



## TEXAS CONTAMINATED SHARPS INJURIES REPORTED: 2002

*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 (HB 2085), 76<sup>th</sup> Legislature.*

Texas Bloodborne Pathogen regulations require governmental entity reporting of contaminated sharps injuries. This report summarizes the information reported by governmental entities in Texas during the year 2002 on contaminated sharps injuries: 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 the 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 in device involved in the injury.

### **Comparison of 2001 with 2002 sharps injuries reported**

Contaminated sharps injuries reports declined 9% from 2001 through 2002.<sup>1</sup> Decline of reported injuries might be an actual decline in injuries or a decline in reporting injuries. Communicable Disease Control (CDC) reports that surveys of health care workers indicate 50% or more do not report their occupational percutaneous injuries.<sup>2</sup>

### **Where Sharps Injuries Occurred**

Tables 1 through 4 show where injuries occurred by Texas public health regions, type of facility reporting, type of facility expanded, and work area within a facility. The frequency of injuries reported was proportional to the regional population (Table 1). As shown in tables 2 and 3, hospitals and medical centers reported the greatest percentage of injuries. Table 4 reveals patient/resident room with the highest percentage of injuries at 24% and operating room, second highest percentage at 21%.

Table 1. Sharps Injuries by Public Health Regions (*n*=1622)

<b>Sharps Injuries by Public Health Region</b>	<b>Number</b>	<b>Percent</b>
1	206	13%
2	116	7%
3	411	25%
4	69	4%
5	4	0%
6	343	21%
7	116	7%
8	192	12%
9	107	7%
10	30	2%
11	28	2%
<b>Total</b>	<b>1622</b>	<b>100%</b>

Table 2. Sharps Injuries By Type of Facility Reporting (*n*=1622)

<b>Type of Facility Reporting</b>	<b>Count</b>	<b>Percent</b>
Hospital/Medical/Health Centers	1196	74%
Colleges/Universities	286	18%
City/County Services	92	6%
State Facilities	29	2%
Schools	16	1%
Federal Facilities	3	0%
<b>Total</b>	<b>1622</b>	<b>100%</b>

Table 3. Injuries By Type of Facility (*n*=1622)

<b>Facility Type</b>	<b>Number</b>	<b>Percent</b>
Hospital	1295	80%
Clinic	124	8%
School	34	2%
EMS/Fire/Police	32	2%
Correctional Facility	29	1.8%
Morgue/Medical Examiner	25	1.5%
Residential Facility	18	1.1%
Outpatient Treatment	18	1.1%
Laboratory (Freestanding)	17	1%
Home Health	13	0.8%
Other	11	0.7%
Dental Facility	4	0.2%
Bloodbank/Center/Mobile	2	0.1%
<b>Total</b>	<b>1622</b>	<b>100%</b>

Table 4. Sharps Injuries By Work Area (*n*=1622)

<b>Sharps Injuries by Work Area</b>	<b>Number</b>	<b>Percent</b>
Patient/Resident Room	388	24%
Operating Room	340	21%
Emergency Dept	153	9%
Procedure Room	146	9%
Laboratory	89	6%
Critical Care	84	5%
Medical/Outpatient Clinic	76	5%
Labor & Delivery	63	4%
Floor, Not Patient Room	46	3%
Autopsy/Pathology	37	2%
Rescue Setting (Non ER)	31	2%
Service/Utility Area	29	2%
Pre-Op Or PACU	22	1%
Other	21	1%
Radiology Department	20	1%
Dialysis Room/Center	14	1%
Home	14	1%
School	14	1%
Dental Clinic	12	1%
Infirmery	8	0%
Jail Unit	7	0%
Blood Bank/Center/Mobile	2	0%
Seclusion Room	1	0%
<b>Total</b>	<b>1617</b>	<b>100%</b>

Missing information: 5

**When Sharps Injuries Occurred**

Most injuries occur during the day shift when more healthcare workers are at the worksite (Figure 1). The highest number of injuries was reported in August, which were 175 (11%) of total injuries (Figure 2). Thirty-nine percent of the injuries happened during use of the sharps device and sixty-one percent happened after the use of the sharps device.

Figure 1. Sharps Injuries Reported by Work Shift

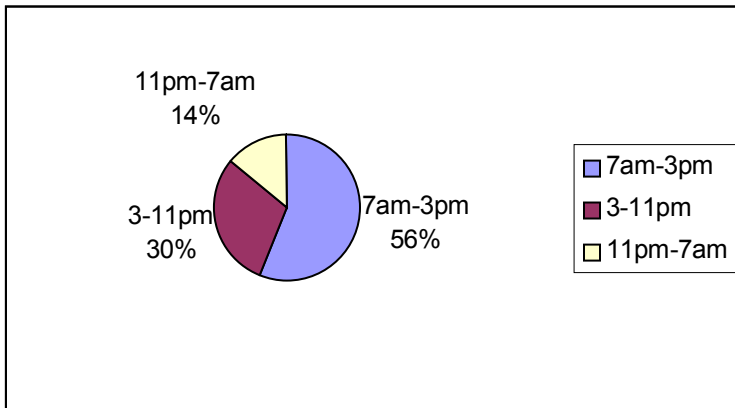
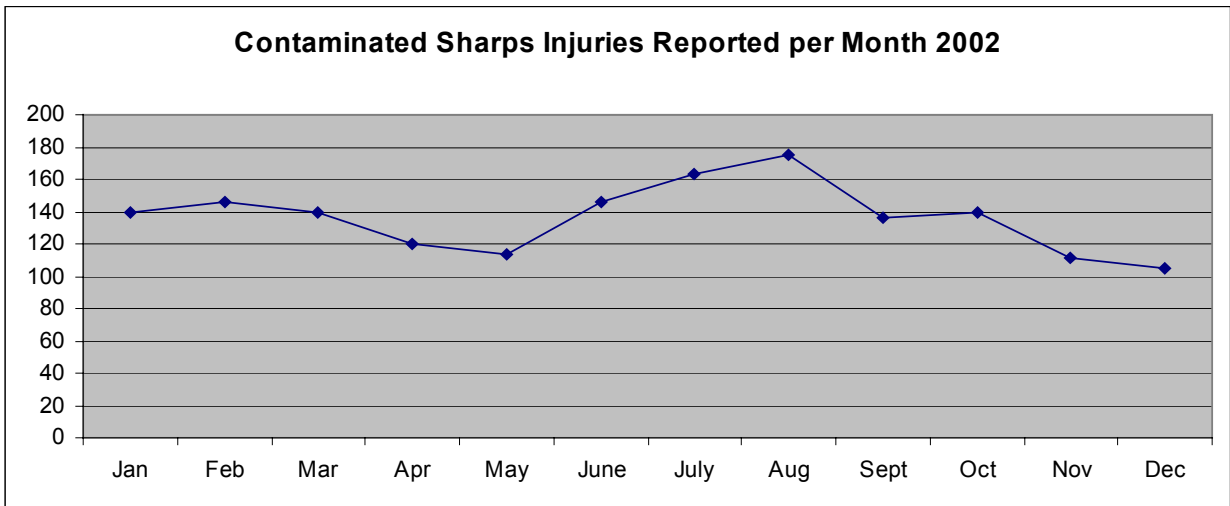


Figure 2. Contaminated Sharps Injuries Reported per Month 2002



### **Sharps Injuries By Healthcare Worker Injured**

Registered Nurses sustained the highest percentage of sharps injuries in 2002 at 26% of total injuries, with physicians reporting the second highest number at 22% of the total injuries (Table 5). These injury percentages for Registered Nurses and Physicians are the same as those reported in 2001. Laboratory workers again, as in 2001, reported the third highest number of injuries at 10%. Both L.V.N. and Surgery Assistant/OR Tech had a 1% decline in number of injuries reported in comparison to 2001. First Responders had a 2% decline in sharps injuries reported from 2001 through 2002.

Table 5. Contaminated Sharps Injuries By Job Classification (*n*=1622)

<b>Sharps Injuries by Job Classification</b>	<b>Number</b>	<b>Percent</b>
RN	424	26%
MD/DO	358	22%
Laboratory	154	10%
Surgery Assistant/Or Tech	117	7%
LVN	116	7%
Aide	62	4%
Student	60	4%
Housekeeper/Laundry	60	4%
First Responder	48	3%
Other Techs	35	2%
Respiratory Therapist	25	2%
Forensic	22	1.4%
Dental	22	1.4%
Other	21	1.3%
Radiology	18	1.1%
CRNA/NP	17	1.0%
School / College	9	0.6%
Maintenance Services	8	0.5%
Central Supply	7	0.4%
Physician Assistant	7	0.4%
Research	7	0.4%
Clerical/Administrative	6	0.4%
Dietary	4	0.2%
Intern / Resident	4	0.2%
Physical Therapy	3	0.2%
Correctional	2	0.1%
Counselor/Social Worker	1	0.1%
Unknown	1	0.1%
Pharmacist	1	0.1%
Transport / Messenger	1	0.1%
<b>Total</b>	<b>1620</b>	<b>100%</b>

Missing: 2

Gender, Age, and Area of Body Injured

Female healthcare workers sustained 67% of the sharps injuries as may be noted in table 6. The largest age group of injured workers in 2002 occurred in the age distribution of 25 through 34 to be found in table 7, which was also the highest age group in 2001. In table 8, the area of body injured reveals 95% of the injuries occurred in the health care worker's hand.

Table 6. Gender of Injured Workers (*n*=1622)

<b>Gender of Injured Workers</b>	<b>Number</b>	<b>Percent</b>
Female	1086	67%
Male	522	32%
Unknown	14	0%
<b>Total</b>	<b>1622</b>	<b>100%</b>

Table 7. Age Distribution of Injured Workers (*n*=1622)

<b>Age Distribution Categories</b>	<b>Number</b>	<b>Percent</b>
18 thru 24	206	13%
25 thru 34	566	35%
35 thru 44	377	23%
45 thru 54	302	19%
55 thru 64	96	6%
65 thru 81	12	0%
Unknown/Missing	63	4%
<b>Total</b>	<b>1622</b>	<b>100%</b>

Table 8. Area of Body Injured (*n*=1622)

<b>Area of Body Injured</b>	<b>Number</b>	<b>Percent</b>
Hand	1533	95%
Arm	43	3%
Leg/Foot	21	1%
Unknown	9	1%
Face/Head/Neck	8	0%
Torso	6	0%
<b>Total</b>	<b>1620</b>	<b>100%</b>

Missing: 2

**How Sharps Injuries Occurred**

As shown in table 9 (condensed), a sum of venous and arterial blood sample collection was 20% of total injuries. Injections (total of subcutaneous, intra dermal, and intra muscular injections) resulted in the second highest number of injuries at 19%. Suturing (sum of Skin and Deep Suturing) resulted in the third highest number of injuries at 18%. Additionally both tables 11 and 12 show suturing and suture needle respectively, at 18% of total injuries.

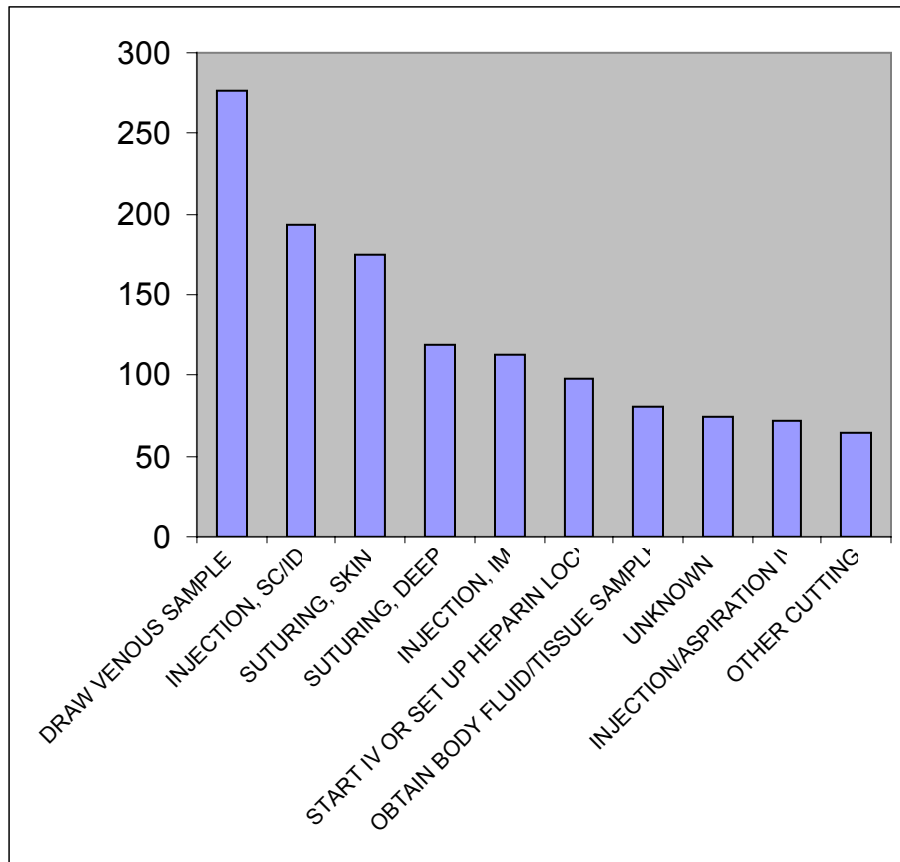
Table 9. Original Intended Use of the Sharps Device (*n*=1622)

<b>Original Intended Use</b>	<b>Number</b>	<b>Percent</b>
Draw Venous Sample	277	17%
Injection, Sc/Id	194	12%
Suturing, Skin	175	11%
Suturing, Deep	119	7%
Injection, IM	113	7%
Start Iv Or Set Up Heparin Lock	98	6%
Obtain Body Fluid/Tissue Sample	81	5%
Unknown	74	5%
Injection/Aspiration Iv	72	4%
Other Cutting	65	4%
Surgery/Surgical Procedure	62	4%
Cutting (Surgery)	52	3%
Finger/Heel Stick	51	3%
Draw Arterial Sample	48	3%
Other	34	2%
Heparin Or Saline Flush	29	1.8%
Contain Specimen/Pharmaceutical	22	1.4%
Dental Procedure	18	1.1%
Wiring	11	0.7%
Electrocautery	9	0.6%
Drilling	7	0.4%
Tattooing	5	0.3%
Other Injection	4	0.2%
Dialysis	2	0.1%
<b>Total</b>	<b>1622</b>	<b>100.0%</b>

**Original Intended Use of Sharp (condensed)**

Draw Blood (Venous and Arterial)	Injections (Subcutaneous, Intradermal and Intramuscular)	Suturing (Deep and Skin)
20%	19%	18%

Figure 3. Original Intended Use of Sharps Device



Selection and use of sharps containers that allow health care workers to see the level of contaminated sharps in the container and placing the container close to place of use are positive steps in sharps container usage.

Table 10. Availability of Sharps Container (*n*=1622)

Sharps Container Available For Disposal	Number	Percent
Yes	1498	92%
No	93	6%
Unknown	23	1%
Not Applicable	8	0%
<b>Total</b>	<b>1622</b>	<b>100%</b>



Table 11 shows suturing, use of the sharps container, and sharps found in an inappropriate place to be involved in the three highest percentages of injuries. Seventy-one injuries occurred while recapping needles. Activation of the safety device resulted in two percent of the injuries.

Table 11. How Sharps Injury Occurred (*n*=1622)

<b>How Injury Occurred (Reason)</b>	<b>Number</b>	<b>Percent</b>
Suturing	295	18%
Use Of Sharps Container	216	13%
Found In An Inappropriate Place	178	11%
Patient Moved During Procedure	157	10%
Other	117	7%
While Disassembling	117	7%
Procedure/Environment	115	7%
Laboratory Procedure/Process	80	5%
While Recapping	71	4.4%
While Carrying/Handling Sharp	63	3.9%
Interaction With Another Employee/Patient	34	2.1%
Unknown	33	2%
Activating Safety Device	31	2%
Cleaning Instruments/Equipment	28	2%
Use Of IV/Central Line	22	1.4%
Surgery	15	0.9%
Passing Instruments	13	0.8%
Device Malfunctioned	13	0.8%
Unsafe Practice	6	0.4%
During Use Of Device	4	0.2%
Blade/Scalpel Use	4	0.2%
<b>Total</b>	<b>1613</b>	<b>100.00%</b>

Missing: 9

Suture needle usage resulted in greatest number of injuries (Table 12). The use of blunt suture needles, as an engineering control is shown to reduce injuries in the operating room.<sup>2</sup> The second highest numbers resulted from syringes with factory attached needles. Other syringes with needle and the winged steel needle were involved in the next highest numbers of injuries.

Table 12. Sharps Injuries by Type of Sharp Involved in the Injury ( $n=1622$ )

<b>Injuries by Type of Sharp</b>	<b>Number</b>	<b>Percent</b>
Suture Needle	293	18%
Needle Factory - Attached To Syringe	222	14%
Other Syringe With Needle	160	10%
Winged Steel Needle	145	9%
Other Surgical Instrument/Non glass Sharp	129	8%
Scalpel	101	6%
Insulin Syringe With Needle	93	6%
Other Non suture Needle	92	6%
Vacuum Tube Collection	74	5%
Iv Catheter, Loose	72	4%
Lancet	45	3%
Syringe, Other	34	2%
Tuberculin Syringe With Needle	32	2%
Blood Gas Syringe	24	1.5%
Needle Connected To Iv Line	21	1.3%
Prefilled Cartridge Syringe	17	1.0%
Unknown	16	1.0%
Blood Tube	14	0.9%
Wire	13	0.8%
Other Glass	10	0.6%
Staples	6	0.4%
Trocar	5	0.3%
Other	2	0.1%
Other Tube	1	0.1%
Other Tattooing	1	0.1%
<b>Total</b>	<b>1622</b>	<b>100.0%</b>

Characteristics of devices that increase the risk of injury as defined by National Institute for Occupational Safety and Health (NIOSH 1999) include:

- Devices with hollow bore needles
- Needle devices that need to be taken apart or manipulated
- Syringes that have an exposed needle after use
- Needles that are attached to tubing such as butterflies that can be difficult to place in sharps disposal containers.<sup>3</sup>

## **Worksite Safety Controls**

Compliance with worksite safety controls ranged from 85% to 88% (Tables 13).

Table 13. Compliance with Worksite Safety Controls (*n*=1622)

<b>Compliance With Worksite Safety Controls At Time Injury</b>	<b>Glove Use At Time of Injury</b>		<b>Hepatitis B Vaccine Series Completed</b>		<b>Received Bloodborne Pathogen Education in Past 12 Months</b>	
	<b>Number</b>	<b>%</b>	<b>Number</b>	<b>%</b>	<b>Number</b>	<b>%</b>
Yes	1373	85%	1417	87%	1428	88%
No	240	15%	181	11%	162	10%
Unknown	9	1%	24	1%	32	2%

Work practice controls in the operating room include:

- Using instruments, rather than fingers to grasp needles, retract tissue, and load/unload needles and scalpels;
- Giving verbal announcements when passing sharps;
- Avoiding hand-to-hand passage of sharp instruments by using a basin or neutral zone;
- Using alternative cutting methods such as blunt electrocautery and laser devices when appropriate;
- Substituting endoscopic surgery for open surgery when possible; and
- Using round-tipped blades instead of sharp-tipped blades.<sup>2</sup>

### **Safety Engineered Sharps Protection**

Both Texas and federal Bloodborne Pathogen regulations require the use of safety engineered sharps devices.<sup>1,4</sup> Thus, health care agencies continue to use frontline teams to screen, test, and implement successive generations of safety engineered devices.

Facilities expect the safety sharps to provide safe and efficient service for both the patient and staff. Quality features of safer devices include:

- Device is needleless or covered when contaminated,
- Safety feature is an integral part of the device,
- Safety feature works automatically (passively) without worker activation,
- Device allows single hand use,
- Device allows hands to remain behind the sharp during use,
- The safety feature cannot be deactivated,
- Device is reliable,
- Device is easy to use and practical,
- Device is safe and effective for patient care.
- The user can easily know when the safety feature is activated.<sup>3</sup>

Tables 14, 15 and 16 display the use or nonuse of safety engineered sharps among injured health care workers. Table 14 shows conventional devices without safety engineering accounted for 68% of injuries. Table 15 shows at what point during use of the safety device, the sharps injury occurred. Table 16 lists a cross tabulation of job classifications by safety engineered sharps use at time of injury.

Table 14. Did The Device Have Safety Engineered Sharps Protection?  
(*n*=1622)

Safety Engineered Sharps Injury Protection	Number	Percent
No	1031	68%
Yes	322	21%
Unknown	161	11%
<b>Total</b>	<b>1514</b>	<b>100%</b>

Missing: 108

Table 15. When The Injury Occurred with Use of a Safety Device (*n*=322)

Before, During, or After Activation of Safety Device	Number	Percent
Before	85	41%
During	55	26%
After	72	34%

Missing: 115

Table 16. Safety Engineered Sharps Use Among Injured Workers  
(*n*=322)

Job Classification	Number	Percent
Registered Nurse	122	29%
Laboratory	67	43%
LVN	29	25%
First Responder	19	40%
Aide	16	26%
Respiratory Therapist	13	52%
MD/DO	11	3%
Student	8	13%
Other Techs	8	23%
Radiology	6	33%
Surg Asst/OR Tech	6	5%
Housekeeping/Laundry	4	7%
Dental	3	14%
Other	2	14%

Missing: 7

As depicted above, sharps injuries do occur when safety engineered sharps devices are in use. According to a 2001 study conducted by the International Healthcare Worker Safety Center, the safety feature was not activated in 71% of injuries, and 57% of injuries happened before the safety device was activated.<sup>5</sup>

### Effects of Implementing Safety Engineered Devices

A hospital based comparison study of sharps injuries pre implementation (3 years 1998-2000) to post implementation (1 year 2001-2002) of safety-engineered sharps devices, concluded that injury rates were reduced. The mean annual incidence rate of percutaneous injuries decreased from 34.08 per 1,000 fulltime equivalent employees before intervention to 14.25 post intervention ( $P < .0001$ ). Nurses had the greatest decrease (74.5%,  $P < .001$ ) in injuries. Injury rates that involved hollow bore needles decreased (70.6%,  $P < .001$ ).<sup>6</sup>

### **Sharps Injury Prevention**

Quality improvement concepts of teamwork, strategic planning and review in a sharps injuries prevention program provide a strong base for injury prevention.

CDC lists a series of organizational steps designed to ensure that a sharps injury prevention program may be integrated into the current worksite safety program with a focus upon targeting performance improvement areas. These series of steps listed by CDC are as follows:

1. Develop organizational capacity
2. Assess program operation processes
3. Prepare baseline profiles of injuries and prevention priorities
4. Determine intervention priorities
5. Develop and implement action plans
6. Monitor performance improvement.<sup>7</sup>

Since there is possible variation in levels of safe operation among safety engineered sharps, worksite tracking of injuries by specific device is an important part of the safety program. Monitoring performance improvement in the sharps injury prevention program includes also review of: staff competency in both device use and work procedure; with a work process improvement approach rather than a punitive or blaming approach. An example of process review would be to look at how needles/instruments are passed during surgery.

OSHA lists the elements of evaluating an exposure incident as:

- An evaluation of the policies and “failures of control” at time of the incident
- Engineering controls in place
- Work practice and protective equipment or clothing
- The procedure used to carry out the task
- The equipment involved or should have been involved in the incident<sup>8</sup>

Work site review of injuries consider work site climate and staffing present at time of injury.<sup>9</sup> Corrective action plans include encouragement of staff to continue to report sharps injuries.

### **Conclusions:**

Registered Nurses are at greater risk of sharps injury than other health care providers. Twenty nine percent of the Registered Nurse injuries occurred with a safety engineered sharp. Hospital staff sustained the greatest number of injuries. Collection of blood samples, giving injections and suturing were the three procedures with highest number of associated injuries. The use of safety-engineered devices as reported among injured workers, rose by 6% from 2001 to 2002.

### **References/Resources:**

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