Data Brief:
Sharps Injuries among Hospital Workers in Massachusetts: Findings from the Massachusetts Sharps Injury Surveillance System, 2014

Massachusetts Department of Public Health APRIL, 2016

Data Highlights and Prevention Measures

- 2,946 sharps injuries were reported in 2014. The sharps injury rate for workers in all Massachusetts Department of Public Health (DPH) licensed hospitals was 16.2 sharps injuries per 100 licensed beds, similar to rates for the three previous years (Figure 2). Comparable findings were observed in rates for employees (per 1,000 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 2002-2010 is leveling off and underscore the need for a continuing commitment to preventing sharps injuries. It is also possible this plateau reflects an increase in workers reporting these injuries. Hospitals, in interpreting their own sharps injury rates, need to understand employee reporting practices in their facilities.

- Of the reported injuries, more sharps injuries occurred among physicians than nurses (39% v. 36%) for the third year in a row. This differs from findings from earlier years where nurses accounted for more injuries than physicians. This likely reflects greater adoption over time of devices with sharps injury prevention features (SESIPs) for devices most often used by nurses. This overall pattern was driven by the experience in larger hospitals and was reversed in smaller and medium sized hospitals where nurses experienced more sharps injuries than physicians. This difference by hospital size may reflect differences in the types of procedures conducted (i.e., more surgery in larger hospitals). Targeted efforts to improve physician reporting of sharps injuries in some larger hospitals may also have played a role.

- Sharps injuries in operating and procedure rooms accounted for nearly half of all sharps injuries (46%). While engineering controls (for example, use of blunt suture needles or alternative methods of closure) may have limited application in the OR setting, work practice controls play an important role in the prevention of sharps injuries. Practices such as hands-free passing and use of neutral zones, as well as verbal cuing when passing instruments can reduce the risk of sharps injuries.

- The presence of a sharps injury prevention feature is most crucial after the device is used. There were 263 sharps injuries due to non-SESIPs that involved commonly used devices for which SESIPS are widely available. Of these, 180 (68%) 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.

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 (an average of 98 hospitals annually) since 2001. This report includes data on sharps injuries that occurred during 2014.

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 2014.

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. Confidence intervals (CI) are presented for each rate. We modelled trends in annual rates using both negative binomial and joinpoint regressions. Negative binomial regression was used to model the overall trends of these rates from 2002 to 2014. Joinpoint regression was used to identify any changes in the trends over the same period.

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.

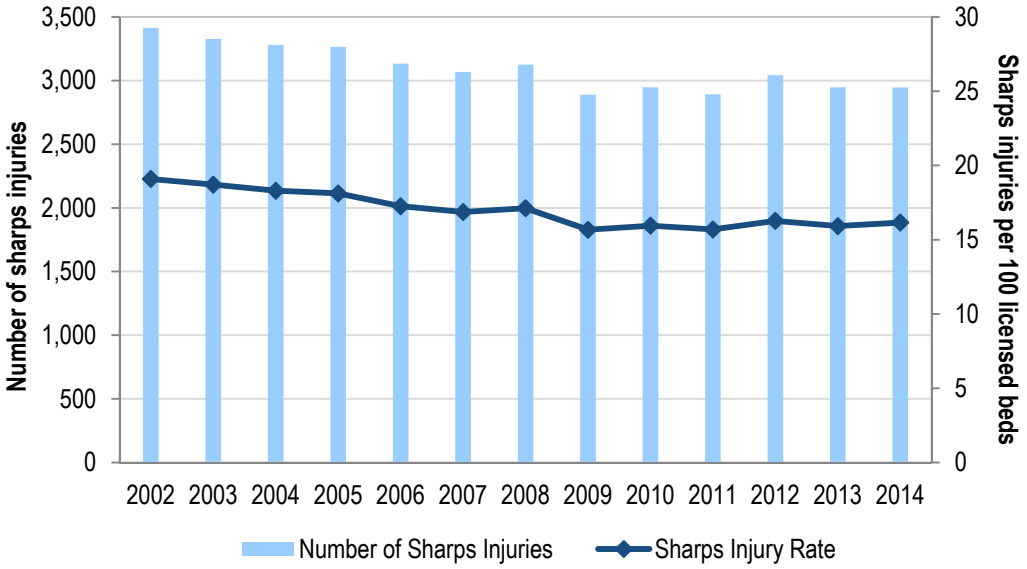
Findings

Table 1. Number and rate of sharps injuries among hospital workers by hospital characteristics, Massachusetts, 2014

	Number of Hospitals	Number of sharps injuries	Rate per 100 licensed beds	95% CI
Hospital size				
Small (< 100 licensed beds)	28	172	10.4	8.9-11.8
Medium (101-300 licensed beds)	53	1101	11.6	11.0-12.3
Large (>300 licensed beds)	14	1673	23.6	22.6-24.6
Service Type				
Acute care	76	2,891	18.7	18.1-19.3
Non-acute care*	19	55	2.0	1.5-2.5
Teaching Status				
Teaching	18	1832	26.9	25.9-28.0
Non-teaching	77	1114	9.7	9.2-10.3
Total	**95**	**2,946**	**16.2**	**15.6-16.7**

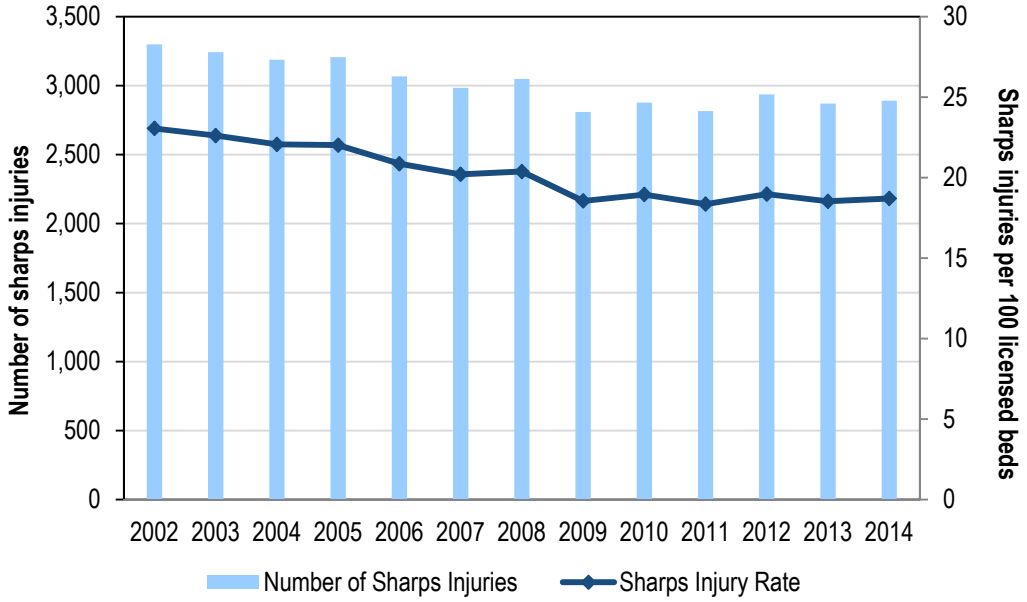
*Non-acute care hospitals include chronic care and rehabilitation facilities.

Figure 1. Number and rate of sharps injuries per licensed beds among all workers in acute and non-acute care hospitals, Massachusetts, 2014



In all hospitals among both employees and non-employees from 2002 to 2014, there was a statistically significant ($p \leq 0.05$) decrease for the sharps injury rate (# of sharps injuries/ # of licensed beds) over the 13 year period. The rate decreased by 15.2% from 19.1 in 2002 to 16.2 in 2014. When using joinpoint, a statically significant ($p \leq 0.05$) leveling off was observed beginning in 2010.

Figure 2. Number and rate of sharps injuries per licensed beds among all workers in acute care hospitals only, Massachusetts, 2014



In acute care hospitals among both employees and non-employees from 2002 to 2014, there was a statistically significant ($p \leq 0.05$) decrease in the rate of sharp injuries from 2002 to 2014. During this period the rates of injuries decreased by 19.0% from 23.1 in 2002 to 18.7 in 2014. When using joinpoint, a statically significant ($p \leq 0.05$) leveling off was observed beginning in 2010.

Table 2. Sharps injuries among hospital workers by worker and incident characteristics by hospital size, Massachusetts, 2014

	All Hospitals 95 hospitals		Hospital Size					
			Small 28 hospitals		Medium 53 hospitals		Large 14 hospitals	
	N	%	N	%	N	%	N	%
Work status of injured worker	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**
Employee	2,464	84	156	91	896	81	1,412	84
Non-Employee Practitioner	384	13	7	4	159	14	218	13
Student	78	3	4	2	33	3	41	2
Temporary / Contract Worker	18	1	4	2	13	1	1	<1
Other / Unknown / Not answered	2	<1	1	1	0	0	1	<1
Occupation	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**
Physician	1,159	39	51	30	305	28	803	48
Nurse	1,069	36	71	41	439	40	559	33
Technician	468	16	37	22	242	22	189	11
Support Services	123	4	7	4	49	4	67	4
Dental Staff	13	<1	1	1	3	<1	9	1
Other Medical Staff	72	2	4	2	42	4	26	2
Other / Unknown / Not answered	42	1	1	1	21	2	20	1
Department where injury occurred	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**
Operating and Procedure Rooms	1,365	46	73	42	462	42	830	50
Inpatient Units	579	20	33	19	273	25	273	16
Emergency Department	291	10	25	15	126	11	140	8
Intensive Care Units	228	8	6	3	60	5	162	10
Outpatient areas	201	7	15	9	72	7	114	7
Laboratories	101	3	8	5	35	3	58	3
Other / Unknown / Not answered	181	6	12	7	73	7	96	6
Device involved in the injury	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**
Hypodermic needle/syringe	982	33	61	35	397	36	524	31
Suture needle	672	23	22	13	214	19	436	26
Other hollow bore needle	298	10	18	10	91	8	189	11
Scalpel blade	226	8	10	6	78	7	138	8
Winged steel needle	212	7	17	10	110	10	85	5
Vacuum tube collection holder/needle	70	2	5	3	45	4	20	1
Glass	37	1	1	1	10	1	26	2
Other / Unknown / Not answered	449	15	38	22	156	14	255	15
Procedure for which the device was	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**
Injection	841	29	46	27	329	30	466	28
Suturing	685	23	28	16	214	19	443	26
Blood procedures	381	13	27	16	190	17	164	10
Making the incision	311	11	20	12	115	10	176	11
Line procedures	296	10	18	10	97	9	181	11
To obtain body fluid or tissue sample	63	2	8	5	27	2	28	2
Dental procedures	12	<1	0	0	2	<1	10	1
Other / Unknown / Not answered	357	12	25	15	127	12	205	12

Table 3. Sharps injuries among hospital workers by occupation by hollow bore device, Massachusetts, 2014

Occupation	Total		Hollow Bore							
			Hypodermic Needle		Winged-Steel Needle		Vacuum Tube Collection Set		Other Hollow Bore	
	N	%	N	%	N	%	N	%	N	%
Nurse	839	100	569	68	90	11	20	2	160	19
Physician	350	100	253	72	5	1	3	1	89	25
Technician	247	100	98	40	84	34	40	16	25	10
Support Services	47	100	28	60	4	9	2	4	13	28
All others / Not answered	79	100	34	43	29	37	5	6	11	14
Total	**1,562**	**100**	**982**	**63**	**212**	**14**	**70**	**4**	**298**	**19**

Table 4. Sharps injuries among hospital workers by occupation by solid bore device, Massachusetts, 2014

Occupation	Total		Suture Needle		Scalpel		Glass		Other/ Unknown	
	N	%	N	%	N	%	N	%	N	%
Physician	809	100	493	61	139	17	5	1	172	21
Nurse	230	100	82	36	33	14	14	6	101	44
Technician	221	100	82	37	46	21	15	7	78	35
Support Services	76	100	6	8	3	4	0	0	67	88
All others / Not answered	48	100	9	19	5	10	3	6	31	65
Total	**1,384**	**100**	**672**	**49**	**226**	**16**	**37**	**3**	**449**	**32**

Table 5. Sharps injuries among hospitals workers by SESIP by hospital size: all devices and excluding suture needles, Massachusetts, 2014

	All Hospitals 95 hospitals		Hospital Size^ Small 28 hospitals		Medium 53 hospitals		Large 14 hospitals	
Sharps Injury Protections	N	%	N	%	N	%	N	%
All devices	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**
SESIP	1,326	45	69	40	589	53	668	40
Non-SESIP	1,520	52	94	55	470	43	956	57
Unknown/Not answered	100	3	9	5	42	4	49	3
Devices excluding suture needles	**2,274**	**100**	**150**	**100**	**887**	**100**	**1,237**	**100**
SESIP	1,316	58	69	46	586	66	661	53
Non-SESIP	866	38	72	48	266	30	528	43
Unknown/Not answered	92	4	9	6	35	4	48	4

^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, 2014

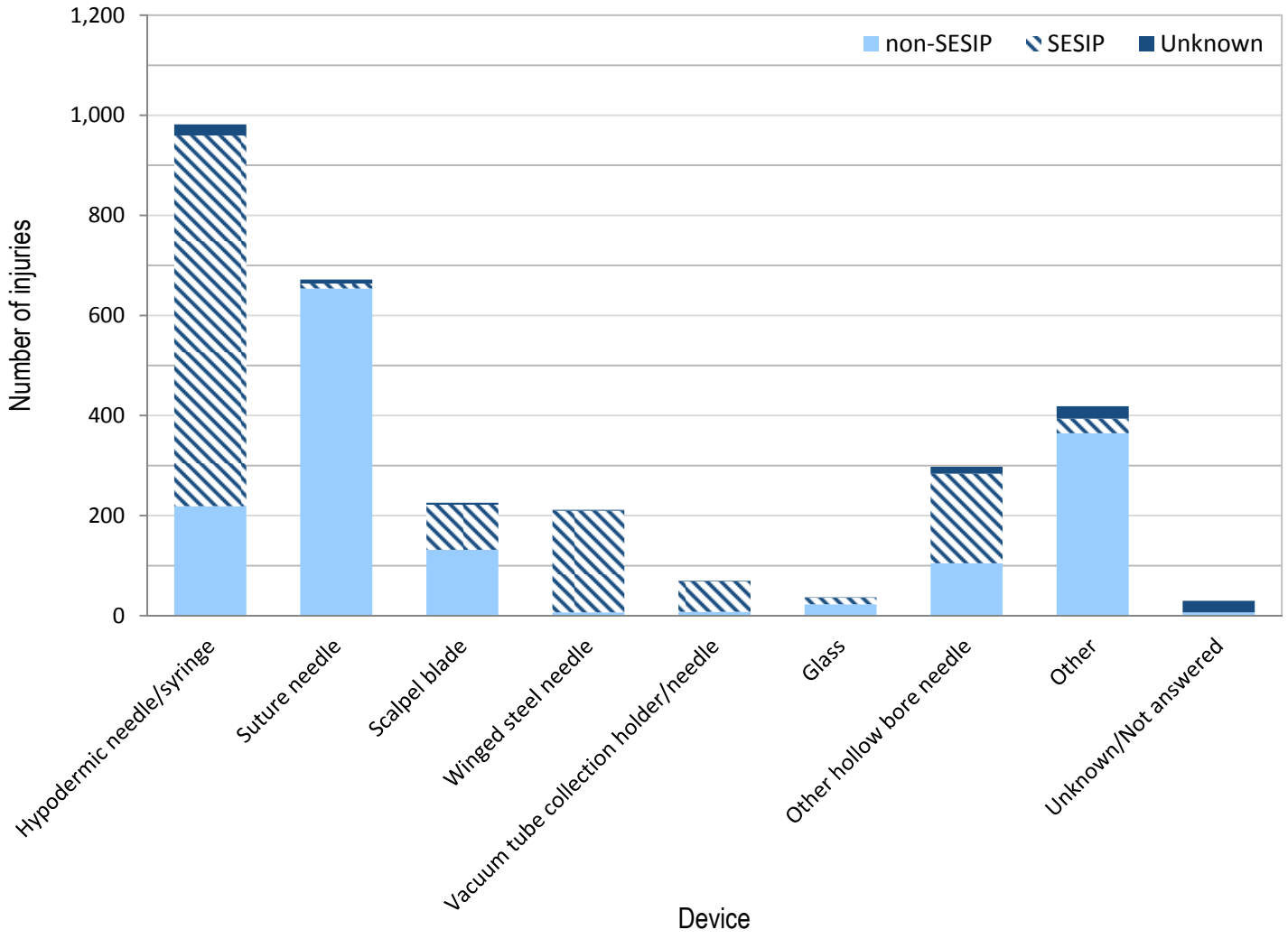


Table 6. Sharps injuries among hospital workers by procedure and SESIP, Massachusetts, 2014

Procedure	Total		SESIP		Non-SESIP		Unknown	
	N	%	N	%	N	%	N	%
Injection procedures								
Subcutaneous injection	625	21	484	37	133	9	8	8
Intramuscular injection	94	3	81	6	13	1	0	0
Other injections	122	4	72	5	45	3	5	5
Blood procedures								
Percutaneous venous puncture	247	8	241	18	4	<1	2	2
Percutaneous arterial puncture	47	2	44	3	3	<1	0	0
Finger stick / Heel stick	43	1	19	1	19	1	5	5
Other blood procedures	44	1	19	1	24	2	1	1
Line procedures								
To insert peripheral IV/set up heparin	99	3	89	7	10	1	0	0
To insert central line	33	1	18	1	13	1	2	2
Other line procedures	164	6	100	8	61	4	3	3
Other procedures	1,428	48	159	12	1,195	79	74	74
Total	**2,946**	**100**	**1,326**	**100**	**1,520**	**100**	**100**	**100**

Table 7. Sharps injuries among hospitals workers involving devices included in prepackaged kits by hospital size, Massachusetts, 2014

	All Hospitals 95 hospitals		Hospital Size^ Small 28 hospitals		Medium 53 hospitals		Large 14 hospitals	
	N	%	N	%	N	%	N	%
Device included in prepackaged kit								
Yes	563	19	26	15	256	23	281	17
No	2,257	77	137	80	793	72	1,327	79
Unknown/Not answered	126	4	9	5	52	5	65	4
Total	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**

^Hospital size: small <101 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, 2014

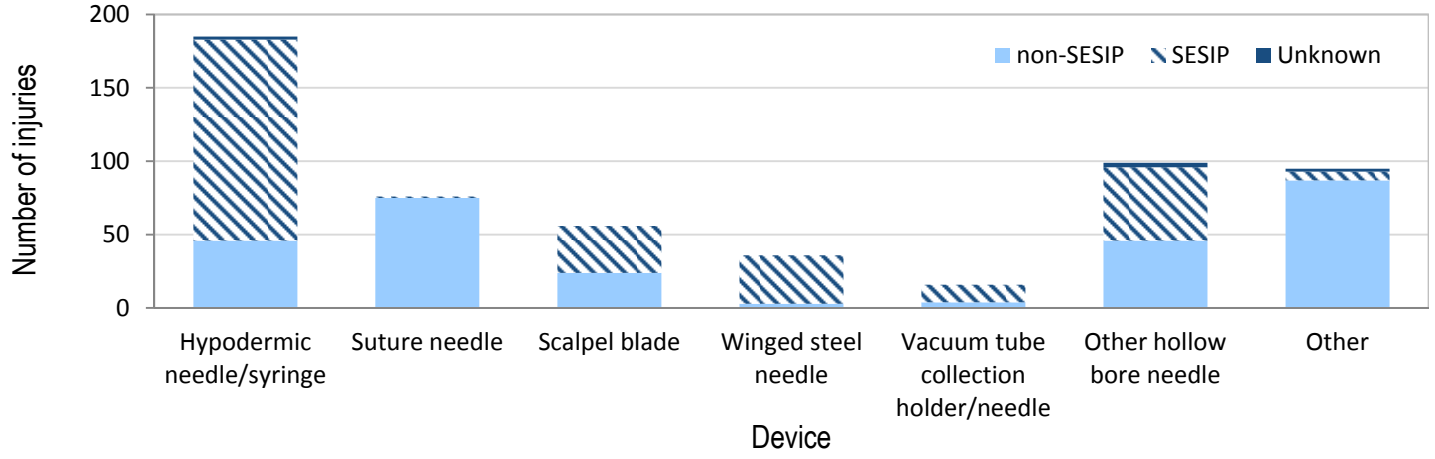


Table 8. Sharps injuries among hospital workers by when and how the injury occurred, Massachusetts, 2014

	All Hospitals 95 hospitals		Hospital Size^ Small 28 hospitals		Medium 53 hospitals		Large 14 hospitals	
	N	%	N	%	N	%	N	%
Before use of the item	**48**	**2**	**3**	**2**	**12**	**1**	**33**	**2**
During use of the item	**1,191**	**40**	**53**	**31**	**399**	**36**	**739**	**44**
Suturing	375	13	13	8	89	8	273	16
Manipulate needle in patient	262	9	11	6	93	8	158	9
Patient moved and jarred device	211	7	9	5	100	9	102	6
Handle/pass equipment	148	5	6	3	49	4	93	6
Collision with worker or sharp	25	1	1	1	12	1	12	1
Access IV line	20	1	1	1	7	1	12	1
Recap needle	2	<1	2	1	0	0	0	0
Other / Unknown / Nonclassifiable	148	5	10	6	49	4	89	5
After use, before disposal	**1,192**	**40**	**88**	**51**	**478**	**43**	**626**	**37**
Activating injury protection mechanism	300	10	14	8	144	13	142	8
Collision with worker or sharp	260	9	33	19	97	9	130	8
During clean-up	179	6	12	7	60	5	107	6
Handle/pass equipment	161	5	7	4	65	6	89	5
Recap needle	105	4	11	6	32	3	62	4
Sharps injury prevention mechanism not activated	94	3	5	3	37	3	52	3
Device malfunction	33	1	2	1	19	2	12	1
Improper disposal	32	1	3	2	17	2	12	1
Other / Unknown / Nonclassifiable	28	1	1	1	7	1	20	1
During or after disposal of item	**365**	**12**	**23**	**13**	**148**	**13**	**194**	**12**
During sharps disposal	191	6	12	7	81	7	98	6
Improper Disposal	112	4	8	5	42	4	62	4
Collision with worker or sharp	47	2	3	2	15	1	29	2
Sharps injury prevention mechanism not activated	9	<1	0	0	7	1	2	<1
Other / Unknown / Nonclassifiable	6	<1	0	0	3	<1	3	<1
Unknown / Not answered / Nonclassifiable	**150**	**5**	**5**	**3**	**64**	**6**	**81**	**5**
Total	**2,946**	**100**	**172**	**100**	**1,101**	**100**	**1,673**	**100**

^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, 2014

Device	Total		When the Injury Occurred									
			Before use		During use		After use, Before Disposal*		During or after Disposal*		Unknown/ Non-classifiable	
	N	%	N	%	N	%	N	%	N	%	N	%
Hypodermic	219	100	3	1	58	26	116	53	36	16	6	2
IV Stylet	29	100	0	0	11	38	9	31	8	28	1	3
Vacuum Tube	8	100	0	0	1	13	3	38	3	38	1	13
Winged-Steele	7	100	0	0	2	29	2	29	3	43	0	0
Total	**263**	**100**	**3**	**1**	**72**	**27**	**130**	**49**	**50**	**19**	**8**	**3**

*SESIPs offer protection during the period after use. Injuries presented in this table that occurred after use (n=180) 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, 2014

	N	%		N	%
Physician	**1,159**	**39**	**Support Services**	**123**	**4**
Intern/Resident	468	16	Housekeeper	70	2
MD	290	10	Central supply	46	2
Fellow	115	4	Attendant/orderly	3	<1
Surgeon	89	3	Maintenance	1	<1
Physician Assistant	81	3	Safety/security	1	<1
Medical Student	64	2	Other ancillary staff	2	<1
Anesthesiologist	41	1			
Radiologist	11	<1	**Other Medical Staff**	**72**	**2**
			Medical assistant	66	2
Nurse	**1,069**	**36**	Other medical staff	6	<1
RN or LPN	921	31			
Nurse assistant	48	2			
Nursing practitioner	35	1	**Dental Staff**	**13**	**<1**
Patient care technician	23	1	Dental assistant/tech	5	<1
Nurse anesthetist	21	1	Dentist	5	<1
Nurse midwife	10	<1	Dental hygienist	3	<1
Nursing student	10	<1			
Home health aide	1	<1			
Technician	**468**	**16**	**Other**	**42**	**1**
OR/Surgical technician	205	7	Pharmacist	6	<1
Phlebotomist	104	4	Counselor/social worker	5	<1
Radiologic technician	33	1	EMT/paramedic	4	<1
Clinical lab technician	33	1	Clerical/administrative	3	<1
Respiratory therapist/ Tech	23	1	Other student	22	1
Hemodialysis technician	4	<1	Other	2	<1
Morgue technician	3	<1			
Psychiatric technician	1	<1			
Other technician	62	2			
			Total	**2,946**	**100**

Table 11. Sharps injuries among hospital workers by department (detailed), Massachusetts, 2014

	N	%		N	%
Operating and Procedure Rooms	**1,365**	**46**	**Laboratory**	**101**	**3**
Operating room	1,015	34	Histology/pathology	35	1
Labor and delivery	105	4	Microbiology	6	<1
Radiology	91	3	Morgue/autopsy room	5	<1
Cardiac catheterization laboratory	64	2	Blood bank	4	<1
Hematology/oncology	32	1	Clinical chemistry	3	<1
Phlebotomy room	27	1	Other laboratory	35	1
Endoscopy/bronchoscopy/cystoscopy	15	1	Laboratory, unspecified	13	<1
Dialysis	10	<1			
Other procedure room	1	<1			
Procedure room, unspecified	5	<1	**Other Areas**	**181**	**6**
			Central sterile supply	52	2
Inpatient Units, other than ICU	**579**	**20**	Dermatology	35	1
Medical/surgical ward	500	17	Exam room	18	1
Psychiatry ward	23	1	Rehabilitation unit	17	1
Pediatrics	22	1	Long term care	11	<1
Obstetrics/gynecology	17	1	Pain clinic	11	<1
Nursery	11	<1	Anesthesia	6	<1
Patient room, ward unspecified	6	<1	Pharmacy	5	<1
			Detox unit	4	<1
Emergency Department	**291**	**10**	Hospital grounds	4	<1
			Central trash area	3	<1
Intensive Care Units	**228**	**8**	Other Location	15	1
Intensive care unit	208	7			
Post anesthesia care unit	20	1			
Outpatient Areas	**201**	**7**			
Ambulatory care clinic	102	3			
Physician's office	20	1			
Dental clinic	19	1			
Home health visit	10	<1			
Other outpatient areas	50	2			
			Total	**2,946**	**100**

Table 12. Sharps injuries among hospital workers by device (detailed), Massachusetts, 2014

	N	%
Hypodermic needles/syringe (hollow bore)	**982**	**33**
Hypodermic needle attached to a disposable syringe	832	28
Unattached hypodermic needle	53	2
Prefilled cartridge syringe	22	1
Hypodermic Needle Attached to a non-disposable syringe	11	<1
Hypodermic needle attached to IV tubing	7	<1
Hypodermic needle, unspecified	57	2
Suture Needle	**672**	**23**
Curved suture needle	504	17
Straight suture needle	38	1
Suture needle, unspecified	130	4
Other Hollow Bore Needles	**298**	**10**
IV Stylet	136	5
Huber Needle	47	2
Biopsy Needle	23	1
Spinal or epidural needle	21	1
Other type of hollow bore needle	14	<1
Hollow bore needle, unspecified	57	2
Scalpel Blade	**226**	**8**
Winged Steel Needle	**212**	**7**
Winged Steel needle attached to a vacuum tube collection holder	116	4
Winged Steele Needle	83	3
Winged Steele Needle attached to IV tubing	13	<1
Vacuum Tube Collection Holder/Needle	**70**	**2**
Vacuum tube collection holder/needle	47	2
Phlebotomy needle (other than winged steel needle)	23	1

	N	%
Glass	**37**	**1**
Specimen / Test / Vacuum tube	21	1
Medication ampule / Vial / IV bottle	4	<1
Slide	4	<1
Capillary tube	1	<1
Other glass item	7	<1
Dental Device or item	**15**	**1**
Dental bur	5	<1
Dental explorer	1	<1
Other dental device or item	9	<1
Other	**404**	**14**
Lancet	49	2
Wire	45	2
Retractor	43	1
Scissors	34	1
Electrode	31	1
Forceps	20	1
Razor	19	1
Drill bit	17	1
Bovie electrocautery device	16	1
Pin	15	1
Bone cutter	12	<1
Cutting blade other than scalpel	10	<1
Trocar	8	<1
Staple	7	<1
Tenaculum	3	<1
Elevator	1	<1
Other needle	7	<1
Other Type of Sharp Object	64	2
Needle, unspecified	3	<1
Unknown/Not Answered	**30**	**1**
Total	**2,946**	**100**

Table 13. Sharps injuries among hospital workers by procedure (detailed), Massachusetts, 2014

	N	%
Injection	**841**	**29**
Subcutaneous injection	625	21
Intramuscular injection	94	3
Epidural/spiral anesthesia	17	1
Other injection	13	<1
Injection, unspecified	92	3
Suturing	**685**	**23**
Suturing	673	23
Suture removal	12	<1
Blood Procedures	**381**	**13**
Percutaneous venous puncture	247	8
Percutaneous arterial puncture	47	2
Finger stick / heel stick	43	1
Dialysis / AV fistula site	8	<1
Draw blood from umbilical vessel	6	<1
Other blood procedure	1	<1
Blood procedure, unspecified	29	1
Making the Incision	**311**	**11**
Making the incision	241	8
Cauterization	11	<1
Other surgical procedure	22	1
Surgical procedure, unspecified	37	1
Line Procedures	**296**	**10**
To insert a peripheral IV line or set up a heparin lock	99	3
Draw blood from central or peripheral IV line or port	43	1
To insert a central IV line	33	1
Other injection into IV site/port	32	1
To insert an arterial line	26	1
To connect IV line	15	1
To flush heparin/saline	14	<1
Draw blood from arterial line	5	<1
Other line procedure	18	1
Line procedure, unspecified	11	<1
To Obtain Body Fluid or Tissue Sample	**63**	**2**
Dental Procedures	**12**	**<1**
Dental drilling	4	<1
Oral surgery	2	<1
Periodontal surgery	1	<1
Dental procedure, unspecified	5	<1
Other	**242**	**8**
Drilling	26	1
Transferring blood/body fluid to another container	25	1
To obtain lab specimens	19	1
Shaving	9	<1
Other procedure	163	6
Unknown/Not answered	**115**	**4**
Total	**2,946**	**100**

For all tables presented, percentages may not total 100% due to rounding.

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

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