MANAGEMENT OF
PATIENTS
WITH HIV & AIDS

http://www.hivtreatmentispower.com/

Timothy Frank MS RN

INCIDENCE

Worldwide –
65 million people infected.

In the U.S. – December 2008;
1,178,350 people living with HIV
20% undiagnosed
48,000 new cases in 2009
Epidemiology - Overview

- ↓ in white males who have sex with men (MSM)
- ↑ in racial & ethnic minority males who have sex with men
- ↑ in minority women
- ↑ in 19-29 year age group, especially in south and midwest states
- ↑ in > 50 age group
  - Lack of prompt testing
  - Women > 50 d/t heterosexual contact

Incidence in US - Transmission

<table>
<thead>
<tr>
<th>Category</th>
<th>2007</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>MSM</td>
<td>↓ to 62%</td>
<td>↓ by 5%</td>
</tr>
<tr>
<td>↑ risk heterosexual</td>
<td>↑ to 11%</td>
<td>↑ to 66%</td>
</tr>
<tr>
<td>IVD Use</td>
<td>↑ to 18%</td>
<td>↑ to 32%</td>
</tr>
</tbody>
</table>
INCIDENCE IN US 2007

Living with HIV/AIDS, by Race/Ethnicity, 2007*

- 48% Black/African American
- 33% White
- 17% Latinx/Hispanic
- <1% Native Hawaiian/other Pacific Islander
- <1% Asian
- <1% American Indian/Alaska Native

AGE @ NEW DIAGNOSIS (2006)

MAJOR TYPES

HIV –1
Group M-Several subtypes
Group O
Not able to be detected with prior routine HIV antibody tests

HIV – 2
Slower progression
West Africa
79 cases in US, but most were African born

Genetic Promiscuity
Rapidly changing nature makes it challenging to develop vaccines
ETIOLOGY & RISK FACTORS

 Sexual Practices

- Completely Safe
  - Autosexual
  - Abstinence
  - Mutually monogamous

- Very Safe
  - Non-insertive

- Probably Safe
  - Insertive w/ condoms

Risky Co-factors

- Under the influence
- Multiple partners
- Sores in genital area
- Oral receptive (possible)
- Anal receptive

Exposure to blood

- Administration of blood or blood products
- Transplantation of tissue or organs
- Implantation of infected semen
EXPOSURE TO BLOOD

Use of injected drugs
- Absolutely safe
- Very Safe
- Probably safe
- Do not inject!
- Sterilized or exchanged needles
- Clean with full strength bleach

EXPOSURE TO BLOOD

Use of injected drugs
- Risky Co-factors
  - geographical seroprevalence
  - social setting
  - frequency of injection

Occupational exposure
- Accidental needle stick exposure
- Report immediately
- High risk exposures, combination ART for 4 weeks following exposure

PERINATAL EXPOSURE

If untreated, @ 25% of babies born to HIV+ mothers become infected at birth. If mothers and or babies are treated, less than 2% of the infants become infected.

Risk ↑ in late stages of AIDS
- viral activity is ↑
- CD4+ titer is ↓

CDC Guidelines - September 25, 2006 & 2011
http://www.cdc.gov/ncidod/EID/vol10no11/04-0622_02.htm
PRENATAL HIV TESTING

Funds available in high prevalence states
Promotion of HIV testing for all pregnant women
“Opt-out” - voluntary
Routine rapid HIV testing is promoted at delivery if HIV status is unknown

>90% HIV status known before delivery
40% of infected infants born to women whose HIV status was unknown

Rapid HIV testing during labor with pharmacologic & OB interventions
CDC recommends testing conserving the “opt-out” provision

OTHER RISK FACTORS

Ulcerative STD's
• Syphilis
• Herpes simplex
• Chancroid

Non-ulcerative STD's
• Gonorrhea
• Chlamydia
• Trichomoniasis

Seroconversion
Occurs 1-3 months post-exposure (window period)
(time it takes from exposure to convert from HIV- to HIV +)

POST EXPOSURE PROPHYLAXIS

Health Maintenance Strategy
• Accidental exposure of health care and public safety workers
• Unprotected anal or vaginal intercourse
• Receptive oral intercourse with ejaculation
• Share needles with infected partner
• Single event exposure, i.e. rape
• Intention to stop high-risk behaviors
#1 – Free virus
#2 – Virus binds to CD4 & fuses to T4 helper cell
#3 – Infectious virus penetrates cell
#4 – Reverse transcription
#5 – Integration
#6 – Transcription
#7 – Assembly
#8 – Budding
#9 – Immature virus leaves cell
#10 – Maturation – develop new virus

T4 helper cells = CD4+ cells

OVERVIEW OF PATHOPHYSIOLOGY

HIV destroys body’s immune system by selectively attacking CD4+ cells, macrophages & B cells

HIV indirectly affects CNS by neurotoxins produced by the infected macrophages

As CD4+ count ↓, body becomes more susceptible to opportunistic infections

T-4

HIV – GP 120 protein attaches to CD4+ receptors on surface of host T-cell
VIRAL LOAD & CD4+
COUNTS

<table>
<thead>
<tr>
<th>Viral load</th>
<th>CD4+</th>
</tr>
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<tbody>
<tr>
<td>10^7</td>
<td>1600</td>
</tr>
<tr>
<td>10^6</td>
<td>1200</td>
</tr>
<tr>
<td>10^5</td>
<td>800</td>
</tr>
<tr>
<td>10^4</td>
<td>600</td>
</tr>
<tr>
<td>10^3</td>
<td>400</td>
</tr>
<tr>
<td>10^2</td>
<td>200</td>
</tr>
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Primary infection
Latency
AIDS

10 7
10 6
10 5
10 4
10 3
10 2

25

PRIMARY HIV –
CATEGORY A

Initial period
50-70% symptomatic with “mono-like” symptoms
Sudden, intense burst of HIV activity
• ↑↑↑ viral load > 1 mil

Starting antiretroviral Rx at this point may prevent damage to immune system
False + are rare except in patients with lupus or those with HIV vaccine

Rapid HIV+ tests
Pre- & post-counseling waived
Results in 10-20 minutes

SUSPICIOUS CASES

High index of suspicion
Risky behaviors
Clinical manifestations

Offer HIV testing

HIV-1 antibody enzyme immunoassay
If antibodies detected, (test is reactive) confirm with Western blot test
• Identifies antibodies to 3 viral proteins
• If 2-3 present, diagnosis of HIV is made
LATENCY PHASE

No CM’s of disease … but…

- CD4+ count ↓ from normal
  (500-1600/µL) to 200 cells/µL
- Remaining weakened CD4+ lose ability to contain the destructive nature of HIV
- Viral load increases
- Recurrent URI’s
- Fatigue
- Candidiasis
- Lymphadenopathy

AIDS PHASE

- CD4 count <200
- AIDS defining illness
- Without antiretroviral therapy, death in 2-3 years
- Opportunistic infection rate ↑↑

OUTCOME MANAGEMENT

- Maintain Health
  - Initiate & maintain Antiretroviral Rx
  - Prevent infection
**Management of Patients with HIV & AIDS**

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**Outcome Management**

**Tertiary Prevention**

- Maintain Health
- Initiate & Maintain Antiretroviral Rx
- Prevent Infection

**Baseline & Annual screening**

- PCP
- MAC
- Tb
- Vaccines

**Adherence to Anti-retroviral Rx**

- Evaluation of Rx

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**Overview**

**Baseline & q 6-12 mos.**

- CBC
- Chemistries

**Annual Screening**

- TB Skin tests/Chest x-ray
- Pregnancy & Pap; STD’s if sexually active
- Hep A & B to determine need for immunization; Hep C
- Testing for pathogens known to cause opportunistic infections
- CD4 & Viral load testing

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**Outcome Management**

**Initiate & Maintain ART**

- Viral load is 5000–10,000
- Evidence of clinical or immunologic deterioration (CD4 counts <500 mm3)
- Viral load > 20,000 even without evidence of clinical deterioration
ANTIRETROVIRAL AGENTS

<table>
<thead>
<tr>
<th>Class</th>
<th>Action</th>
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<tbody>
<tr>
<td>Nucleoside Reverse Transcriptase Inhibitors (NRTI's)</td>
<td>Incorporate into viral DNA terminating its construction</td>
</tr>
<tr>
<td>Protease Inhibitors (PI's)</td>
<td>Prevent assembly &amp; release of new virus particles</td>
</tr>
<tr>
<td>Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI's)</td>
<td>Action is similar to NRTI's; bind directly to reverse transcriptase</td>
</tr>
<tr>
<td>Entry Inhibitors-Fuzeon</td>
<td>Prevent HIV from entering healthy T cells in the body</td>
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ADHERENCE

Major cause of resistance is sub-therapeutic dosing
- failure to take prescribed dose
- failure to take prescribed dose at prescribed intervals
- interactions with other drugs →↓ blood levels of ART

Factors affecting adherence
- Complex dosing schedules
- Adverse side effects
- Unknown cross reactions
- Cost
- Access to Care

EVALUATION OF TREATMENT

Criteria
- ↓ HIV RNA (viral load) in blood
- ↑ # of T cells
- Appropriate clinical response

Treatment Failure
- ↑ viral load with ↓ T-cell count
- Clinical deterioration
- New opportunistic infections
**PREVENT INFECTION**

- **Pneumocystosis carinii**
  - Pneumonia (80%) at least once
  - Prophylaxis when CD4+ count < 200 mm³
    - Dapsone
    - TMP-SMX

- **Mycobacterium avium complex** (60%) found to have active infection at death
  - Prophylaxis when CD4+ count < 50 mm³

- PPĐ with a CM’s of active Tb
- Prophylaxis with INH-9 mos
- Pyridoxine to prevent peripheral neuropathy

- Flu & pneumonia vaccine
- Prevention of travelers diarrhea
  - Cipro
- Safer sex practices
- Food & water safety
- Skin & mucous membrane integrity

**OUTCOME MANAGEMENT**

- Maintain Health

  **Initiate & maintain**
  **Antiretroviral Rx**

  **Prevent infection**

**NURSING CARE**

- **Assessment**
  - Ask
  - Believe
  - Compile
  - Differentiate

- Communicate
  - Refer to specialized services
PAIN AND SYMPTOM MANAGEMENT IN R/T VIRAL INVASION OF BODY TISSUES & ORGANS

Opportunistic Infections
- Cryptococcal meningitis → (headache)
- Mycobacterium Avium Complex (MAC) → visceral abdominal pain

Effects of AIDS or Immune response to AIDS
- Distal sensory polyneuropathy
- HIV related myopathy

Effects of Medications
- Peripheral neuropathy
- Headache
- GI distress

Non-specific effects of chronic debilitating disease

COMMON LATE STAGE SYMPTOMS

Nutrition < body requires
Fatigue/Anorexia/weight loss/N&V&D
Pain/Infections/Insomnia
Depression/Impaired Cognition
Sleep Pattern Disturbance
Medication Side Effects

Symptoms increased in patients with history of IVDA as mode of transmission
FATIGUE

- Muscular weakness
- Lethargy, Sleepiness
- Mood disturbance – depression
- Cognitive disturbance – difficulty concentrating

Interventions
- Fatigue diary for one week
- Avoid caffeine, smoking, alcohol
- Promote adequate sleep
- Promote adequate balance of rest/activity
- Promote energy saving procedures & exercise

PAIN

Alarmingly undertreated, especially in women

Significantly alters psychological well being and functional ability

Profound impact on quality of life

Pain management for injecting drug users

PAIN SYNDROMES/CAUSES IN HIV

- Sensory peripheral neuropathy
- Extensive Kaposi’s sarcoma
- Headache
- Oral and pharyngeal pain
- Abdominal & chest pain
- Arthralgias & myalgias
- Painful dermatologic conditions

45% - HIV infection & immunosuppression
15-30% - AIDS Rx & diagnostic procedures
25-40% - unrelated
GENDER RELATED DIFFERENCES: WOMEN

- Increased frequency & intensity
- 2x as likely to be under-treated
- Unique pain syndromes of gynecological nature r/t opportunistic infections
  - CA pelvis & GU tract
  - 2x in radiculopathy & headache

SPECIFIC AIDS RELATED PROBLEMS

**Invasive Cervical Cancer**
- CIN – cervical intraepithelial neoplasia
- Rate in women w/HIV
- Related to ↓ CD4+ counts

**Kaposi's Sarcoma**
- HIV related KS-fulminant
- Disseminated throughout
- Unrelated to CD4+ count
- Can occur early in disease

**AIDS dementia complex**
- Very young & older pts.
- Anemia & weight loss
- < 12th grade education

**HIV Wasting Syndrome**
- 90% of people w/ HIV
- Profound wt. loss (>10% baseline) w/ chronic diarrhea, weakness, fever for >30 days

INVASIVE CERVICAL CANCER

**Assessment**
- Early – cervical dysplasia
- Post-coital bleeding
  - Metrorrhagia
  - Blood tinged vaginal discharge

**Advanced Disease**
- Back, pelvic, leg pain, edema of legs
- Weight loss
- Vaginal bleeding → anemia
- Lymphadenopathy

**Treatment**
- Minimally invasive procedures
- Surgery
- Internal radiation chemotherapy
AIDS RELATED KAPOSI'S SARCOMA

Assessment
Symmetrical, bilateral flat pink patches that look like bruises
Turn to deep violet or black lesions

Location:
- mouth, skin, mm’s
- Head, neck, torso, limbs, genitals
- Internal organs

Rx
Depends on CD4+ count, CM’s, other diseases & functional ability
Radiation, localized chemotherapy, cryotherapy

AIDS DEMENTIA COMPLEX
HIV ENCEPHALOPATHY

Cognitive Dysfunction
- ↓ concentration, memory
- Slowed thinking
- Impaired judgment

Motor Problems
- Leg weakness
- Ataxia
- Clumsiness

Behavior Changes
- Apathy, ↓ spontaneity, social withdrawal
- Irritability, ↑ activity
- Anxiety, mania, delirium
**HIV WASTING SYNDROME**

**Incidence**
- 90% of people with HIV infection

**Cause**
- ↓ food intake
- Malabsorption
- Altered metabolism

**Profound involuntary weight loss with chronic diarrhea, weakness & fever > 30 days**

**Rx**
- Replace low testosterone in men & women
- Stimulate appetite with megestrol & dronabinal
- Human growth hormone

**WASTING SYNDROME**

**NEW ADVANCES**

Four New Antiretroviral Agents approved by the FDA for HIV-1 infection:
- CCR5 co-receptor antagonists: Maraviroc (Selzentry)
- Integrase Inhibitor: raltegravir (Isentress)
- NNRTI's: etravirine (Intelence) & rilpivirine (Edurant)

[www.hivguidelines.org](http://www.hivguidelines.org) retrieved 11/30/11

Worldwide efforts continue with many programs performing Clinical Trials to develop an HIV Vaccine