

# Kentucky State HIV Certification for Medical Providers

Kentucky AIDS Education Training Center  
Southeast AIDS Training and Education Center

## Objectives

- Discuss the basic epidemiology of AIDS on a national and local level
- Demonstrate knowledge of current antiretroviral treatments
- Describe the modes of transmission of HIV/AIDS
- Explain the basic process of post exposure prophylaxis
- List national and local resources available on HIV/AIDS

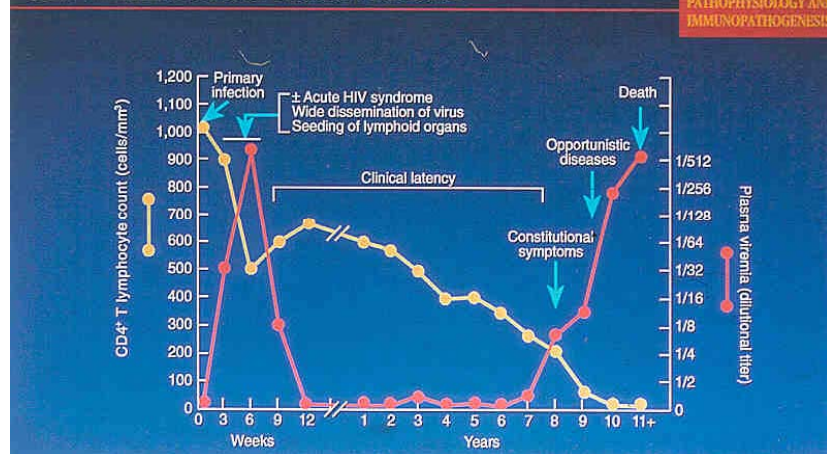
## Acute HIV

### Defining HIV+

- Patient's test is ELISA reactive
- ELISA test is repeated and is reactive
- Test is confirmed by western blot
- Patient is now said to be "HIV positive"

## Progression of HIV

### Typical Course of HIV-Infected Individual



### Case #1

- 28 year old male presents to your office
- 5 day history of fever (101), sore throat, headache, diarrhea, rash
- Exam:
  - Diffuse adenopathy
  - Exudative pharyngitis
  - Rash-macular, erythematous, non-pruritic
  - Mild splenomegaly
- Differential?



## Accurate Patient Information

- History of drug use (non-prescribed)
- Sexual history (men, women, or both?)
- Travel history
- Exposure to HIV infected individuals
- Past history of STDs
- Other environmental history

## Accurate Patient Information

- Assure confidentiality/Be non-judgmental
- Imbed into the assessment
- Are you now or have you ever been sexually active?
- Do you have sex with men, women, or both?
- Do you know about the sexual activities of your partner's?
- Have you ever had anonymous sex?
- Have you ever exchanged sex for money or drugs?

## Acute HIV Disease

- 40-90% of people who acquire acute HIV infection experience:
  - Transient symptomatic illness
  - Lasts about 2-4 weeks.
- High-titer HIV-1 replication
- Detectable HIV RNA, with negative or indeterminate HIV antibody test

## Acute HIV Disease

- Fever-96%
- Adenopathy-74%
- Pharyngitis-70%
- Rash-70%
- Myalgia/arthralgia-54%
- Diarrhea-32%
- Headache-32%
- Nausea/vomiting-27%
- Hepatosplenomegaly-14%
- Weight loss-13%
- Thrush-12%
- Neurological symptoms-12%

## Acute HIV Disease

- Erythematous maculopapular
  - Face, trunk and sometimes extremities (palms/soles)
- Mucocutaneous ulceration
  - Mouth, esophagus, or genitals (distinguishes HIV from mononucleosis –EBV)

## Acute HIV Disease



From: Walker, B. 40<sup>th</sup> IDSA, Chicago 2002.

## Chronic HIV/AIDS

## Defining AIDS

- HIV+ with a CD<sub>4</sub> cell count that is or ever has been less than 200 cells/mm<sup>3</sup>
- HIV+ and have had an AIDS defining illness such as PCP, toxoplasmosis, MAC, etc. - regardless of CD<sub>4</sub> cell count

## Chronic HIV/AIDS

- Individuals known to be at risk for HIV infection should be screened for antibodies on a regular basis ( yearly )
- Patients may remain asymptomatic (clinical latency) for 2-8 years
- Around 8 years, symptoms may appear



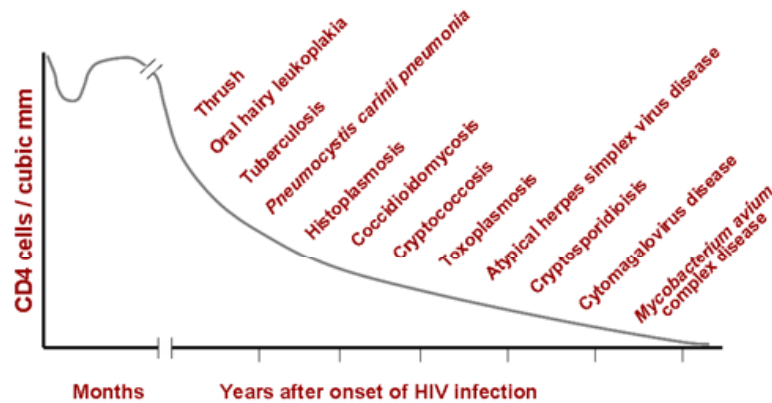
## AIDS Defining Conditions

- M.A.C./M Kansasi-disseminated
- Cryptococcal disease-extrapulmonary
- PCP
- HIV dementia
- Histoplasmosis: extrapulmonary
- Cervical Cancer
- Cryptosporidiosis/Isosporporiasis
- HSV-bronchitis, pneumonitis, esophagitis, ulcer (>1mo)
- Salmonella septicemia

## AIDS Defining Conditions

- Lymphoma
- Toxoplasmosis
- PML
- CMV
- Kaposi's sarcoma
- Candidiasis-esophagus, trachea, bronchi, lungs
- Wasting syndrome
- Coccidioidomycos, extrapulmonary
- Mycobacteria. Tb
- Bacterial Pneumonia (>2/yr)

## Onset of Opportunistic Infections



## AIDS Defining Conditions

- PCP is the most common AIDS-defining infection
- Oropharyngeal candidiasis is frequent in HIV+ persons, even early stages on

## Bacterial Disease:

- Rates higher than in HIV uninfected

Organisms:

- *S pneumoniae*
  - >150 times more common than in HIV uninfected
  - Recurrence in 8-25% within 6 months
- *H influenzae*
  - 40 times more common in HIV infected
- *P aeruginosa*
- *S aureus*

## Seborrheic Dermatitis



<http://www.lib.uiowa.edu/>

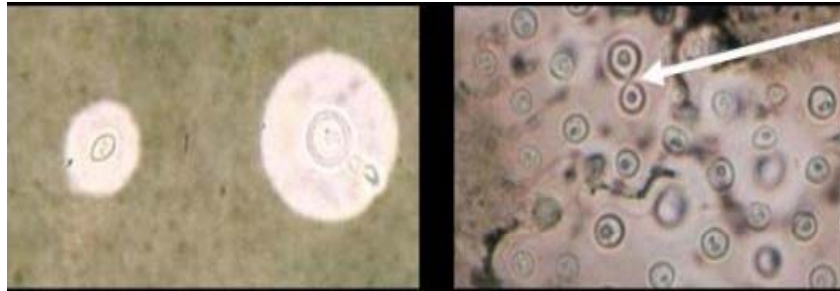
# Kaposi's Sarcoma



# Candidiasis



# Cryptococcosis

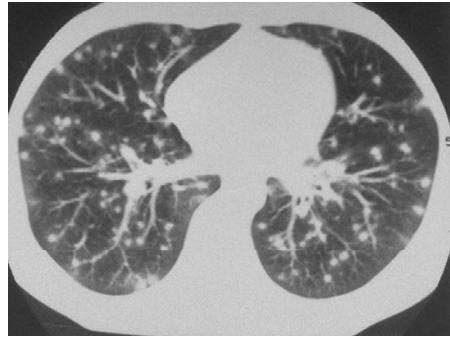
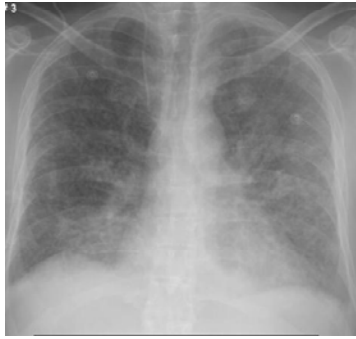


Credit: Images courtesy AIDS Images Library  
[www.aidsimages.ch](http://www.aidsimages.ch)

# CMV Retinitis



# Histoplasmosis



Credit: Images courtesy AIDS Images Library  
[www.aidsimages.ch](http://www.aidsimages.ch)

# Histoplasmosis



Credit: Images courtesy AIDS Images Library  
[www.aidsimages.ch](http://www.aidsimages.ch)

## Herpes Simplex



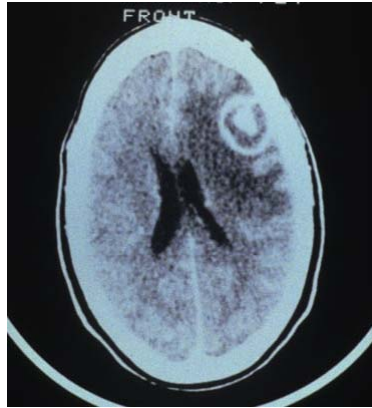
## Varicella Zoster Virus Disease



Credit: © I-TECH

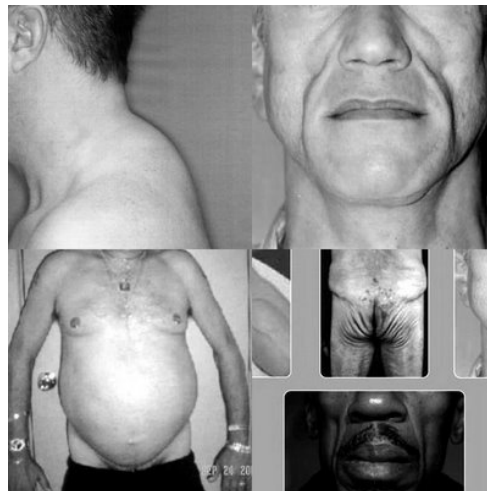


# Toxoplasma gondii Encephalitis



Credit: P. Volberding, MD, UCSF Center for HIV Information Image Library

# Lipodystrophy, Fat Accumulation and Syndrome X





## Survival

- Late stage disease
  - CD4 count <200cells
  - Development: opportunistic infections, selected tumors, wasting, and neurologic complications
- Untreated person
  - Median survival after the CD4 has fallen to <200, is 3.7 years.
- Untreated person,
  - CD4 count at the time of the first AIDs defining illness is 60-70 cells, and the median survival is 1.3 years.

## Case #2

- A 62 yo white woman presented with 6 pounds weight loss and fatigue.
- She is a retired school teacher, married, and monogamous.
- Hospitalized for hepatitis six months prior.
- Physical examination was unremarkable except diffused lymphadenopathy.
  
- Differential?

## Case #2

- She was found to be positive for HIV. Her CD<sub>4</sub> count was 284.
- Her husband was subsequently found to be HIV positive. He later admitted to extramarital affairs.

## HIV/AIDS Epidemiology

## Adults and children estimated to be living with HIV | 2009



**Total: 33.3 million** [31.4 million – 35.3 million]

WHO, 2011

## Epidemiology – World Wide

- 2009: 7,000 New HIV Infections Each Day
- 97% are in low/middle income countries
- 1,000 are in children under 15 yoa
- 6,000 are in persons aged 15 and older
  - Almost 51% are women
  - About 41% are 15-24 y/o

# Epidemiology – United States, 2009

- > 1 million cases of HIV
- New surveillance methodologies
  - 56,300 new cases/yr.
  - African-Americans– 45% of new infections
- Shift: minorities, women, rural, heterosexuals

### Fast Facts

In 2006, blacks accounted for 45% of new HIV infections in the US.

1 in 16 black men will be diagnosed with HIV at some point in his lifetime, as will 1 in 30 black women.

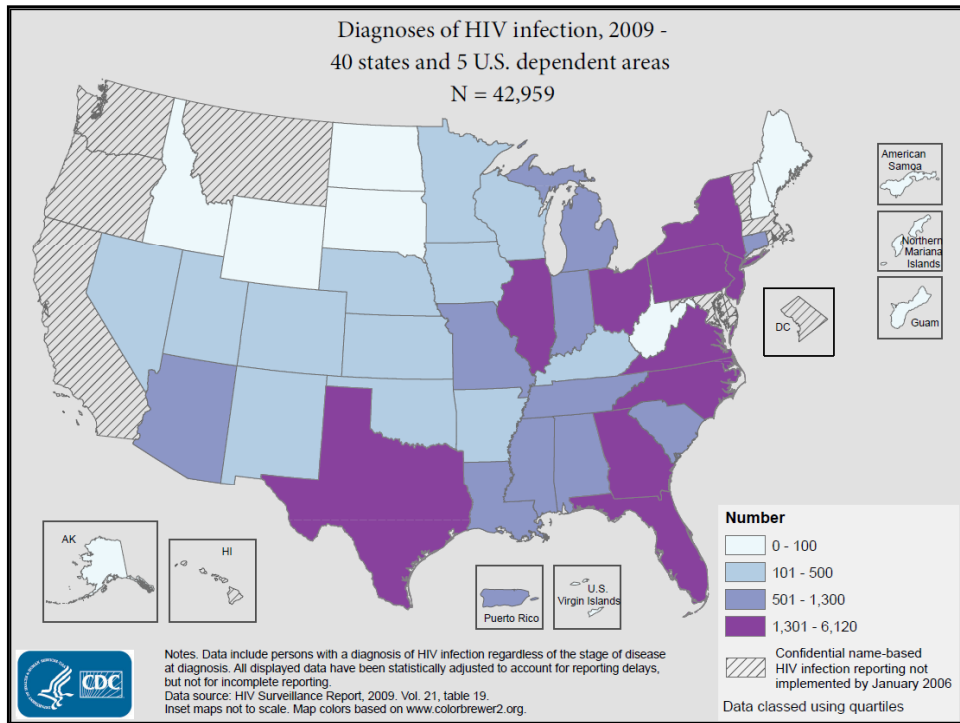
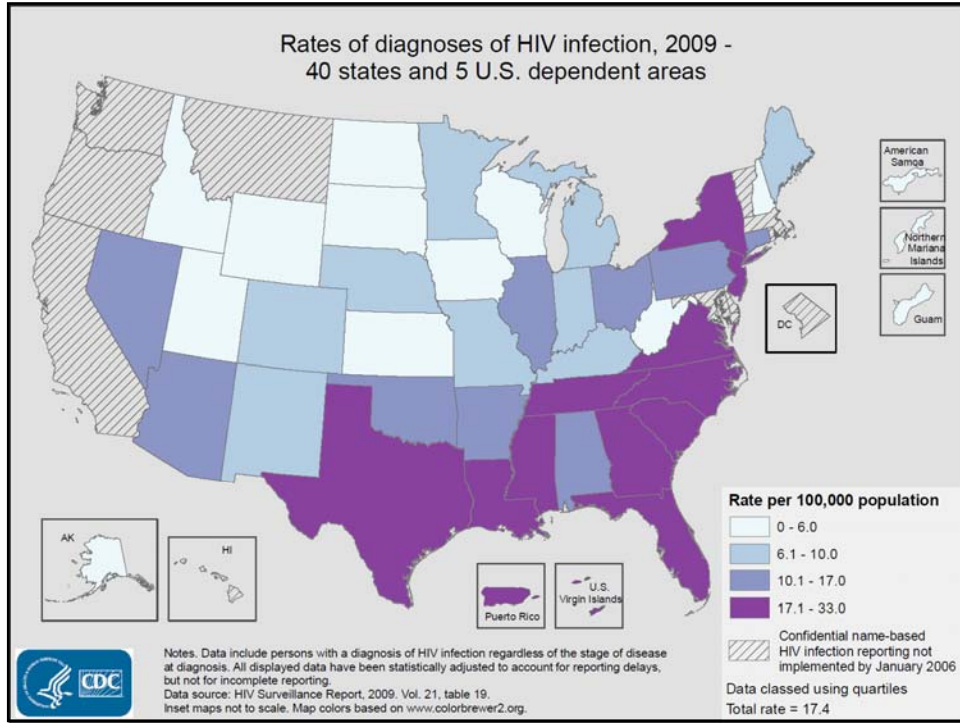
In 2006, HIV was the ninth leading cause of death for all African Americans.

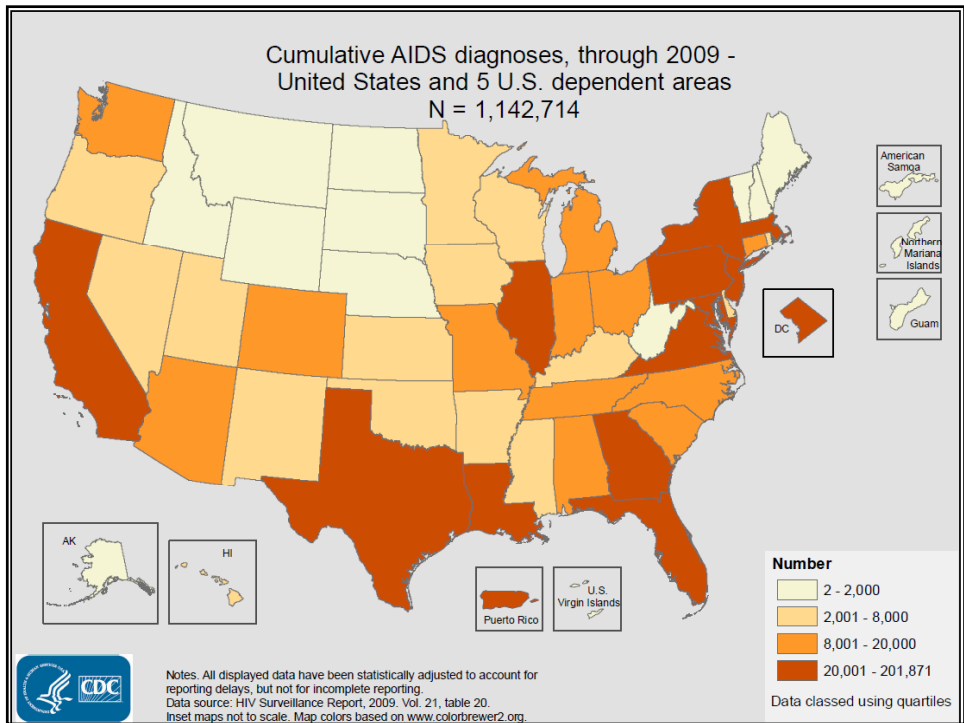
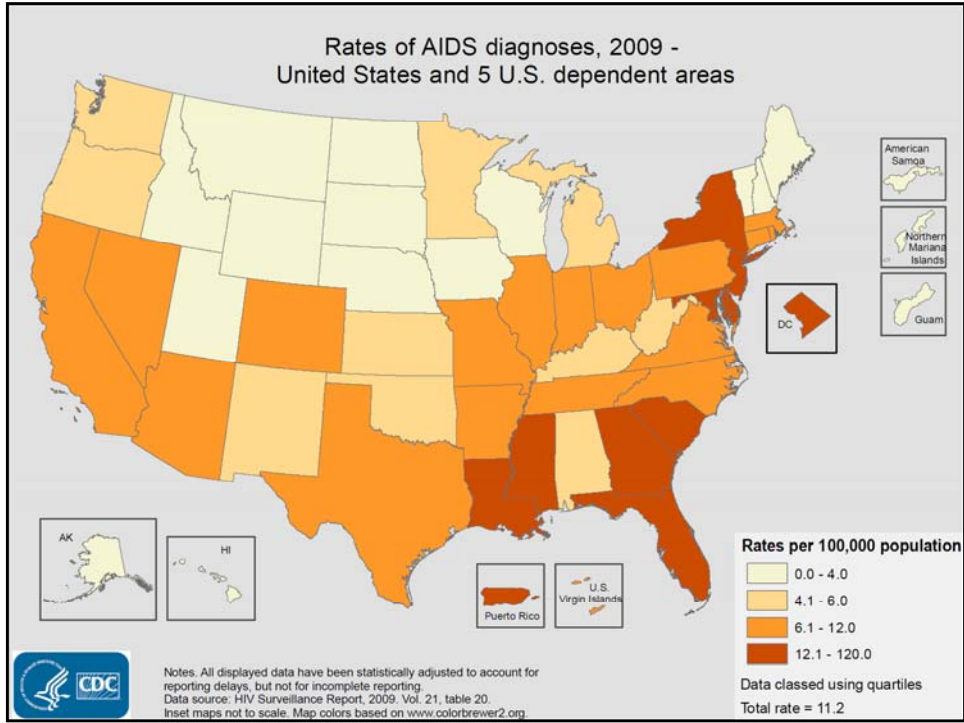
## HIV among African Americans

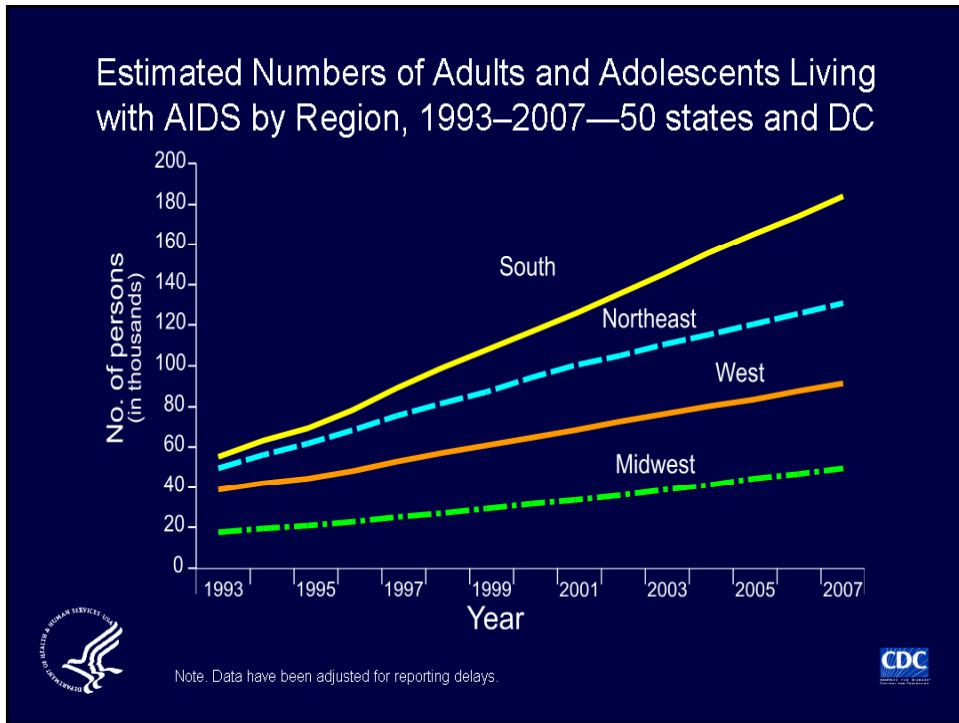
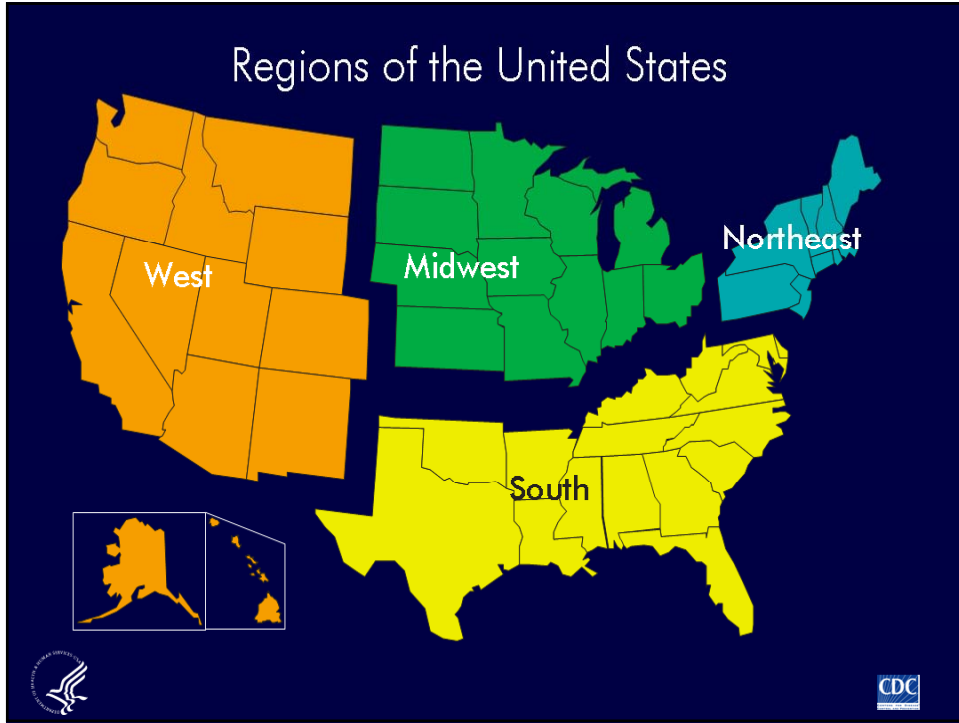
### Estimated Rates of New HIV Infections, by Race/Ethnicity and Gender, 2006

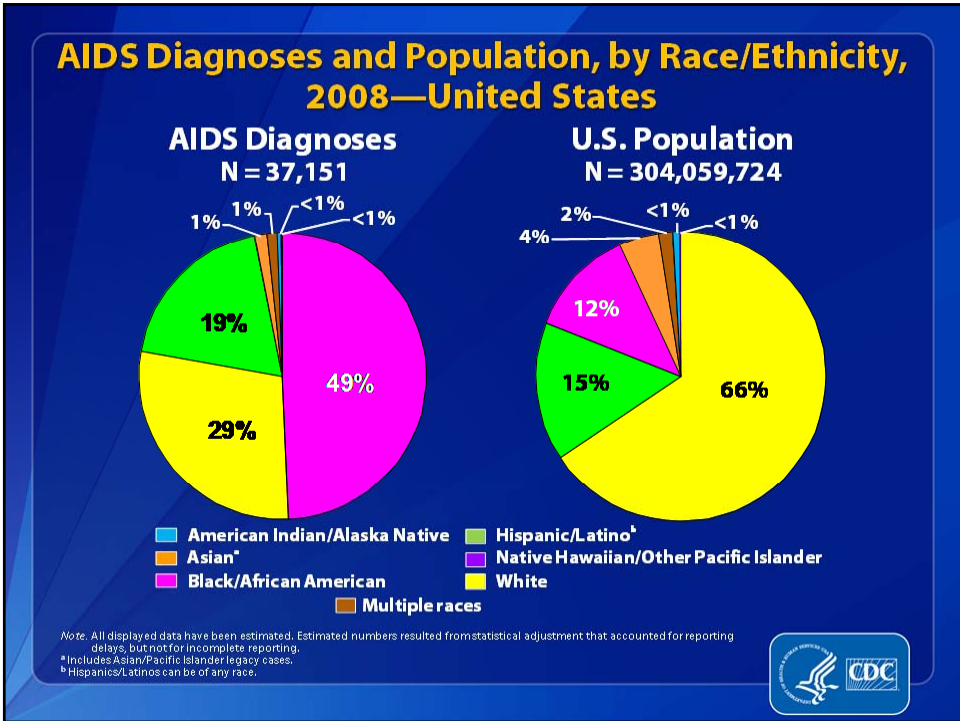
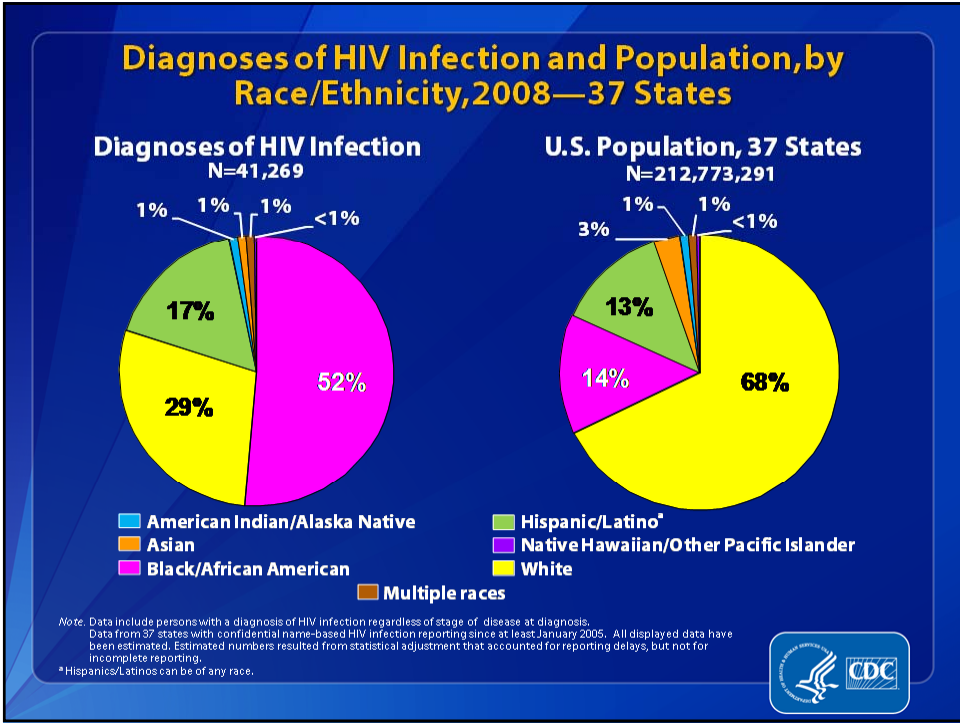
Race/Ethnicity and Gender	Rate per 100,000 Population
Black Men	115.7
Hispanic/Latino Men	43.1
White Men	19.6
Black Women	55.7
Hispanic/Latino Women	14.4
White Women	3.8

Source: CDC. Subpopulation Estimates from the HIV Incidence Surveillance System—United States, 2006. *MMWR*. 2008; 57(36):985–989.











## Epidemiology: HIV in Kentucky

- From January 2005 – December 2009
  - 1,740 new HIV cases reported

## Epidemiology

AIDS in Kentucky as of 12-31-2009

Case Type	Number of Cases
Cases living with AIDS	2,669
Total AIDS Cases (living and deceased)	5,227

### Cumulative AIDS Statistics by Area Development District (ADD)

Figure 2. Cumulative AIDS Cases by Area Development District (ADD) of Residence at Time of Diagnosis through December 31, 2009

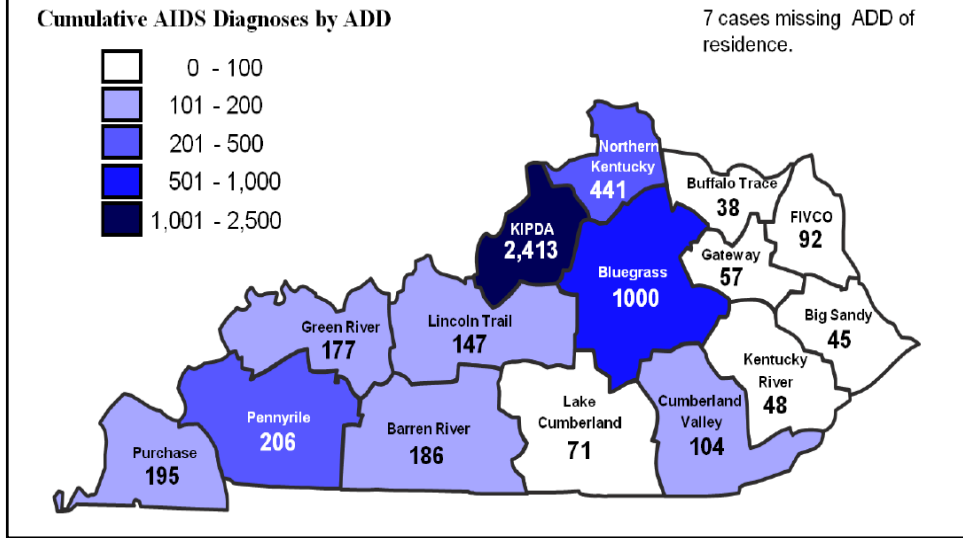
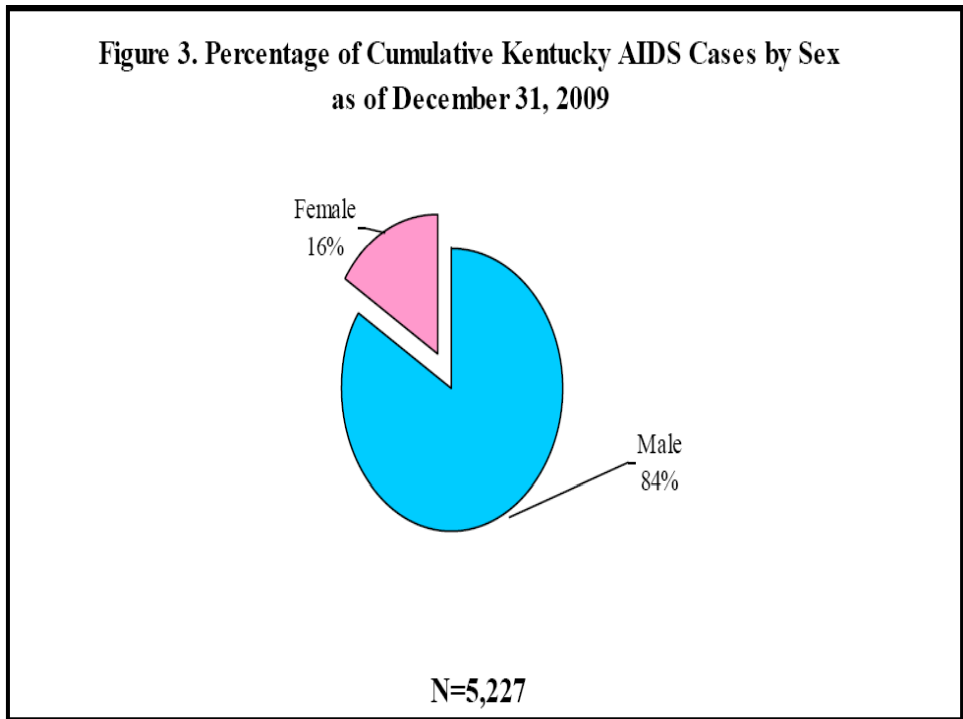
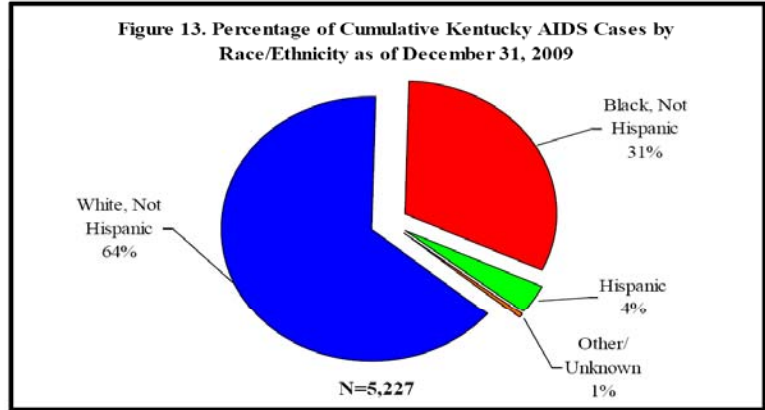


Figure 3. Percentage of Cumulative Kentucky AIDS Cases by Sex as of December 31, 2009





# Epidemiology





- African Americans represent approximately 7.5% of the general Ky population
- African American cases are up from 29% in 2002.

# HIV/AIDS Transmission

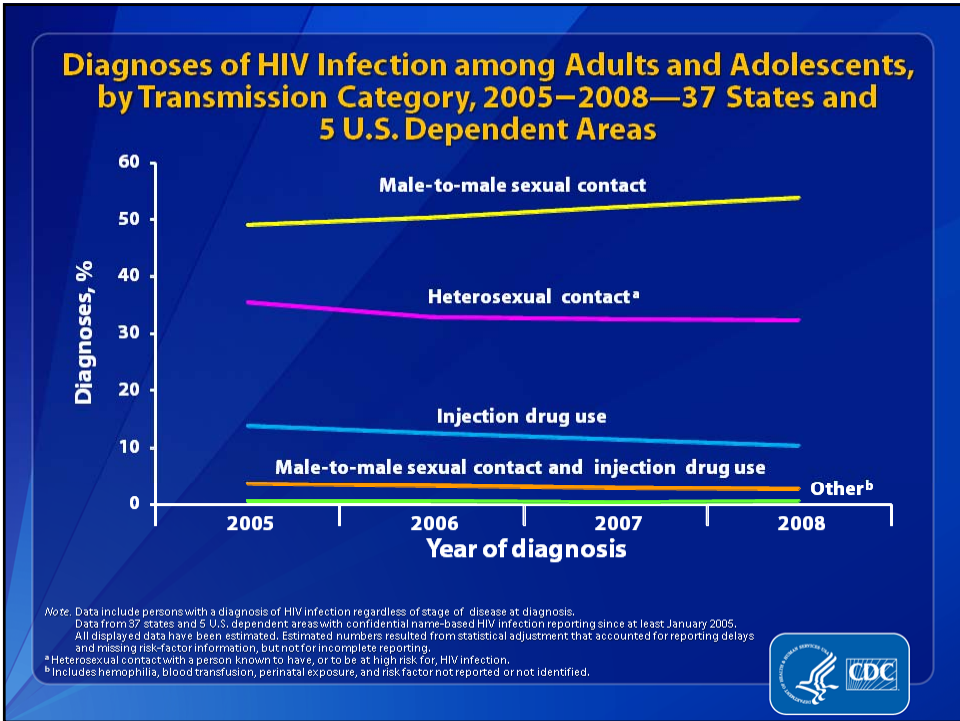
The most common methods of transmission of HIV are:

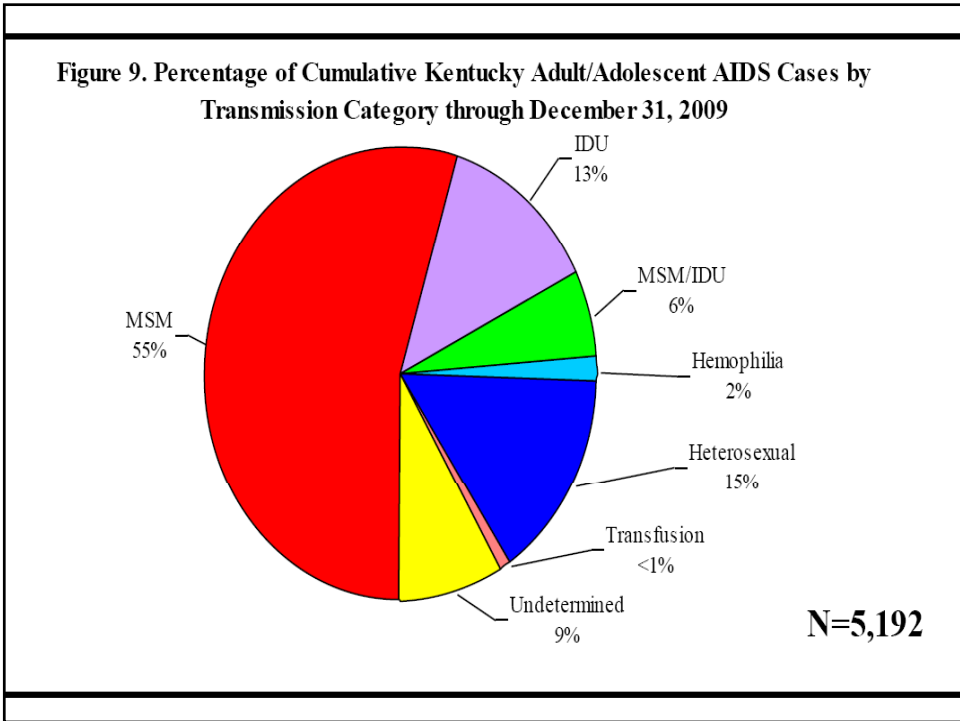
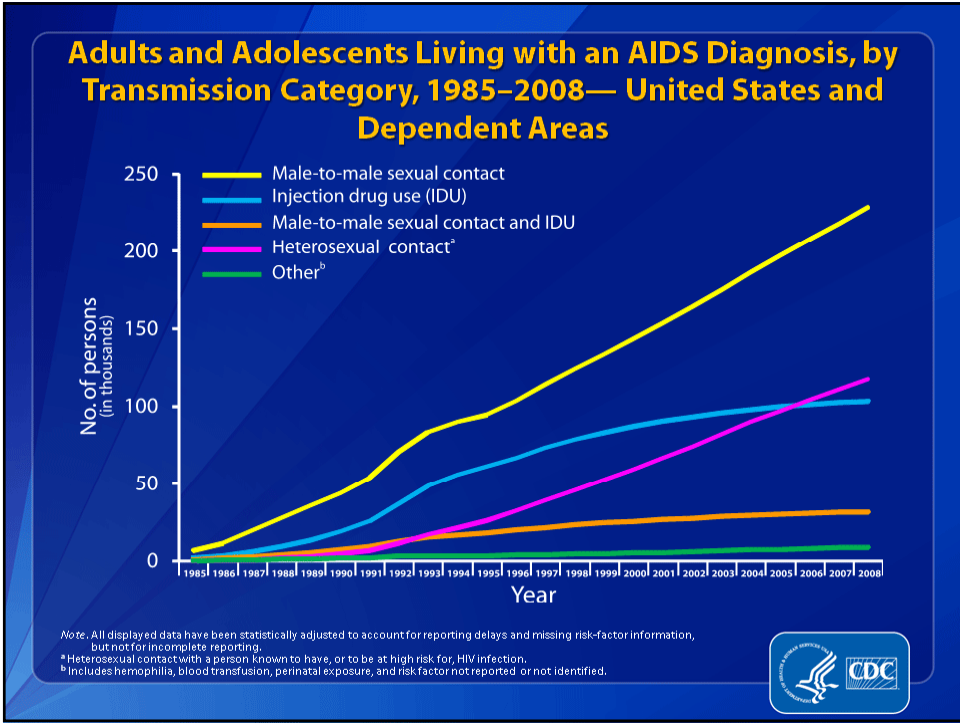
	Unprotected sex with an infected partner		Sharing needles with infected person
---	--	--	--------------------------------------

Almost eliminated as risk factors for HIV transmission are:

	Transmission from infected mother to fetus		Infection from blood products
---	--	--	-------------------------------

ADAM.





## Exposure Risks (average, per episode, involving HIV-infected source patient)

Percutaneous (blood) <sup>1</sup>	0.3%
Mucocutaneous (blood) <sup>2</sup>	0.09%
Receptive anal intercourse <sup>3</sup>	0.3 - 3%
Insertive anal intercourse <sup>4</sup>	0.06%
Receptive vaginal intercourse <sup>5</sup>	0.1 – 0.2%
Insertive vaginal intercourse <sup>6</sup>	0.03 – 0.14%
Receptive oral (male) <sup>7</sup>	0.06%
Female-female orogenital <sup>8</sup>	4 case reports
IDU needle sharing <sup>9</sup>	0.67%
Vertical (no prophylaxis) <sup>10</sup>	24%

## Precautions

- Safer Sex
  - anal
  - vaginal
  - receptive oral sex
- Latex condoms
- Standard precautions
- Barrier techniques (dental dams)
- Abstinence



## Perinatal Precautions

- Intrauterine - ACTG protocol 076
- Begin AZT 100mg PO 5X/day at 14-34 weeks of gestation
- IV AZT during labor - load with 2mg/kg then 1mg/kg/h until birth
- AZT 2mg/kg q6h for the 1st 6 weeks of newborn's life

## Perinatal Precautions

- Randomized controlled trial to assess ability of AZT to reduce perinatal transmission in humans
- Risk of vertical transmission reduced from 22.6 % in placebo treated controls to 7.6% in treatment arm (AZT alone)
- Reduction of 67%
- Reduction in viral load only partially explained reduction in transmission

Connor, 1994

## More About Testing

### Why Should We Test?

- One-Quarter of all HIV-infected persons are unaware of their status
  - *In 2000, 31% did not return for results of HIV-positive conventional tests at publicly funded sites*
- Earlier treatment could increase wellness
- Studies have shown those who know they are infected are:
  - More likely to practice safer sex
  - More likely to inform their partner of their status



## Why Should We Test?

- Need for immediate information or referral for treatment choices
  - Perinatal settings
  - Post-exposure treatment settings
- Screening in high-volume, high-prevalence settings

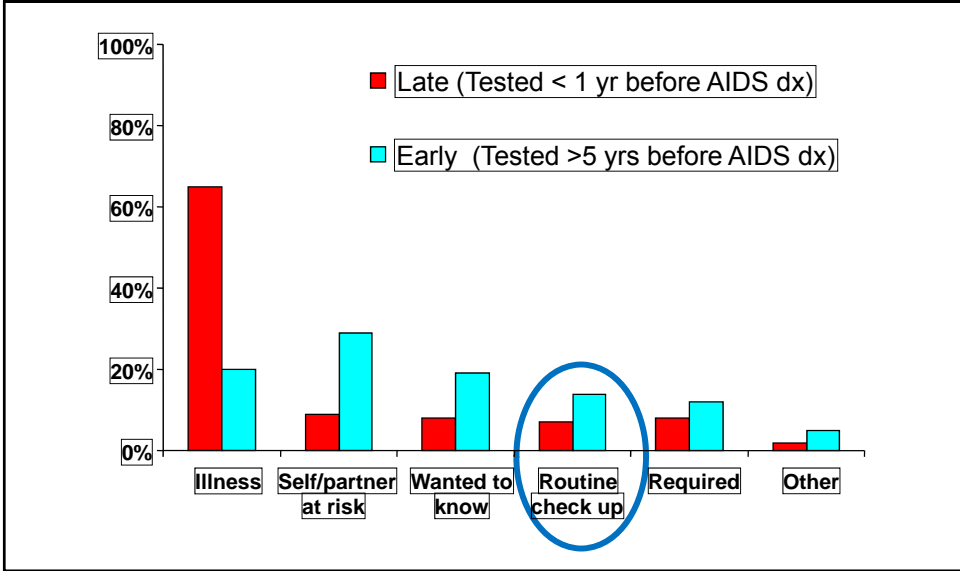
## Late HIV Testing is Common Supplement to HIV/AIDS Surveillance, 2000-2003

- Among 4,127 persons with AIDS\*, 45% were first diagnosed HIV-positive within 12 months of AIDS diagnosis ("late testers")
- Late testers, compared to those tested early (>5 yrs before AIDS diagnosis) were more likely to be:
  - Younger (18-29 yrs)
  - Heterosexual
  - Less educated
  - African American or Hispanic

*MMWR June 27, 2003*

## Reasons for testing: late versus early testers

Supplement to HIV/AIDS Surveillance, 2000-2003



## Who Should We Test?

- **CDC: A routine component of care ... 13 to 64 YO**
- **Those at high risk - yearly**

## How Do We Incorporate Testing?

- Incorporate into routine medical care
- Prevention counseling/written consent not recommended
- Pregnant women
  - Opt-out testing
  - Repeat screening in 3<sup>rd</sup> trimester in areas with high rates of HIV infection among pregnant women

## Testing Basics

- ELISA Initial screening test
- Highly sensitive but not specific
- High incidence of false positives
- Positive tests should be repeated and confirmed by a western blot
- Negative tests should be repeated in 6 months

## Testing Technology

- OraQuick Advantage HIV-1/2<sup>®</sup>
  - CLIA-waived 20 minute fingerstick/oral fluid ELISA test.
  - Confirmation testing still required.
  - May capture patients who do not report for initial test results.

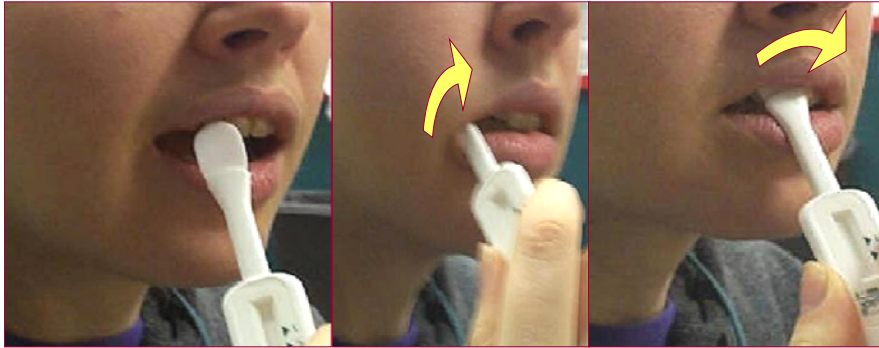
## Testing Technology

- OraQuick<sup>®</sup> Advance HIV-1/2



## Testing Technology

- Collect oral fluid specimens by swabbing gums with test device.
- Gloves optional; waste not biohazardous



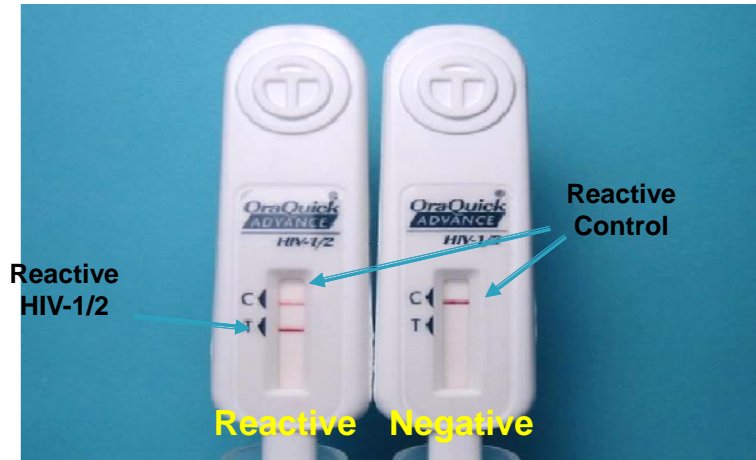
## Testing Technology

- Insert device; test develops in 20 minutes



# Testing Technology

- Read results in 20 – 40 minutes



# Source of HIV Tests and Positive Tests

- 38% - 44% of adults age 18-64 have been tested
- 16-22 million persons age 18-64 tested annually in U.S.

	HIV tests*	HIV+ tests**
Private doctor/HMO	44%	17%
Hospital, ED, Outpatient	22%	27%
Community clinic (public)	9%	21%
HIV counseling/testing	5%	9%
Correctional facility	0.6%	5%
STD clinic	0.1%	6%
Drug treatment clinic	0.7%	2%

\*National Health Interview Survey, 2002

\*\*Suppl. to HIV/AIDS surveillance, 2000-2003

## HIV Testing in ED's

- Survey of 95 Academic EDs
- For patients with suspected STDs:
  - 93% screen for gonorrhea
  - 88% screen for chlamydia
  - 58% screen for syphilis
  - 3% screen for HIV

## Confidentiality Issues

- **Cannot disclose any info of patient or result to anyone *EXCEPT*:**
- Legally authorized representative of pt.
- HCW responsible for health & welfare of pt
- HCW consulting for diagnosis & treatment
- Cabinet for reporting controlling spread of disease
- HCW dealing with body parts/fluids of deceased

## Confidentiality Issues

- Cannot disclose any info of patient or result to anyone *EXCEPT*:
- Health facility staff committees for conducting, monitoring, & evaluating programs
- Authorized medical or epidemiological researchers
- Parent, foster parent, or legal guardian of a minor
- Person allowed access by a court order

## Kentucky Reporting Requirements

- Physicians & Medical Laboratories must report:
  - A positive test result within 5 business days
  - CD4+ assay
  - HIV detectable Viral Load Assay
  - A positive serological test result
  - A diagnosis of AIDS that meets the proper criteria and use the proper forms



## Kentucky Reporting Requirements

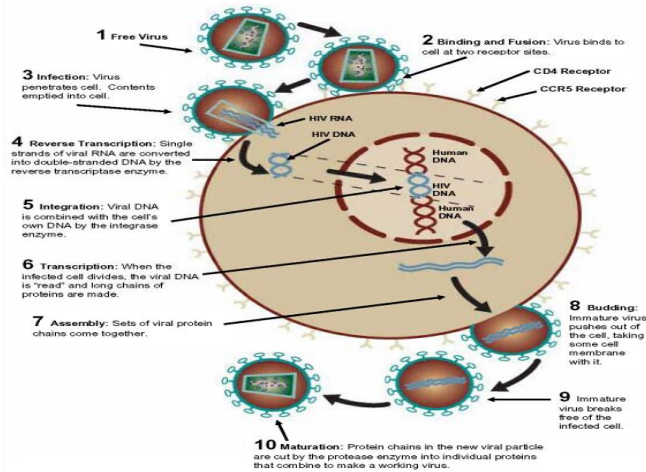
- **Positive report must include:**
  - Patient's full name
  - Date of birth, Gender, Race
  - Risk factor
  - County of residence
  - Name of facility submitting report
  - Date & type of HIV test performed
  - Results of CD4+ cell counts
  - Results of viral load, and TB testing
  - PCR, HIV culture, HIV antigen, if performed
  - HIV status of partner, spouse or children

## Kentucky Reporting Requirements

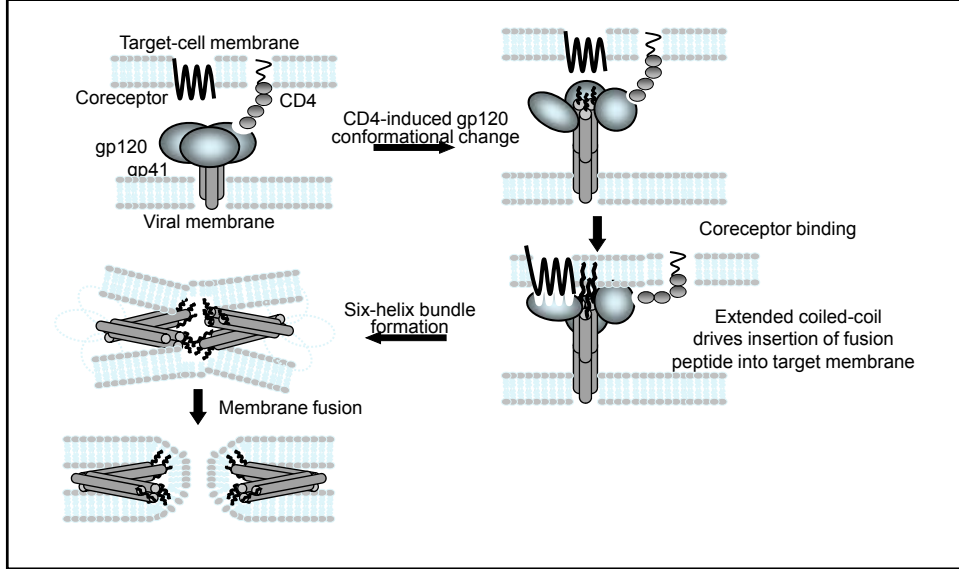
- **Reports of AIDS:**
  - Must be made regardless of previous HIV infection
  - If pt. was never reported as having HIV, AIDS report will serve
- **Must include subsection:**
  - The patient's complete address
  - Opportunistic infections diagnosed
  - Date of onset of illness

# Treatment

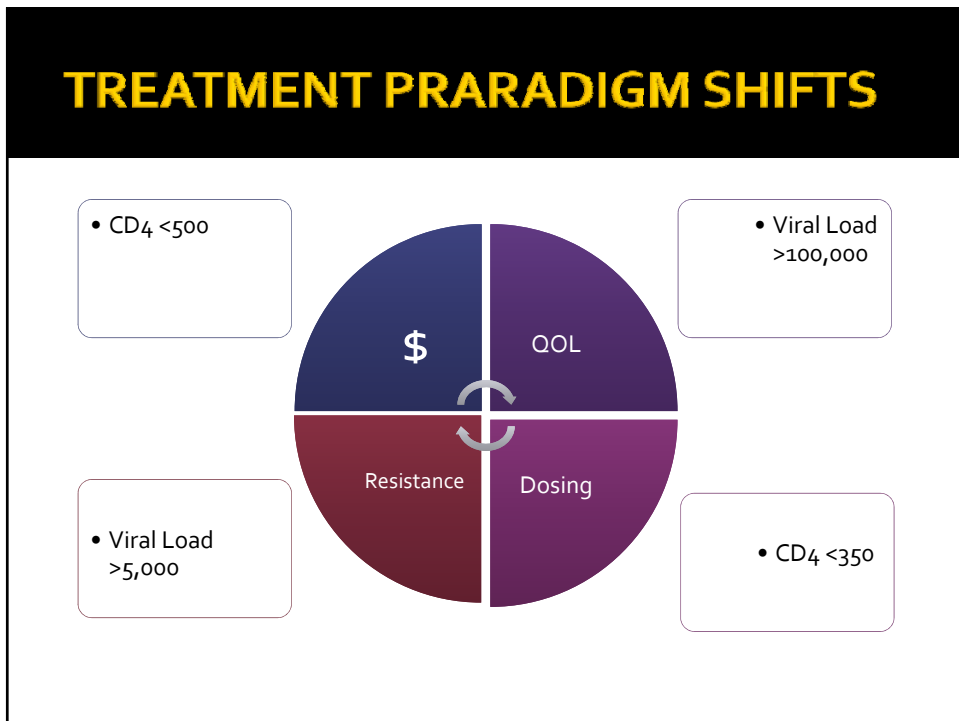
## Traditional Model of HIV Inhibition



## New Model of HIV Replication



## TREATMENT PRARADIGM SHIFTS




## Treatment

- Resistance testing:  
Genotype early/Phenotype late
- Treat:
  - Symptomatic patients
  - Pregnant
  - HIV-nephropathy,
  - Hep B co-infected (if Hep B tx is indicated)

## Treatment

- Asymptomatic patients:  
Treat: < 350 cells/mm<sup>3</sup>  
Recommend Treat: 350-500 cells/mm<sup>3</sup>
- Patients with CD4<sup>+</sup> cell count >500 cells/mm<sup>3</sup>:

50% panel members  Treatment  
50% panel members  Optional

## Treatment Regimens

- Typical backbones:  
    **2 NRTIs + 1 NNRTI**  
    **2 NRTIs + 1 PI**

## Treatment Regimens Medication Selection

- Downgrades  
    Kaletra® (except in pregnancy)
- Recommendations  
    Atripla®  
    Truvada®+Ral  
    Truvada®+Ata/rit  
    Truvada®+Dar/rit

## Treatment Regimens

### 'What Not To Use'

- Ata plus Ind
- DDI plus D<sub>4</sub>T
- Two NNRTI combinations
- EFV in women of childbearing potential
- 3TC and FTC
- ETV and unboosted PIs
- ETV and boosted ATA or fAMP
- NVP in naïve females with CD<sub>4</sub><sup>+</sup> > 250 or males > 400
- Unboosted Dar, Saq, Tip
- AZT plus D<sub>4</sub>T

## Goal of Therapy

### Primary Goal

To reduce and maintain plasma HIV RNA levels (viral load) below the point of detection

**<48 COPIES/ML**

### Secondary Goal

Preservation of the CD<sub>4</sub><sup>+</sup> cell count

## Therapeutic Arsenal

- Nucleoside Reverse Transcriptase Inhibitors (NRTIs)
- Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)
- Protease Inhibitors (PIs)
- Nucleotide Reverse Transcriptase Inhibitors
- Fusion Inhibitors
- Co-receptor antagonists
- Integrase Inhibitors

## Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

- Inhibit reverse transcriptase enzyme
- Plagued with drug resistance and intra-class resistance
- Multiple newer combination drug products

## Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

Zidovudine	AZT	(Retrovir®)	Marrow suppression
Didanosine	ddl	(Videx EC®)	Peripheral neuropathy
Stavudine	d4T	(Zerit®)	Peripheral neuropath
Lamivudine	3TC	(EpiVir®)	Headache, Nausea
Emtricitabine	FTC	(Emtriva®)	Headache, Nausea
Abacavir	ABC	(Ziagen®)	Hypersensitivity

**Combivir®** AZT/3TC  
**Trizivir®** AZT/3TC/ABC  
**Truvada®** FTC/TF  
**Epzicom®** 3TC/ABC



## Atripla®






Emtricitabine 200 mg + Tenofovir 300 mg + Efavirenz 600 mg

- First triple therapy single pill option
- Gold standard?
- Unprecedented manufacturer cooperation
- Cost comparable
- Single co-pay?
- 1 PO Qhs





## The Ideal Antiretroviral

- **Potent.** 
- **Easily administered.** 
- Low cost.
- High resistance barrier.
- **Effective as monotherapy.** 
- **Few adverse effects.** 
- **Few drug interactions.** 
- Disturb latent HIV reservoirs.

## Nucleotide Reverse Transcriptase Inhibitors

- Inhibit reverse transcriptase enzyme
- Requires less intracellular phosphorylation and activation
- Less amenable to resistance
- Salvage therapy

## Nucleotide Reverse Transcriptase Inhibitors

- **Tenofovir (Viread®)**
- 300mg PO QD
- Efficacy against Hep B
- Nausea/vomiting
- Increased gas



## Non-nucleoside Reverse Transcriptase Inhibitors

- Structurally distinct from the NRTIs
- Resistance remains a problem as does cross-resistance

## Non-nucleoside Reverse Transcriptase Inhibitors

- **Nevirapine** (Viramune®) 200 mg qd x 2 weeks  
Rash, Diarrhea then 200 mg BID
- **Delavirdine** (Rescriptor®) 400 mg TID  
Rash, Headache
- **Efavirenz** (Sustiva®) 600 mg Qhs  
Rash, CNS Disengagement



## Second generation NNRTI Etravirine (Intelence®)

- Formerly TMC125
- Second generation NNRTI
- Higher resistance ceiling [K103N] [Y181C]
- 200 mg PO BID
- Salvage therapy
- Rash, diarrhea
- D/I: (several) Tip, fAMP, ATA

## **Second Generation NNRTIs**

### **Rilpivirine (Edurant®)**

- Formerly TMC25
- Higher resistance ceiling [K103N] [Y181C]
- Cross-resistance with ETV
- 25 mg QD (1 tab)
- Salvage therapy
- Rash, insomnia
- D/I: PPIs, AEDs
- Ril plus Truvada® vs. Atripla® [B-Tripla]

## **Protease Inhibitors**

- Among the most potent of the antiviral medications
- Resistance develops quickly, especially in cases of non-adherence
- Wide intra-class resistance
- Boosting

## Protease Inhibitors

<b>Saquinavir</b> (Invirase®) Nausea, vomiting, diarrhea	500 mg BID
<b>Ritonavir</b> (Norvir®) D/I, GI distress, perioral tingling	600 mg BID
<b>Indinavir</b> (Crixivan®) Nephrolithiasis, increased bilirubin	800 mg q8h
<b>Nelfinavir</b> (Viracept®) Diarrhea, nausea	1250 mg BID



## Protease Inhibitors

<b>Lopinavir/Ritonavir</b> (Kaletra®) Nausea, HyperTG, diarrhea	2 Caps BID
<b>Fosamprenavir</b> (Lexiva®) Nausea, diarrhea	700 mg BID (variable)
<b>Atazanavir</b> (Reyataz®) Increased bilirubin	400 mg QD
<b>Tipranavir</b> (Aptivus®) Nausea, diarrhea	500 mg BID (boosted)
<b>Darunavir</b> (Prezista®) Nausea, diarrhea	600 mg BID (boosted)



## Fusion Inhibitors

- Enfurvitide (Fuzeon®)  
90mg SQ BID  
\$\$  
Injection site reactions  
Salvage therapy



## Co-Receptor Antagonists

- AKA “chemokine receptor blockers”
- Block either CCR5 or CXCR4
- Concern regarding tropism [CXCR4 associated with increased virulence]
- Theoretical concerns: malignancy, infection, others?

## Maraviroc (Selzentry®; Celsentri®)

- Father of the class – CCR5 antagonist
- Indicated for tx experienced patients only
- Requires trophic assay before use - \$\$\$ [TroFile™]
- Dose: 150 mg PO BID – varies with concurrent drug use [interactions]
- Pneumonia? Malignancy? Cardiovascular complications? Trophic conversion?

## Integrase Inhibitors Raltegravir (Isentress®)

- Newest anti-HIV class
- “Years” of research
- Tx experienced patients only
- 400 mg PO BID
- HA, NV, ↑CPK
- UGT1A1 Glucuronidation
- D/Is: Tip/Rit, Rif
- Cost: \$27.00/day (\$2.00/d less than MAR)

## Opportunistic Infection Prophylaxis and Treatment

- *Pneumocystis jiroveci* formerly *Pneumocystis carinii* (PCP)

Prophylaxis (CD4<sup>+</sup> cell count <200): Bactrim DS 1 PO QD

Treatment: Bactrim IV 15 mg/kg/d x 21 d

- *Toxoplasmosis gondii*

Prophylaxis (CD4<sup>+</sup> cell count <100): Bactrim DS 1 PO QD

Treatment: Sulfadiazine and Pyrimethamine

## Opportunistic Infection Prophylaxis and Treatment

- *Mycobacterium avium* Complex

Prophylaxis (CD4<sup>+</sup> cell count <50): Azithromycin 1200 mg PO Qweek

Treatment: Clairithromycin and Ethambutol

- *Candida albicans*

Prophylaxis (Frequent, recurrent, or severe infection): Fluconazole

Treatment: Fluconazole High Dose or IV



## Medication Burden

"HIV treatment only marginally better than HIV disease itself."

- Zidovudine "I have no energy."
- Nelfinavir "I'm having 10-12 BM per day!"
- Stavudine "I need methadone for the pain!"
- PIs "Look what has happened to my face!"
- Ritonavir "I can't stop throwing up!"
- Atazanavir "I'm yellow!"
- Efavirenz "I'm too scared to go to sleep!"
- Indinavir "I have a horrible pain in my side!"

## Post Exposure Prophylaxis (PEP)

## OSHA Bloodborne Pathogens Standards

### Exposure Control Plan:

- Must have if employees have occupational exposure and review & update annually
- Must include schedule and implementation for:
  - Exposure Determination
  - Methods of Compliance
  - HIV & HBV Research Laboratories & Production Facilities
  - Hepatitis B Vaccination, Post-Exposure Evaluation & Follow-up
  - Communication of Hazards
  - Recordkeeping, of this standard
  - Procedure for the evaluation of circumstances surrounding exposure incidents
- Designed to eliminate or minimize exposure

## PEP Recommendations

- Treatment should be immediately available
- Exposure should be confirmed
- PEP regimen with best chance of adherence should be selected
- Adverse effects should be anticipated, monitored and treated

## Question #1

- Which of the following body substances most easily transmits HIV?
  1. Feces and saliva
  2. Blood
  3. Breast milk and tears
  4. Vaginal secretions and urine

## Infectious Material

- Blood and blood products, breast milk, vaginal secretions, semen
- Occupational transmission of HIV: health care and laboratory workers
- Other body fluids if **BLOODY**
- Saliva (only implicated through oral sex)
- Feces, nasal secretions, saliva, sputum, sweat, tears, urine, and vomitus are not considered potentially infectious **unless** they are visibly **bloody**. The risk for transmission of HIV infection from these fluids and materials is low . MMWR 2005.
- Possible: Cerebrospinal fluid, exudates, serosal fluids, amniotic fluid

## High Risk Exposures

- Hollow bore needle, visible blood on needle or device, deep puncture, device used in blood vessel, advanced disease in source patient
- Risk of transmission: 0.3%
- 57 confirmed and 139 possible transmissions

## Risk of Transmission: Occupational Needlestick Exposure

- Deep Injury
  - Odds Ratio 15
- Visible Blood in a device
  - Odds Ratio 6.2
- Needle in a artery or vein
  - Odds Ratio 4.3
- Advanced HIV
  - Odds Ratio 5.6

## Risk of Transmission: Other

- Mucosal contact, contact with broken skin
  - Transmission by this route has been documented (pooled risk estimate: 0.1%)
- Bite wound
  - Possible route of transmission in 2 cases of non-occupational exposure.

## PEP Management

- Clean the exposed site with an antiseptics
- Irrigate the eyes with copious amount of water
- No evidence that squeezing the wound reduces the risk of transmission

### Case #3

- A 32 yo female ICU nurse is starting an IV on a patient with advanced HIV
- As she inserts the needle and accesses the vein, the patient jerks and the needle punctures her forearm

### Case #3

- You evaluate her and decide that:
  1. This is a high risk exposure
  2. This is a low risk exposure

## Increased Risk Factors

- Larger quantity of blood
  - Hollow bore needle
  - Needle visibly contaminated with blood
  - Needle in vein or artery
  - Deep injury
- Source with terminal illness
  - Plasma viral load

## Case #3

Q. You tell her the risk of HIV transmission with a needlestick is

1. 1/333 (0.3%)
2. 1/500 (0.2%)
3. 1/100 (1%)
4. 1/1000 (0.1%)

## The Rule of 3

- Rate of Transmission with a needlestick is:
  - Hepatitis B 30%
  - Hepatitis C 3%
  - HIV 0.3%

## Estimation of Transmission Risk

- Percutaneous exposure to blood: 0.3%
- Mucous membrane exposure to blood: 0.09%
- Nonintact skin exposure to blood: < 0.09%
- Other body fluids exposure: less than blood risk



## Case #3

- You decide she should receive HIV PEP. Which of the following would be important in determining the status of the source patient:
  1. CD4 cell count
  2. HIV viral load
  3. ART history
  4. Resistance history
  5. Clinical status of the patient
  6. All of the above

## Source Assessment

- **Do not** delay PEP while awaiting source patient laboratory results.
- The decision to start PEP is based on the clinical risk assessment.
- Testing options:
  - Rapid vs standard HIV antibody
  - Antibody testing vs direct virus assay
  - No option to test discarded needles

## Case #3

- When should PEP be started?
  - 1-2 hours
  - 24 hours
  - 72 hours
  - 1 week (or more?)

## Timing of PEP

- When?
  - Preferably within hours
    - Animal studies less benefit if >48 hours from exposure
    - 17~47% HCW did not complete 28 days
  - Discontinue if source patient found to be HIV negative
  - Do not delay pending test results

## PEP Choices

- When designing a medication plan:
  - Review all relevant source information
  - Review your facility's PEP Plan
  - Consult with local and national resources if needed

### Case 4. After giving an injection, a nurse is stuck with the needle after the patient becomes agitated.

When is the best time for the employer to test the nurse for HIV antibodies?

1. Immediately and then again in 6 weeks
2. Immediately and then again in 3 months
3. Immediately, in 6 weeks, 12 weeks, and in 6 months
4. In 6 weeks and then in 1 year

## Post-Exposure Follow-Up

- HIV Antibody Testing:
  - Baseline, 6 wks, 3 mo, 6 mo
    - Consider 12 month for co-exposures to HIV/HCV
    - HIV testing (PCR) if exposed person develops illness compatible with acute retroviral syndrome
- HCV Antibody Testing & ALT:
  - Baseline, 6 wks, 3 mos, 6 mos
  - Confirm positives
- HCV RNA testing
  - Consider at 4-6 weeks if earlier diagnosis needed
  - Unlike HIV, most patients are not symptomatic with acute HCV infection
- HBV testing – as clinically indicated

## Case #5

- 25 yo nurse is splashed in her eye and mouth with urine from a patient with advanced AIDS
- The patient was recently diagnosed with PML.
- His current CD<sub>4</sub> count is 10 and VL is 100,000.
- His current ART is AZT/3TC/Kaletra.

## Case #5

- You recommend:
  1. Wait until you get the source genotype before starting PEP
  2. Start PEP with AZT/3TC/EFV
  3. She does not need PEP
  4. Start PEP with AZT/3TC/Kaletra

## OSHA Standards

- Never recap needles, only use one hand
- Dispose of all sharps and contaminated supplies in designated containers
- Beware of sharps, all the time

## PEP Conclusions

- Consult with an expert
- Regimens should be chosen to minimize potential drug toxicities and maximize adherence
- Consider history and resistance of the source person
- Timing: the sooner the better

## National PEP Hotline

**888 / HIV-4911**  
**888 / 448 - 4911**

**24-hours/day**

## Pre Exposure Prophylaxis (PrEP)

CDC Interim Guidance: PrEP for the  
Prevention of HIV Infection in MSM

### Before initiating PrEP

- **Determine Eligibility**
- Document negative HIV antibody test(s) immediately before starting PrEP medication.
- Test for acute HIV infection if patient has symptoms consistent with acute HIV infection.
- Confirm that patient is at substantial, ongoing, high risk for acquiring HIV infection.
- Confirm that calculated creatinine clearance is  $> 60$  mL per minute (via Cockcroft-Gault formula).
- **Other Recommended Actions**
- Screen for hepatitis B infection: vaccinate against hepatitis B if susceptible, or treat if active infection exists, regardless of decision about prescribing PrEP.
- Screen and treat as needed for STIs.

## Beginning PrEP medication regimen

- Prescribe 1 tablet of Truvada<sup>1</sup> (300 mg TDF/200 mg FTC) daily.
- Prescribe no more than a 90-day supply, renewable after HIV testing confirms that patient is
- HIV-uninfected.
- Consider using TDF/FTC for both treatment of active hepatitis B infection and HIV prevention.
- Provide risk-reduction and PrEP medication adherence counseling and condoms.

## Follow up while PrEP medication is taken

- Every 2-3 months, perform an HIV antibody test: document negative result.
- Evaluate and support PrEP medication adherence at each follow-up visit, more often if inconsistent adherence is identified.
- Every 2-3 months, assess risk behaviors and provide risk-reduction counseling and condoms.
- Assess STI symptoms and, if present, test and treat for STI as needed.
- Every 6 months, test for STI even if patient is asymptomatic, and treat as needed.
- 3 months after initiation, then yearly while on PrEP medication, check blood urea nitrogen and serum creatine.



## On Discontinuing PrEP

- Perform HIV test(s) to confirm whether HIV infection has occurred
- If HIV positive, order and document results of resistance testing and establish linkage to care.
- If HIV negative, establish linkage to risk-reduction support services as indicated.
- If active Hepatitis B is diagnosed, consider appropriate medication for continued treatment.

## Resources

## Americans with Disabilities Act

- Gives federal civil rights protections to individuals with disabilities
- Protects individuals who are HIV positive, regarded as positive, & associated with positive people from discrimination
- Guarantees equal opportunity in:
  - Public accommodations
  - Employment
  - Transportation
  - State & local government services
  - Telecommunications



## Ryan White Services – Medical Clinics

### *WINGS Clinic*

University of Louisville  
555 S Jackson St.  
2<sup>nd</sup> Fl, ABC  
Louisville, KY 40202  
(502) 561-8844

### *Heartland Cares, Inc.*

619 N. 30th Street  
Paducah, KY 42001  
(270) 444-8183

### *Bluegrass Care Clinic*

University of Kentucky  
740 South Limestone  
Lexington, KY 40536  
(859) 323-5544

### *Matthew 25*

411 Letcher Street  
Henderson, KY 42420  
(270) 826-0200

## Ryan White Services – Social Services Sites

*Cumberland Valley District Health Dept.*  
316 North Hill Street  
London, KY 40741  
(606) 864-3776

*Heartland Cares, Inc.*

619 N. 30th Street  
Paducah, KY 42001  
(270) 444-8183

*Bluegrass Care Clinic*

University of Kentucky  
740 South Limestone  
Lexington, KY 40536  
(859) 323-5544

*Matthew 25*

411 Letcher Street  
Henderson, KY 42420  
(270) 826-0200

*Northern KY Health Dept.*

2388 Grandview Drive  
Fort Mitchell, KY 41017  
(859) 363-2082

*Volunteers of America of KY*

850 Barret Ave., Suite 302  
Louisville, KY 40204  
(502) 574-0161

## Kentucky AIDS Education Training Center

UK Chandler Medical Center, MN672  
Lexington, KY 40536  
(P) 859-323-9969 (F) 859-323-8926  
(W) [www.mc.uky.edu/kyaetc](http://www.mc.uky.edu/kyaetc)

## Always Remember

### The "Golden Rule" Outlook

- Do unto others as you would have them do unto you

