

Cost Effectiveness of Routine Opt-Out Rapid HIV Screening in the Emergency Department: Results from an Ongoing Prospective Clinical Trial

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BACKGROUND

Undiagnosed HIV infection in the United States continues to significantly contribute to its forward transmission.

The revised CDC recommendations for HIV testing in healthcare settings call for increasing opportunities for identifying undiagnosed HIV infection by performing routine opt-out rapid HIV screening.

Cost effectiveness is critical when considering potential clinical venues for performing routine HIV screening, such as emergency departments (EDs).

OBJECTIVE

The objective of this study was to compare the cost effectiveness of performing routine opt-out rapid HIV screening with physician-directed diagnostic testing in an urban ED.

METHODS

This was a cohort study nested in a prospective controlled clinical trial in the ED at Denver Health Medical Center (DHMC) in Denver, Colorado. DHMC is an urban, inner-city hospital with an annual adult ED census of 55,000.

Routine opt-out rapid HIV screening (intervention) and physician-directed diagnostic rapid HIV testing (control) were alternated in four-month time periods.

During intervention periods, all ED patients (≥16 years) are offered rapid HIV testing on an opt-out basis. During control periods, physicians used a diagnostic approach to offer rapid HIV testing. Each method was fully integrated into ED operations (Figure).

Direct program costs were determined using the perspective of the payer.

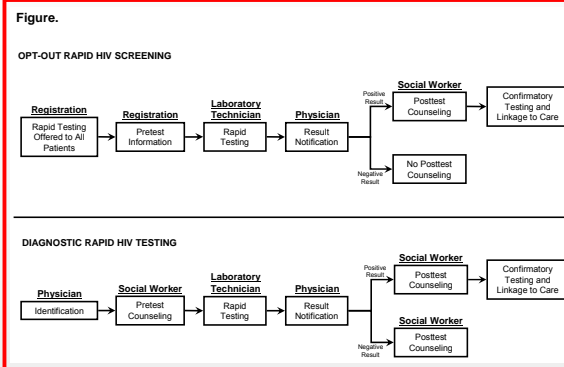


Table 1. Annual program costs for routine opt-out rapid HIV screening and physician-directed diagnostic rapid HIV testing in an urban emergency department (ED).

Cost Variable	Unit Cost (U.S. Dollars)	Routine Opt-Out Screening (Intervention)		Physician-Directed Diagnostic Testing (Control)	
		Number of Units	Cost (U.S. Dollars)	Number of Units	Cost (U.S. Dollars)
Startup					
Computer software	N/A	N/A	\$1,844.00	N/A	\$0.00
ED and laboratory staff training	N/A	N/A	\$7,687.31	N/A	\$1,694.19
Personnel					
ED and laboratory staff time	N/A	N/A	\$23,085.64	N/A	\$9,788.59
Administrative staff time	N/A	N/A	\$31,272.80	N/A	\$15,636.40
Test Kit					
Uni-Gold rapid test	\$10.00	7,872	\$78,717.58	254	\$2,541.85
Orapack rapid test	\$11.60	24	\$276.13	0	\$0.00
Multipos rapid test	\$31.00	8	\$246.00	0	\$0.00
Confirmatory WB test	\$110.00	15	\$1,657.00	5	\$499.93
Supplies and Equipment					
Blood draw supplies					
Entire blood draw kit	\$1.05	2,838	\$2,980.33	254	\$266.89
Blood tube only	\$0.06	5,034	\$302.06	0	\$0.00
Other supplies and printing					
Opt-out consent form	\$0.08	43,467	\$3,477.34	N/A	\$0.00
Patient information sheet	\$0.002	43,467	\$86.93	254	\$0.51
Targeted testing consent form	\$0.002	N/A	\$0.00	254	\$0.51
TOTAL			\$151,652.63		\$30,418.87

Table 2. Cost effectiveness ratios (CERs) and incremental cost effectiveness ratios (ICERs) for routine opt-out rapid HIV screening and physician-directed diagnostic rapid HIV testing by the number of total, new, and repeat HIV diagnoses.

Program	Total Cost [C]	Health Effect [E]	Average CER [C/E]	Incremental Cost [ΔC]	Incremental Effect [ΔE]	ICER [ΔC/ΔE]
Total HIV Diagnoses						
Diagnostic HIV Testing	\$30,419	4.54	\$6,693.07	\$30,418.87	4.54	\$6,693.07
Routine Opt-Out HIV Screening	\$151,653	21.25	\$7,135.34	\$121,233.77	16.71	\$7,255.63
New HIV Diagnoses						
Diagnostic HIV Testing	\$30,419	3.03	\$10,052.46	\$30,418.87	3.03	\$10,052.46
Routine Opt-Out HIV Screening	\$151,653	8.66	\$17,541.01	\$121,233.77	5.63	\$21,522.36
Repeat HIV Diagnoses						
Diagnostic HIV Testing	\$30,419	1.50	\$20,282.04	\$30,418.87	1.50	\$20,282.04
Routine Opt-Out HIV Screening	\$151,653	12.14	\$12,487.46	\$121,233.77	10.64	\$11,389.23

METHODS (Cont.)

Program costs included startup, personnel, test kits, and supplies and equipment costs.

Time motion methodology was used to estimate costs related to the performance of all personnel activities related to each testing method. Patients diagnosed with HIV infection served as this study's outcome.

RESULTS

From April 2007 through August 2008 two intervention and two control periods were completed.

During the control period, 29,171 eligible patients presented to the ED and 166 (0.6%) completed testing. Of these, 3 (1.8%) were diagnosed with HIV infection.

During the intervention period, 30,281 eligible patients presented to the ED and 5,377 (18%) completed rapid HIV testing. Of these, 14 (0.3%) were diagnosed with HIV infection.

Total annual costs for opt-out HIV screening were \$151,653, whereas total annual costs for diagnostic HIV testing were \$30,419 (Table 1).

The average annual costs per new HIV diagnosis for both testing methods were \$17,541 and \$10,052, respectively (Table 2).

CONCLUSIONS

Diagnostic rapid HIV testing is more cost effective than routine opt-out rapid HIV screening in the ED.

More effective and or less costly testing strategies are required to improve identification of patients with undiagnosed HIV infection.

Differences in the lifetime medical costs and transmissions averted between the two arms may impact the cost effectiveness.

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