Implementation of 4th Generation HIV Screening in the Emergency Department

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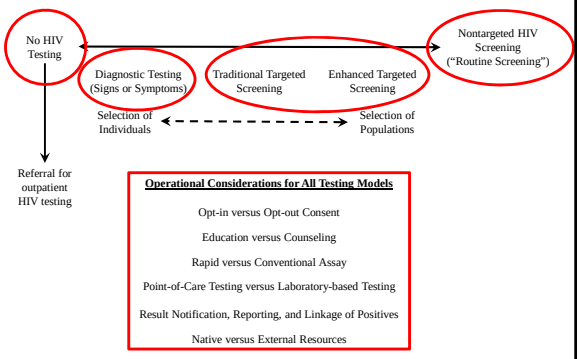
Figure. Conceptual model for performing HIV testing in emergency departments.



Adapted from Rothman et al. *Acad Emerg Med* 2007;14:653-657.

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Table Peer-reviewed studies (N=18) reporting effectiveness of nontargeted HIV screening in emergency departments since 2006, stratified by consent method.

Authors	Year Published	Setting*	External Staff	Eligible Patients† N	Offered Testing N_1	Offered Testing %	Patients Tested N_2	Patients Tested %	Confirmed Positive N_3	Confirmed Positive %
Opt-in Consent										
Silva et al.[24]	2007	U, I	Y	3,030	NR	-	1,428	47%	8	0.56%
Mehta et al.[25]	2007	U, A, I	Y	NR	2,924	-	1,428	-	8	0.56%
Walensky et al.[26]	2008	U, A	Y	2,356	1,397	59%	854	36%	5	0.59%
White et al.[27]	2009	U, A, I	N	118,324	45,159	38%	7,923	7%	55	0.69%
White et al.[28]**	2011	U, A, I	N	23,236	6,479	28%	4,053	17%	8	0.20%§
d'Almeida et al.[29]	2011	MI	N	78,411	20,962	27%	12,754	16%	18	0.14%§
Wilbur L et al.[30]	2011	U, A, I	Y	5,794	1,484	26%	1,121	19%	5	0.45%
Casalino et al.[31]	2012	MI	N	183,957	11,401	6%	7,215	4%	40	0.55%§
Haukoos et al.[32]**	2012	U, A, I	N	5,985	5,781	97%	389	6%	0	0%
Hack et al.[33]	2013	U, A, P	Y	2,645	300	11%	224	8%	0	0%
Haukoos et al.[34]	2013	U, A, I	N	29,510	19,634	67%	3,591	12%	7	0.20%§
Lyons et al.[35]	2013	U, A, I	Y	5,501	4,692	85%	1,911	35%	6	0.31%§
Median						**33%**		**16%**		**0.20%§**
Range						**6% - 97%**		**4% - 47%**		**0.14% - 0.55%§**
Opt-out Consent										
Brown et al.[36]	2007	U, A, I	Y	13,240	4,187	32%	2,486	19%	9	0.36%
Haukoos et al.[37]	2010	U, A, I	N	28,043	NR	-	6,933	25%	15	0.22%§
Sattin et al.[38]¶	2011	U, A, I	Y	13,035	9,343	72%	8,504	65%	35	0.41%
Wheatley et al.[39]	2011	U, A	Y	NR	8,922	-	7,616	-	129	1.7%
White et al.[28]**	2011	U, A, I	N	26,757	20,280	76%	4,679	18%	21	0.45%§
Hoxhaj et al.[40]	2011	U, A, I	N	24,686	NR	-	14,093	57%	80	0.57%§
Haukoos et al.[32]**	2012	U, A, I	N	6,842	6,602	97%	886	13%	2	0.23%§
Geren et al.[21]	2014	U, A, I	N	71,556	55,500	78%	27,952	39%	78	0.28
Median						**76%**		**25%**		**0.34§**
Range						**32% - 97%**		**13% - 65%**		**0.22% - 0.57%§**

Abbreviations: NR = not reported.
* Setting: U = urban; A = academic; I = Level 1 trauma center; MI = multiple institutions; P = pediatric-only.
† Eligibility varied by study.
§ Specifically indicates new HIV diagnoses.
¶ Reports more complete results that overlap with a prior publication (Freeman AE et al. Acceptance of rapid HIV screening in a southeastern emergency department. Acad Emerg Med 2009;16:1156-1164).
**Reported in the same study.

Haukoos et al. *Ann Emerg Med* 2014 (In Press)

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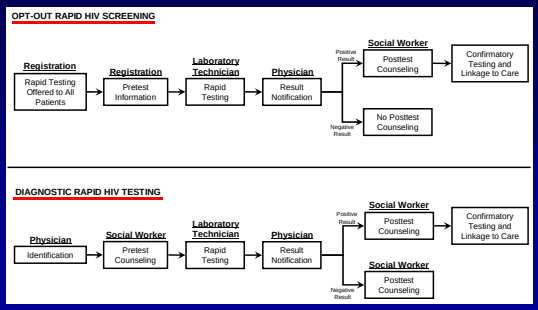
Methods: Operational Schema



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HIV Screening Methods:
The Denver Model

- Full integration
- Various forms of screening
- Whole blood drawn by nurses or techs
- Central hospital laboratory with 30 min turnaround
- Electronic medical record with clinical staff providing results
- Linkage to care by social workers

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Table. Fourth-generation HIV testing, confirmed HIV prevalence, and acute HIV infection prevalence among four urban emergency departments.

Site	Date range	4th generation assay type*	Total tests performed N	Confirmed HIV positive N_1 (%)	Acute HIV infections† N_2 (%)
Alameda Health System, Highland Hospital, Oakland, CA	January, 2014 – April, 2014	Architect® HIV Ag/Ab Combo	1,930	23 (1.2)	2 (0.09)
Denver Health Medical Center, Denver, CO	April, 2014 – June, 2014	Determine™ HIV-1/2 Ag/Ab Combo	1,985	11 (0.6)	0 (0)
Johns Hopkins Hospital, Baltimore, MD	July, 2013 – May, 2014	Architect® HIV Ag/Ab Combo	6,991	25 (0.4)	2 (0.03)
Maricopa Integrated Health System, Maricopa Medical Center, Phoenix, AZ [23]	July, 2011 – January, 2014	Architect® HIV Ag/Ab Combo	27,952	78 (0.3)	18 (0.06)
Total			38,858	137 (0.4)	22 (0.06)

*Testing algorithms: Highland Hospital – Architect® HIV Ag/Ab Combo, followed by Western blot and viral load; Denver Health Medical Center – Determine™ HIV-1/2 Ag/Ab Combo, followed by viral load; Johns Hopkins Hospital - Architect® HIV Ag/Ab Combo, followed by Bio-Rad Multispot HIV-1/HIV-2 Rapid Test and viral load.
†Acute HIV infection defined serologically as antigen positive, antibody negative, and detectable virus.

Haukoos et al. *Ann Emerg Med* 2014 (In Press)

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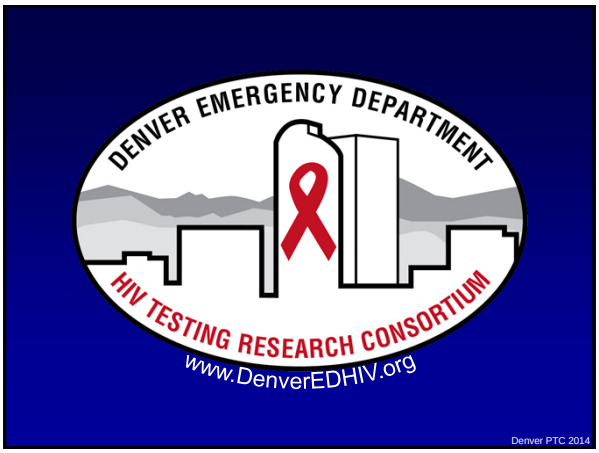
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