Linkage to care and initiating ART after diagnosis with acute or established HIV infection in 8 US emergency departments

Thomas P. Giordano (Presenter), Baylor College of Medicine, Houston, TX
Siavash Pasalar, Harris Health System, Houston, TX*
Daniel Feaster, University of Miami, Miami, FL
Nancy Glick, Sinai Health Systems, Chicago, IL*
Kathleen Jacobson, University of Southern California, Los Angeles, CA
Douglas White, Alameda Health System, Oakland, CA*
Beverly Sha, Rush University Medical Center, Chicago, IL*
Priya Mammen, Thomas Jefferson University Hospitals, Philadelphia, PA*
Lisa Moreno-Walton, Louisiana State Univ. Health Science Center, New Orleans, LA*
Bernie Branson, Scientific Affairs, LLC

* Sites contributing clinical data

12th International Conference on HIV Treatment and Prevention Adherence
Miami, FL
June 4-6, 2017
Conflict of Interest Disclosure

Funding for the some of the HIV testing was provided by Gilead, Inc. and the US Centers for Disease Control and Prevention via grants and contracts to the institutions involved in this project.

None of the other authors has additional conflicts of interest to report.
Background

- HIV testing algorithms based on 4\textsuperscript{th} generation assays are optimized to detect acute HIV infection (AHI) in addition to established HIV infection (EHI)
- Linkage rates following new diagnosis in ED have been variable
  - San Francisco: rapid testing in 2008-09, 31 new dx, >95\% linked in median 3.5 d (Christopoulos, JAIDS 2013 62(2):e30-8)
  - Birmingham: rapid testing in 2011-13, 252 new dx, 76\% linkage in unspecified time (Galbraith Public Health Reports 2016 131(Suppl 1):96-106)
  - Baltimore: mix of rapid (62\%) and routine (38\%) testing, 29 new diagnoses, 93\% linked in unspecified time (Signer, Public Health Rep 2016 131(Suppl 1):82-9)
  - Chicago: 4\textsuperscript{th} gen assay 2012-14, 129 newly diagnosed, half in ED, 77\% linked in 90 d (Rucker Public Health Rep 2016 131(Suppl 1):121-9)
  - Systematic review: overall linkage rate of 74\%, but is a mix of acute and chronic, rapid and standard, and targeted and routine testing strategies (Menon, Acad Emerg Med 2016 23(7):835-42)
- Rates of linkage to care and initiation of ART for broad sample of persons diagnosed with AHI and EHI after ED screening with routine 4\textsuperscript{th} generation tests are unknown

Giordano TP, Continuum of care after diagnosis in ED, abstract 318, 12\textsuperscript{th} Adherence Conference, Miami, 2017
Objectives

• To determine continuum of care outcomes after diagnosis of HIV infection in the ED
• To compare continuum of care outcomes among persons diagnosed with acute HIV infection (AHI) and established HIV infection (EHI)
Methods

• Retrospective data from 8 EDs from 6 health systems in 5 US cities that initiated routine HIV screening with a 4th generation antigen-antibody immunoassay between November 2012 and July 2015—Chicago, IL (2 EDs in 2 systems); Houston, TX (2 EDs in 1 system); New Orleans, LA; Oakland, CA; Philadelphia, PA (2 EDs in 1 system)

• Supplemental testing was performed using an HIV-1&2 antibody differentiation assay when the screening test was positive

• HIV RNA nucleic acid amplification tests (NAAT) were performed when the screen was positive but the differentiation assay was negative

• Established HIV infection (EHI) was defined as positive immunoassay and a positive differentiation test

• Acute HIV infection (AHI) was defined as a positive immunoassay, negative differentiation test, and positive NAAT

• Data abstracted from paper and electronic records onto a standardized data abstraction form
Primary Outcomes and Analysis

- Dates to linkage to care, initiation of ART, and first HIV RNA VL<200 c/mL were recorded from medical records
- Linkage to care: completed visit with a provider outside the ED who can prescribe ART
- Initiation of ART: date of prescription of ART
- Viral load suppression: VL<200 c/mL
- Calculated differences in demographic characteristics and outcomes with Chi-squared testing
Results

• 159,102 tests performed
• 605 persons newly diagnosed with HIV (0.38%)
  – 507 had EHI
  – 98 (16.2% of new diagnoses; 95% CI 13.3%, 19.1%) had AHI
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>AHI n=98, %</th>
<th>EHI n=507, %</th>
<th>Total n=605, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>71.4</td>
<td>64.3</td>
<td>65.5</td>
</tr>
<tr>
<td>Female</td>
<td>28.6</td>
<td>35.7</td>
<td>34.5</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>17.3</td>
<td>16.8</td>
<td>16.9</td>
</tr>
<tr>
<td>Black</td>
<td>63.3</td>
<td>64.5</td>
<td>64.3</td>
</tr>
<tr>
<td>White</td>
<td>14.3</td>
<td>12.4</td>
<td>12.7</td>
</tr>
<tr>
<td>Other</td>
<td>5.1</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Age Category, years*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>29.6</td>
<td>14.6</td>
<td>17.0</td>
</tr>
<tr>
<td>25-34</td>
<td>33.7</td>
<td>32.5</td>
<td>32.7</td>
</tr>
<tr>
<td>35-44</td>
<td>17.3</td>
<td>23.5</td>
<td>22.5</td>
</tr>
<tr>
<td>45-54</td>
<td>14.3</td>
<td>18.9</td>
<td>18.2</td>
</tr>
<tr>
<td>55-64</td>
<td>4.1</td>
<td>8.1</td>
<td>7.4</td>
</tr>
<tr>
<td>65+</td>
<td>1.0</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Not Reported</td>
<td>0.0</td>
<td>1.0</td>
<td>0.8</td>
</tr>
</tbody>
</table>

*p < .020

Giordano TP, Continuum of care after diagnosis in ED, abstract 318, 12th Adherence Conference, Miami, 2017
Continuum of Care Outcomes

Giordano TP, Continuum of care after diagnosis in ED, abstract 318, 12th Adherence Conference, Miami, 2017
AHI vs. EHI: Linkage to Care

Giordano TP, Continuum of care after diagnosis in ED, abstract 318, 12th Adherence Conference, Miami, 2017
AHI vs. EHI: Prescribed ART

AHI vs. EHI: Prescribed ART

0 10 20 30 40 50 60 70 80 90 100
Percent

30 d * 42 21
90 d * 64 48
180 d * 67 52

AHI  EHI

*P<.01

Giordano TP, Continuum of care after diagnosis in ED, abstract 318, 12th Adherence Conference, Miami, 2017
AHI vs. EHI: VL < 200

Percent

AHI vs. EHI: VL < 200

30 d  90 d*  180 d**

3  27  48

1  16

32

AHI  EHI

*P=.01,  **P<.01

Giordano TP, Continuum of care after diagnosis in ED, abstract 318, 12th Adherence Conference, Miami, 2017
Discussion

• Largest study to date reporting outcomes for AHI and EHI
• Linkage rate overall (60%) is lower than in previous studies and compared to most recent CDC data (75%, not restricted to ED)
  – Our data likely represent more universal and less targeted screening since all non-rapid testing
• AHI had higher linkage, possibly due to more symptomatic disease, more likely hospitalized, more attention from clinicians
  – 2 EDs had special protocols to rapidly link AHI to care
• If linked, most started ART, consistent with recommendations, and high proportion suppressed at 180 d
  – But overall, 35% suppressed at 6 m
• Detection of AHI in ED is possible and better outcomes achieved
Limitations

• Retrospective study of observational data
• Protocol for whom to test varied from site to site
• Not all sites confirmed “new diagnosis” status with public health data
• Data on hospitalization, which may have impacted continuum of care outcomes, were not available
• Data from external sites of post-diagnosis care not available, so estimates of outcomes are likely a lower bound
Conclusions

• Persons diagnosed with AHI in these 8 urban EDs have better and earlier linkage to care, ART prescription and VL suppression rates compared with persons newly diagnosed with established HIV infection.
• Lessons learned from successes in persons with AHI could be applied to persons newly diagnosed with established infection in EDs to improve linkage to care, initiation of ART and VL suppression.
Acknowledgements

**Additional Staff:**
- Vincent Adomolga (Thomas Jefferson University Hospitals, Philadelphia, PA)
- Bijou Hunt (Sinai Health Systems, Chicago, IL)
- Nancy Miertschin (Harris Health System, Houston, TX)
- Audra Tobin (Sinai Health Systems, Chicago, IL)
- Tamara Todorovic (Alameda Health System, Oakland, CA)

**Funding:**
- US CDC
- Gilead “Focus” Program