



Data Brief:

Sharps Injuries among Hospital Workers in Massachusetts: Findings from the Massachusetts Sharps Injury Surveillance System, 2021 & 2022

Massachusetts Department of Public Health

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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) and to use sharps with engineered sharps injury prevention features (SESIPs). Annual data have been collected from all DPH licensed hospitals since 2002. This report includes data on sharps injuries that occurred during 2021 and 2022.

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: [Sharps Injuries among Hospital Workers in Massachusetts, 2004: Findings from the Massachusetts Sharps Injury Surveillance System](#).

Data Highlights and Prevention Measures

- The number of sharps injuries reported by all DPH licensed hospitals in Massachusetts remained steady in 2021 and 2022, with 2,878 and 2,743 sharps injuries (SI) reported in each respective year. The SI rate fluctuated slightly from 16.4 to 15.7 SI per 100 licensed beds. These rates were similar to rates since 2010 (Figure 1), demonstrating a plateau in the sharps injury rate for more than a decade.
- Sharps injuries involving sharps with engineered sharps injury prevention features (SESIPs) accounted for more reported sharps injuries in each year than SI occurring with devices lacking sharps injury prevention features (2021: 49% vs. 44%; 2022: 51% vs. 42%). While this may reflect a change in procurement practices, it also highlights the point that engineering controls are not the sole solution and that comprehensive sharps injury prevention program also includes evaluation of devices. With more than 10% of injuries occurring during activation of the sharps injury prevention feature, this highlights the need for thorough training for all users on the mechanisms of those devices as well as safer work practices.
- Hypodermic needles and syringes accounted for more than 30% of all sharps injuries in each year; 84% of those involved sharps with engineered sharps injury prevention features. Among those, approximately 40% each year involved the sliding sheath mechanism, and another 40% involved the hinged cap mechanism. These findings highlight the need for hospitals to use their own Sharps Injury Surveillance data for quality improvement purposes such as evaluating devices, and to include frontline workers in device evaluation and selection.
- When looking at injuries by procedure type, injuries involving devices used for injection procedures were most frequent (2021: 973; 2022: 858). In each year, 82% of those injuries involved devices with sharps injury prevention features (Tables 7a and 7b). Hospitals are encouraged to look at the circumstances of these injuries to determine the timing of injuries relative to use of the item, evaluate the effectiveness of the mechanisms involved, identify gaps in work practices, and assess the availability and placement of disposal containers.
- The presence of a sharps injury prevention feature is most critical after a device is used. Of injuries involving devices lacking sharps injury prevention features, in each year, more than 60% of those involving hypodermic needles and syringes occurred either after use and before disposal or during or after disposal; For vacuum tube collection sets that percentage was as high as 84% (2021), and for IV stylets the percentage was as high as 69% (2022) (Table 9a and 9b). These injuries could be thought of as “never events” in that the use of devices with sharps injury prevention features could have likely prevented the injury.

Key Definitions and Methods

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 years 2021 and 2022.

Sharps injury rates: Numbers are the counts of sharps injuries, while sharps injury rates indicate the probability or risk of a worker sustaining a sharps injury within the surveillance period. Rates were calculated by dividing the number of sharps injuries among all workers by the number of licensed beds, and by dividing the number of sharps injuries among employees of acute care hospitals by the number of full-time equivalent employees in those hospitals. Confidence intervals (CI) are presented for each rate. Trends in annual rates were modeled using both negative binomial and joinpoint regressions. Negative binomial regression was used to model the overall trends of these rates from 2002 to 2022. Joinpoint regression was used to identify any changes in the trends over the same period. Both rates and numbers of injuries must be considered when targeting and evaluating prevention efforts. 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.

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 1a. Number and rate of sharps injuries among hospital workers by hospital characteristics, Massachusetts, 2021

	Hospitals		Sharps Injuries		Rate per 100 licensed beds	95% CI
Hospital size	N	%	N	%		
Small (< 100 licensed beds)	26	29.2	167	5.8	12.3	10.5-14.2
Medium (101-300 licensed beds)	45	50.6	815	28.3	9.8	9.1-10.5
Large (>300 licensed beds)	18	20.2	1,896	65.9	19.6	18.7-20.5
Service Type						
Acute care	71	79.8	2,826	98.2	19.2	18.5-19.9
Non-acute care*	18	20.2	52	1.8	1.9	1.4-2.4
Teaching Status						
Teaching	17	19.1	1,814	64.2	27.9	16.6-29.2
Non-teaching	72	80.9	1,064	37.	9.8	8.8-9.9
Total	89	100	2,878	100	16.4	15.8-17.0

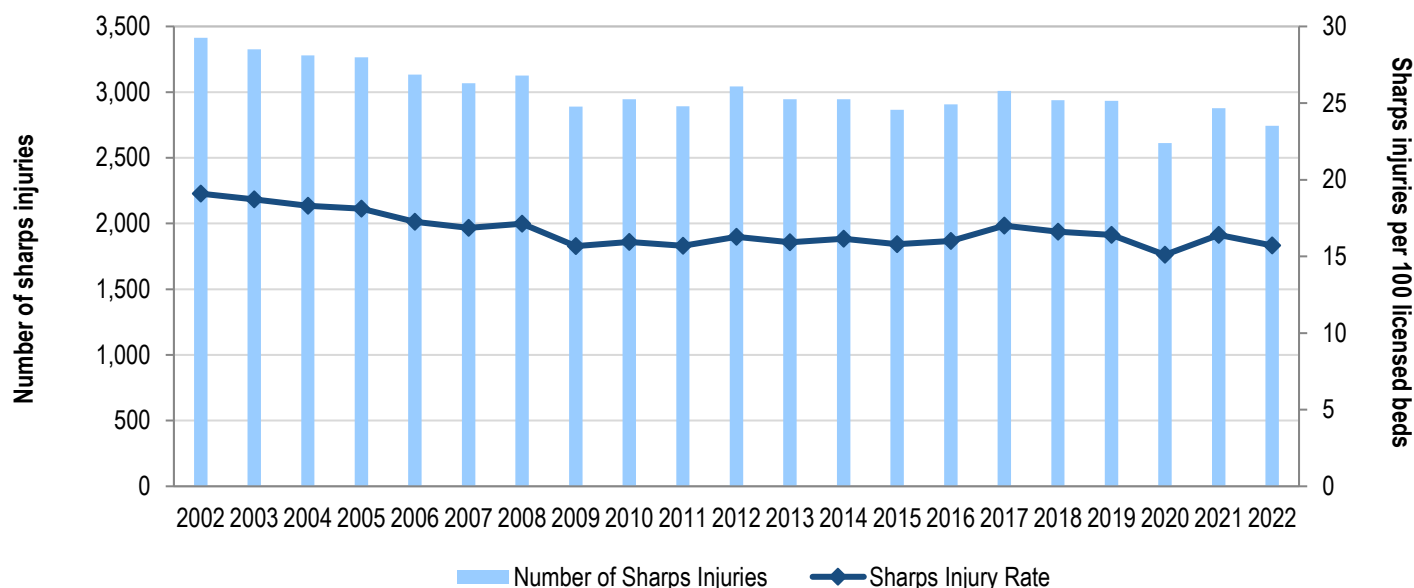
*Non-acute care hospitals include chronic care and rehabilitation facilities.

Table 1b. Number and rate of sharps injuries among hospital workers by hospital characteristics, Massachusetts, 2022

	Hospitals		Sharps Injuries		Rate per 100 licensed beds	95% CI
Hospital size	N	%	N	%		
Small (< 100 licensed beds)	27	30.3	172	6.3	12.1	10.3-13.9
Medium (101-300 licensed beds)	44	49.4	834	30.4	9.8	9.1-10.5
Large (>300 licensed beds)	18	20.2	1,737	63.3	18.0	17.1-18.8
Service Type						
Acute care	71	79.8	2,702	98.5	18.3	17.6-19.0
Non-acute care*	18	20.2	41	1.5	1.5	1.0-2.0
Teaching Status						
Teaching	18	20.2	1,724	62.9	26.1	24.9-27.4
Non-teaching	71	79.8	1,019	37.2	9.4	8.8-9.9
Total	89	100	2,743	100	15.7	15.1-16.3

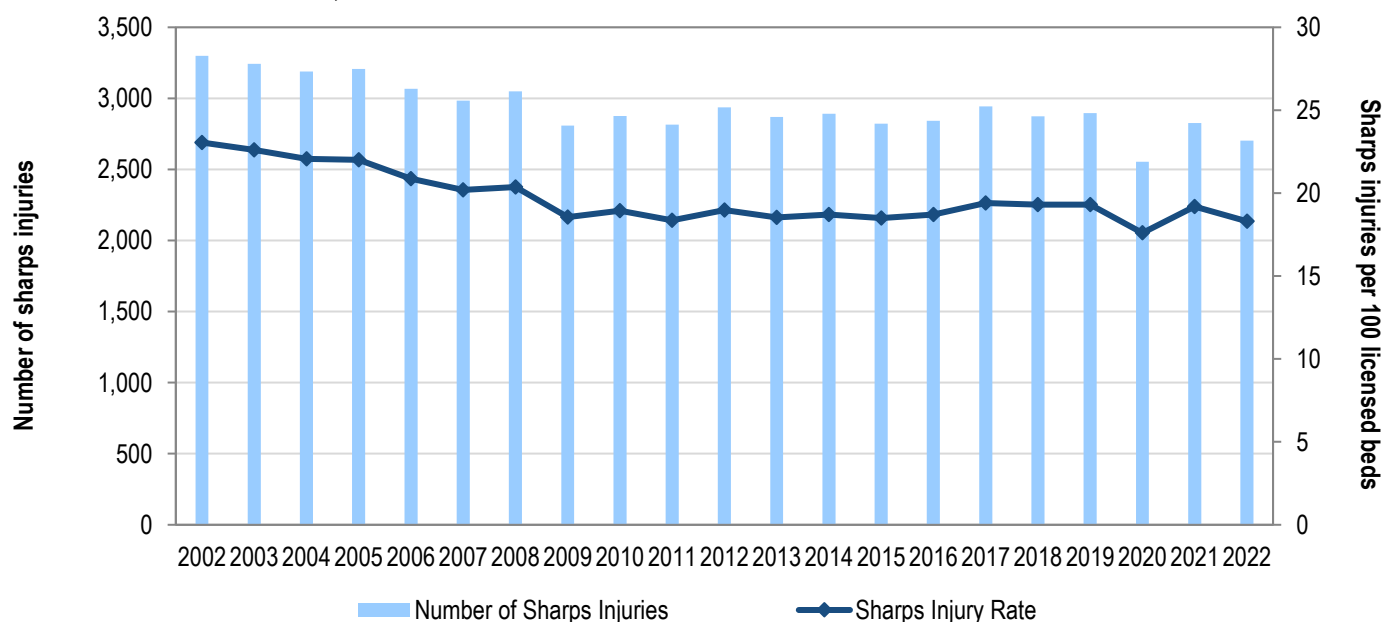
*Non-acute care hospitals include chronic care and rehabilitation facilities.

Figure 1. Number and rate of sharps injuries per licensed beds among all workers in acute and non-acute care hospitals, Massachusetts, 2002-2022



The sharps injury rate for all hospitals combined decreased significantly between 2002 and 2009. The average annual percent change in the sharps injury rate between 2002 and 2009 was -2.50 ($p<0.0001$). However, the average annual percent change from 2009 to 2022 was 0.12 ($p=0.53$), indicating the rate remained relatively steady over that time period.

Figure 2. Number and rate of sharps injuries per licensed beds among all workers in acute care hospitals only, Massachusetts, 2002-2022



The sharps injury rate for acute care hospitals decreased significantly between 2002 and 2010. The average annual percent change in the sharps injury rate between 2002 and 2010 was -2.69 ($p<0.0001$). However, the average annual percent change from 2010 to 2022 was -0.03 ($p=0.89$), indicating that the rate remained relatively steady over that time period. When looking at the rate of sharps injuries among employees of acute care hospitals by full time equivalents (FTEs), the rate significantly decreased between 2002 and 2009 with an average annual percent change of -4.79 ($p<0.0001$). Between 2009 to 2022 the rate remained relatively steady (average annual percent change = -0.42 ($p=0.23$)).

Table 2a. Sharps injuries by worker and incident characteristics and hospital size, Massachusetts hospital workers, 2021

	All Hospitals		Small		Hospital Size		Large	
	89 hospitals		26 hospitals		Medium		18 hospitals	
	N	%	N	%	N	%	N	%
Work status of injured worker	2,878	100	167	100	815	100	1,896	100
Employee	2,488	86	154	92	687	84	1,647	87
Non-Employee practitioner	227	8	7	4	66	8	154	8
Temporary / Contract worker	86	3	4	2	36	4	46	2
Student	73	3	2	1	24	3	47	2
Volunteer	1	<1	0	0	1	<1	0	0
Other/Unknown/Nonclassifiable	3	<1	0	0	1	<1	2	<1
Occupation	2,878	100	167	100	815	100	1,896	100
Nurse	1,190	41	87	52	405	50	698	37
Physician	1,049	36	36	22	169	21	844	45
Technician	389	14	26	16	157	19	206	11
Support Services	119	4	10	6	26	3	83	4
Dental staff	10	<1	0	0	3	<1	7	<1
Other medical staff	80	3	7	4	35	4	38	2
Other/Unknown/Nonclassifiable	41	1	1	<1	20	2	20	1
Department where injury occurred	2,878	100	167	100	815	100	1,896	100
Operating and Procedure rooms	1,229	43	51	31	298	37	880	46
Inpatient units, excluding ICU	612	21	33	20	220	27	359	19
Emergency Department	307	11	25	15	113	14	169	9
Outpatient areas	244	8	33	20	60	7	151	8
Intensive Care Units	233	8	3	2	43	5	187	10
Laboratories	54	2	1	1	7	1	46	2
Other/Unknown/Nonclassifiable	199	7	21	13	74	9	104	5
Device involved in the injury	2,878	100	167	100	815	100	1,896	100
Hypodermic needle/syringe	1,122	39	64	38	347	43	711	38
Suture needle	560	19	23	14	112	14	425	22
Winged-steel needle	213	7	23	14	83	10	107	6
Scalpel blade	212	7	5	3	47	6	160	8
Vacuum tube collection holder/needle	113	4	6	4	49	6	58	3
Glass	20	1	2	1	7	1	11	1
Dental device or item	9	<1	1	<1	3	<1	5	<1
Other hollow bore needle	233	8	18	11	64	8	151	8
Other /Unknown/Nonclassifiable	396	13	25	15	103	13	268	14
Procedure for which the device was used	2,878	100	167	100	815	100	1,896	100
Injection	973	34	53	32	306	38	614	32
Suturing	572	20	24	4	112	14	436	23
Blood procedures	357	12	27	16	147	18	183	10
Making the incision	294	10	10	6	71	9	213	11
Line procedures	269	9	25	15	73	9	171	9
To obtain body fluid or tissue sample	55	2	1	1	14	2	40	2
Dental procedures	10	<1	1	1	3	<1	6	<1
Other/Unknown/Nonclassifiable	348	11	26	16	89	11	233	12

Table 2b. Sharps injuries by worker and incident characteristics and hospital size, Massachusetts hospital workers, 2022

	All Hospitals		Small		Hospital Size		Large	
	89 hospitals		27 hospitals		Medium		18 hospitals	
	N	%	N	%	N	%	N	%
Work status of injured worker	2,743	100	172	100	834	100	1,737	100
Employee	2,366	86	151	88	688	82	1,527	88
Non-Employee practitioner	164	6	7	4	60	7	97	6
Temporary / Contract worker	147	5	13	8	60	7	74	4
Student	66	2	1	1	26	3	39	2
Occupation								
Nurse	1,184	43	94	55	395	47	695	40
Physician	868	32	39	23	162	19	667	38
Technician	450	16	26	15	190	23	234	13
Support Services	95	3	4	2	32	4	59	3
Dental staff	4	<1	0	0	1	<1	3	<1
Other medical staff	89	3	8	5	33	4	48	3
Other/Unknown/Nonclassifiable	53	2	1	1	21	3	31	2
Department where injury occurred	2,743	100	172	100	834	100	1,737	100
Operating and Procedure rooms	1,111	41	63	37	271	32	777	45
Inpatient units, excluding ICU	633	23	34	20	252	30	347	20
Emergency Department	338	12	29	17	127	15	182	10
Intensive Care Units	224	8	2	1	54	6	168	10
Outpatient areas	206	8	27	16	48	6	131	8
Laboratories	95	3	4	2	28	3	63	4
Other/Unknown/Nonclassifiable	136	6	13	8	54	7	69	5
Device involved in the injury	2,743	100	172	100	834	100	1,737	100
Hypodermic needle/syringe	964	35	64	37	316	38	584	34
Suture needle	471	17	20	12	102	12	349	20
Winged-steel needle	287	10	26	15	99	12	162	9
Scalpel blade	191	7	8	5	45	5	138	8
Vacuum tube collection holder/needle	116	4	3	2	51	6	62	4
Glass	22	1	0	0	10	1	12	1
Dental device or item	3	<1	0	0	2	<1	1	<1
Other hollow bore needle	325	12	23	13	96	12	206	12
Other /Unknown/Nonclassifiable	364	14	28	16	113	14	223	13
Procedure for which the device was used	2,743	100	172	100	834	100	1,737	100
Injection	858	31	57	33	272	33	529	30
Suturing	477	17	20	12	100	12	357	21
Blood procedures	442	16	24	14	185	22	233	13
Making the incision	292	11	24	14	84	10	184	11
Line procedures	299	11	24	14	86	10	189	11
To obtain body fluid or tissue sample	38	1	2	1	12	1	24	1
Dental procedures	6	<1	1	1	2	<1	3	<1
Other/Unknown/Nonclassifiable	331	12	20	11	93	11	218	13

Table 3a. Sharps injuries involving hollow-bore devices by device type and occupation, Massachusetts hospital workers, 2021

Occupation	Total		Hollow Bore							
			Hypodermic Needle/Syringe		Winged-Steel Needle		Vacuum Tube Collection Set		Other Hollow Bore	
	N	%	N	%	N	%	N	%	N	%
Nurse	1,005	100	734	73	98	10	57	6	116	12
Physician	323	100	229	71	8	2	-	-	86	27
Technician	227	100	63	28	93	41	52	23	19	8
Support services	37	100	23	62	2	5	3	8	9	24
Dental staff	5	100	5	100	-	-	-	-	-	-
Other medical staff	67	100	52	78	11	16	1	1	3	4
Other	17	100	16	94	1	6	-	-	-	-
Total	1,681	100	1,122	67	213	13	113	7	233	14

Table 3b. Sharps injuries involving hollow-bore devices by device type and occupation, Massachusetts hospital workers, 2022

Occupation	Total		Hollow Bore							
			Hypodermic Needle/Syringe		Winged-Steel Needle		Vacuum Tube Collection Set		Other Hollow Bore	
	N	%	N	%	N	%	N	%	N	%
Nurse	1001	100	636	64	132	13	47	5	186	19
Physician	286	100	186	65	5	2	6	2	89	31
Technician	272	100	66	24	122	45	52	19	32	12
Support services	30	100	17	57	1	3	2	7	1	3
Dental staff	3	100	2	67	-	-	-	-	-	-
Other medical staff	74	100	41	55	22	30	8	11	3	4
Other	26	100	16	62	5	19	1	4	4	15
Total	1692	100	964	57	287	17	116	7	325	19

Table 4a. Sharps injuries involving solid-bore devices by device type and occupation, Massachusetts hospital workers, 2021

Occupation	Total		Suture Needle		Scalpel		Glass		Other		Unknown	
	N	%	N	%	N	%	N	%	N	%	N	%
Physician	724	100	437	60	133	18	3	0	133	18	18	2
Nurse	182	100	61	34	34	19	8	4	60	33	19	10
Technician	161	100	51	32	35	22	7	4	52	32	16	10
Support services	81	100	4	5	3	4	1	1	40	49	33	41
Other medical staff	13	100	1	8	3	23	-	-	7	54	2	15
Other/Unknown	24	100	6	26	4	17	1	4	8	35	5	18
Total	1,185	100	560	47	212	18	20	2	300	25	93	8

Table 4b. Sharps injuries involving solid-bore devices by device type and occupation, Massachusetts hospital workers, 2022

Occupation	Total		Suture Needle		Scalpel		Glass		Other		Unknown	
	N	%	N	%	N	%	N	%	N	%	N	%
Physician	579	100	340	59	104	18	5	1	116	20	14	2
Nurse	171	100	64	37	26	15	4	2	66	39	11	6
Technician	176	100	56	32	49	28	9	5	54	31	8	5
Support services	65	100	2	3	1	2	1	2	38	58	23	35
Other medical staff	15	100	1	7	6	40	1	7	7	47	0	0
Other/Unknown	26	100	8	31	5	19	2	8	10	38	1	4
Total	1,032	100	471	46	191	19	22	2	291	28	57	6

Table 5a. Sharps injuries by SESIP by hospital size: all devices and excluding suture needles, Massachusetts hospital workers, 2021

	All Hospitals 89 hospitals		Hospital Size [^]					
			Small 26 hospitals		Medium 45 hospitals		Large 18 hospitals	
Sharps Injury Protections	N	%	N	%	N	%	N	%
All devices	2,878	100	167	100	815	100	1,896	100
SESIP	1,407	49	97	58	478	59	832	44
Non-SESIP	1,270	44	52	31	288	35	930	49
Unknown/Not answered/Nonclassifiable	201	7	18	11	49	6	134	7
Devices excluding suture needles	2,318	100	144	100	703	100	1,471	100
SESIP	1,404	61	97	67	475	68	832	57
Non-SESIP	722	31	29	20	181	26	512	35
Unknown/Not Answered/Nonclassifiable	192	8	18	13	47	6	127	8

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

Table 5b. Sharps injuries by SESIP by hospital size: all devices and excluding suture needles, Massachusetts hospital workers, 2022

	All Hospitals 89 hospitals		Hospital Size [^]					
			Small 27 hospitals		Medium 44 hospitals		Large 18 hospitals	
Sharps Injury Protections	N	%	N	%	N	%	N	%
All devices	2,743	100	172	100	834	100	1,737	100
SESIP	1,403	51	93	54	502	60	808	47
Non-SESIP	1,146	42	65	38	282	34	799	46
Unknown/Not answered/Nonclassifiable	194	7	14	8	50	6	130	7
Devices excluding suture needles	2,272	100	152	100	732	100	1,388	100
SESIP	1,401	62	93	61	501	68	807	58
Non-SESIP	684	30	46	30	181	25	457	33
Unknown/Not Answered/Nonclassifiable	187	8	13	9	50	7	124	9

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

Table 6a. Sharps injuries involving devices from prepackaged kits by device and SESIP, Massachusetts hospital workers, 2021

Device	Total		In a kit					
			SESIP		SESIP Status		Unknown/	
	N	%	N	%	N	%	N	%
Hypodermic needle/syringe	243	100	174	72	65	27	4	2
Winged steel needle	58	100	58	100	-	-	-	-
Scalpel blade	57	100	36	63	19	33	2	4
Vacuum tube collection holder/needle	20	100	13	65	7	35	-	-
Suture needle	96	100	3	3	92	96	1	1
Other hollow bore needle	77	100	21	27	52	68	4	5
Other	73	100	2	3	70	96	1	1
Total	624	100	307	49	305	49	12	2

Table 6b. Sharps injuries involving devices from prepackaged kits by device and SESIP, Massachusetts hospital workers, 2022

Device	Total		In a kit					
			SESIP		SESIP Status		Unknown/	
	N	%	N	%	N	%	N	%
Hypodermic needle/syringe	204	100	158	77	40	20	6	3
Winged steel needle	82	100	80	98	2	2	0	0
Scalpel blade	59	100	34	58	19	32	6	10
Vacuum tube collection holder/needle	25	100	23	92	2	8	0	0
Suture needle	81	100	2	2	79	98	0	0
Other hollow bore needle	121	100	59	49	60	50	2	2
Other	58	100	6	10	47	81	5	9
Total	630	100	362	57	249	40	19	3

Table 7a. Sharps injuries by select procedures and SESIP, Massachusetts hospital workers, 2021

Procedure	Total		SESIP		Non-SESIP		Unknown	
	N	%	N	%	N	%	N	%
Injection procedures	973	100	794	82	149	15	30	3
Subcutaneous injection	716	100	595	83	102	14	19	3
Intramuscular injection	221	100	190	15	26	9	5	9
Other injections	36	100	9	25	21	58	6	17
Blood procedures	357	100	292	82	45	13	20	5
Percutaneous venous puncture	299	100	260	87	27	9	12	4
Percutaneous arterial puncture	21	100	15	71	5	24	1	5
Finger stick / Heel stick	21	100	6	29	10	48	5	23
Other blood procedures	16	100	11	69	3	19	2	12
Line procedures	269	100	180	67	81	30	8	3
To insert peripheral IV/set up heparin lock	96	100	91	95	4	4	1	1
To insert central line	37	100	12	32	25	68	-	-
Other line procedures	136	100	77	57	52	38	7	5
Total	1,599	100	1,266	79	275	17	58	4

Table 7b. Sharps injuries by select procedures and SESIP, Massachusetts hospital workers, 2022

Procedure	Total		SESIP		Non-SESIP		Unknown	
	N	%	N	%	N	%	N	%
Injection procedures	858	100	700	82	119	14	39	5
Subcutaneous injection	657	100	541	82	84	13	32	5
Intramuscular injection	166	100	142	86	18	11	6	4
Other injections	35	100	17	49	17	49	1	3
Blood procedures	442	100	387	88	39	9	16	4
Percutaneous venous puncture	347	100	324	93	13	4	10	3
Percutaneous arterial puncture	28	100	24	86	2	7	2	7
Finger stick / Heel stick	28	100	11	39	14	50	3	11
Other blood procedures	39	100	28	72	10	26	1	3
Line procedures	299	100	202	68	82	27	15	5
To insert peripheral IV/set up heparin lock	114	100	106	93	6	5	2	2
To insert central line	40	100	13	33	20	50	7	18
Other line procedures	145	100	83	57	56	39	6	4
Total	1599	100	1289	81	240	15	70	4

Table 8a. Sharps injuries among hospital workers by when and how the injury occurred by hospital size, Massachusetts, 2021

			Hospital Size [^]					
			Small		Medium		Large	
	All Hospitals 89 hospitals		26 hospitals		45 hospitals		18 hospitals	
	N	%	N	%	N	%	N	%
Before use of the item	23	1	-	-	8	1	15	1
During use of the item	1,356	47	53	32	379	47	924	49
Manipulate needle in patient	311	11	11	7	104	13	196	10
Suturing	313	11	13	8	64	8	236	12
Patient moved and jarred device	226	8	10	6	84	10	132	7
Collision with worker or sharp	206	7	7	4	52	6	147	8
Handle/pass equipment	99	3	6	4	18	2	75	4
Access IV line	24	1	1	1	12	1	11	1
Device Malfunction	12	<1	1	1	5	1	6	<1
Other/Unknown/Not answered/Nonclassifiable	169	6	2	1	5	1	15	1
After use, before disposal	1,185	41	83	50	342	42	760	40
Activating injury protection mechanism	355	12	29	17	122	15	204	11
Handle/pass equipment	237	8	13	8	62	8	162	9
During clean-up	205	7	17	10	46	6	142	7
Recap needle	105	4	8	5	30	4	67	4
Collision with worker or sharp	74	3	2	1	19	2	53	3
During sharps disposal	60	2	2	1	15	2	43	2
Sharps injury prevention mechanism not activated	51	2	7	4	21	3	23	1
Device malfunction	27	1	2	1	12	1	13	1
Patient moved and jarred device	17	1	1	1	5	1	11	1
Other/Unknown/Not answered/Nonclassifiable	54	2	2	1	10	1	42	2
During or after disposal of item	290	10	27	16	84	10	179	9
Improper disposal	141	5	12	7	32	4	97	5
During sharps disposal	128	4	13	8	42	5	73	4
Collision with worker or sharp	10	<1	1	1	4	<1	5	<1
Device malfunction	5	<1	-	-	3	<1	2	<1
Sharps injury prevention mechanism not activated	2	<1	1	1	1	<1	-	-
Unknown / Not answered / Nonclassifiable	24	1	4	2	2	<1	18	1
Device malfunction	6	<1	1	1	1	<1	4	<1
Unknown/Not answered/Nonclassifiable	18	1	3	2	1	<1	14	1
Total	2,878	100	167	100	815	100	1,896	100

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

Table 8b. Sharps injuries among hospital workers by when and how the injury occurred by hospital size, Massachusetts, 2022

	Hospital Size [^]							
	All Hospitals 89 hospitals		Small 27 hospitals		Medium 44 hospitals		Large 18 hospitals	
	N	%	N	%	N	%	N	%
Before use of the item	16	1	0	0	5	1	11	1
During use of the item	1,270	46	79	46	353	42	838	48
Manipulate needle in patient	306	11	22	13	82	10	202	12
Suturing	277	10	8	5	58	7	211	12
Patient moved and jarred device	246	9	27	16	89	11	130	7
Collision with worker or sharp	222	8	13	8	78	9	131	8
Handle/pass equipment	4	<1	0	0	3	<1	1	0
Access IV line	34	1	1	1	6	1	27	2
Device Malfunction	20	1	1	1	5	1	14	1
Other/Unknown/Not answered/Nonclassifiable	159	7	7	4	30	4	122	8
After use, before disposal	1,197	44	73	42	388	46	741	43
Activating injury protection mechanism	347	13	18	10	121	15	208	12
Handle/pass equipment	269	10	16	9	80	10	173	10
During clean-up	160	6	15	9	40	5	105	6
Recap needle	87	3	5	3	37	4	45	3
Collision with worker or sharp	92	3	7	4	33	4	52	3
During sharps disposal	69	3	2	1	14	2	53	3
Sharps injury prevention mechanism not activated	87	3	4	2	34	4	49	3
Device malfunction	37	1	5	3	11	1	21	1
Patient moved and jarred device	2	<1	0	0	1	<1	1	<1
Other/Unknown/Not answered/Nonclassifiable	4	<1	0	0	2	<1	2	<1
During or after disposal of item	223	8	19	11	82	10	122	7
During sharps disposal	110	4	12	7	44	5	54	3
Improper disposal	101	4	5	3	32	4	64	4
Handle/pass equipment	5	<1	1	1	2	<1	2	<1
Collision with worker or sharp	3	<1	0	0	3	<1	0	0
Device malfunction	2	<1	0	0	0	0	2	<1
During clean-up	1	<1	0	0	1	<1	0	0
Sharps injury prevention mechanism not activated	1	<1	0	0	1	<1	0	0
Other	1	<1	1	1	0	0	0	0
Unknown / Not answered / Nonclassifiable	38	1	1	1	11	1	26	1
Device malfunction	4	<1	1	1	1	<1	2	<2
Patient moved and jarred device	1	<1	0	0	1	<1	0	0
Recap needle	1	<1	0	0	0	0	1	<1
Other/Unknown/Not answered/Nonclassifiable	31	1	0	0	9	1	22	1
Total	2,743	100	172	100	834	100	1,737	100

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

Table 9a. Sharps injuries involving select devices without sharps injury prevention features but for which SESIPs are widely available, by when the injury occurred, Massachusetts hospital workers, 2021

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 Needle	178	100	-	-	46	26	109	61	20	11	3	2
Vacuum Tube Collection Holder	36	100	-	-	5	14	15	42	15	42	1	3
IV Stylet	34	100	1	3	21	62	5	15	5	15	2	6
Winged-Steel Needle Holder	7	100	-	-	3	43	2	29	2	29	-	-
Total	255	100	1	3	75	29	131	51	42	16	6	2

*SESIPs offer protection during the period after use. Injuries presented in this table that occurred after use (n=136) can be considered “preventable adverse events” – events that could have been prevented with the use of SESIPS.

Table 9b. Sharps injuries involving select devices without sharps injury prevention features but for which SESIPs are widely available, by when the injury occurred, Massachusetts hospital workers, 2022

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 Needle	139	100	1	< 1	48	35	70	50	17	12	3	3
Vacuum Tube Collection Holder	32	100	0	0	12	38	10	31	10	31	0	0
IV Stylet	26	100	0	0	7	27	14	54	4	15	1	4
Winged-Steel Needle Holder	4	100	0	0	2	50	1	25	1	25	0	0
Total	201	100	1	<	69	34	95	41	32	16	4	2

*SESIPs offer protection during the period after use. Injuries presented in this table that occurred after use (n=136) can be considered “preventable adverse events” – events that could have been prevented with the use of SESIPS.

Table 10a. Sharps injuries by occupation (detailed), Massachusetts hospital workers, 2021

	N	%		N	%
Nurse	1,190	41	Support Services	119	4
RN or LPN	1,061	37	Housekeeper	58	2
Patient care technician	38	1	Central supply	39	1
Nurse practitioner	28	1	Safety/security	17	1
Nurse assistant	27	1	Transport/messenger/porter	2	<1
Nursing student	17	1	Other ancillary staff	3	<1
Nurse anesthetist	11	<1			
Nurse midwife	7	<1	Other Medical Staff	80	3
Home health aide	1	<1	Medical assistant	73	3
Physician	1,049	36	Physical Therapist	1	<1
Intern/Resident	403	14	Other medical staff	6	<1
Physician	245	9			
Fellow	128	4	Dental Staff	10	<1
Surgeon	95	3	Dental assistant/tech	6	<1
Physician Assistant	88	3	Dentist	2	<1
Medical student	45	2	Dentist hygienist	1	<1
Anesthesiologist	40	1	Dental student	1	<1
Radiologist	5	<1			
			Other	40	1
Technician	389	14	Researcher	9	<1
OR/Surgical technician	157	5	Pharmacist	6	<1
Phlebotomist	135	5	EMT/paramedic	3	<1
Clinical lab technician	24	1	Counselor/social worker	3	<1
Emergency department technician	24	1	Clerical/administrative	1	<1
Radiologic technician	22	1	Dietician	1	<1
Respiratory therapist/technician	11	<1	Other student	12	<1
Anesthesia technician	3	<1	Other	5	<1
Morgue technician	2	<1			
Other technician	11	<1	Unknown/Not Answered/Nonclassifiable	1	<1
			Total	2,878	100

Table 10b. Sharps injuries by occupation (detailed), Massachusetts hospital workers, 2022

	N	%		N	%
Nurse	1,184	43	Support Services	95	3
RN or LPN	1,050	38	Housekeeper	47	2
Patient care technician	51	2	Central supply	38	1
Nurse assistant	33	1	Safety/security	10	<1
Nurse practitioner	28	1			
Nurse anesthetist	13	<1			
Nursing student	6	<1			
Nurse midwife	3	<1	Other Medical Staff	89	3
			Medical assistant	64	2
			Other medical staff	7	<1
Physician	868	32			
Intern/Resident	333	12			
Physician	193	7			
Fellow	115	4	Dental Staff	4	<1
Surgeon	82	3	Dental assistant/tech	4	<1
Physician Assistant	78	3			
Anesthesiologist	31	1			
Medical student	30	1			
Radiologist	6	0			
			Other	53	2
Technician	450	16	Researcher	11	<1
Phlebotomist	159	6	Pharmacist	7	<1
OR/Surgical technician	158	6	EMT/paramedic	3	<1
Clinical lab technician	39	1	Counselor/social worker	1	<1
Radiologic technician	22	1	Clerical/administrative	3	<1
Respiratory therapist/technician	18	1	Other student	26	1
Hemodialysis technician	2	<1	Other	2	<1
Morgue technician	2	<1			
Psychiatric technician	2	<1			
Other technician	48	<2	Unknown/Not Answered/Nonclassifiable	0	0
			Total	2,743	100

Table 11a. Sharps injuries by department (detailed), Massachusetts hospital workers, 2021

	N	%		N	%
Operating and Procedure Rooms	1,229	43	Laboratory	54	2
Operating room	902	31	Histology/pathology	23	1
Labor and delivery	76	3	Morgue/autopsy room	7	<1
Radiology	69	2	Microbiology	6	<1
Cardiac catheterization laboratory	56	2	Blood bank	4	<1
Hematology/oncology	53	2	Clinical chemistry	2	<1
Phlebotomy room	45	2	Hematology	1	<1
Endoscopy/bronchoscopy/cystoscopy	8	<1	Other laboratory	10	<1
Dialysis	3	<1	Laboratory, unspecified	1	<1
Other procedure room	17	1			
			Other Areas	196	7
Inpatient Units, other than ICU	612	21	Central sterile supply	41	1
Medical/surgical ward	547	19	Rehabilitation unit	35	1
Obstetrics/gynecology	33	1	Dermatology	32	1
Psychiatry ward	14	<1	Exam room	17	1
Pediatrics	13	<1	Pain clinic	9	<1
Nursery	5	<1	Anesthesia	7	<1
			Hospital grounds	5	<1
Emergency Department	307	11	Long term care	2	<1
			Pharmacy	2	<1
Outpatient Areas	244		Central trash area	2	<1
			Employee health/infection control	2	<1
			Other location	42	1
			Unknown/Not Answered/Nonclassifiable	3	<1
			Total	2,878	100

Table 11b. Sharps injuries by department (detailed), Massachusetts hospital workers, 2022

	N	%		N	%
Operating and Procedure Rooms	1,111	41	Laboratory	95	3
Operating room	825	30	Histology/pathology	32	1
Labor and delivery	57	2	Morgue/autopsy room	9	<1
Radiology	66	2	Microbiology	9	<1
Cardiac catheterization laboratory	50	2	Clinical chemistry	3	<1
Hematology/oncology	50	2	Blood bank	1	<1
Phlebotomy room	33	1	Laboratory, unspecified	22	1
Endoscopy/bronchoscopy/cystoscopy	6	<1	Other laboratory	19	1
Dialysis	6	<1			
Other procedure room	18	1			
			Other Areas	134	5
Inpatient Units, other than ICU	633	23	Central sterile supply	42	2
Medical/surgical ward	559	20	Rehabilitation unit	23	1
Obstetrics/gynecology	24	1	Dermatology	20	1
Psychiatry ward	18	1	Exam room	10	<1
Pediatrics	16	1	Pain clinic	6	<1
Nursery	5	<1	Hospital grounds	6	<1
Patient room, ward unspecified	11	<1	Long term care	6	<1
			Pharmacy	4	<1
Emergency Department	338	12	Central trash area	3	<1
			Home health visit	3	<1
Intensive Care Unit	224	8	Ambulance	1	<1
Intensive Care Unit	209	8	Employee health/infection control	1	<1
Post anesthesia care unit	15	1	Other location	9	<1
Outpatient Areas	206	8	Unknown/Not Answered	2	<1
Ambulatory care clinic	143	5			
Physician office	21	1			
Dental clinic	7	<1			
Community health center	3	<1			
Other outpatient area	29	1			
			Total	2,743	100

Table 12a. Sharps injuries by device (detailed), Massachusetts hospital workers, 2021

	N	%		N	%
Hypodermic needles/syringe	1,122	39	Glass	20	1
Hypodermic needle attached to a disposable syringe	1,011	35	Specimen / Test / Vacuum tube	9	<1
Prefilled cartridge syringe	55	2	Medication ampule / Vial / IV bottle	4	<1
Unattached hypodermic needle	29	1	Slide	3	<1
Hypodermic needle attached to IV tubing	20	1	Pipette	1	<1
Hypodermic needle attached to a non-disposable syringe	4	<1	Other glass item	3	<1
Hypodermic needle, unspecified	3	<1	Dental Device or item	9	<1
Suture Needle	560	19	Dental pick	3	<1
Curved suture needle	535	19	Scaler/curette	2	<1
Straight suture needle	21	1	Dental explorer	1	<1
Suture needle, unspecified	4	<1	Dental bur	1	<1
			Root canal file	1	<1
			Other dental device or item	1	<1
Other Hollow Bore Needles	233	8	Other	300	10
IV Stylet	118	4	Electrode	41	1
Huber needle	38	1	Wire	38	1
Spinal or epidural needle	20	1	Bovie electrocautery device	24	1
Biopsy needle	17	1	Lancet	23	1
Intraosseous needle	2	<1	Retractor	20	1
Other type of hollow bore needle	7	<1	Forceps	19	1
Hollow bore needle, unspecified	31	1	Scissors	18	<1
			Drill bit	13	<1
Scalpel Blade	212	7	Cutting blade other than scalpel	12	<1
			Pin	12	<1
Winged Steel Needle	213	7	Trocar	10	<1
Winged steel needle attached to a vacuum tube collection holder	147	5	Bone cutter	10	<1
Winged steel needle	46	2	Staple	9	<1
Winged steel needle attached to IV tubing	20	1	Bone chip/chipped tooth	5	<1
			Tenaculum	5	<1
Vacuum Tube Collection Holder/Needle	113	4	Razor	2	<1
Vacuum tube collection holder/needle	67	2	Other needle	3	<1
Phlebotomy needle (other than winged steel needle)	46	2	Other type of sharp object	34	1
			Needle, unspecified	2	<1
			Unknown/Not Answered/Nonclassifiable	96	3
			Total	2,878	100

Table 12b. Sharps injuries by device (detailed), Massachusetts hospital workers, 2022

	N	%		N	%
Hypodermic needles/syringe	964	35	Glass	22	1
Hypodermic needle attached to a disposable syringe	855	31	Specimen / Test / Vacuum tube	8	<1
Prefilled cartridge syringe	44	2	Medication ampule / Vial / IV bottle	4	<1
Unattached hypodermic needle	24	1	Slide	3	<1
Hypodermic needle attached to IV tubing	14	1	Other glass item	7	<1
Hypodermic needle attached to a non-disposable syringe	6	<1			
Hypodermic needle, unspecified	21	1	Dental Device or item	3	<1
Suture Needle	471	17	Dental bur	2	<1
Curved suture needle	435	16	Scaler/curette	1	<1
Straight suture needle	16	1			
Suture needle, unspecified	20	1	Other	291	11
Other Hollow Bore Needles	329	12	Electrode	29	1
IV Stylet	126	5	Wire	30	1
Huber needle	60	2	Bovie electrocautery device	11	<1
Spinal or epidural needle	17	1	Lancet	30	1
Biopsy needle	25	1	Retractor	25	1
Intraosseous needle	4	<	Forceps	15	1
Other type of hollow bore needle	49	2	Scissors	27	1
Hollow bore needle, unspecified	48	2	Drill bit	15	1
			Cutting blade other than scalpel	10	<1
Scalpel Blade	191	7	Pin	15	1
Winged Steel Needle	287	10	Trocar	6	<1
Winged steel needle attached to a vacuum tube collection holder	225	8	Bone cutter	7	<1
Winged steel needle	54	2	Staple	5	<1
Winged steel needle attached to IV tubing	8	<1	Bone chip/chipped tooth	5	<1
			Tenaculum	3	<1
Vacuum Tube Collection Holder/Needle	116	4	Razor	6	<1
Vacuum tube collection holder/needle	55	2	Other needle	1	<1
Phlebotomy needle (other than winged steel needle)	61	2	Other type of sharp object	48	2
			Needle, unspecified	2	<1
			Solid bore harpoon	1	<1
			Unknown/Not Answered/Nonclassifiable	57	2
			Total	2,743	100

Table 13a. Sharps injuries by procedure (detailed), Massachusetts hospital workers, 2021

	N	%		N	%
Injection	973	34	Line Procedures	269	9
Subcutaneous injection	716	25	To insert a peripheral IV line or set up a heparin lock	96	3
Intramuscular injection	221	8	Draw blood from central or peripheral IV line or port	42	1
Epidural/spinal anesthesia	16	1	To insert a central IV line	37	1
Injection, unspecified	10	<1	Other injection into IV site/port	32	1
Other injection	10	<1	To insert an arterial line	26	1
Suturing	572	20	Draw blood from arterial line	13	<1
Suturing	567	20	To connect IV line	5	<1
Suture removal	5	<1	To flush heparin/saline	3	<1
Blood Procedures	357	12	Line procedure, unspecified	2	<1
Percutaneous venous puncture	299	10	Other line procedure	13	<1
Percutaneous arterial puncture	21	1	Dental Procedures	10	<1
Finger stick / heel stick	21	1	Dental drilling	3	<1
Draw blood from umbilical vessel	9	<1	Hygiene	2	<1
Dialysis / AV fistula site	3	<1	Oral surgery	2	<1
Blood procedure, unspecified	3	<1	Restorative	2	<1
Other blood procedure	1	<1	Other dental	1	<1
Making the Incision	294	10	Other	201	7
Making the incision	247	9	To obtain lab specimens	38	1
Cauterization	13	<1	Transferring blood/body fluid to another container	19	1
Surgical procedure, unspecified	1	<1	Drilling	14	<1
Other surgical procedure	33	1	Shaving	2	<1
To Obtain Body Fluid or Tissue Sample	55	2	Other procedure	128	4
			Unknown/Not answered	147	5
			Total	2,878	100

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

Table 13b. Sharps injuries by procedure (detailed), Massachusetts hospital workers, 2022

	N	%		N	%
Injection	858	100	Making the Incision	292	11
Subcutaneous injection	657	24	Making the incision	207	8
Intramuscular injection	166	6	Surgical procedure, unspecified	8	<1
Epidural/spinal anesthesia	15	1	Cauterization	7	<1
Injection, unspecified	11	<1	Other surgical procedure	70	3
Other injection	9	<1			
			To Obtain Body Fluid or Tissue Sample	38	1
Suturing	477	17			
Suturing	472	17			
Suture removal	5	<1	Dental Procedures	6	<1
			Dental drilling	1	<1
Blood Procedures	442	16	Dental procedures, unspecified	1	<1
Percutaneous venous puncture	347	13	Oral surgery	2	<1
Percutaneous arterial puncture	28	1	Restorative	2	<1
Finger stick / heel stick	28	1			
Draw blood from umbilical vessel	9	<1			
Dialysis / AV fistula site	6	<1	Other	204	7
Blood procedure, unspecified	24	1	To obtain lab specimens	47	2
			Drilling	22	1
Line Procedures	299	11	Transferring blood/body fluid to another container	21	1
To insert a peripheral IV line or set up a heparin lock	114	4	Shaving	4	<1
Draw blood from central or peripheral IV line or port	50	2	Other procedure	84	3
To insert a central IV line	40	1	Procedure, unspecified	1	<1
Other injection into IV site/port	44	2			
To insert an arterial line	19	1	Unknown/Not answered		
Draw blood from arterial line	16	1			
To connect IV line	4	<1			
To flush heparin/saline	1	<1			
Other line procedure	11	<1			
			Total	2,743	100

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

Resources

- [DPH: Occupational Health Surveillance Program homepage](https://mass.gov/orgs/occupational-health-surveillance-program)
(mass.gov/orgs/occupational-health-surveillance-program)
- [CDC: Workbook for Designing, Implementing & Evaluating a Sharps Injury Prevention Program](https://cdc.gov/infection-control/hcp/sharps-safety/program-workbook.html)
(cdc.gov/infection-control/hcp/sharps-safety/program-workbook.html)
- [NIOSH: Bloodborne Infectious Disease Risk Factors](https://cdc.gov/niosh/healthcare/risk-factors/bloodborne-infectious-diseases.html)
(cdc.gov/niosh/healthcare/risk-factors/bloodborne-infectious-diseases.html)
- [OSHA: Bloodborne Pathogens and Needlestick Prevention](https://osha.gov/bloodborne-pathogens/standards)
(osha.gov/bloodborne-pathogens/standards)

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