Using EHRs to Improve Cascades in Primary Care Settings

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OVERVIEW

- Cascades
- Electronic Health Records and HIV
- Overview of the Alliance of Chicago
- HIV EHRs
- Preview of future HER plans
CASCADES
CASCADES:
ENGAGEMENT IN CARE
Engagement in HIV Care and Treatment: USA

Gardner, et al., Clin Infect Dis 2011
Refocusing Engagement in Care and Treatment

Those not:

- HIV-diagnosed: 232,344
- Linked to HIV care: 450,858
- Retained in HIV care: 669,372
- Need ART: 756,778
- On ART: 844,183
- Adherent/
ELECTRONIC HEALTH RECORDS AND HIV CARE
RECOMMENDATIONS FOR ADVANCING ENGAGEMENT IN CARE

<table>
<thead>
<tr>
<th>Domain</th>
<th>Recommendation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance/evaluation</td>
<td>Develop integrated health informatics systems to collect real-time, actionable, patient-level surveillance of HIV testing and engagement in care activities.</td>
</tr>
<tr>
<td></td>
<td>Standardize national quality benchmarks for linkage and retention in care and hold agencies that provide HIV testing, prevention, treatment, and supportive service accountable for meeting minimum standards.</td>
</tr>
<tr>
<td>Information/education</td>
<td>Deploy educational and social marketing campaigns aimed at emphasizing the importance of HIV testing and engagement in care activities.</td>
</tr>
<tr>
<td>Resource allocation</td>
<td>Allocation of federal HIV funds for dissemination and implementation of cost-effective, integrated TLC+ programs.</td>
</tr>
<tr>
<td>TLC+ service delivery</td>
<td>Coordinate activities from funding agencies and service delivery organizations that provide HIV testing, prevention, medical and supportive services to facilitate integrated TLC+ programs.</td>
</tr>
<tr>
<td></td>
<td>Develop additional evidence-based individual- and systems-level interventions to improve linkage and retention in HIV care. Cost-effectiveness, dissemination, and implementation studies are notably lacking and are imperative to inform policy and practice decisions.</td>
</tr>
</tbody>
</table>

Mugavero, Norton, Saag. Clin Infect Dis 201
Estimates of differences between EHR- and paper-based practices for 27,207 adults in 46 clinics.

Composite standards:
- Diabetes care 35.1% higher at EHR sites (P<0.001)
- Outcomes 15.2% higher at EHR sites (P<0.005)

Use of EHRs may improve quality of care
Urban HIV outpt facility in Kampala, Uganda, implemented EMR

Compared 2,383 visits (from 100 pts; paper) to 34,957 visits (from 10,920 pts, EMR)

Decreased proportion of reporting errors from:

- OIs: 66% to 2%
- ART toxicity: 52% to 3.5%
- Reasons for ART interruption: 83% to 12.5%
- Reasons for ART switch: 94% to 0.9%

EMR well accepted by providers
EMR AND HIV HEALTH CARE

A Meta-analysis of EMR-clinical decision support

- 12 studies (10 SSA, 2 Caribbean)
- Improved ordering rates for CD4
- Reductions in data errors, missed appointments
- Reduction in missed CD4 results and patient wait time
- Increased time spent in direct pt care

- Barriers: technical infrastructure, power cuts, connectivity, computer literacy
- High quality evaluations needed

Oluch, et al., Int J Med Inform, 2012
PARTNERSHIPS
HISTORY AND MISSION OF COMMUNITY HEALTH CENTERS

- First funded by the Federal Government as part of the War on Poverty in the mid-1960s.
- Designed to provide accessible, affordable personal health care services for people living in medically underserved communities.
- Mission encompasses quality, access, and responsiveness to particular needs of the community served.
- Typical services include primary care (Including Pediatrics, Internal Medicine, OB/GYN, and Family Practice), dental, behavioral health, nutrition, case management and health education.
HEALTH CENTERS
WORKING INDEPENDENTLY

Health Center

Health Center

Health Center

Health Center

Health Center

Health Center

Health Center
A LEARNING COMMUNITY
CHC HEALTH INFORMATION NETWORKS

- Consortia of multiple health centers supported by HRSA
- Collaborate, share, and/or integrate key functions core operations such as clinical, fiscal, IT, managed care, and administration
UNIQUE ROLE
OF HEALTH CENTER NETWORKS

 å Improve health outcomes and support quality care through:
   ñ Development and adoption of electronic health record systems
   ñ Track quality measurement

 å Integrate clinical decision making and performance measures into a commercial EMR

 å Research and evaluation
INTEGRATION OF HIV CARE INTO PRIMARY CARE SETTINGS: LESSONS LEARNED

- Enables health system to test more, initiate more ART, reduce loss-to-follow-up and achieve greater geographic coverage.
  - Pfeiffer, et al., JAIDS, 2010 (Mozambique)

- May improve treatment outcomes by integrating evidence-based interventions for co-morbid mental health, substance use and neurocognitive disorders.
  - Eustache, et al., PLOS Medicine, 2013
### HIV Monitoring

#### HIV Management - Preventive Care Review

<table>
<thead>
<tr>
<th>Type of Screening</th>
<th>Last Screening</th>
<th>Protocol</th>
<th>Recommendation</th>
<th>Today/Excl</th>
<th>Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 Count</td>
<td>CD4: 596/cL (01/11/2012)</td>
<td>Every 4 months</td>
<td>Due</td>
<td></td>
<td>Add CD4</td>
</tr>
<tr>
<td>CD4 Percentile</td>
<td>CD4 %: 31.6 (01/11/2012)</td>
<td>Every 4 months</td>
<td>Due</td>
<td></td>
<td>Add CD4 %</td>
</tr>
<tr>
<td>Viral Load</td>
<td>VL: &lt;75 copies/mL (01/11/2012)</td>
<td>Every 4 months</td>
<td>Due</td>
<td></td>
<td>Add Viral Load</td>
</tr>
<tr>
<td>CBC with Differential</td>
<td>WBC: 4.7 X10^9/UL (01/11/2012)</td>
<td>Every 4 months</td>
<td>Due</td>
<td></td>
<td>Add CBC</td>
</tr>
<tr>
<td>Comprehensive Metabolic Panel</td>
<td>Na: 139 (01/11/2012)</td>
<td>Every 4 months</td>
<td>Due</td>
<td></td>
<td>Add CMP</td>
</tr>
<tr>
<td>Lipid Panel</td>
<td>Chol: 222 (01/11/2012)</td>
<td>Yearly</td>
<td>Protocol Satisfied</td>
<td>Add Lipid Panel</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis Screening</td>
<td>PPD Ind: 0 mm (06/09/2009)</td>
<td>Yearly</td>
<td>Protocol Satisfied</td>
<td>Add PPD</td>
<td></td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>Gon: Negative (08/27/2011 9:10:00 AM)</td>
<td>Yearly</td>
<td>Due</td>
<td>Add Gonorrhea</td>
<td></td>
</tr>
<tr>
<td>Chlamydia</td>
<td>Chlam: Negative (08/27/2011 9:10:00 AM)</td>
<td>Yearly</td>
<td>Due</td>
<td>Add Chlamydia</td>
<td></td>
</tr>
<tr>
<td>Syphilis (RPR)</td>
<td>Syph: Non Reactive (08/27/2011 9:10:00 AM)</td>
<td>Yearly</td>
<td>Due</td>
<td>Add Syphilis</td>
<td></td>
</tr>
</tbody>
</table>

**References:** [DHHS Guidelines - Adults/Adol](#), [DHHS Guidelines - Peds](#), [Plagisguidelines.org (FY Dept of Health): Primary Care Approach](#)
## MONITORING (CONTINUED)

<table>
<thead>
<tr>
<th>Type of Screening</th>
<th>Last Screening</th>
<th>Protocol</th>
<th>Recommendation</th>
<th>Today/Excl</th>
<th>add</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal Vaccine</td>
<td>#1: 05/21/2007</td>
<td>Two doses (#1 &amp; booster) OR exclusion yearly</td>
<td>Due</td>
<td>Add Pneumovax</td>
<td></td>
</tr>
<tr>
<td>Influenza Vaccine</td>
<td>#1: given (11/30/2010) #2: given (10/10/2009)</td>
<td>Vaccine yearly OR exclusion yearly</td>
<td>Protocol Satisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>Ab: Positive (07/03/2010) #1: #2: #3:</td>
<td>Hep A total antibody yearly OR Hep A vaccine #1 &amp; #2 OR exclusion yearly</td>
<td>Protocol Satisfied</td>
<td>Add Hep A Ab</td>
<td>Add Hep A Vacx</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Ab: 9.95 (07/28/2010) #1: #2: #3:</td>
<td>Hep B antibody yearly OR Hep B vaccine #1, #2 &amp; #3 OR exclusion yearly</td>
<td>Due</td>
<td>Add Hep B Ab</td>
<td>Add Hep B Vacx</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>HCAB: Negative (02/09/2007)</td>
<td>Hep C antibody yearly OR exclusion yearly</td>
<td>Due</td>
<td>Add Hep C Ab</td>
<td></td>
</tr>
<tr>
<td>Toxoplasmosis</td>
<td>Toxo IgG: Negative (02/09/2007)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add Toxo IgG</td>
<td></td>
</tr>
<tr>
<td>Anal Pap Smear</td>
<td>Anal Pap:</td>
<td>Yearly</td>
<td>Due</td>
<td>Add Anal Pap</td>
<td></td>
</tr>
<tr>
<td>Cervical Pap Smear</td>
<td>Cerv Pap:</td>
<td>Yearly, for females age 21+</td>
<td>Protocol does not apply to patient.</td>
<td>Add Cerv Pap</td>
<td></td>
</tr>
<tr>
<td>Ophthalmologic Exam</td>
<td>Exam Date:</td>
<td>Yearly</td>
<td>Due</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental Exam</td>
<td>Exam Date: 04/11/2012</td>
<td>Yearly</td>
<td>Protocol Satisfied</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References:  [DHHS Guidelines - Adults/Adol](#), [DHHS Guidelines - Peds](#), [nyguidelines.org (NY Dept of Health): Primary Care Approach](#)
IMPLEMENTING PERFORMANCE IMPROVEMENT
### POINT OF CARE REMINDER

<table>
<thead>
<tr>
<th>TEST</th>
<th>PROTOCOL</th>
<th>LAST TEST</th>
<th>RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 Count</td>
<td>Every 3 Months</td>
<td></td>
<td>CD4 Count Due Today</td>
</tr>
<tr>
<td>Viral Load</td>
<td>Every 3 Months</td>
<td></td>
<td>Viral Load Due Today</td>
</tr>
<tr>
<td>HDL</td>
<td>Yearly</td>
<td>66 (11/22/2004)</td>
<td>HDL Due Today</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>Yearly</td>
<td>216 (11/22/2004)</td>
<td>Triglyceride Due Today</td>
</tr>
</tbody>
</table>

**Update Flowsheet** **Add Orders** **Add Problems**

Prev Form (Ctrl+PgUp)  Next Form (Ctrl+PgDn)
RESULTS

% With CD4+ Test > 90 Days Apart

- Aug-10: 71.6%
- Sep-10: 71.9%
- Oct-10: 71.9%
- Nov-10: 74.4%
- Dec-10: 77.2%
- Jan-11: 78.3%
- Feb-11: 77.2%
- Mar-11: 76.8%
- Apr-11: 76.9%
- May-11: 78.1%
- Jun-11: 78.6%
- Jul-11: 78.0%

The chart shows the percentage of individuals with CD4+ tests performed more than 90 days apart from the previous test.
SHOW PATIENT LIST

DOQ-IT Diabetes Mellitus

Measure
- DM-1: HbA1c Management
- DM-4: Lipid Measurement
- DM-7: Eye exam
- DM-3: Blood Pressure Management
- DM-5: LDL Cholesterol Level
- DM-2: HbA1c Management Control
- DM-8: Foot exam
- DM-6: Urine protein testing

Data as of 30-Jun-2011 Patient Count = 7

Select measures from the list, then click button to show patient list.

Show Patient List

Patient List For Selected Measures

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Of Birth</th>
<th>Address</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lisa M. Chavez</td>
<td>15-Feb-1988</td>
<td>1704 N Keystone Ave, 60638</td>
<td>Active</td>
</tr>
<tr>
<td>Michael Cadieux</td>
<td>25-Feb-1972</td>
<td>5555 North Kenmore Ave Apt 3B, 60664</td>
<td>Active</td>
</tr>
</tbody>
</table>

0 selected

Page 1 of 1 (Total 2 patients)
CONTACT PATIENTS
HCV MODULE DEVELOPMENT
PROJECT OVERVIEW

Â Pilot Program to implement a shared Clinical Decision Support (CDS) Tool at clinics in two US cities (Chicago, IL and Huston, TX) that participate in the Alliance Network/Learning Community

Â Focus of CDS was to support both screening and treatment of HCV

Â Baseline data compiled related to screening and testing of HCV

Â Capture data on use of CDS and impact of screening and treatment post CDS Implementation
FOCUS GROUP

• Members – clinicians from CHCs with high incidence of people living with HCV
• Models of care – integrated, vertical, referral
• Expense of treatment
• Need for policy and funding similar to RWCA
• Need for decision making tools to support
  - HCV screening
  - HCV treatment
Clinical Content Development Process

- **Partnership**: IAPAC and The Alliance
- Key areas of clinical need identified and prioritized
- Subject Matter Experts (SMEs) are assigned to work with the Alliance Informatics Team to design and build the clinical templates
- Built templates are tested for usability and accuracy
- Approves content to put into use based on testing
- Alliance Informatics team creates necessary training material to support use
## Test Sites – Chicago and Houston

<table>
<thead>
<tr>
<th>Diagnosis of HCV</th>
<th>Unique Patients seen in 2012</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2314</td>
<td></td>
<td>8.3%</td>
</tr>
<tr>
<td>Screened for HCV</td>
<td>1506</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>745</td>
</tr>
<tr>
<td>Male</td>
<td>1568</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-18</td>
<td>6</td>
</tr>
<tr>
<td>19-29</td>
<td>105</td>
</tr>
<tr>
<td>30-39</td>
<td>249</td>
</tr>
<tr>
<td>40-49</td>
<td>765</td>
</tr>
<tr>
<td>50+</td>
<td>1179</td>
</tr>
</tbody>
</table>
Hepatitis C Screening

DOB: 08/10/1946  Patient Age: 56 Years Old

Hepatitis C Status on Problem List
No diagnosis of Hepatitis C on his/her Problem List.

Hepatitis C Results
Ab: positive (11/30/2012)
Viral Load: 675,000 (12/17/2012)

Risk Alert
Born between 1945 and 1965

HIV/AIDS on Problem List
Liver Disease on Problem List

Risk Assessment
- Yes (01/29/2013)
- No (01/29/2013)
- Yes (01/29/2013)
- No (01/29/2013)
- Yes (01/29/2013)
- Unsure (01/29/2013)
- No (01/29/2013)
- No (01/29/2013)

Have you ever injected an illegal drug?  ○ Yes  ○ No  ○ Unsure
Did you receive any blood/organ/tissue transplants before 1993?  ○ Yes  ○ No  ○ Unsure
Did you receive any blood clotting products before 1987?  ○ Yes  ○ No  ○ Unsure
Are you HIV-positive?  ○ Yes  ○ No  ○ Unsure
Have you ever been on hemodialysis?  ○ Yes  ○ No  ○ Unsure
Have you ever had signs or symptoms of liver disease?  ○ Yes  ○ No  ○ Unsure
When you were born, was your mother infected with Hepatitis C?  ○ Yes  ○ No  ○ Unsure
Have you ever been exposed to Hepatitis C at work?  ○ Yes  ○ No  ○ Unsure
Have you ever had any other exposure to Hepatitis C?  ○ Yes  ○ No  ○ Unsure

Comments:

Patient Education
Disease Process
- 01/29/2013  ○ general Hepatitis C info
- 01/29/2013  ○ impact of liver disease

Harm Reduction
- 01/29/2013  ○ decreasing alcohol intake
- 01/29/2013  ○ maintaining a healthy weight
- 01/29/2013  ○ Hepatitis A vaccine
- 01/29/2013  ○ Hepatitis B vaccine
- 01/29/2013  ○ handwashing & infection control
- 01/29/2013  ○ proper needle use & disposal

Follow-Up Instructions
- □ return to clinic in □ day(s) □ week(s) □ month(s)
- □ clinic to call the patient with lab results and instructions
- □ schedule an appointment for reviewing lab results
- □ other instructions (please specify in Comments)

Comments:
<table>
<thead>
<tr>
<th>Type</th>
<th>Last Screening</th>
<th>Protocol</th>
<th>Recommendation</th>
<th>Add Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis C Antibody</td>
<td>Ab: positive (11/30/2012)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add Antibody</td>
</tr>
<tr>
<td>Hepatitis C Viral Load</td>
<td>RNA: 675,000 (12/17/2012)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add Viral Load</td>
</tr>
<tr>
<td>Hepatitis C Genotype</td>
<td>Genotype: 1b (12/17/2012)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add Genotype</td>
</tr>
<tr>
<td>Liver Panel</td>
<td>AST: 41.4 (12/17/2012)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add Liver Panel</td>
</tr>
<tr>
<td></td>
<td>ALT: 57.4 (12/17/2012)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bilirubin: 1.1 (12/17/2012)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alkaline phosphatase: 112 (12/17/2012)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver Biopsy</td>
<td>Biopsy: portal fibrosis found in left lower section (01/08/2013)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add Liver Biopsy</td>
</tr>
<tr>
<td>Liver Ultrasound</td>
<td>Ultrasound:</td>
<td>Once</td>
<td>Due</td>
<td>Add Liver Ultrasound</td>
</tr>
<tr>
<td>Alpha-Fetoprotein</td>
<td>AFP: 9.4 (01/08/2013)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add AFP</td>
</tr>
<tr>
<td>eGFR</td>
<td>eGFR: 32 (12/18/2012)</td>
<td>Once</td>
<td>Protocol Satisfied</td>
<td>Add eGFR</td>
</tr>
</tbody>
</table>

Reference: AASLD Hepatitis C Guidelines
Hepatitis C Management - Patient Engagement

**Retention**
- High risk for loss to care

**Risk Factors:**
- Behavioral health issues
- Financial issues
- Incarceration
- Housing issues
- Relocation
- Substance abuse

**Patient Education**

<table>
<thead>
<tr>
<th>Disease Process</th>
<th>Harm Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/29/2013</td>
<td>Decreasing alcohol intake</td>
</tr>
<tr>
<td>01/29/2013</td>
<td>Maintaining a healthy weight</td>
</tr>
<tr>
<td>01/29/2013</td>
<td>Hepatitis A vaccine</td>
</tr>
<tr>
<td>01/29/2013</td>
<td>Proper needle use and disposal</td>
</tr>
<tr>
<td>01/29/2013</td>
<td>Hepatitis B vaccine</td>
</tr>
</tbody>
</table>

**Self Management Goals**

1. **Goal #1:** Disease-Specific Goal
   - Description: Take Hepatitis C medications as prescribed
   - Last updated: 02/26/2013

2. **Goal #2:** Exercise
   - Description: Walk in the park at least 3x/week for 30 minutes
   - Last updated: 02/26/2013

3. **Goal #3:** Diet
   - Description: Eat more vegetables and drink more water, instead of snack foods and soda
   - Last updated: 02/26/2013

4. **Goal #4:**
   - Description: 
   - Last updated: 

5. **Goal #5:**
   - Description: 
   - Last updated: 

Comments: 

Care Management Plan
CONTENT ROLLOUT

- Provided access to real-time and recorded webinar style trainings
- Issued a one page FAQ
- Offered on-site/live training
- Go-live was scheduled for March 1, 2013
PRELIMINARY RESULTS
USE OF CDS BY SITES BY WEEK

Teter, et al., DDW 2013
NEXT STEPS:
HIV ENGAGEMENT IN CARE
MODULE DEVELOPMENT
### U.S. Preventive Services Task Force

**Screening for HIV**

**Clinical Summary of U.S. Preventive Services Task Force Recommendation**

<table>
<thead>
<tr>
<th>Population</th>
<th>Adolescents and adults aged 15 to 65 years, younger adolescents and older adults at increased risk for infection, and pregnant women</th>
</tr>
</thead>
</table>
| Recommendation | **Screen for HIV infection.**  
**Grade:** A |
Entry/Retention/Adherence Guidelines

- Entry and retention in HIV care
- Monitoring ART adherence
- Interventions to improve ART Adherence
- Adherence tools for patients
- Education and counseling interventions
- Health system and service delivery interventions
- Special populations

Clinical Guidelines

Guidelines for Improving Entry Into and Retention in Care and Antiretroviral Adherence for Persons With HIV: Evidence-Based Recommendations From an International Association of Physicians in AIDS Care Panel

Melanie A. Thompson, MD; Michael J. Mugavero, MD, MHSc; K. Rivet Amico, PhD; Victoria A. Cargill, MD, MSCE; Larry W. Chang, MD, MPH; Robert Gross, MD, MSCE; Catherine Orrell, MBChB, MSc, MMed; Frederick L. Altice, MD; David R. Bangsberg, MD, MPH; John G. Bartlett, MD; Curt G. Beckwith, MD; Nadia Dowshen, MD; Christopher M. Gordon, PhD; Tim Horn, MS; Princy Kumar, MD; James D. Scott, PharmD, MEd; Michael J. Stirratt, PhD; Robert H. Remien, PhD; Jane M. Simoni, PhD; and Jean B. Nachega, MD, PhD, MPH

RECOMMENDATIONS: ENTRY INTO/RETENTION IN CARE

- Systematic monitoring of successful entry into HIV care is recommended for all individuals diagnosed with HIV (II A).
- Systematic monitoring of retention in HIV care is recommended for all patients (II A).
- Brief, strengths-based case management for individuals with a new HIV diagnosis is recommended (II B).
- Intensive outreach for individuals not engaged in medical care within 6 months of a new HIV diagnosis may be considered (III C).
- Use of peer or paraprofessional patient navigators may be considered (III C).
Improving Entry Into and Retention in Care and Antiretroviral Adherence for Persons with HIV

**MONITOR ENTRY IN CARE**
- Systematic monitoring of successful entry into HIV care is recommended (II A)
- Brief, strengths-based case management for individuals with a new HIV diagnosis is recommended (II B)
- Intensive outreach for individuals not engaged in medical care within 6 months of a new HIV diagnosis may be considered (II C)
- Use peer or paraprofessional patient navigators may be considered (II C)

Integrating multiple data sources, including surveillance and administrative databases, and medical clinic records, may enhance monitoring of initial entry into care.

**MONITOR RETENTION IN CARE**
- Monitoring retention in HIV care is recommended for all patients (II A)
- Use peer or paraprofessional patient navigators (III C)

Many retention measures and data sources (surveillance, medical records, administrative databases) are available and may be applied in accordance with local resources and standards of care.

**IS ART INDICATED?**
- No

**PATIENT ALREADY ON ART**
- Monitoring adherence
  - Self-reported adherence should be obtained routinely in all patients (II A)
  - Pharmacy refill data are recommended for adherence monitoring when medication refills are not automatically sent to patients (II B)

The following are not routinely recommended:
- Drug concentrations in biological samples (II C)
- Pill counts performed by staff or patients (III C)
- Electronic drug monitors (II C)

**IS ART COMPLEX OR POORLY TOLERATED?**
- No

**SUPPORT AND MONITOR ADHERENCE**
- Education and counseling
  - Individual 1-on-1 ART education (II A) and counseling (II A) are recommended
  - Multidisciplinary education and counseling approaches are recommended (II B)
  - Group education and group counseling are recommended (II C), and offering peer support may be considered (II C)

**ART strategy for treatment-experienced patients**
- Switching treatment-experienced patients receiving complex or poorly tolerated regimens to once-daily (QD) regimens is recommended, given regimens with equivalent efficacy (II B)

**ART strategies for treatment-naïve patients**
- Among regimens of similar efficacy and tolerability, once-daily (QD) regimens are recommended for treatment-naïve patients beginning ART (II B)
- Among regimens of equal efficacy and safety, fixed-dose combinations are recommended to decrease pill burden (II B)

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SUMMARY

- EHRs can improve health-related outcomes
- Development process should engage stakeholders at all levels
- EHR implementation can facilitate CDS use
- EHR-CDS modules in development to incorporate normative guidance for engagement in HIV care
ACKNOWLEDGMENTS

Alliance
Shannon Pohl
Andrew Hamilton

IAPAC
Vincent Congiu
Amane Sidibé
José Zuniga
ACKNOWLEDGMENTS

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