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## Nonoccupational Needlestick Injuries

*Several serious infections can be transmitted through needlestick exposures: human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), and tetanus. Recommendations regarding prophylaxis after a needlestick or sharp injury are clearly defined for health care workers. In a health care setting, these types of employee injuries are evaluated and treated immediately according to strictly defined protocols. Are guidelines for health care workers applicable outside a health care setting? What should be done when someone intentionally sticks another person with a needle?*

The risk of transmission of bloodborne infections in a health care setting varies by the type of disease. Risk factors are related to the source (previous user), type of injury (ie, the amount of blood present, the depth of the stick, and whether or not the needle had a hollow bore), duration of employment, and vaccination status of the person who was stuck with the sharp object.<sup>1</sup> The risk of infection after percutaneous exposure to infected blood, depending on the type of infection, ranges from 0.3% to 40%.<sup>2</sup> This finding is based on prospective studies of health care workers who were exposed at work to blood infected with HIV, HBV, or HCV. The risk of transmission outside the health care setting is probably much lower.

Outside the health care setting, an exposure is classified as a **high-risk needlestick** when the source of the needle is known and is positive for HIV, HCV, or HBsAg (hepatitis B surface antigen).<sup>3</sup> A **low-risk needlestick** occurs when the needle was found on the street, beach, park, or other public location.<sup>3</sup> In situations of low-risk needlesticks, tetanus infection is of greater concern than are bloodborne diseases.

Over the past few years, the Texas Department of Health (TDH) has had an increase in the number of reported incidents where children bring needles to school and stick other children. Three incidents were reported to the Infectious Disease Epidemiology and Surveillance Division during the 1996-97 school year.

A child had taken an 18-gauge needle that his father used to remove splinters at work. The child brought the needle to school and poked 9

other children in succession with the needle. Initially, parents were concerned that the needle might have been found in an area where injecting drug users met. The father and all the children who sustained a needlestick injury were tested and found to be seronegative for selected bloodborne infectious agents, including HIV, HBV, and HCV.

On another occasion, at a different school, a child put a hypodermic needle into a pen and jabbed a number of children. It was later learned that the child had brought the needle from home, where a diabetic grandparent had used it for insulin injections. A more recent injury occurred when a child sustained a needlestick while participating in a community clean-up project. The child was stuck by a needle lying on the ground while he was working with volunteers cleaning up a community park.

Since these incidents continue to occur in Texas, the TDH Infectious Disease Epidemiology and Surveillance Division in cooperation with the Bureau of HIV and STD Prevention have developed the following protocol for management of needlestick and other sharp object injuries that potentially expose the general public to bloodborne pathogens. These recommendations may be used as a guideline for school officials or physicians when these

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types of injuries occur. A brief description of diseases associated with needlesticks and the appropriate postexposure follow up for each condition are provided below.

## HIV

HIV is the virus that causes acquired immunodeficiency syndrome (AIDS). The virus can be passed from a person infected with the virus to another through blood-to-blood and sexual contact. AIDS damages the immune system, greatly reducing its capacity to effectively protect the body against disease. HIV can be transmitted under the following conditions:<sup>4</sup>

- ◆ An uninfected person comes in contact with HIV-infected blood while sharing needles or syringes with someone who has the virus. It also can be transmitted by an accidental needlestick from an infected source.
- ◆ An uninfected person has intimate sexual contact that involves transfer of HIV-infected blood, semen and vaginal/cervical secretions from an infected person.
- ◆ An HIV-infected mother transmits the virus to her baby during pregnancy or during delivery.
- ◆ An HIV-infected mother breastfeeds her newborn.

In the event of a nonoccupational needlestick injury, the HIV status of the source of the exposure should be determined if possible. If the HIV status of the source cannot be determined, the child should be tested for HIV at the time of the initial exposure or as soon as possible after the initial exposure. Repeat testing should be done at 6 weeks, 12 weeks, and 6 months after the exposure. If the source is known to be HIV-positive, the exposed child should be examined immediately by a physician and testing should proceed according to the above protocol. If the physician thinks it

is warranted, chemoprophylaxis should be initiated, ideally within 24 hours.<sup>5</sup>

## Hepatitis B Virus

Hepatitis B is a viral infection that primarily affects the liver. Exposure can occur through contact with blood and body fluids of an infected person while having intimate sexual contact, sharing drug needles, giving birth, or sharing razors and toothbrushes. Needlestick injuries may be a route of exposure to the hepatitis B virus if the needle has come in contact with the blood of a person infected with this virus. The dose and viral concentration of the exposure determine whether the person with a needlestick injury contracts hepatitis B. In the health care setting, estimates of infections after occupational exposures to needlesticks from an infected source have ranged from 2% to 40%,<sup>1</sup> depending on the infectivity of the source.

Postexposure treatment for hepatitis B infection (HBV) depends on the immunization status of the exposed person and the infectivity of the source. If the source of the needle is known and consent can be obtained from the person who used the needle, this person should be checked for hepatitis B surface antigen (HBsAg), which indicates whether or not the person is a carrier of the virus. If the source is positive for HBsAg, and the exposed person has not been vaccinated against hepatitis B, postexposure treatment is necessary to prevent possible infection. When indicated and if possible, HBV hyperimmune globulin (HBIG) should be given within 24 hours of an exposure; the value of HBIG beyond 7 days is unclear. If the hepatitis B status of the source cannot be determined within 7 days, the exposed person should be treated according to guidelines that apply when the source is untested or unknown.

Developed by the Centers for Disease Control and Prevention (CDC), the guidelines presented in Table 1 describe appropriate prophylaxis of hepatitis B infection following needlestick exposures.<sup>6,7</sup>

*Continued* ☛

**Table 1. Prophylaxis\* of Hepatitis B Infection (HBV) Following Needlestick Exposures**

Status of exposed person	Treatment when source is HBsAg-positive**	Treatment when source is HbsAg-negative	Treatment when source is not tested or unknown
Unvaccinated	1 dose of HBV hyperimmune globulin (HBIG) (0.06 ml/kg) plus hepatitis B vaccine series	Initiate hepatitis B vaccine series	Initiate hepatitis B vaccine series
Previously vaccinated Known responder	Test exposed for antibodies to hepatitis B surface antigen (anti-HBs): - If $\geq 10$ mIU/ml, no treatment; - If $< 10$ mIU/ml, 1 hepatitis B booster dose	No treatment	No treatment
Known nonresponder to vaccine	2 doses of HBV hyperimmune globulin 1 month apart or 1 dose of HBV hyperimmune globulin plus 1 dose of hepatitis B vaccine	No treatment	If known high-risk source, may treat as if source were HBsAg-positive***
Response unknown	Test exposed for anti-HBs: - If $\geq 10$ mIU/ml, no treatment; - If $< 10$ mIU/ml, 1 dose of HBV hyperimmune globulin and 1 booster dose of vaccine - Anti-HBs titer unknown, 1 booster dose of vaccine	No treatment	Test exposed for anti-HBs - if $\geq 10$ mIU/ml, no treatment; - if $< 10$ mIU/ml, hepatitis B vaccine booster dose

\* Prophylaxis, if indicated, should begin within 24 hours after exposure if possible, but no later than 7 days postexposure.

\*\* In most nonoccupational situations, the status of the source will not be known.

\*\*\* A **high-risk needlestick** occurs when the source of the needle is known and the source is HIV, HCV, or HBsAg positive. A **low-risk needlestick** occurs when the needle was found on the street, beach, park, or other public location.

Effective August 1, 1998, children who are 5 years old or older and were born on or after September 2, 1992, must have received 3 doses of hepatitis B vaccine prior to entering kindergarten or prekindergarten in Texas.<sup>8</sup> Furthermore, the current hepatitis B prevention strategy in the US includes catch-up immunization of adolescents born on or after January 1, 1982, who are at least 11 years old, and infants and children born on or after January 1, 1991. Therefore, in the future, it is likely that the majority of Texas school children will have been vaccinated against HBV. It will remain important, however, to check the immunization status of children in determining the appropriate actions after needlestick exposures have occurred.

## Hepatitis C Virus

Hepatitis C is a viral infection that also primarily affects the liver. Unlike hepatitis B, there currently is no vaccine available to prevent this infection. CDC does not recommend the use of immune globulin for postexposure prophylaxis against hepatitis C. Hepatitis C is most often spread by percutaneous (through the skin) exposures to blood of an infected person. This route of exposure could occur through transfusion of blood or blood products (rare now because of screening of donors/blood at blood banks), contaminated needles shared among injecting drug users, and needlestick exposures from a source who has hepatitis C. For health care workers, the risk of contracting hepatitis C from a

*Continued* ↻

needlestick exposure to infectious blood is approximately 3.5%,<sup>9</sup> with a range of 3% to 10%.<sup>2,10</sup>

When needlestick exposures occur, the source should be tested for hepatitis C virus (HCV) antibodies if possible. If positive, the person exposed to the needlestick should also be tested for HCV antibodies soon after exposure and then have follow-up testing for antibody 6 months after exposure. If the HCV status of the source is unknown or unavailable, it should be determined whether the needle came from a high-risk source such as an injecting drug user. If so, or if risk cannot be determined, the exposed person should have baseline and 6-month follow-up testing for antibodies to HCV. CDC recommends that all anti-HCV results reported as repeatedly reactive (positive) by enzyme immunoassay (EIA) be confirmed by supplemental anti-HCV testing. Persons who test positive for antibodies to HCV on the 6-month follow up should also have a liver function test (alanine aminotransferase [ALT]) to identify chronic hepatitis. Up to 85% of persons with HCV infection develop chronic hepatitis, and at least 20% of these persons develop cirrhosis within 2 decades of the onset of infection.<sup>10</sup>

## Tetanus

Tetanus (lockjaw) is a neurologic disease characterized by severe muscular spasms caused by the neurotoxin produced by *Clostridium tetani* in a contaminated wound. *Clostridium tetani* is a normal inhabitant of animal and human intestines and the soil. It is ubiquitous in the environment but found much more frequently at sites that might have been contaminated by feces from animals or humans. Wounds, recognized or unrecognized, are the sites at which the organism multiplies and elaborates toxin; wounds with dead tissue and deep puncture wounds are at greatest risk. Widespread immunization against tetanus has decreased the incidence of this infection. A needle or sharp object that

has been lying on the ground for an unknown period of time may be contaminated by the *Clostridium tetani* bacilli. Anyone stuck with a sharp object should be sure that his or her tetanus immunization is up-to-date. If the person has completed the primary series of tetanus toxoid, a booster dose of tetanus toxoid is necessary every 10 years. It is not necessary for a person with a minor wound from a sharp instrument to receive tetanus toxoid unless 10 years have elapsed since the last dose was received.

Use tetanus immune globulin when

- ◆ the patient's personal history of active immunization with tetanus toxoid is unknown or uncertain
- ◆ the person has received fewer than 3 doses of tetanus toxoid
- ◆ the person has received 3 prior doses of tetanus toxoid, but a delay of 24 hours or longer has occurred between the time of injury and initiation of tetanus prophylaxis

## Protocol

In summary, once a needlestick injury has occurred, the following protocol will help school officials and health care providers determine and provide the appropriate postexposure follow up and treatment.

1. Clean the wounds with soap and water.
2. Identify all the injured persons by thoroughly investigating the incident.
3. Get as much information about the sharp object or needle as possible. This information should include where the needle was found, who the previous user was, and how the needle may have been used prior to the injury. This information will help medical personnel make the appropriate follow-up recommendations.

Continued ◀

4. While the risk of transmission of bloodborne infections in a school population is probably small, it is prudent to provide available prophylaxis when indicated.
5. All persons who were stuck with the needle should begin the hepatitis B vaccine series if not already vaccinated.
6. HIV testing should be done at the time of the injury and repeated at 6 weeks, 12 weeks, and 6 months after exposure. If the source is known to be HIV-positive and/or the incident involves a high-risk needlestick, the child should be referred to his or her physician for consideration of chemoprophylaxis.
7. Hepatitis C testing should be done at the time of the injury and repeated in 6 months if the source of exposure is either HCV-positive or unknown.
8. A tetanus booster should be administered to all injured persons who have not had a tetanus booster within the last 10 years.

## Prevention

Parents should be aware that needlestick injuries carry a possible, although minimal, risk of transmitting bloodborne infections. To reduce the risk of children being stuck with contaminated needles, parents should talk with their children about the dangers of picking up or handling discarded needles. They should explain the ways infections can be spread when children are stabbed with used or discarded needles. Most importantly, children should be instructed to tell their parents or another adult when an injury occurs so that appropriate medical intervention may be provided.

*For further information on HIV contact Linda S. Moore at (512)490-2505. For further information on the other conditions described in this article and needlestick injuries contact either Beverly Ray or Jean Brender at (512)458-7676.*

Prepared by Beverly Ray, RN, CIC, Jean Brender, RN, PhD, TDH Infectious Disease Epidemiology and Surveillance Division and Linda S. Moore, MS, RN, TDH Bureau of HIV & STD Prevention.

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### Coalition Building: A Healthy Community is Everyone's Business

Communities in Texas are faced with many complex health problems and issues that affect everyone. Disease, poverty, crime, scarce resources, drug and alcohol abuse, and lack of health care are only a few problems concerning citizens, groups, and organizations. The search for solutions to these issues led the Texas Department Board of Health to create a Coalition Task Force, in recognition of coalition building as a strategic priority for creating effective health promotion programs.

This task force has developed the manual, *Coalition Building: A Healthy Community is Everyone's Business*, which describes the development stages of a coalition and the specific actions required for them to proceed. During the **Forming Stage**, an important social issue is identified and recognized as a problem. There is a call to action and a formal meeting of potential partners. **Storming** is characterized by conflict and negotiation, when the participants determine each other's relative contribution to the coalition. The **Norming Stage** finds the coalition with formal leadership structure, mission, and vision statements, and other indications the new entity is unique and more than the sum of it members. During the **Performing Stage**, the coalition conducts activities that are directed to the larger community. Once goals have been reached, funds are depleted, and resources have expired, the coalition moves into the **Adjourning Stage**.

Lessons learned about each stage, suggested technical support needed, and steps taken to successfully work through each stage are included in the manual. Additionally, specific tools and examples with instructions have been created to assist the coalition builder.

To order *Coalition Building: A Healthy Community is Everyone's Business*, complete the order form below and return it with your check or purchase voucher to **Public Health Promotion Program, Bureau of State Health Data and Policy Analysis, Texas Department of Health, 1100 West 49th Street, Austin, Texas 78756-3199**. Allow up to 6 weeks for delivery. For further information call (512) 458-7405.

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Bimonthly Statistical Summary of Selected Reportable Diseases

Selected Diseases/Conditions	HHSC Region											Selected Texas Counties								This Period		Cumulative(1)	
	1	2	3	4	5	6	7	8	9	10	11	Bexar	Dallas	El Paso	Harris	Hidalgo	Nueces	Tarrant	Travis	1996	1997	1996	1997
<b>Sexually Transmitted Diseases(2)</b>																							
Syphilis, primary and secondary	*1	*0	*22	*2	*6	*31	*12	*7	*0	*0	1	*5	11	*0	*27	0	0	*10	*3	153	*85	627	*374
Congenital Syphilis	*0	*0	*1	*1	*1	*13	*0	*0	*0	*0	1	*0	0	*0	*12	0	1	*0	*0	28	*17	125	*77
Resistant Neisseria gonorrhoeae	*0	*0	*0	*0	*0	*0	*0	*0	*0	*0	0	*0	0	*0	*0	0	0	*0	*0	4	*0	39	*5
<b>Enteric Diseases</b>																							
Salmonellosis	10	6	14	8	7	52	31	12	8	9	29	6	4	9	38	6	12	4	18	731	186	1808	1159
Shigellosis	11	4	20	6	9	51	36	11	5	11	21	5	5	11	37	4	9	2	12	472	185	1469	1238
Hepatitis A	14	1	33	12	3	16	9	13	15	6	91	3	11	6	9	44	6	3	5	626	213	2136	2395
Campylobacteriosis	14	1	12	1	3	4	27	3	4	9	10	3	4	8	0	0	5	3	19	197	88	599	548
<b>Bacterial Infections</b>																							
H. influenzae, invasive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3
Meningococcal, invasive	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	0	0	15	5	162	131
Lyme disease	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	31	2	76	28
Vibrio species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	14	9
<b>Other Conditions</b>																							
AIDS(4)	7	3	186	12	11	322	42	53	3	17	10	51	144	17	304	2	3	34	19	895	665	3272	3109
Hepatitis B	7	1	7	1	0	4	3	2	2	1	5	0	1	0	2	0	3	2	2	202	33	878	591
Adult elevated blood lead levels	0	0	9	5	1	0	0	8	0	0	0	5	3	0	0	0	0	0	0	78	23	251	186
Animal rabies - total	2	1	3	5	0	5	5	1	5	1	3	0	1	1	3	0	0	1	3	44	31	261	155
Animal rabies - dogs and cats	2	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	6	5	22	11
<b>Tuberculosis Disease(2)</b>																							
Children (0-14 years)	1	0	2	0	1	7	2	2	1	4	8	2	2	4	5	2	3	0	1	25	26	101	93
Adults (>14 years)	0	6	62	5	2	136	20	32	6	11	45	22	38	10	111	14	9	19	10	280	325	1220	1158
<b>Injuries(2)</b>																							
Spinal Cord Injuries	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	20	3	172	51

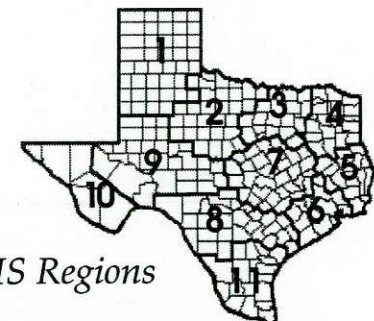
1. Cumulative to this month. 2. Data for the STD's, Tuberculosis, and spinal cord injuries are provided by date of report, rather than date of onset. 3. Voluntary reporting. 4. AIDS totals include reported cases from Texas Department of Corrections, which are not included in the regional and county totals. \*Data incomplete.

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1996 POPULATION ESTIMATES

HHSC REGIONS			
1	760,526	4	947,431
2	532,854	5	683,583
3	4,968,610	6	4,325,854
7	1,902,211	10	722,076
8	1,983,995	11	1,574,446
9	548,963		
STATEWIDE TOTAL 18,950,549			

SELECTED TEXAS COUNTIES			
Bexar	1,308,092	Hidalgo	475,917
Dallas	2,053,859	Nueces	313,907
El Paso	694,878	Tarrant	1,390,298
Harris	3,099,066	Travis	620,718



DHHS Regions





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## **Fourth Case of Hantavirus Pulmonary Syndrome Reported in September**

In February 1997, the Texas Department of Health confirmed the eighth case of hantavirus pulmonary syndrome (HPS) to occur in Texas since this disease was identified. The patient was a 50-year-old man from Hunt County who became ill with nausea, vomiting, anorexia, fever, chills, and malaise on January 19. He was admitted to a hospital with severe respiratory distress and diaphoresis on January 24; he died the next day. (See *DPN* Vol.57, No. 12 for an in-depth case history.) Since then 3 more cases have been reported in Texas.

The second case was in a 26-year-old man from Randall County. He developed shortness of breath, malaise, arthralgias, fever, chills, and diarrhea on May 27, 1997. The patient was hospitalized for 4 days beginning May 31; a chest x-ray showed bilateral infiltrates indicative of early adult respiratory distress syndrome, but he was never intubated. He was discharged on June 3.

A 51-year-old Hispanic woman from El Paso County had onset of fever, chills, headache, dyspnea, myalgia, cough, nausea, and vomiting on July 20. This patient, whose case was the third confirmed this year, was admitted to the hospital on July 24 and discharged on August 18.

The Sin Nombre virus was identified as the cause in the 3 cases noted above. On September 14, a 16-year-old boy from Taylor County began feeling ill with fever, diarrhea, fatigue, and malaise. He was hospitalized on September 19, and HPS was confirmed on September 24; this case is still under investigation.