HIV Pre-Exposure and Post-Exposure Prophylaxis

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Objectives:

- Understanding facts about HIV
- List indications for pre-exposure prophylaxis to HIV (PrEP)
- Describe efficacy data in various populations at risk for HIV
- Construct an appropriate PrEP plan for a patient
- Identify appropriate follow up for a PrEP patient
- Understanding post-exposure risk
- Treatment for post-exposure prophylaxis (PEP)
- Testing post-exposure

Ending the HIV Epidemic

- Four Pillars of ending HIV Epidemic:
  - Increase diagnosis
  - Initiate treatment
  - Prevent HIV infections
  - Rapid response to new clusters of HIV transmissions
- Goals of the 4 pillars:
  - 10 year plan of reducing HIV infection in the US by 75% by 2025 and by 90% by 2030
  - Resulting in a new US infection rate of less than 3,000 new cases yearly

Facts about HIV

- Globally, 76 million persons estimated to have contracted HIV
  - 33 million of them have died due to complications of the disease
- Rates of infection in White men have declined, but increased in Black, Hispanic/Latino men who have sex with men populations
- Incidence of HIV have declined 40% since the peak in 1998
  - Rates of infections have not declined since 2014 ~1.7 million new cases yearly
- Incidence of HIV in children have declined 52% since 2010

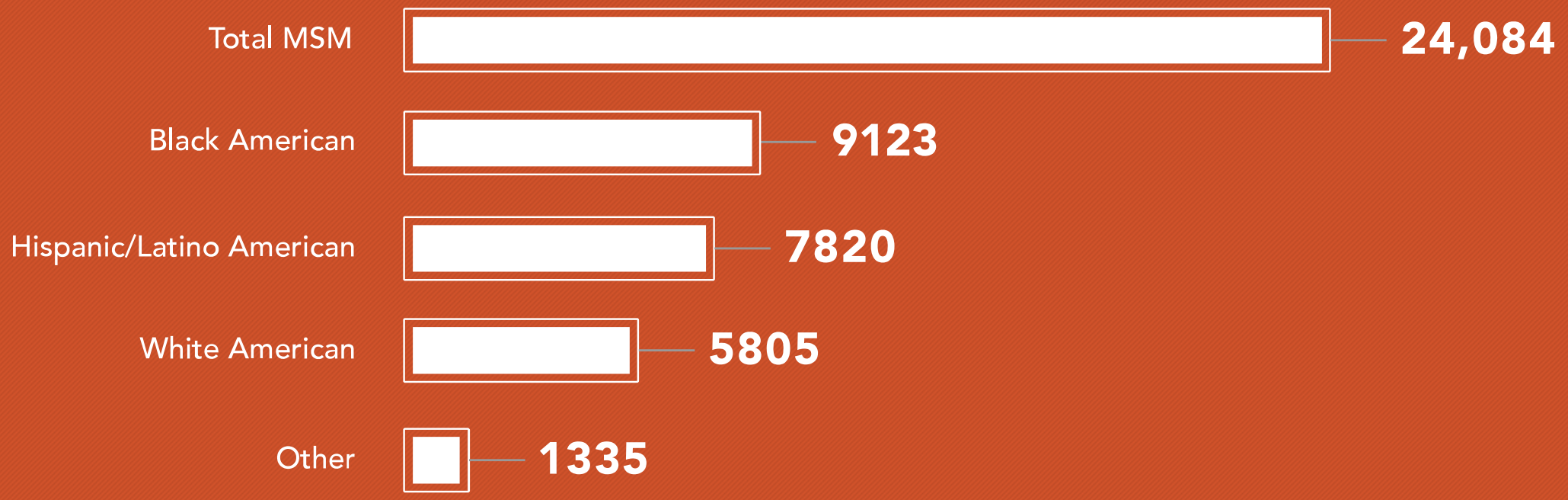
Why Prescribe PrEP?

- In 2019, 38 million people worldwide are living with HIV/AIDs
  - 67% on treatment
  - 59% viral load suppression
- An estimated 1.2 million US adults were living with HIV at the end of 2018
  - 14% (161,800) of them were unaware of their diagnosis
    - The unaware diagnosis are responsible for 38% of new HIV diagnosis
  - 37,968 people were given a new HIV/AIDs diagnosis:
    - 69% were gay or bisexual
    - 24% Heterosexual
    - 7% IV drug users
    - 45% were diagnosed with AIDs
- In 2018, 35% of people living with HIV were out of care

MSM and HIV

- Men who have sex with men are more likely to contract HIV
  - In 2018, 82% of the newly diagnosed were MSM
- Age of transmission within this population:
  - 43% diagnosed between 25-35 years old
  - 25% diagnosed between 13-25 years old
  - 16% diagnosed between 35-44 years old
  - 11% diagnosed between 45-54 years old
  - 5% diagnosed at the age of 55 and older
- MSM make up an estimated 2% of the US population, but accounted for 66% of new annual HIV infections in 2017
- As of 2018, 1 in 6 MSM living with HIV was unaware of their status

New HIV diagnoses among MSM in the US by Race/Ethnicity, 2019

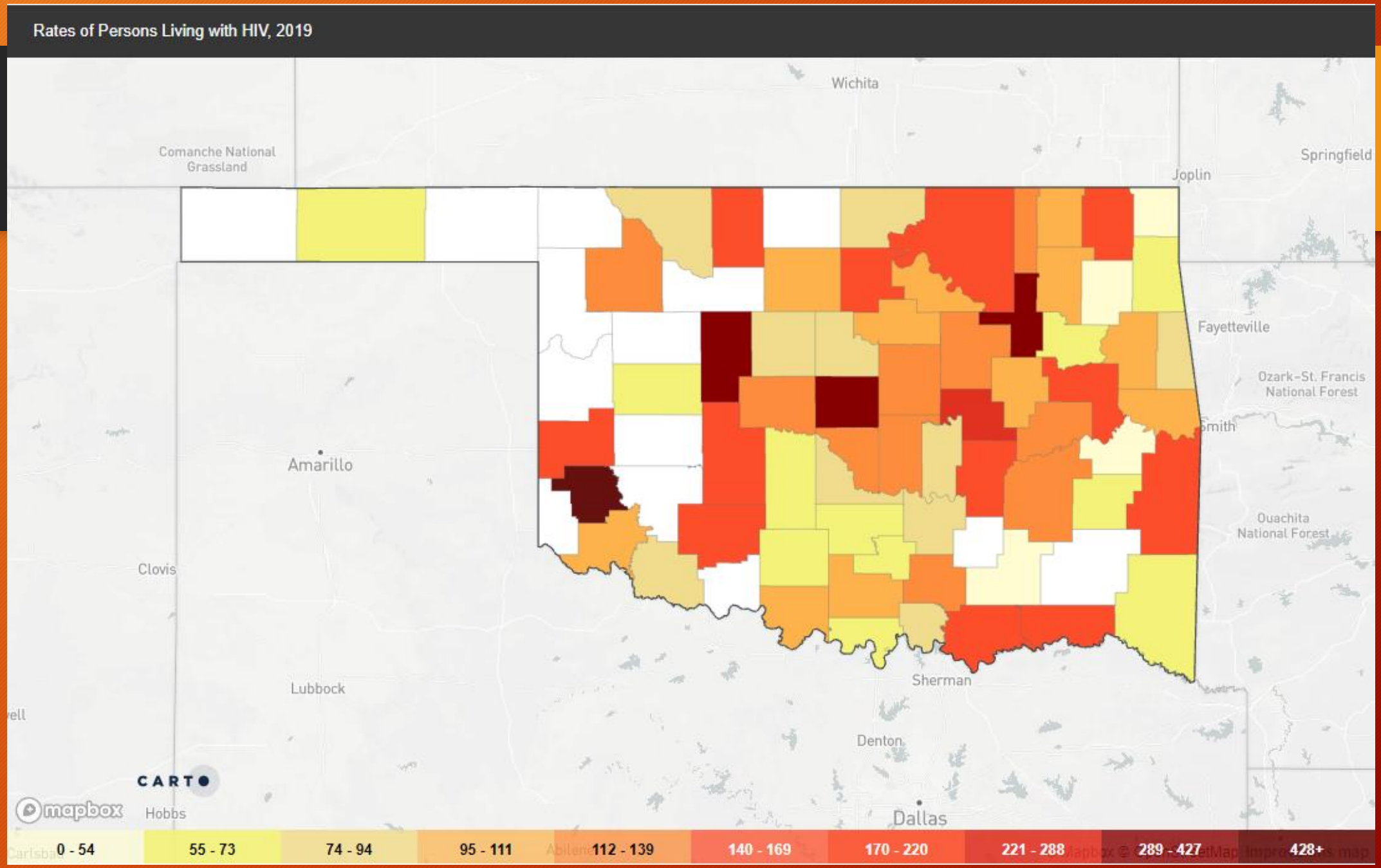


Transgender and HIV

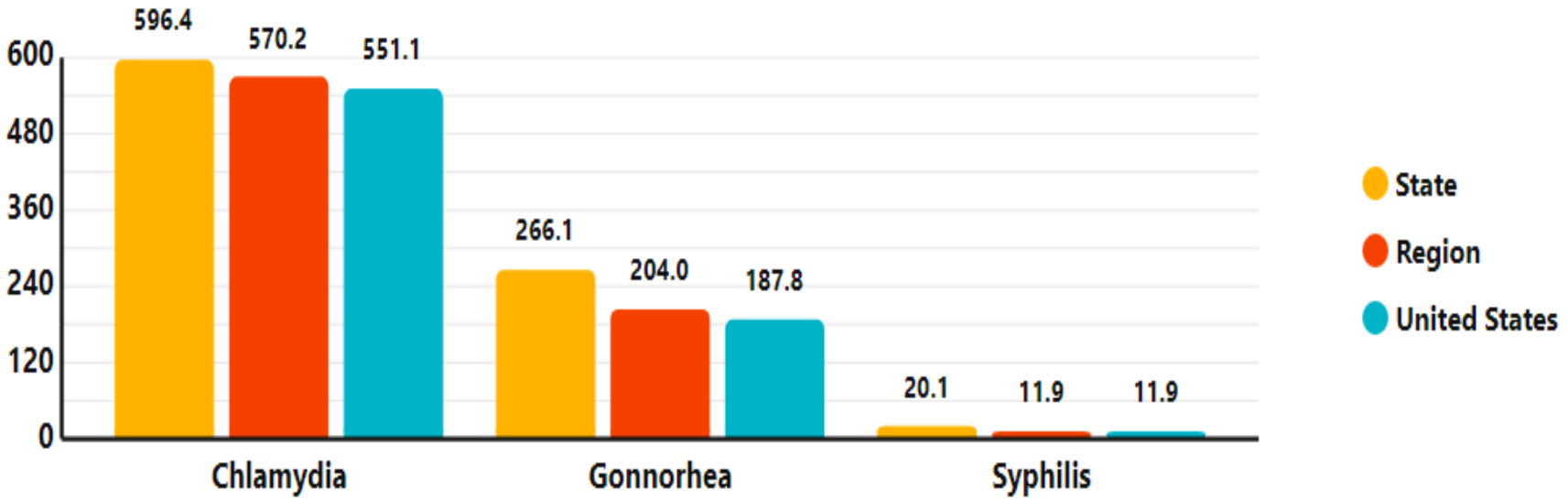
- 2,351 HIV positive transgender people in the US:
  - 84% transgender women
  - 15% transgender men
  - 1% other transgender identity
- Transgender women have a high infection rate globally

Why Prescribe PrEP?

- 2014-2018, persons living with HIV increased in the Midwest, South and West
- Largest percentage of increase in the rate of infection, 11%, was the Midwest
- Highest prevalence of HIV continues to be the Northeast
- Only 18% of men, who qualify for PrEP, have a prescription


Rates of Persons Living with HIV, 2019
Wichita
Comanche National Grassland
Springfield
Joplin
Fayetteville
Ozark-St. Francis National Forest
Amarillo
Ouachita National Forest
Clovis
Lubbock
Sherman
Denton
Dallas
Hobbs
CARTO
mapbox
0 - 54
55 - 73
74 - 94
95 - 111
112 - 139
140 - 169
170 - 220
221 - 288
289 - 427
428+

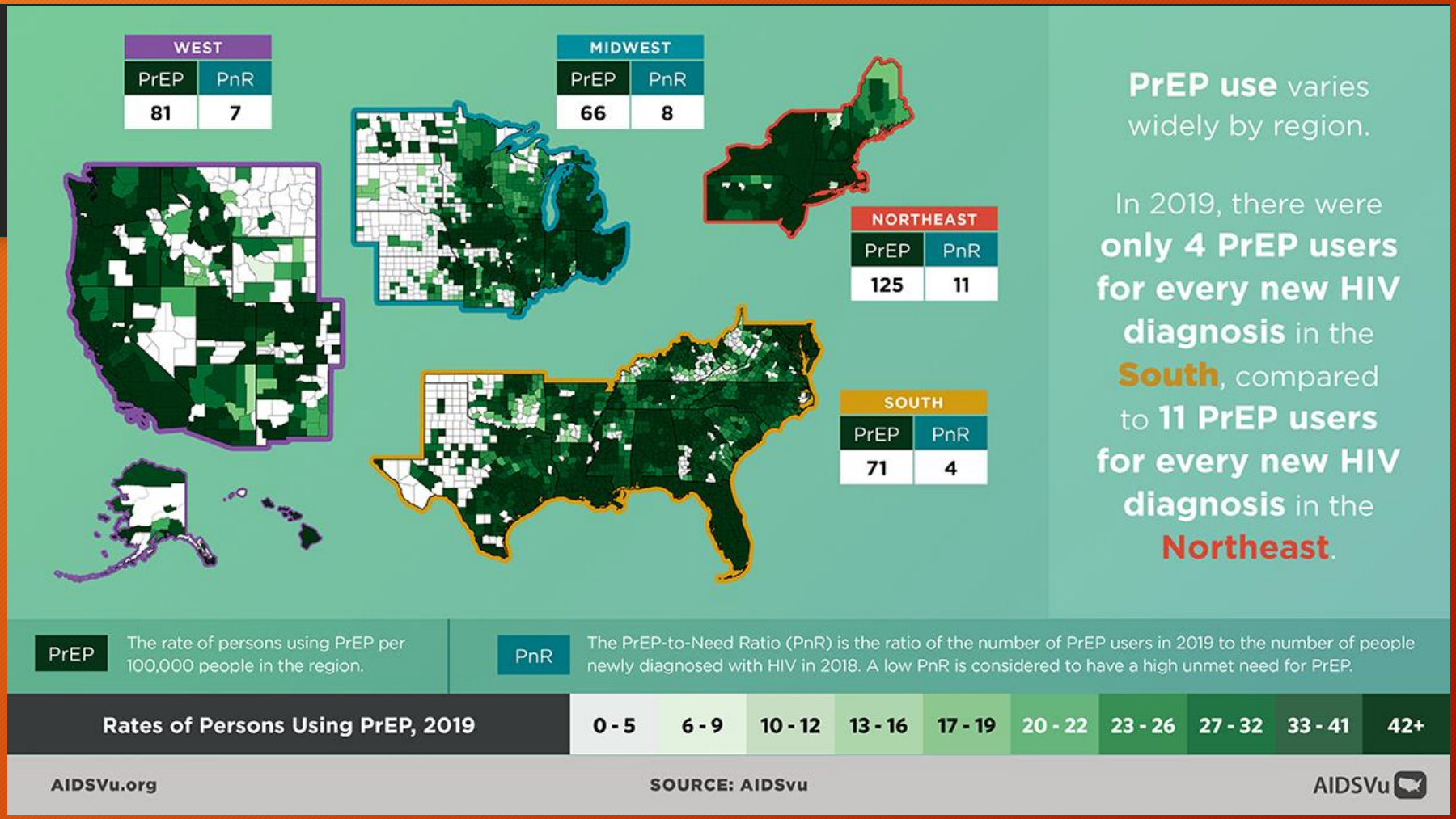
Sexually Transmitted Diseases, 2019



Rates of Sexually Transmitted Diseases per 100,000 Population, 2019

HIV/AIDS in Oklahoma

- In 2019, there were 6,351 people living with HIV in Oklahoma
  - 81.8% are men
  - 18.2% are women
- In 2019, 320 people were newly diagnosed with HIV
  - 81.6% are men
  - 18.4% are women



The Southern U.S. represented half of new HIV diagnoses in 2019 (51%) but had the lowest PnR (3.9) in 2019 among all regions. In contrast, the Northeast region had the highest PnR (10.7) in 2019

What is PrEP?

- Tenofovir disoproxil-Emtricitabine (Truvada®)
  - Single tablet taken once daily for the prevention of HIV
  - 2-1-1 dosing
    - 2 tablets prior 2-24 hours prior to sex, 1 pill 24 hours after, and 1 table 48 hours after exposure (or daily until 2 days sex free)
    - Creatinine clearance > 60mL/min
- Tenofovir alafenamide-emtricitabine (Descovy®)
  - Single tablet taken once daily for the prevention of HIV
    - Creatinine clearance > 30mL/min
- Cabotegravir (Apretude®)
  - Oral options for one month followed by 1 injection monthly for 2 months; then followed by 1 injection every 2 months
  - 1 injection monthly for 2 months; then followed by 1 injection every 2 months

Opportunities for PrEP

Transmission Risk Group	% with PrEP indications	Estimated Number
Men who have sex with men, age 18-59 yrs	24.7%	492,000
Adults who inject drugs, age >18 yrs	18.5%	115,000
Heterosexually active adults, age 18-59 yrs	0.4%	624,000
-Men	0.2%	157,000
-Women	0.6%	468,000
Total	**--**	**1,232,000**

PrEP Indications

- Men that have sex with men
  - Not in a monogamous relationship and one of the following
    - Anal sex in the last 6 months
    - STI in the last 6 months
    - Ongoing sexual relationship with an HIV positive partner
- Heterosexually active men and women
  - Not in a monogamous relationship and one of the following
    - Infrequent condom use with 1 or more partners of unknown HIV status
    - Ongoing sexual relationship with an HIV partner
- Adolescents at increased risk
  - Weighing at least 35 kg

PrEP Indications

- Injection Drug User
  - Injection drug use in last 6 months and one of the follow
    - Sharing injection drug/equipment in the last 6 months
    - Use of Methadone, buprenorphine, or suboxone treatment in the last 6 months

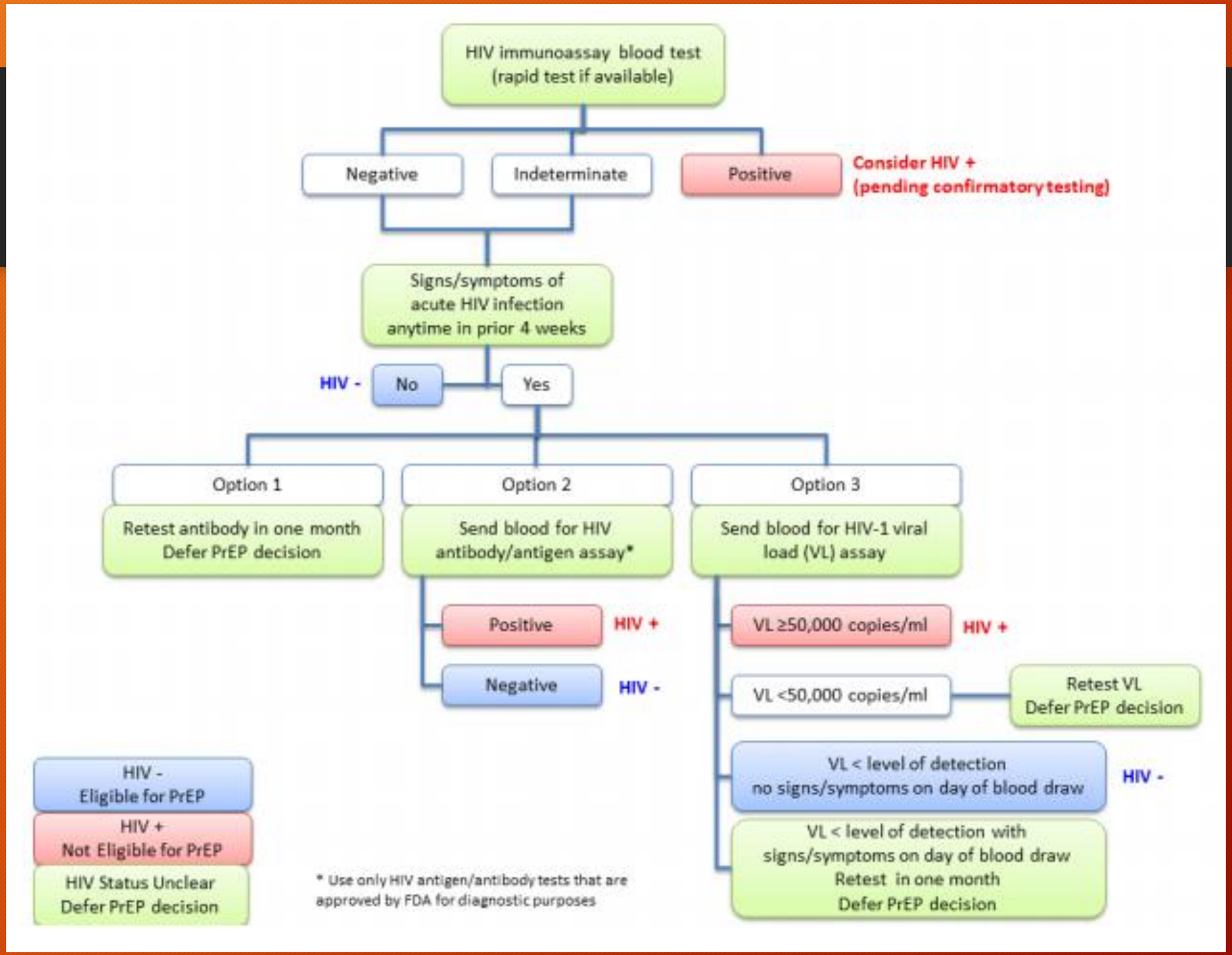
- A patient requesting PrEP is likely an indication for PrEP

PrEP Indications by Genders

- Truvada indicated for men, women, adolescence, and IVDU
  - Safe in pregnancy
  - Creatinine clearance > 60mL/min
- Descovy only indicated for men and transgender females
- Cabotegravir indicated for men and transgender females

Prescribing PrEP

- "It is all in the history, Micah."
- Labs:
  - CBC
  - CMP
  - HIV screening antigen/antibody (4th generation test)
  - RPR or Syphilis IgG with reflex if indicated
  - Acute Hepatitis profile
  - Hepatitis B surface antibody
  - Urine Gonorrhea and Chlamydia
  - Pregnancy test
- Document
  - No sign or symptoms of active HIV infection
  - Negative HIV testing
  - Renal function
  - HBV immune status
  - No contraindicated medications


HIV immunoassay blood test
(rapid test if available)
Negative
Indeterminate
Positive
Consider HIV +
(pending confirmatory testing)
Signs/symptoms of
acute HIV infection
anytime in prior 4 weeks
HIV -
No
Yes
Option 1
Retest antibody in one month
Defer PrEP decision
Option 2
Send blood for HIV
antibody/antigen assay*
Positive
HIV +
Negative
HIV -
Option 3
Send blood for HIV-1 viral
load (VL) assay
VL ≥50,000 copies/ml
HIV +
VL <50,000 copies/ml
Retest VL
Defer PrEP decision
VL < level of detection
no signs/symptoms on day of blood draw
HIV -
VL < level of detection with
signs/symptoms on day of blood draw
Retest in one month
Defer PrEP decision
HIV -
Eligible for PrEP
HIV +
Not Eligible for PrEP
HIV Status Unclear
Defer PrEP decision
* Use only HIV antigen/antibody tests that are
approved by FDA for diagnostic purposes

Time to Protection

- No consensus on when maximal protection occurs

- Suggestions of maximal intracellular concentrations:
  - In blood: 20 days
  - Rectal tissue: 7 days
  - Cervicovaginal tissues: 20 days

PrEP Follow-up

- Every 3 months with provider
  - Reassess HIV
  - Repeat labs
  - Discuss safe sex practices
  - Treat STIs
  - Consider anal paps in MSM yearly
  - Continue conversation concerning PrEP cessation

Occupational Postexposure Prophylaxis (PEP)

Changes from Previous Guidelines

- Elimination of risk stratification for exposure incidents
- 3-drug regimen for all
- Updated preferred therapy
  - Emphasis on tolerability and convenience of PEP regimen

Occupational Risk Exposures in HCP

- Percutaneous injury (needlestick, cut)

OR

- Contact of mucous membrane or nonintact skin

WITH:

- Blood
- Tissue
- Other body fluids that are potentially infectious (cerebrospinal, synovial, pleural, pericardial, peritoneal, or amniotic fluids; semen or vaginal secretions)

NOT Considered Infectious for HIV Unless *Visibly Bloody*

- Feces
- Nasal Secretions
- Saliva
- Sputum
- Sweat
- Tears
- Urine
- Vomitus

Risk of Occupational Transmission of HIV

- Following percutaneous exposure: approximately 0.3%
- Following mucous membrane exposure: approximately 0.09%
- Risk following nonintact skin exposure estimated to be <0.09%
- Risk following exposure to fluids or tissues other than HIV-infected blood estimated to be “considerably lower” than for blood exposure

Selection of HIV PEP Regimens

- Guidelines recommend use of ≥3 ARVs for treatment of HIV infection
- Newer ARVs are better tolerated and have better toxicity profiles than agents previously used for PEP
- PEP regimens comprising 3 (or more) tolerable ARVs now recommended for all occupational exposures to HIV

Issues Associated with Treatment

- Host resistance
  - Known vs unknown
- Drug interactions
  - Check against current medication list including herbal products
- Potential toxicities
  - Additional medications may be prescribed to mitigate adverse reactions

Management by Emergency Physicians

- Expert consultation
  - Should not delay treatment
- Initial source patient and exposed HCP lab testing
- Counseling
- Identifying and ordering initial HIV PEP regimen
- Outpatient follow-up
  - Re-evaluate within 72 hours

Timing and Duration of PEP

- PEP is most effective when begun soon after the exposure, less effective as time increases (animal studies)
  - PEP should be started as soon as possible after the exposure, preferably within hours
  - Point at which no benefit may be gained is not defined; in animal studies less effective if started >72 hours after exposure
- Optimal duration unknown; 4 weeks appeared protective in occupational and animal studies
  - PEP should be taken for 4 weeks, if tolerated

Selection of HIV PEP Drugs

- Risk stratification of exposure no longer recommended
- 3-drug PEP is indicated for all exposures
  - 2-NRTI backbone (tenofovir/emtricitabine) + integrase inhibitor
- Other ARV may be indicated (esp. with known host resistance), but expert consultation is recommended

PEP Regimens

- Preferred HIV PEP regimen:
  - Tenofovir/Emtricitabine (Truvada) 1 daily + Raltegravir (Isentress) 400 mg BID
  - Tenofovir/Emtricitabine (Truvada) 1 daily + dolutegravir (Tivicay) 50 mg daily
- ARV agents contraindicated as PEP:
  - Nevirapine

Situations in which Expert Consultation is Advised

- Delayed exposure report (i.e. >72 hours)
  - Interval after which benefit from PEP undefined
- Unknown source (e.g. needle in sharps disposal container or laundry)
  - Use of PEP to be decided on case-by-case basis
  - Do not test needles or other sharp instruments for HIV
- Known or suspected pregnancy (or breast-feeding) in the exposed person
  - Provision of PEP should not be delayed while awaiting consultation

Situations in which Expert Consultation Is Advised

- Known or suspected resistance of the source virus
- Toxicity of the initial PEP regimen
- Significant co-morbidities in the exposed HCP
  - Renal disease or co-administration of multiple medications

Follow-Up of Exposed HCP

- Post-exposure counseling
  - Exposed HCP should be advised to use precautions (e.g. use latex barriers during sex, avoid blood or tissue donations, pregnancy, and, if possible, breast-feeding) to prevent secondary transmission, especially during the first 6-12 weeks post-exposure
  - For PEP recipients, provide information on:
    - Need for adherence to PEP, importance of completing PEP regimen
    - Possible drug toxicities
    - Possible drug interactions

Non-occupational Postexposure Prophylaxis (nPEP)

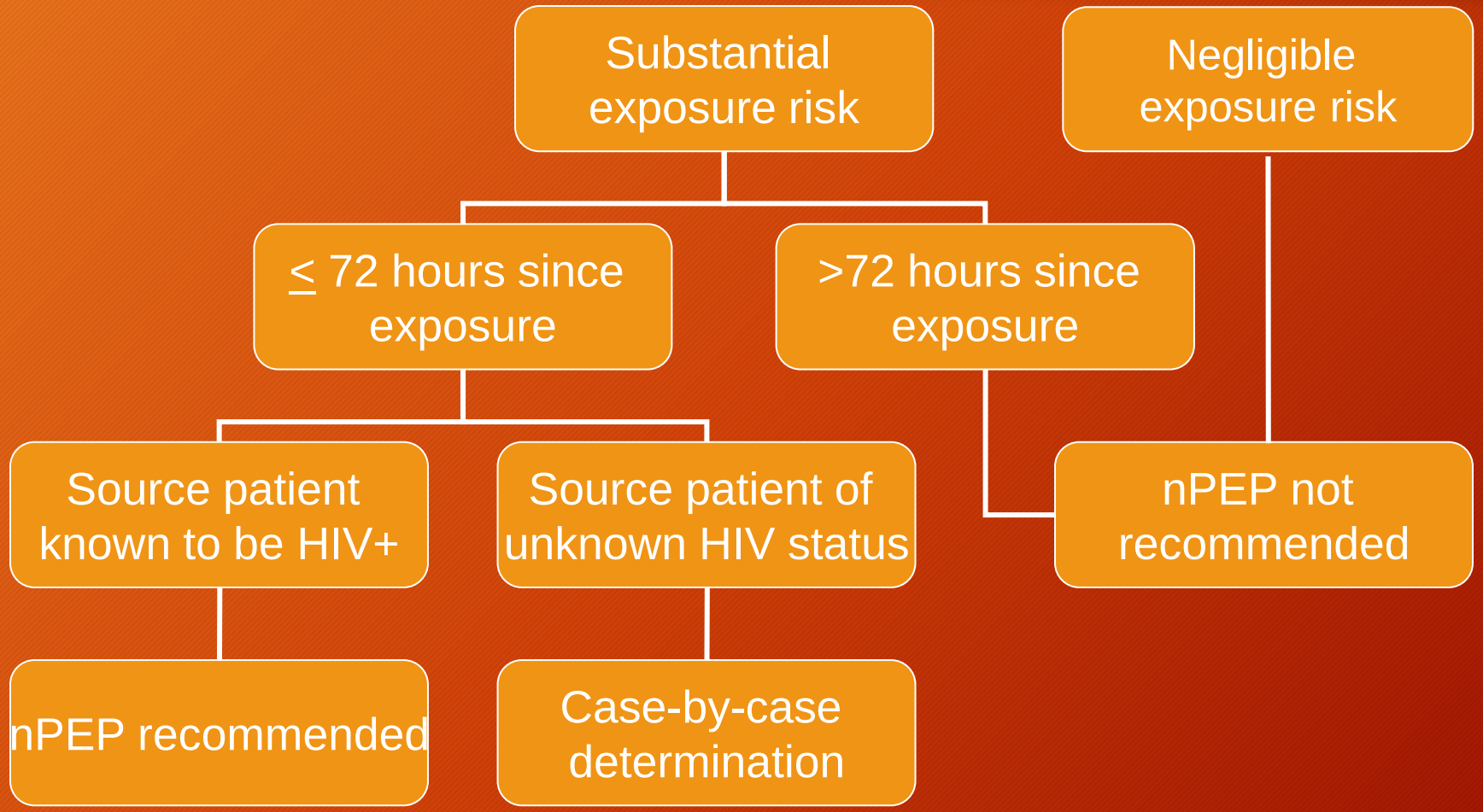
Evaluation of persons seeking nPEP

- HIV status of person seeking nPEP and of the potential source
  - Baseline testing with rapid tests for patient
  - HIV positive vs unknown source
    - Do not delay initiation of nPEP for source testing
- Time and frequency of exposure
  - nPEP less effective if initiated >72 hours post-exposure
  - nPEP should be used infrequently

Estimated Per-At Risk for Acquisition of HIV by Exposure Route

Exposure Route	Risk per 10,000 exposures
Blood transfusion	9,000
Needle-sharing injection drug use	67
Receptive anal intercourse	50
Percutaneous needle stick	30
Receptive penile-vaginal intercourse	10
Insertive anal intercourse	6.5
Insertive penile-vaginal intercourse	10
Receptive oral intercourse	1
Insertive oral intercourse	0.5

Recommendations for use of ARVs for nPEP



Assessing Risk of HIV Exposure

Substantial Risk of HIV Exposure

Exposure of:

- vagina, rectum, eye, mouth or other mucous membrane, nonintact skin, or percutaneous contact

With:

- blood, semen, vaginal secretions, rectal secretions, breast milk, or any body fluid that is visibly contaminated with blood

When the source is known to be HIV infected

Negligible Risk of HIV Exposure

Exposure of:

- vagina, rectum, eye, mouth or other mucous membrane, intact or nonintact skin, or percutaneous contact

With:

- urine, nasal secretions, saliva, sweat, or tears if not visibly contaminated with blood

Regardless of the known or suspected HIV status of the source

Post-Exposure Testing

- Retest HIV antigen/antibody (4th generation) at 4-6 weeks and 3-4 months post exposure
  - If using HIV antibody only assay, repeat testing at 6 weeks, 3 months, and 6 months

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