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Direct Cost of Follow-up for Percutaneous and Mucocutaneous Exposures to At-Risk Body Fluids: *Data From Two Hospitals*

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THE INTERNATIONAL HEALTH CARE WORKER Safety Center has received many requests for information on the cost of needlestick injuries and other occupational blood exposures. Hospitals participating in the EPINet data-sharing network do not routinely forward cost information to us; therefore, cost data recorded in the Center's research databases are limited and until now we have declined to publish it. But because of the continuing demand for this information and a lack of new and better data, we have compiled a brief report in hopes that it will contribute a realistic, if imperfect, picture of direct costs of post-exposure follow-up.

A section on the EPINet report forms is provided for recording post-exposure follow-up charges. The data fields on the forms are broken down into four categories, including: (1) lab charges for blood tests; (2) charges for treatments such as hepatitis B immunoglobulin, hepatitis B vaccine, chemoprophylactic drugs for HIV, and tetanus vaccine; (3) service charges for emergency department or employee health department visits or other services; and (4) other costs such as surgery or any costs not falling into another category. We selected two hospitals, out of approximately 70 hospitals in the EPINet data-sharing network, that provide complete information in the cost fields and forward the information to the Center. Both hospitals are large, exceeding 450 occupied beds. Hospital A is a community hospital in a high-HIV

prevalence region, while hospital B is a teaching hospital in a low-HIV prevalence region. In this report we present cost data from these two hospitals between June 1, 1995 and May 31, 1997. This time period was chosen to reflect the most current costs and also to capture differences in treatment costs that might be attributed to the new chemoprophylaxis regimens recommended by the Centers for Disease Control and Prevention (CDC) for HIV-exposed health care workers in June 1996.

These data have several limitations. First, there were no standardized definitions for what constituted a charge or a cost. For instance, hospital B recorded only direct charges to the employee health department, while hospital A added an across-the-board estimate of the cost of lost time for the exposed worker. Also, charges to departments other than the employee health department may not be accounted for in data recorded on the EPINet form. We have not adjusted the data from the two hospitals to redress these limitations or to improve comparability. Second, the data do not provide a breakdown of specific tests performed or treatments provided, so the impact of specific cost components cannot be evaluated. Third, these data do not include any indirect costs or the cost of occupational infections, both of which may be significant. Fourth, the hospitals included in this report may not be representative of other hospitals.

The following tables show cost comparisons of the two hospitals for the time

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period before and after the implementation of post-exposure chemoprophylaxis guidelines, and for cases of percutaneous injury and mucocutaneous exposure with different characteristics that might impact upon cost of follow-up.

Although the total direct cost of follow-up was similar in the two hospitals, there were considerable differences between the hospitals in the cost of laboratory tests and in service charges. Another important difference, as noted previously, was that hospital A added a cost component for the lost work time of the exposed employees which accounted for about one-third of the total recorded cost. A similar amount of time may have been lost by employees in hospital B, but that cost was not accounted for.

The comparison of costs before and after the implementation of post-exposure chemoprophylaxis showed little cost impact of the new policy in these two institutions, despite the fact that hospital A is a high HIV-prevalence region. One circumstance resulting in higher cost, but only in hospital B, was if an exposure involved an unknown source patient. Cost comparisons were also carried out to determine if injuries to employees in different job classifications or if injuries from different types of devices resulted in different follow-up costs, but these comparisons yielded no remarkable differences.

In summary, the ways in which these two hospitals accounted for direct costs of post-exposure follow-up differed greatly. Further studies of these costs will need to clearly identify the full spectrum of cost parameters and develop standard definitions for each parameter in order to make direct comparisons among hospitals and to develop more accurate extrapolations of the global cost impact of health care workers' occupational exposures to bloodborne pathogens. □

Table 1. Average and Range of Direct Cost of Percutaneous Injuries and Mucocutaneous Exposures in Two Hospitals, June 1, 1995–May 31, 1997

	percutaneous injuries	mucocutaneous exposures
Hospital A	cases = 345	cases = 114
average	\$672	\$660
range	\$340 - \$1,025	\$265 - \$975
Hospital B	cases = 594	cases = 334
average	\$539	\$546
range	\$197 - \$1,094	\$0.0 - \$1,232

NOTE: Numbers in all tables have been rounded to the nearest dollar.

Table 2. Average Direct Cost of Percutaneous Injuries in Two Hospitals, During Two Time Periods

	June 1, 1995– May 31, 1996	June 1, 1996– May 31, 1997
Hospital A	cases = 185	cases = 160
lab tests	\$163	\$161
treatment	\$ 14	\$ 19
service	\$245	\$242
other	\$250	\$249
TOTAL	\$672	\$671
Hospital B	cases = 311	cases = 283
lab tests	\$525	\$523
treatment	\$ 3	\$ 6
service	\$ 9	\$ 11
other	\$ 0	\$ 0
TOTAL	\$537	\$540

Table 3. Average Direct Cost of Percutaneous Injuries in Two Hospitals for Cases in Which the Source Patient was Known vs. Cases in Which the Source Patient was Unknown, June 1, 1995–May 31, 1997

	source known	source unknown
Hospital A	cases = 329	cases = 16
lab tests	\$164	\$129
treatment	\$ 17	\$ 11
service	\$243	\$277
other	\$249	\$250
TOTAL	\$673	\$667
Hospital B	cases = 501	cases = 93
lab tests	\$515	\$574
treatment	\$ 2	\$ 21
service	\$ 10	\$ 10
other	\$ 0	\$ 0
TOTAL	\$527	\$605

Table 4. Average Direct Cost of Percutaneous Injuries in Two Hospitals for High-Risk Injuries* vs. Low-Risk Injuries

	<u>high-risk injuries</u>	<u>low-risk injuries</u>
Hospital A	cases = 157	cases = 188
lab tests	\$167	\$159
treatment	\$ 20	\$ 13
service	\$254	\$236
other	\$250	\$249
TOTAL	\$691	\$657
Hospital B	cases = 81	cases = 513
lab tests	\$520	\$525
treatment	\$ 0	\$ 5
service	\$ 12	\$ 10
other	\$ 0	\$ 0
TOTAL	\$532	\$540

*Note: "High-risk injuries" were defined as injuries caused by needles that had been used to draw blood or to establish intravenous access; all other injuries were classified as low risk.

Table 5. Average Direct Cost of Mucocutaneous Exposures in Two Hospitals During Two Time Periods

	<u>June 1, 1995- May 31, 1996</u>	<u>June 1, 1996- May 31, 1997</u>
Hospital A	cases = 63	cases = 51
lab tests	\$160	\$154
treatment	\$ 17	\$ 10
service	\$245	\$235
other	\$250	\$250
TOTAL	\$672	\$649
Hospital B	cases = 173	cases = 161
lab tests	\$530	\$523
treatment	\$ 2	\$ 12
service	\$ 9	\$ 17
other	\$ 0	\$ 0
TOTAL	\$541	\$552

Table 6. Charges for Specific Items in Follow-up Protocol in Hospital A and Hospital B

Hospital A		Hospital B	
Laboratory:	Employee HBsAb \$ 15	Laboratory:	Employee hepatitis profile* \$141
	Employee HIV antibody panel (ELISA) \$ 25		Employee HIV antibody panel (ELISA) \$ 56
	Source HBsAg \$ 15		Employee HCV panel \$ 56
	Source HIV antibody panel (ELISA) \$ 25		Source hepatitis profile* \$141
	(between June 1, 1995 - May 31, 1997 no HCV tests were performed)		Source HIV antibody panel (ELISA) \$ 56
Treatment:	HBIG \$100		Source HCV panel \$ 56
	HBV vaccine (3 doses + blood tests) \$150		*(HBsAg, anti-HBs, anti-HBc)
	Tetanus \$ 10	Treatment:	HBV vaccine (3 doses) \$127
	AZT + 3TC ± IDV (4 wk. supply) \$650		Gamma globulin (5cc) \$ 8
Service:	Emergency Department visit \$ 85		AZT + 3TC ± IDV (4 wk. supply) \$598
	Employee Health visit (simple) \$ 50		Tetanus \$ 2
	Employee Health visit (moderate) \$150		HBIG (5 doses) \$465
	Employee Health visit (extensive) \$250	Service:	Emergency Department visit \$ 40
Other:	Employee time \$250		Employee Health visit \$ 60
		Other:	HBV booster \$ 30

Note: The costs cited above were in effect between June 1, 1995 - May 31, 1997