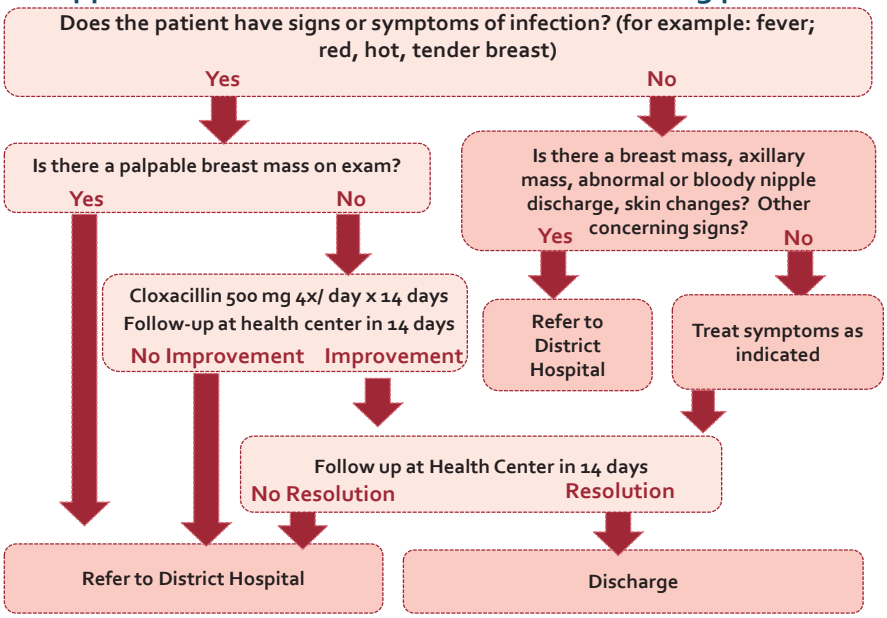
4. Don't lift fingers off breast

5. Palpate entire breast using grid technique

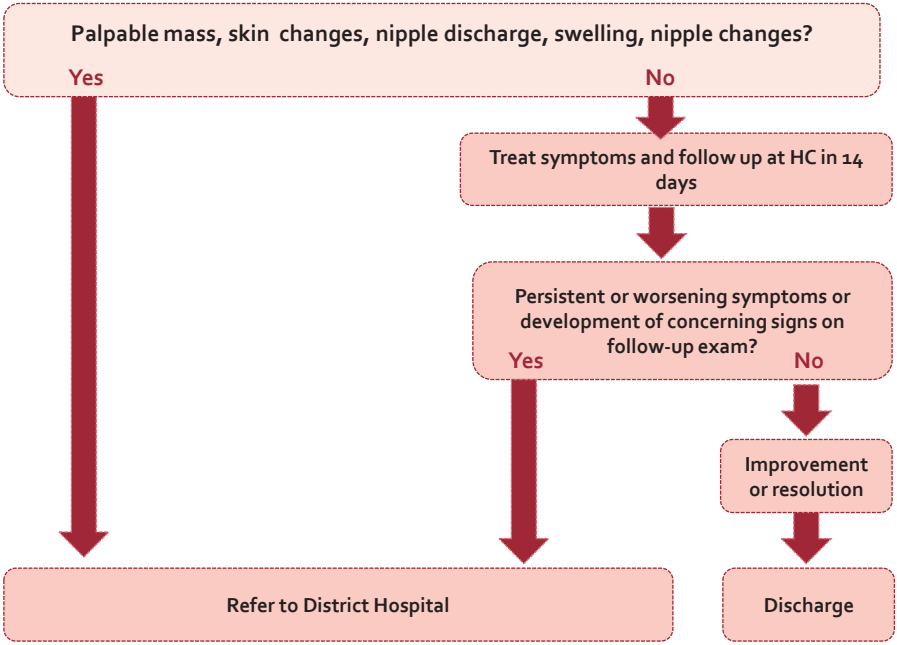
6. Don't forget axillary tail!

7. TAKE YOUR TIME – some recommendations have proposed 2-3 minutes PER BREAST

Approach to breast concerns in a breastfeeding patient



Approach to a non-breastfeeding patient with breast complaint



Recommendations at the District Hospital

- Confirm mass or other finding on clinical breast exam and refer to referral hospital
- If clinical symptoms are present in addition to risk factors, then patient should be referred to referral hospital

8.4.5 KAPOSI'S SARCOMA

Definition

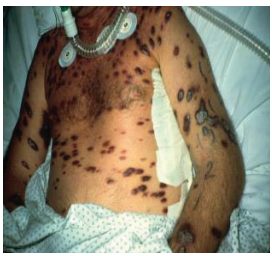
Kaposi sarcoma (KS) is a cancer that develops from the cells that line lymph or blood vessels. It usually appears as tumors on the skin or on mucosal surfaces such as inside the mouth, but tumors can also develop in other parts of the body,

such as in the lymph nodes (bean-sized collections of immune cells throughout the body), the lungs, or digestive tract.

Risk factors and causes

Kaposi sarcoma (KS) is caused by infection with a virus called the Kaposi sarcoma associated herpesvirus (KSHV), also known as human herpesvirus 8 (HHV8). Infection with KSHV seems to be needed to cause KS, but in most cases infection with KSHV alone does not lead to KS. Risk factors such as **weakened immune system**, due to **HIV infection**, organ transplant, or older age may predispose patients to develop KS.

Signs and symptoms



- Skin and mucosal lesions:
- Flat ->plaques ->rubbery nodules
- Hyper pigmented (reddish- ɔle)
- Non-painful
- Distribution includes: cutaneous (extremities, abdomen), oral (palate), eye, face
- The skin lesions range in size from very small to several centimeters in diameter, and they can remain unchanged for months to years, or grow rapidly within a few weeks and disseminate

Diagnosis

- Histology of biopsy taken from the lesions
- Chest x-ray for pulmonary presentation
- Bronchoscopy to look in the trachea and other large airways of the lungs
- Gastrointestinal endoscopy: upper of lower to see digestive tube lesions
- Serology for possible underlying infections: **HIV**
- Clinical diagnosis can be performed at the referral level

Treatment

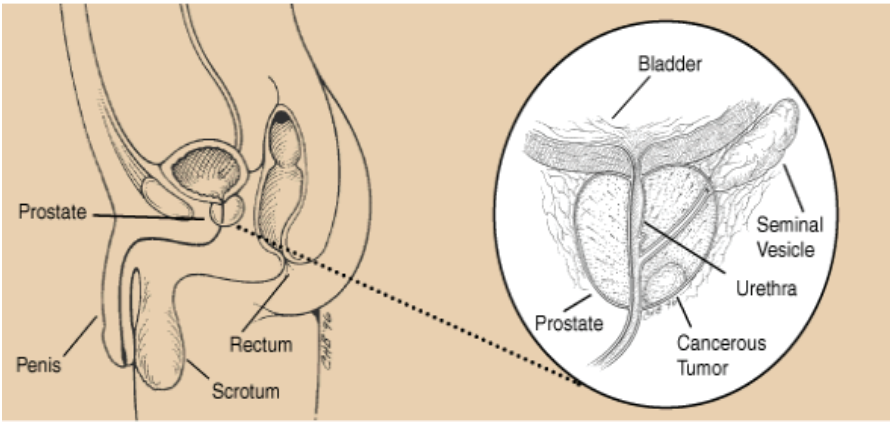
For patients with immune system problems, the most important treatment is keeping the immune system healthy and any **related infections** under control, **HAART** for **HIV positive** people. Some of the other treatments used for KS are: **Radiation therapy, Chemotherapy**

8.4.6 PROSTATE CANCER

Definition

Prostate cancers develop from the prostate gland cells (the cells that make the prostate fluid that is added to the semen). The medical term for a cancer that starts in gland cells is **adenocarcinoma.**

Anatomy of the prostate



Risk factors

- **Age:** The risk of having prostate cancer rises rapidly after age 50. About 6 in 10 cases of prostate cancer are found in men over the age of 65
- **Race/ethnicity:** Prostate cancer occurs more often in men of African ancestry than in men of other origins

- Family history: Prostate cancer in the familly
- Genetic predisposition
- Diet and Obesity: Meals rich in red meat
- Smoking
- Infalmmation of the prostate

Signs and symptoms

Early prostate cancer usually causes no symptoms. But more advanced prostate cancers can sometimes cause symptoms, such as:

- Problems passing urine, including a slow or weak urinary stream or the need to urinate more often, especially at night.
- Blood in the urine
- Trouble getting an erection (erectile dysfunction)
- Pain in the hips, back (spine), chest (ribs), or other areas from cancer that has spread to bones
- Weakness or numbness in the legs or feet, or even loss of bladder or bowel control from cancer pressing on the spinal cord.

Diagnosis

- **Blood tests: In our setting, the prostate-specific antigen (PSA**) blood test is not preferred as a routine mechanism for screening. It can be informative but not definitively diagnose
- **Transrectal ultrasound (TRUS):** TRUS is often used to look at the prostate when a man has a high PSA level or has an abnormal digital rectal exam (DRE) result. It is also used during a prostate biopsy to guide the needles into the right area of the prostate.
- **Pathology examination**
- **Imaging tests to look for prostate cancer spread**: Computed tomography (CT) scan, Magnetic resonance imaging (MRI), X-ray

Treatment

Depending on the situation, the treatment options for men with prostate cancer might include:

- Expectant management (watchful waiting) or active surveillance:
  Because prostate cancer often grows very slowly, some men (especially those who are older or have other serious health problems) might never need treatment for their prostate cancer.
- Surgery
- Radiation therapy
- Cryosurgery (cryotherapy)
- Hormone therapy
- Chemotherapy
- Bone-directed treatment

These treatments are generally used one at a time, although in some cases they may be combined.

8.4.7 COLORECTAL CANCER

Definition

Colorectal cancer is a term used for cancer that starts in the colon or the rectum. These cancers can also be referred to separately as colon cancer or rectal cancer, depending on where they start. Colon cancer and rectal cancer have many features in common.

Abnormal growths in the colon or rectum

Most colorectal cancers develop slowly over several years. Before a cancer develops, a growth of tissue or tumor usually begins as a non-cancerous polyp on the inner lining of the colon or rectum.

- Adenomatous polyps (adenomas) are polyps that can change into cancer. Because of this, adenomas are called a pre-cancerous condition.

- Dysplasia is an area in the lining of the colon or rectum where the cells look abnormal (but not like true cancer cells) when viewed under a microscope.

- Hyperplastic polyps and inflammatory polyps: in general, are not pre-cancerous.

Causes and risk factors

Lifestyle-related factors**:** Several lifestyle-related factors have been linked to colorectal cancer. In fact, the links between diet, weight, and exercise and colorectal cancer risk are some of the strongest for any type of cancer.

- Diet rich in red meat especially when it's grilled can **increase** colorectal cancer risk. Diets high in vegetables, fruits, and whole grains have been linked with a **decreased** risk of colorectal cancer
- Physical inactivity
- Obesity
- Smoking
- Heavy alcohol use

Other risk factors**:** Increased age over 50 years, Personal history of colorectal polyps or colorectal cancer, Personal history of inflammatory bowel disease, Family history of colorectal cancer or adenomatous polyps, Racial and ethnic background (Black people), genetic predisposition, Type 2 diabetes

Signs and symptoms

Colorectal cancer may cause one or more of the symptoms below.

- A change in bowel habits, such as diarrhea, constipation, or narrowing of the stool that lasts for more than a few days
- A feeling that you need to have a bowel movement that is not relieved by doing so
- Rectal bleeding
- Blood in the stool which may make it look dark
- Cramping or abdominal (belly) pain
- Weakness and fatigue
- Unintended weight loss

Diagnosis

- **Blood tests:** Complete blood count (CBC) to look for anemia, Tumor markers (carcinoembryonic antigen (CEA)).
- Colonoscopy
- Pathology test of the biopsy
- CT scan
- Ultrasound
- MRI scan
- Chest x-ray for lung metastasis

Treatment

After the cancer is found and staged, the main types of treatment that can be used for colon and rectal cancer are:

- Surgery
- Radiation therapy
- Chemotherapy
- Targeted therapy

8.4.8 CERVICAL CANCER

Definition

Cervical cancer starts in the cells lining the uterine cervix. The main types of cervical cancers are squamous cell carcinoma (9/10) and adenocarcinoma (1/10).

Risk factors and causes

- High risk sexual behavior
- Early sexual activity
- Multiple sexual partners

○ Human papilloma virus infection: The most important risk factor for cervical cancer is infection by the human papilloma virus (HPV).

- Chlamydia infection
- Human immunodeficiency virus (HIV), the virus that causes AIDS, damages the immune system and puts women at higher risk for HPV infections
- Smoking
- Unhealthy diet
- Being overweight
- Having multiple full-term pregnancies
- Having a family history of cervical cancer

Signs and Symptoms

Women with early cervical cancers and pre-cancers usually have no symptoms. Symptoms often do not begin until the cancer becomes invasive and grows into nearby tissue. When this happens, the most common symptoms are:

- Abnormal vaginal bleeding, such as bleeding after vaginal intercourse, peri-menopausal bleeding, bleeding and spotting between periods
- An unusual discharge from the vagina − the discharge may contain some blood and may occur between your periods or after menopause.
- Pain during intercourse.

Screening and Diagnosis

- Visual Inspection with acetic acid (VIA): Screening (age 30-50 years old if HIV+; age 35-50 years old if HIV negative) and initial diagnostic evaluation
- Pap smear
- HPV test, HIV test (risk factors)
- Colposcopy: For symptoms that suggest cancer or of Pap smear of VIA are abnormal.
- Pathology for cervical biopsies
- Imaging tests to detect spreading: Chest x-ray, CT scan, MRI scan

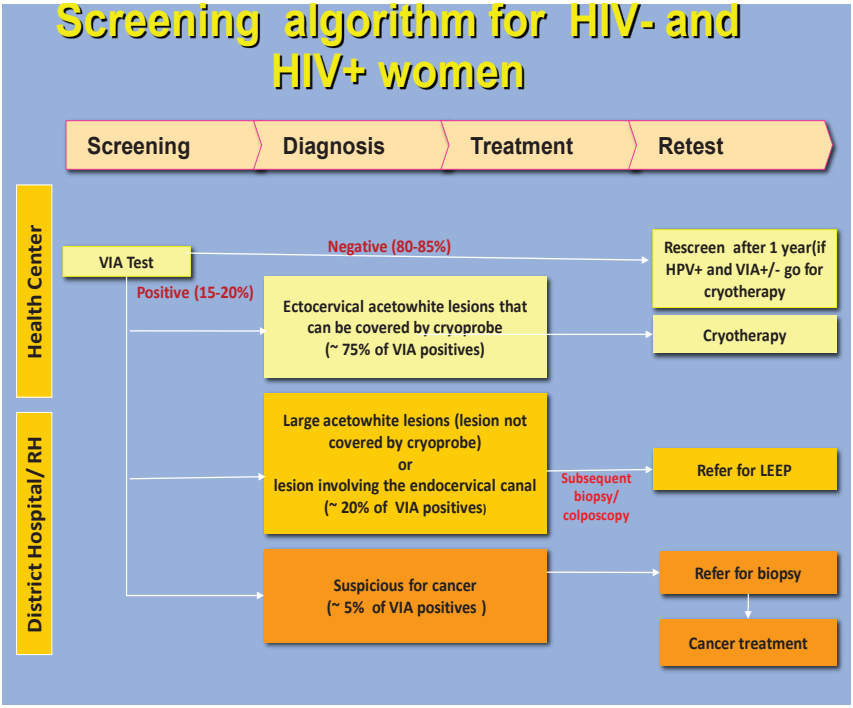
Treatment

Depending on the type and stage of your cancer, you may need more than one type of treatment. Common types of treatments for cervical cancer include:

- Surgery
- Radiation therapy
- Chemotherapy
- Targeted-therapy

NB: Precancerous lesions can be treated using Cryotherapy and Loop electrosurgical procedure (LEEP)

Figure 7: Algorithm for cervical cancer screening and treatment of cervical precancerous lesions



8.4.9 LIVER CANCER

Classification

Liver cancers can be classified into two types. They are either primary, when cancer starts in the liver itself or secondary (metastatic) when the cancer has spread to the liver from some other parts of the body.

Primary liver cancer

Inadults, most primary liver cancers belong to one of two types: hepatomas, or hepatocellularcarcinomas (HCC), which start in the liver tissue itself; and cholangiomas, or cholangiocarcinomas, which are cancers that develop in thebile ducts inside the liver. About 80% to 90% of primary liver cancers are hepatomas.

Metastatic liver cancer

The second major category of liver cancer, metastatic liver cancer; primary cancers in the colon, stomach, pancreas, rectum, esophagus, breast, lung, or skin are the most likely to metastasize (spread) to the liver.

Risk factors

- **Chronic viral hepatitis**: Hepatis B and C
- **Liver cirrhosis**: Cirrhosis is a disease in which liver cells become damaged and are replaced by scar tissue. It can be caused by viruses, HBV & HCV, heavy alcohol use,..
- **Heavy alcohol use**: this leads to liver cirrhosis
- **Tobacco use:** Smoking increases the risk of getting liver cancer. Former smokers have a lower risk than current smokers, but both groups have a higher risk than those who never smoked.
- **Obesity:** This is probably because it can result in fatty liver disease and cirrhosis.

- **Inherited metabolic diseases**: Certain inherited metabolic diseases can lead to cirrhosis (e.g., hereditary hemochromatosis)
- **Aflatoxins:** These cancer-causing substances are made by a fungus that contaminates peanuts, wheat, soybeans, ground nuts, corn, and rice. Storage in a moist, warm environment can lead to the growth of this fungus.
- **Infection with parasites**: Schistosomiasis can cause liver damage and is linked to liver cancer

Vaccination of Hepatitis B Virus and treatment of chronic hepatitis B and C infection can prevent and reduce the risk of developing liver cancers

Signs and symptoms

Signs and symptoms of liver cancer often do not show up until the later stages of the disease, but sometimes they may show up sooner. Some of the most common symptoms of liver cancer are:

- Weight loss without any cause
- Loss of appetite
- Feeling full after a small meal
- Nausea or vomiting
- An enlarged liver, felt as a mass under the ribs on the right side
- An enlarged spleen, felt as a mass under the ribs on the left side
- Pain in the abdomen or near the right shoulder blade
- Swelling or fluid build-up in the abdomen
- Itching
- Yellowing of the skin and eyes (jaundice)

Some other symptoms can include fever, enlarged veins on the belly that can be seen through the skin, and abnormal bruising or bleeding.

Diagnosis

- Medical history and physical exam
- **Blood tests:** Alpha-fetoprotein blood **(AFP)** test, if AFP levels are very high in someone with a liver tumor, it can be a sign that liver cancer is present, Liver function tests (LFTs), Blood clotting tests, **Tests for viral hepatitis**, Kidney function tests, Full blood count (FBC), Blood chemistry tests
- **Imaging tests:** Ultrasound, Computed tomography (CT), Magnetic resonance imaging (MRI), Angiography
- **Pathology** on liver biopsy

Treatment

In creating your treatment plan, important factors to consider include the stage (extent) of the cancer and the health of the rest of the liver.

- Surgery
- Tumor ablation
- Radiation therapy
- Targeted therapy
- Chemotherapy

8.4.10 GASTRIC CANCER

Definition

Gastric cancer, also called stomach cancer, is a cancer that starts in the stomach. About 90% to 95% of cancers of the stomach are adenocarcinomas. These cancers develop from the cells that form the innermost lining of the stomach (known as the mucosa). 10% include gastrointestinal stromal tumors (GIST), lymphoma and leiomyosarcoma

Risk factors and causes

- Helicobacter pylori infection
- Epstein Barr Virus infection: 5-10% of gastric cancer found to be associated with EBV infection
- Smoking
- Diet: Diets that have large amounts of smoked foods, salted fish and meat
- Obesity
- Atrophic gastritis
- Intestinal metaplasia and dysplasia
- Pernicious anemia
- Increased age (over 50 years)

Signs and symptoms

Unfortunately, early-stage stomach cancer rarely causes symptoms. This is one of the reasons stomach cancer is so hard to detect early. The signs and symptoms of stomach cancer can include:

- Poor appetite
- Weight loss
- Epigastric pain
- Vague discomfort in the abdomen, usually above the navel
- A sense of fullness in the upper abdomen after eating a small meal
- Indigestion
- Nausea & vomiting, with or without blood
- Swelling or fluid build-up in the abdomen

These signs are similar to peptic ulcer signs; investigations are needed to distinguish from gastric cancer to peptic ulcers or gastritis

Diagnosis

- Medical history and physical exam
- Upper endoscopy
- Endoscopic ultrasound
- Pathology on biopsies
- Imaging tests

Treatment

Once the cancer has been diagnosed and staged, the main treatments for stomach cancer are:

- Surgery
- Chemotherapy
- Targeted therapy
- Radiation therapy

8.4.11 EYES CANCER

Definition

An eye cancer starts in the eye. There are different types of eye cancers:

Primary intraocular cancer**s** start inside the eyeball. In adults, melanoma is the most common primary intraocular cancer. In children, retinoblastoma (a cancer that starts in cells in the retina) is the most common primary intraocular cancer,

Secondary intraocular cancers start somewhere else in the body and then spread to the eye.

Risk factors and causes

- Weakened immune system: infection with HIV/AIDS, people who take anti-rejection drugs after organ or tissue transplants
- Other factors: Age, certain inherited conditions, sun exposure,

Signs and symptoms

Certain signs and symptoms might suggest that a person could have an eye melanoma, but tests are needed to confirm the diagnosis.

- Problems with vision (blurry vision or sudden loss of vision)
- Floaters (spots or squiggles drifting in the field of vision) or flashes of light
- Visual field loss (losing part of your field of sight)
- A growing dark spot on the colored part of the eye (iris)
- Change in the size or shape of the pupil (the dark spot in the center of the eye)
- Change in position of the eyeball within its orbit
- Bulging of the eye
- Change in the way the eye moves within the orbit

Diagnosis

- History and physical exam
- Exam with ophthalmoscope
- Imaging tests: Echography, chest x-ray, CT scan, MRI
- Pathology on biopsies

Treatment

After an eye cancer is found and staged, depending on the type and stage of the cancer and other factors, treatment options for eye cancer can include:

- Surgery
- Radiation therapy
- Laser therapy
- Chemotherapy
- Targeted therapy

8.4.12 BONE CANCER (OSTEOSARCOMA)

Definition

Osteosarcoma (also called osteogenic sarcoma) is a type of cancer that starts in the bones.

Risk factors and causes

- **Age**: Risk is highest in teens and young adults, but it is also higher in people over 60 years
- **Gender**: Osteosarcoma is more common in males than in females.
- **Radiation to bones**: Young people who were treated with radiation for an earlier cancer have a higher risk of osteosarcoma in the same area later.
- **Certain bone diseases:** Paget disease of the bone, Hereditary multiple osteochondromas
- **Certain cancer syndromes**: People with certain rare, inherited cancer syndromes have an increased risk of getting osteosarcoma

Signs and Symptoms

Osteosarcomas are usually found because of the symptoms they cause.

Pain and swelling**:** Pain in the affected bone (usually around the knee or in the upper arm) is the most common symptom of osteosarcoma. Swelling in the area is another common symptom, although it may not occur until several weeks after the pain starts

Bone fractures (breaks): Factures at the site of the tumor are very common as the bone has been weakened by the cancer.

Diagnosis

- **Medical history and physical exam**: to find signs and symptoms
- **Imaging tests**: Bone x-ray, Magnetic resonance imaging (MRI) scan, Computed tomography (CT) scan
- **Pathology** on biopsy

Treatment

The treatment depends on the staging on the disease, the types of treatment used for osteosarcomas include:

- Surgery
- Chemotherapy
- Radiation therapy (in certain cases)

Most often, both chemotherapy and surgery are needed.

8.4.13 MALIGNANT GESTATIONNAL TROPHOBLASTIC DISEASE

Definition

Malignant gestational trophoblastic disease (GTD) is the persistence of gestational trophoblastic tissue, usually following a molar pregnancy. Malignant GTD includes invasive mole and choriocarcinoma.

The presence of malignant GTD can become apparent clinically (for example, through persistent bleeding following a pregnancy or evidence of disease or metastases on physical exam), radiologically (for example, through persistent molar tissue noted on pelvic ultrasound or evidence of metastases on other imaging), or hormonally (through a persistently elevated beta HCG level).

Diagnosis

Diagnosis is confirmed by the presence of a **persistently elevated or rising** beta HCG level >= 3 weeks after evacuation of a molar pregnancy. Note: Evacuation of the uterus must occur to rule out other explanations for persistently elevated HCG or bleeding after a pregnancy, such as retained products of conception. Ectopic pregnancy should also be considered.

Diagnosis is supported by:

a) Clinical symptoms such as persistent abnormal vaginal bleeding or evidence of metastases on physical exam;

b) Persistent molar tissue on pelvic ultrasound or evidence of metastases on imaging;

c) Pathologic diagnosis of molar tissue upon repeated evacuation of the uterus.

Evaluation (minimal):

- Quantitative serum beta HCG level
- Pelvic ultrasound and physical exam
- CXR
- Abdominal ultrasound

Management

a) Hydatidiform mole (molar pregnancy): initial management

· Suction curettage is the standard treatment; sharp curettage two weeks later is then done for histopathological diagnosis.

· Provide combined oral contraceptive pill for at least one year after treatment.

· Monitor by serum -hCG levels monthly until three negative values.

· Hysterectomy is an alternative in special cases that should be decided bygynecology oncologists and discussed with the patient.

· Administer anti-D after uterine evacuation.

The common treatments for GTD are**:**

1)Surgery: For women not desiring future fertility, hysterectomy should be performed, especially for women with choriocarcinoma.

2) Chemotherapy

-All patients should start a family planning method (oral contraceptives, implants, or injection) prior to starting chemotherapy

Subsequent follow-up

-Patients who have completed chemotherapy and have hormonal and radiographic evidence of remission can be followed every month x 3 months, and then every 3 months, for a year. Beta HCG should be checked at each visit.

-Family planning. All patients with active malignant GTD, including those who are on treatment must be on effective family planning methods. Patients with non-metastatic disease should continue family planning for 12 months following completion of chemotherapy. Patients with metastatic disease should continue family planning for 24 months following completion of chemotherapy.

8.4.14 HEAD AND NECK CANCERS

Introduction

Head and neck cancers include a heterogeneous group of malignant tumors arising in all structures above the clavicles, except for the brain, spinal cord, base of the skull and usually the skin. A meaningful understanding of these malignant tumors requires anatomic separation into those cancers arising in the oral cavity, oropharynx, hypopharynx, nasopharynx, larynx, nasal fossa, paranasal sinuses, thyroid and salivary glands.

Risk Factors

Alcohol and tobacco are the two most important risk factors for head and neck cancers, especially cancers of the oral cavity, oropharynx, hypopharynx, and larynx

Infection with cancer-causing types of human papillomavirus (HPV), especially HPV-16, is a risk factor for some types of head and neck cancers, particularly oropharyngeal.

Prevention includes

• Abstinence from the use of alcoholic beverages and tobacco is recommended.
• Elimination of chronic irritants, such as an irregular sharp tooth or ill-fittingdenture, is desirable.
• Appropriate, life style modification is recommended.

Symptoms and signs:

- Painless mass
- Local ulceration with or without pain
- Referred pain to teeth or ear
- Dysphagia
- Alteration of speech, such as difficulty pronouncing words (tongue) or change in character (larynx, nasopharynx)
- Persistent hoarseness (larynx)
- Unilateral tonsillar enlargement in an adult

- Persistent unilateral “sinusitis”
- Persistent unilateral nosebleed or obstruction
- Unilateral hearing loss
- Cranial nerve palsies
- Loosening of the teeth

Physical examination

Complete physical examination with special emphasis on the ear, nose, oral cavity,pharynx and neck with emphasis on presence and location of swellings, ulcers and neurological defects.

Diagnosis

• All primary and metastatic cancers must be documented histologically or cytologically. Additional investigations such as immunohistochemistry may be required to confirm the diagnosis

• FNA cytology is advised for cervical masses as a screening test to be confirmed by histology if malignant.

• Open biopsies of metastatic neck disease is not recommended.

• Chest x-rays and other relevant x-rays remain part of the evaluation,

• Computed tomography (CT) or/and Magnetic resonance imaging (MRI) extent of the tumor.

• Ultrasound should be considered in determining the nature of the neck mass.

• Endoscopy for Visualization of the oral cavity, nasal cavity, nasopharynx, oropharynx, hypopharynx, larynx, cervical esophagus, and trachea is essential in establishing the presence and extent of tumor.

Management

-Surgery
-Radiotherapy
-Chemotherapy

8.4.15 KEY RECOMENDATION

At Health center and District level

Refer any patient who presents the following signs at Referral Hospital:

- Red or red and white patches of the oral mucosa which persist for more than three weeks at any particular site.

-Ulceration of oral mucosa or oropharynx which persists for more than three weeks.

-Oral swellings which persist for more than three weeks.

-Unexplained tooth mobility not associated with periodontal disease.

-Persistent, particularly unilateral, discomfort in the throat for more than four weeks.

-Pain on swallowing persisting for three weeks that does not resolve with antibiotics.

-Dysphagia which persists for more than three weeks.

-Hoarseness which persists for more than three weeks.

-Stridor (requires same day referral).

-Unresolved head or neck mass which persists for more than three weeks.

-Unilateral serosanguineous nasal discharge which persists for more than three weeks particularly with associated symptoms.

-Facial palsy, weakness or severe facial pain or numbness.

-Orbital masses.

-Unilateral Ear pain without evidence of local ear abnormalities.

PART 7: Palliative care

9 PALLIATIVE CARE GUIDELINES

9.1 Introduction

Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.

Palliative care:

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten or postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patients illness and in their own bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counselling, if indicated;
- will enhance quality of life, and may also positively influence the course of illness;

It is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

9.2 Guiding Principles

The Initial Visit

The initial visit plan emphasizes a systematic approach, which will help you:

1. Identify palliative care needs

Identify the following needs

- Physical
- Psychological
- Social
- Spiritual

2. Identify physical needs

Identify symptoms that are most troubling to the patient

- Pain
- Breathlessness
- Nausea/Vomiting
- Constipation
- Drowsiness
- Diarrhea

SYSTEMATIC APPROACH

This guide takes you through the following framework for each patient visit:

1. History
2. Vital Signs
3. Holisticassessment
4. Lab Review
5. Impression and management
6. Plan

3. Identify type of pain, then severity of pain

- Understand that there are different types of pain and are treated with different medications.
- Using pain assessment tools to classify the severity of pain and treat according to the WHO analgesic ladder

The Follow-up Visit

The follow-up visit emphasizes a systematic approach, which will help you:

1. Assess patient's medication adherence

Evaluate the patient's ability to follow the treatment plan from last visit.

2. Assess the patient's quality of pain control on the current WHO step of therapy.

Determine if current medication class, dose, and frequency are adequate for the patient.

9.3 The Initial Visit

This section emphasizes a systematic approach, which will help answer the following basic questions: 1. What are the patient's h palliative care needs? 2. What are the patient's physical , psychological , social, and spiritual needs? 3. What is the type, severity of the patient's pain?

Patient Background
Review the following information before the patient visit, if available:

- How was the patient referred to the palliative care clinic?
- What chronic illness does the patient have?
- Has the patient's illness been explained to him/her?
- Has the patient received medication for pain or other symptoms including Psychological, social and spiritual?

9.3.1 HISTORY

9.3.1.1 Clinical history

9.3.1.1.1 Emergency

- Find out if the patient has experienced any of the following emergency signs:

❑ Seizure
❑ Intolerance to food/water
❑ Spinal cord compression
❑ Attempt and ideas of suicide
❑ Fever…..
❑ Pathological fracture
❑ Confusion
❑ Severe nausea or vomiting
❑ Acute Urine retention
❑ Haemoptysis
❑ Hiccup
❑
❑
❑ Severe uncontrolled pain
❑ Constipation
❑ Breathlessness
❑ Bleeding
❑

2. If the patient has these symptoms, call the physician and initiate transfer. However you should complete the patient's workup and begin treatment before the transfer.

9.3.1.1.2 Pain Type & Severity

Ask the patient the following questions:

- **Location:** Where is your pain located?
- **Quality:**Is your pain sharp, dull, burning?
- **Intensity:**Use a pain scale (i.e. faces, number of fingers)?
- **Aggravating:** What makes the pain worse?
- **Relieving:**Does anything relieve the pain?
- **Medications**: Do the medications that you take now help control your pain?
- **Radiation**To where does the pain start and then travel?

9.3.1.1.3 Other symptoms

Ask the patient or their familythe following questions:

- **Constipation:** Is it difficult to have a bowel movement?
- **Nausea/Vomiting:**How many times in the past week have you vomited? Are you able to tolerate food?
- **Breathlessness:**Is it difficult to breath while performing daily activities? Or at rest?
- **Fluid Overload: Are your legs swelling? Is it difficult to breath?**
- **Itching:** Do you itch all the time or only after taking medication?
- **Confusion:** Ask family members if patient has been forgetful or behaving differently?

- **Anxiety:**Do you feel more tense or irritable?

9.3.1.1.4 Co-Morbidities

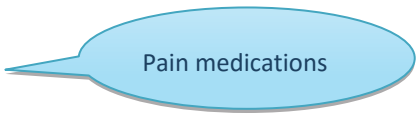
1. The presence of specific co-morbidities may help direct therapy:

❑ HIV ❑ Kidney Disease ❑ Hepatitis
❑ Cancer ❑ Respiratory Disease
❑ Diabetic ❑ CVD

9.3.1.1.5 Medications

1. Ask the patient if they are taking or have taken any of the following medicines now or in the past:

❑ Morphine
❑ Brufen
❑ Paracetamol
❑ Tramadol



❑ Dexamethasone or prednisolone Adjuvants vomiting
❑ Medications for nausea and vomiting(moclopramide,andansetron, haloperidol)
❑ Medications for depression (i.e. amitriptyline,anafranil, tofranil)
❑ Medications for constipation (i.e. forlax, Colace, bisacodyl)
❑ Medications for itching (i.e. promethazine, diphenhydramine)

9.3.1.2 PSYCHOSOCIAL AND SPIRITUAL HISTORY

1. Ask about the following:

Psychological

- How are you coping with your illness?
- How have your emotions changed as your illness has become more severe?
- Are you able to do things that you enjoy?

Social

- Have family & friends supported you while you have been sick?
- Which relationships are the most supportive for you?
- Which relationships do you wish were stronger?
- Are you facing any resource challenge?

Spiritual

- Have you felt close to God during your illness?
- Are there ways that you wish you felt closer to God?
- Where do you find hope and strength?

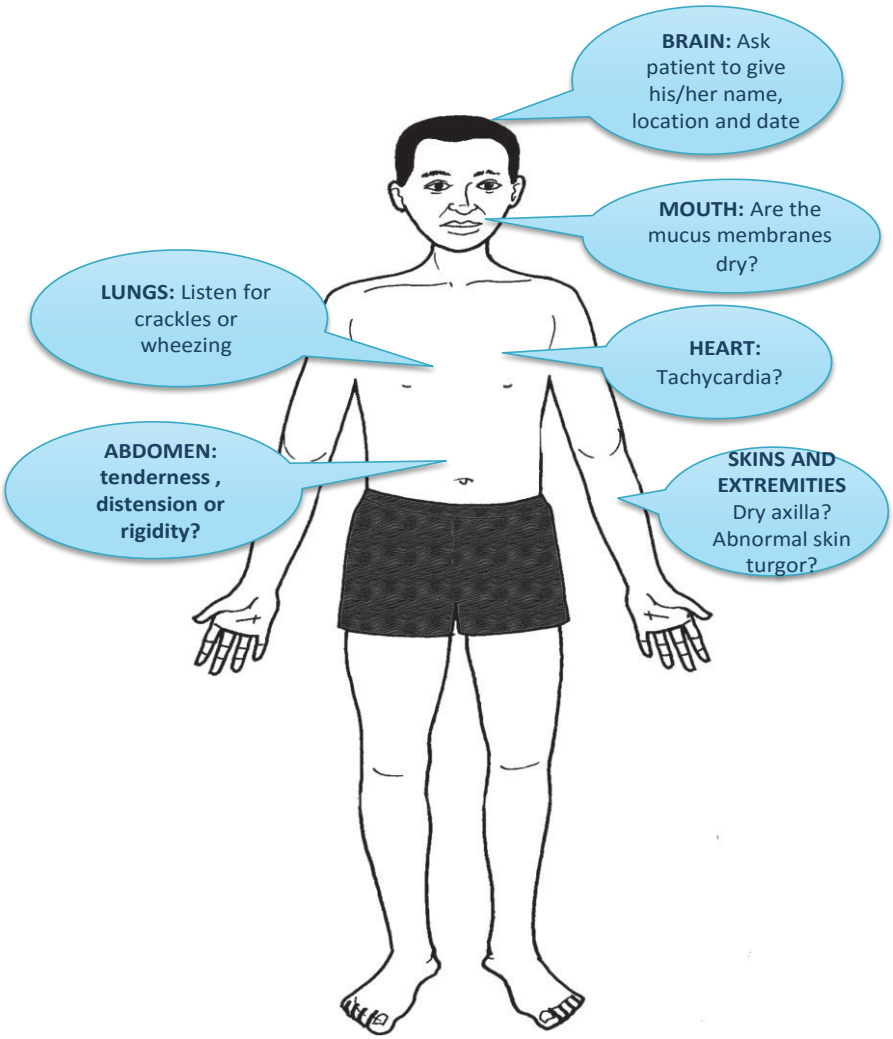
9.3.2 Vital SIGNS

Always review vitals signs before the physical exam. They will almost always help you understand if a patient is sick and will provide important information about whether the patient should be referred to the district hospital.

VITAL SIGN	Notes
If a patient has unstable vital signs then therapy can usually be provided to ease suffering!	
Temperature	Infections are common at the end of life and should be addressed if the patient will benefit.
Heart Rate	***Tachycardia:*** IV fluids may help relieve distress
Blood Pressure	***Low blood pressure:*** Medications to lower the blood pressure may need to be stopped. However, more extreme measures are not indicated.
Respiratory Rate	***Tachypnea***: Sign of respiratory distress or anxiety
O2 Saturation	***Hypoxia***: Sign of respiratory distress!
Weight	Should be done at initial visit and all follow-up visits. May become irrelevant as the end of life approaches

9.3.3 PHYSICAL EXAM

Observe the patient. Sometimes it is possible to determine that a patient is delirious or has severe pain or breathlessness simply from observing the patient.



9.3.4 LAB REVIEW

LAB	**WHEN**	Notes
Creatinine	Only Indicated	Progressive renal failure is expected in patients who are dying Increasing creatinine may be a sign of dehydration, which may be relieved with IV fluids.
FBC	Only as indicated	HB/Hct: Anemia can mimic dehydration. WBC: Very important to identify a patient who has an infection. Infections should be treated in dying if he/she will benefit. Platelets: If very low (< 10) then the patient may need a platelet transfusion to help prevent bleeding.
Urea	Only as indicated	Elevated urea can suggest dehydration (less blood reaches the kidneys so less urea gets excreted in the urine).
Bilirubin, SGOT/SGPT	Only as indicated	Liver failure could herald multi-organ failure in palliative care patients.
Electrolytes	Only as indicated	Sodium: Patients usually become hyponatremic due to multiple causes. Potassium: Replete if low. Bicarbonate: Acidosis should NOT be treated with bicarbonate in dying patients.

9.3.5 IMPRESSION

9.3.5.1 Identify palliative care needs

PHYSICAL

Much of palliative medical management addresses a patient's physical needs. Please remember that family, spiritual, cultural, and psychological needs are often more important to patients than physical needs at the end of life.

PSYCHOLOGICAL | **SOCIAL** | **SPIRITUAL**

9.3.5.2 Identify physical needs

DELIRIUM *Always physician and admit to district hospital*	**NAUSEA / VOMITING**	**ANXIETY**
PAIN	**BREATHLESSNESS**	**CONSTIPATION**

9.3.5.3 Identify type of pain, then severity of pain

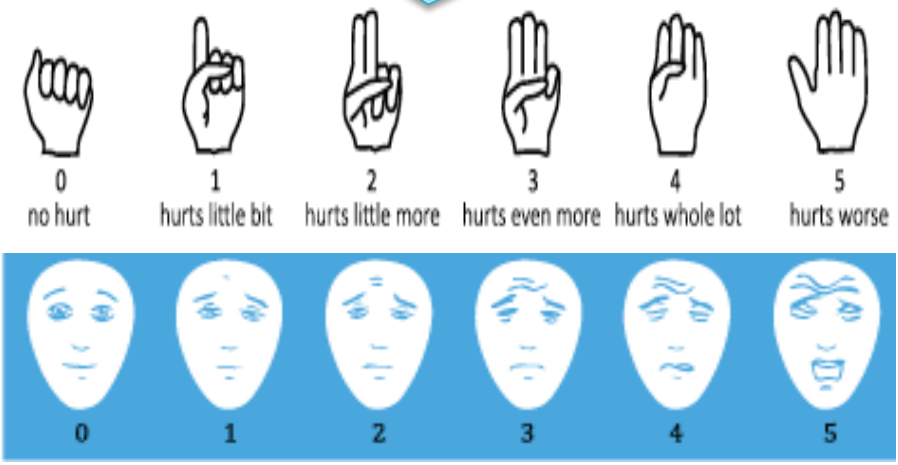
TYPE OF PAIN

Nociceptive Pain – Including somatic and visceral

Neuropathic Pain

SEVERITY OF PAIN

Use one of the following pain scales to determine pain severity



1-2: MILD PAIN	3: MODERATE PAIN	4: SEVERE PAIN

5: PAIN EMERGENCY

9.3.6 PLAN

COMMON MEDICAL PROBLEMS IN PALLIATIVE CARE PATIENTS	
Weight loss	This is a normal pattern of many chronic illnesses and may not be related to nutritional status
Dehydration	It is normal for dying patients to stop eating. . Important note: In end stage parenteral fluids are contraindicated because fluids given parenterally build up in the body causing oedema including swelling ofthe brain Food and drink should be given on request by the patient
GI Bleeding / Anemia	NFS Give NS Order PRBCs Call physician and admit to the hospital
Fever	If easily able to localize infection, prescribe antibiotics. If unable to identify source, admit for furtherassessment
HIV Positive	Patients with HIV are at risk for many complications. Call physician with any questions.

9.3.6.1 Emergencies

Pain level #5 – Unable to achieve adequate control with oral medications

- Give morphine 5-10 mg P.O immediately.
- If pain not improved after 30 minutes give another 5-10 mg P.O of morphineAdmit the patient

Breathlessness – Subjective dyspnea with RR > 30 or O2 sat < 90%

- Reassure the patient, breathlessness can be extremely frightening and is exacerbated by anxiety**.**
- Give shorter acting
- Breathing exercises and relaxation techniques should be taught to the patient
- Find the most comfortable position for the patient(usually sitting up)
- Ensure good ventilation : open windowsconserve energy by limiting or reducing activities
- Treat the underlying causes:
- Bronchial secretions or asthma/COPD - nebulized salbutamol in 09% saline.
- Pulmonary Edema – furosemide 40mg oral x1
- benzodiazepines to reduce anxiety (ex diazepam 2mg-10mg . note that oral or rectal route act quickly than IV because of the metabolism of diazepam)
- the low dose of morphine e.g 2.5 peros 4hrly can improve the symptom s breathlessness
- Hypoxia – O2 by nasal cannula
- Admit the patient.

Delirium (acute confusional state) –

Never manage as an outpatient

Confusion is a common and distressing problem. It involves abnormalities of thoughts, perceptions, and fluctuating level of consciousness.

It is common in patient with advanced diseases, especially elderly and those approaching end of life.

In management good holistic care requires a combination of general non-clinical measures and advice, investigation and treatment of any underlying causes and appropriate symptomatic treatment.

The management of these patients should focus on improving symptoms and quality of life whilst regularly reassessing

- Ensure a safe environment for the patient :
- A caretaker should remain with the patient
- Remove any objects that could be harmful
- Educate the family regarding delirium and provide support both emotionally and psychologically
- Give haldol 2.5mg-5mg PO or SC first line
- Give chlorpromazine 25-50mg PO or SC Second line Admit the patient h al.

Nausea/Vomiting

Vomiting is less distressing to many patients than persistent nausea and sometimes easier to control.Neither symptom is anfalways be accompanied by vomiting the two symptoms are best considered together.

Management:

- correct cause and exacerbating factors where possible
- non drug measures :
- avoid strong smells if possible
- Manipulate diet,the temperature of the food and timing of meals.Use small portions
- Give IV normal saline
- Metoclopramide 10mg IVtds
- In case of severe vomiting not responding to metoclopramide , give haloperidol 2.5mg OD
- Admit if patient is unable to tolerate food or liquid

Other Emergencies

Palliative care does not mean no care! Terminal heart failure, renal failure, or respiratory disease patients can still be treated in the hospital for these problems. With agreement of the hospital, the patient and the family, those issues may also be managed at home with support.

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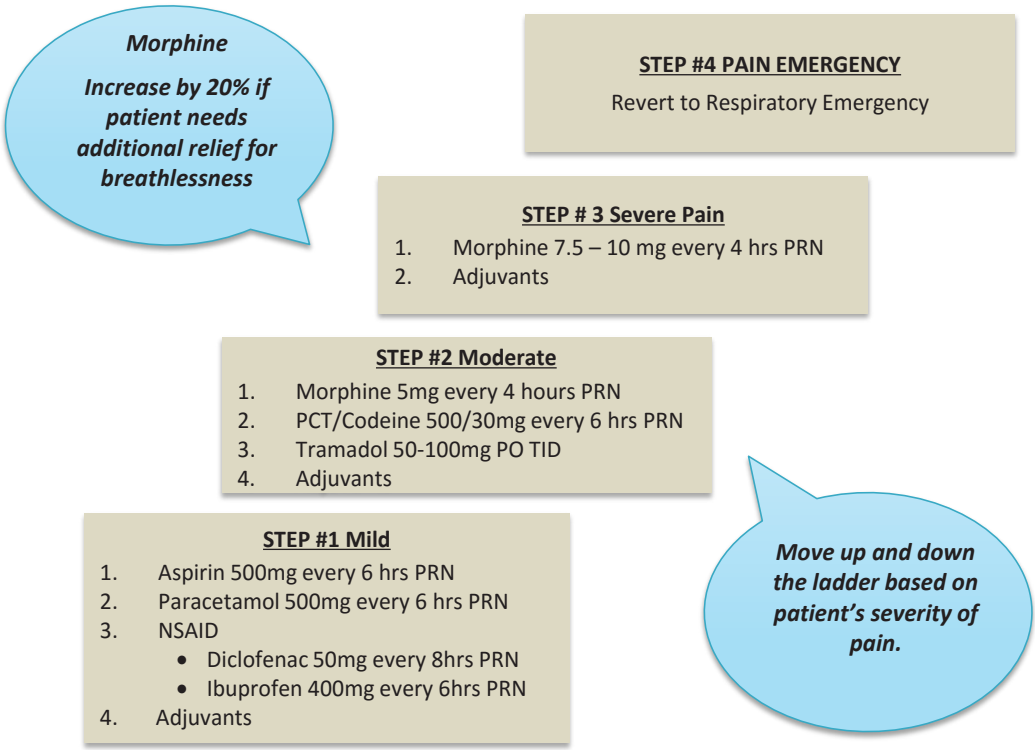
9.3.6.2 Pain Control

9.3.6.2.1 Nociceptive Pain:

Use the WHOanalgesic ladder as a guide to pain control,



Correct use of analgesic medicines will relieve pain in most patients and should be based on the following principles:

- By the mouth/appropriate route (use oral route whenever possible.
- By the clock.
- By the ladder(use WHO analgesic ladder)

- Individualized treatment
- Use of adjuvants drugs

Type of Pain	Medication	Starting Dose	Max Dose	Notes
Neuropathic	**Amitriptyline (1^{st} Line)**	25mg oral 1x/day	75mg oral 1x/day	**Contraindicated in patients who have attempted suicide or expressed a desire to hurt themselves.**
	Clonazepam (2^{nd} Line)	0.5mg oral 1x/day	1mg oral 1x/day	
RUQ pain from liver capsule stretch	**Dexamethasone**	4mg oral 1x/day	8mg oral x/day	Can cause delirium & immunosuppression Worsens glucose control in DM patients
Skeletal Pain	**Diazepam**	5mg oral 1x/day	5mg oral 3x/day	Titrate slowly in patients also taking morphine
Visceral Pain	**Buscopan**	20mg oral 3x/day		For smooth muscle pain

9.3.6.2.2 Non-Nociceptive Pain:

Use the paragraphs below to treat other types of pain

Breathlessness

Emergency: Revert to Emergency section above

Treat underlying cause:

- Heart Failure -> furosemide, control blood pressure
- Chronic Respiratory Disease -> salbutamol, beclamethasone, oxygen
- Chronic Kidney Disease -> furosemide, control blood pressure
- Anxiety -.> diazepam 2.5-5mg PO TD

Symptomatic Treatment:

- Morphine 5mg PO every 4 hrs as needed.
- Diazepam 2.5-5mg PO TD (best for anxiety)

Morphine & Diazepam

Increase by 20% if patient needs additional relief for breathlessness

Constipation

Constipation refer to the passage of small,hard feces infrequently and with difficult.Treat underlying cause:

- Medications: opioids (morphine), ondansetron,cough sedatives,anticholinergic drugs, tricyclic antidepressants,phenothiazines,diuretics etc…)
- Dehydration
- Relative immobility/weakness
- Small food intakes of predominantly low roughage,high milk content diet(invalid foods')

Treatment

- Encourage fluid intake
- Increase fibre in diet
- Encourage exercise
- Bisacodyl 5-15mg oral daily
- Forlax 1 packet mixed with water daily

- Docusate 100mg oral 2x/day
- Liquid Paraffin 10mls OD
- Glycerine suppository 1PR od

Nausea & vomiting

Emergency: Revert to Emergency section above

- End of life care management
- Most patients find taking medication a burden especially towards the end of life.
- Focus on giving medication that will improve the patient's quality of life and discontinue any unnecessary medications.
- Assess if the patient is unable to swallow choose an appropriate route to give necessary medication(e.g NG tube,parenteral or PR)
- Subcutaneous(SC) is recommended when the enteral route is not possible(e.g patient have bowel obstruction)

Management:

Common symptoms encountered towards the end of life include pain,agitation,nausea and excessive respiratory secretions. Management of these symptoms is highlighted below.

Symptoms	Enteral route	Subcutaneous route
Pain	Morphine 5-7.5 mg 4hourly	2.5mg- 5mg 4hourly
Nausea and vomiting	Haloperidol 2.5mg od titrated to bd	Haloperidol 2.5mg od titrated to bd
Anxiety or agitation	Diazepam 5mg-10mg od titrated to tds	Diazepam 5mg-10mg od titrated to tds
Excessive bronchial secretions		Hyocinebutylbromide 20mg od titrated tds

Issues of hydration and nutrition

- Patients should eat and drink as they wish and take sips of water as long as they are able
- Families should be educated that it is normal for patients to lose their appetite, sense of thirst and feeding towards the end of life. They should not feed patients if they are no longer able to swallow as this may cause choking and distress
- IV fluids at this stage will not prolong life and will not prevent thirst. over hydration may contribute to distressing respiratory secretions or generalized oedema and are generally discouraged;good regular mouth care is the best way to keep the patient comfortable.
- If there is a reduced level of consciousness patient should be not be fed due to the risk of aspiration and artificial nutrition is generally discouraged at the end of life.

Spinal cord compression

SCC occurs in 3% of patients with advanced cancer, most commonly occurring in cancers of the breast, bronchus and prostate but also associated with cell carcinoma, lymphoma, multiple myeloma, melanoma, sarcoma, head and neck cancer.

The commonest site for compression is in the thoracic spine 70%, followed by the lumber spine 20%, and cervical spine 10%

Spinal cord compression usually presents with back pain (<90%). Typically pain is the earliest sign.

Investigations

- Plain X-rays
- MRI
- CT scan

Treatment

- Steroids: dexamethasone 16mg- 24mg in divided dose with the first dose given IV if possible.
- Referral for urgent Radiotherapy should be made if available and appropriate.
- Management of paraplegia
- Particular attention should be paid to continence, bowel care and pressure areas.
- Patients with urine retention will require catheterization.
- Those with complete cord compression unresponsive to treatment and constipation are likely to require enemas or manual evacuation of rectum regularly, with a regular routine arranged for convenience, privacy and less smells.
- Helping the patient to sit out for periods and regular changing of position, will be required to prevent pressure areas. Massage for pressure oints by a carer three times a day can also assist using wet soap but not methylated as in the past.
- Family members can be taught how to care their relative in this way.
- Educate the patient and family about the prognosis.

Seizures

Seizures can be caused by the tumor itself, metastases, metabolic, disturbances, radiation injury, cerebral infarctions, or infections.

Treatment:

- Abolish active seizure with benzodiazepine (eg diazepam 10-20mg) IM then give anticonvulsive treatment with Phenobarbital or other anticonvulsant of choice.
- The Prophylactic anticonvulsant therapy is not recommended unless the patient is at a high risk for seizures (melanoma primary or hemorrhagic metastases).

9.3.6.3 Psychological, social, & spiritual Needs

Psychological

- Assess patient's emotions (guilt, sadness, worry, shame, depression)
- Assess patient's ability to carry out his/her role as a parent, mother, provider
- Provide support for the patient once psychological needs are identified
- Consider the family too

Social

- Assess familial support (Who helps the patient? Are they supportive? Are they able to meet patient's needs?)
- Assess social needs (Money, job, family members that will need support)
- Maximize support for patient's social needs & family

Spiritual Needs

- Assess sources of hope and strength
- Assess if patient's spiritual needs are being met
- Help patient identify a spiritual leader in the community that the patient trusts who might provide counseling

9.3.7 EDUCATION

SYMPTOM MONITORING	
Pain:	Instruct patients and family to return to the clinic if pain is worsening on the current "WHO treatment step". Explain the principles of medication management
Constipation:	Teach patients that pain medications can cause constipation and laxatives might be essential.
Nausea/Vomitting:	Teach patients that nausea and vomiting have many causes and can be treated
Psycological, social , & Spiritual Needs	
Monitoring:	Stress to the patient that the most important aspects of palliative cannot be 'treated with a pill.' Counsel the patient to express psychological, physical, & spiritual needs at future appointments.
DIET	
Diet Counseling:	Explain that loss of appetite is a normal part of the dying process.

9.4 The Follow-up Patient Visit

This section emphasizes a systematic approach, which will helpyou: 1.Assess medication adherence; and 2. Assess pain control.

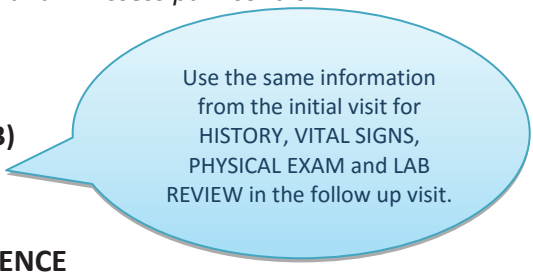
1. History (See par 0)

2. Vital Signs (See par 9.3.2)

3. Physical Exam (See par 9.3.3)

4. Lab Review (See par 9.3.4)

5. Impression



9.4.1 MEDICATION ADHERENCE

Evaluate the patient's ability to follow the treatment plan from last visit.

9.4.2 PAIN CONTROL

Determine if current medication class, dose, and frequency are adequate for patient.

Good Control

- Medication class, dose, and frequency control pain greater than 75% of the time.
- Continue therapy on the 'current step.'

Poor Control

- Medication class, dose, and frequency control pain less than 75% of the time.
- Re-assess pain holisticaly and think of all causes
- Consider moving to a 'higher step' of therapy.
- Or change the therapy according the causes

Emergency

- Pain level #5, delirium, severe dyspnea, intractable nausea/vomiting
- Requires emergency attention!

9.4.3 PLAN

Refer to par 9.3.6for planning and management.

PART 8: Community Check-up

10 COMMUNITY CHECK-UP GUIDELINES

Rwanda Community Health Assessment Checklist		
Patient Name:		
Date of birth:	Gender:	
Age:	Date of evaluation:	
BMI:	Blood pressure:	Pulse:
Past medical history:		Current medications:

Please check one for each of the following	Yes	No	n/a	Comments
General Aspects				
Have you had recent unexplained weight loss?				
Do you have dizziness?				
Do you have unusual thirst?				
Do you have frequent/abundant urination?				
Do you have mood changes?				
Do you have hallucinations?				
Are you pregnant?				
Head and Neck				
Do you have difficulties seeing objects close to you?				
Do you have difficulties seeing objects far away?				
Do you have difficulties seeing things in the periphery?				
Do you have blurred vision?				
Do your eyes itch?				
Have your eyes changed color?				

Please check one for each of the following	Yes	No	n/a	Comments
Do you have any difficulties hearing?				
Do you have pain in your teeth?				
Do your gums bleed?				
Have you had pain in your throat?				
Dou you have pain during swallowing?				
Do you have difficulty swallowing solids, liquids or both?				
Do you have often morning headaches?				
Thorax				
Do you have shortness of breath related to exertion?				
Do you have a persistent cough?				
Do you have a history of pulmonary TB?				
Do you have heart palpitations?				
Do you have chest pain?				
Is there a history of asthma or skin allergy in your family?				
Do you have breast pain?				
Do you palpate a lump in your breast? (Nodule)				
Do you have skin modification on your breast?				
Do you have breast discharge?				
Is there any history of breast cancer in your family?				
Abdomen				
Have you noticed blood in your stools?				
Do you have constipation?				
Do you have persistent diarrhea?				
Do you have abdominal pain?				
Do you have epigastric of chest pain?				
Do you have heart burn?				
Do you feel any mass in your abdomen?				

Please check one for each of the following	Yes	No	n/a	Comments
Genito-urinary				
Do you have urine incontinence?				
Do you have urine in your vagina or in your stools?				
Do you have pain during urination?				
Do you have urine retention?				
Do you have abnormal genital discharge?				
Do you have post-coital spots/bleeding?				
Do you have pain during sexual intercourse?				
Dou you palpate any mass in your genital area?				
How often do you wake up during the night for urination?				
Limbs/ Musculoskeletal				
Do you have blue color of fingers/toes?				
Do you have restriction of limb movement?				
Do you have limb pain?				