

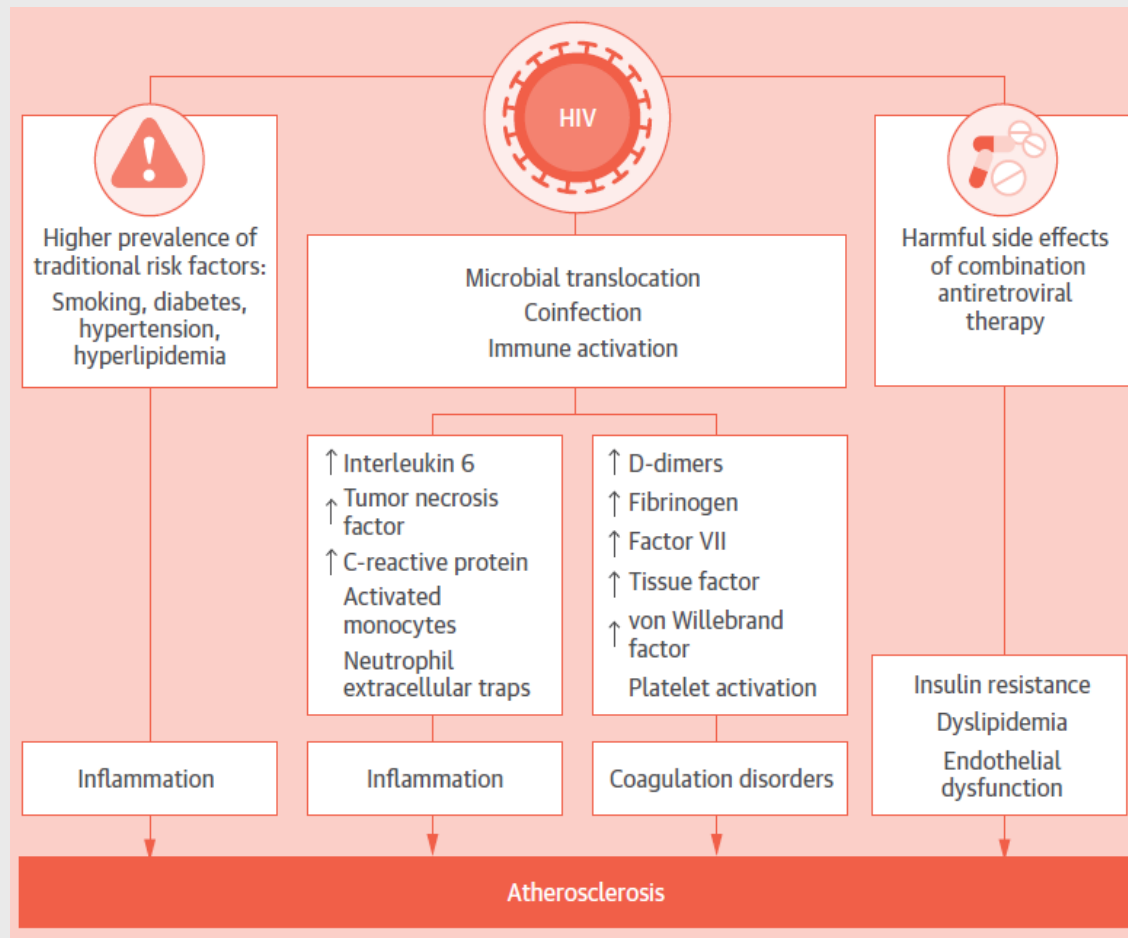
# Herz und HIV



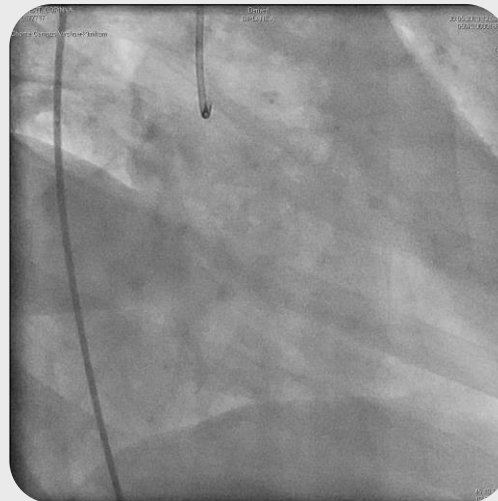
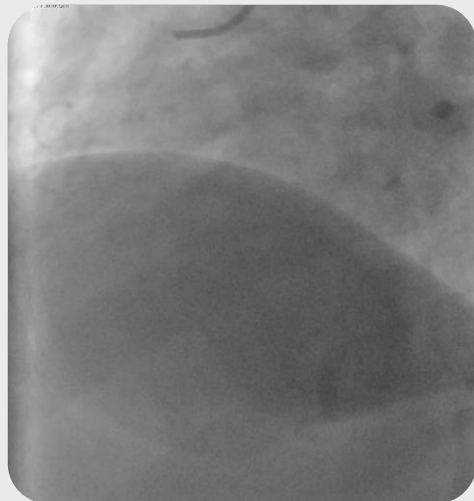
# Ätiologie der HIV-assoziierten KHK

(Vachiat A, et al . J Am Coll Cardiol. 2017 Jan 3;69(1):73-82)

Die Mortalität nach einem Herzinfarkt ist bei HIV Patienten 4,5 fach höher als bei nicht-HIV Patienten.

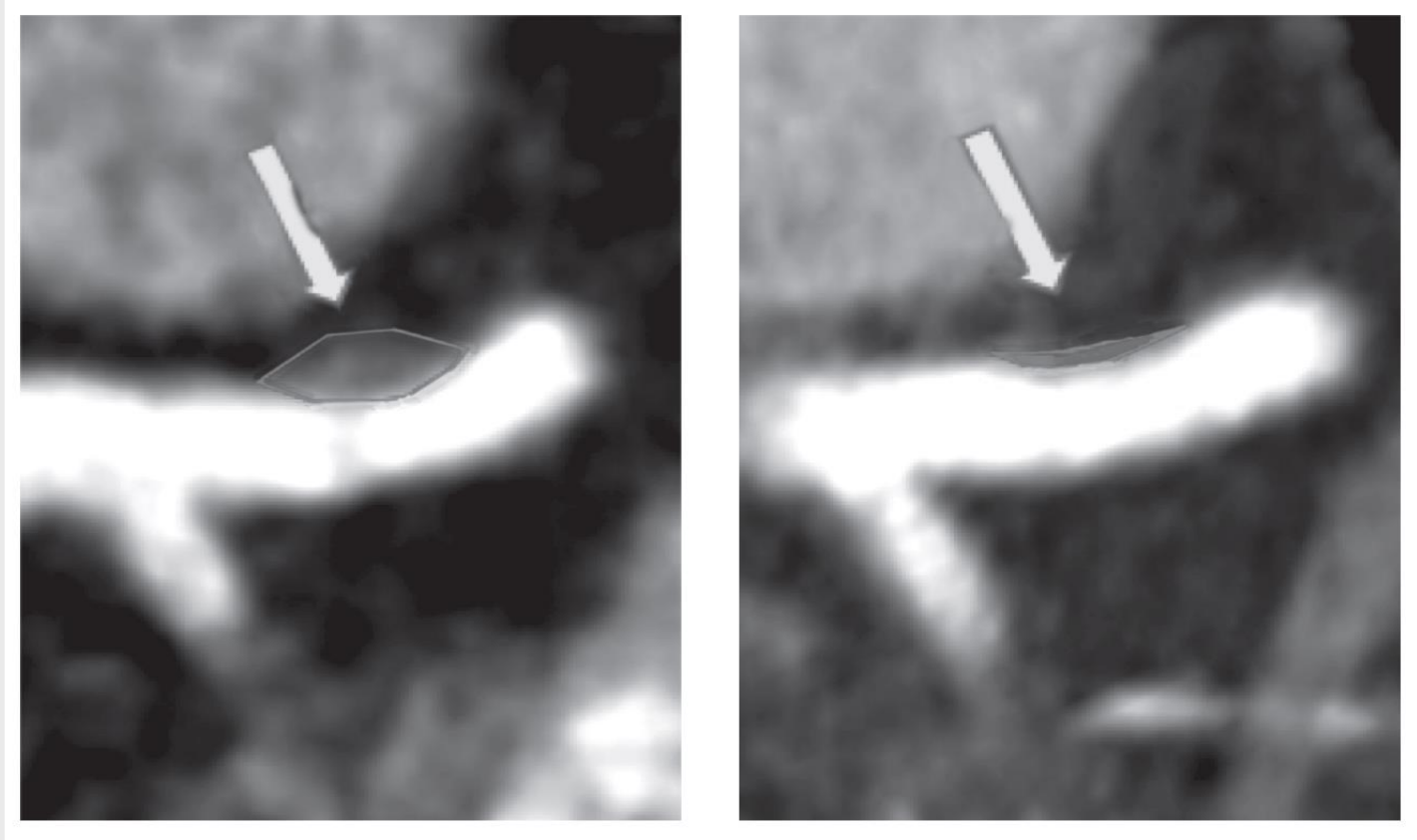


# Weiche Plaques bei der HIV-assoziierten KHK



# Weiche Plaques der Koronarien bei einem HIV-Patienten: Effekt einer 12 monatigen Statintherapie mit Atorvastatin

(Gilbert JM, et al Top Antivir Med. 2015 Oct-Nov;23(4):146-9)



# Effekt einer antiviralen Therapie auf das Lipidprofil

(Vachiat A, et al . J Am Coll Cardiol. 2017 Jan 3;69(1):73-82)

cART	Effect on Dyslipidemia	Comment
<b>NRTI</b>		
Zidovudine	↑↑	Significant increase in TC/LDL
Stavudine	↑↑	Significant increase in TC/TG
Abacavir	↔→/↑	TC/HDL ratio unchanged
Tenofovir	↓	Reduction in LDL/TC
<b>NNRTI</b>		
Nevirapine	↓	Can increase HDL level
Efavirenz	↔→/↑	May increase lipid level slightly
Etravirine	↔→/↑	No significant changes
<b>Protease inhibitor</b>		
Lopinavir/ritonavir	↔→/↑	Elevation of TC/TG frequent
Fosamprenavir/ritonavir	↑	Elevation of TC/TG
Atazanavir/ritonavir	↔↔	PI with best lipid profile
Darunavir/ritonavir	↔↔	Good lipid profile
<b>Integrase inhibitor</b>		
Raltegravir	↔↔	Low frequency of dyslipidemia
<b>Chemokine receptor-5 antagonist</b>		
Maraviroc	↔↔	No significant changes

Zahlreiche antivirale Medikamente beeinflussen das Lipidprofil ungünstig

# Statin Interaktionen mit antiviralen Medikamenten

(Vachiat A, et al . J Am Coll Cardiol. 2017 Jan 3;69(1):73-82)

Drug	Metabolism	PI	NNRTI
Lovastatin	CYP3A4	<u>Contraindicated with PIs</u>	Decreases lovastatin's AUC; thus, a higher lovastatin starting dose may be needed
Simvastatin	CYP3A4	<u>Contraindicated with PIs</u>	Acceptable with appropriate dosing Efavirenz and etravirine decrease simvastatin's AUC
<b>Cave: Energy</b>			
Pravastatin	Partial hepatic (OATP1B1); partial urinary/biliary excretion	Acceptable with appropriate dosing and monitoring; darunavir increases pravastatin's AUC	Acceptable with appropriate dosing and monitoring
<u>Fluvastatin</u>	CYP2C9, CYP3A4	Acceptable with appropriate dosing and monitoring; not recommended with nelfinavir	Acceptable with appropriate dosing and monitoring Etravirine may increase fluvastatin's AUC
Atorvastatin	CYP3A4	<u>Use with caution.</u> Do not coadminister with tipranavir/ritonavir	Acceptable with appropriate dosing and monitoring Efavirenz and etravirine decrease atorvastatin's AUC
Rosuvastatin	CYP2C9	Acceptable with appropriate dosing and monitoring; lopinavir/ritonavir and tipranavir/ritonavir increases rosuvastatin's AUC	Acceptable with appropriate dosing and monitoring
Pitavastatin	CYP2Cp; glucuronidation	No significant interaction; mild decrease in pitavastatin's AUC with darunavir	No data on NNRTI

**Zahlreiche Statine lassen sich Nicht einfach mit antiviralen Medikamenten kombinieren.**

**Ezetimibe scheint möglich (wenige Daten vorhanden)**

# Interaktionen zwischen Plättcheninhibitoren und antiviralen Medikamenten

(Vachiat A, et al . J Am Coll Cardiol. 2017 Jan 3;69(1):73-82)

Antiretroviral Agent	Mechanism of Interaction	PI	NRTI	NNRTI	Integrase Inhibitors
Clopidogrel	CYP3A4, CYP2C19, CYP2C9	Unlikely to be clinically relevant	No interaction	Etravirine and efavirenz decrease effect of clopidogrel	Unlikely to be clinically relevant
Prasugrel	CYP3A4	Ritonavir decreases clinical effect	No interaction	Unlikely to be clinically relevant	Cobicistat decreases clinical effect
Ticagrelor	CYP3A4, Pgp	Increased risk of bleeding	No interaction	Unlikely to be clinically relevant	Increased risk of bleeding with cobicistat

Als günstigster Kombinationspartner wird Prasugrel angegeben, so lange Ritonavir nicht mit im Behandlungskonzept ist.

# HIV und nicht-ischämische kardiale Komplikationen

Manga P, et al. J Am Coll Cardiol. 2017 Jan 3;69(1):83-91

Pathogenesis and Risk Factors Associated With HIV Infection and Heart Disease

**A Pulmonary arterial hypertension**

Endothelial dysfunction and a procoagulant state (caused by inflammation)

Vasoconstriction (caused by invasion of endothelial cells and endothelin 1)

Endothelial dysfunction (caused by negative regulation of gp120 protein and HIV-trans-activation of transcription factors)

**B Arteropathy**

Obstruction of vasorum (caused by inflammation)

Regurgitation, aneurysm, and weakness of vessel walls (+ immune response)

**C Cardiomyopathy**

Inflammation

Immune dysfunction

Opportunistic infections

Myocyte injury

Cardiac steatosis (induced by coinfection with anti-retroviral therapy)

**Haupt-essages**

**Pulmonaler Hypertonie:**  
ET<sub>a</sub>/ET<sub>b</sub> Endothelin Antagonist  
Macitentan bevorzugt

**HRST:**  
4-fach erhöhter  
Sudden Death, wegen der  
QT Zeit Verlängerungen  
durch antivirale Med./Antibiotika

**Vorhofflimmern:**  
Marcumar –INR  
Dabigatran –Vorteile bezüglich  
Medk. Interaktionen

**CHF**  
ACEI/Sartane/Diuretika möglich



# Herz und HIV

## Zusammenfassung:

- **HIV induziert eine hohe kardiovaskuläre Mortalität**

- **Cave bezügl. den Medikamenteninteraktionen  
Statinen, Plättchenhemmern, NOAKs**

- **Cave: Sudden Death durch QT Zeit  
Verlängerungen**