Sharps Injuries among Hospital Workers in Massachusetts, 2006

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 postexposure management of all workers who have sustained occupational exposure to bloodborne pathogens (MMWR, 2001; MMWR, 2005). These guidelines provide information for determining when postexposure prophylaxis is appropriate, based on the type and severity of the exposure, infectious status of the source patient and the immune status of the exposed health care worker. 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 2006 data collection period. It includes information regarding the devices and procedures associated with sharps

[1] "Sharps Injuries among Hospital Workers in Massachusetts" for 2002, 2003, 2004 and 2005 can be downloaded from www.mass.gov/dph/ohsp under "Needlesticks and Other Sharps Injuries" and "Data and Statistics".

injuries in Massachusetts hospitals as well as the departments in which these injuries occurred and 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 2006. A total of 3,133 sharps injuries were sustained by Massachusetts hospital workers in 2006 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 3,133 sharps injuries among hospital health care workers in Massachusetts were reported for the surveillance period January 1 to December 31, 2006. This is similar to the annual number of sharps injuries reported in previous years.

- Eighty-six percent of the injured workers (2,702) were hospital employees, 8% (254) were non-employee practitioners, 4% (123) were students, and 1% (41) were temporary or contract employees.

Occupation and Department

- Nurses sustained more injuries (37%, 1,153) than any other occupational group, followed by physicians (35%, 1,101). 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) (44%, 817).

- Technicians, such as surgical technicians and phlebotomists, sustained 19% (589) of the injuries. Four percent (117) of the injuries were sustained by support service workers; of whom close to a third (72) were housekeepers.

- Injuries occurred most frequently in operating rooms (32%, 1,007) followed by medical surgical wards (15%, 480). 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 56% (1,733) of all injuries reported. Hypodermic needles / syringes accounted for more injuries (31%, 980) 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% (118) and 10% (299) of all injuries, respectively.

- Injuries involving solid sharp devices and material, including suture needles, scalpels and glass, accounted for 42% (1,339) of all injuries. Injuries involving suture needles occurred 22% (701) of the time, followed by scalpel blades (7%, 220) and glass items (1%, 42).

- Of the injuries with devices for which information was recorded regarding the presence of safety features (2,865), over half (58%, 1,660) 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 31% (300) 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% (24) of winged steel needles and 24% (28) 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 (26%, 808) and suturing (22%, 699) followed by blood procedures (17%, 520). In medium hospitals injuries were most often related to injections (30%, 289), while in small and large sized hospitals, injections accounted for 24% of injuries (70 and 449 injuries respectively). Suturing also accounted for 24% of injuries in both small and large hospitals (69 and 447 injuries respectively), in contrast to 19% (183) in medium sized hospitals.

- Injuries occurred during the use of devices in 45% (1,422) of the cases. After use of the device was a more dangerous time to handle a device as compared with during use. About half (48%, 1,492) of the injuries occurred after use of the device. These included injuries sustained after use but before disposal of devices (37%, 1,157) and injuries occurring during or after disposal (11%, 335).

- Collision with sharp accounted for 13% (415) 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% (340) 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 3,100 sharps injuries were reported by Massachusetts hospitals in 2006, 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 1,600 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 the inventory of devices lacking sharps injury prevention features and proceed with evaluating and implementing devices with sharps injury prevention features where clinically appropriate.

- Blood procedures, which include percutaneous venous or arterial punctures as well as finger sticks, account for about 17% 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 details regarding how the injury occurred. Evaluation of injuries related to blood procedures may lead to selection of new devices as well as additional training on the use of devices with sharps injury prevention features.

- Injuries in operating and procedure rooms constitute 44% 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 sharps injury prevention features. These measures include use of neutral zones for hands free passing and increased verbal communications regarding the transfer of devices among staff. Evaluation of devices used, and consideration of those with safety features, such as scalpel blades and blunt suture needles is also needed. Together with OSHA, NIOSH issued a safety and health information bulletin (SHIB) regarding the implementation of blunt suture needles in 2007. Prior to the NIOSH SHIB, the American College of Surgeons issued a statement at the 2005 Annual Meeting supporting “the universal adoption of blunt suture needles as the first choice for fascial suturing to minimize or eliminate needle-stick injuries from surgical needles”. In addition to suture needles, 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 and helps to prevent 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, 2006

STATE TOTAL	**3,133**	**100%**

WORK STATUS OF INJURED WORKER	**N**	**%**
Employee	2,702	86
Non-employee practitioner	254	8
Student	123	4
Temporary / Contract worker	41	1
Volunteer	1	<1
Other	1	<1
Nonclassifiable	11	<1
Not answered	0	0

OCCUPATION OF INJURED WORKER	**N**	**%**
Nurse	**1,153**	**37%**
RN or LPN	1,025	33
Nursing assistant	48	2
Patient care technician	41	1
Nurse anesthetist	13	<1
Nursing student	12	<1
Nurse practitioner	9	<1
Nurse midwife	3	<1
Home health aide	2	<1
Physician	**1,101**	**35%**
Intern / Resident	482	15
MD	335	11
Physician assistant	75	2
Fellow	72	2
Medical student	61	2
Surgeon	46	1
Anesthesiologist	16	1
Radiologist	14	<1
Technician	**589**	**19%**
OR / Surgical technician	238	8
Phlebotomist	133	4
Clinical lab technician	65	2
Radiologic technician	34	1
Respiratory therapist / Tech	24	1
Other technician	95	3
Support Services	**117**	**4%**
Housekeeper	72	2
Central supply	32	1
Attendant / Orderly	6	<1
Maintenance	4	<1
Safety / Security	2	<1
Other ancillary staff	1	<1
Other Medical Staff	**44**	**1%**
Medical assistant	40	1
Other medical staff	3	<1

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OCCUPATION OF INJURED WORKER	N	%
Physical Therapist	1	<1
Dental Staff	**13**	**<1%**
Dental Assistant / Tech	2	<1
Dentist	6	<1
Dental Student	5	<1
Other	**105**	**3%**
Researcher	10	<1
EMT / Paramedic	5	<1
Counselor / Social worker	3	<1
Clerical / Administrative	2	<1
Pharmacist	1	<1
Other student	27	1
Other	57	2
Unknown / Not Answered	**10**	**<1%**
Nonclassifiable	**1**	**<1%**

DEPARTMENT WHERE INCIDENT OCCURRED	N	%
Operating and Procedure Rooms	**1,371**	**44%**
Operating room	1,007	32
Labor and delivery	124	4
Radiology	96	3
Cardiac catheterization laboratory	30	1
Endoscopy / Bronchoscopy / Cytoscopy	25	<1
Phlebotomy room	20	1
Dialysis	20	1
Hematology / Oncology	18	1
Other procedure room	11	<1
Procedure room, unspecified	20	1
Inpatient Units	**695**	**22%**
Medical / Surgical ward	480	15
Pediatrics	25	1
Psychiatry ward	20	1
Obstetrics / Gynecology	17	1
Nursery	13	<1
Specific ward, type unknown**	25	1
Patient room, ward unspecified	115	4
Emergency Department	**296**	**9%**
Intensive Care Units	**251**	**8%**
Intensive care unit	238	8
Post anesthesia care unit	13	<1
Outpatient Areas	**208**	**7%**
Ambulatory care clinic	93	3
Home health visit	38	1
Dental clinic	15	<1
Other outpatient areas	62	2

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DEPARTMENT WHERE INCIDENT OCCURRED	N	%
Laboratory	**158**	**5%**
Histology / Pathology	24	1
Clinical chemistry	16	1
Morgue / Autopsy room	11	<1
Blood bank	5	<1
Microbiology	3	<1
Hematology	1	<1
Other laboratory	34	1
Laboratory, unspecified	64	2
Other Areas	**137**	**4%**
Central sterile supply	29	1
Dermatology	25	<1
Rehabilitation unit	20	1
Long term care	9	<1
Central trash area	9	<1
Pain clinic	6	<1
Exam room	5	<1
Detox unit	4	<1
Anesthesia	2	<1
Ambulance	2	<1
Employee health / Infection control	1	<1
Pharmacy	1	<1
Other location	24	1
Unknown / Not answered	**17**	**1%**

PROCEDURE FOR WHICH DEVICE WAS USED	N	%
Injection	**808**	**26%**
Subcutaneous injection	403	13
Intramuscular injection	62	2
Epidural / Spinal anesthesia	17	1
Other injection	20	1
Injection, unspecified	306	10
Suturing	**699**	**22%**
Suturing	692	22
Suture removal	7	<1
Blood Procedures	**520**	**17%**
Percutaneous venous puncture	389	12
Percutaneous arterial puncture	61	2
Finger stick / Heel stick	40	1
Dialysis / AV fistula site	11	<1
Draw blood from umbilical vessel	6	<1
Other blood procedure	5	<1
Blood procedure, unspecified	8	<1
Line Procedures	**282**	**9%**
To insert a peripheral IV line or set up a heparin lock	120	4
To insert a central IV line	28	1
Other injection into IV site / port	37	1

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PROCEDURE FOR WHICH DEVICE WAS USED	N	%
To insert an arterial line	20	<1
To flush heparin / saline	20	<1
Draw blood from central or peripheral IV line or port	13	<1
To connect IV line	10	<1
Draw blood from arterial line	1	<1
Other line procedure	27	<1
Line procedure, unspecified	6	<1
Making the incision	**247**	**8%**
To Obtain Body Fluid or Tissue sample	**85**	**3%**
Dental Procedures	**17**	**1%**
Oral surgery	4	<1
Restorative	2	<1
Dental drilling	1	<1
Hygiene	1	<1
Other dental procedure	4	<1
Dental procedure, unspecified	5	<1
Other	**328**	**10%**
To obtain lab specimens	26	1
Transferring blood / body fluid to another container	23	1
During disposal	10	<1
Shaving	5	<1
Drilling	12	<1
Other procedure	236	8
Procedure, unspecified	16	1
Unknown / Not answered	**122**	**4%**
Nonclassifiable	**25**	**1%**

DEVICE INVOLVED IN THE INJURY	N	%
Hypodermic needles / syringe (hollow bore)	**980**	**31%**
Hypodermic needle attached to a disposable syringe	857	27
Prefilled cartridge syringe	39	1
Hypodermic needle attached to a non-disposable syringe	34	1
Unattached hypodermic needle	29	1
Hypodermic needle attached to IV tubing	8	<1
Hypodermic needle, unspecified	13	<1
Suture Needle	**701**	**22%**
Curved suture needle	191	6
Straight suture needle	26	1
Suture needle, unspecified	484	15
Other Hollow Bore Needle	**335**	**11%**
IV stylet	163	5
Huber needle	34	1
Spinal or epidural needle	30	1
Biopsy needle	13	<1
Other type of hollow bore needle	49	2

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DEVICE INVOLVED IN THE INJURY	N	%
Hollow bore needle, unspecified	46	1
Butterfly Needle (hollow bore)	**299**	**10%**
Winged steel needle	198	6
Winged steel needle attached to a vacuum tube collection holder	98	3
Winged steel needle attached to IV tubing	3	<1
Scalpel Blade	**220**	**7%**
Vacuum Tube Collection Holder / Needle (hollow bore)	**118**	**4%**
Vacuum tube collection holder / needle	90	3
Phlebotomy needle (other than butterfly)	28	1
Glass	**42**	**1%**
Specimen / Test / Vacuum tube	15	<1
Pipette	4	<1
Medication ampule / Vial / IV bottle	3	<1
Slide	4	<1
Other glass item	16	1
Dental Device or Item	**5**	**<1%**
Dental bur	1	<1
Dental needle	1	<1
Other dental device or item	3	<1
Other	**376**	**12%**
Lancet	46	1
Scissors	31	1
Wire	27	1
Retractor	23	1
Pin	21	1
Forceps	18	1
Bovie electrocautery device	12	<1
Bone cutter	11	<1
Razor	10	<1
Trocar	9	<1
Drill bit	6	<1
Bone chip / chipped tooth	3	<1
Tenaculum	3	<1
Elevator	2	<1
Histology cutting blade	1	<1
Other needle	47	2
Needle, Unspecified	39	1
Other type of sharp object	67	2
Unknown / Not answered	**57**	**2%**

SAFETY DEVICE	N	%
No	1,671	53
Yes	1,206	38
Unknown / Not answered	256	8

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WHEN THE INJURY OCCURRED	N	%
Before use of the item	34	1
During use of the item	1,422	45
After use and before disposal	1,157	37
During or after disposal of the item	335	11
Unknown / Not answered	116	4
Nonclassifiable	69	2

HOW THE INJURY OCCURRED	N	%
Collision with Worker or Sharp	**742**	**24%**
Collided with sharp	415	13
Collided with sharp after procedure	238	8
Collided with coworker or other person	89	3
Suturing	**340**	**11%**
Suturing	301	10
Manipulating suture needle in holder	30	1
Tying suture	9	<1
During Clean-up	**132**	**4%**
During clean-up	94	3
Disassembling device or equipment	7	<1
Decontamination / Processing of used equipment	31	1
Handle / Pass Equipment	**239**	**8%**
Receiving / Passing / Transferring equipment	120	4
Disassembling device or equipment	69	2
Handling equipment on tray or stand	45	1
Opening / breaking glass containers	5	<1
Patient Moved and Jarred Device	**193**	**6%**
Activating Safety Device	**268**	**9%**
Activating safety device	217	7
Incomplete activation	51	2
Improper Disposal	**162**	**5%**
In trash	49	2
Left on table / tray	43	1
Left in bed / mattress	16	1
On floor	16	1
In pocket / clothing	7	<1
In linen / laundry	4	<1
Other improper disposal	25	1
Improper disposal, unspecified	2	<1
During Sharps Disposal	**190**	**6%**
Collided with sharp during / after disposal	63	2
Protruding from opened container	14	<1
While placing sharp in container, injured by sharp being disposed	31	1
Overfilled sharps container	14	1

APPENDIX A

Sharps Injuries among Hospital Workers in Massachusetts, 2006

HOW THE INJURY OCCURRED	N	%
While placing sharp in container, injured by sharp (unclear if sharp in container or being disposed)	32	1
In transit to disposal	18	1
While placing sharp in container, injured by sharp already in container	7	<1
While manipulating container	6	<1
Struck by detached IV line needle during / after disposal	2	<1
Sharp object dropped during / after disposal	1	<1
Punctured sharps container	1	<1
During sharps disposal, unspecified	1	<1
Manipulate Needle in Patient	**209**	**7%**
While withdrawing needle from patient	115	4
While inserting needle in patient	68	2
While manipulating needle in patient	26	1
Recap Needle	**97**	**3%**
Recapping	80	3
Cap fell off after recapping	11	<1
Removing cap after recapping	6	<1
Access IV Line	**24**	**1%**
While withdrawing needle from line	11	1
While inserting needle in line	8	<1
While manipulating needle in line	3	<1
Struck by detached IV line needle	2	<1
Failure to Activate Safety Device	**105**	**3%**
Device Malfunction	**46**	**1%**
Before Use of the Item	**32**	**1%**
Other	**280**	**9%**
Incising	59	2
Sharp object dropped	39	1
Transferring blood / bodily fluids into specimen container	17	1
Processing specimens	22	1
Sharp object dropped after procedure	6	<1
Palpating / Exploring	4	<1
Other	133	4
Unknown / Not answered	**71**	**2%**
Nonclassifiable	**3**	**<1%**
STATE TOTAL	**3,133**	**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, 2006

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	300	31	622	63	58	6	980	100%
Suture Needle	653	93	8	1	40	6	701	100%
Winged Steel Needle	24	8	267	89	8	3	299	100%
Scalpel Blade	176	80	24	11	20	9	220	100%
Vacuum tube collection holder / needle	28	24	83	70	7	6	118	100%
Other Hollow bore needle	149	44	159	47	27	8	335	100%
Other	341	71	43	9	96	20	480	100%
Total	1,671	53	1,206	38	256	8	3,133	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	9	15	52	84	1	2	62	100%
Subcutaneous Injection	126	31	259	64	18	4	403	100%
Other Injections	110	32	208	61	25	7	343	100%
Blood Procedures								
Percutaneous venous puncture	46	12	331	85	12	3	389	100%
Percutaneous arterial puncture	14	23	45	74	2	3	61	100%
Finger stick / Heel stick	29	73	4	10	7	18	40	100%
Other blood procedures	8	27	19	63	3	10	30	100%
Line Procedures								
To insert central line	22	79	3	11	3	11	28	100%
To insert peripheral IV or set up heparin lock	19	16	96	80	5	4	120	100%
Other line procedures	56	42	74	55	4	3	134	100%
Other procedures	1,232	81	115	8	176	12	1,523	100%
Total	1,671	53	1,206	38	256	8	3,133	100%

APPENDIX B

Sharps Injuries among Hospital Workers by Number of Licensed Hospital Beds, Massachusetts, 2006

	Hospital size							
	<100 beds		**101-300 Beds**		**> 300 beds**		**All Hospitals**	
	29 hospitals		52 hospitals		15 hospitals		99 hospitals	
	N	**%***	**N**	**%***	**N**	**%***	**N**	**%***
STATE TOTAL	**286**	**100%**	**979**	**100%**	**1,868**	**100%**	**3,133**	**100%**
WORK STATUS OF INJURED WORKER								
Employee	230	80	825	84	1,647	88	2,702	100 %
Non-Employee Practitioner	28	10	101	10	125	7	254	100
Student	14	5	25	3	84	4	123	100
Temporary / Contract Worker	13	5	17	2	11	1	41	100
Volunteer	1	0	0	0	0	0	1	100
Other	0	0	0	0	1	0	1	100
Unknown / Not answered / Nonclassifiable	0	0	11	1	0	0	11	100
OCCUPATION								
Nurse	110	38	425	43	618	33	1,153	100 %
Physician	79	28	205	21	817	44	1,101	100
Technician	63	22	269	27	257	14	589	100
Support Services	12	4	42	4	63	3	117	100
Other Medical Staff	5	2	19	2	20	1	44	100
Dental Staff	1	<1	4	<1	8	<1	13	100
Other	16	6	12	1	77	4	105	100
Unknown / Not answered / Nonclassifiable	0	0	3	<1	8	<1	11	100
DEPARTMENT WHERE INJURY OCCURRED								
Operating and Procedure Rooms	140	49	378	39	853	46	1,371	100 %
Inpatient Units	45	16	269	27	381	20	695	100
Emergency Department	35	12	112	11	149	8	296	100
Intensive Care Units	9	3	56	6	186	10	251	100
Outpatient areas	25	9	58	11	125	7	208	100
Laboratories	25	9	41	4	92	5	158	100
Other areas	7	2	60	6	70	4	137	100
Unknown / Not answered / Nonclassifiable	0	0	5	1	12	1	17	100
PROCEDURE FOR WHICH DEVICE WAS USED								
Injection	70	24	289	30	449	24	808	100 %
Suturing	69	24	183	19	447	24	699	100
Blood Procedures	43	15	208	21	269	14	520	100
Line Procedures	25	9	84	9	173	9	282	100
Making the Incision	26	9	81	8	140	7	247	100
To Obtain Body Fluid or Tissue Sample	7	2	24	2	54	3	85	100
Dental Procedures	1	<1	6	1	10	1	17	100
Other	32	11	56	6	240	13	328	100
Unknown / Not answered / Nonclassifiable	13	5	48	5	86	5	147	100

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, 2006

	Hospital size							
	<100 beds		**101-300 Beds**		**> 300 beds**		**All Hospitals**	
	29 hospitals		52 hospitals		15 hospitals		99 hospitals	
	N	**%***	**N**	**%***	**N**	**%***	**N**	**%***
STATE TOTAL	**286**	**100%**	**979**	**100%**	**1,868**	**100%**	**3,133**	**100%**
DEVICE INVOLVED IN THE INJURY								
Hypodermic needles / syringe	89	31	327	33	564	30	980	100 %
Suture Needle	72	25	189	19	440	24	701	100
Winged Steel Needle	23	8	130	13	146	8	299	100
Scalpel Blade	17	6	62	6	141	8	220	100
Vacuum Tube Collection Holder / Needle	10	3	54	6	54	3	118	100
Glass	8	3	9	1	25	1	42	100
Dental Device or Item	0	0	2	<1	3	<1	5	100
Other Hollow Bore Needle	25	9	91	9	219	12	335	100
Other	36	13	93	9	247	13	376	100
Unknown / Not answered / Nonclassifiable	6	2	22	2	29	2	57	100
SAFETY DEVICE								
No	160	56	439	45	1,072	57	1,671	100 %
Yes	103	36	475	49	628	34	1,206	100
Unknown / Not answered	23	8	65	7	168	9	256	100
WHEN THE INJURY OCCURRED								
During Use of the Item	124	43	383	39	915	49	1,422	100 %
After Use / Before Disposal	97	34	388	40	672	36	1,157	100
During or After Disposal of the Item	37	13	119	12	179	10	335	100
Before Use of the Item	5	2	5	5	24	1	34	100
Unknown / Not answered / Nonclassifiable	23	8	84	9	78	4	185	100
HOW THE INJURY OCCURRED								
Collision with Worker or Sharp	52	18	178	18	512	27	742	100 %
Suturing	37	13	81	8	222	12	340	100
Activate Safety Device	21	7	117	12	130	7	268	100
Handle / Pass Equipment	25	9	78	8	136	7	239	100
Manipulate Needle in Patient	21	7	63	6	125	7	209	100
Patient Moved / Jarred Device	20	7	84	9	89	5	193	100
During Sharps Disposal	22	8	71	7	97	5	190	100
Improper Disposal	16	6	58	6	88	5	162	100
During Clean-up	13	5	49	5	70	4	132	100
Failure to Activate Safety Device	6	2	46	5	53	3	105	100
Recap Needle	12	4	23	2	62	3	97	100
Device Malfunctioned	5	2	23	2	18	1	46	100
Before Use of Item	4	1	5	1	23	1	32	100
Access IV Line	1	<1	6	1	17	1	24	100
Other	23	8	55	5	202	11	280	100
Unknown / Not answered / Nonclassifiable	8	3	42	4	24	1	74	100

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, 2006

	Teaching Status					
	Teaching		Non-teaching		All Hospitals	
	19 hospitals		80 hospitals		99 hospitals	
	N	%*	N	%*	N	%*
STATE TOTAL	**2,038**	**100%**	**1,095**	**100%**	**3,133**	**100%**
WORK STATUS OF INJURED WORKER						
Employee	1,796	88	906	83	2,702	100 %
Non-Employee Practitioner	126	6	128	12	254	100
Student	102	5	21	2	123	100
Temp / Contract	13	1	28	3	41	100
Volunteer	0	0	1	<1	1	100
Other	1	<1	0	0	1	100
Unknown / Not answered / Nonclassifiable	0	0	11	1	11	100
OCCUPATION						
Nurse	661	32	492	45	1,153	100 %
Physician	884	43	217	20	1,101	100
Technician	294	14	295	27	589	100
Support Services	66	3	51	5	117	100
Other Medical Staff	23	1	21	2	44	100
Dental Staff	12	1	1	<1	13	100
Other	90	4	15	1	105	100
Unknown / Not answered / Nonclassifiable	8	<1	3	<1	11	100
DEPARTMENT WHERE INJURY OCCURRED						
Operating and Procedure Rooms	956	47	415	38	1,371	100%
Inpatient Units	397	19	298	27	695	100
Emergency Department	160	8	136	12	296	100
Intensive Care Units	191	9	60	5	251	100
Outpatient areas	140	7	68	6	208	100
Laboratories	109	5	49	4	158	100
Other areas	71	3	66	6	137	100
Unknown / Not answered / Nonclassifiable	14	1	3	<1	17	100
PROCEDURE FOR WHICH DEVICE WAS USED						
Injection	493	24	315	29	808	100%
Suturing	497	24	202	18	699	100
Blood Procedures	293	14	227	21	520	100
Line Procedures	178	9	104	9	282	100
Making the Incision	167	8	80	7	247	100
To Obtain Body Fluid or Tissue Sample	56	3	29	3	85	100
Dental Procedures	13	1	4	<1	17	100
Other	250	12	78	7	328	100
Unknown / Not answered / Nonclassifiable	91	4	56	5	147	100

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, 2006

	Teaching Status					
	Teaching		Non-teaching		All Hospitals	
	19 hospitals		80 hospitals		99 hospitals	
	N	%*	N	%*	N	%*
STATE TOTAL	**2,038**	**100%**	**1,095**	**100%**	**3,133**	**100%**
DEVICE INVOLVED IN THE INJURY						
Hypodermic needles / syringe	608	30	372	34	980	100%
Suture Needle	490	24	211	19	701	100
Winged Steel Needle	175	9	124	11	299	100
Scalpel Blade	159	8	61	6	220	100
Vacuum Tube Collection Holder / Needle	48	2	70	6	118	100
Glass	28	1	14	1	42	100
Dental Device or Item	4	<1	1	<1	5	100
Other Hollow Bore Needle	228	11	107	10	335	100
Other	266	13	110	10	376	100
Unknown / Not answered / Nonclassifiable	32	2	25	2	57	100
SAFETY DEVICE						
No	1,173	58	498	45	1,671	100%
Yes	688	34	518	47	1,206	100
Unknown / Not answered	177	9	79	7	256	100
WHEN THE INJURY OCCURRED						
During Use of the Item	989	49	433	40	1,422	100%
After Use / Before Disposal	742	36	415	38	1,157	100
During or After Disposal of the Item	188	9	147	13	335	100
Before Use of the Item	24	1	10	1	34	100
Unknown / Not answered / Nonclassifiable	95	5	90	8	185	100
HOW THE INJURY OCCURRED						
Collision with Worker or Sharp	541	27	201	18	742	100%
Suturing	256	13	84	8	340	100
Activate Safety Device	147	7	121	11	268	100
Handle / Pass Equipment	167	8	72	7	239	100
Manipulate Needle in Patient	127	6	82	7	209	100
Patient Moved / Jarred Device	96	5	97	9	193	100
During Sharps Disposal	111	5	79	7	190	100
Improper Disposal	88	4	74	7	162	100
During Clean-up	72	4	60	5	132	100
Failure to Activate Safety Device	53	3	52	5	105	100
Recap Needle	70	3	27	2	97	100
Device Malfunctioned	20	1	26	2	46	100
Before Use of Item	24	1	8	1	32	100
Access IV Line	17	1	7	1	24	100
Other	221	11	59	5	280	100
Unknown / Not answered / Nonclassifiable	28	1	46	4	74	100

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