Sharps Injuries among Hospital Workers in Massachusetts, 2005

Findings from the Massachusetts Sharps Injury Surveillance System

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BACKGROUND:

Sharps Injuries

Health care worker exposures to bloodborne pathogens as a result of injuries caused by contaminated needles and other sharp devices, also known as percutaneous injuries, are a significant public health concern. Estimates by the U.S. Centers for Disease Control and Prevention (CDC) put the number of sharps injuries in healthcare as well in excess of half a million each year, with about half of those injuries, or approximately 1,000 percutaneous injuries per day, occurring in US hospitals (Panlillio, Cardo, Campbell, Srivastava, Jagger, Orelien, et al., 2000). While several studies report that injuries occur frequently to nurses and physicians, housekeeping and other support staff are also at risk (Hiransuthikul, Tanthitippong, Jiamjarasrangsi, 2006). As a measure of likelihood of injury among hospital workers, it has been estimated that 22 sharps injuries occur annually for every 100 occupied hospital beds. (Perry, Parker, & Jagger, 2003).

U.S. Public Health Service guidelines provide recommendations for post-exposure management of all workers who have sustained occupational exposure to bloodborne pathogens (MMWR, 2001; MMWR, 2005). These guidelines provide information for determining when post-exposure prophylaxis is appropriate. Preventive medical treatment following exposure may decrease the likelihood of infection with human immunodeficiency virus (HIV) and hepatitis B virus (HBV) (Cardo, Culver, Ciesielski, Srivastava, Marcus, Abiteboul, et al., 1997; MMWR, 2001). Costs of treating a single sharps injury ranges from under $100 to almost $5,000 (O'Malley, Scott, Gayle, Dekutoski, Foltzer, Lundstrom, et al., 2007).

Sharps injuries are preventable and the overall goal should be their elimination. As a step in that direction, the U.S. Public Health Service has called for the reduction of sharps injuries among health care workers by 30% as a national health objective for 2010 (DHHS, 2000). In addition, health care facilities are required by state and federal regulations to implement comprehensive plans to reduce these injuries. Preventing sharps injuries requires the combined effort of government agencies, employers, and equipment manufacturers, as well as health care workers themselves. Elements of a successful sharps injury prevention program, as outlined by the CDC, include: promoting an overall culture of safety in the workplace, eliminating the unnecessary use of needles and other sharp devices, using devices with sharps injury prevention features (safety devices), employing safe workplace practices, and training health care personnel (CDC, 2004). Sharps injury surveillance is also a key component of a comprehensive program.

Prior to 2000, while some national data had been collected, little was known about the extent and distribution of sharps injuries among health care workers at the state level. In 2001, pursuant to An Act Relative to Needlestick Injury Prevention (MGL Chapter 111 §53D) the Massachusetts Department of Public Health (MDPH) promulgated regulations requiring hospitals to report sharps injury data to MDPH. This led to the establishment of the Massachusetts Sharps Injury Surveillance System, which has collected data from all MDPH licensed hospitals for the past seven years.

The Massachusetts Sharps Injury Surveillance System is intended to provide information that can assist Massachusetts hospitals and health care workers in targeting and evaluating efforts to reduce the incidence of sharps injuries and the associated human and economic costs. Comprehensive reports of surveillance findings for 2002, 2003 and 2004 have been produced.[1] This brief report includes findings from the Massachusetts Sharps Injury Surveillance System for the 2005 data collection period. It includes information regarding the devices and procedures associated with sharps injuries in Massachusetts hospitals as well as the departments in which these injuries occurred and

[1] "Sharps Injuries among Hospital Workers in Massachusetts" for 2002, 2003 and 2004 can be downloaded from www.mass.gov/dph/ohsp under "Needlesticks and Other Sharps Injuries" and "Data and Statistics".

the occupations involved. Findings are presented by hospital bed-size categories and by teaching status as well as for all hospital combined to allow hospitals to compare their individual experiences with those in similar facilities. Input from hospitals and health care workers regarding the surveillance activities and the content of this report is welcome. MDPH looks forward to continued collaboration in building an effective sharps injury surveillance system to improve the health and safety of health care workers in Massachusetts.

The Massachusetts Sharps Injury Surveillance System

MDPH regulations, mirroring the federal Occupational Safety and Health Administration (OSHA) Bloodborne Pathogen Standard (29 CFR 19101.1030) revised in 2001, require that licensed hospitals use devices with sharps injury prevention technology, develop exposure control plans, and maintain logs of worker injuries with contaminated sharps. MDPH requires that licensed hospitals submit the data from their sharps logs annually to the Department. Data reported to the MDPH Sharps Injury Surveillance System are compiled and published to guide state efforts to prevent sharps injuries and promote action at the local level. The surveillance system provides information about occupations at risk as well as devices, procedures and departments associated with sharps injuries. It also serves as a vehicle for hospitals and health care workers in Massachusetts to share information about prevention strategies.

Under-reporting of Sharps Injuries

Under-reporting of sharps injuries by employees is well documented in the literature, and varies by occupation and by hospital. Under-reporting has been estimated by the CDC to be in excess of 50% (Perry, 2000). There are many reasons why healthcare workers may not report sharps injuries; they may perceive that the injuries or the source patients are low risk; they may fear the diseases to which they have potentially been exposed; they may have concerns about job security or the extra paperwork and time involved in follow-up (Tandberg, Stewart, Doezema, 1991). In addition, they may lack information and training about appropriate reporting procedures or the reporting procedures themselves may be inadequate. Hospitals with well established sharps injury surveillance programs and strong safety cultures may identify and report more injuries than hospitals with less well developed programs. Under-reporting must be taken into account in interpreting the findings presented in this report. Hospitals, in evaluating their own data, should do so within the context of their own sharps injury surveillance and prevention programs. Assessment of under-reporting should be an integral part of sharps injury prevention activities.

METHODS:

All health care workers in acute and non-acute care hospitals licensed by MDPH, as well as any satellite units (e.g., community health centers, ambulatory care centers) operating under a hospital license, are included in the population under surveillance. Reportable exposure incidents are defined as exposures to blood or other potentially infectious materials as a result of events that pierce the skin or mucous membranes during the performance of an employee's duties. See the MPDH report *Sharps Injuries among Hospital Workers in Massachusetts, 2004: Findings from the Massachusetts Sharps Injury Surveillance System* (www.mass.gov/Eeohhs2/docs/dph/occupational_health/injuries_hospital_2004.pdf) for a more detailed description of the surveillance system and methods. Frequencies are presented for each of the data elements collected, with the exception of brand/model of device. Rate based analysis was not conducted.

DATA HIGHLIGHTS:

All 99 hospitals licensed by MDPH submitted Annual Sharps Injury Reports for 2005. A total of 3,265 sharps injuries were sustained by Massachusetts hospital workers in 2005 and reported to MDPH by Massachusetts hospitals. The number of sharps injuries reported by individual hospitals ranged from 0 to 339, with over half of the hospitals reporting fewer than 20 injuries. The extent to which high numbers of reported injuries reflect a true higher incidence of injuries compared to low numbers or better sharps injury reporting practices is unknown.

The 19 Massachusetts teaching hospitals reported 62% (2,023) of all sharps injuries. Teaching status is strongly correlated with hospital size; more than half of the teaching hospitals (67%, 12) have over 300 beds. Detailed findings for all hospitals combined are presented in Appendix A. Summary tables of findings by hospital size and teaching status are provided in Appendices B, and C.

Overview

- A total of 3,265 sharps injuries among hospital health care workers in Massachusetts were reported for the surveillance period January 1 to December 31, 2005. This is similar to the annual number of sharps injuries reported in previous years.

- Eighty-six percent of the injured workers (2,813) were hospital employees, 9% (293) were non-employee practitioners, 3% (84) were students, and 1% (32) were temporary or contract employees.

Occupation and Department

- Nurses sustained more injuries (36%, 1,188) than any other occupational group, followed by physicians (35%, 1,135). Close to half of the injuries in the physician category were sustained by interns and residents. Physicians accounted for proportionately more injuries in large hospitals (> 300 licensed beds) (42%, 787).

- Technicians, such as surgical technicians and phlebotomists, sustained 20% (653) of the injuries. Four percent (146) of the injuries were sustained by support service workers; of whom close to half (79) were housekeepers.

- Injuries occurred most frequently in operating rooms (32%, 1,037) followed by medical surgical wards (14%, 443). Emergency departments and intensive care units each accounted for 9% of the injuries.

Type of Device

- Hollow bore needles, which include hypodermic needles / syringes, winged steel needles, vacuum tube collection devices and IV stylets, as a group accounted for 55% (1,777) of all injuries reported. Hypodermic needles / syringes accounted for more injuries (30%, 969) than any other type of device. While most frequent, injuries with hypodermic needles / syringes generally involve less direct blood exposure and thus present less risk than injuries involving vacuum tube collection devices and winged steel needles. Injuries with these two types of devices accounted for 4% (139) and 10% (318) of all injuries, respectively.

- Injuries involving solid sharp devices and material, including suture needles, scalpels and glass, accounted for 43% (1,414) of all injuries. Injuries involving suture needles occurred 22% (732) of the time, followed by scalpel blades (7%, 239) and glass items (1%, 32).

- Of the injuries with devices for which information was recorded regarding the presence of safety features (2,885), over half (59%, 1,715) involved devices without engineered sharps injury

prevention features. Hollow bore needles had safety features more often than solid needles. However hypodermic needles / syringes lacked safety features in 37% (338) of the injuries, even though hypodermic needles / syringes with safety features have been available on the market for the past 12 years. By contrast, only 8% (26) of winged steel needles and 14% (18) of vacuum tube collection holder / needles lacked safety features.

Procedure for which the Device was Used and When the Injury Occurred

- Devices involved in injuries were most frequently used for injections (23%, 739) and suturing (22%, 728) followed by blood procedures (18%, 601). In large hospitals most injuries were related to suturing (24%, 439), while in small and medium sized hospitals, most injuries involved injections (21%, 56 and 25%, 284 respectively).

- Injuries occurred during the use of devices in 41% (1,348) of the cases. After use of the device was a more dangerous time to handle a device as compared with during use. About half (45%, 1,452) of the injuries occurred after use of the device. These included injuries sustained after use but before disposal of devices (33%, 1,070) and injuries occurring during or after disposal (12%, 382).

- Collision with sharp accounted for 21% (692) of the reported cases. MDPH continues to work with hospitals to encourage greater detail in descriptions of the incident so that these cases can be more appropriately coded. An additional 11% (350) of the cases occurred during the act of suturing. Alternative methods of closure should be explored in order to minimize the number of injuries associated with suturing.

LIMITATIONS:

There are a number of limitations to be considered in interpreting the findings presented in this report. In order for an injury to be included on the Annual Sharps Summary, hospitals rely on health care workers to report sharps injuries. As discussed previously, there are many reasons why health care workers may choose not to report sharps injuries, and under-reporting by health care workers has been well documented. Also, there is evidence that the likelihood of reporting varies by occupation and completeness of reporting varies by hospital (CDC, 1999). Thus the surveillance findings presented in this report should be considered conservative estimates of the burden of sharps injuries among hospital workers in Massachusetts.

For the most part, the information about each reported injury provided by hospitals was complete. However, there was some missing information, which has been coded as “not answered”, and for several data elements (such as department where injury occurred and brand of device) there was some confusion about what information should be submitted. MDPH is working with hospitals to clarify these outstanding issues.

DISCUSSION:

More than 3,200 sharps injuries were reported by Massachusetts hospitals in 2005, underscoring the need for continued efforts to reduce the incidence of these injuries. Findings highlight a number of specific issues to be addressed in Massachusetts:

- Use of devices without safety features continues, as evidenced by the more than 1,100 injuries with such devices. This is true even for those devices for which alternatives with engineered sharps injury prevention features exist on the market and are widely available. Previous studies have shown that implementation of devices with safety features can reduce injuries related to those device types by as much as 86%. (Adams& Elliot, 2006; Muntz & Hultburg, 2004) Hospitals

should examine non-safety device inventories and evaluate and implement devices with sharps injury prevention features where clinically appropriate.

- Blood procedures continue to account for about 20% of all injuries reported. Injuries with hollow bore needles, particularly those used for blood procedures, are associated with a higher risk of transmission of bloodborne pathogens. Issues with devices or technique may be revealed through closer examination of the circumstances surrounding injuries associated with blood procedures, particularly how the injury has occurred.

- Injuries in operating and procedure rooms constitute 45% of all reported injuries. Work-practice controls are as essential as engineering controls in operating and procedure rooms, particularly because some devices have fewer alternatives with safety features. Evaluation of devices used, and consideration of those with safety features, such as scalpel blades and blunt suture needles is needed. In addition, evaluation of the practice of multi-dose administration of various medications via injection should also be reviewed and alternative practices evaluated, as this practice does not allow for the use of hypodermic needles / syringes with safety features. It also prevents the risk of cross-contamination and transmission of infections to patients (MMWR, 2008).

The Massachusetts Sharps Injury Surveillance System is a collaborative effort between the MDPH, hospitals, professional associations and community advocates. The success of the program in collecting data is a result of this collaboration. MDPH will continue to work with these groups to conduct surveillance, review exposure control activities in hospitals, and facilitate the exchange of information among hospitals about successful prevention strategies.

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APPENDIX A
Sharps Injuries among Hospital Workers in Massachusetts, 2005

STATE TOTAL	**3,265**	**100%**
WORK STATUS OF INJURED WORKER	**N**	**%**
Employee	2,813	86
Non-employee practitioner	293	9
Student	84	3
Temporary / Contract worker	32	1
Volunteer	2	<1
Other	3	<1
Not answered	11	<1
Nonclassifiable	27	1
OCCUPATION OF INJURED WORKER	**N**	**%**
Nurse	**1,188**	**36%**
RN or LPN	1,028	31
Nursing assistant	62	2
Patient care technician	41	1
Nurse practitioner	26	1
Nursing student	10	<1
Home health aide	9	<1
Nurse midwife	7	<1
Nurse anesthetist	5	<1
Physician	**1,135**	**35%**
Intern / Resident	516	16
MD	365	11
Medical student	75	2
Fellow	70	2
Physician assistant	51	2
Surgeon	33	1
Anesthesiologist	15	<1
Radiologist	10	<1
Technician	**653**	**20%**
OR / Surgical technician	244	7
Phlebotomist	142	4
Clinical lab technician	96	3
Radiologic technician	47	1
Respiratory therapist / Tech	22	1
Morgue technician	3	<1
Hemodialysis technician	1	<1
Psychiatric technician	1	<1
Other technician	97	3
Support Services	**146**	**4%**
Housekeeper	79	2
Central supply	47	1
Attendant / Orderly	7	<1
Safety / Security	6	<1
Maintenance	4	<1
Food service	1	<1
Transport / Messenger / Porter	1	<1

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OCCUPATION OF INJURED WORKER	N	%
Other ancillary staff	1	<1
Other Medical Staff	**33**	**1%**
Medical assistant	32	1
Other medical staff	1	<1
Dental Staff	**13**	**<1%**
Dental Assistant / Tech	4	<1
Dental Student	3	<1
Dentist	2	<1
Dental Hygienist	1	<1
Other Dental Worker	3	<1
Other	**84**	**3%**
Clerical / Administrative	3	<1
EMT / Paramedic	3	<1
Researcher	6	<1
Pharmacist	2	<1
Counselor / Social worker	1	<1
Other student	19	1
Other	50	2
Not Answered	**2**	**<1%**
Nonclassifiable	**11**	**<1%**

DEPARTMENT WHERE INCIDENT OCCURRED	N	%
Operating and Procedure Rooms	**1,470**	**45%**
Operating room	1,037	32
Labor and delivery	134	4
Radiology	115	4
Cardiac catheterization laboratory	40	1
Dialysis	28	1
Hematology / Oncology	28	1
Phlebotomy room	18	1
Endoscopy / Bronchoscopy / Cytoscopy	10	<1
Other procedure room	16	1
Procedure room, unspecified	44	1
Inpatient Units	**704**	**22%**
Medical / Surgical ward	443	14
Psychiatry ward	22	1
Obstetrics / Gynecology	20	1
Pediatrics	20	1
Nursery	10	<1
Specific ward, type unknown**	79	2
Patient room, ward unspecified	110	3
Intensive Care Units	**284**	**9%**
Intensive care unit	270	8
Post anesthesia care unit	14	<1
Emergency Department	**283**	**9%**

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DEPARTMENT WHERE INCIDENT OCCURRED	N	%
Laboratory	**186**	**6%**
Histology / Pathology	26	1
Clinical chemistry	14	<1
Morgue / Autopsy room	14	<1
Blood bank	8	<1
Hematology	6	<1
Microbiology	3	<1
Other laboratory	29	1
Laboratory, unspecified	86	3
Outpatient Areas	**159**	**5%**
Ambulatory care clinic	27	1
Dental clinic	17	1
Home health visit	11	<1
Other outpatient areas	104	3
Other Areas	**145**	**4%**
Central sterile supply	44	1
Rehabilitation unit	20	1
Anesthesia	8	<1
Dermatology	8	<1
Long term care	5	<1
Exam room	4	<1
Pain clinic	3	<1
Ambulance	2	<1
Central trash area	2	<1
Detox unit	2	<1
Employee health / Infection control	2	<1
Hospital grounds	1	<1
Jail unit	1	<1
Other location	43	1
Unknown / Not answered	**6**	**<1%**
Nonclassifiable	**28**	**1%**

PROCEDURE FOR WHICH DEVICE WAS USED	N	%
Injection	**739**	**23%**
Subcutaneous injection	337	10
Intramuscular injection	52	2
Epidural / Spinal anesthesia	11	<1
Other injection	13	<1
Injection, unspecified	326	10
Suturing	**728**	**22%**
Suturing	725	22
Suture removal	3	<1
Blood Procedures	**601**	**18%**
Percutaneous venous puncture	436	13
Percutaneous arterial puncture	68	2
Finger stick / Heel stick	39	1
Dialysis / AV fistula site	22	1

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PROCEDURE FOR WHICH DEVICE WAS USED	N	%
Draw blood from umbilical vessel	8	<1
Draw blood from central or peripheral IV line or port	7	<1
Draw blood from arterial line	5	<1
Other blood procedure	9	<1
Blood procedure, unspecified	7	<1
Line Procedures	**256**	**8%**
To insert a peripheral IV line or set up a heparin lock	124	4
To insert a central IV line	34	1
Other injection into IV site / port	30	1
To insert an arterial line	14	<1
To flush heparin / saline	12	<1
To connect IV line	11	<1
Other line procedure	12	<1
Line procedure, unspecified	19	1
Making the incision	**227**	**7%**
To Obtain Body Fluid or Tissue sample	**98**	**3%**
Dental Procedures	**12**	**<1%**
Dental drilling	2	<1
Periodontal surgery	2	<1
Restorative	2	<1
Hygiene	1	<1
Other dental procedure	5	<1
Other	**362**	**11%**
To obtain lab specimens	28	1
Transferring blood / body fluid to another container	27	1
During disposal	18	<1
Shaving	6	<1
Drilling	5	<1
Other procedure	278	8
Unknown / Not answered	**119**	**4%**
Nonclassifiable	**123**	**4%**

DEVICE INVOLVED IN THE INJURY	N	%
Hypodermic needles / syringe (hollow bore)	**969**	**30%**
Hypodermic needle attached to a disposable syringe	830	25
Hypodermic needle attached to a non-disposable syringe	43	1
Unattached hypodermic needle	40	1
Prefilled cartridge syringe	35	1
Hypodermic needle attached to IV tubing	12	<1
Hypodermic needle, unspecified	9	<1
Suture Needle	**732**	**22%**
Curved suture needle	175	5
Straight suture needle	29	1
Suture needle, unspecified	528	16

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DEVICE INVOLVED IN THE INJURY	N	%
Other Hollow Bore Needle	**351**	**11%**
IV stylet	147	5
Biopsy needle	36	1
Spinal or epidural needle	26	1
Huber needle	24	1
Other type of hollow bore needle	45	1
Hollow bore needle, unspecified	73	2
Butterfly Needle (hollow bore)	**318**	**10%**
Winged steel needle	242	7
Winged steel needle attached to a vacuum tube collection holder	71	2
Winged steel needle attached to IV tubing	5	<1
Scalpel Blade	**239**	**7%**
Vacuum Tube Collection Holder / Needle (hollow bore)	**139**	**4%**
Vacuum tube collection holder / needle	79	2
Phlebotomy needle (other than butterfly)	60	2
Glass	**32**	**1%**
Specimen / Test / Vacuum tube	15	<1
Pipette	4	<1
Medication ampule / Vial / IV bottle	3	<1
Slide	2	<1
Other glass item	8	<1
Dental Device or Item	**12**	**<1%**
Dental explorer	4	<1
Dental bur	4	<1
Scaler / Curette	1	<1
Other dental device or item	3	<1
Other	**411**	**13%**
Wire	48	1
Lancet	36	1
Retractor	35	1
Scissors	33	1
Bovie electrocautery device	19	1
Forceps	19	1
Razor	18	1
Pin	16	1
Trocar	9	<1
Bone chip / chipped tooth	5	<1
Histology cutting blade	4	<1
Bone cutter	3	<1
Drill bit	2	<1
Elevator	1	<1
Rod	1	<1
Other needle	40	1
Needle, Unspecified	36	1
Other type of sharp object	86	3
Unknown / Not answered	**54**	**2%**

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DEVICE INVOLVED IN THE INJURY	N	%
Nonclassifiable	**8**	**<1%**

SAFETY DEVICE	N	%
No	1,772	54
Yes	1,173	36
Unknown / Not answered	320	10

WHEN THE INJURY OCCURRED	N	%
During use of the item	1,348	41
After use and before disposal	1,070	33
During or after disposal of the item	382	12
Before use of the item	41	1
Unknown / Not answered	424	13

HOW THE INJURY OCCURRED	N	%
Collision with Worker or Sharp	**692**	**21%**
Collided with sharp	329	10
Collided with sharp after procedure	235	7
Collided with coworker or other person	128	4
Suturing	**350**	**11%**
Suturing	306	9
Manipulating suture needle in holder	32	1
Tying suture	12	<1
During Clean-up	**224**	**7%**
During clean-up	121	4
Disassembling device or equipment	58	2
Decontamination / Processing of used equipment	45	1
Handle / Pass Equipment	**245**	**8%**
Receiving / Passing / Transferring equipment	130	4
Handling equipment on tray or stand	106	3
Opening / breaking glass containers	9	<1
Patient Moved and Jarred Device	**214**	**7%**
Activating Safety Device	**230**	**7%**
Activating safety device	206	6
Incomplete activation	24	1
Improper Disposal	**188**	**6%**
In trash	58	2
Left on table / tray	27	1
Left in bed / mattress	24	1
On floor	13	<1
In linen / laundry	10	<1
In pocket / clothing	10	<1
Other improper disposal	34	1
Improper disposal, unspecified	12	<1

Data Source: Annual Summary of Sharps Injuries, 2005

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Sharps Injuries among Hospital Workers in Massachusetts, 2005

HOW THE INJURY OCCURRED	N	%
During Sharps Disposal	**192**	**6%**
Collided with sharp during / after disposal	76	2
Protruding from opened container	22	1
While placing sharp in container, injured by sharp being disposed	21	1
Overfilled sharps container	19	1
While placing sharp in container, injured by sharp (unclear if sharp in container or being disposed)	17	1
While placing sharp in container, injured by sharp already in container	11	<1
In transit to disposal	10	<1
Sharp object dropped during / after disposal	3	<1
While manipulating container	3	<1
Punctured sharps container	2	<1
During sharps disposal, unspecified	8	<1
Manipulate Needle in Patient	**164**	**5%**
While withdrawing needle from patient	105	3
While inserting needle in patient	40	1
While manipulating needle in patient	19	1
Recap Needle	**101**	**3%**
Recapping	91	3
Cap fell off after recapping	6	<1
Removing cap after recapping	4	<1
Access IV Line	**37**	**1%**
While withdrawing needle from line	21	1
While inserting needle in line	10	<1
While manipulating needle in line	4	<1
Struck by detached IV line needle	2	<1
Failure to Activate Safety Device	**44**	**1%**
Device Malfunction	**34**	**1%**
Before Use of the Item	**41**	**1%**
Other	**347**	**11%**
Incising	35	1
Sharp object dropped	34	1
Transferring blood / bodily fluids into specimen container	29	1
Processing specimens	15	<1
Sharp object dropped after procedure	14	<1
Palpating / Exploring	4	<1
Other	216	7
Unknown / Not answered	**44**	**1%**
Nonclassifiable	**118**	**4%**
STATE TOTAL	**3,265**	**100%**

** Hospital specific nomenclature provided, without specifying department

Percentages for frequencies less than 5 were not calculated; Percentages calculated are column percents.

APPENDIX A

Sharps Injuries among Hospital Workers in Massachusetts, 2005

Sharps Injuries among Hospital Workers by Device and Presence of Safety Features

Device	No Safety Features		Safety Features		Unknown		Total	
	N	%	N	%	N	%	N	%
Hypodermic Needle / syringe	338	35	570	59	61	6	908	100%
Suture Needle	674	92	7	1	51	7	681	100%
Winged Steel Needle	26	8	284	89	8	3	310	100%
Scalpel Blade	174	73	31	13	34	14	205	100%
Vacuum tube collection holder / needle	18	13	110	79	11	8	128	100%
Other Hollow bore needle	181	52	144	41	26	7	325	100%
Other	337	74	24	5	94	21	328	100%
Total	1,772	54	1,170	36	320	10	3,265	100%

Sharps Injuries among Hospital workers by Procedure and Devices With and Without Safety Features

Procedure	No Safety Features		Safety Features		Unknown		Total	
	N	%	N	%	N	%	N	%
Injection Procedures								
Intramuscular Injection	15	29	32	62	5	10	52	100%
Subcutaneous Injection	94	28	228	68	15	4	337	100%
Other Injections	135	39	195	56	20	6	350	100%
Blood Procedures								
Percutaneous venous puncture	48	11	369	85	19	4	436	100%
Percutaneous arterial puncture	13	19	6	9	49	72	68	100%
Finger stick / Heel stick	16	41	20	51	3	8	39	100%
Other blood procedures	27	47	24	41	7	12	58	100%
Line Procedures								
To insert central line	27	80	3	9	4	12	34	100%
To insert peripheral IV or set up heparin lock	25	20	92	74	7	6	124	100%
Other line procedures	47	48	43	44	8	8	98	100%
Other procedures	1,180	83	87	6	160	11	1,427	100%
Total	1,772	54	1,170	36	320	10	3,265	100%

APPENDIX B

Sharps Injuries among Hospital Workers by Number of Licensed Hospital Beds, Massachusetts, 2005

	Hospital size							
	<100 beds		101-300 Beds		> 300 beds		All Hospitals	
	33 hospitals		50 hospitals		16 hospitals		99 hospitals	
	N	%*	N	%*	N	%*	N	%*
STATE TOTAL	**267**	**100%**	**1,144**	**100%**	**1,854**	**100%**	**3,265**	**100%**
WORK STATUS OF INJURED WORKER								
Employee	231	87 %	965	84 %	1,617	87 %	2,813	86 %
Non-Employee Practitioner	20	7	135	12	138	7	293	9
Student	3	<1	17	1	64	3	84	3
Temporary / Contract Worker	6	2	11	1	15	1	32	1
Volunteer	0	<1	0	<1	2	<1	2	<1
Other	2	<1	1	<1	0	<1	3	<1
Unknown / Not answered / Nonclassifiable	5	2	15	1	18	1	38	1
OCCUPATION								
Nurse	97	36 %	451	40 %	640	35 %	1,188	36 %
Physician	76	28	272	24	787	42	1,135	35
Technician	69	26	307	27	277	15	653	20
Support Services	10	4	72	6	64	3	146	4
Other Medical Staff	1	<1	16	1	16	1	33	1
Dental Staff	0	<1	3	<1	10	1	13	<1
Other	9	3	20	2	55	3	84	3
Unknown / Not answered / Nonclassifiable	5	2	3	<1	5	<1	13	<1
DEPARTMENT WHERE INJURY OCCURRED								
Operating and Procedure Rooms	115	43 %	479	42%	876	47%	1,470	45 %
Inpatient Units	55	21	255	22	394	21	704	22
Intensive Care Units	14	5	83	7	187	10	284	9
Emergency Department	28	10	127	11	128	7	283	8
Laboratories	27	10	63	6	96	5	186	6
Outpatient areas	10	4	50	4	99	5	159	5
Other areas	12	4	70	6	63	3	145	8
Unknown / Not answered / Nonclassifiable	6	2	17	1	11	1	34	1
PROCEDURE FOR WHICH DEVICE WAS USED								
Injection	56	21 %	284	25%	399	22 %	739	23 %
Suturing	50	19	239	21	439	24	728	22
Blood Procedures	52	19	229	20	320	17	601	18
Line Procedures	23	9	71	6	162	9	256	8
Making the Incision	20	7	70	6	137	7	227	7
To Obtain Body Fluid or Tissue Sample	6	2	27	2	65	4	98	3
Dental Procedures	1	<1	6	1	5	<1	12	<1
Other	40	15	114	10	208	11	362	11
Unknown / Not answered / Nonclassifiable	19	7	104	9	119	6	242	7

Percentages calculated are column percents; Percentages for frequencies less than 5 were not calculated.

APPENDIX B

Sharps Injuries among Hospital Workers by Number of Licensed Hospital Beds, Massachusetts, 2005

	Hospital size							
	<100 beds		101-300 Beds		> 300 beds		All Hospitals	
	33 hospitals		50 hospitals		16 hospitals		99 hospitals	
	N	%*	N	%*	N	%*	N	%*
STATE TOTAL	**267**	**100%**	**1,144**	**100%**	**1,854**	**100%**	**3,265**	**100%**
DEVICE INVOLVED IN THE INJURY								
Hypodermic needles / syringe	75	28 %	362	32 %	532	29 %	969	30 %
Suture Needle	54	20	239	21	439	24	732	22
Butterfly Needle	28	11	115	10	175	9	318	10
Scalpel Blade	17	6	75	7	147	8	239	7
Vacuum Tube Collection Holder / Needle	13	5	70	6	56	3	139	4
Glass	6	2	11	1	15	1	32	1
Dental Device or Item	1	<1	4	<1	7	<1	12	<1
Other Hollow Bore Needle	31	12	103	9	217	12	351	11
Other	38	14	146	13	227	12	411	13
Unknown / Not answered / Nonclassifiable	4	<1	19	2	39	2	62	2
SAFETY DEVICE								
No	148	55 %	584	51 %	1,040	56 %	1,772	54 %
Yes	105	39	498	44	570	31	1,173	36
Unknown / Not answered	14	5	62	5	244	16	320	10
WHEN THE INJURY OCCURRED								
During Use of the Item	108	40 %	437	38 %	803	43 %	1,348	41 %
After Use / Before Disposal	85	32	410	36	575	31	1,070	33
During or After Disposal of the Item	32	12	143	13	207	11	382	12
Before Use of the Item	2	<1	9	1	30	2	41	1
Unknown / Not answered / Nonclassifiable	40	15	145	13	239	13	424	13
HOW THE INJURY OCCURRED								
Collision with Worker or Sharp	44	16 %	196	17 %	452	24 %	692	21 %
Suturing	26	10	114	10	210	11	350	11
Handle / Pass Equipment	20	7	96	8	129	7	245	8
Activate Safety Device	21	8	103	9	106	6	230	7
During Clean-up	19	7	90	8	115	6	224	7
Patient Moved / Jarred Device	22	8	90	8	102	6	214	7
During Sharps Disposal	17	6	75	7	100	5	192	6
Improper Disposal	15	6	67	6	106	6	188	6
Manipulate Needle in Patient	22	8	69	6	73	4	164	5
Recap Needle	4	<1	38	3	59	3	101	3
Failure to Activate Safety Device	3	<1	25	2	16	1	44	1
Before Use of Item	2	<1	9	1	30	2	41	1
Access IV Line	5	2	6	1	26	1	37	1
Device Malfunctioned	2	<1	18	2	14	1	34	1
Other	31	12	106	9	210	11	347	11
Unknown / Not answered / Nonclassifiable	14	5	42	4	106	6	162	5

Percentages calculated are column percents; Percentages for frequencies less than 5 were not calculated.

APPENDIX C

Sharps Injuries among Hospital Workers by Hospital Teaching Status, Massachusetts, 2005

	Teaching Status					
	Teaching		Non-teaching		All Hospitals	
	19 hospitals		80 hospitals		99 hospitals	
	N	%*	N	%*	N	%*
STATE TOTAL	**2,023**	**100%**	**1,242**	**100%**	**3,265**	**100%**
WORK STATUS OF INJURED WORKER						
Employee	1,761	87%	1,052	85%	2,813	86 %
Non-Employee Practitioner	148	7	145	12	293	9
Student	70	3	14	1	84	3
Temp / Contract	18	1	14	1	32	1
Volunteer	2	<1	0	0	2	<1
Other	1	<1	2	<1	3	<1
Unknown / Not answered / Nonclassifiable	23	1	15	1	38	1
OCCUPATION						
Nurse	645	32%	543	44%	1,188	36 %
Physician	902	45	233	19	1,135	35
Technician	301	15	352	28	653	20
Support Services	70	3	76	6	146	4
Other Medical Staff	21	1	12	1	33	1
Dental Staff	13	1	0	0	13	<1
Other	66	3	18	1	84	3
Unknown / Not answered / Nonclassifiable	5	<1	8	1	13	<1
DEPARTMENT WHERE INJURY OCCURRED						
Operating and Procedure Rooms	986	49%	484	39%	1,470	45%
Inpatient Units	371	18	333	27	704	22
Intensive Care Units	206	10	78	6	284	9
Emergency Department	136	7	147	12	283	9
Laboratories	108	5	78	6	186	6
Outpatient areas	121	6	38	3	159	5
Other areas	80	4	65	5	145	8
Unknown / Not answered / Nonclassifiable	15	1	19	2	34	1
PROCEDURE FOR WHICH DEVICE WAS USED						
Injection	415	21%	324	26%	739	23%
Suturing	505	25	223	18	728	22
Blood Procedures	314	16	287	23	601	18
Line Procedures	167	8	89	7	256	8
Making the Incision	149	7	78	6	227	7
To Obtain Body Fluid or Tissue Sample	73	4	25	2	98	3
Dental Procedures	11	1	1	<1	12	<1
Other	244	12	118	10	362	11
Unknown / Not answered / Nonclassifiable	145	7	97	8	242	7

Percentages calculated are column percents; Percentages for frequencies less than 5 were not calculated.

APPENDIX C

Sharps Injuries among Hospital Workers by Hospital Teaching Status, Massachusetts, 2005

	Teaching Status					
	Teaching		Non-teaching		All Hospitals	
	19 hospitals		80 hospitals		99 hospitals	
	N	%*	N	%*	N	%*
STATE TOTAL	**2,023**	**100%**	**1,242**	**100%**	**3,265**	**100%**
DEVICE INVOLVED IN THE INJURY						
Hypodermic needles / syringe	555	27%	414	33%	969	30%
Suture Needle	504	25	228	18	732	22
Butterfly Needle	183	9	135	11	318	10
Scalpel Blade	168	8	71	6	239	7
Vacuum Tube Collection Holder / Needle	54	3	85	7	139	4
Glass	21	1	11	1	32	1
Dental Device or Item	11	1	1	<1	12	<1
Other Hollow Bore Needle	237	12	114	9	351	11
Other	253	13	158	13	411	13
Unknown / Not answered / Nonclassifiable	37	2	25	2	62	2
SAFETY DEVICE						
No	1,195	59%	577	46%	1,772	54%
Yes	590	29	583	47	1,173	36
Unknown / Not answered	238	12	82	7	320	10
WHEN THE INJURY OCCURRED						
During Use of the Item	891	44%	457	37%	1,348	41%
After Use / Before Disposal	621	31	449	36	1,070	33
During or After Disposal of the Item	209	10	173	14	382	12
Before Use of the Item	33	2	8	1	41	1
Unknown / Not answered / Nonclassifiable	269	13	155	12	424	13
HOW THE INJURY OCCURRED						
Collision with Worker or Sharp	474	23%	218	18%	692	21%
Suturing	250	12	100	8	350	11
Handle / Pass Equipment	151	7	94	8	245	8
Activate Safety Device	117	6	113	9	230	7
During Clean-up	131	6	93	7	224	7
Patient Moved / Jarred Device	104	5	110	9	214	7
During Sharps Disposal	107	5	85	7	192	6
Improper Disposal	100	5	88	7	188	6
Manipulate Needle in Patient	91	5	73	6	164	5
Recap Needle	67	3	34	3	101	3
Failure to Activate Safety Device	19	1	25	2	44	1
Before Use of the Item	33	2	8	1	41	1
Access IV Line	24	1	13	1	37	1
Device Malfunctioned	13	1	21	2	34	1
Other	228	11	119	10	347	11
Unknown / Not answered / Nonclassifiable	114	6	48	4	162	5

Percentages calculated are column percents; Percentages for frequencies less than 5 were not calculated.

APPENDIX D
Resources
Sharps Injury Surveillance and Prevention

MDPH Occupational Health Surveillance Program
http://www.mass.gov/dph/ohsp
Sharps Injury Surveillance and Prevention Project - e-mail: Sharps.Injury@state.ma.us

OSHA Subject Page for Needle Sticks
Includes Bloodborne Pathogens Standard and compliance directive
http://www.osha.gov/SLTC/bloodbornepathogens/index.html

CDC-MMWR September 30, 2005 / Vol. 54 / RR-9
Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Post Exposure Prophylaxis
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5409a1.htm

CDC-MMWR June 29, 2001 / Vol. 50 / RR-11
Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV and HIV and Recommendations for Post Exposure Prophylaxis
http://www.cdc.gov/mmwr/PDF/rr/rr5011.pdf

CDC Division of Healthcare Quality Promotion
Workbook for Designing, Implementing, and Evaluating a Sharps Injury Prevention Program
http://www.cdc.gov/sharpssafety/

CDC Division of Healthcare Quality Promotion, Issues in Healthcare
Information related to bloodborne pathogens
http://www.cdc.gov/ncidod/hip/Blood/blood.htm

CDC Division of Healthcare Quality Promotion, National Surveillance System for Health care Workers
http://www.cdc.gov/ncidod/hip/SURVEILL/nash.HTM

National Surveillance System for Health care Workers,
Summary report for data collected from June 1995 through July 1999
http://www.cdc.gov/ncidod/hip/NASH/report99.PDF

NIOSH Alert – Preventing Needlestick Injuries in Health care settings
http://www.cdc.gov/niosh/2000-108.html

JCAHO Sentinel Event Alert, Issue 22 August 2001
Preventing Needlestick and Sharps Injuries
http://www.jcaho.org/edu_pub/sealert/sea22.html

EPINet, International Health Care Worker Safety Center, University of Virginia
http://www.med.virginia.edu/medcntr/centers/epinet/

Training for Development of Innovative Control Technologies (TDICT) Project, San Francisco General Hospital
http://www.tdict.org/

Sustainable Hospitals Project, Lowell Center for Sustainable Production, University of Massachusetts Lowell
http://sustainablehospitals.org