Preventing HIV-Related Comorbidities in Adolescents

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Financial Relationships With Ineligible Companies (Formerly Described as Commercial Interests by the ACCME) Within the Last 2 Years

Dr Agwu has served on the scientific advisory boards for Gilead Sciences, Inc., and Merck & Co, Inc. (Updated 9/29/21)

Learning Objectives

At the end of this presentation, learners will be able to:
• Review the epidemiology of adolescents living with HIV
• Describe risk factors for developing comorbidities over the life course among adolescents with HIV
• Discuss opportunities to prevent comorbidities and optimize outcomes
FDA approves 1st HIV test although they make up only 1% of AIDS patients, they have unique clinical, social, and public health problems that require special attention.

Rogers 1990

FDA approves Nelfinavir for kids 1985-1987

1988-1994

1996-2003

2006-2013

2014-2020

2021


Rogers et al. 1987 (79): 1008-1014

Many AYA born with HIV are thriving........
Diagnoses of HIV Infection among Adults and Adolescents by Age at Diagnosis, 2018—United States

Note. Data for the year 2018 are considered preliminary and based on 6 months reporting delay.

Adolescents and Young Adults Aged 13–24 Years Living with Diagnosed HIV Infection by Sex and Transmission Category, Year-end 2017—United States and 6 Dependent Areas

Note. Data have been statistically adjusted to account for missing transmission category. “Other” transmission category not displayed as it comprises 1% or less of cases.

a Includes Asian/Pacific Islander legacy cases.

b Hispanics/Latinos can be of any race.

Adolescents and Young Adults Aged 13–24 Years Living with Diagnosed HIV Infection, by Sex and Race/Ethnicity, Year-end 2017—United States and 6 Dependent Areas

Note. Data have been statistically adjusted to account for missing transmission category. “Other” transmission category not displayed as it comprises 1% or less of cases.

a Includes Asian/Pacific Islander legacy cases.

b Hispanics/Latinos can be of any race.
Persons Living with Diagnosed or Undiagnosed HIV Infection
HIV Care Continuum Outcomes, by Age, 2018—United States

Note. Receipt of medical care was defined as ≥1 test (CD4 or VL) in 2018.
Retained in continuous medical care was defined as ≥2 tests (CD4 or VL) ≥3 months apart in 2018.
Viral suppression was defined as <200 copies/mL on the most recent VL test in 2018.

Life course perspective for adolescents with HIV
Life course perspective for adolescents with HIV

How will adolescents with HIV infection be impacted?
Percentage of adults in the U.S. with diabetes as of 2016, by age and ethnicity

| Age Group                  | White | Black | Hispanic | Asian
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>18-29 years</td>
<td>2.6%</td>
<td>7.0%</td>
<td>7.5%</td>
<td>14.7%</td>
</tr>
<tr>
<td>30-44 years</td>
<td>7.2%</td>
<td>19.7%</td>
<td>9.7%</td>
<td>20.4%</td>
</tr>
<tr>
<td>45-64 years</td>
<td>21.2%</td>
<td>27.1%</td>
<td>12.7%</td>
<td>21.7%</td>
</tr>
<tr>
<td>65 years and older</td>
<td>36.9%</td>
<td>41.0%</td>
<td>28.4%</td>
<td>37.8%</td>
</tr>
</tbody>
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Note(s):
United States; January 2 to December 30, 2016; 18 years and older; 177,192 respondents; Full or part-time workers.
Further information regarding this statistic can be found on page 8.

Source(s):
Gallup (Gallup - Sharecare Well-Being Index); Sharecare; ID 790778

Rates of Adolescents Aged 13-19 Years Living with Diagnosed HIV Infection
Year-end 2017—United States and A Dependent Areas

<table>
<thead>
<tr>
<th>State</th>
<th>HIV Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Samoa</td>
<td>0.0%</td>
</tr>
<tr>
<td>Guam</td>
<td>5.0%</td>
</tr>
<tr>
<td>Northern Mariana Islands</td>
<td>0.0%</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>14.6%</td>
</tr>
<tr>
<td>Republic of Palau</td>
<td>0.0%</td>
</tr>
<tr>
<td>U.S. Virgin Islands</td>
<td>34.3%</td>
</tr>
</tbody>
</table>

Note:
Data are based on address of residence as of December 31, 2017 (i.e., most recent known address).
CVD Data for Youth with HIV

- Studies of children and youths in non-HIV disease states (diabetes, obesity) link arterial stiffness and thickness to hypertension & increased left ventricular mass
- Limited data on youth with perinatal infection
- Limited data on youth with perinatal infection
  - Studies of children and youths in non-HIV disease states (diabetes, obesity) link arterial stiffness and thickness to hypertension & increased left ventricular mass
  - Limited data on youth with perinatal infection
  - Limited data on youth with perinatal infection
- A Harbinger for bad things to come...?
  - Findings provide further evidence that HIV+ children are at risk for CVD. As many of these biomarkers were associated with modifiable risk factors as hyperlipidemia, interventions to modify these risks should be considered in future studies.
- Long-term morbidity of HIV+/- ART
  - Cardiovascular disease
  - Malignancy
  - Medication side effects: kidney, bone, liver, other
  - Metabolic abnormalities: mitochondrial toxicity, lipodystrophy/lipoatrophy, insulin resistance, weight gain
  - Central nervous system: mental health and cognition, strokes, cognitive effects
  - Longstanding inflammation
  - Unknown? Consequences of lifelong ART? Consequences of lifelong HIV?
AIDS Survivor Syndrome: physical, psychological and emotional symptoms that a person (either HIV-/+) may experience after living through intense grief and trauma of the AIDS epidemic.

Mental health in adults born with HIV

- 25% to 60% of youth with PHIV in PHACS had mental health problems (depression, anxiety, ADHD)
- High rates of internalized stigma; associated with depression

Phillips Pediatrics 2016; Malee AIDS Care 2011; Scharko AIDS Care 2006; Earnshaw AIDS & Behavior 2018; Well Project; Winston et al. Lancet HIV 2020

Sexual and reproductive health for adults born with HIV

Rates of chlamydia, gonorrhea, and primary & secondary syphilis increased for both sexes in 15-24 year olds

Chlamydia: highest among women 15-24 years; males 15-24 years increased 29% (2013-2017), while the rate in females increased 9%
Gonorrhea: males 15-24 years increased 52%, while the rate in females increased 24%

Reasons for increases include:
- Incidence
- Screening among young men

STI Rates among adolescents

Rates of chlamydia, gonorrhea, and primary & secondary syphilis: 7 for both sexes in 15-24 year olds

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Comorbidities and Sequelae Resulting from STIs

Tobacco use among adolescents

- 7% of middle schoolers and 23% of high schoolers report current use of a tobacco product
- Use of cigarettes has markedly increased, particularly among Black adolescents
Physical activity and lifestyle among adolescents

Obesity
- 21% of 12-19 year olds are obese
  - Hispanic (26%)
  - non-Hispanic Black (24%)
  - non-Hispanic White (16%)

CDC, Youth Risk Behavior Survey 2019

Weight again among adolescents with HIV

Li et al. JPIDS 2020; Koay et al. OFID 2021
What can you do?

- Take a good history
- Assess risk factors
  - Tobacco
  - Substances
  - Sex
  - Activities
  - Helmets, firearms
- Detailed family history
- Physical examination

What can you do?

- Education (patient and staff)
- Counseling
  - Nutrition
  - Exercise
  - Smoking (cigarettes, vape, cigarettes, e-cigarettes)
  - Substance, ETOH use
  - Sex
  - BC
- Screening: BP, lipids (fasting/non-fasting), glucose, weight
Risk calculators for adolescents?

- ASCVD Heart Risk Calculator (age 40-79)
- If you know your lipids information and you are <60, the Framingham Heart Study General Cardiovascular Disease 30-Year Lipid-Based Risk Score Calculator is used.
- For ages 30-79
- If you don’t know your lipids information and you are <60, the Framingham Heart Study General Cardiovascular Disease 10-Year BMI-Based Risk Score Calculator is used.
- If you know your lipids information and you are ≥60 or older, the ACC/AHA Pooled Cohort Equations CV Risk Calculator is used.
- If you don’t know your lipids information and you ≥ 60 or older, the Framingham Heart Study Cardiovascular Disease 10-Year BMI-Based Risk Score Calculator is used.


What can you do?

- Actions:
  - Smoking cessation
  - Lifestyle modification
  - Treatment
    - HTN (<130/80 goal) or <90th percentile
    - Hyperlipidemia (benefits for older years with risk factors)
    - Weight loss
    - Hypertension
    - Tobacco use cessation
    - STD counseling, screening, and treatment; family planning
    - Immunizations

Immunizations for Adolescents and Young Adults

- Human Papilloma (HPV)
- Hepatitis A
- Hepatitis B
- Tdap
- MCV
- Flu
- COVID
- PCV & PPS
- Others as indicated
Conclusion

• Adolescents with HIV (perinatally or non-perinatally acquired) are surviving into adulthood
• Providers must be aware of potential comorbidities that may arise in adolescence
• Critically important to screen for and address comorbidities with prevention and early treatment.