

# VETERANS' GENERAL HOSPITAL-TAIPEI, REPORT OF OCCUPATIONALLY- ASSOCIATED OPERATIVE BLOOD EXPOSURES

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This is a report of factors associated with occupational blood exposures occurring in the operating room. Circulating nurses completed reports for personnel who experienced punctures with used sharps or blood in contact with mucous membranes or nonintact skin; blood in contact with intact skin was also included, but was not considered to present as serious a risk for transmission of blood borne pathogens including Hepatitis B or HIV infection. The purpose of the study was to provide epidemiologic information to personnel and surgeons so that they could identify methods for reducing the frequency of blood exposures in VGH operating rooms, and to compare patterns for exposures with similar studies in the US. Denominator data about the cases performed during the period were not collected, precluding the calculation of rates or other measures of incidence.

1.Types of cases with larger numbers of blood contacts and exposures included orthopedic, oral maxillofacial/ear, nose and throat (OMF/ENT) and general surgical procedures. Several US studies have identified orthopedic, thoracic and OMF/ENT as higher risk.

N2	CASTYPE	Freq	Percent
2	Eye	2	2.0%
3	Gen Surg	19	19.0%
5	Trauma	1	1.0%
6	Neuro	2	2.0%
8	OMF/ENT	24	24.0%
10	Orthoped	35	35.0%
11	Thoracic	12	12.0%
12	Urology	2	2.0%
13	Other	3	3.0%
	Total	100	100.0%

2.Time of day cases with blood contacts and exposures was predominately weekday, but with several on evening shift of weekdays and also weekends. This points out the need for education about prevention on all shifts.

N3	TIMEDAY	Freq	Percent
1	W/DAY 7-3	87	87.9%
2	W/DAY 3-11	8	8.1%
4	W/END 7-3	3	3.0%
5	W/END 3-11	1	1.0%
	Total	99	100.0%

3. Emergency cases with blood contacts and exposures were noted; some studies have suggested that more risk is associated with emergency cases, and that protective attire such as more fluid-resistant gowns and double gloves may be important to reduce risk for exposures during these cases, particularly if they are thoracic or orthopedic procedures.

N4	EMERGENCY	Freq	Percent
1	No	84	84.0%
2	Yes	16	16.0%
	Total	100	100.0%

4. Length of surgery has been an important predictor of operative blood contacts and exposures; some investigators have suggested that protective attire be increased for cases longer than 2 hours, and that personnel examine their clothing and gloves periodically on longer cases. This might be particularly important for orthopedic, thoracic and emergency cases.

N5	LENGTHSU	Freq	Percent
0	30 min	2	2.0%
1	hour	12	12.0%
2	hours	20	20.0%
3		21	21.0%
4		16	16.0%
5		8	8.0%
6		4	4.0%
7		7	7.0%
8		6	6.0%
9		4	4.0%
	Total	100	100.0%

5.Type of exposure and location of blood contacts and exposures provides valuable information for preventing exposures. Punctures are more likely to result in transmission of bloodborne pathogens than other types of contacts and exposures and should be the first priority for prevention, followed by mucous membrane exposures. Punctures to the fingers are frequently associated with suture needle manipulations and passing sharps. Mucous membrane exposures can be prevented by requiring personnel to wear fluid-resistant masks and eyeglasses, face shields or goggles for all cases that involve risk for spatter of bloody fluid.

N10	LOCATION	Punc	NMemb	Non-Skin	Intact Skin	Total
1	Finger	16	0	5	11	32
2	Hand	1	0	0	6	7
3	Muc Memb	0	9	0	2	11
4	Face	2	0	1	40	43
5	Neck	0	0	0	2	2
6	Arm	1	0	0	1	2
7	Body	0	0	0	1	1
8	Leg/Feet	0	0	0	3	3
	Total	20	9	6	66	101

6.Activity associated with blood contact or exposure was often spatter. incising, suturing, strikethrough of clothing, or glove leaks. Spatter usually affects the face while strikethrough may affect the arms. torso or more commonly, legs and feet. Passing and receiving instruments, and suturing were more commonly associated with punctures.

N8	ACTIVITY	Freq	Percent
1	Incising	10	10.0%
2	Suturing	7	7.0%
3	Passing	6	6.0%
4	Receiving	3	3.0%
5	Suction	3	3.0%
7	Injecting	1	1.0%
8	IV Manipulate	5	5.0%
9	Sharp Manipul	7	7.0%
10	Glove Leak	7	7.0%
11	Power Equip	7	7.0%

12	Strikethrough	8	8.0%
13	Spatter	34	34.0%
14	Blood:Improper Location	1	1.0%
15	Other	1	1.0%
	Total	100	100.0%

7. Jobclass and location of blood contacts and exposures shows that high risk occurs for surgeons on fingers, mucous membranes and faces. For other personnel, fingers, hands and mucous membranes were important. US studies have shown that blood runs off gowns and drapes onto feet and legs more frequently than at VGH; this may be due to use of more fluid resistant fabrics than muslin. Some masks are both larger and more fluid-resistant than others, thus more likely to prevent spatter from reaching the mucous membranes of the nose and mouth.

N6	JOBCLASS	N10 LOCATION								Total
		Finger	Hand	NMem	Face	Neck	Arm	Body	Leg/F	
1	Surgeon	17	1	9	39	2	1	1	2	72
2	Scrub	7	2	0	1	0	0	0	0	10
3	Circulator	4	2	0	0	0	0	0	0	6
4	Anesthesia	3	2	1	3	0	1	0	0	10
6	Med Student	1	0	1	0	0	0	0	1	3
	Total	32	7	11	43	2	2	1	3	101

8. Jobclass and type of exposure shows that punctures affect surgeons more frequently than other personnel, but scrub personnel and those who perform IV manipulations also have risk.

N6	JOBCLASS	Puncture	NMem	Non-Skin	Intact Skin	Total
1	Surgeon	7	8	3	54	72
2	Scrub	5	0	2	3	10
3	Circulator	3	0	1	2	6
4	Anesthesia	4	1	0	5	10
6	Med Student	1	0	0	2	3
	Total	20	9	6	66	101

9. For PUNCTURES ONLY, jobclass and activity associated with exposure show that passing and receiving instruments were important. Some operating rooms now use a "no-touch" passing technique, so that sharp instruments are not passed from hand to hand, but instead are placed in a basin or on specific area of the drape called the "neutral zone". Other studies have shown that suturing and especially finger guided suture placement result in punctures of the surgeons' fingers.

N8	ACTIVITY	Surgeon	Scrub	Circulator	Anes	Student	Total
		1	2	3	4	6	
2	Suturing	5	0	0	0	0	5
3	Passing	0	2	0	1	1	4
4	Receiving	0	1	0	0	0	1
8	IV Manipulation	0	0	1	2	0	3
9	Sharp Manipulat	1	2	2	0	0	5
11	Power Equip	1	0	0	0	0	1
13	Spatter	0	0	0	1	0	1
	Total	7	5	3	4	1	20

10. Jobclass and types of exposures associated with blood contacts and exposures shows punctures distributed among most personnel although surgeons experienced nearly 3/4 of all contacts and exposures.

N6	JOBCLASS	Puncture	NMem	Non-Skin	Intact Skin	Total
1	Surgeon	7	8	3	54	72
2	Scrub	5	0	2	3	10
3	Circulator	3	0	1	2	6
4	Anesthesia	4	1	0	5	10
6	Med Student	1	0	0	2	3
	Total	20	9	6	66	101

11. For ORTHOPEDIC CASES ONLY, jobclass and location show that spatter to the face but not facial mucous membranes is important for the operating team. This is common for orthopedic procedures and best prevented by using larger masks or face shields that protect more of the face. Fingers also received contact and exposures from punctures and glove leaks; double gloving has been reported to reduce the incidence.

N6	JOBCLASS	Finger	Hand	NMemb	Face	Neck	Leg/F	Total
		1	2	3	4	6	7	
1	Surgeon	6	0	4	17	0	1	28
2	Scrub	0	0	0	1	0	0	1
3	Circulator	1	0	0	0	0	0	1
4	Anesthesia	1	1	0	2	1	0	5
	Total	8	1	4	20	1	1	35

12. For OMF/ENT CASES ONLY, jobclass and location also show that fingers and facial contacts and exposures were important. More than half of all contacts and exposures were important. More than half of all contacts and exposures occurred on orthopedic and OMF/ENT cases, so focusing prevention methods on these services may be effective.

N6	JOBCLASS	Finger	Hand	NMemb	Face	Arm	Body	Total
		1	2	3	4	5	8	
1	Surgeon	1	0	1	10	1	1	15
2	Scrub	4	1	0	0	0	0	5
3	Circulator	0	1	0	0	0	0	1
4	Anesthesia	0	0	0	1	0	0	1
6	Med Student	1	0	0	0	0	1	2
	Total	6	2	2	11	1	2	24

13. Patient exposure to blood of punctured personnel was only reported once at VGH. In US studies, patient exposure was reported to occur after 11-29 of personnel punctures, most commonly involving punctures during suture or orthopedic pin and wire placement. This provides another reason to prevent surgeon and personnel punctures.

N11	PATIENT	Freq	Percent
1	No	100	99.0%
2	Yes	1	1.0%
	Total	101	100.0%

14. The second phase of the Collaborative Operative Blood Exposure (COBEI) study in the US showed that surgical teams were able to reduce the frequency of blood exposures significantly once they were aware of the patterns of exposures and contacts at their own

facility.

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