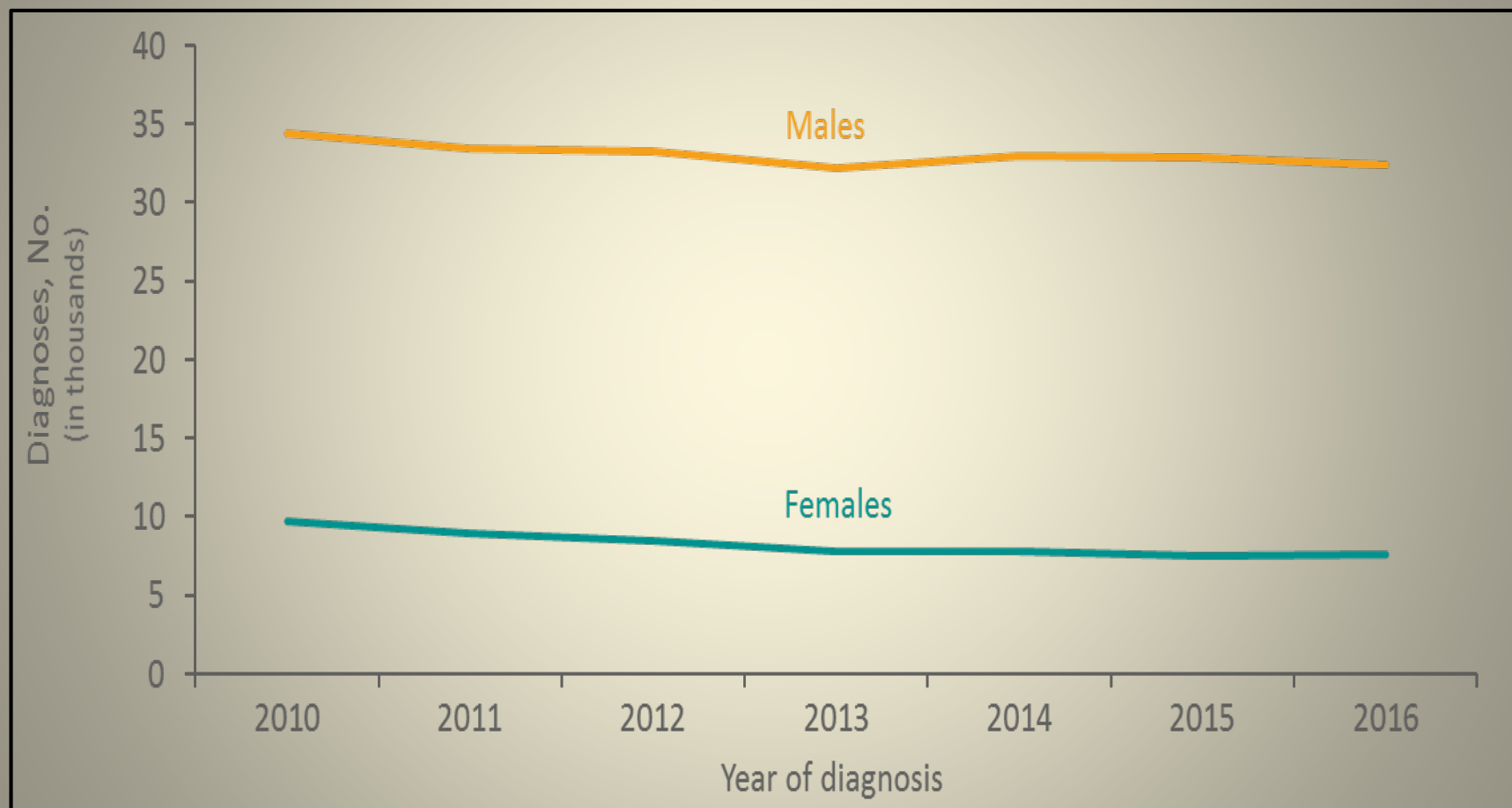


HIV Treatment 101

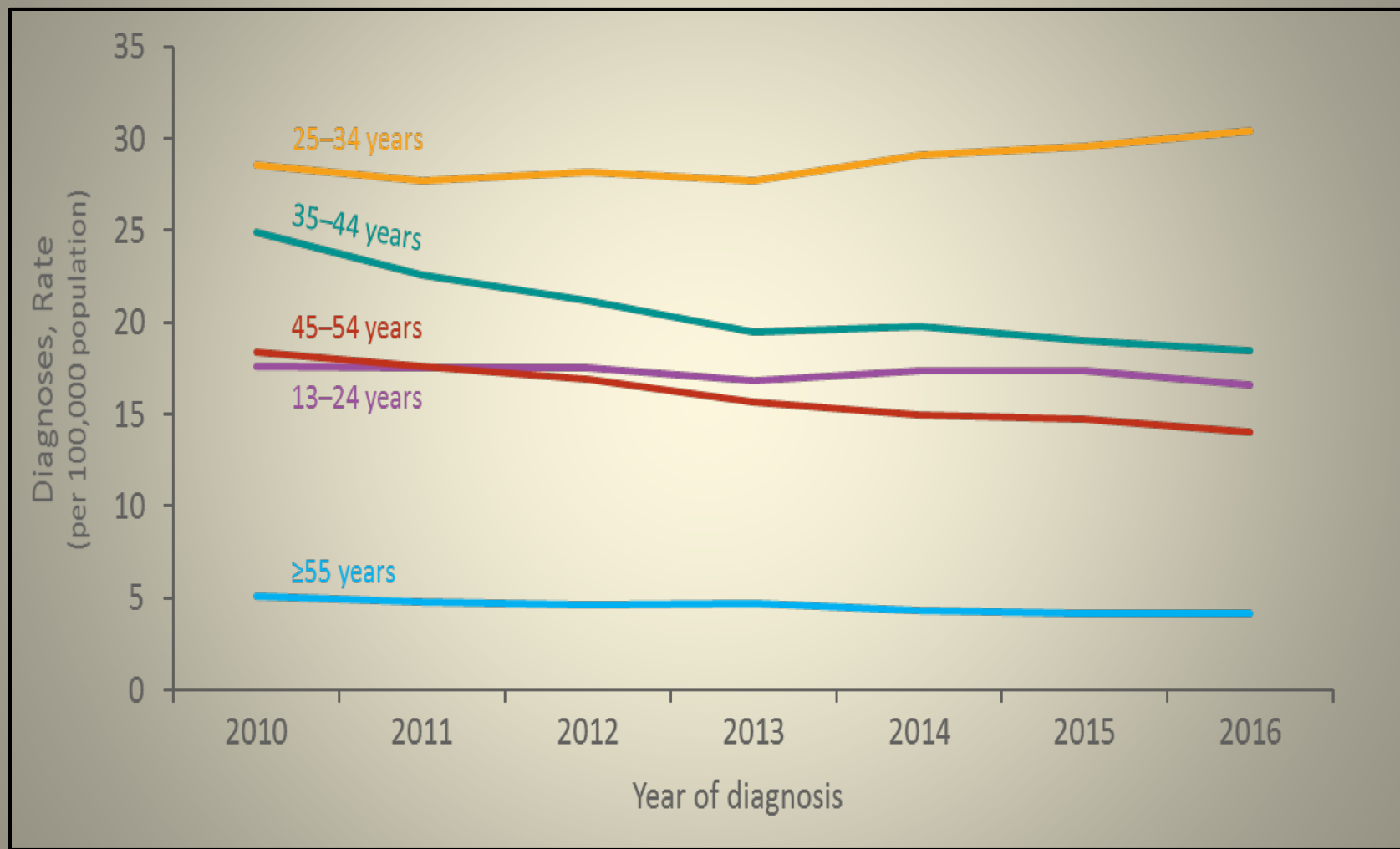
Carol Salisbury FNP MSN

Epidemiology of HIV Infection through 2017

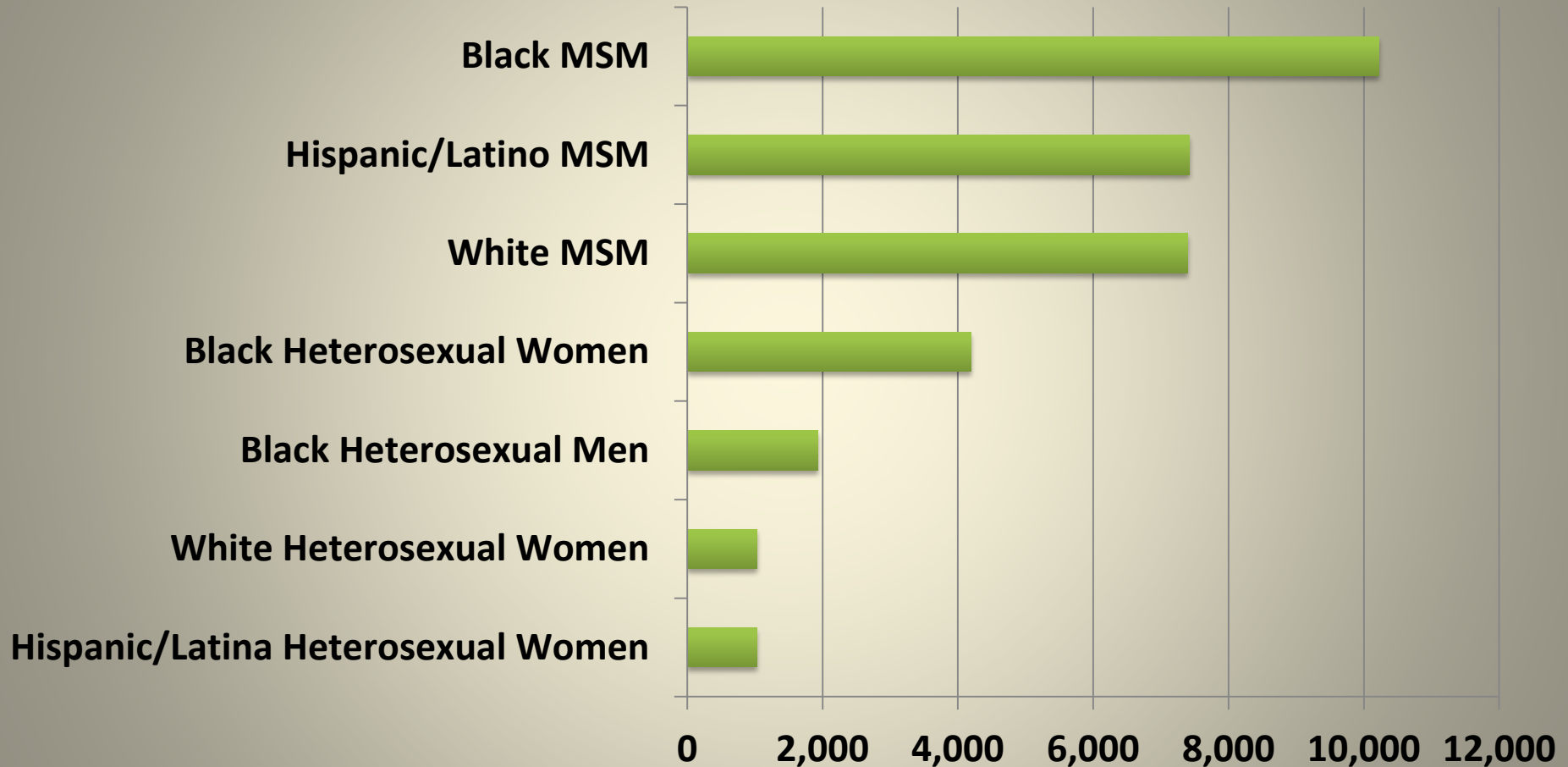
Diagnoses of HIV Infection among Adults and Adolescents, by Sex 2010–2016—United States and 6 Dependent Areas



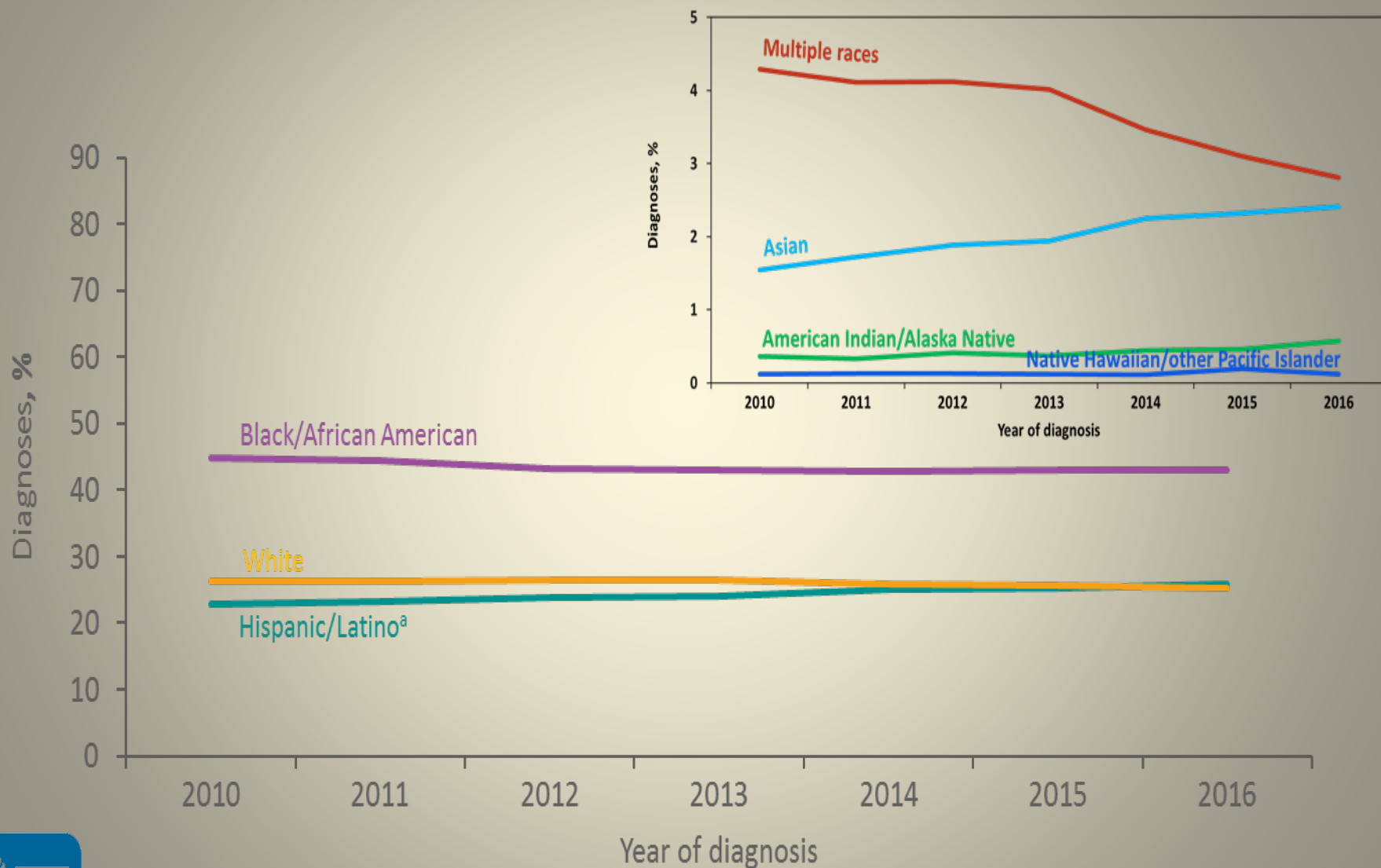
Rates of Diagnoses of HIV Infection among Adults and Adolescents by Age at Diagnosis, 2010–2016—United States



New HIV Cases in the US - 2016

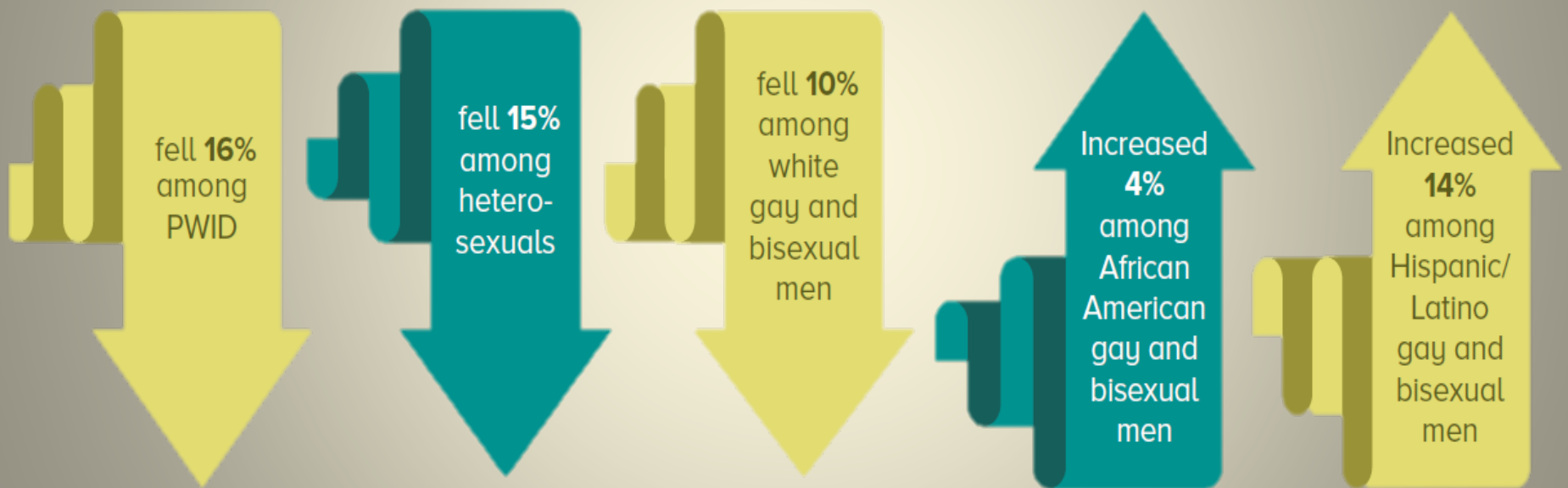


Diagnoses of HIV Infection among Adults and Adolescents, by Race/Ethnicity 2010–2016—United States and 6 Dependent Areas

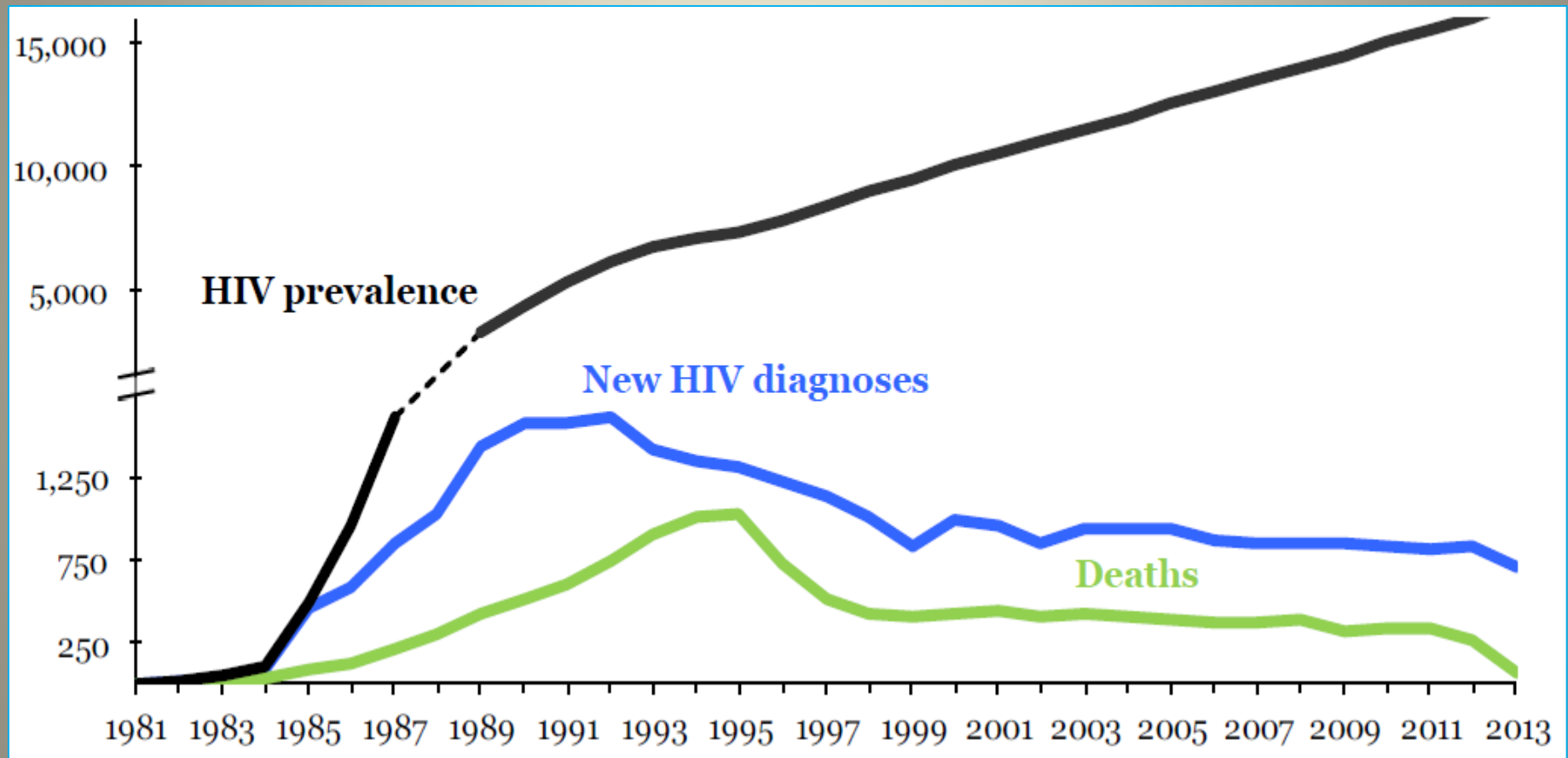


^a Hispanics/Latinos can be of any race.

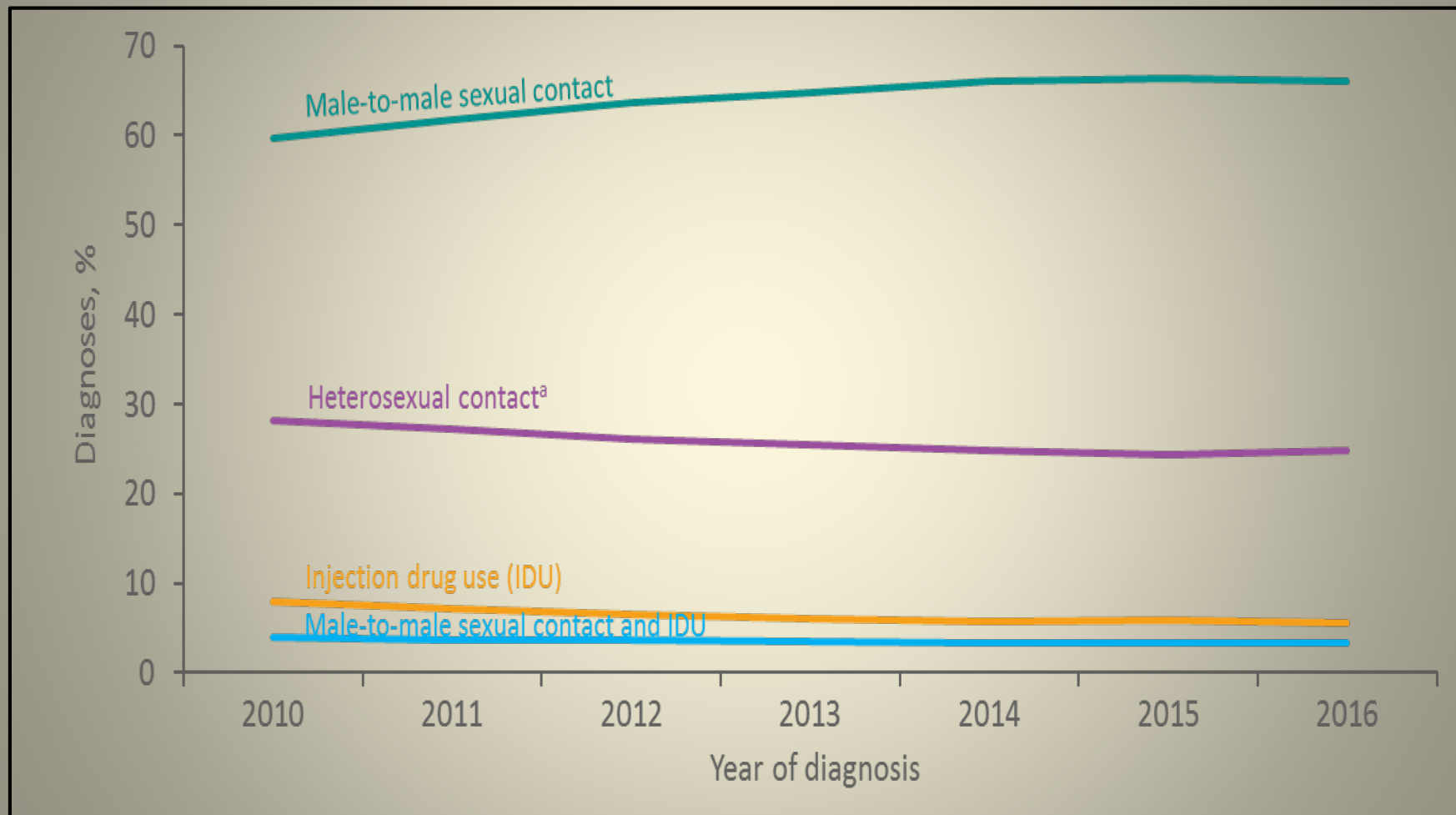
Trends In New US Cases 2011 to 2015



Prevalence, Deaths, and Diagnoses in Michigan



Diagnoses of HIV Infection among Adults and Adolescents, by Transmission Category, 2010–2016—United States and 6 Dependent Areas

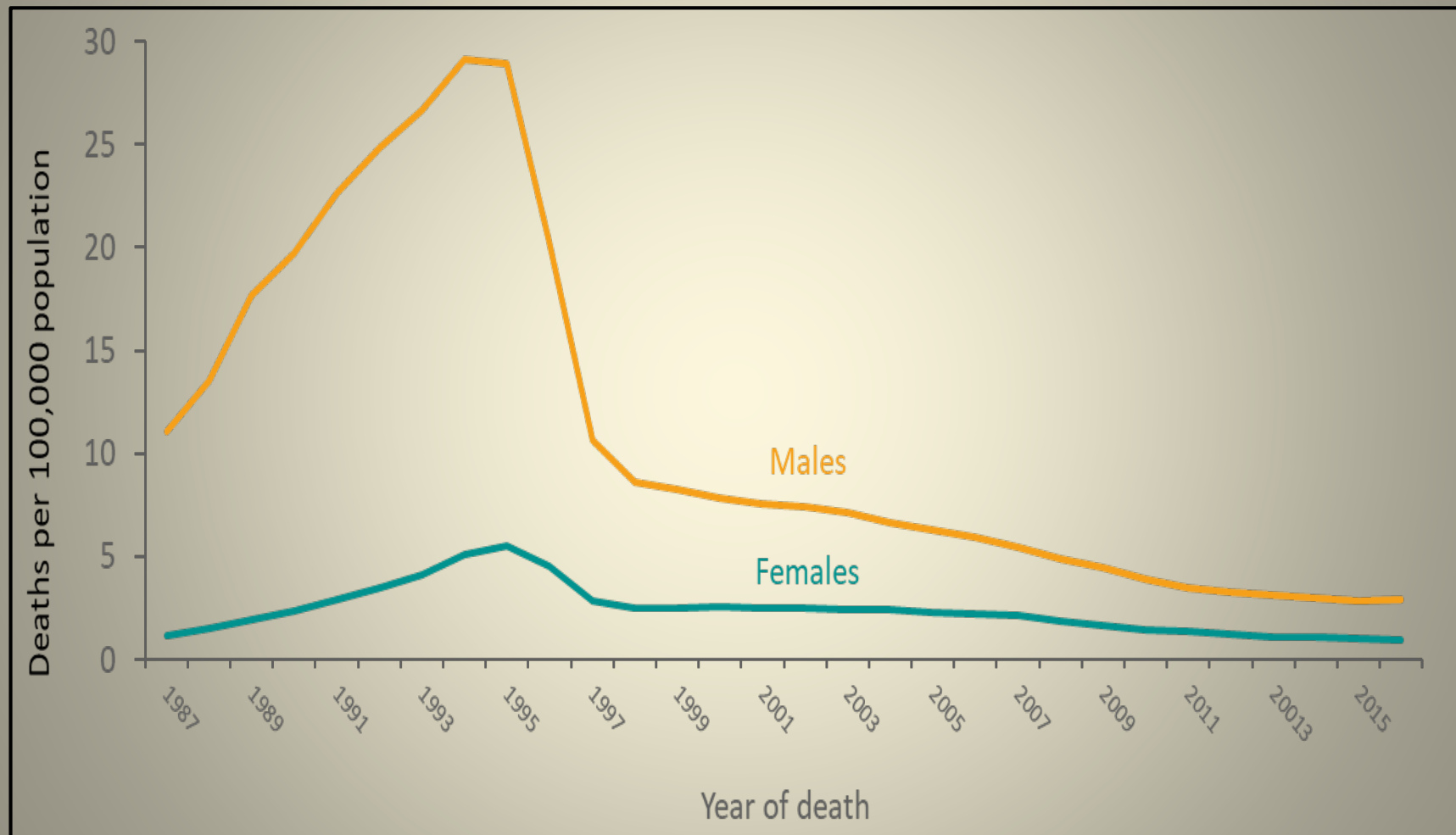


Note. Data have been statistically adjusted to account for missing transmission category. “Other” transmission category not displayed as it comprises less than 1% of cases.

^a Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.



Trends in annual Age-Adjusted* Rate of Death Due to HIV Infection by Sex 1987–2016 — United States



Note. For comparison with data for 1999 and later years, data for 1987–1998 were modified to account for ICD-10 rules instead of ICD-9 rules.

*Standard: age distribution of 2000 US population



What is HIV?

- **H**uman
 - Only found in humans
- **I**mmunodeficiency
 - Weakens immune system by destroying CD4 cells
- **V**irus
 - Reproduces by taking over a host cell

HIV Testing

- **CDC recommends that everyone between the ages of 13 and 64 get tested for HIV at least once as part of routine health care**
 - **About 1 in 7 people in the United States who have HIV don't know they have it**
- **Michigan requires that providers obtain consent prior to administering an HIV test**

HIV Screening and Primary Care

- **Primary care providers need to know:**
 - **CDC's recommendation for routine HIV screening of patients in all health-care settings**
 - **Potential risks of HIV infection in their communities**
 - **Potential risks of HIV in their patients and how to assess for them**
 - **Signs and symptoms of undiagnosed HIV**
 - **Michigan's HIV laws and guidelines**

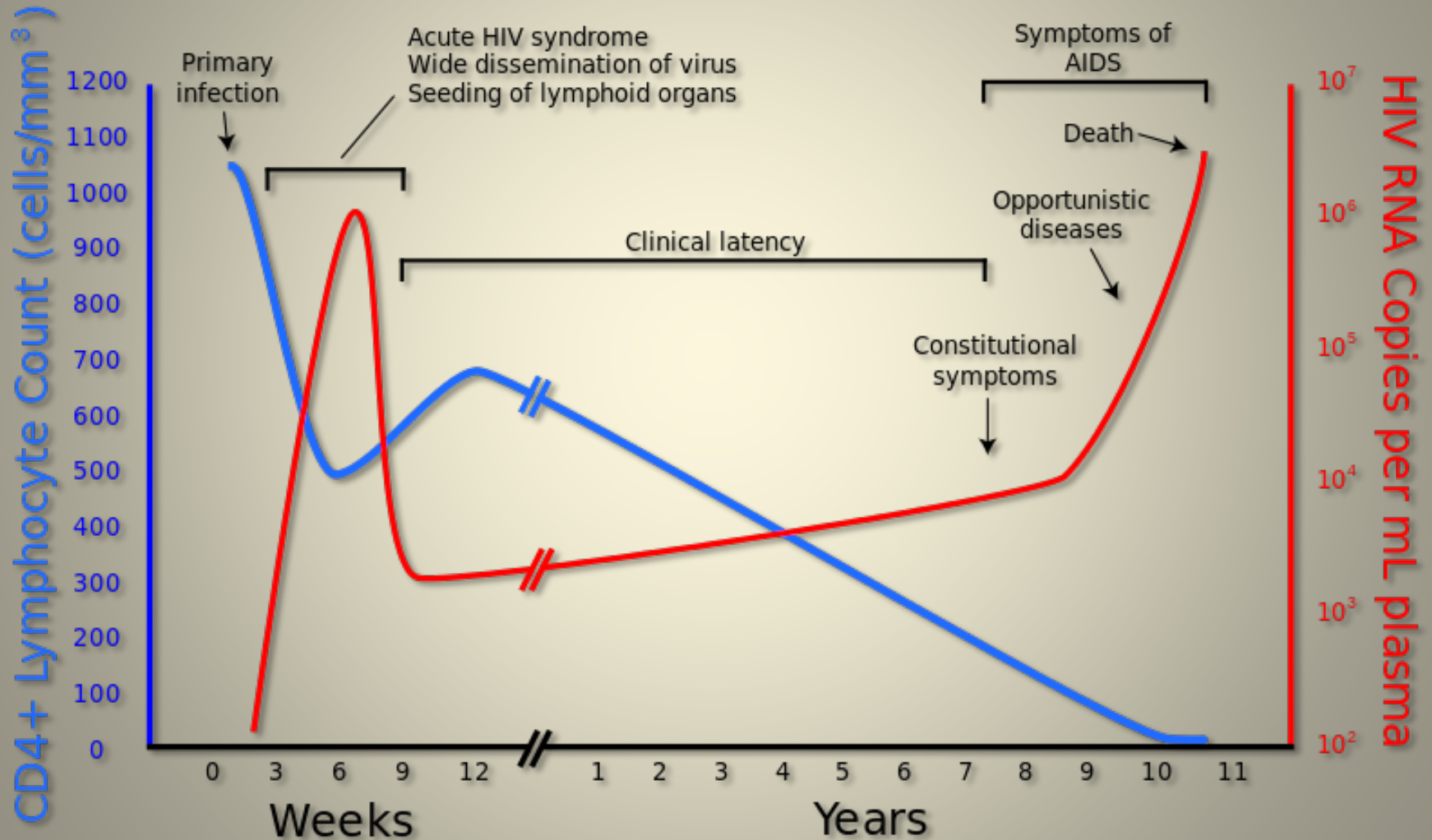
4th Generation HIV Testing

- **Simultaneously detects both antigen and antibodies for HIV**
- **Can be used to diagnosis HIV-1/HIV-2 infection**
- **Allows detection of acute HIV based on identification of the HIV p24 antigen**
- **When in doubt: check a viral load**

Common HIV Labs

- **Viral Load**
 - How much HIV is in the blood?
 - Lower the better
- **CD4 Count**
 - How strong is the immune system?
 - Higher the better
- **Genotype**
 - Has HIV found ways to avoid certain medications?
 - Resistance test

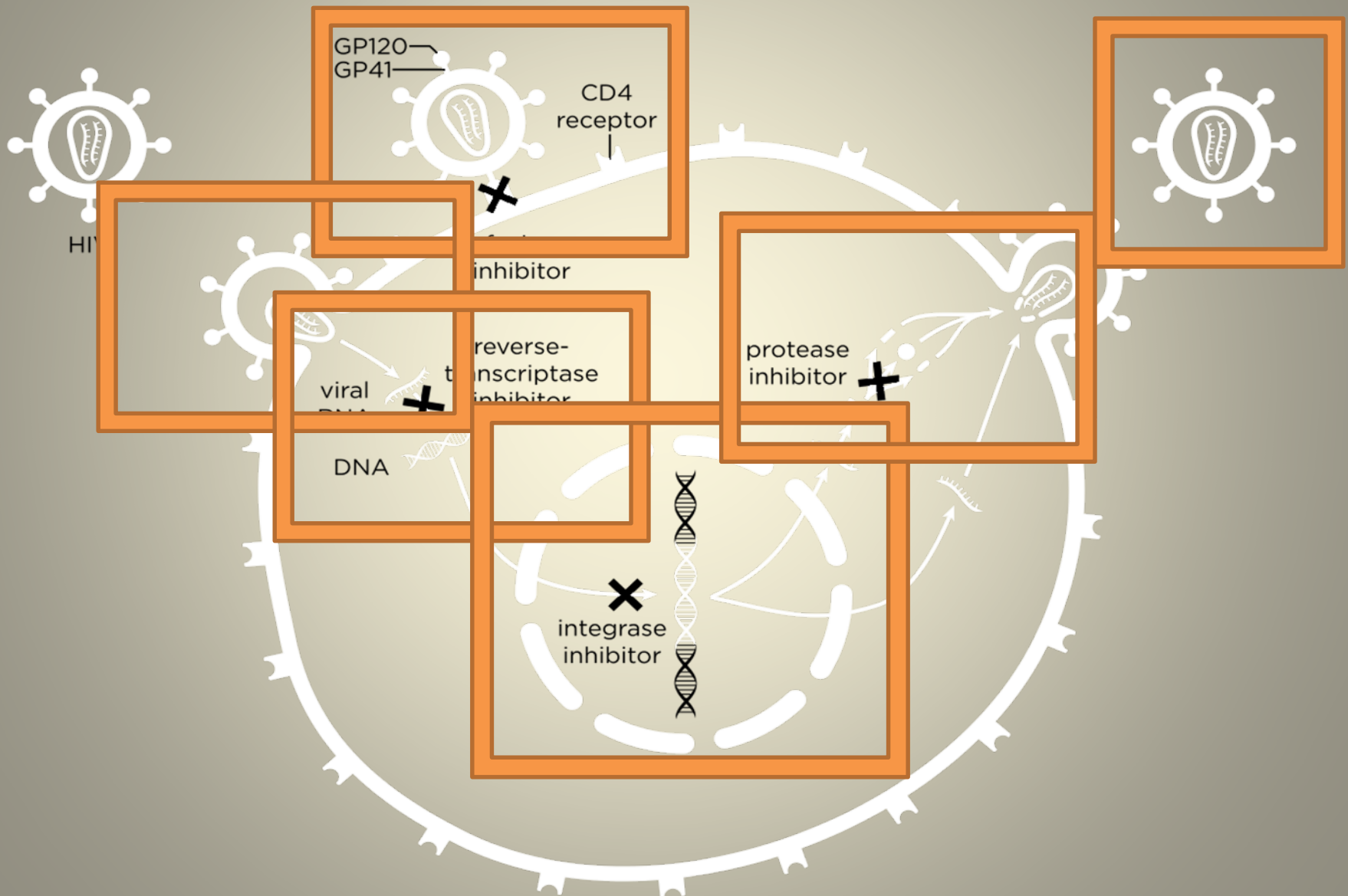
HIV Time Course



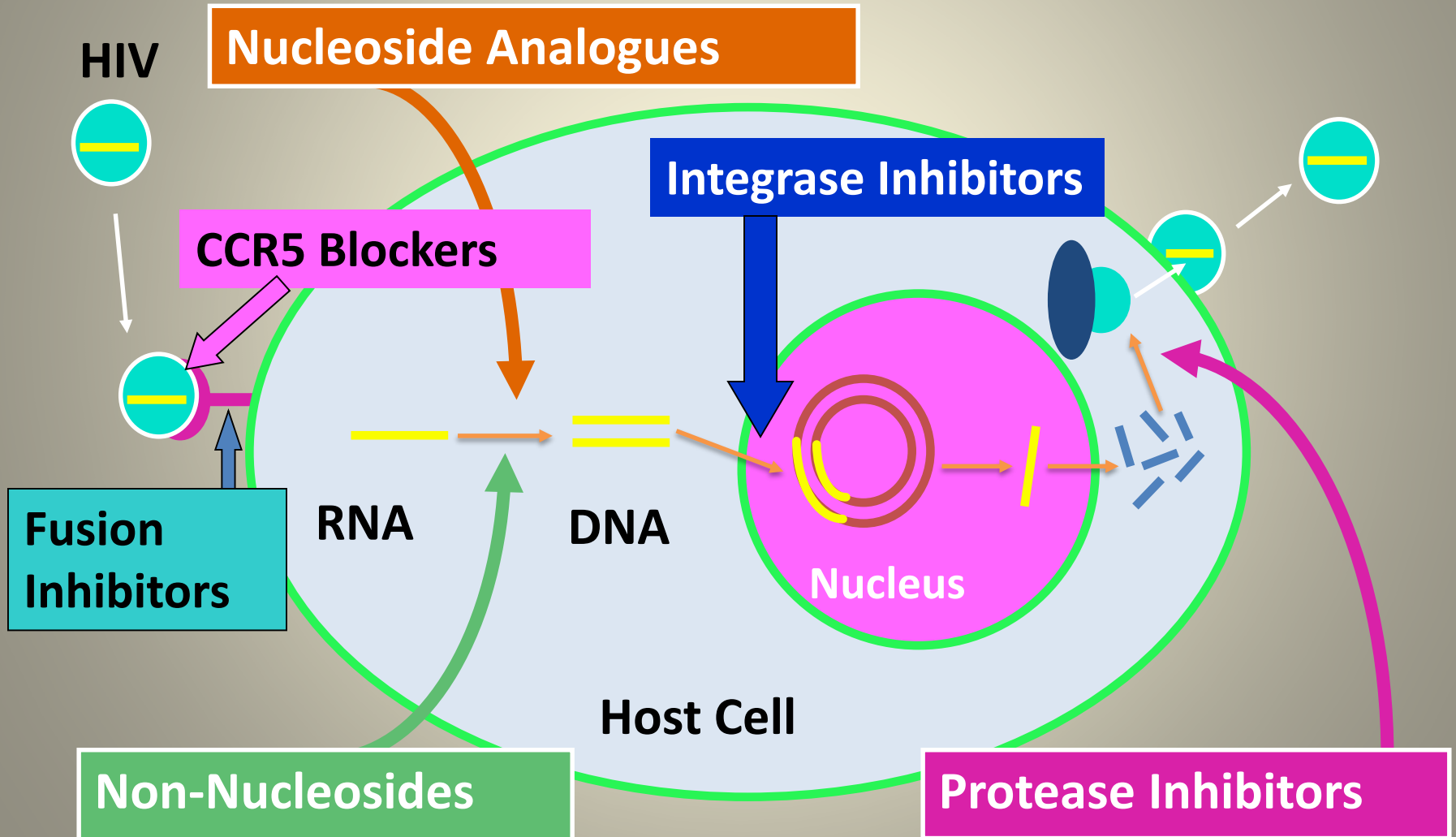
Goals of Therapy

- **Increase the CD4**
 - Above 200, preferably above 500
- **Decrease the VL**
 - Non-detectable
- **Improve quality of life**
- **Reduce secondary HIV related disease**
- **Reduce transmission**
 - (Undetectable = Untransmittable)

HIV Life Cycle



HIV: Antiretroviral Therapy



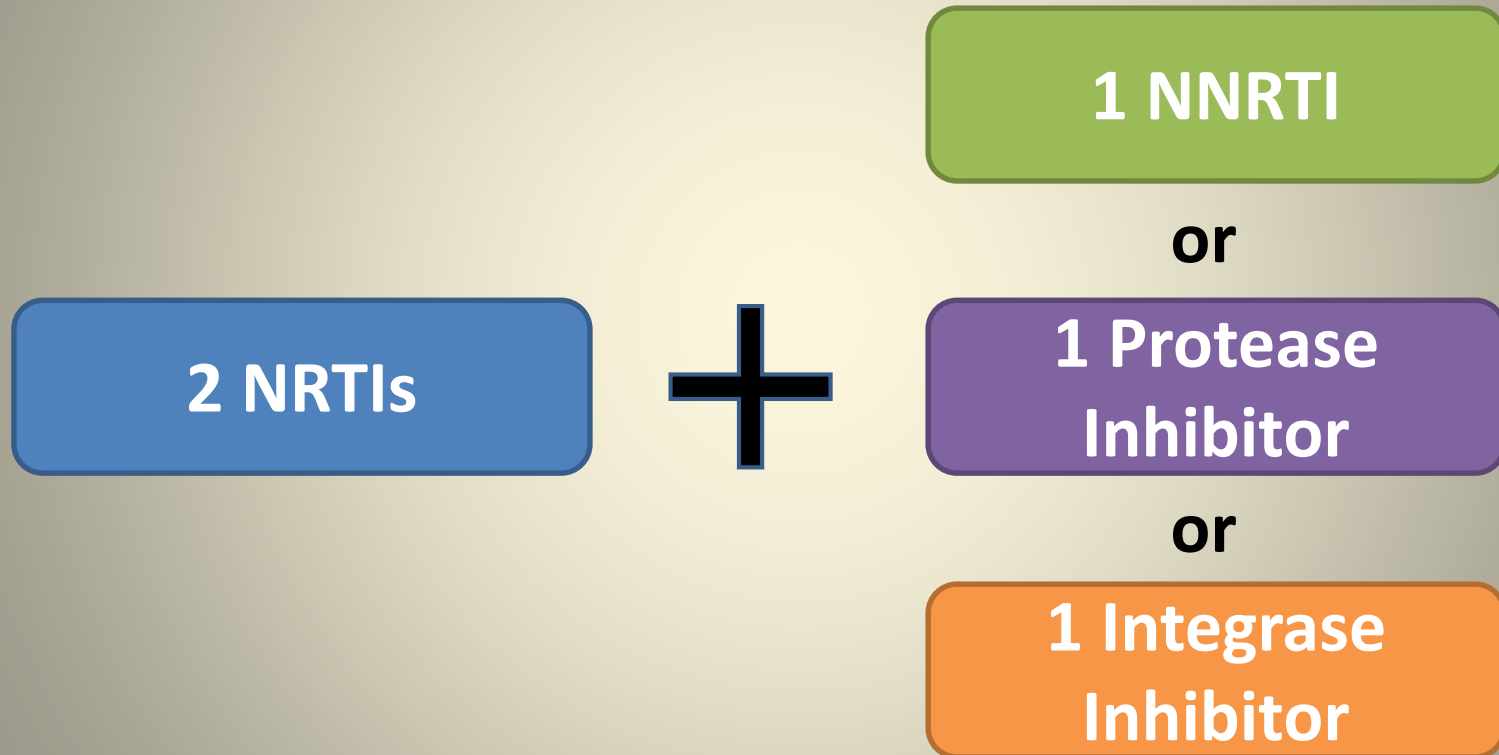
FDA Approved Antiretrovirals

NRTIs	NNTRIs	PIs	Entry/Fusion Inhibitors
Combivir®	Edurant®	Aptivus®	Fuzeon®
Descovy®	Intelence®	Crixivan®	Selzentry®
Emtriva®	Rescriptor®	Evotaz®	Single Tablet Regimens
Epivir®	Sustiva®	Invirase®	Symtuza
Epzicom®	Viramune®	Kaletra®	Atripla®
Retrovir®		Lexiva®	Biktarvy®
Trizivir®	INSTIs	Norvir®	Complera®
Truvada®	Isentress®	Prezcobix®	Genvoya®
Videx®	Tivicay®	Prezista®	Juluca®
Viread®	Vitekta®	Reyataz®	Odefsey®
Zerit®		Viracept®	Stribild®
Ziagen®			Triumeq® Symfilo

Building an HIV Regimen for a New Patient

- Three medications from at least 2 different classes
 - Never mono or dual therapy
 - NRTIs are the only class we routinely use more than 1 at a time
 - Ritonavir and Cobicistat do not count
- Number of *medications* does not have to match the number of *pills*

Building an HIV Regimen



Treatment Initiation Over Time

	1998	2001	2002	2004	2007	2012
CD4 Count	Treat: <500	Treat: <200 Off: <200	Treat: <200 Off: <200	Treat: <200 Off: <200	Treat: <200 Off: <200	Treat: <200 Off: <200
VL	>20,000	>20,000	>20,000	>20,000	>20,000	>20,000
Other factors					Pregnant HBV HIVAN Indiv. >500	Pregnant HBV HIVAN High risk of transmitting

Start Everyone

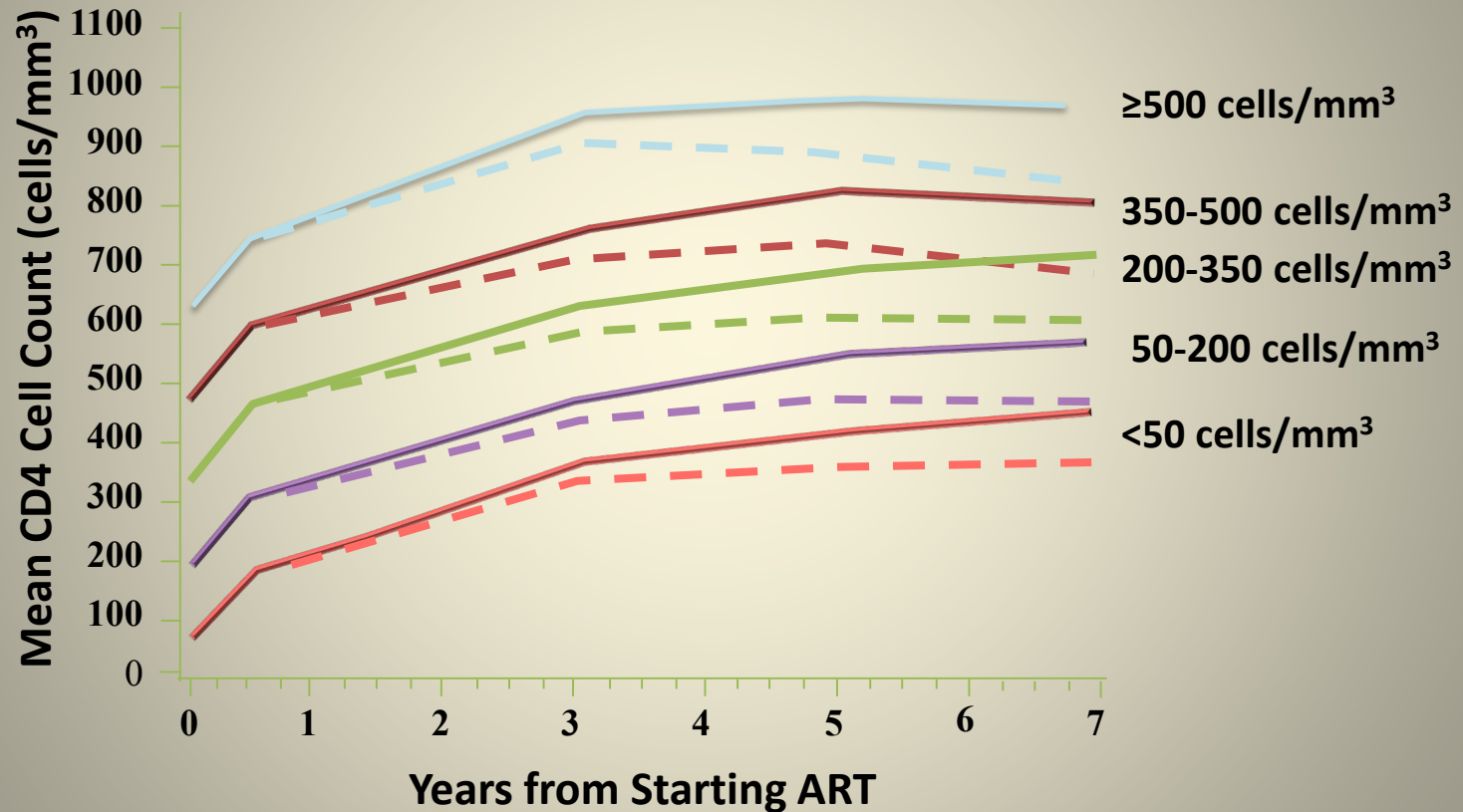
A1 – Strong Recommendation

Benefits of Early Treatment

- **Maintain higher CD4 count to prevent damage to the immune system**
- **Decrease risk of HIV associated complications**
 - **Opportunistic infections**
 - **Underlying inflammation**
- **Decrease risk of transmission**
 - **Undetectable = Untransmittable**

Increase in CD4 Count

Median CD4 Response in Patients ≥ 50 Years at the Start of ART



— male, <50 years at start of ART

- - - male, ≥ 50 years at start of ART

Risks of Early Treatment

- **Development of treatment related side effects**
- **Less time for patient readiness assessment**
- **Increased total time on medications**
 - **Greater chance of pill fatigue**
 - **More long term side effects of medications**
- **Longer opportunity to develop resistant virus if not adherent to medications**

Treatment Naïve:

Treatment Selection Factors

- **Baseline resistance testing and viral load**
- **Patient anticipated adherence**
- **Other health conditions**
 - **Kidney disease**
 - **Heart disease**
 - **Pregnancy**
 - **Hepatitis co-infections**
- **Side Effects**
- **Drug interactions**
- **Patient's daily schedule and meal times**

Reasons For Therapy Changes

- **Viral Failure**
- **Side Effects**
- **Drug Interactions**
- **Comorbidities**
- **Reduce Pill Burden**
- **Pregnancy**
- **Cost/Insurance**



PrEP: Pre-exposure Prophylaxis

- **How does it work?**
 - **Uninfected person takes antiretrovirals**
 - **May prevent replication of virus & infection**
- **Daily adherence to TDF/FTC**

PrEP: Clinical Eligibility

- **Documented negative HIV test**
- **No signs/symptoms of acute HIV infection**
- **Normal renal function**
- **No contraindicated medications**
- **Documented hepatitis B infection & vaccination status**

PrEP: Candidates

Substantial risk of acquiring HIV infection

- **Men who have sex with men (MSM)**
 - HIV-positive sexual partner
 - Recent bacterial STI
 - High number of sex partners
 - History of inconsistent/no condom use
 - Commercial sex work

PrEP: Candidates

Substantial risk of acquiring HIV infection

- **Heterosexual women and men**
 - HIV-positive sexual partner
 - Recent bacterial STI
 - High number of sex partners
 - History of inconsistent/no condom use
 - Commercial sex work
 - High-prevalence area or network

PrEP: Candidates

Substantial risk of acquiring HIV infection

- **Injection drug users (IDU)**
 - HIV-positive injecting partner
 - Sharing injection equipment
 - Recent drug treatment (but currently injecting)

Questions?

Thanks for your attention!