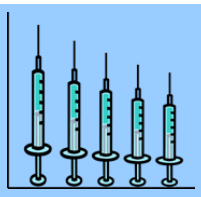
Sharps Injuries among Hospital Workers in Massachusetts



Findings from the Massachusetts Sharps Injury Surveillance System, 2012

Occupational Health Surveillance Program – Massachusetts Department of Public Health August 2014

Data Highlights and Prevention Measures

- 3,019 sharps injuries (SIs) were reported in 2012. The SI rate for workers in all MDPH licensed hospitals was 16.4 SIs per 100 licensed beds, similar to rates for the three previous years (Figure 2). Comparable findings were observed in rates for employees (per full time employee equivalents) in acute care hospitals only (data not shown). These findings (Figure 2) suggest that the earlier observed decline in rates from 2002-2009 is leveling off. Not all workers report their SIs to employee health, thus this plateauing could possibly reflect a positive change, i.e., improvements in worker reporting. Nevertheless, these findings underscore need for a continuing commitment to preventing SIs. Hospitals in interpreting their own SI rates need to understand the employee reporting practices in their facilities.

- After excluding SIs involving sutures, 54% of the SIs involved Sharps with engineered sharps injury protections **(**SESIPs) (Table 5). This is a substantially higher proportion than observed in the early years of surveillance (32% in 2002) and is good news as it likely reflects increased use of SESIPS as required. However, while use of these devices is critical to preventing SIs, they are not failsafe. Inexperience and lack of training in use of these devices as well as flaws in product design can contribute to injuries with these devices. Hospitals should provide training in use of SESIPS and safe work practices, and seek input from front line workers in selecting devices as part of a comprehensive SI prevention program and continuous quality improvement.

- The presence of a SI prevention features is most crucial after the device is used. There were 280 SIs due to non-SESIPs that involved commonly used devices for which SEIPS are widely available. Of these, 154 (55%) occurred after use of the device (Table 9). These injuries could be thought of as never events in that use of SESIPs could have likely prevented the injury.

- SIs in the operating room constituted 44% of all SIs reported. Work-practice controls are particularly important in operating and procedure rooms due to the limited number of SEISPs available for use in these settings. These measures include use of neutral zone for hands-free passing and increased oral communication when transferring devices among staff. In addition to the use of blunt suture needles, evaluation of multi-dose administration of injection medications should be reviewed to incorporate use of SESIPs. Alternative methods of closure, such as staples and glues should also be considered.

Since 2001, hospitals licensed by the Massachusetts Department of Public Health (DPH) have been required to report data on sharps injuries among workers to the Department annually (MGL/Chapter 111 s 53D). Data have been collected from all DPH licensed hospitals (approximately 99 hospitals) since 2001. This report includes data on sharps injuries that occurred during 2012.

The Massachusetts Sharps Injury Surveillance System is intended to provide information to assist Massachusetts hospitals and hospital workers in targeting and evaluating efforts to reduce the incidence of sharps injuries and the associated human and economic costs. For a more comprehensive description of the system, please see: http://www.mass.gov/eohhs/docs/dph/occupational-health/injuries/injuries-hospital-2004.pdf.

Key Definitions

Sharps injury (also referred to as an exposure incident): An exposure to blood or other potentially infectious materials as a result of an incident involving a contaminated sharp device that pierces the skin or mucous membranes. An injury with a clean sharp or device (before use) through contaminated gloves or other contaminated mediums is also considered a sharps injury. An injury involving a clean device without any contact with infectious materials is not considered an exposure incident.

Sharps device: Any object that can penetrate the skin or any part of the body and result in an exposure incident, including but not limited to needle devices, scalpels, lancets, broken glass, and broken capillary tubes.

Population under surveillance: All health care workers in acute and non-acute care hospitals licensed by DPH, as well as any satellite units (e.g., ambulatory care centers) operating under a hospital license.

Surveillance Period: Calendar year 2012.

Sharps injury rates: Sharps injury rates indicate the probability or risk of a worker sustaining a sharps injury within the surveillance period. Numbers are the counts of sharps injuries. A large hospital may have many workers who sustain sharps injuries but the rate of injury may be low. Conversely, in a smaller hospital, relatively few workers may sustain sharps injuries but the risk may be high. Both rates and numbers of injuries must be considered when targeting and evaluating prevention efforts. The rates presented in this report were calculated by dividing the number of sharps injuries among all workers by the number of licensed beds.

Sharps with engineered sharps injury protections (SESIPs): Needle devices and non-needle sharps used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with built-in sharps injury prevention features or mechanisms that effectively reduce the risk of an exposure incident.

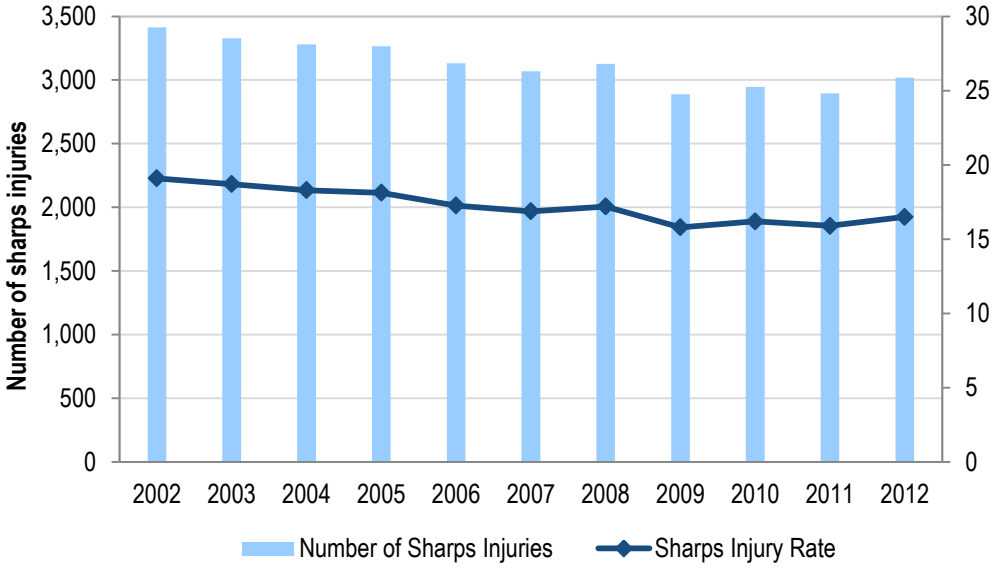
Findings

Table 1. Number and rate of sharps injuries among hospital workers by hospital characteristics, Massachusetts, 2012

	Number of sharps injuries	Rate per 100 licensed beds	95% CI
Hospital size			
Small (< 100 licensed beds)	227	14.0	12.3-15.7
Medium (101-300 licensed beds)	1,038	10.3	9.7-10.9
Large (>300 licensed beds)	1,754	26.6	25.5-27.7
Service Type			
Acute care	2,912	19.0	18.4-19.6
Non-acute care*	107	3.6	3.0-4.3
Teaching Status			
Teaching	1,910	27.7	26.7-28.8
Non-teaching	1,109	9.7	9.2-10.3
Total	**3,019**	**16.5**	**16.0-17.1**

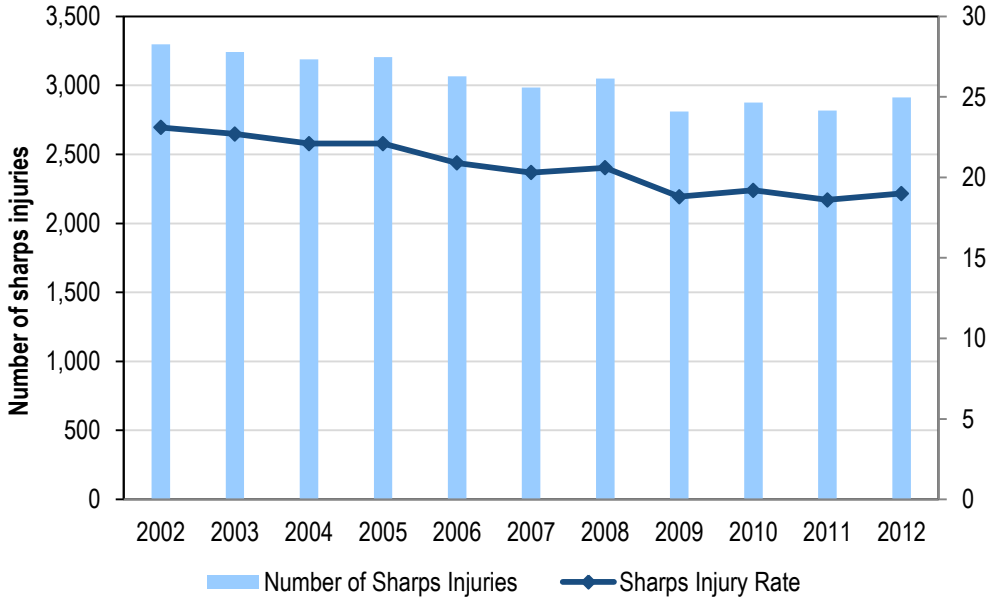
*Non-acute care hospitals include chronic care and rehabilitation facilities.

Figure 1. Number and rate of sharps injuries per licensed beds among all workers in acute and non-acute care hospitals, Massachusetts, 2012



In all hospitals among both employees and non-employees from 2002 to 2012, there was a statistically significant decrease for the sharps injury rate (# of sharps injuries/ # of licensed beds) over the 11 year period. The rate decreased by 14.7% from 19.1 in 2002 to 16.3 in 2012.

Figure 2. Number and rate of sharps injuries per licensed beds among all workers in acute care hospitals only, Massachusetts, 2012



In acute care hospitals among both employees and non-employees from 2002 to 2011, there was a statistically significant decrease in the rate of sharp injuries from 2002 to 2011. During this period the rates of injuries decreased by 17.8% from 23.1 in 2002 to 19.0 in 2012. The rates for the past several years appear to be holding steady. A similar pattern was observed when calculating the rate of sharps injuries among employees of acute care hospitals by FTEs.

Table 2. Sharps injuries among hospital workers by worker and incident characteristics by hospital size, Massachusetts, 2012

	All Hospitals 97 hospitals		Hospital Size					
			Small 29 hospitals		Medium 53 hospitals		Large 15 hospitals	
	N	%	N	%	N	%	N	%
Work status of injured worker	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**
Employee	2,614	87	200	88	858	83	1,556	89
Non-Employee Practitioner	300	10	11	5	138	13	151	9
Student	64	2	6	3	22	2	36	2
Temporary / Contract Worker	30	1	10	4	10	1	10	1
Other / Unknown / Not answered	11	<1	0	0	10	1	1	<1
Occupation	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**
Physician	1,131	37	59	26	259	25	813	46
Nurse	1,130	37	107	47	427	41	596	34
Technician	507	17	44	19	247	24	216	12
Support Services	108	4	7	3	44	4	57	3
Dental Staff	16	<1	2	1	1	<1	13	1
Other Medical Staff	76	3	5	2	33	3	38	2
Other / Unknown / Not answered	51	2	3	1	27	3	21	1
Department where injury occurred	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**
Operating and Procedure Rooms	1,344	45	97	43	430	41	817	47
Inpatient Units	561	19	47	21	244	23	270	15
Emergency Department	303	10	29	13	131	13	143	8
Intensive Care Units	296	10	6	3	73	7	217	12
Outpatient areas	161	5	13	6	43	4	105	6
Laboratories	131	4	10	4	37	4	84	5
Other / Unknown / Not answered	223	7	25	11	80	8	118	7
Device involved in the injury	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**
Hypodermic needle/syringe	912	30	81	36	355	34	476	27
Suture needle	685	23	35	15	182	18	468	27
Other hollow bore needle	331	11	20	9	120	12	191	11
Scalpel blade	242	9	18	8	72	7	152	9
Winged steel needle	233	8	19	8	100	10	114	7
Vacuum tube collection holder/needle	131	4	13	6	49	5	69	4
Glass	26	1	0	0	8	1	18	1
Other / Unknown / Not answered	459	14	41	18	152	15	266	15
Procedure for which the device was used	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**
Injection	780	26	72	32	291	28	417	24
Suturing	700	23	39	17	181	17	480	27
Blood procedures	404	13	30	13	186	18	188	11
Making the incision	354	12	34	15	109	11	211	12
Line procedures	322	11	17	8	109	11	196	12
To obtain body fluid or tissue sample	79	3	2	1	26	3	51	3
Dental procedures	12	<1	1	<1	0	0	11	<1
Other / Unknown / Not answered	368	12	32	14	136	13	200	11

[a] Hospital size: small<100 licensed beds; medium 101-300 licensed beds; large >300 licensed beds

Table 3. **Sharps injuries among hospital workers by occupation by hollow bore device, Massachusetts, 2012**

Occupation	Total		Hollow Bore							
			Hypodermic Needle		Butterfly Needle		Vacuum Tube		Other Hollow Bore	
	N	%	N	%	N	%	N	%	N	%
Nurse	897	100	557	62	106	12	61	7	173	19
Physician	345	100	212	61	13	4	14	4	106	31
Technician	259	100	88	37	90	37	51	21	30	5
Support Services	36	100	18	50	1	3	3	8	14	39
All Others/Not Answered	70	100	37	51	23	32	2	3	8	15
Total	**1,607**	**100**								

Table 4. **Sharps injuries among hospital workers by occupation by solid bore device, Massachusetts, 2012**

Occupation	Total		Suture Needle		Scalpel		Other/ Unknown	
	N	%	N	%	N	%	N	%
Physician	786	100	499	64	121	15	166	21
Technician	248	100	88	36	63	25	97	39
Nurse	233	100	80	34	36	15	117	50
Support Services	72	100	2	3	5	7	65	90
All Others/Not Answered	73	100	16	22	17	23	40	55
Total	**1,412**	**100**						

Table 5. Sharps injuries among hospitals workers by SESIP by hospital size: all devices and excluding suture needles, Massachusetts, 2012

	All Hospitals 97 hospitals		Hospital Size					
			Small 29 hospitals		Medium 53 hospitals		Large 15 hospitals	
Sharps Injury Protections	N	%	N	%	N	%	N	%
All devices	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**
SESIP	1,290	43	103	45	515	50	672	38
Non-SESIP	1,526	51	113	50	429	41	984	56
Unknown/Not answered	203	7	11	5	94	9	98	6
Devices excluding suture needles	**2,334**	**100**	**192**	**100**	**856**	**100**	**1,286**	**100**
SESIP	1,252	54	103	54	514	60	635	49
Non-SESIP	899	39	78	41	260	30	561	44
Unknown/Not answered	183	8	11	6	82	10	90	7

[a] Hospital size: small= <100 licensed beds; medium=101-300 licensed beds; large=>300 licensed beds

Figure 3. Sharps injuries among hospital workers by device and SESIP, Massachusetts, 2012

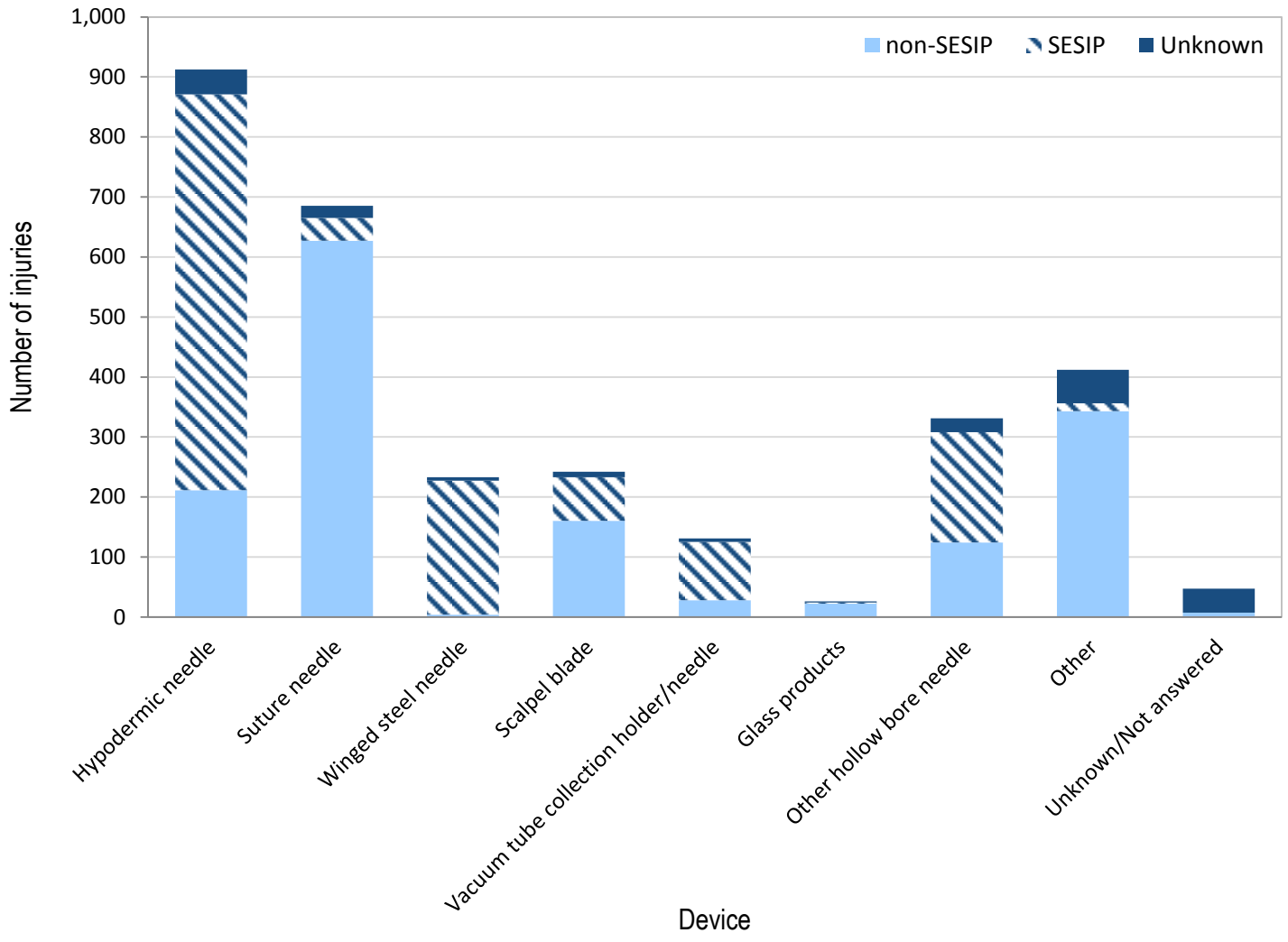


Table 6. Sharps injuries among hospital workers by procedure and SESIP, Massachusetts, 2012

Procedure	Total		SESIP		Non-SESIP		Unknown	
	N	%	N	%	N	%	N	%
Injection procedures	**780**	**26**	**580**	**45**	**179**	**12**	**21**	**10**
Subcutaneous injection	599	20	474	37	113	7	12	6
Intramuscular injection	83	3	63	5	19	1	1	<1
Other injections	98	3	43	3	47	3	8	4
Blood procedures	**404**	**13**	**324**	**25**	**68**	**5**	**12**	**6**
Percutaneous venous puncture	298	10	279	22	17	1	2	1
Finger stick/Heel stick	43	1	8	<1	30	2	5	3
Percutaneous arterial puncture	35	1	24	2	11	1	0	0
Other blood procedures	28	1	13	1	10	1	5	3
Line procedures	**322**	**11**	**210**	**16**	**97**	**6**	**15**	**7**
To insert peripheral IV/set up heparin	138	5	121	9	15	1	2	1
To insert central line	49	2	11	1	31	2	7	3
Other line procedures	135	4	78	6	51	3	6	3
Other procedures	**1,513**	**50**	**176**	**14**	**1,182**	**77**	**155**	**76**
Total	**3,019**	**100**	**1,290**	**100**	**1,526**	**100**	**203**	**100**

Table 7. Sharps injuries among hospitals workers involving devices included in prepackaged kits by hospital size, Massachusetts, 2012

	All Hospitals 97 hospitals		Hospital Size					
			Small 29 hospitals		Medium 53 hospitals		Large 15 hospitals	
	N	%	N	%	N	%	N	%
Device included in prepackaged kit								
Yes	627	21	48	21	231	22	348	20
No	2,107	70	162	71	728	70	1,217	69
Unknown/Not answered	285	9	17	7	79	8	189	11
Total	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**

[a] Hospital size: small <100 licensed beds; medium 101-300 licensed beds; large >300 licensed beds

Figure 4. Sharps injuries among hospital workers involving devices from prepackaged kits by SESIP, Massachusetts, 2012

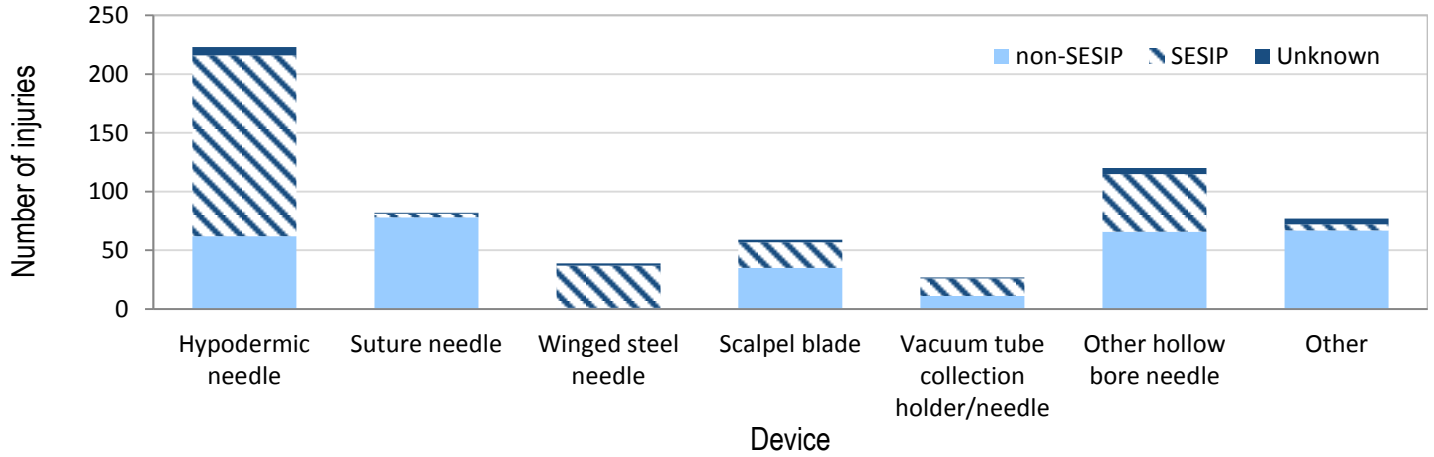


Table 8. Sharps injuries among hospital workers by when and how the injury occurred, Massachusetts, 2012

	All Hospitals 97 hospitals		Hospital Size					
			Small 29 hospitals		Medium 53 hospitals		Large 15 hospitals	
	N	%	N	%	N	%	N	%
Before use of the item	**19**	**1**	**1**	**<1**	**5**	**1**	**13**	**1**
During use of the item	**1,340**	**44**	**99**	**44**	**422**	**41**	**819**	**47**
Suturing	363	12	20	9	84	8	259	15
Manipulate needle in patient	283	9	13	6	108	10	162	9
Patient moved and jarred device	215	7	32	14	97	9	86	5
Collision with worker or sharp	102	3	8	4	38	4	56	3
Handle/pass equipment	85	3	0	0	23	2	62	4
Device malfunction	37	1	4	2	17	2	16	1
Access IV line	20	1	1	<1	6	1	13	1
Recap needle	6	<1	1	<1	2	<1	3	<1
Other / Unknown / Nonclassifiable	229	8	20	9	47	5	162	9
After use, before disposal	**1,118**	**37**	**96**	**42**	**398**	**38**	**624**	**36**
Activating injury protection mechanism	219	7	19	7	90	9	110	6
Handle/pass equipment	213	7	21	9	62	6	130	7
During clean-up	182	6	13	6	56	6	113	6
Improper disposal	145	5	8	4	61	6	76	4
Collision with worker or sharp	118	4	13	6	30	3	75	4
Sharps injury prevention mechanism not activated	82	3	8	4	42	4	32	2
Recap needle	69	2	8	4	23	2	38	2
Device malfunction	23	1	2	1	17	2	4	<1
Patient moved and jarred device	4	<1	0	0	3	<1	1	<1
Access IV line	1	<1	0	0	1	<1	0	0
Other / Unknown / Nonclassifiable	62	2	4	2	13	1	45	3
During or after disposal of item	**199**	**7**	**8**	**4**	**100**	**10**	**91**	**5**
During sharps disposal	171	6	7	3	87	8	77	4
Sharps injury prevention mechanism not activated	12	<1	0	0	8	1	4	<1
Collision with worker or sharp	5	<1	1	<1	1	<1	3	<1
Device malfunction	1	<1	0	0	1	<1	0	0
Patient moved and jarred device	1	<1	0	0	1	<1	0	0
Other / Unknown / Nonclassifiable	9	<1	0	0	2	<1	7	<1
Unknown / Not answered / Nonclassifiable	**343**	**11**	**23**	**10**	**113**	**11**	**207**	**12**
Total	**3,019**	**100**	**227**	**100**	**1,038**	**100**	**1,754**	**100**

[a] Hospital size: small<100 licensed beds; medium 101-300 licensed beds; large >300 licensed beds

Table 9. Sharps injuries involving select devices without sharps injury prevention features but for which SESIPs are widely available, by when the injury occurred, Massachusetts, 2012

Device	Total		Time of Injury									
			Before use		During use		After use, Before Disposal*		During or after Disposal*		Unknown/ Non-classifiable	
	N	%	N	%	N	%	N	%	N	%	N	%
Hypodermic	211	100	3	1	69	33	96	46	18	9	25	12
IV Stylet	37	100	0	0	13	35	16	43	4	11	4	11
Vacuum Tube	28	100	0	0	10	36	12	43	4	14	2	7
Winged-Steele Needle	4	100	0	0	3	75	1	25	0	0	0	0
Total	**280**	**100**										

*SESIPs offer protection during the period after use. Injuries presented in this table that occurred after use (n=151) can be considered "never events" – events that could have been prevented with the use of SESIPS.

Table 10. Sharps injuries among hospital workers by occupation (detailed), Massachusetts, 2012

	N	%		N	%
Physician	**1,131**	**37**	**Support Services**	**108**	**4**
Intern/Resident	458	15	Housekeeper	66	2
MD	310	10	Central supply	37	1
Fellow	108	4	Safety/security	2	<1
Physician Assistant	87	3	Attendant/orderly	1	<1
Surgeon	68	2	Maintenance	1	<1
Medical Student	62	2	Food service	1	<1
Anesthesiologist	28	1			
Radiologist	10	<1	**Other Medical Staff**	**76**	**3**
			Medical assistant	74	2
Nurse	**1,130**	**37**	Physical therapist	1	<1
RN or LPN	989	33	Other medical staff	1	<1
Nursing assistant	54	2			
Nurse practitioner	30	1	**Dental Staff**	**16**	**1**
Patient care technician	27	1	Dental assistant/tech	9	<1
Nurse anesthetist	12	<1	Dentist	4	<1
Nurse midwife	9	<1	Dental hygienist	1	<1
Nursing student	8	<1	Dental student	1	<1
Home health aide	1	<1	Other dental worker	1	<1
Technician	**507**	**17**	**Other**	**47**	**2**
OR/Surgical technician	211	7	Researcher	8	<1
Phlebotomist	109	4	EMT/paramedic	6	<1
Radiologic technician	47	2	Clerical/administrative	3	<1
Clinical lab technician	46	2	Counselor/social worker	3	<1
Respiratory therapist/ Tech	27	1	Other student	24	1
Hemodialysis technician	2	<1	Other	3	<1
Morgue technician	2	<1			
Other technician	63	2	**Unknown/Not Answered**	**4**	**<1**
			Total	**3,019**	**100**

Table 11. Sharps injuries among hospital workers by department (detailed), Massachusetts, 2012

	N	%		N	%
Operating and Procedure Rooms	**1,344**	**44**	**Laboratory**	**131**	**4**
Operating room	986	33	Histology/pathology	45	1
Labor and delivery	115	4	Clinical chemistry	8	<1
Radiology	101	3	Microbiology	5	<1
Hematology/oncology	38	1	Blood bank	2	<1
Cardiac catheterization laboratory	37	1	Morgue/autopsy room	2	<1
Phlebotomy room	24	1	Hematology	1	<1
Endoscopy/bronchoscopy/cystoscop	18	1	Other laboratory	20	1
Dialysis	12	<1	Laboratory, unspecified	48	2
Other procedure room	1	<1			
Procedure room, unspecified	12	<1	**Other Areas**	**214**	**7**
			Rehabilitation unit	50	2
Inpatient Units	**561**	**19**	Central sterile supply	39	1
Medical/surgical ward	479	16	Dermatology	33	1
Psychiatry ward	32	1	Exam room	25	1
Obstetrics/gynecology	17	1	Long term care	20	1
Pediatrics	14	<1	Pain clinic	11	<1
Nursery	6	<1	Hospital grounds	3	<1
Patient room, ward unspecified	13	<1	Anesthesia	1	<1
			Ambulance	1	<1
Emergency Department	**303**	**10**	Central trash area	1	<1
			Employee health/ Infection control	1	<1
Intensive Care Units	**296**	**10**	Podiatry	1	<1
Intensive care unit	217	7	Laundry room	1	<1
Post anesthesia care unit	79	3	Detox unit	1	<1
			Other Location	26	1
Outpatient areas	**161**	**5**			
Ambulatory care clinic	70	2	**Unknown/Not Answered**	**9**	**<1**
Physician's office	24	1			
Home health visit	16	1			
Dental clinic	15	<1			
Community health center	7	<1			
Other outpatient areas	29	1			
			Total	**3,019**	**100**

Table 12. Sharps injuries among hospital workers by device (detailed), Massachusetts, 2012

	N	%
Hypodermic needles/syringe (hollow bore)	**912**	**30**
Hypodermic needle attached to a disposable syringe	812	27
Prefilled cartridge syringe	56	2
Unattached hypodermic needle	22	1
Hypodermic Needle Attached to a non-disposable syringe	14	<1
Hypodermic needle attached to IV tubing	5	<1
Hypodermic needle, unspecified	3	<1
Suture Needle	**685**	**23**
Curved suture needle	593	20
Suture needle, unspecified	68	2
Straight suture needle	24	1
Other Hollow Bore Needles	**331**	**11**
IV Stylet	179	6
Huber Needle	44	1
Other type of hollow bore needle	33	1
Spinal or epidural needle	26	1
Hollow bore needle, unspecified	25	1
Biopsy Needle	24	1
Scalpel Blade	**242**	**8**
Butterfly Needle	**233**	8
Winged Steel needle attached to a vacuum tube collection holder	139	5
Winged Steele Needle	79	3
Winged Steele Needle attached to IV tubing	15	<1
Vacuum Tube Collection Holder/Needle	**131**	**4**
Vacuum tube collection holder/needle	107	4
Phlebotomy needle (other than winged steel needle)	24	1

	N	%
Glass	**26**	**1**
Medication ampule / Vial / IV bottle	11	<1
Specimen / Test / Vacuum tube	4	<1
Pipette	3	<1
Slide	3	<1
Capillary tube	1	<1
Other glass item	4	<1
Dental Device of item	**19**	**1**
Dental bur	2	<1
Scaler/curette	3	<1
Dental explorer	2	<1
Dental pick	3	<1
Other dental device or item	9	<1
Other	**393**	13
Wire	46	2
Lancet	42	1
Retractor	38	1
Scissors	31	1
Cutting blade other than scalpel	31	1
Bovie electrocautery device	22	1
Electrode	19	1
Forceps	19	1
Trocar	14	<1
Drill bit	10	<1
Staple	8	<1
Pin	7	<1
Needle/unspecified	6	<1
Bone cutter	5	<1
Other needle	5	<1
Rod	3	<1
Bone chip/chipped tooth	2	<1
Tenaculum	2	<1
Elevator	1	<1
Other Type of Sharp Object	82	3
Unknown/Not Answered	**47**	**2**
Total	**3,019**	**100**

Table 13. Sharps injuries among hospital workers by procedure (detailed), Massachusetts, 2012

	N	%		N	%
Injection	**780**	**26**	**Line Procedures**	**322**	**11**
Subcutaneous injection	599	20	To insert a peripheral IV line or set up a heparin lock	138	5
Intramuscular injection	83	3	To insert a central IV line	49	2
Injection, unspecified	51	2	Draw blood from central or peripheral IV line or port	32	1
Epidural/spiral anesthesia	25	1	Other injection into IV site/port	27	1
Other injection	22	1	To insert an arterial line	17	1
			Draw Blood from Arterial line	15	<1
Suturing	**700**	**23**	To flush heparin/saline	12	<1
Suturing	689	23	To connect IV line	8	<1
Suture removal	11	<1	Other line procedure	23	1
			Line procedure, unspecified	1	<1
Blood Procedures	**404**	**13**			
Percutaneous venous puncture	298	10	**To Obtain Body Fluid or Tissue Sample**	**79**	**3**
Finger stick/heel stick	43	1			
Percutaneous arterial puncture	35	1	**Dental Procedures**	**12**	**<1**
Draw blood from umbilical vessel	12	<1	Oral surgery	2	<1
Dialysis/AV Fistula site	9	<1	Dental drilling	1	<1
Blood Procedure, unspecified	7	<1	Hygiene	5	<1
			Dental procedure, unspecified	4	<1
Making the incision	**354**	**12**			
Making the incision	263	9	**Other**	**276**	**9**
Cauterization	15	<1	Transferring blood/body fluid to another container	18	1
Surgical procedure, unspecified	46	2	To obtain lab specimens	16	1
Other surgical procedure	30	1	Drilling	13	<1
			Shaving	6	<1
			Procedure, unspecified	7	<1
			Other procedure	216	7
			Unknown/Not answered	**92**	**3**
			Total	**3,019**	**100**

Resources

CDC Sharps Safety for Healthcare Settings: Workbook and Teaching Tools www.cdc.gov/sharpssafety

NIOSH Preventing Needlesticks and Sharps Injuries www.cdc.gov/niosh/topics/bbp/sharps.html

OSHA Bloodborne Pathogens and Needlestick Prevention www.osha.gov/SLTC/bloodbornepathogens