



TEXAS CONTAMINATED SHARPS INJURIES: 2004

Report

This report contains the aggregate contaminated sharps injury data submitted to Texas Department of State Health Services as required by Texas Health and Safety Code, Chapter 81, Subchapter H (HB2085), 76th Legislature.

Texas Bloodborne Pathogen law and federal bloodborne pathogen regulations seek to protect the health care worker from worksite acquired bloodborne diseases. Bloodborne pathogens of concern at the healthcare worksite are human immunodeficiency virus (HIV), Hepatitis B (HBV) and Hepatitis C (HCV) infections. United States (U.S.) and global surveillance of HIV, HBV and HCV acquired in the community and at the healthcare worksite are described below.

HIV/AIDS STATISTICS

At end of the year 2000, there was an estimated 36.1 million adults and children living with HIV/AIDS throughout the world¹ and an estimated 340,000 persons were living with AIDS in the U.S. at the conclusion of 2000.² More than 1 million persons were estimated to be living with HIV infection in the U.S. in 2003.³ Due to the highly active antiretroviral therapy (HAART) since 1996, persons with HIV are living longer and the progression to AIDS has lessened.³ CDC thus recommends that states and territories adopt confidential, name-based surveillance systems that report HIV infections because AIDS surveillance no longer provides an accurate population-based monitoring of the epidemic.³

GLOBAL AND US BLOODBORNE PATHOGEN INFECTIONS AMONG HEALTH CARE WORKERS

Reports of bloodborne infections among the estimated 35 to 100 million global health care workers world wide are fortunately small in comparison to the size of the at risk population: 65,000 Hepatitis B (HBV) infections, 16,400 Hepatitis C (HCV) and 1000 Human immunodeficiency virus (HIV) infections in the year 2000.⁴ There continues to be fifty-seven health personnel in the U.S. that have been documented to seroconvert to HIV following occupational exposures.⁵ Additionally, 139 other cases of HIV infection or AIDS have occurred among healthcare workers who have not reported other risk factors for HIV infection.⁵ No new cases of occupational acquired HIV/AIDS have been documented since the end of 2001 in the U.S.⁵

TEXAS CONTAMINATED SHARPS INJURIES REPORTED IN 2004

Texas Bloodborne Pathogen regulations require governmental entity reporting of contaminated sharps injuries as shown in table 1. A contaminated sharps injury is defined as any sharps injury that occurs with a sharp used or encountered in a health care setting that is contaminated with human blood or body fluids.⁶

Table 1. Texas Sharps Injuries

Year Reported	Number
2001	1789
2002	1622
2003	1779
2004	1686

Aggregate reporting of contaminated sharps injuries among governmental entities in Texas during 2004 includes the following: where the injuries occurred; when did the injury occur by time and date; information about the workers who sustained injuries; what was the original intended use of sharps device involved in the injury; how the injury occurred; type of sharps device in use at time of injury; worksite safety controls; and safety engineered sharps protection status of device involved in the injury.⁶

Where Sharps Injuries Occurred in Texas

Higher percentages of sharps injuries continue to reflect the higher urban populations and greater number of health care facilities in Health Service Regions 1, 3, and 6 (table 2).

Table 2. Health Service Regions (HSR) Injuries (*n=1686*)

Health Service Region	Injuries per Region	Percent
1	198	11.86%
2	102	6.11%
3	340	20.37%
4	58	3.48%
5	17	1.02%
6	609	36.49%
7	100	5.99%
8	96	5.75%
9	99	5.93%
10	41	2.46%
11	9	0.54%
Missing	17	1.02%
Total	1669	100.00%

Governmental entity hospital/medical/health centers continue to report the greatest number of injuries as shown in table 3. These numbers could be expected in relationship to higher number patient and staff populations and the higher number of procedures with potential sharps risk in a hospital, health care centers, and medical centers.

Table 3. Injuries by Type of Governmental Entity
(*n=1686*)

Facility	Count	Percent
Hospital/Medical/Health Centers	1211	71.83%
Colleges/Universities	366	21.71%
City/County Services	61	3.62%
State Facilities	22	1.30%
Schools	13	0.77%
Home Health	6	0.36%
Other	3	0.18%
LTC	3	0.18%
Federal Facilities	1	0.06%
Total	1686	100.00%

Table 4. Injuries by Further Definition of Type of Facility
(*n=1686*)

Facility Type	Number	Percent
Hospital	1410	83.63%
Clinic	109	6.47%
EMS/Fire/Police	32	1.90%
School	26	1.54%
Correctional Facility	25	1.48%
Morgue/Medical Examiner	22	1.30%
Home Health	17	1.01%
Dental Facility	13	0.77%
Outpatient Treatment	12	0.71%
Residential Facility	10	0.59%
Other	4	0.24%
Laboratory (Freestanding)	3	0.18%
Bloodbank/Center/Mobile	2	0.12%
Ambulance	1	0.06%
Total	1686	100.00%

Table 5. Work Area Where Injury Occurred
(n=1686)

Work area	Number of Injuries	Percent
Operating Room	478	28.35%
Patient/Resident Room	323	19.16%
Procedure Room	167	9.91%
Emergency Dept	154	9.13%
Laboratory	81	4.80%
Medical/Outpatient Clinic	67	3.97%
L & D/Gynecology Unit	72	4.27%
Critical Care	63	3.74%
Other	44	2.61%
Autopsy/Pathology	30	1.78%
Floor, Not Patient Room	27	1.60%
Pre-Op Or PACU	25	1.48%
Service/Utility Area	25	1.48%
Home	15	0.89%
Law Enforcement	12	0.71%
Nursery	10	0.59%
Dental Clinic	10	0.59%
Ambulance	10	0.59%
Rescue Setting (Non ER)	15	0.89%
Field (Non EMS)	9	0.53%
Radiology	9	0.53%
School	7	0.42%
Infirmery	7	0.42%
Central Supply	5	0.30%
CATH Lab	4	0.24%
Medical/Surgical Unit	4	0.24%
Dialysis Room/Center	3	0.18%
Blood Bank Center/Mobile	3	0.18%
Radiology Department	2	0.12%
Pharmacy	2	0.12%
Physical Therapy	2	0.12%
Hospice	1	0.06%
Total	1686	100.00%

As noted in table 5, the highest percentage of sharps injuries were reported to have occurred in the operating room. It is of interest also, to compare reported operating room injuries with patient's room injuries over time as seen in table 6.

Table 6. Comparison of Operating Room and Patient Room Injuries Over Time

Year	Percentage of Injuries Reported In Operating Room	Percentage of Injuries Reported In Patient's Room
2001	19%	25%
2002	21%	24%
2003	25%	21%
2004	28%	19%

The changes in percentages in table 6 could be possibly attributed to an increase in the use of safer devices or perhaps changes in reporting by healthcare workers or other unknown factors.

When Injuries Occurred

Sharps injuries per month do not reflect a seasonal variation. The majority of injuries continue to be reported during the day shift (7 am to 3 pm) as to be expected considering the greater number of both staff and procedures during the day shift. The greatest number of injuries continue to be reported to have occurred after use of a sharps device.

Table 7. Sharps Injuries Per Month 2004
(*n=1686*)

Month of Injury	Number	Percent
January	150	8.90%
February	147	8.72%
March	148	8.78%
April	152	9.02%
May	140	8.30%
June	140	8.30%
July	125	7.41%
August	143	8.48%
September	144	8.54%
October	111	6.58%
November	145	8.60%
December	141	8.36%
Total	1686	100.00%

Table 8. Time of Sharps Injuries
(*n=1686*)

Time of Injury	Number	Percent
7:00 am through 2:59 pm	973	59.08%
3:00 pm through 10:59 pm	507	30.78%
11:00 pm through 6:59 am	167	10.14%
Unknown	39	23.67%
Total	1647	100.00%

Table 9. Sharps Injuries by Phase of Procedure
(*n*=1686)

When Injury Occurred	Number	Percent
After	939	55.89%
During	641	38.15%
Unknown	94	5.60%
Before	12	0.71%
Total	1686	100.00%

Texas Health Care Worker Information

The medical and nursing professions reported the highest number of injuries. Females ages 25 through 34 continued to report the most injuries and the greatest number of injuries were sustained to the hand.

Table 10. Sharps Injuries By Job Classification (*n=1686*)

Job Classification	Number	Percent
RN	399	23.67%
MD/DO	374	22.18%
Intern/Resident	146	8.66%
Surgery Assistant/OR Tech	117	6.94%
Laboratory	107	6.35%
LVN	105	6.23%
Student	86	5.10%
Housekeeper/Laundry	53	3.14%
First Responder	47	2.79%
Aide	40	2.37%
Dental	31	1.84%
Unknown	26	1.54%
Physician Assistant	21	1.25%
Other Techs	20	1.19%
Radiology	18	1.07%
Research	17	1.01%
CRNA/NP	17	1.01%
Respiratory Therapist	16	0.95%
Other	15	0.89%
Forensic	10	0.59%
Maintenance Services	9	0.53%
School / College	6	0.36%
Central Supply	5	0.30%
Physical Therapy	3	0.18%
Pharmacist	3	0.18%
Counselor/Social Worker	3	0.18%
Correctional	3	0.18%
Clerical/Administrative	3	0.18%
Pathology	2	0.12%
Occupational Therapy	2	0.12%
Medical Student	2	0.12%
Emergency Room Tech	1	0.06%
Dietary	1	0.06%
Total	1686	100.00%

Table 11. Gender of Injured Worker
(*n*=1686)

Gender	Number	Percent
Female	1071	63.52%
Male	578	34.28%
Missing	37	2.19%
Total	1686	100.00%

Table 12. Age Distribution of Injured Workers
(*n*=1686)

Age Group	Number	Percent
Less than 18	5	0.30%
18 through 24	167	9.91%
25 through 34	652	38.67%
35 through 44	387	22.95%
45 through 54	251	14.89%
55 through 64	100	5.93%
65 through 76	10	0.59%
Missing	114	6.76%
Total	1686	100.00%

Table 13. Area of Body Injured
(*n*=1686)

Body Part	Number	Percent
Hand	1590	94.53%
Arm	35	2.08%
Leg/Foot	25	1.49%
Unknown	32	1.90%
Face/Head/Neck	12	0.71%
Torso	3	0.18%
Total	1686	100.00%

How Sharps Injuries Occurred

A review of the stated reason for the injury, the device involved, and the original intended use of the sharps device provides a broad review of how sharps injures occurred.

Table 14. Procedure or Process Involved in Injuries (*n=1686*)

Reason	Count	Percent
Suturing	293	17.38%
Found In An Inappropriate Place	185	10.97%
Use Of Sharps Container	159	9.43%
Between Steps Of A Multi Step Procedure	145	8.60%
Laboratory Procedures/Process	142	8.42%
Patient Moved During Procedure	125	7.41%
Use Of IV/Central Line	97	5.75%
Disassembling Device Or Equipment	90	5.34%
Blade/Scalpel Use	86	5.10%
Interaction With Another Person	64	3.80%
Other/Unknown	59	3.50%
Surgery	50	2.97%
Recapping	53	3.14%
Activating Safety Device	35	2.08%
Unsafe Practice	34	2.02%
Device Malfunctioned	25	1.48%
Preparation For Reuse Of Instrument	25	1.48%
Procedure/Environment	12	0.71%
Dental	5	0.30%
Tattoo	2	0.12%
Total	1686	100.00%

Four years comparison of the reason for sharps injuries reveals a 1% decrease in injuries due to device being found in an inappropriate place and due to suturing. In comparison, use of the sharps container injuries has decreased by 5%.

Table 15. Four Years Comparison of the Stated Reason for Sharps Injuries

YEAR	FOUND IN AN INAPPROPRIATE PLACE	SUTURING	USE OF SHARPS CONTAINER
2001	12%	18%	14%
2002	11%	18%	13%
2003	11%	18%	12%
2004	11%	17%	9%

A sum all needles and syringes (excluding iv needles/catheters) was 42% of the injuries. Suture needles and surgical instruments comprised 39% of the injuries.

Table 16. Type of Sharp Involved in Injuries (*n*=1686)

Type of Sharp	Count	Percent
Suture Needle	386	22.89%
Disposable Syringe	240	14.23%
Other Syringe With Needle	185	10.97%
Scalpel	130	7.71%
Other Surgical Instrument	111	6.58%
Winged Steel Needle	105	6.23%
Disposable Syringe Insulin	68	4.03%
IV Catheter, Loose	66	3.91%
Other Non Suture Needle	63	3.74%
Vacuum Tube Collection	56	3.32%
Lancet	46	2.73%
Needle On IV Line	27	1.60%
Unknown	24	1.42%
Disposable Syringe Tuberculin	23	1.36%
Blood Gas Syringe	20	1.19%
Needle Factory - Attached	17	1.01%
Other	16	0.95%
Wire	12	0.71%
Blood Tube	10	0.59%
Staples	8	0.47%
Arterial Catheter Introducer	8	0.47%
Prefilled Cartridge Syringe	8	0.47%
Huber Needle	7	0.42%
Other Glass	6	0.36%
Unattached Hypodermic Needle	5	0.30%
Spinal Needle	4	0.24%
Dental Instrument	4	0.24%
Tattoo Pin	4	0.24%
Syringe, Other	4	0.24%
Pipette	4	0.24%
Biopsy Needle	3	0.18%
Drill Bit	3	0.18%
Central Line Catheter Needle	3	0.18%
Scissors	3	0.18%
Other Vascular Catheter Needle	3	0.18%
Retractor	3	0.18%
Razor	3	0.18%
Microtome Blade	2	0.12%
Total	1686	100.00%

Table 17. Use of Sharp At Time of Injury (*n*=1686)

Original use	Number	Percent
Injection, SC/ID/IM	317	18.80%
Suture Skin	235	13.94%
Draw Venous Sample	199	11.80%
Suture Deep	165	9.79%
Cutting	154	9.13%
Unknown/Not Applicable	114	6.76%
Start IV Or Set Up Heparin Lock	104	6.17%
Obtain Body Fluid/Tissue Sample	88	5.22%
Injection/Aspiration IV	50	2.97%
Finger Stick/Heel Stick	45	2.67%
Draw Arterial Sample	42	2.49%
Other	31	1.84%
Contain Specimen/Pharmaceutical	26	1.54%
Place Central Line	17	1.01%
Retraction	17	1.01%
Dental	15	0.89%
Wiring	13	0.77%
Heparin Or Saline Flush	10	0.59%
Drilling	9	0.53%
Electrocautery	6	0.36%
Remove Central Line/PORTA Catheter	6	0.36%
Tattoo	5	0.30%
Dialysis	4	0.24%
Surgery/Surgical Procedure	3	0.18%
Suture Removal	3	0.18%
Shave	3	0.18%
Fetal Monitor	2	0.12%
Staples Removal	1	0.06%
Total	1686	100.00%

WORKSITE SAFETY CONTROL

Tables 18 and 19 show the compliance or lack of compliance in the use of safety engineered sharps and whether the safety mechanism was activated. In comparison, table 20 shows a high rate of compliance with glove use, Hepatitis B vaccination, bloodborne pathogen education, and availability of the sharps container.

Table 18. Was Device Safety Engineered?
(n=1686)

Safety Sharp	Number	Percent
No	982	58.66%
Yes	370	22.10%
Unknown	334	19.95%
Total	1686	100.00%

Table 19. Was Safety Feature Activated?
(n=1686)

Protective mechanism activated	Number	Percent
Not Applicable	1049	62.22%
Unknown	288	17.08%
No	243	14.41%
Yes Partial	75	4.45%
Yes Fully	31	1.84%
Total	1686	100.00%

Table 20. Worksite Safety Controls
(n=1686)

Compliance With Worksite Safety Controls At Time Of Injury	Glove Use At Time Of Injury		Hepatitis B Vaccine Series Completed		Received Bloodborne Pathogen Education In Past 12 Months		Availability Of Sharps Container	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Yes	1482	88.37	1531	91.29	1563	93.20	1577	94.04
No	172	10.26	106	6.32	83	4.95	62	3.70
Unknown	18	1.07	40	2.39	31	1.85	38	2.27
Not Applicable	5	0.30						

SAFER DEVICES AND PRACTICES IN THE HEALTHCARE FIELD

U.S. Laws and Directives

In 1955, Roehr Products introduced a plastic disposal syringe.⁷ Plastic disposal syringes replaced the reusable glass syringes thus reducing the potential of contaminants in a reused syringe and needle as well as eliminating the risk of breakage. Disposable plastic syringes were designed initially without safety features. The Federal Bloodborne Pathogen standard issued in 1991, required work place Bloodborne Pathogen Exposure Control Plans that described how the site would implement sharps containers, safety engineered devices, and bloodborne pathogen education. In 2001, the Federal Needlestick Safety and Prevention Act and Texas Bloodborne Pathogen Law as well as other state's bloodborne pathogen laws required health care facilities to establish a team of direct care staff to screen, test, and recommend implementation of appropriate syringes and other devices that are safety designed.

Federal directives over time have addressed specific bloodborne pathogen risk issues. Occupational Safety Health Agency (OSHA) requires employers to substitute non-glass products (e.g., plastic) when available such as blood tubes and slides.⁸ A joint FDA/NIOSH/OSHA advisory in February 1999 provided an alert as to the potential risk of use of glass capillary tubes and recommended that the users consider capillary tubes that are not made of glass, products that use a method of sealing that does not require manually pushing one end of the capillary tube, and products that allow the blood Hematocrit to be measured without centrifugation.⁹ OSHA clarified its policy on the prohibition of removing contaminated needles from blood tube holders: "Removing contaminated needles and reusing blood tube holders can expose workers to multiple hazards".¹⁰ Blood tube holder reuse is a potential hazard also for the patient, clinical studies have shown a 50-80% contamination of the blood tube holder after one usage.¹¹ CDC reported the transmission of Hepatitis B Virus in three long term care facilities was attributed to shared devices (blood glucose monitors, multi dose vials of insulin, and lancets), and other breaks in infection control practices related to blood glucose monitoring.¹² Thus, single patient/resident dedicated glucose monitors, insulin vials, and lancets are the preferred infection control approach.

World Health Organization Study Considers the Global Burden of Disease Attributable to Contaminated Injections in Health Care Settings

As a part of the 2000 Global Burden of Disease study by the World Health Organization, the death and disability from injection-associated infections with hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) were quantified. The model based the study on the fraction of the annual number of infections attributable to injections, the proportion of infections resulting with reused equipment, the probability of infections resulting from percutaneous exposure, the prevalence of active infection, the prevalence of immunity and total incidence.¹³ These infections were converted into disability-adjusted life years (DALYS) in 2000-2030.¹³ During 2000, in Ten Global Burden of Disease regions, where persons received an average of 3.4 injections per year, 39.3% of the injections were given with reused equipment.¹³ Thus contaminated injections were anticipated to cause an estimated 21 million HBV infections, two million

HCV infections, and 260,000 HIV infections resulting in a new infection burden of 9,177,679 DALYS between the years 2000 and 2030.¹³ The study demonstrated the need for policies and plans for safe and appropriate use of injections to reduce the burden of disability and death in countries with poor injection practices.¹³

RECOMMENDATIONS:

1. Healthcare administration support and monitoring of worksite safety in relation to safety sharps selection and usage.
2. Annual update of worksite Bloodborne Pathogen Exposure Control Plans including policies and procedures to prevent sharps injuries and manage Post Exposure Prophylaxis
3. Continued encouragement of employees to report sharps injuries.
4. Conduct worksite tracking of sharps injuries in relationship to specific devices and work processes.
5. Revise worksite procedures for processes that have higher incidence of injuries.

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