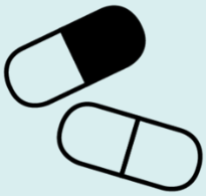
Strengthening Interprofessional Education for HIV

# Module 2

Cardiovascular Disease in Patients with Well-Controlled HIV



# Learner 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.
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

PEPFAR

HRSA Health Resources & Services Administration

UCSF Institute for Global Health Sciences

AFRE health African Forum for Research and Education in Health

## 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

**Additional learner materials**

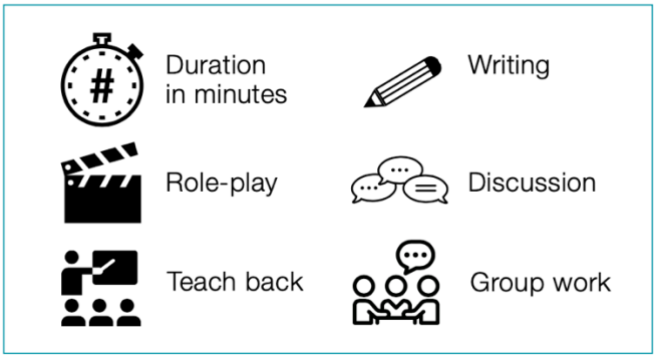
- Select pages of the WHO 2011 Global Atlas of Cardiovascular Disease Prevention and Control
- Select pages of the 2007 WHO Prevention of CVD Pocket Guidelines
- Select pages from the 2020 WHO HEARTS Technical package for cardiovascular disease management in primary health care (two documents – one has "lab based" prediction tools and one has prediction tools to be used with no labs)
- 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**




**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

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### 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?

## ACTIVITY 2

15

### 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.

## ACTIVITY 3

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### 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 details how to deliver a team-based approach to cardiovascular care (see Reference #6).**

| Category | Suggested professions to provide Recommendations |
|---|---|
| Physical activity | |
| Dietary changes | |
| Smoking cessation | |
| Avoiding harmful alcohol | |
| Blood pressure | |
| ART regimen | |
| Goal HIV RNA | |
| Weight control | |
| Lipid lowering agent | |
| Hypoglycemic agent | |

| Category | Recommendation (Answers) | "In-depth" Answer |
|---|---|---|
| Physical activity | | |
| Dietary changes | | |
| Smoking cessation | | |
| Avoiding harmful alcohol | | |
| Blood pressure | | |
| ART regimen | | |
| Goal HIV RNA | | |
| Weight control | | |
| Lipid lowering agent | | |
| Hypoglycemic agent | | |

## 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?

**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 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?

## 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 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 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.

## Conclusion

**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)
2. Arnett DK et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease. Circulation. 2019.
3. World Health Organization (WHO) 2011 Global Atlas of cardiovascular Disease Prevention and Control. Available at https://www.who.int/ cardiovascular_diseases/publications/atlas_cvd/ en/. Accessed July 4, 2019.
4. World Health Organization (WHO) 2007 Guideline on Prevention of Cardiovascular Diseases. Accessed July 2019 at: https://www.who.int/ cardiovascular_diseases/guidelines/PocketGL. ENGLISH.AFR-D-E.rev1.pdf
5. HEARTS technical package for cardiovascular disease management in primary health care: risk based CVD management. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0 IGO. Accessed November 2023 at: https://www.who.int/publications/i/item/9789240001367.
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.