Strengthening Interprofessional Education for HIV

Module 2

Cardiovascular Disease in Patients with Well-Controlled HIV

Facilitator Guide

OVERVIEW

Goal

The goal of this session is to prepare learners to evaluate for, prevent, and manage cardio-metabolic complications in people with HIV. The session exemplifies team-based approaches to chronic disease management.

Objectives

By the end of the module, the learner will be able to:

1. Identify common cardiovascular disease risk factors among people with HIV (PWH)
2. Apply risk prediction tools to estimate cardiovascular risk in a patient with HIV
3. Develop and explain recommendations to optimize a patient's cardiovascular health using an interprofessional team-based approach
4. Identify drug-drug interactions between Antiretroviral Therapy (ART) and pharmacologic agents used to prevent and treat cardio-metabolic conditions
5. Recognize the negative impact of CVD on long-term outcomes of PWH
6. Discuss the psychosocial impact of CVD on long-term outcomes of PWH
7. Appreciate other non-communicable diseases experienced by PWH

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Strengthening Interprofessional Education for HIV

Workshop Roadmap

Duration: 75 minutes

Duration	Activity	Content
5 min.	Introduction	
5 min.	1. Discussion	CVD risk factors
15 min.	2. Group work	CVD risk reduction and role clarification
10 min.	3. Group work	Recommendations
5 min. (Optional)	4. Discussion	Drug-drug interactions
5 min.	5. Discussion	Team approach to discharge
10 min.	6. Discussion	Impact of CVD
5 min. (Optional)	7. List	Other NCDs affecting PWH
5 min.	Conclusion	

Workshop Setup

How to tailor this module: Use of national guidelines for CVD management and treatment is recommended to convey to learners available medicines and treatment protocol. In addition, preferred and alternative ART regimens may need to be adapted according to national guidelines.

Activity 7 is meant to begin a discussion on other co-morbidities affecting PWH. Facilitators have the option to further develop this activity to discuss the management of HIV patients with specific NCDs. Reminder to facilitators: Key learning points in the Answers will be underlined. Please emphasize these learning points as you move through the module.

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Additional learner materials

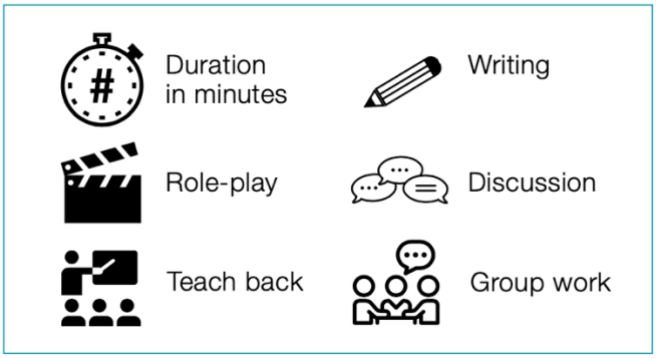
- Select pages of the WHO 2011 Global Atlas of Cardiovascular Disease Prevention and Control (p3)
- Select pages of the 2007 WHO Prevention of CVD Pocket Guidelines
- Select pages from the 2020 WHO HEARTS Technical package for cardiovascular disease management in primary health care (two documents – one has "lab-based" (pages 17 to 19 and 35 to 38) prediction tools and one has prediction tools to be used with no labs (pages 19 to 21 and 56 to 59))
- Can be accessed on learners' laptops or print a few copies per table

Abbreviations

ART	Antiretroviral therapy
AZT	Zidovudine
BMI	Body mass index
BP	Blood pressure
CV	Cardiovascular
CVD	Cardiovascular disease
FBS	Fasting blood sugar
HIV	Human Immunodeficiency Virus
HIV RNA	HIV ribonucleic acid or HIV viral load
HTN	Hypertension
INSTI	Integrase strand transferase inhibitor
NCD	Non-communicable disease
r/LPV	Ritonavir/Lopinavir
PI	Protease inhibitor
PWH	People with HIV
SBP	Systolic blood pressure
WHO	World Health Organization
3TC	Lamivudine

Introduction

Activity Components



Facilitator: Introduce yourself and share the background to this topic: We know that people with HIV are now living longer than before because of effective ART. In the past 10–15 years, a new body of literature indicating an increased risk of cardio-metabolic disease among PWH has emerged. However, little attention is given to screening, prevention, and management of PWH at increased risk for CVD, which can manifest as stroke, heart attack, heart failure, or peripheral arterial disease. Unfortunately, while most interventions recommended for the general population are useful in addressing CVD risk among PWH, special attention needs to be paid to this patient population because they are at a significantly higher risk of CVD beyond what can be explained by HIV, ART, or traditional risk factors for CVD.

Case: James is a 50-year-old man with long-standing, well-controlled HIV on 3TC, AZT, and r/LPV who presents to the clinic for routine HIV care. His last HIV RNA one month ago was undetectable, and his pill count shows that he is very adherent to his ART. The doctor says he would like to see James back in 6 months and asks, "What other concerns do you have today?" James explains that he has been having poor erections, and he is very frustrated and embarrassed. His wife thinks he is cheating on her with other women.

Past medical history: High blood pressure not on treatment.

Social History: He is a truck driver and smokes 8-10 cigarettes per day but does not drink any alcohol. He is married.

Family History: He has no family history of cardiovascular disease.

Physical Exam

Vital Signs: T 37.4°C, HR 72, RR 16, BP 162/97, O2 sat 99% RA, weight 108kg

General: Well-appearing, central obesity with comparatively thinner arms and legs.

Respiratory: Clear to auscultation bilaterally.

Cardiovascular: Regular rate and rhythm, normal S1 and S2, no murmurs/rubs/gallops.

Gastrointestinal: Soft, obese, non-tender.

Neurologic: Dozes off during the examination but is woken up by his loud but brief snoring.

Psychiatric: Appropriate mood.

ACTIVITY 1

Identify common cardiovascular disease risk factors among people with HIV.

In your small group, use page 3 of the WHO 2011 Global Atlas of Cardiovascular Disease Prevention and Control in Additional Learner Materials as a resource to answer this question. What history and examination findings are risk factors in general for increased risk of CVD?

Answer: After 5 minutes, review the answer with learners. Risk factors for CVD among PWH include traditional risk factors for CVD, such as hypertension (especially uncontrolled blood pressure), age, obesity, diabetes mellitus, dyslipidemia (especially elevated LDL cholesterol), sedentary lifestyle, family history, and cigarette smoking. Additional risk factors that remain less well appreciated include untreated obstructive sleep apnea (which we suspect in this patient, given his thick neck and falling asleep/snoring during physical examination). There are several well-established HIV-associated risk factors for CVD among PWH, such as ongoing HIV viral replication, low CD4 nadir, and inflammation.

"In-depth" Answer: Inflammation is common in PWH, and may be associated with arterial inflammation, which in turn predisposes to the formation of non-calcified plaque (the type of plaque that is more common among PWH as compared to their non-HIV-infected counterparts).

ACTIVITY 2

Apply risk prediction tools to estimate cardiovascular risk in a patient.

A blood pressure reading is repeated to verify elevation. This time, the BP reads 160/96. The doctor explains he is concerned about three things: (1) his elevated BP, (2) that he may have lipodystrophy from the Combivir (lamivudine, zidovudine) and (3) that he may have elevated cholesterol from the Aluvia (ritonavir/lopinavir).

Use the 2020 WHO HEARTS Technical Package for Cardiovascular Disease Management in Primary Health Care in Additional Learner Materials (ALM) to predict his CVD risk, assuming James lives in your country. Assume that James recently had laboratory testing indicating that he did not have diabetes and that he had a total cholesterol of 5.2mmol/l. In this example, we will use the "labs" prediction tool in ALM since we have a cholesterol level and diabetes testing, but please be aware of the "no labs" WHO prediction tool in ALM that can be used if these lab tests are not available.

Answer: Refer learners to Table 2 at the start of the ALM document, which describes how to use the charts to calculate a 10-year risk of a cardiovascular event. To use the charts, learners will need to have to know if your country is part of the WHO Western, Central, Eastern, or Southern Sub-Saharan Africa group (countries are listed at the top of the risk prediction tool) and will need the following information about the patient (all available from the case vignette): age (50), sex (male), diabetes status (no), smoking (yes), systolic blood pressure (162), and cholesterol (5.2).

Have learners calculate James's CVD risk assessment. According to the WHO CVD risk prediction, this patient has 12-13% chance of having a fatal or non-fatal cardiovascular event in the next 10 years (specifically, the risk

estimate is 13% for Western, Central, and Eastern Sub-Saharan Africa and 12% for Southern Sub-Saharan Africa). This should take approximately 5 minutes.

ACTIVITY 3

Develop and explain recommendations to optimize a patient's cardiovascular health using an interprofessional, team-based approach.

Multi-disciplinary rounds involve health care professionals from different disciplines coming together to discuss a patient and create a comprehensive care plan. Spend 5 minutes reviewing Table 3 of the 2020 WHO HEARTS Technical Package "Management of total CVD risk" (available in both the "no labs" and "lab based" documents in additional learner materials. Then, in your small group, conduct multidisciplinary rounds.

Of note, WHO has created a HEARTS Technical Package for Cardiovascular Disease Management in Primary Health Care: Team-based Care that outlines how to deliver a team-based approach to cardiovascular care (see Reference #6).

Facilitator: Give everyone 5 minutes to individually review Table 3. Then have each small group conduct multidisciplinary rounds to allow each health profession to suggest recommendations within the categories that relate to their profession/expertise.

Category	Suggested professions to provide Recommendations
Physical activity	(Dietician/Nutritionist, Nurse, community health worker, physical therapist)
Dietary changes	(Dietician/Nutritionist, Nurse, community health worker)
Smoking cessation	(Nurse, physician)
Avoiding harmful alcohol	(Dietician/Nutritionist, nurse, community health worker, physician)
Blood pressure	(Nurse, physician)
ART regimen	(Physician, pharmacist)
Goal HIV RNA	(Physician, pharmacist)
Weight control	(Nursing, dietician/nutritionist)
Lipid lowering agent	(Physician, pharmacist)
Hypoglycemic agent	(Physician, pharmacist)

Answer: After 15 minutes, come back as a large group. Have each group share their recommendations from their respective area of expertise. The patient should be seen back in 6-12 weeks to assess for interval change after the recommendations were made. If time permits or learners are interested, "in-depth" answers are also provided.

Category	Recommendation (Answers)	"In-depth" Answer
Physical activity	Increase aerobic exercise	> 150 min/ week
Dietary changes	Less salt (<1tsp a day) and total fat intake	< 2000 calories/day
Smoking cessation	Complete cessation of all tobacco products should be the goal	Stopping all at once more effective than "weaning" cigarettes
Avoiding harmful alcohol	Stopping any amount that leads to detrimental health and social consequences	Goal ≤1 standard drink daily
Blood pressure	Decrease BP	Goal <140/90 or <130/80 if diabetic or risk is >30%
ART regimen	Change to regimen that does not include a PI and has fewer lipid effects	Consider TDF/FTC/DTG
Goal HIV RNA	Goal undetectable	Persistent viral replication may be tied to inflammation
Weight control	Weight loss is desirable if overweight	Goal BMI 20-25
Lipid lowering agent	Consider initiation for CVD risk >30% or diabetes or individuals with persistently elevated cholesterol* (total cholesterol >8 mmol/L) despite lipid lowering diet	Atorvastatin or Simvastatin
Hypoglycemic agent	Consider if FBS > 7 mmol/L	Metformin

ACTIVITY 4

OPTIONAL ACTIVITY FOR PHYSICIAN & PHARMACY LEARNERS

Identify drug-drug interactions between ART and pharmacologic agents used to prevent and treat cardio-metabolic conditions.

In addition to lifestyle changes, pharmaceutical agents can help prevent or treat CVD. The doctor is considering changing James's ART. Discuss with your small group what drug-drug interactions you might look for if an ART change was planned for James?

Answer: James should be asked if he uses over-the-counter or traditional medications or if he has been prescribed any other medications by other healthcare providers outside of the HIV clinic. Caution should be used with combinations of ritonavir-containing ART. Similarly, caution should be used when prescribing dolutegravir and metformin. Encourage learners to use a drug-drug interaction checker (such as the Liverpool HIV interaction checker (https://www.hiv-druginteractions.org) online or to download as an application for a phone whenever starting medications in addition to ART.

CLINICIAN'S CORNER - Rhabdomyolysis and HIV

Ritonavir, a potent inhibitor of the CYP450 system, can result in significantly elevated levels of nearly all statins (such as simvastatin, atorvastatin, and rosuvastatin), putting the patient at risk of muscle injury (rhabdomyolysis). Thus, it is important to ask your patient if they are having any muscle aches or pains or fatigue to screen for symptoms. If available, a creatine kinase blood test can be obtained, which would be elevated in rhabdomyolysis. Some of the INSTIs can also cause rhabdomyolysis although this is exceedingly rare and would not be a reason to avoid an INSTI such as dolutegravir or use of a statin if indicated. Any patient with suspected statin-induced muscle injury should stop the medication and be evaluated quickly as breakdown products of muscle injury can lead to permanent kidney failure if not detected early.

ACTIVITY 5

Recognize the negative impact of cardiovascular disease on long-term outcomes of PWH.

Joyce is a 38-year-old woman with 12 years of well-controlled HIV who presents to a rural triage clinic with acute onset left-sided weakness of 6 hours duration, consistent with a stroke. Her past medical history is only significant for uncontrolled HTN (today it measured 192/110), which she had attributed to stress since she separated from her husband.

Although a CT scan of the head was not available, her symptoms were most consistent with stroke. She was not a candidate for thrombolysis given how many hours had elapsed, but aspirin was started. Initially, permissive hypertension was allowed, but a few days into hospitalization, anti-hypertensives were started. Note that recommendations for secondary prophylaxis or CVD prevention after a CV event are different than discussed above and are available as a resource on pages 24-27 of the 2007 WHO Prevention of CVD Pocket Guidelines in Additional Learner Materials.

Over the next few days, Joyce's condition improves. You are preparing to discharge her from the hospital. What are the roles of different health professionals and the patient's family/ community in preparing for discharge, and what important considerations should be made for this patient?

Answer: There are no right or wrong answers for this question. After 5 minutes, ask if any of the groups would like to share some of the issues they considered. Facilitators can contribute with their experiences with discharging patients in their context or medical facility. Then proceed to the next activity.

ACTIVITY 6

Discuss the psychosocial impact of CVD on long-term outcomes of PWH.

Divide into small groups of 3-4. Half of the groups should discuss the psychosocial impact of erectile dysfunction on James's life. The other half of the groups should discuss the implications of a stroke on Joyce's life.

Answer: After 5 minutes, first share that PWH are twice as likely to experience CVD diagnoses, even after controlling (factoring in) known traditional risk factors for CVD. Unfortunately, PWH in sub-Saharan Africa are expected to experience the highest burden of CVD among all PWH globally. Have each group share thoughts from their discussion with the large group.

As was noted in scenario A, unrecognized (and hence untreated) CVD may predispose to microvascular complications such as erectile dysfunction. Such complications can lead to low self-esteem and relationship stressors. It may be a source of conflict in the home, and if the patient attributes the problem to ART, there is risk of non-adherence. In scenario B, a stroke may render a patient immobile, impairing ability to ambulate or predisposing to bedsores. It may impair swallowing and put the patient at risk for aspiration.

The loss of independence and mobility may result in loss of income and dignity and may put a financial and emotional cost of care onto the family, for example.

If time allows, discuss with learners how poorly controlled HIV can also have adverse outcomes on cardiovascular disease. Persistently elevated HIV viral load increases the likelihood of immune activation/inflammation that can increase cardiovascular risk. Underscore the importance of ART adherence.

CLINICIAN'S CORNER

Targets for Blood Pressure and Cholesterol Treatment

By not defining blood pressure targets, and not educating patients about such targets and the importance of medication adherence, most patients (~50%) living with elevated blood pressures do not attain the goal BP of <140/90. Similarly, because comprehensive CVD risk assessment is required (not just the measurement of cholesterol) in order to identify patients who should be recommended statin therapy, many patients who should be on this therapy never receive it because global CVD risk assessment has not been done. For instance, if James were 60 years old, with a "normal" cholesterol of 5 mmol/L and SBP 180 mmHg, he would still meet the criteria to be on statin therapy. However, if we relied on cholesterol levels alone, we would erroneously deny him a key CVD preventive therapy!

In addition, multiple studies have shown that PWH have a higher risk of stroke and heart attack than what is estimated by risk prediction tools such as the WHO calculator used in this module. This is likely due to the increased inflammation caused by chronic HIV infection. Recently, a large multinational study (including over 1000 participants from countries in Sub-Saharan Africa) called REPRIEVE randomized PWH with low-to moderate risk of cardiovascular disease to a statin (pitavastatin) or placebo. Despite not being from groups that were traditionally prescribed statins, PWH who received pitavastatin had a 35% reduction in cardiovascular events. This study, published in 2023, suggests that there may be benefit to liberalizing our prescription of statins to PWH beyond country-specific guidelines for people who do not have HIV.

ACTIVITY 7

OPTIONAL ACTIVITY

Recognize the negative impact of CVD on long-term outcomes of PWH.

For people with HIV and without HIV, the risk for NCDs increases with age. However, in addition to CVD, the risk for other NCDs is also higher in PWH, either because of the infection itself or because of certain ARVs. It is therefore important to incorporate the management of multiple NCDs into HIV care.

As a large group, list NCDs other than CVD that affect PWH.

Answer: On a flipchart or a chalkboard/whiteboard, create a list of NCDs identified by the learners. Example answers include: type 2 diabetes, hypertension, depression, chronic kidney disease, and some cancers (particularly Kaposi's sarcoma, cervical cancer, and anal cancer).

Conclusion

Facilitator: Refer to the learning objectives at the beginning of the Guide. Briefly summarize the key learning from the module by going through each objective and having learners report key learning points from each. Underscore the importance of identifying and treating cardiovascular complications in PWH. Emphasize that the prevalence of these kinds of health issues is likely to increase as people are living longer on ART. Also, there is a rising incidence of cardiovascular disease in the general population in Africa (due to urbanization, changing dietary patterns, etc.).

References/Resources

1. American Heart Association (AHA) scientific Statement on Characteristics, Prevention, and Management of Cardiovascular Disease in People Living With HIV by Feinstein et al (AHA journal, 2019)
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6. WHO. HEARTS Technical package for cardiovascular disease management in primary health care: Team-based care. 2016. Available at: https://apps.who.int/iris/bitstream/handle/10665/260424/WHO-NMH-NVI-18.4-eng.pdf?sequence=1
7. Grinspoon et al. N Engl J Med 2023; 389: 687-99.