HIV and HCV Care Cascades

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Conflict of Interest Disclosure Statement

• No financial relationships to disclose
• No off-label discussions in presentation
Objectives

1. To understand the evolution of the HIV Care Continuum

2. To evaluate the HIV Care Continuum and its applications

3. To investigate the Hepatitis C Virus Continuum of Care

The HIV Care Continuum
HIV Continuum: Definitions and Data

- HIV Prevalence: estimated by CDC using National HIV Surveillance System (NHSS) data
- HIV Diagnosis: also from NHSS
- Linked to HIV Care: Snapshot of recent diagnoses linked within 30 days, NHSS data
- Retained in HIV Care: Based on laboratory data (NHSS) or actual visit data (Medical Monitoring Project – MMP)
- Viral Suppression = HIV-RNA < 200 copies/ml

Two Types of HIV Care Continuums

- Prevalence Based: Denominator is the total number of HIV infected individuals
  - Includes individuals unaware of their HIV infection
- Diagnosis Based: Denominator is the population with diagnosed HIV infection
  - Approach used to look at smaller sub-populations or individual clinics/systems
- One cannot compare rates of viral suppression between the different types of continuums
The U.S. 2011 HIV Care Continuum

HIV Care Continuum Shows Where Improvements are Needed

In the US, 1.2 million people are living with HIV. Of those:

- **DIAGNOSED**: 86%
- **ENGAGED IN CARE**: 40%
- **PRESCRIBED ART***: 37%
- **VIRALLY SUPPRESSED**: 30%


https://www.aids.gov/federal-resources/policies/care-continuum/

Really? Just 30% Suppressed?

https://www.aids.gov/federal-resources/policies/care-continuum/
Why might 30% be a low estimate?

- Denominators: case based vs. lab based
- Missed Migration
- Missed Mortality

- What supports this?
  - (Clinical Experience)
  - HIV Incidence Data
  - HIV Mortality Data

The CDC 2011 Cascade: Different Layout
This is based on Case Reporting

Continuum Based on Lab Reporting Rather than Case Reporting


Denver HIV Continuum over Time

Rowan et al. IAC 2012 Poster MOPDC0305
Denver HIV Continuum over Time
Censoring Out-Migration and Death

Rowan et al. IAC 2012 Poster MOPDC0305

Estimated annual HIV infections in the U.S. declined **18%**
Between 2008 - 2014 infections fell from 45,700 to 37,600

Gay and bisexual men remain most affected

37,600
New HIV Infections in 2014

Heterosexuals
8,600 infections

People who inject drugs
1,700 infections

Gay and bisexual men who inject drugs
1,100 infections

Gay and bisexual men
20,200 infections

56% decline among people who inject drugs
36% decline among heterosexuals
26% decline among gay and bisexual men aged 35-44 years
18% decline among gay and bisexual men aged 13-24 years
Trends in annual Age-Adjusted* Rate of Death Due to HIV Infection by sex, United States, 1987-2014

Other HIV Continuums and Their Uses
The Cascade of HIV Care in British Columbia Over Time: 1996-2011

Engagement in HIV care in Denver by year of Diagnosis

Rowan et al. CROI 2012; Poster 1118.
Prevention of Mother to Child Transmission (PMTCT) Cascade

EID = Early Infant Diagnosis, CTX = Cotrimoxazole

(J Acquir Immune Defic Syndr 2017;75:S27–S35)
Hepatitis C Virus
Continuum of Care

HCV and HIV, Similar Yet Different

• Similar
  – No vaccine (no protective immunity)
  – Similar modes of transmission
  – Chronic viral infection with a long asymptomatic (but contagious) infectious period
  – Treatments are highly effective
  – Treatments prevent disease progression and death
  – Treatment prevents transmission to others

• Different
  – 20% of HCV patients clear infection spontaneously
  – Duration of required engagement/treatment is much shorter for HCV
  – Lower price/better insurance coverage for HIV
  – HCV is curable. Re-infection is possible
Stages of the HCV Continuum of Care

• HCV infected
• HCV diagnosed (HCV antibody positive)
• Active HCV infection (HCV-RNA positive)
• In Care for HCV infection
  – Pre-treatment
  – Treatment
  – Follow-up
• On direct acting antiviral agents
• Sustained Virologic Response (SVR12)

HCV – New Infections
Increase in new HCV infections, U.S.

- Peaked in the 1980s at ~300,000 cases/year
- 45% increase in reported cases from 2010 to 2011 and 2011-2012

CDC Surveillance for Viral Hepatitis 2013

- 124% increase in infants born to HCV-infected women

Women of childbearing potential wishing to become pregnant are a priority group in the AASLD/IDSA guidelines
New HCV infections are increasing on a national level

Change in HCV incidence age ≤30yrs: 2006 vs 2012

HCV Diagnosis
Who Should be Tested for HCV: USPSTF Grade B Recommendations

- Everyone born from 1945-1965 (one-time)
- Past or present injection drug use
- Sex with an IDU; other high risk sex
- Blood transfusion prior to 1992
- HIV+
- Persons with hemophilia
- Long-term hemodialysis
- Born to an HCV-infected mother
- Incarceration
- Intranasal drug use
- Unregulated tattoo
- Occupational percutaneous exposure
- Surgery prior to universal precautions


Repeat HCV Testing...

- Annually for persons who inject drugs
- Annually for persons living with HIV who are men who have unprotected sex with other men
- Periodically for others with ongoing HCV risk
HCV-RNA Evaluation

HCV-RNA Testing

- Used to confirm ‘active’ infection in HCV antibody positive individuals
- Used as the first test to screen for re-infection
- Used in HCV antibody negative patients with liver disease and high risk for HCV
- Used in HCV antibody negative patients who are immunocompromised in the setting of liver disease
RNA Testing is One Barrier to Progression along the Continuum

<=50% of HCV Antibody Positive Patients Tested for HCV-RNA

Linkage to HCV Care
Low Referral Rates to HCV Specialists
Baby Boomer Testing at Denver Health

- 2603 HCV tests
- 329 HCV ab+ (13%)
- 219 RNA+ (8%)
- 205 Post Test Counseling
- 170 PCP Visit
- 59 HCV Specialty Clinic Referral
- 3 HCV Antiviral Treatment

Reasons for Non-Referral to HCV Clinic

- Substance Abuse: 36
- Homelessness: 8
- Medical Disease: 35
- Mental Illness: 4
- Not Interested: 12
- Other: 13

Rowan et al. ID Week 2015.
Strategies to Improve Linkage to Care

• Bring the Specialists to the Community: ECHO Extension for Community Healthcare Outcomes
• Colocation of HCV screening and treatment services
  – Correctional care
  – Needle exchange
  – Methadone clinics
• Case Management, particularly for patients with mental health issues and substance abuse
• Patient Navigation

Direct Acting Antiviral Therapy
Integrated Care and HCV Tx/SVR

- Integrated care delivered by a mental health provider in the HCV clinic
- Brief psychological interventions
- Case management
- Multidisciplinary HCV care in the same setting
- Patients had underlying mental health or substance diagnoses
- 364 Patients were randomized 1:1 to Integrated Care (IC) vs. Usual Care (UC)


Integrated Care Patients were more likely to initiate HCV Treatment

Integrated Care Patients were more likely to adhere to HCV Treatment

Sustained Virologic Response
Integrated Care Patients on Treatment were more likely to achieve SVR


Integrated Care Patients Overall were More Likely to Achieve SVR

HCV Treatment SVR by Treatment Era

![Graph showing the improvement in sustained virological response rates (SVR) over different treatment eras.](TheLancet.com)

The HCV Continuum
HCV Test, Care, and Cure Continuum, United States

3.2 million persons living with HCV

- All HCV infected: 5,500,000
- Anti-HCV tested: 1.6 M (30%)
- HCV RNA: 1.2 M (38%)
- Treated: 750,000 (23%)
- SVR: 360,000 (11%)
- SVR: 200,000 (6%)


Stages of the HCV Continuum of Care, US

- Chronic HCV-infected: 1,743,000
- Diagnosed and Aware: 1,743,000
- Access to Outpatient Care: 1,200,000
- HCV RNA Confirmed: 43%
- Underwent Liver Biopsy: 17%
- Prescribed HCV treatment: 16%
- Achieved SVR: 9%

Only 9% of people living with HCV are CURED

(Yehia et al. PLOS One, 2014)
Conclusions

- HIV Care Continuums continue to allow localities to evaluate their strengths, weaknesses and progress across continuum transitions

- HCV Continuums of Care usage will continue to grow as HCV therapies become more widely available
Thank You

Questions?