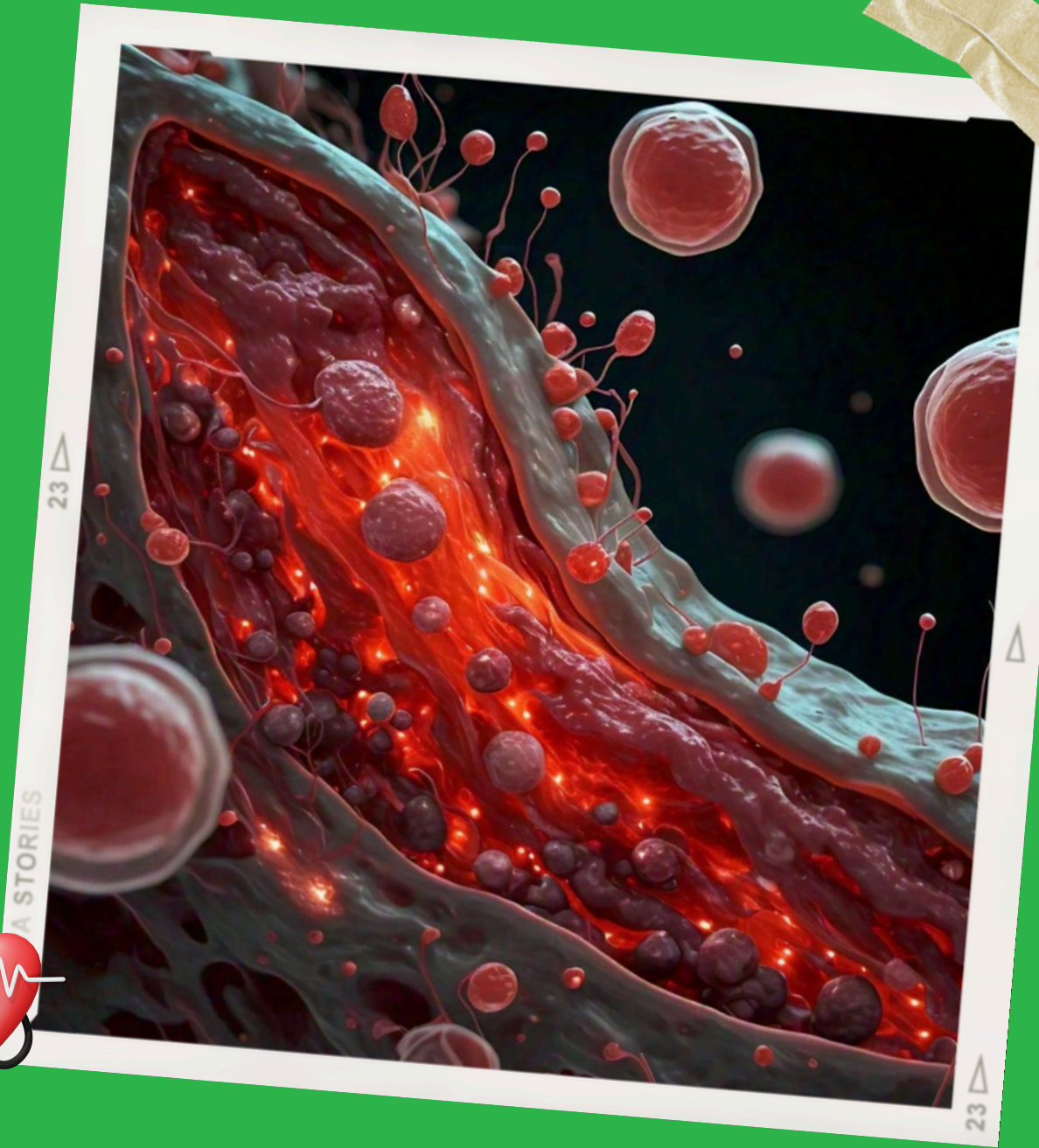




INTEGRATED HIV/HTN

# The Hidden Link



**How Inflammation Drives HIV-  
Associated Hypertension**

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EDCTP

## INTRODUCTION: CONNECTING THE DOTS BETWEEN HIV AND HYPERTENSION



For many years, medical research has focused on how HIV impacts the immune system. However, as treatments for HIV have advanced, people living with the virus are living longer—and a new health challenge has emerged: hypertension, or high blood pressure. Researchers have discovered a fascinating connection between HIV and hypertension, with a surprising key player: inflammation. But what exactly is inflammation, and why does it matter in this context? Let's dive into the details to understand the role of inflammation in HIV-associated hypertension.

## UNDERSTANDING INFLAMMATION: THE BODY'S DOUBLE-EDGED SWORD



Inflammation is a natural response of the immune system. When you cut your finger or catch a cold, inflammation steps in to help the body heal. In these cases, inflammation is short-lived and effective. However, when inflammation becomes chronic—lasting weeks, months, or even years—it can damage tissues and organs.

For people living with HIV, inflammation often persists as the immune system remains in a heightened state, even when the virus is well-managed with antiretroviral therapy (ART). This constant “low-level” inflammation may seem mild, but over time, it has been shown to increase the risk of several conditions, including hypertension.

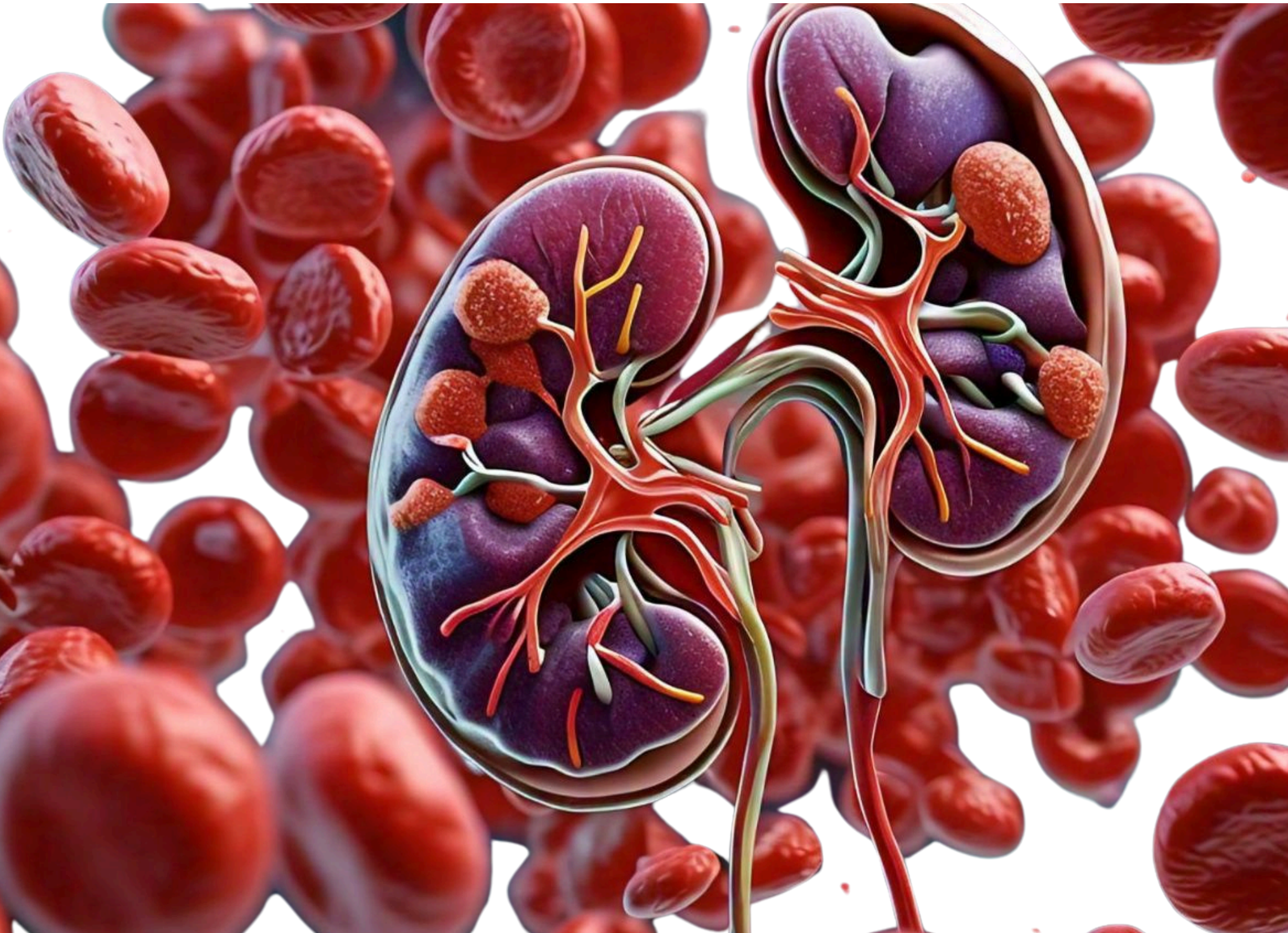
## WHY INFLAMMATION STICKS AROUND IN HIV



HIV targets the immune system, specifically the body's CD4 cells, which play a crucial role in defending against infections. As the immune system fights the virus, it creates an inflammatory response. Although ART controls HIV, reducing its activity in the body, the immune system never fully returns to its pre-HIV state. The virus persists in “hidden” cells, continually sparking low-level inflammation even when viral load is undetectable.

This lingering inflammation creates stress on blood vessels, contributing to the onset of hypertension. In fact, studies show that people living with HIV are nearly twice as likely to develop high blood pressure compared to those without the virus.

# How Inflammation Contributes to Hypertension



## BLOOD VESSEL DAMAGE



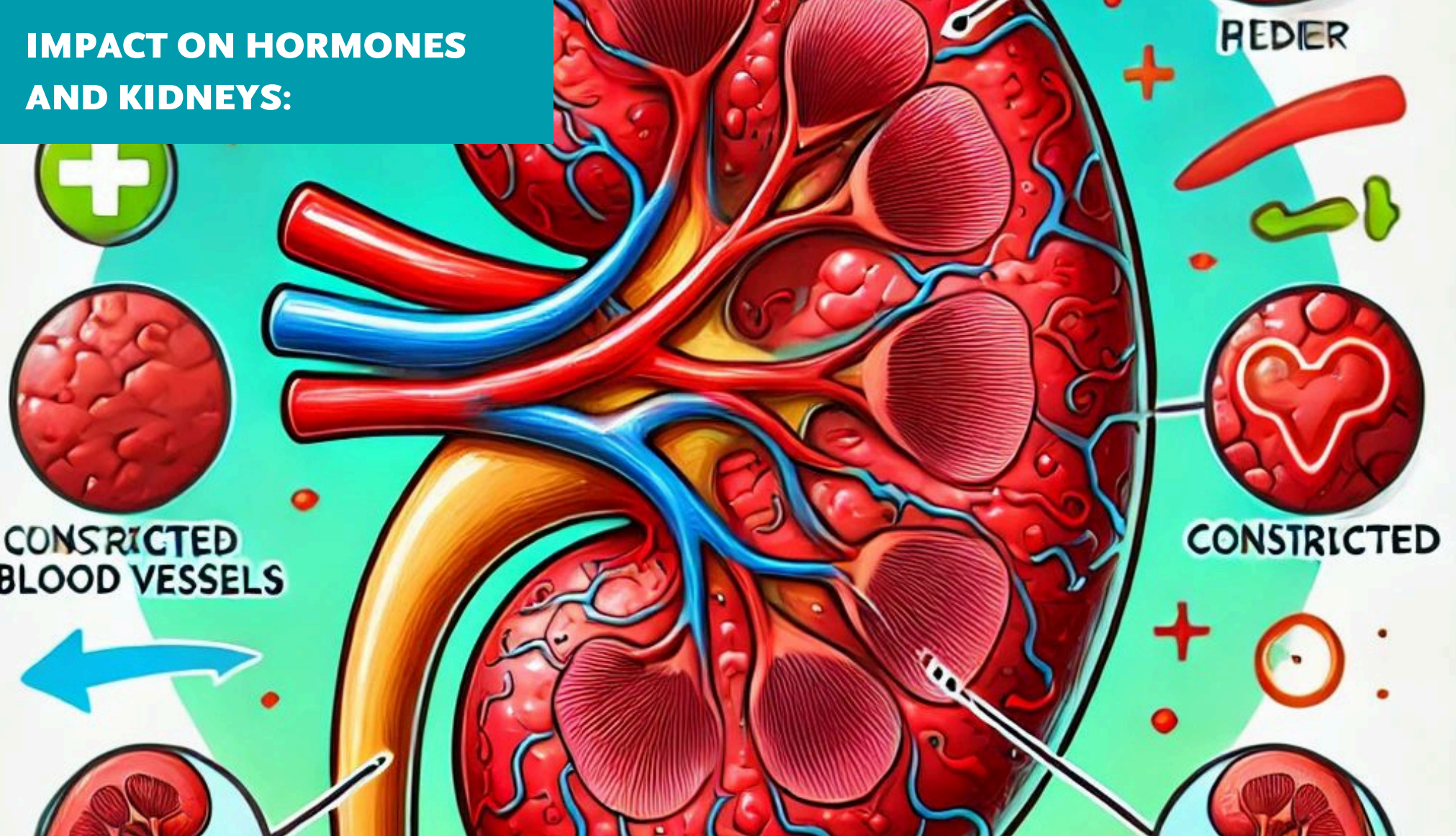
Chronic inflammation can damage the cells lining the blood vessels, known as endothelial cells. When these cells are damaged, the blood vessels become stiffer, making it harder for blood to flow smoothly. This added resistance in blood flow causes blood pressure to rise.

## DISRUPTED BLOOD FLOW REGULATION



Normally, blood vessels can widen or narrow to regulate blood flow and maintain blood pressure. However, inflammation interferes with this function, making it harder for the vessels to relax. When vessels are chronically narrowed, it raises blood pressure.

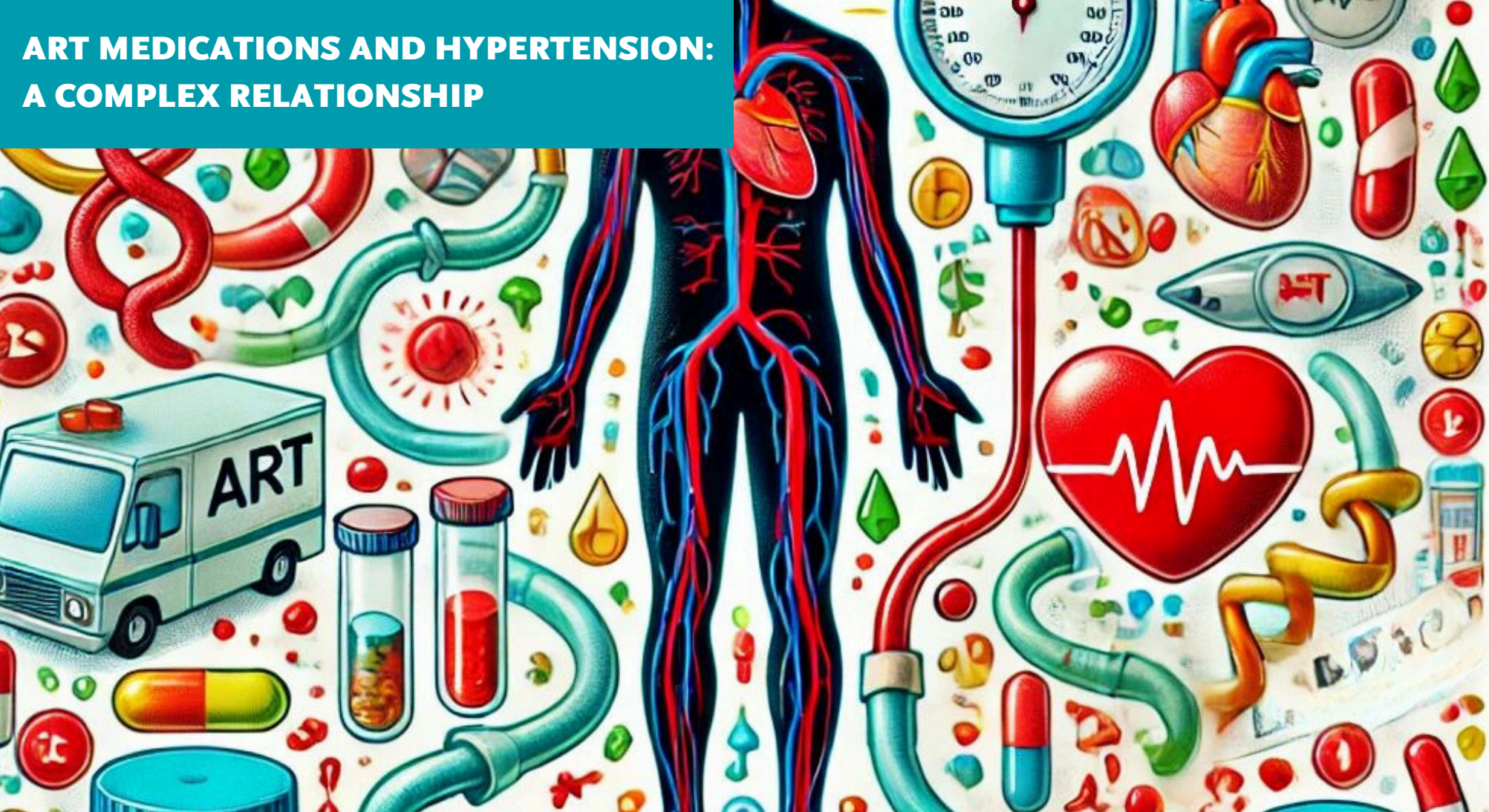
## IMPACT ON HORMONES AND KIDNEYS:



Inflammation also affects hormone systems that regulate blood pressure, including the renin-angiotensin system (RAS), which controls blood vessel constriction and salt balance. Additionally, the kidneys, which filter excess salt and waste from the body, can be impacted by chronic inflammation. When these systems are disrupted, blood pressure often increases.



## ART MEDICATIONS AND HYPERTENSION: A COMPLEX RELATIONSHIP



Antiretroviral therapy has transformed HIV from a fatal illness into a manageable chronic condition, enabling people living with HIV to live longer lives. But while ART controls the virus, some of these medications have been linked to metabolic side effects, including weight gain, insulin resistance, and increased cholesterol levels—all of which can contribute to hypertension. Although ART is essential, it is crucial for healthcare providers to balance its benefits with potential side effects, especially those that affect cardiovascular health.

# Managing Inflammation and Hypertension in HIV: What Can Be Done?



## ANTI-INFLAMMATORY THERAPIES



While not yet standard practice, research is ongoing in to treatments that could specifically target chronic inflammation in people living with HIV. These could potentially prevent or slow down the development of hypertension and other inflammatory complications.

## LIFESTYLE CHANGES



Simple lifestyle adjustments can make a big difference. Regular exercise, a healthy diet, and not smoking can all reduce inflammation and help maintain healthy blood pressure levels. Reducing alcohol intake and managing stress are also important.

## REGULAR MONITORING



People living with HIV should have their blood pressure and other cardiovascular markers checked regularly. Early detection of hypertension allows for early intervention, which can prevent complications.

# LOOKING AHEAD: THE FUTURE OF HIV AND HYPERTENSION RESEARCH



The link between HIV inflammation and hypertension is a rapidly evolving area of research. As scientists continue to explore this connection, new therapies may emerge that specifically target inflammation, potentially reducing the risk of hypertension in people living with HIV. Additionally, future HIV treatments may be designed to minimise inflammation as a side effect.

<http://integratedhivhtn.idrc-uganda.org/index.html>



In the meantime, understanding the hidden role of inflammation offers a powerful insight into how HIV impacts more than just the immune system. This knowledge can empower people living with HIV to take proactive steps toward a healthier, longer life. The journey from HIV diagnosis to hypertension prevention is one of resilience, innovation, and the ongoing commitment of the medical community to improve the quality of life for people living with HIV.

## CONCLUSION: A CALL TO AWARENESS AND ACTION



The relationship between HIV, inflammation, and hypertension underscores the need for a holistic approach to healthcare for people living with HIV. By raising awareness and advancing research, we can not only treat HIV but also mitigate its broader impacts, offering hope and health for those living with the virus.