

Blood and Body Fluid Exposure

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HIV Core Curriculum

November 17, 2015

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Learning Objectives

- * To understand the epidemiology of occupationally acquired HIV
- * To learn the principles of post-exposure evaluation and management for bloodborne pathogens including HIV, and current guidelines
- * To learn strategies to prevent exposures to bloodborne pathogens

Definition and Examples

What Constitutes Blood and Body Fluid Exposure?

- * Percutaneous injury: needlestick or cut with a sharp object such as a scalpel or a blade
- * Contact of mucous membrane with blood, tissue, or other body fluids
- * Contact with non-intact skin, or extensive skin contact with blood, tissue, or other body fluids
- * Other – e.g., Infusion (contaminated syringes, contaminated fluids or medications)

Source and Exposed

- * Source can be a patient, a healthcare worker, or contaminated medication or fluid, any object in the environment
- * Exposed can be a healthcare worker (occupational exposure) or a patient or a visitor

One Friday Afternoon.....

A resident got stuck with an 18-gauge needle while he was placing a femoral line for emergency fluid resuscitation. The patient was a victim of motor vehicle accident, and her past medical history is unknown.

The resident and his wife had been planning for a baby for several months...

Another Friday Afternoon..

- * A patient gets iv fluid infusion through a tubing that was potentially contaminated with someone else's blood.....

Epidemiology

Epidemiology

- * An estimated 600,000 to 800,000 needlestick injuries occur among US healthcare workers every year (NIOSH alert 1999)
- * Incidence: 1.8 per 10,000 EMS calls in a Boston ER
- * 2,273 actively licensed registered nurses from 2 states in the United States – 15.6% recalled needlestick injury within previous 1 year
- * Survey of surgery residents in 17 medical centers: 99% of PGY-5's had needlestick injury

Gross Under-reporting

- * Surgeons in training at 17 medical centers
- * 95% response rate
- * 582 of 699 respondents (83%) reported a needlestick injury during training (99% of the PGY-5s have had a needlestick injury)
- * 53% involving a high risk patient
- * 51% informed their attending
- * 13% informed their significant other

						PPE
Month	UNIT	STAFF	Circumstances	EXPOSURE SITE	Exposure Type	Y/ N
Jan	Surgery	Resident	after a procedure	left thumb	N/S	Yes
Jan	Clinical Decesion Unit	Med Surg Tech	after a procedure	left finger	Puncture	No
Jan	CCU	Med Surg Tech	after accucheck	finger	Laceration	No
Jan	Special Surgery	RN	cleaning area	right thumb	N/S	Yes
Jan	Phlebotomy	Phlebotomist	closing safety needle	Wrist	N/S	Yes
Jan	Corp. Comm.	Mkgt. Coord	cut w ith knife	thumb	Laceration	
Jan	Internal Med	Resident	during a procedure	right thumb	N/S	Yes
Jan	Env. Services	Associate	emptying trash	pinkky finger	N/S	Yes
Jan	Env. Services	Associate	emptying trash	right hand	N/S	Yes
Jan	Inpatient Rehab	RN	needle in pillow	index finger	N/S	
Jan	Chemistry	Med Tech	plastic sealant broken	left finger	Laceration	Yes
Jan	Renal SE	RN	pulling needle out of arm	Right thumb	N/S	Yes
Jan	Chemistry	Lab Tech	rearranging w orksheets	Left arm	Puncture	N
Jan	Nephrology	Resident	recapping needle	thumb	N/S	Yes
Jan	OB/GYN	Resident	removing electrode	right index finger	Laceration	Yes
Jan	Ortho	Resident	suturing	Finger	N/S	Yes
Jan	Ortho	Resident	suturing	finger	Laceration	Yes
Jan	Ortho	Resident	suturing	right hand	N/S	Yes
Jan	EC	RN	transferring blood	left finger	N/S	Yes
Feb	Hartman	Med Surg Tech	after a procedure	lt index finger	N/S	Yes

Example of an Employee Health Spreadsheet: Sharp Injuries

Month	UNIT	STAFF	Circumstances	EXPOSURE SITE	Exposure Type	Y/N
Jan	EC	RN	combative patient	face	spit	Yes
Jan	Transplan	RN	unclamping tube	right eye	blood	Yes
Jan	Anesthetic	Resident	injecting sterile	eyes	blood	No
Jan	EC	EC Tech	IV got tangled	left nostril	blood	No
Jan	Transplan	Med Surg	emptying urine	eyes	urine	Yes
Feb	EC Regist	Specialist	touched by error	right arm	blood	Yes
Feb	EC	Technician	machine malfunction	eyes	blood	
Feb	IPCU	RN	starting IV	fingernails	blood	No

Example of an Employee Health Spreadsheet: Splash injuries

Occupationally Acquired HIV

- * Documented Occupationally acquired HIV infections among healthcare workers 1981-2010:
- * Definite 57 (49 – HIV+ blood; 3 – lab exposure; 1 bloody fluid; four to an unspecified fluid); possible 143 (last 2009)
- * <http://www.cdc.gov/HAI/organisms/hiv/Surveillance-Occupationally-Acquired-HIV-AIDS.html#table>
- * >90% have non-occupational risk factors
- * No updates since May 2011

Evaluation

Is HIV the Only Risk?

- * 26 viruses
- * 18 bacteria/ rickettsia
- * 13 parasites
- * 3 yeasts
- * Important to Watch Out when consulted for BBF Exposure

Sample List

Hepatitis B

HIV

Hepatitis C

Syphilis

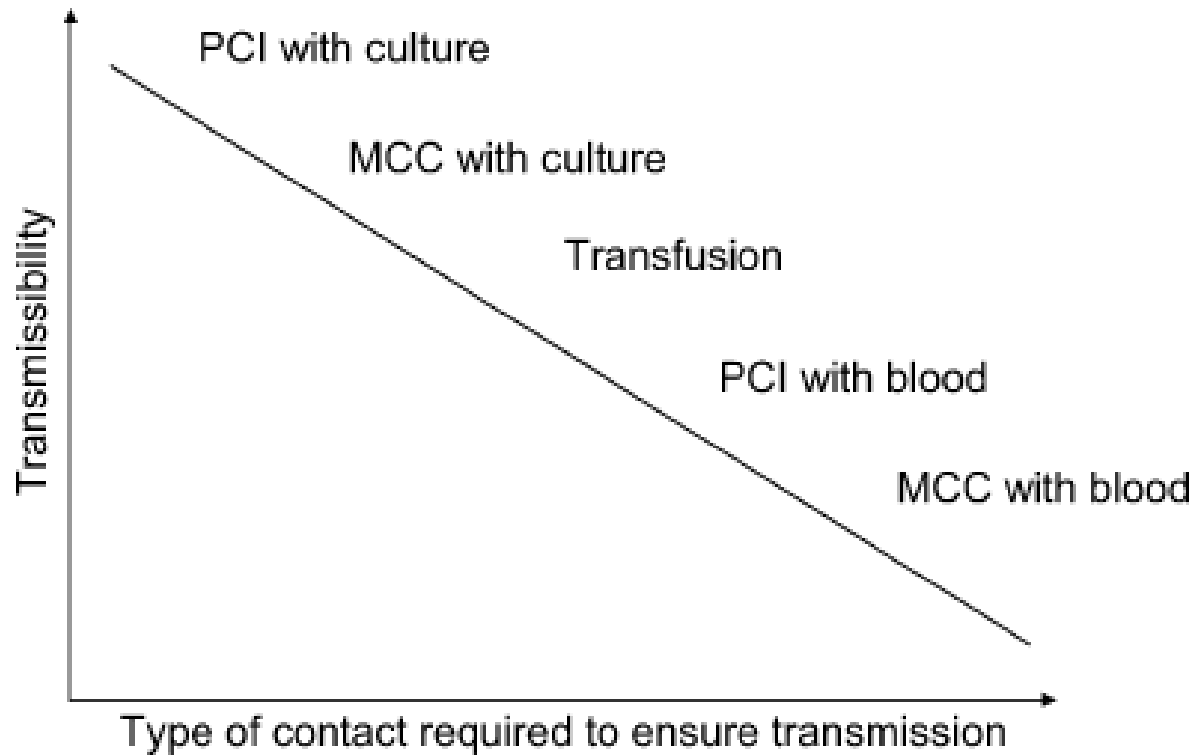
Malaria

Brucellosis

Arboviral infections

Viral hemorrhagic fever

Risk



PCI – percutaneous injury; MCC ~~16~~ mucocutaneous contact

Risk from percutaneous exposure

Organism

HBV

HCV

HIV

Risk

6-30%

1.8% (0-7%)

0.3%

Estimated per-act risk of acquisition of HIV, by exposure route

Exposure Route

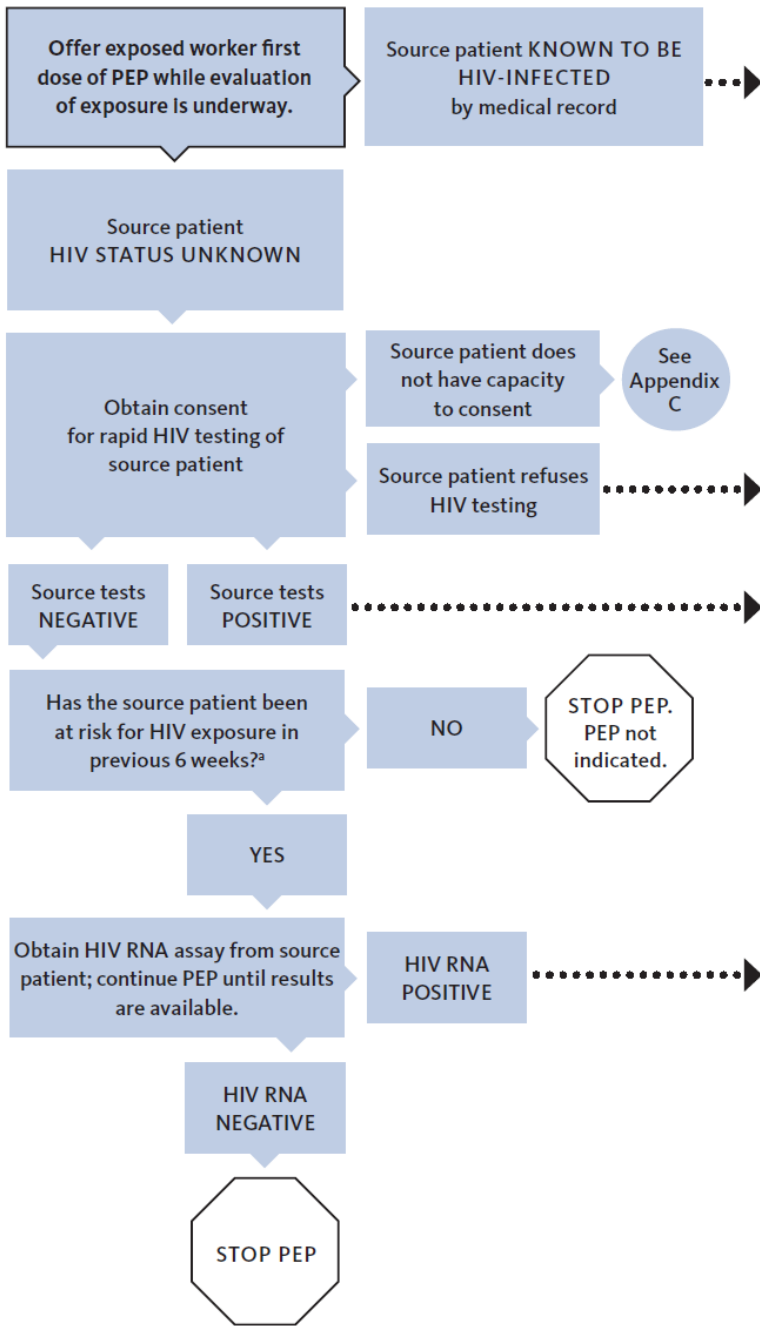
Risk per 10,000 exposures to an infected source

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	5
Receptive oral intercourse	1
Insertive oral intercourse	0.5

Management

After an exposure

- * Initiate local wound care to the exposed site – washing and cleansing; no milking of wound; no bleach or other caustic agents
- * Seek immediate care
- * Inform supervisor
- * Assign someone else to draw labs on source; HIV Ab, HBsAg, HCV, STD screen
- * Occasionally on source: HIV genotype, viral load for HepC or HIV, HBsIgM, etc
- * Post-exposure prophylaxis for HIV within 1-2 hours; can be started even later
- * Emotional counselling



**COMPLETE
28-DAY REGIMEN:
Recommended PEP Regimen^{b,c}**

Tenofovir 300 mg PO qd
+
Emtricitabine^d 200 mg PO qd

PLUS

Raltegravir^e 400 mg PO bid
or
Dolutegravir^e 50 mg PO qd

- Perform baseline confidential HIV testing of the exposed worker and refer to experienced clinician within 3 days of initiating PEP.
- See Tables 4 and 5 for alternative regimens.



Dolutegravir has more convenient dosing but more expensive - \$817 vs. \$586

Post-exposure HIV Prophylaxis

- * Truvada and Raltegravir
- * Customize to source HIV genotype if necessary
- * Avoid drugs that need prior testing
- * Avoid Nevirapine

Reports of HIV PEP failure

TABLE 6. Reported instances of failure of combination drug postexposure prophylaxis (PEP) to prevent HIV-infection among health-care personnel exposed to HIV-infected blood through percutaneous injury

Year of incident	Device	PEP regimen*	Time to first dose (hrs)	No. of days to onset of retroviral illness	No. of days to document seroconversion†	Source-patient		
						HIV-infection status	On anti retrovirals	Virus resistant to antiretrovirals§
1992¶	Biopsy needle	ZDV, ddI	0.5	23	23	AIDS, terminally ill	Yes	Unknown
1996**	Hollow-bore needle	ZDV, ddI††	1.5	45	97	Asymptomatic HIV infection	No	Not tested
1997**	Large or hollow-bore needle	ZDV, 3TC, IDV§§	1.5	40	55	AIDS	Yes	No
1998¶¶	Hollow-bore needle	ZDV, 3TC, ddI, IDV	0.7	70	83	AIDS	Yes	Yes
1999***	Unknown sharp	ddI, d4T, NVP†††	2.0	42	100	AIDS	Yes	Yes
2001§§§	Phlebotomy needle	ZDV, 3TC, IDV¶¶¶	1.6	24	~90	AIDS	Yes	Yes

Post exposure HBV prophylaxis

Vaccination status of exposed HCW*	Antibody Response Status		
	Source HBsAg Positive	Source HBsAg Negative	Source unknown or not available for testing
Unvaccinated	HBIG [†] x 1 and initiate HBV vaccine series	Initiate HBV vaccine series	Initiate HBV vaccine series If known high risk source, treat as if HBsAg positive
Previously Vaccinated			
Known responder ¹	No treatment	No treatment	No treatment
Known nonresponder ²	HBIG x 1 and initiate revaccination or HBIG x 2 ^{††}	No treatment Consider revaccination	If known high risk source, treat as if HBsAg positive
Antibody Response Unknown	Test exposed HCW for anti-HBs** 1. If adequate, ¹ no treatment is necessary 2. If inadequate, ² administer HBIG x 1 and vaccine booster	No treatment	Test exposed HCW for anti-HBs** 1. If adequate, ¹ no treatment is necessary 2. If inadequate, ² administer vaccine booster and recheck titer in 1-2 months

Post exposure HCV prophylaxis

- * No PEP available
- * Follow for acute hepatitis C infection
- * Treat acute hepatitis C if it develops

Testing on the Exposed during Follow-Up Period

Test	Baseline	During HIV prophylaxis	4-6 weeks	3 months	6 months
HIV Ab	X		X	X	
CBC with diff	X	X			
Serum ALT	X	X			
BUN/ Cr	X	X			
STD Screen (Gonorrhea, Chlamydia, Syphilis)	X		X		
HBsAg	X		X	X	X
HepC Ab	X		X	X	X
Pregnancy Test	X				
HCV Viral Load	X		X	X	X

On Campus Procedures

- * PEP regimens same – Parkland, UTSWUH, VA
- * Pediatric considerations at CMC
- * HIV Consult Service is a resource to Occupational Health
- * 24-hr on call pager
- * OHS/ Student Health Clinic during routine hours
- * ER during off-hours

Preventing Exposures in Healthcare Settings

Prevention

- * Standard precautions – hand hygiene, respiratory etiquette, personal protective equipment, safe handling of needles and sharps, safe injection practices
- * Engineering controls: Safety sharps
- * Work practice controls – no recapping, bending cutting of needles or removing them from syringe; not overfilling sharps containers
- * Proper waste disposal in healthcare settings
- * Slowing down for safety and mindfulness

Resources

- * <http://www.hivguidelines.org/clinical-guidelines/post-exposure-prophylaxis/hiv-prophylaxis-following-occupational-exposure/>
- * <http://www.nccc.ucsf.edu/docs/Texas.pdf>
- * <http://www.cdc.gov/niosh/topics/bbp/>
- * Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV. MMWR 2013
- * Warmline: 800-933-3413
- * PEPLine: 888-448-4911
- * Perinatal HIV Hotline: 888-448-8765

Thank You!