Implementation of 4th Generation HIV Screening in the Emergency Department

Denver PTC 2014

Denver Emergency Department HIV Research Consortium

Denver Health

Denver Public Health

The Children’s Hospital

Colorado Department of Public Health and Environment

University of Colorado

Jason S. Haukoos, MD, MSc
Professor, Emergency Medicine & Epidemiology
Director, Denver ED HIV Research Consortium
Denver Health Medical Center
University of Colorado School of Medicine
Colorado School of Public Health
Denver, Colorado

No HIV Testing

Nontargeted HIV Screening ("Routine Screening")

Referral for outpatient HIV testing

Traditional Targeted Screening (Diagnostic Testing)

Selection of Individuals

Enhanced Targeted Screening

Selection of Populations

Operational Considerations for All Testing Models

Opt-in versus Opt-out Consent

Education versus Counseling

Rapid versus Conventional Assay

Point-of-Care Testing versus Laboratory-based Testing

Result Notification, Reporting, and Linkage of Positives

Native versus External Resources

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

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

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year Published</th>
<th>Setting</th>
<th>External Staff</th>
<th>Eligible Patients †</th>
<th>Offered Testing Patients Tested</th>
<th>Confirmed Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silva et al.</td>
<td>2007</td>
<td>U, I</td>
<td>Y</td>
<td>3,030</td>
<td>NR</td>
<td>-</td>
</tr>
<tr>
<td>Mehta et al.</td>
<td>2007</td>
<td>U, A, I</td>
<td>Y</td>
<td>NR</td>
<td>2,924</td>
<td>-</td>
</tr>
<tr>
<td>Walensky et al.</td>
<td>2008</td>
<td>U, A</td>
<td>Y</td>
<td>2,356</td>
<td>1,397</td>
<td>59%</td>
</tr>
<tr>
<td>White et al.</td>
<td>2009</td>
<td>U, A, I</td>
<td>N</td>
<td>118,324</td>
<td>45,159</td>
<td>38%</td>
</tr>
<tr>
<td>White et al.</td>
<td>2011</td>
<td>U, A, I</td>
<td>N</td>
<td>23,236</td>
<td>6,479</td>
<td>28%</td>
</tr>
<tr>
<td>d’Almeida et al.</td>
<td>2011</td>
<td>MI</td>
<td>N</td>
<td>78,411</td>
<td>20,962</td>
<td>27%</td>
</tr>
<tr>
<td>Wilbur L et al.</td>
<td>2011</td>
<td>U, A, I</td>
<td>Y</td>
<td>5,794</td>
<td>1,484</td>
<td>26%</td>
</tr>
<tr>
<td>Casalino et al.</td>
<td>2012</td>
<td>MI</td>
<td>N</td>
<td>183,957</td>
<td>11,401</td>
<td>6%</td>
</tr>
<tr>
<td>Haukoos et al.</td>
<td>2010</td>
<td>U, A, I</td>
<td>N</td>
<td>28,043</td>
<td>NR</td>
<td>-</td>
</tr>
<tr>
<td>Sattin et al.</td>
<td>2011</td>
<td>U, A, I</td>
<td>Y</td>
<td>13,035</td>
<td>9,343</td>
<td>72%</td>
</tr>
<tr>
<td>Wheatley et al.</td>
<td>2011</td>
<td>U, A</td>
<td>Y</td>
<td>NR</td>
<td>8,922</td>
<td>-</td>
</tr>
<tr>
<td>White et al.</td>
<td>2011</td>
<td>U, A, I</td>
<td>N</td>
<td>26,757</td>
<td>20,280</td>
<td>76%</td>
</tr>
<tr>
<td>Hoxhaj et al.</td>
<td>2011</td>
<td>U, A, I</td>
<td>N</td>
<td>24,686</td>
<td>NR</td>
<td>-</td>
</tr>
<tr>
<td>Haukoos et al.</td>
<td>2012</td>
<td>U, A, I</td>
<td>N</td>
<td>6,842</td>
<td>6,602</td>
<td>97%</td>
</tr>
<tr>
<td>Geren et al.</td>
<td>2014</td>
<td>U, A, I</td>
<td>N</td>
<td>71,556</td>
<td>55,500</td>
<td>78%</td>
</tr>
</tbody>
</table>

Median

33%  16%  0.20% §

Range

6% - 97%  4% - 47% 0.14% - 0.55% §

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.

Adapted from Rothman et al. Acad Emerg Med 2007;14:653-657.
OPT-OUT RAPID HIV SCREENING

Rapid Testing Offered to All Patients

Pretest Information

Confirmatory Testing and Linkage to Care

Posttest Counseling

Rapid Testing Positive Result

Negative Result

No Posttest Counseling

Registration

Social Worker

Identifying

Pretest Counseling

Confirmatory Testing and Linkage to Care

Posttest Counseling

Rapid Testing

DIAGNOSTIC RAPID HIV TESTING

Laboratory Technician

Social Worker

Physician

Result Notification

Positive Result

Negative Result

Laboratory Technician

Denver PTC 2014

Methods: Operational Schema

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

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Date range</th>
<th>4th generation assay type*</th>
<th>Total tests performed</th>
<th>Confirmed HIV positive (%)</th>
<th>Acute HIV infections† (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda Health System, Highland Hospital, Highland, CA</td>
<td>January, 2014 – April, 2014</td>
<td>Architect® HIV Ag/Ab Combo</td>
<td>1,930</td>
<td>23 (1.2)</td>
<td>2 (0.10)</td>
</tr>
<tr>
<td>Denver Health Medical Center, Denver, CO</td>
<td>April, 2014 – June, 2014</td>
<td>Determine HIV-1/2 Ag/Ab Combo</td>
<td>1,985</td>
<td>11 (0.6)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Johns Hopkins Hospital, Baltimore, MD</td>
<td>July, 2013 – May, 2014</td>
<td>Architect® HIV Ag/Ab Combo</td>
<td>6,991</td>
<td>25 (0.4)</td>
<td>2 (0.03)</td>
</tr>
<tr>
<td>Maricopa Integrated Health System, Maricopa Medical Center, Phoenix, AZ</td>
<td>July, 2011 – January, 2014</td>
<td>Architect® HIV Ag/Ab Combo</td>
<td>27,952</td>
<td>78 (0.3)</td>
<td>18 (0.06)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>38,858</td>
<td>137 (0.4)</td>
<td>22 (0.06)</td>
</tr>
</tbody>
</table>

*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.
