Adolescent HIV and the Developing Teen Brain

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Financial Disclosure Slide

I have no real or perceived financial disclosures to any commercial products or therapies.

I will not promote the use of any commercial products during this discussion.

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Objectives

- Identify the milestones of adolescent development and recognize how HIV can affect these
- Recognize the barriers to care for adolescents and young adults living with HIV
- Review the key indicators for successful transition to adult care
- Identify tangible steps to make your practice more friendly for adolescents and young adults living with HIV

Psychosocial tasks of Adolescence[1]

- Emotional separation from parents
- Greater sense of personal identity
- Identification with a peer group
- Assigning increased importance to body image and acceptance of one's body
- Establishing sexual, vocational and moral identities

Psychosocial development

- Early- 10 to 13 years
- Middle- 14 to 16 years
- Late- 17 to 21 years
- Young Adulthood- 21 years and beyond

Early Adolescence[1]

- Physical Changes
  - Initiation of puberty
  - Preoccupation with self image
- Cognitive State
  - Concrete thought process
- Social Context
  - Reliance on parents
- Sexuality
  - Crushes and beginning sexual experimentation

Middle Adolescence[1]

- Physical
  - Completion of puberty
- Cognitive
  - Some abstract thinking
  - Deficit of risk consequence reasoning
- Emotional
  - Risk taking and experimentation
- Social
  - Peer influence increases
  - Diminished family influence
- Sexual
  - Intense romantic relationships
  - Serial monogamy

Late Adolescence[1]

- Physical
  - Reproductive maturity
- Cognitive
  - Abstract reasoning
  - Understand risk consequence logic
- Emotional
  - Develop intimate relationships
  - Empathy and connectedness with others
- Social
  - Understand role and reacceptance of family
  - Social networks
- Sexual
  - Healthier communication and decisions regarding sex

Young Adulthood[2]

- Physical
  - Acceptance of self and image toward others
- Cognitive
  - Beginning to master delayed gratification
- Emotional
  - Beginning to master emotional regulation
- Social
  - Broader networks of social connections
  - Transition into vocational goals
- Sexual
  - Fully establishing sexual identity and preferences in the context of social culture

Adolescent Brain Development[3]

- Based on functional MRI studies we see a **mismatch** in brain development
  - Limbic System (drives emotions) intensifies during puberty **(TURBO-BOOST)**
  - Prefrontal cortex (impulse control) doesn't finish developing until the mid 20s

Adolescent Brain Maturation

- Proliferation
- Pruning
- Myelination

Proliferation

- Sub-cortical areas of the brain show significant development during adolescence
- Limbic system: amygdala, nucleus accumbens (addiction reward center)
- Associated with reward/pleasure seeking activities ad emotions
- Occurs early in puberty
  - Girls: peaks at 11 years old
  - Boys: peaks at 12 years old

Proliferation

- Cortical areas develop later on during adolescence
- Ventromedial prefrontal cortex
  - Demonstrates greatest amount of cortical growth
  - Last region to mature
  - Associated with capacity to evaluate risk and reward, guide decision making

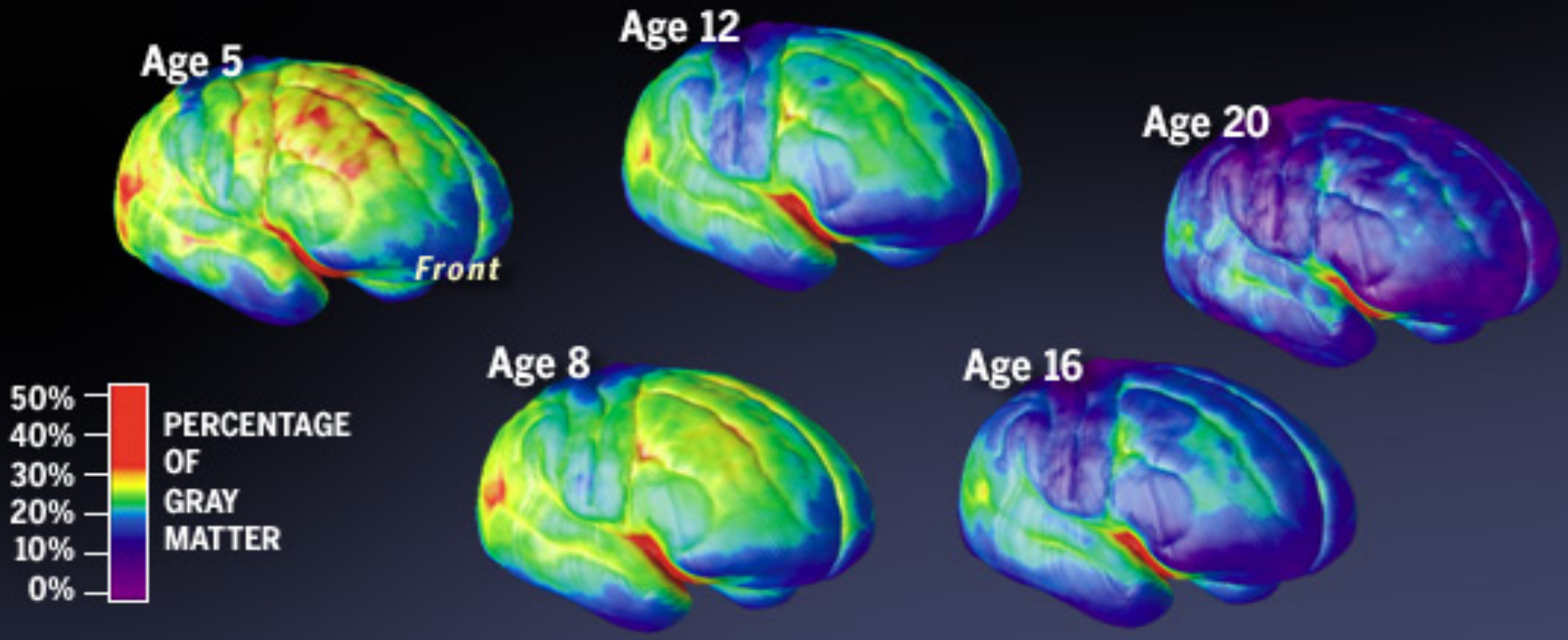
Pruning

- Decrease in cortical gray matter
  - Occurs simultaneously in areas of proliferation
  - Significance unclear

- Experience driven “pruning” of active versus idle neuronal connections
  - Fine tuning/strengthening of importance connections
  - “Use it or lose it”
  - Importance of adolescent experiences/exposures

Time-Lapse Brain

■ Gray matter wanes as the brain matures. Here 15 years of brain development are compressed into five images, showing a shift from red (least mature) to blue.



« PREVIOUS

NEXT: Launch Flash Movie »

SOURCES: Dr. Jay Giedd, Chief of Brain Imaging, Child Psychiatric Branch—NIMH; Paul Thompson; Andrew Lee; Kiralee Hayashi; Arthur Toga—UCLA Lab of Neuro Imaging and Nitin Gogtay; Judy Rapoport—NIMH Child Psychiatry Branch.

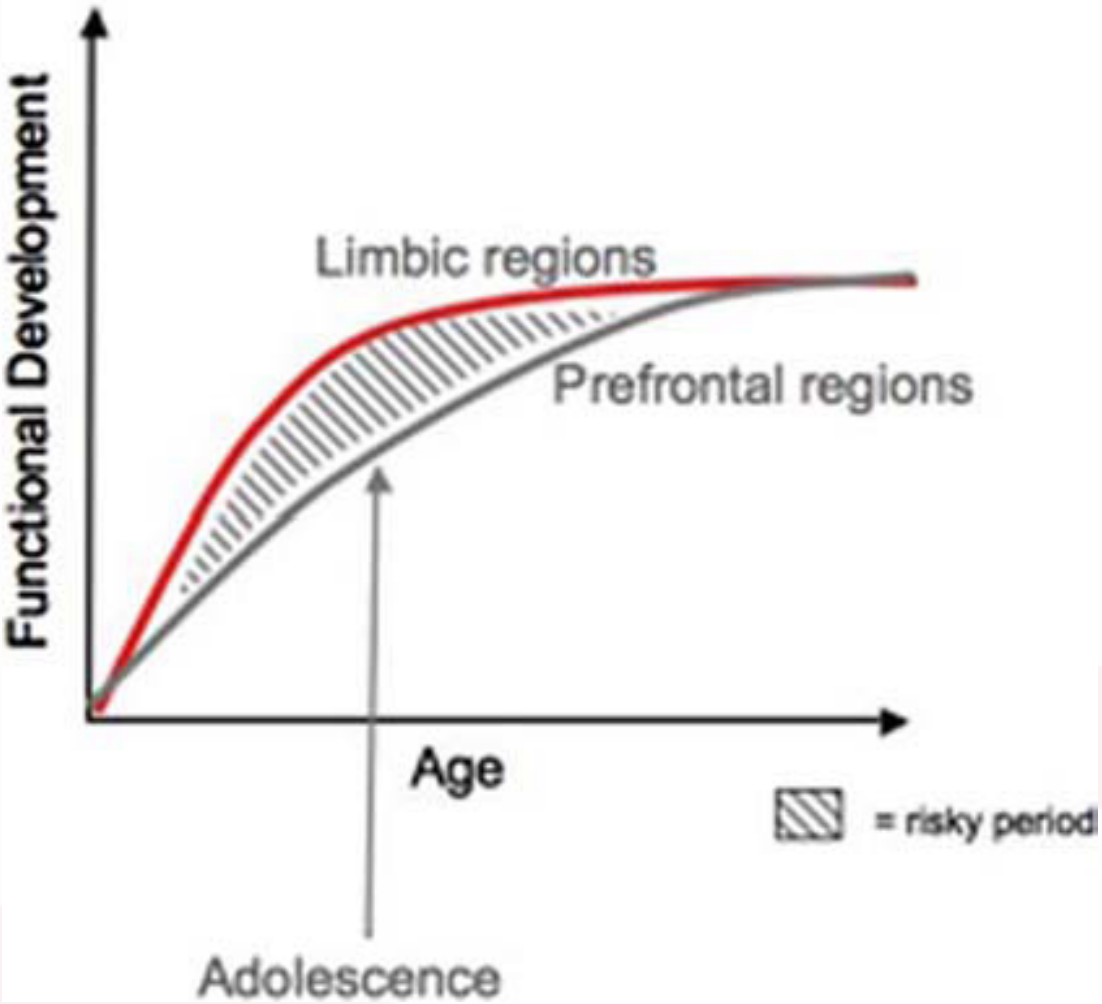
Myelination

- Significant increases in white matter volume during adolescence
  - Focal recruitment of pathways over time
- Believed to represent myelination of frequently used pathways
- Facilitating connections among cortical-subcortical regions
  - Strengthening of connections
  - “Optimum efficiency”

Development Mismatch[4]

- Relative imbalance between limbic and cortical systems during adolescence
  - fMRI: greater activity in amygdala versus prefrontal cortex in younger adolescents in response to “emotional situations”
  - Heightened response to rewards/pleasure with decreased capacity to control/weigh risks
  - Limbic system is highly sensitive to hormones

Development Mismatch



Adolescent Invincibility

- “Nothing bad can happen to me”
- Results in Risk taking
- Teens believe they will be exception to the rule that actions have consequences
- Results from the mismatch of development and egocentrism

HIV and the developing brain[5]

- Literature from other chronic conditions (Cystic fibrosis, Diabetes, Cancer, substance abuse) shows a significant delay in cognitive maturity compared to controls

- Chronic conditions affect the emotional regulation of the invincibility fable (If I am dependent on taking ART or insulin every day for survival I'm really not invincible like my peers)

- Newer studies have started to show white matter changes associated with HIV infection in children (maybe less white matter to begin adolescence)

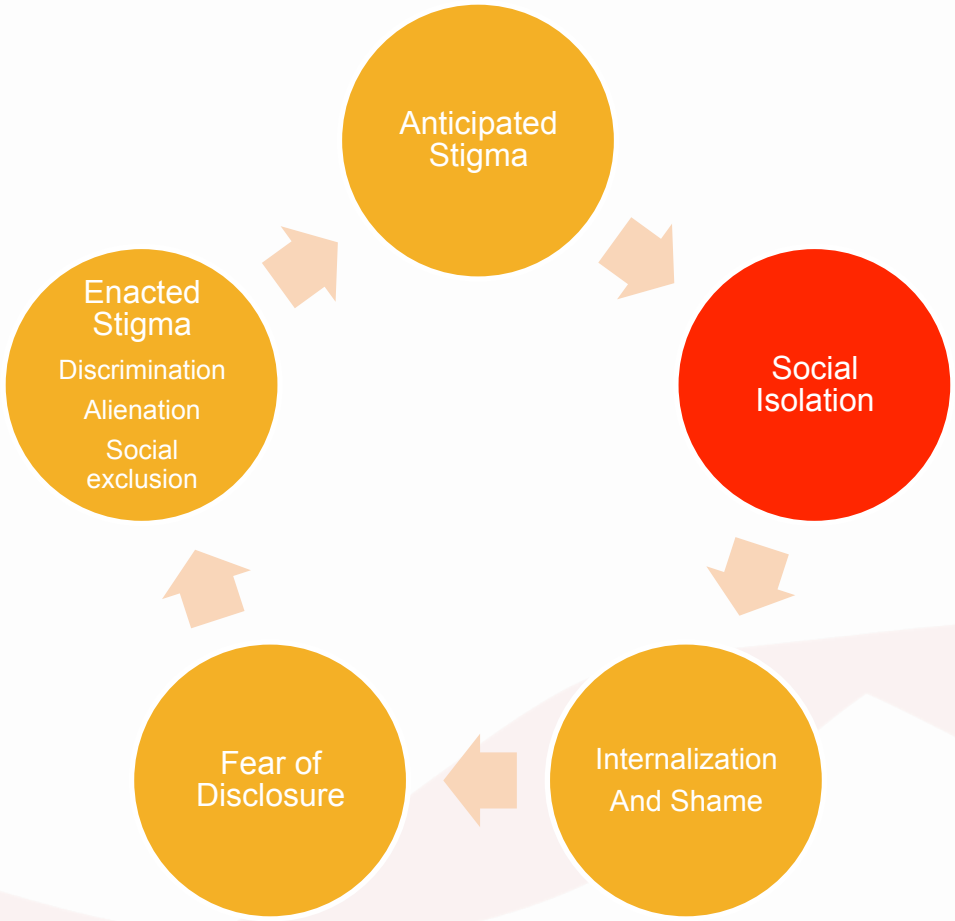
Barriers to care for youth living with HIV

- “I can’t go in that waiting room because my partner doesn’t know I have HIV. She is from a very large family and it will get back to her if someone sees me in there.”
- “Every time I go to the doctor it is focused on my HIV care, I don’t feel comfortable talking about other healthcare concerns.”
- “I live with my grandmother and she doesn’t approve of me being gay so getting to clinic visits is challenging.”
- “The way I found out I had HIV was very traumatic for me and it affects me to this day.”
- “I've been taking this pill daily for ten years and we don’t talk about it in my family. So obviously this is something we shouldn’t talk about.”

Barriers to care for youth living with HIV

- Stigma
- Disclosure fear or trauma
- Marginalization
- Co-morbidities – Substance abuse, mental health issues

The Cycle of Stigma for People living with HIV[6]



Disclosure[7]

- Inadvertent self disclosure can occur in youth who have perinatal acquired HIV (internet, peers, health care providers, family)
- Inadvertent disclosure to others can undermine trust in social situations or health care settings and potentially reinforce social isolation
- For young adults who are in a relationship concealing their status could create major barriers to seeking care and therapy

Marginalization

- Cultural Discrimination
  - 50% of children and adolescents living with HIV in Middle Tennessee are born abroad (Colombia, Haiti, Congo, Russia, India)
  - Very difficult for providers and all team members to be attuned to cultural norms for a diverse group of families
- Gender Identity and Sexual preference discrimination
- Racial Discrimination and resource allocation

Comorbidities as barriers to care[8]

- Generally the rates of depression/anxiety and substance use/abuse were similar for Adolescents living with HIV and age controls.
- Depression and anxiety were associated with lower ART adherence and higher viral loads in adolescents
- Persistent substance use and abuse were associated with ART nonadherence.

The balance beam of resilience in Adolescents and Young Adults

Substance misuse

Mental health illness

Stigma

Trauma

Family Support

Social Engagement

Education

Peer Support

Key determinants of Successful Transition

. . . In pursuit of the "Aha!!" moment

- Successful candidates can individually manage to refill and take medications on the correct schedule
- Successful candidates can make appointments, cancel and reschedule appointments, and seek out care without impediments
- Successful candidates can advocate for their own health care needs and navigate a complex insurance market
- Successful candidates have some social or familial support to maintain accountability and pursue other goals in life without constant fear of stigma or disclosure

Key Indicators of Successful Transition

- Can we control patient's viral load for at least two years after transition?
- Can patients make it to appointments, obtain bloodwork, and refill medications?
- Can patients continue to be successful with routine health care maintenance?
- Can patients continue to manage other chronic conditions?

Youth Friendly Services (YFS)[9]

- YFS are “accessible, acceptable, equitable, appropriate and effective to address the specialized needs of adolescents.”

How can clinicians provide YFS?

- Training in adolescent specific needs
  - Importance of Confidentiality
  - HEADDSSS psychosocial review
  - Incorporation of family in collaborative decision making
- Training and comfort with sexual and reproductive health services
  - Contraceptive services
  - Fertility/Pregnancy counseling
- Training in comprehensive care of youth
  - Mental health, social determinants of health
  - Providers must be comfortable and adept at addressing non HIV related medical care “Do you have any other unmet health needs?”

How can we make Youth friendly Clinic Structure?

- Training all staff in Youth friendly services and competency (Front desk, nurses, clinical assistants, social workers, pharmacists, and managers)
- Overt symbols and signs of acceptance, safety, and equality
  - Transgender Youth are welcome (Electronic Records that can allow gender preference)
  - Lesbian Gay, Bisexual youth are welcome
  - Homeless youth are welcome
  - Persons from all races and nationalities are welcome (Map of the World)
- Waiting room with other adolescents and young adults
- Adolescent friendly clinic hours and cancellation/late policy and friendly patient health information portals

How can we meet the needs and preferences of the client?

- Motivational interviewing to meet the client where they are in the stages of change in behavior or acceptance of health issues
- Remain nonjudgmental and non-biased with open ended questions and dialogue
- Strengths based approach – make sure the client is aware of their own resiliency factors (family, education or work, peers)
- Flexibility and reassurance that we are in this provider-client relationship for the longer term

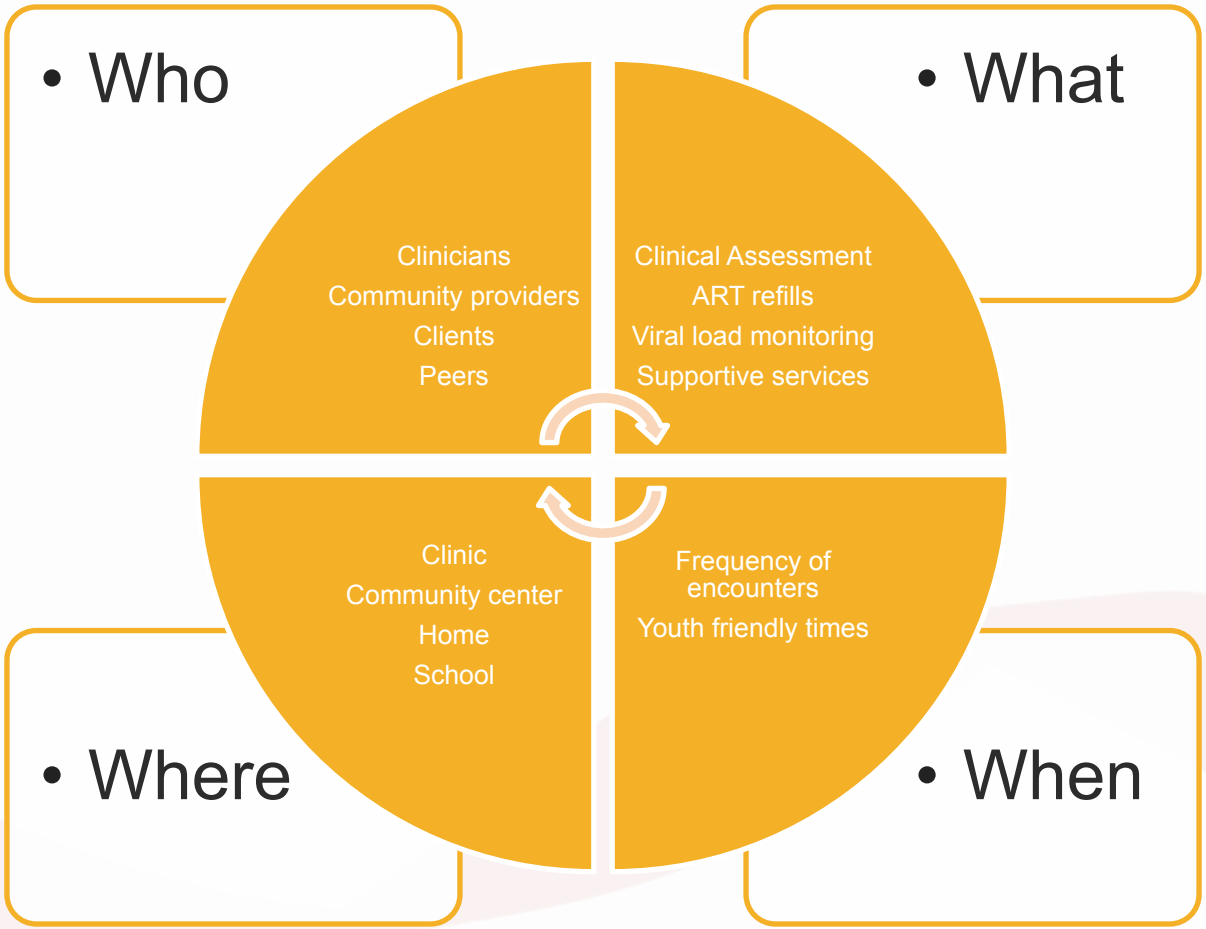
How can we meet the needs and preferences of the client?[9]

- Younger Adolescents (10-14) need direct support of family and caregivers
- Older Adolescents (15-19) require sexual and reproductive health resources and mental health resources
- Young Adults (20-25) need help disclosing status to partners and help with prevention of transmission to others

Differentiated Models of Care[9]

- Promote use of family based approach to collaborate for young people's care
- Integration of psychosocial support and sexual and reproductive services
- Peer Education and support groups

Differentiated Models of Care



Differentiated Models of Care[10-13]

- Social Groups (Teen Club, Saturday Club)
  - Have shown improved retention of care for youth living with HIV
  - Have not shown benefit for patients who have adherence challenges or who are lost to care
  - Increasing social engagement and resilience factors and perhaps accountability

- Multi- Month Script program for adolescents who have demonstrated adherence have shown lower attrition and mortality

- Community based programs in Haiti and Zimbabwe have shown benefit from school based or home visits and peer education support

Key Summary Points

- Health Care providers should recognize the developmental mismatch in the adolescent brain which results in high risk behavior.
- Providers should recognize the important barriers to care and adherence for young people living with HIV and individualize discussions using a strengths based approach.
- Providers should know the key indicators for successful transition from pediatric to adult care.
- We can enhance access to care for YPLWH by focusing on client needs, youth friendly environments, and social engagement in care.

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