Adolescence: An Overview

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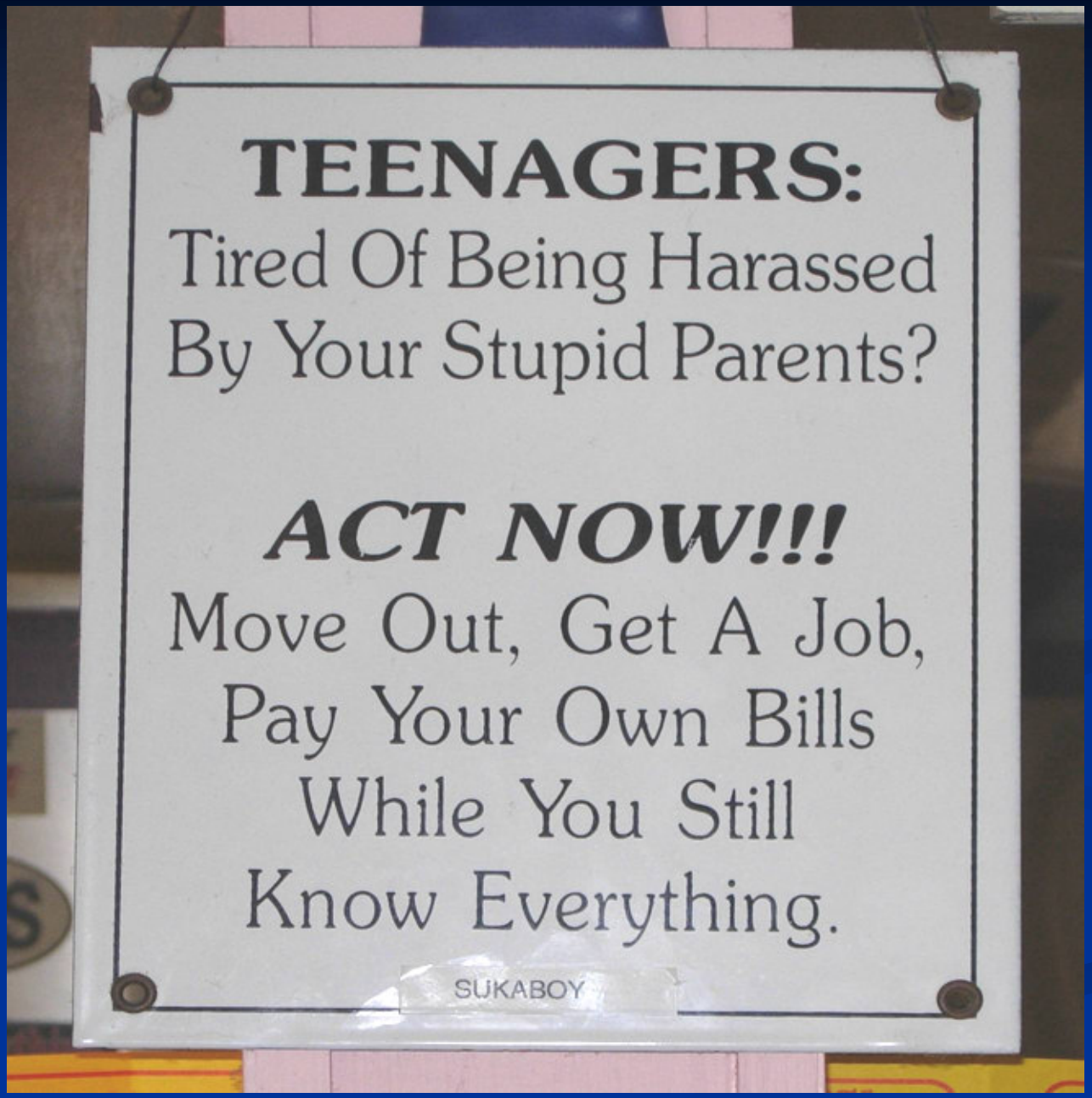

TEENAGERS:
Tired Of Being Harassed
By Your Stupid Parents?
ACT NOW!!!
Move Out, Get A Job,
Pay Your Own Bills
While You Still
Know Everything.
SUKABOY

Objectives

- Define adolescence
- Describe key aspects of physical, emotional, social, and cognitive maturation
- Review brain development during adolescence and how this relates to cognitive abilities
- Discuss opportunities for promoting health among adolescents

The leading cause of death for teenagers in the U.S. is

A. AIDS
B. cancer
C. homicide
D. suicide
E. unintentional injury

Deaths, Percent of Total Mortality, and Death Rates by Cause, 15-19 year olds, U.S., 2004

Cause	Number	Percent	Rate/100,000
All Causes	13,706	100.0	66.1
Unintentional injury	6,825	49.8	32.9
Homicide	1.932	14.1	9.3
Suicide	1,700	12.4	8.2
Malignancy	731	5.3	3.5

National Vital Statistics Reports 2007;56(5)

What percent of high school seniors report having been drunk?

A. 25%

B. 40%

C. 55%

D. 70%

E. 85%

Lifetime Prevalence of Use (%) of Various Substances by High School Seniors

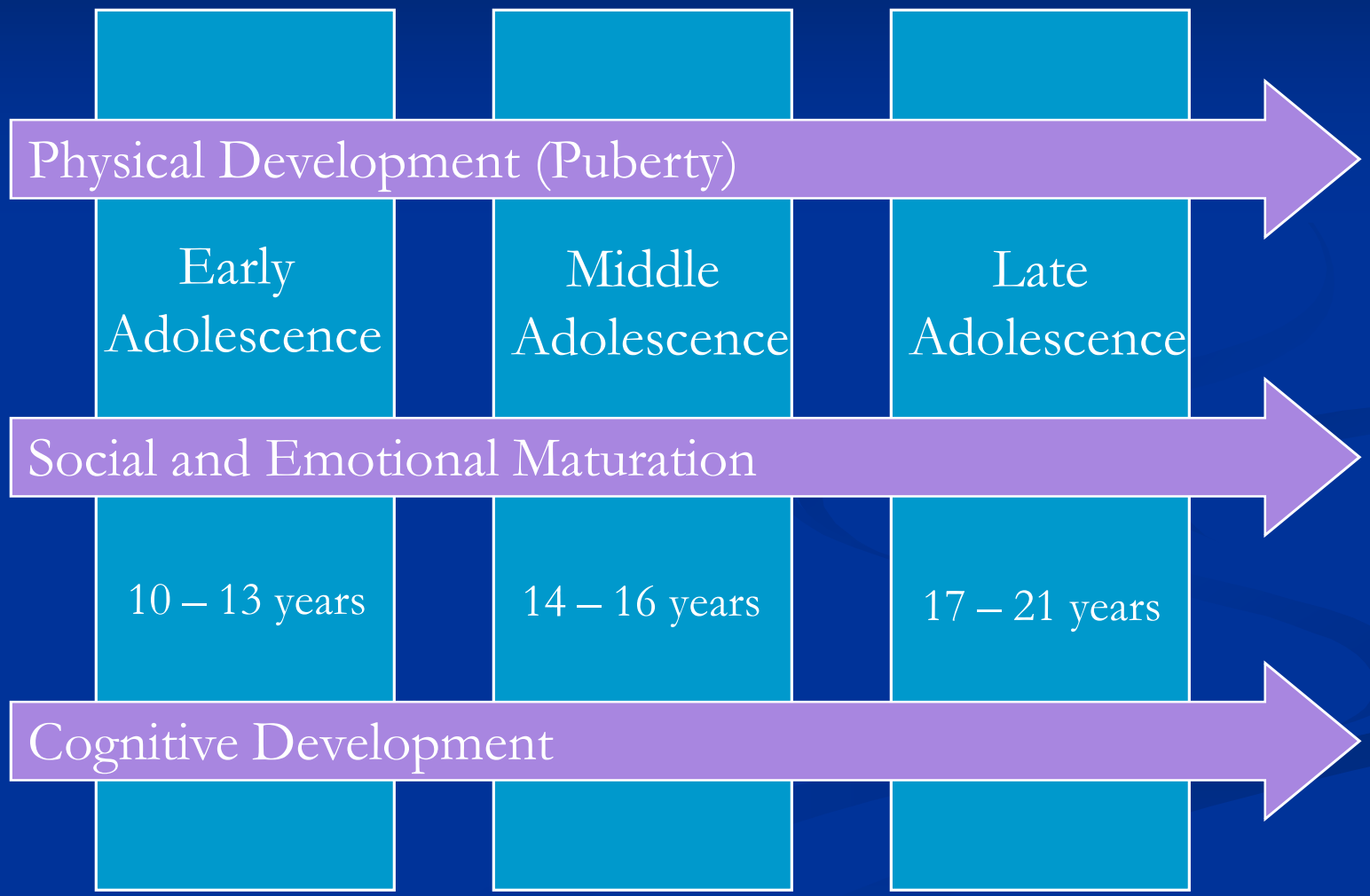
Substance	1980	1985	1990	1995	2000	2003	2005	2006	2007
Any illicit drug	65.4	60.6	47.9	48.4	54.0	51.1	50.4	48.2	46.8
Marijuana	60.3	54.2	40.7	41.7	48.8	46.1	44.8	42.3	41.8
LSD	9.3	7.5	8.7	11.7	11.1	5.9	3.5	3.3	3.4
Ecstasy	-	-	-	-	11.0	8.3	5.5	6.5	6.5
Cocaine	15.7	17.3	9.4	6.0	8.6	7.7	8.0	8.5	7.8
Been drunk	-	-	-	63.2	62.3	58.1	57.5	56.4	55.1
Cigarettes	71.0	68.8	64.4	64.2	62.5	53.7	50.0	47.1	46.2

http://monitoringthefuture.org/ (12/07)

Adolescence

- Period of marked physical and psychosocial change.
- Typically considered to take place during the second decade, but considerable variation exists in the onset and duration of adolescence.

Adolescent Development



Physical Development (Puberty)

- Physical growth:
  - 20% of height and 50% of weight contributed by the adolescent growth spurt
  - During the year of most rapid growth, boys grow 4 in. and girls 3.5 in.
  - Muscle mass increases by 100% in boys and 50% in girls
  - 60% of bone density acquired during adolescence
- Sexual development:
  - Girls:
    - Begins with breast development at 9-10 yrs.
    - Two years later (at a mean of 12.8 yrs.) menses begin
  - Boys:
    - Begins with testicular enlargement at 11.5 yrs.
    - Complete in 2-5 yrs.

Variations in Physical Development: Possible Psychosocial Implications

- A 15-year-old boy who looks like he's 12.
- A 15-year-old girl who looks like she's 17.

Social and Emotional Maturation

- Emotional separation from parents
- Develop a sense of personal identity and self-image
- Identify with a peer group
- Explore romantic relationships

Hazen E, et al. *Pediatr Rev* 2008;29:161-168

Cognitive Development

- Increased ability to think abstractly
- Greater impulse control
- Improved ability to assess risk vs. reward
- Improved use of working memory (the information in memory available for working on a problem)

Hazen E, et al. *Pediatr Rev* 2008;29:161-168

Cognitive and Social Development

Early Adolescence

- Less interest in parental activities, testing authority
- Emotional lability
- Body image concerns
- Same gender peers
- Concrete thinking, lack of impulse control

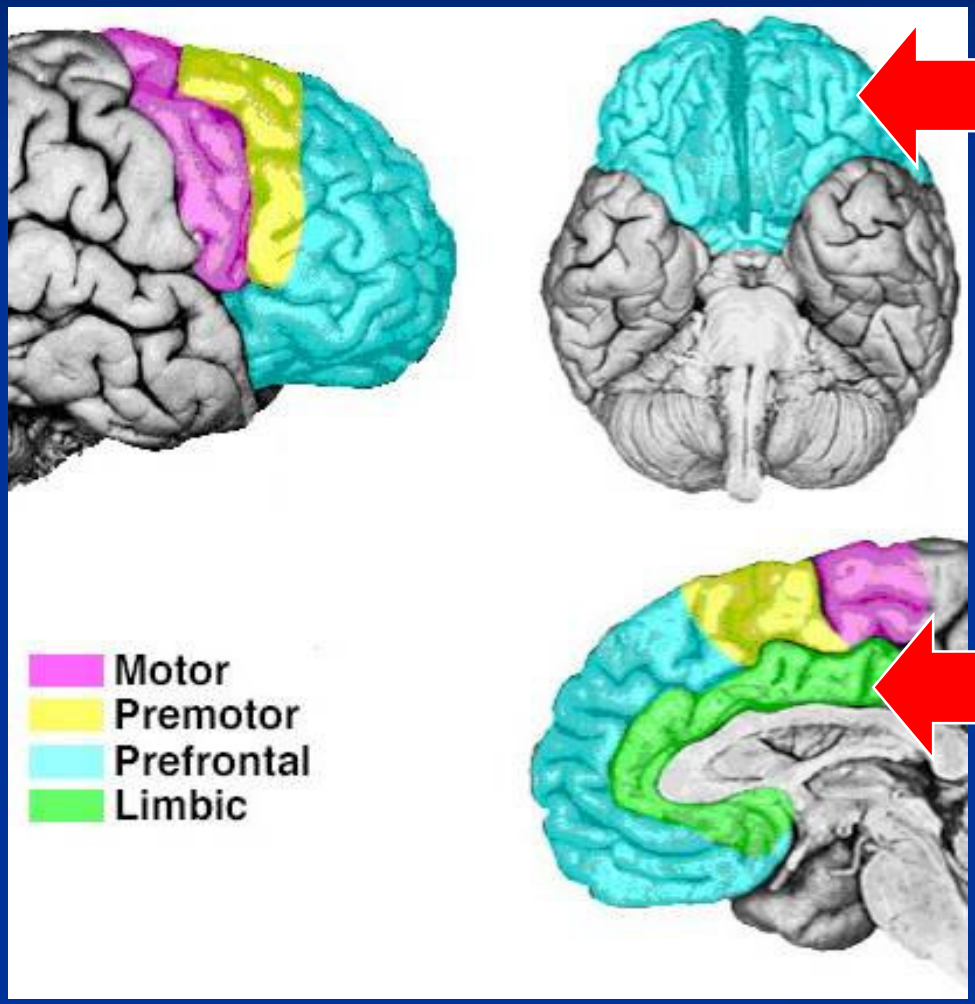
Middle Adolescence

- Less interest in parental activities, desire to spend more time with peers
- Increased comfort with body
- Increased ability to reason, feeling of omnipotence

Late Adolescence

- Separation from parents
- Peer group exerts less influence
- Understanding of consequences of behavior
- Greater ability to make independent decisions

Brain Anatomy and Function



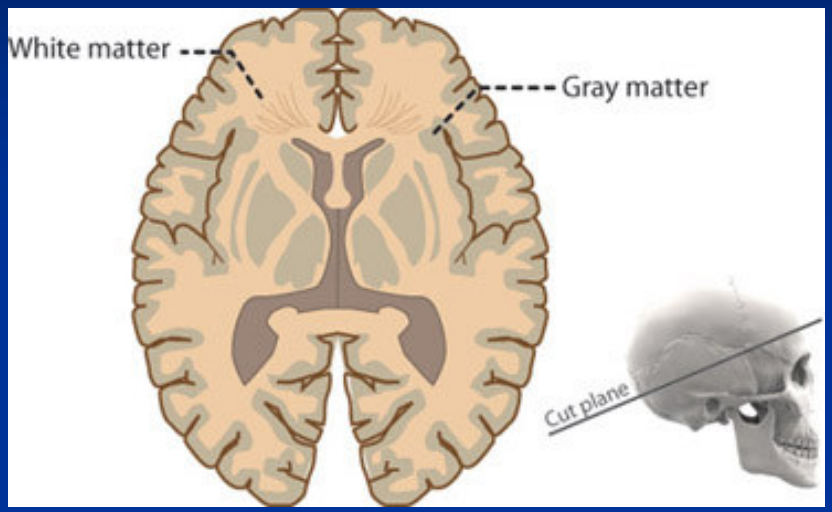
Prefrontal cortex

-Impulse control
-Setting priorities
-Formulating plans
-Decision-making
-Envisioning consequences of actions

Limbic system

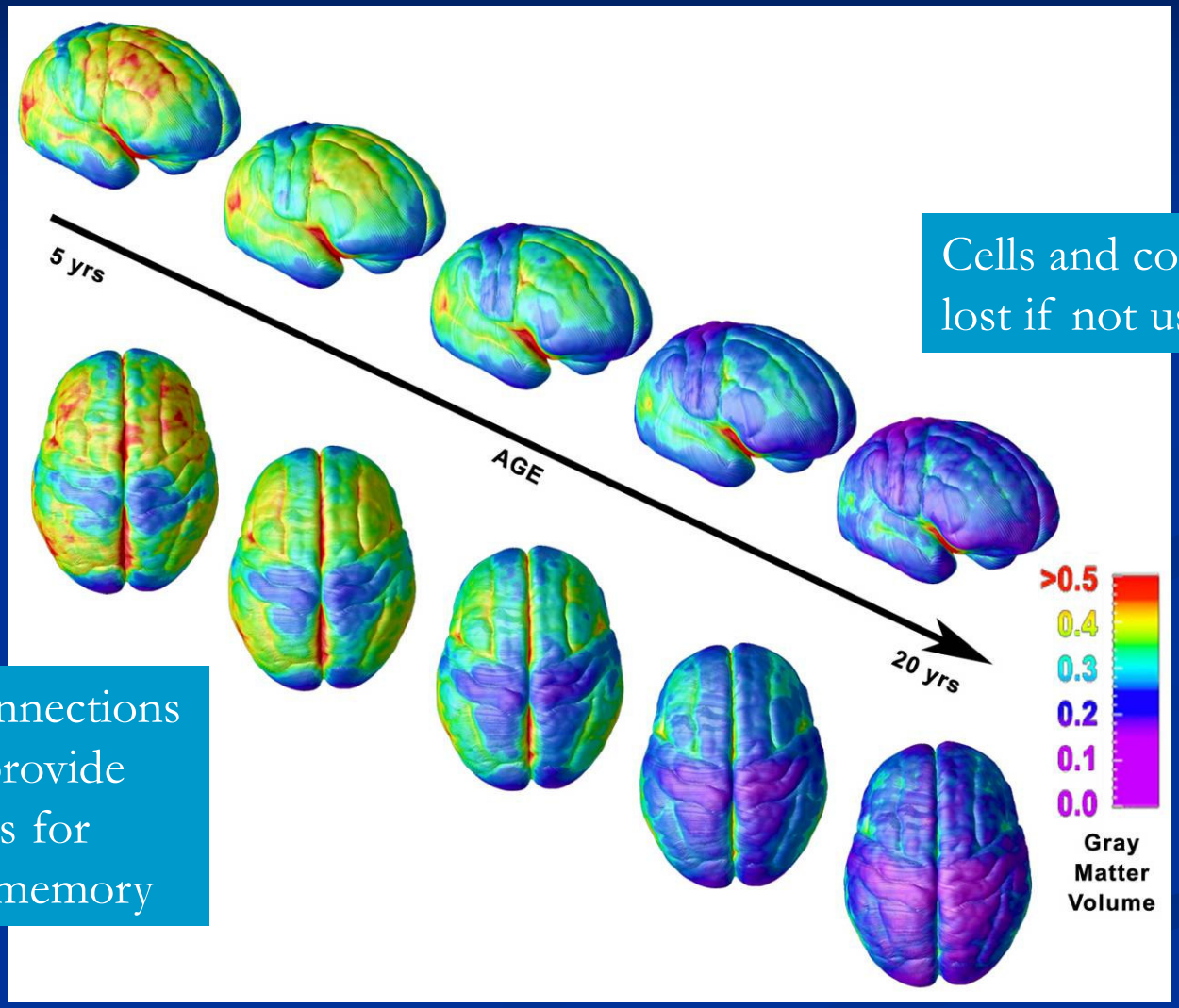
-Impulsiveness
-Sensation-seeking

Key Elements of Brain Development



- Gray matter (cortex):
  - Processes information
  - Increases in pre-adolescence then decreases
- White matter:
  - Extensions that connect areas of the brain
  - Increases into the 3rd decade
- Dopaminergic neurons:
  - Important for focusing attention when choosing between conflicting options
  - Develop late in prefrontal cortex

Cortical Development



Cells and connections are lost if not used

Cells and connections increase to provide opportunities for leaning and memory

Gogtay N, et al. *PNAS* 2004;101:8174-8179

Implications

- Late maturation of areas of the brain responsible for complex thought processes helps explain adolescents' involvement in risky behaviors.
- Adolescents need supportive parents, adults, and institutions that provide guidance and help them learn appropriate skills and adult behaviors.
- Strategies for health promotion should consider the developmental abilities of adolescents (i.e., should be "developmentally appropriate").

Opportunities to Promote Health

Entities that Impact Adolescent Health

- Policy makers: federal, state, local
- Funding agencies
- Organizations:
  - Governmental
  - Professional
  - Schools
  - Other
- Service providers

Healthy People 2010

- Program of the Office of Disease Prevention and Health Promotion (of US DHHS).
  - Increase the quality and healthy years of life
  - Eliminate health disparities
- In 2000, published comprehensive set of disease prevention and health promotion objectives for the nation.
- Objectives to be used by individuals, communities, states, professional organizations.

http://www.healthypeople.gov/

Healthy People 2010

- 467 objectives; 107 relevant for adolescents; 21 objectives in the following 6 areas considered critical:
  - Mortality
  - Unintentional injury
  - Violence
  - Mental health and substance abuse
  - Reproductive health
  - Prevention of chronic disease during adulthood

Park MJ, et al. *J Adolesc Health* 2008;42:329-334.

Healthy People 2010 – Favorable Trends at Midcourse

Objective	Baseline	Current	Target
Reduce deaths (10-14 year-olds)	21.5*	18.7*	16.5*
Reduce proportion who rode with driver who had been drinking	33%	28.5%	30%
Increase seat belt use	84%	89.8%	92%
Increase proportion receiving mental health treatment	60%	64%	66%
Decrease pregnancy rate	67**	44.4**	43**
Reduce tobacco use	40%	28.4%	21%

* /100,000; ** /1000

Park MJ, et al. *J Adolesc Health* 2008;42:329-334.

Healthy People 2010 – Opportunities at Midcourse

- Mortality:
  - Reduce deaths among 15-19 year-olds and 20-24 year-olds
- Unintentional injury:
  - Reduce deaths caused by MVAs
  - Reduce deaths and injuries caused by alcohol-related MVAs
- Violence:
  - Reduce homicides, fighting, weapon-carrying at school
- Substance use/mental health:
  - Reduce suicides and attempts
  - Reduce binge drinking
  - Reduce marijuana use
- Reproductive health:
  - Increase proportion never sexually active, not currently sexually active, using condoms
  - Reduce chlamydial infections, new cases of HIV/AIDS
- Prevent chronic illness:
  - Reduce overweight/obesity
  - Increase physical activity

Park MJ, et al. *J Adolesc Health* 2008;42:329-334.

Guidelines for Preventive Care

Organization	Age	Recommendations
American Academy of Family Physicians	13-18 yrs	Every 1-3 years tailored to the individual; 1 comprehensive exam between 13 and 18 yrs
Maternal and Child Health Bureau (Bright Futures)	11-21 yrs	Annual with comprehensive examination
American Medical Association (Guidelines for Adolescent Preventive Services)	11-21 yrs	Annual with comprehensive examination once during early, middle and late adolescence
American Academy of Pediatrics	11-21 yrs	Annual with comprehensive examination
Agency for Healthcare Research and Quality	11-24 yrs	Every 1-3 yrs tailored to the individual

Broder KR, et al. *Pediatrics* 2008;121 (suppl 1):S25-S24.

Clinical Preventive Services[1]

- Immunizations: Tdap, meningococcal, HPV, varicella
- Health guidance for adolescents
- Health guidance for parents
- Laboratory tests: TB, STDs, Pap smear, cholesterol, hearing, vision
- Behavioral screening and risk-reduction[2]
  - *H*ome
  - *E*ducation
  - *E*ating
  - *A*ctivities (peer group)
  - *D*epression/suicide
  - *S*exual activity
  - *S*ubstance use
  - *S*afety

[1]Broder KR, et al. *Pediatrics* 2008;121 (suppl 1):S25-S24.
[2]Goldenring JM, Rosen DS. *Contemp Pediatr* 2004;21:64-90.

Tobacco Use

- 9.4% of high school students use cigarettes frequently ($\geq$20 of 30 days/month)[1]
- Half of the 3000 adolescents who begin smoking each day will become daily smokers[2]
- 90% of adult smokers began smoking as adolescents[2]

[1]Centers for Disease Control and Prevention. *Youth Risk Behavior Surveillance.* http://www.cdc.gov/mmwr/PDF/SS/SS5505.pdf
[2]Ziedonis D, et al. *Adolesc Med Clin* 2006;17:381-410

Preventing Tobacco Use

- Standard approach:
  - Advise adolescent of adverse effects of tobacco use
- Developmentally appropriate approach:
  - Parental supervision
  - Policy making:
    - Prohibiting sale of tobacco to minors
    - Prohibit tobacco advertising
    - Prohibit tobacco use on school grounds (students, staff, parents)

Preventing Tobacco Use

- 3834 youths 12-17 years living in towns with strong restaurant smoking regulations
- Odds of progressing from experimentation to established smoking reduced by 40%
- Rationale:
  - Reduce youths' exposure to tobacco in public places (lowers perception of smoking prevalence)
  - Change perceived social acceptability of smoking

Siegal M, et al. *Arch Peditr Adolesc Med* 2008;162:477-483

Summary

- Adolescents are unique both in their capabilities and health care needs.
- Threats to the health of adolescents often have a behavioral component that is, at least in part, biologically based.
- Opportunities exist for health promotion. These should be developmentally appropriate and multi-faceted.