

1. Bloodborne pathogens: Human immune deficiency virus (HIV-1)
Hepatitis B virus (HBV)
Hepatitis C virus (HCV)
2. Bloodborne pathogen (BBP) risk correlates with:
 - 1) Hollow-bore needles
 - 2) Needle used within an artery or vein (such as an intravenous or blooddrawing needle)
 - 3) Needle used to aspirate (rather than just inject) material
 - 4) Quantity of BBP virus in the blood (viral load) in the blood of the source patient
 - 5) Depth of NS/wound penetration
3. BBP Prevalence (balanced U.S. population sample)
HIV*: 0.1 – 0.2% (1-2/1000 population)
HIV2 – no cases of transmission in U.S.
HBV: 0.2 – 0.3%
HCV: 1 – 2 %

* 57 definite healthcare workers HIV positive transmission cases by 12/01: 135 possible
4. Seroconversion (negative to positive test) Risk – single stick from patient with active BBP disease
HIV: 0.2 – 0.5% (0.3% average)– 99.7% NS exposures do not result in HIVinfection
HBV: Hepatitis Be antigen negative source patient: 1 – 6%
Hepatitis Be antigen positive: 22 – 40%
(overall, 0.3 – 9.0% in UK)
HCV: 0 – 10% (most studies say about 3%)
5. BBP Virus Viability:
HIV lasts at most several hours outside a living system. Hep B lasts at least a week, if embedded in tissue debris (blood, etc.) or on fomites. BBP viruses must be within living cells to remain viable and to propagate.

So, any significant amount of time that passes, in which a needle or other implement (that is the vehicle for tissue penetration and BBP viral injection) remains fallow with drying/dessication of biological debris, will result in death of the BBP.
6. BBP Time Windows (for effective medical intervention post-exposure)
HIV: hours; the value of post-exposure prophylaxis (PEP) meds beyond 36H is very uncertain.
Hep B: 24 hours
Hep C: none in acute period; possibly, if given interferon/ribavirin within 2-4 weeks of evidence of Hep C virus infection, will result in less chance of chronic active Hep C and/or less severe disease (controversial).
7. BBP Baseline/Monitoring Test Protocols*
IMMEDIATELY: antibody (serology) tests – HIV
ALT
Hepatitis B core antibody**
HCV

Needle-Stick (NS) Exposure Facts

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** May not need if history of Hep B infection or vaccine. In that case, run Hep B surface antibody test; if positive, no further Hep B testing needed.

1 MONTH: Hep C RNA PCR
ALT

HIV antibody

3 MONTHS: Hep B core antibody

HIV antibody (most likely to convert to positive at 6-12 weeks)

6 MONTHS: HIV, Hep C antibodies

12 MONTHS: HIV antibody if Hep C positive – can take longer to see HIV positive

Can do HIV Ab anyway, if patient wishes

* May run some tests (or direct BBP viral tests) sooner if patient develops an atypical illness compatible with BBP acute primary infection.

NOTE: Direct viral tests (PCR, antigens, etc.) are generally not used because,

- 1) Very expensive
- 2) False positives create problems in counseling and decision-making.
- 3) BBP infection is statistically very unlikely post-NS

8. Counseling Post-NS

Pending results of BBP tests (especially the first 6-12 weeks post-exposure when conversion to a positive test is most likely).

*High-risk exposures

- a. No breastfeeding*
- b. Protected sex x 3 months*
- c. Avoid pregnancy x 3 months*
- d. No blood donation
- e. HIV Meds

- 1) When HIV status of source patient unknown, meds generally not recommended unless high-risk context (sick patient with history HIV-risk behavior).
- 2) Must take meds x 1 month (per animal studies on prophylactic efficacy).
- 3) Start within hours of exposure, not days
- 4) Non-adherence to 4wk med course completion: 17-47%
- 5) HIV med adverse effects: 47% - fatigue, malaise, nausea (26.5%)
- 6) Start treatment immediately, with option to stop within several days after consideration of risk/benefit analysis and all new facts (such as complete information on BBP/health status of source patient).
- 7) Vast majority of persons do not develop HIV, even if they do not take meds.
- 8) Safety and efficacy data on HIV med prophylactic treatment are incomplete.
- 9) To date, only AZT has been proven to prevent HIV.
- 10) No data prove that combination HIV treatment (multiple drugs) is more effective than single-drug treatment for HIV transmission prevention.

f. Other:

Hep B: HBIG + vaccine

Hep C: Interferon + ribavirin 2-4weeks post-exposure (? treat acute Hep C infection)

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