



**What YOU  
NEED  
To Know**

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Pre-Hospital Post  
Significant Exposure  
Guide

# Introduction:

If you are reading this, you have been involved in some type of exposure. This was designed as a tool to help you through the process.

There is some important information here, which may calm your fears and anxiety.

(The following article was written by a group of 10 different doctors from the San Francisco metropolitan area)



## Risk of Transmitting the Human Immunodeficiency Virus, and Hepatitis B Virus to Health Care Workers Exposed to Patients with AIDS

This prospective cohort study was designed to evaluate the risk of occupational transmission of Human Immunodeficiency Virus (HIV), and Hepatitis B virus (HBV), to health care workers **with intensive exposure to HIV-infected patients**. 75% of the 270 subjects had been exposed to patients with AIDS for at least one year before enrollment, 18% worked in specialized AIDS units, and 35% sustained a total of 342 accidental parenteral exposures to HIV-infected body fluids.

**None of the 175 subjects retested 10 months later had acquired the HIV antibody!**

These results indicate that health care workers are at minimal risk for HIV, and HBV transmission from occupational exposure to patients with AIDS, even when intensively exposed for prolonged periods of time.



So take a deep breath. Let's move on...

## What To Do Immediately After an Exposure:

1. Wash the penetration site with soap and water
2. Flush splashes to the nose, mouth, or skin with water
3. Irrigate eyes with clean water, or saline

Note: No scientific evidence shows that using antiseptics or squeezing the wound will reduce the risk of transmission of a bloodborne pathogen. Using a caustic agent such as bleach is not recommended.

## How Are We Getting Exposed?

\*Percutaneous injuries (injuries through the skin) with contaminated sharp instruments such as needles and scalpels (82%)

\*Contact with mucous membranes of the eyes, nose, or mouth (14%)

\*Exposure of broken or abraded skin (3%)

\*Human bites (1%)



## Needlestick Exposure:



Needlestick Injuries are the most common type of pre-hospital exposures and considered the most dangerous.

**The Good News:** Fortunately, most needlestick injuries do not result in exposure to an infectious disease, and of those that do, the majority do not result in the transmission of infection.

**The Bad News:** Needlestick exposures were associated with 89% of the documented work related acquired infections.

It is estimated that annually there are 66,000 infections with HBV, 16,000 with HCV, and 1,000 with HIV worldwide. In addition, a needlestick injury may lead to significant stress and anxiety for the affected injured person.

Hepatitis B carries the greatest risk of transmission, with 37 to 62% of exposed workers eventually showing seroconversion and 22 to 31% showing clinical Hepatitis B infection. The hepatitis C transmission rate has been reported at 1.8%, but newer, larger surveys have shown only a 0.5% transmission rate. The overall risk of HIV infection after percutaneous exposure to HIV-infected material in the health care setting is still 0.3%.



**The specific risk of a single injury depends on a number of factors when the patients harbor the virus of concern.** Injuries with a hollow-bore needle, deep penetration, visible blood on the needle, a needle that was located in a deep artery or vein, or with blood from terminally ill patients are known to increase the risk for HIV infection.

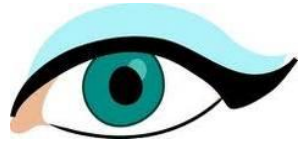
While the vast majority of needlestick injuries occur when the source-person does not carry the HBV, HCV, and HIV and thus do not carry a risk of infection, these events nevertheless cause stress and anxiety and signal a breakdown in protocol and prevention.

**Important:** Needlestick injuries may occur not only with freshly contaminated sharps, but also, after some time, with needles that carry dry blood. While the infectiousness of HIV and HCV decrease within a couple of hours, HBV remains stable during desiccation and infectious for more than a week.

# What You Need To Know about a Mucous Membrane Exposure:

The risk of converting after being exposed to a Mucous Membrane is very small. There is a 0.09 % risk of HIV transmission after a mucous membrane exposure to HIV infected blood. The risk of transmission of **HepB** and **HepC** has not been documented well. It is believed that it is less than in a percutaneous injury, but it is not negligible.

What body fluids are potentially infectious during an occupational exposure?



When evaluating occupational exposures to fluids that might contain Hepatitis B virus (HBV), Hepatitis C virus (HCV), or Human Immunodeficiency Virus (HIV), health care workers should consider that all blood, body fluids, secretions, and excretions contain transmissible infectious agents. Blood contains the greatest proportion of infectious bloodborne virus particles of all body fluids and is the most critical transmission vehicle in the health-care setting. If blood is not visible within the fluid, it is still likely that very small quantities of blood are present, but the risk for transmitting HBV, HCV, or HIV is extremely small in this situation. Despite this small transmission risk, a qualified health care professional should evaluate any occupational exposure to fluids, regardless of visible blood.

# HIV Facts:

## What is HIV?

HIV (human immunodeficiency virus) is the virus that causes AIDS. This virus may be passed from one person to another when infected blood, semen, or vaginal secretions come in contact with an uninfected person's broken skin or mucous membranes\*. In addition, infected pregnant women can pass HIV to their baby during pregnancy or delivery, as well as through breast-feeding. People with HIV have what is called HIV infection. Some of these people will develop AIDS as a result of their HIV infection.



## What is AIDS?

AIDS stands for Acquired Immunodeficiency Syndrome.

Acquired – means that the disease is not hereditary but develops after birth from contact with a disease causing agent (in this case, HIV).

Immunodeficiency – means that the disease is characterized by a weakening of the immune system.

Syndrome – refers to a group of symptoms that collectively indicate or characterize a disease. In the case of AIDS this can include the development of certain infections and/or cancers, as well as a decrease in the number of certain cells in a person's immune system.

## What causes AIDS?

AIDS is caused by infection with a virus called human immunodeficiency virus (HIV). This virus is passed from

one person to another through blood-to-blood and sexual contact. In addition, infected pregnant women can pass HIV to their babies during pregnancy or delivery, as well as through breast-feeding. People with HIV have what is called HIV infection. Some of these people will develop AIDS as a result of their HIV infection.

## How does HIV cause AIDS?

HIV destroys a certain kind of blood cell (CD4+ T cells) which is crucial to the normal function of the human immune system. In fact, loss of these cells in people with HIV is an extremely powerful predictor of the development of AIDS. Studies of thousands of people have revealed that most people infected with HIV carry the virus for years before enough damage is done to the immune system for AIDS to develop. However, sensitive tests have shown a strong connection between the amount of HIV in the blood and the decline in CD4+ T cells and the development of AIDS.

Reducing the amount of virus in the body with anti-retroviral therapies can dramatically slow the destruction of a person's immune system.



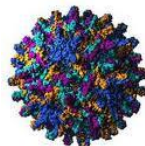
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# Hepatitis B Facts:

**HepB Question: What is it?** Hepatitis B infection is a liver disease caused by the hepatitis B virus. Symptoms may include fever, lack of energy, nausea, vomiting, and abdominal pain followed by jaundice (yellow color to the skin or whites of the eyes and dark urine). Some persons, who have hepatitis B, including younger children, have no symptoms. A small number of hepatitis B infections are rapidly fatal. Although most infected persons recover completely, some develop chronic infection, and can spread this infection. Cirrhosis (scarring of the liver) and liver failure are serious risks with this disease, but may take decades to develop.

How common is hepatitis B?



There are 50 to 100 newly diagnosed acute hepatitis B cases in Washington each year and an estimated 20,000 persons chronically infected.

## HepB Question: How is it spread?

The virus is spread by blood, serum, or sexual fluids of an infected person even if the person has no symptoms. This can happen by sharing needles or having sex with somebody infected with hepatitis B. Transmission can also occur for people living together for a long time in the same household or institution. Infected women can pass the virus to their babies. Donated blood is now tested to prevent spreading hepatitis B but

in the past some cases resulted from blood transfusion. Medical personnel are at risk of exposure due to needle sticks.



## HepB Question: How soon do symptoms appear?

Usually within 60 to 90 days of infection, but can take as long as six months

# Hepatitis C Facts:

## HepC Question: What is it?

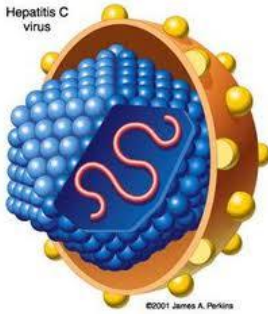
HCV infection is the most common blood-borne infection in the United States. Hepatitis C is a liver disease caused by the hepatitis C virus. Many persons who have hepatitis C have no symptoms. Symptoms may include fever, lack of energy, nausea, vomiting, abdominal discomfort and jaundice (yellow color to the whites of the eyes or skin and darkening of urine). Most infected persons develop chronic, long-term hepatitis C (carrier) and can spread the infection. Cirrhosis (scarring of the liver) and liver failure are serious risks with this disease, but may take decades to develop.

## HepC Question: How common is it?

It is estimated that almost 4 million persons in the U.S. are infected with hepatitis C. It accounts for most of the hepatitis cases that used to be referred to as non-A, non-B hepatitis. Hepatitis C is the leading cause for liver transplantation and

accounts for nearly 8,000-10,000 deaths each year in the U.S.

## Hep C Question: How is it spread?



The virus is spread mainly by direct contact with the blood from an infected person. About 80% of people who have ever injected street drugs and/or shared injection drug equipment are infected with hepatitis C. It can also be spread when health

care workers are exposed to an infected person's blood, or through organ transplants or blood transfusions, especially those received prior to the development of a hepatitis C test in the early 1990s. Infected mothers can pass the virus to their babies but this is thought to occur at a low rate and accounts for about 5% of cases in the United States. The risk of sexual transmission also appears to be low, accounting for about 5% of cases in this country. Other persons at risk include kidney dialysis patients.

Hepatitis C is not spread by sneezing, coughing, hugging, sharing eating utensils or drinking glasses, or other casual contact. It is not spread by food or water.



## HepC Question: How soon do symptoms occur?

Many people with hepatitis C have no symptoms. If symptoms occur, they do so an average of six to seven weeks after exposure but may occur two weeks to six months after exposure.

## HepC Question: When and for how long is a person able to spread Hep C?

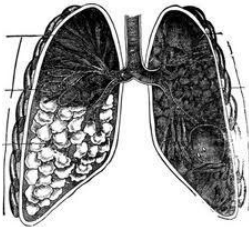
Some people carry the virus in their blood for the rest of their lives. Acute hepatitis C infection may be followed by recovery but usually becomes chronic and causes symptoms for years. An infected person with no symptoms can still spread hepatitis C to others.

## HepC Question: Is there a vaccine available?

Not yet. While there are vaccines for both hepatitis A and B, they do not provide protection against hepatitis C. There is no vaccine for hepatitis C because the virus changes easily, making it very difficult to develop an effective vaccine.

# What I Need To Know About TB:

**TB** is considered a moderate exposure and not an immediate time sensitive issue. After being notified there has been an exposure, you must have a PPD within 10 days at a facility of your department's choosing to obtain a baseline. You will receive another PPD test to determine if you have been exposed. Tuberculosis exposure is detected through a test known by its initials,



"PPD" which stands for Purified Protein Derivative. (*We all received this test after we were hired.*) In this test, a small amount of purified TB protein (which is not capable of causing disease) is injected just under the skin. If the body has been exposed to TB previously, the immune system

will recognize and attack the protein, causing localized redness. A nurse or physician reads the test negative, or indeterminate. If the test is positive, the individual has most likely been exposed to TB at some point, and should be referred to an Infectious Disease doctor for treatment.

**Update:** In December 2002, the FDA approved a new TB blood test. This new test by Cellestis is called QuantiFERON-TB or QFT. QuantiFERON-TB is based on a blood test, it doesn't require a second visit and it eliminates reader bias or confusion common with the old TB test where people looked at their arms and wondered, "Is this really a positive or not?"

# Source TESTING:

## For Blood Borne Exposures...



The source will be tested for HIV and the various forms of hepatitis as soon as consent has been obtained. If it is impossible to draw blood from the source individual, but some other sample of his or her blood was drawn for any other reason, this sample legally can be used. If the source individual is unable or unwilling to give consent, the EMS organization should consider seeking the legal authority to act without his or her consent. This can be obtained through a court order.

Concerning bloodborne exposures, time is an issue. A Rapid HIV test should be conducted in “*hours, but not days*” from the time of the exposure. The use of rapid HIV testing has become the standard and has eliminated the need to place healthcare workers on very toxic drugs even for short periods of time. The test takes approximately thirty minutes to one hour to complete. This test is able to identify the HIV-1 antibody as soon as two weeks after an exposure.

Some protocols state that if the source of the exposure is found to be negative with a Rapid HIV test, the physician is not going to offer or prescribe treatment medications. The chances of converting HIV from a recent infection outweigh the potential risks of taking the “HIV Cocktail”. But, you can still request treatment.

After your Rapid HIV test, you will have baseline blood tests drawn for Hep B and C. This may be done in the ER or at another facility on the following day per each department’s protocols.

## Question: What about exposures to blood from an individual whose infection status is unknown?

If the source individual cannot be identified or tested, decisions regarding follow-up should be based on the exposure risk and whether the source is likely to be a person who is infected with a bloodborne pathogen.

## TREATMENT FOR YOUR EXPOSURE:



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### What is Post Exposure Prophylaxis (PEP)?

PEP is just what the name suggests: prophylaxis or preventative medications given after an exposure in hopes of decreasing the likelihood of infection from the exposure. The PEP medication combinations used depends on the degree of exposure and the status of the source of the exposure. But before any medications are prescribed, it has to be determined if PEP is indicated and appropriate.

#### When is PEP Indicated?

The following scenarios warrant PEP.



#### Two Drug PEP Recommended:

1. Exposure to asymptomatic HIV+ person by solid needle stick or superficial injury that break the skin.
2. A mucous membrane exposure to a large volume of HIV infected blood that's source is symptomatic.
3. A mucous membrane exposure to a small volume of HIV infected blood that's source is symptomatic.

Three Drug PEP Recommended:

1. Exposure to asymptomatic HIV+ person via deep puncture from a large bore hollow needle
2. A puncture from a needle with visible blood on the needle
3. A puncture from a needle used in a patient's vein or artery

Two Drug PEP under Certain Circumstances:

1. Needle stick with any type needle and any degree of exposure if the source has an unknown HIV status but has HIV risk factors
2. Needle stick with any type needle and any degree of exposure if the source has an unknown HIV status and unknown risk factors but a setting in which exposure to HIV+ persons is likely
3. A mucous membrane exposure to any volume of blood whose source has an unknown HIV status but has HIV risk factors
4. A mucous membrane exposure to any volume of blood whose source has an unknown HIV status but is in a setting where HIV exposure is likely





NO PEP Warranted:

1. Any needle stick injury involving a known HIV negative source
2. A mucous membrane exposure to any volume of HIV negative blood

## Question: What Medication Combination is Used?

PEP regimens are chosen depending on the type of exposure. Typically regimens are prescribed for a four-week period. PEP should be started within hours of the potential exposure not days. The sooner PEP is begun the better.

Preferred Two-Drug Regimen:

1. Option One- **Combivir** (Retrovir + Efavirenz) twice daily is typically substituted for ease of administration. This twice a day regimen is a bit harder to take but is recommended in pregnancy.
2. Option 2- **Truvada** (Tenofovir + Emtricitabine) taken once daily. This one drug regimen is easier to take but does have the risk of liver toxicity.

Preferred Three-drug Expanded Regimen:

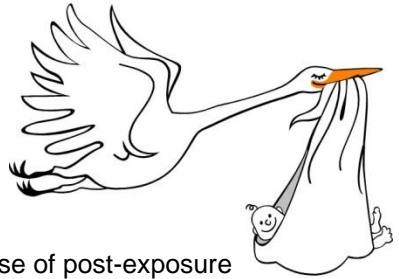
1. Basic two drug regimen option 1 or 2 above with the addition of **Kaletra** (Lopinavir + Ritonavir) twice daily.

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## The Last Word on PEP

PEP is a viable option for occupational exposures to HIV. While it is not without its downfalls, it is effective in reducing the risk of HIV infection from a needle stick. But, without addressing the problem of needle sticks, more people are going to become infected by this route, health care cost will continue to rise and the epidemic will continue to grow

## Treatment and Pregnancy:



### HIV

Pregnancy should not rule out the use of post-exposure treatment when it is warranted. If you are pregnant you should understand what is known and not known regarding the potential benefits and risks associated with the use of antiviral drugs in order to make an informed decision about treatment.

### HBV

Yes. Women who are pregnant or breast-feeding can be vaccinated against HBV infection and/or get HBIG (Hepatitis B immune globulin, which contains antibodies to hepatitis B virus and offers prompt but short lived protection.) Pregnant women who are exposed to blood should be vaccinated against HBV infection, because infection during pregnancy can cause severe illness in the mother and a chronic infection in the newborn. The vaccine does not harm the fetus.

## **TB**

Pregnant women with TB must be given adequate therapy as soon as TB is suspected. The preferred initial treatment regimen is isoniazid, rifampin, and ethambutol (ethambutol may be excluded if primary isoniazid resistance is unlikely). Streptomycin should not be used because it has been shown to have harmful effects on the fetus. In addition, pyrazinamide should not be used routinely because its effect on the fetus is unknown. Because the 6-month treatment regimen cannot be used, a minimum of 9 months of therapy should be given. To prevent peripheral neuropathy, it is advisable to give pyridoxine (vitamin B<sub>6</sub>) to pregnant women who are taking isoniazid.

The small concentrations of TB drugs in breast milk do not have a toxic effect on nursing newborns, and breast-feeding should not be discouraged for women undergoing anti-TB therapy. Similarly, drugs in breast milk should not be considered effective treatment for disease or infection in a nursing infant.

# FOLLOW-UP AFTER AN EXPOSURE:

Remember: **YOU** are responsible to keep track of your own follow-up schedule.

What follow-up should be done after your exposure?

## HIV

- Perform HIV-antibody testing for at least 6 months postexposure (e.g., at baseline, 6 weeks, 3 months and 6 months.)
- Perform HIVB antibody testing if illness compatible with an acute retroviral syndrome occurs.
- Evaluate exposed persons taking post exposure meds within 72 hours after exposure and monitor for drug toxicity for at least 2 weeks.

## HBV

- Perform follow-up anti-HBs testing in persons who receive hepatitis B vaccine
  - Test for anti-HBs 1-2 months after last dose of vaccine.
  - Anti-HBs response to vaccine cannot be ascertained if HBIG (Hepatitis B Immune globulin) was received in the previous 3-4 months.



-Check again at 6 months if no antibody detected.

## **HCV**

- Perform baseline and follow-up testing for anti-HCV 4-6 months after exposures.
- Perform HCV RNA at 4-6 weeks if earlier diagnosis of HCV infection desired.
- Confirm repeatedly reactive anti-HCV enzyme immunoassays (EIAs) with supplemental tests.

## **TB**

Within 10 days perform baseline PPD and at 10-12 weeks perform follow-up testing for TB exposure. If indicated by development of symptoms of active disease or a PPD skin test conversion, follow with an Infectious disease physician. Understand that once treatment begins, a patient ordinarily quickly becomes noninfectious; that is, they cannot spread the disease to others.



## Treatment Precautions:

### HIV

During the follow-up period, especially the first 6-12 weeks when most infected persons are expected to show signs of infection, you should follow recommendations for preventing transmission of HIV. These include not donating blood (for one year), semen, or organs and not having sexual intercourse. If you choose to have sexual intercourse, using a condom consistently and correctly may reduce the risk of HIV transmission. You must also continue to use a condom at least 30 days after you discontinue the drug regimen. In addition, women should consider not breast-feeding infants during the follow-up period to prevent exposing their infants to HIV in breast milk.

HBV If you are exposed to HBV and receive post-exposure treatment, it isn't likely that you will become infected and pass the infection on to others.

No precautions are recommended.

## **HCV**

No precautions are recommended.

## **TB**

During follow-up you must never deviate from your medication schedule. After you have successfully started treatment for tuberculosis, within a short time you are no longer able to pass it on to others. Re-infection in a normal healthy person is rare. However, in rare circumstances it may be possible to become re-infected, particularly if the immune system becomes compromised for any reason.

If a person has resistant TB, he/she can remain infectious to others for a longer period of time.

# **APPENDIX:**

## **HIV:**

**CDC National AIDS Hotline  
(1-800-342-2437)**

Information specialists here can answer questions or provide information on HIV infection, AIDS and the resources available in your area.

**[www.AIDSmeds.com](http://www.AIDSmeds.com)**

**www.TREATHIV.com**

**The HIV/AIDS Treatment Information Service  
(1-800-448-0440)**

can also be contacted for information on the clinical treatment of HIV/AIDS.

For free copies of printed material on HIV infection and AIDS, please call or write:

**CDC National Prevention Information Network**

P.O. Box 6003, Rockville, MD 20849-6003,

1-800-458-5231

Internet address [www.cdcnpin.org](http://www.cdcnpin.org)

Additional information about occupational exposures to Bloodborne pathogens is available on CDC's Hospital Infections

Program's website at [www.cdc.gov/hai/](http://www.cdc.gov/hai/) or on CDC's National Institute of Occupational Safety and Health's website at

[www.cdc.gov/niosh](http://www.cdc.gov/niosh) or call

1-800-35 NIOSH (1-800-356-4674).

## **Hepatitis:**

For additional information about Hepatitis B and hepatitis C you can call the *hepatitis information* line at

**1-888-4-HEPCDC (1-888-443-7232)**

Or visit **CDC's** hepatitis website at

<http://www.cdc.gov/hepatitis/>

**The Vaccine Adverse Event Reporting System**

1-800-822-7967



# **Tuberculosis:**

**AG Holly State Hospital TB Hotline-**  
1-800-4TB-INFO

**AG Holly TB State Hospital Web Site-**  
[www.doh.state.fl.us/agholley/](http://www.doh.state.fl.us/agholley/)

**Orange County Health Department**  
[www.orch](http://www.orch)