



ADOLESCENCE

- Adolescence is the phase of life between childhood and adulthood, from ages 10 to 19. It is a unique stage of human development and an important time for laying the foundations of good health
- Adolescents experience rapid physical, cognitive and psychosocial growth. This affects how they feel, think, make decisions, and interact with the world around them
- Despite being thought of as a healthy stage of life, there is significant death, illness and injury in the adolescent years. Much of this is preventable or treatable
- During this phase, adolescents establish patterns of behavior (related to diet, physical activity, substance use, etc...) that can protect their health and the health of others around them or put their health at risk now and in the future

The Historical Emergence of Adolescence

- The term *adolescence* first appeared in the 15th century and is derived from the Latin word *adolescere*, meaning “to grow up” or “to grow into maturity.”
- Psychologist G. Stanley Hall characterized it as a “new” phase of life that emerged due to social changes associated with the Industrial Revolution.
- Hall linked the emergence of adolescence to the expansion of public schooling, compulsory education laws, and legal restrictions on child labor during the Progressive era. These reforms removed young people from the workforce and placed them in educational settings.

The Historical Emergence of Adolescence

- Young adolescents became increasingly dependent on parents and families for longer periods of time.
- Schooling also created opportunities for adolescents to spend extended time with peers of the same age, allowing for the formation of peer groups that became central to adolescent social development.

- The duration of adolescence has expanded over time, lengthened at the beginning by earlier pubertal onset and at the end by delayed entry into careers, marriage, and financial independence.
- The lengthening of adolescence does not affect all individuals equally. Puberty tends to occur earlier among children from lower socioeconomic backgrounds, while the transition to adulthood is often delayed among more affluent youth.

Stages of Adolescent Development

Early Adolescence : 10 – 13 years

Middle adolescence : 14 – 17 years

Late adolescence : 18 – 21 and beyond

Early Adolescence (Ages 10 to 13)

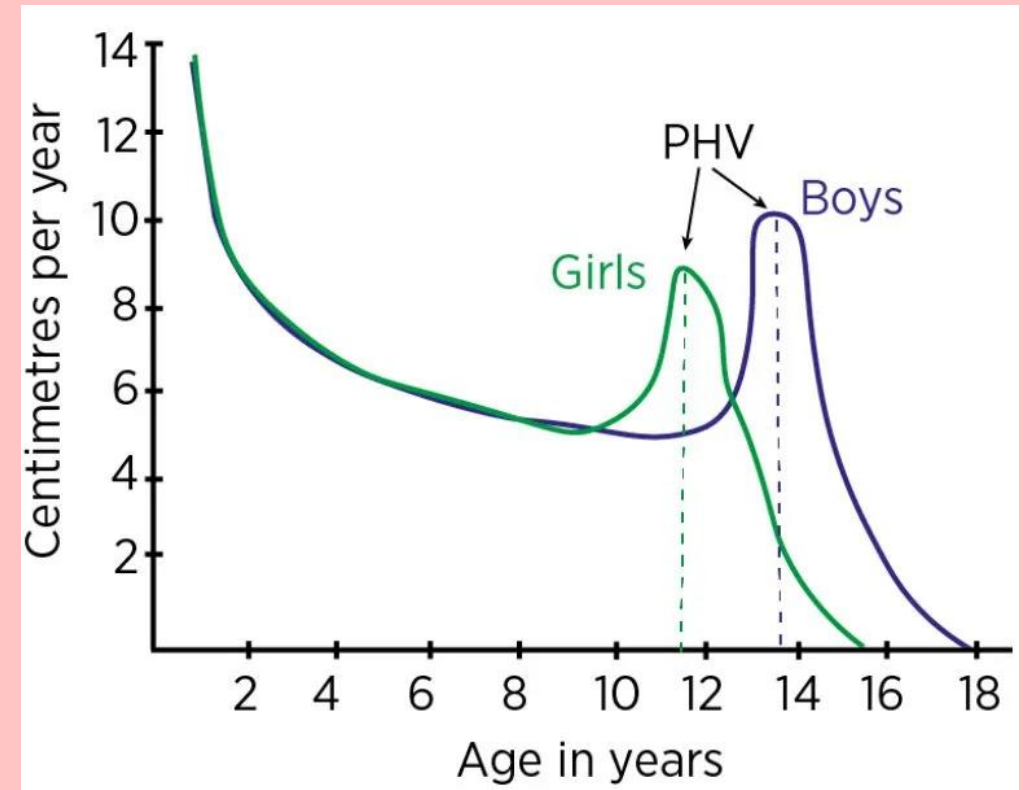
- Children often start to grow more quickly and notice body changes, including hair growth under the arms, breast development in females, and enlargement of testicles in males. Changes usually start a year or two earlier in girls; some may begin as early as age 8 for girls and age 9 for boys. Many girls start their period around age 12, 2–3 years after breast development begins.
- Early adolescents have concrete, black-and-white thinking, Things are either right or wrong, great or terrible, without much room in between
- It is normal at this stage for young people to center their thinking on themselves (called "egocentrism"). As part of this, preteens and early teens are often self-conscious about their appearance and feel as though they are always being judged by their peers.
- They feel an increased need for privacy and may explore independence, pushing boundaries and reacting strongly to limits.

Middle Adolescence (Ages 14 to 17)

- Physical changes continue: most males have started their growth spurt, may experience voice cracking or acne; females' changes are nearly complete, with most having regular periods.
- Many middle adolescents have more arguments with parents, spend more time with friends, and experience heightened peer pressure.
- Brain development continues; frontal lobes are not fully mature, affecting decision-making, impulse control, and ability to consider consequences. Teens can think abstractly but may struggle to apply logic in the moment, especially under strong emotions. Examples include skipping studying, or underestimating risks like smoking.

Peak height velocity (PHV)

- Is a period in childhood where maximum rate of growth occurs. It is otherwise known as the Growth Spurt. It indicates hormonal, physiological and anatomical changes in the body bringing a child into adolescence.
- This usually takes place few years earlier in girls (10-12 years old) than boys (12-14 years old). Peak growth can last anything from a few weeks to a few months.



What happens during PHV?

Prior to puberty, boys and girls develop at a similar rate. Around and during PHV, there are significant changes occurring in the body.

- **Hormonal:** Estrogen and Progesterone are released from the ovaries in girls with the onset of menarche usually around the same time. For boys, the testes release testosterone (usually at a slightly later age).
- **Growth:** During PHV, the bone growth plates in become very active producing new cells. Height rapidly increases along with muscle mass and weight.
- **Physical characteristics:** The physical capabilities of boys and girls rapidly change, with increases in strength, speed, agility and endurance. Boys generally have more dramatic increases in strength due to higher testosterone levels.

Late Adolescence (18–21 and beyond)

- Physical development is generally complete, impulse control improves, and risk-reward evaluation becomes more accurate.
- Teens entering early adulthood have a stronger sense of individuality, identify their values, focus more on the future, and make decisions based on hopes and ideals.
- Emotional and physical separation from family increases, and many reestablish an "adult" relationship with parents, treating them more as equals for advice and discussion rather than authority figures.

Peer Influence

- Peers become extremely important during adolescence. As they pull away from their family, early adolescents are not strong enough to stand on their own and they turn to their peers for guidance and support.
- By mid-adolescence, the peer group exerts a huge influence over the teen. At this time, peer groups demand that members conform as this reduces stress related to decision-making. If the group wears black clothing, then the all the members must do the same. To do otherwise would risk exclusion from the group. Unfortunately, this also includes risk behaviors such as substance use and participation in gangs.
- By late adolescence, peer groups do not demand the same level of conformity. Individuality is more acceptable.
- A useful strategy for providers is to ask about the risk behaviors of the teen's friends, since teens are often more comfortable sharing information about friends than about themselves. This enables the physician to explore the adolescent's feelings and knowledge of risk behavior

Why Adolescence?

Public Health Rationale-Mortality

- Over 1.3 billion of the world's population are adolescents.
- Only about 11% of the world's adolescents live in HICs*, while about 2/3 live in LMICs.
- In 2019 an estimated 0.9 million adolescents died. Approximately 2/3 of these deaths were in LMICs*.

- HICs : High Income Countries
- LMICs: Low & Middle Income Countries

Table 2.1. Overview of the burden of mortality and morbidity among adolescents globally and by modified WHO region, 2019

	Global	African LMICs	Americas LMICs	Eastern Mediterranean LMICs	European LMICs	South-East Asia LMICs	Western Pacific LMICs	HICs
Adolescent population in millions (% of global total)	1240 (100)	249 (20)	103 (8)	129 (10)	53 (4)	362 (29)	214 (17)	131 (11)
Adolescent deaths in thousands (%)	857 (100)	321 (38)	67 (8)	104 (12)	19 (2)	244 (28)	73 (8)	29 (3)
Mortality rate (deaths per 100 000 adolescents)	69	129	65	81	36	67	34	22

Table 2.2. Main causes of adolescent mortality by sex, age, globally and by modified WHO region

Injuries		Communicable, maternal, perinatal and nutritional conditions		
	Males		Females	
Age	Cause	Mortality rate (per 100 000)	Cause	Mortality rate (per 100 000)
Global				
10–14 years	Road injury	<div><div></div></div> 9	Diarrhoeal diseases	<div><div></div></div> 8
	Diarrhoeal diseases	<div><div></div></div> 9	Road injury	<div><div></div></div> 5
	Drowning	<div><div></div></div> 4	Lower respiratory infections	<div><div></div></div> 3
	Lower respiratory infections	<div><div></div></div> 3	HIV/AIDS	<div><div></div></div> 3
	HIV/AIDS	<div><div></div></div> 3	Meningitis	<div><div></div></div> 2
15–19 years	Road injury	<div><div></div></div> 18	Tuberculosis	<div><div></div></div> 9
	Interpersonal violence	<div><div></div></div> 12	Maternal conditions	<div><div></div></div> 7
	Tuberculosis	<div><div></div></div> 10	Self-harm	<div><div></div></div> 5
	Self-harm	<div><div></div></div> 6	Road injury	<div><div></div></div> 5
	Diarrhoeal diseases	<div><div></div></div> 5	Diarrhoeal diseases	<div><div></div></div> 4

Age-Specific Risk Factors in Adolescence and Young Adulthood

- For 10–14-year-olds, most deaths occur in low- and middle-income countries, where children continue to die from preventable communicable diseases. This pattern reflects poor living conditions, with the most significant risk factors including unsafe water and inadequate sanitation.
- In older adolescents (15–19) and young adults (20–24), the risk profile shifts. Behavioral factors become more dominant, especially unsafe sex and alcohol consumption. In addition, occupational injuries emerge as a major cause of harm, particularly in countries where workplace safety is minimal. Nevertheless, unsafe water and sanitation remain relevant risks in the 15–19 age group, underscoring the ongoing burden of poor infrastructure.

Gender-Based Differences in Risk:

- Adolescent girls are less likely to attend or complete secondary school, which results in limited knowledge of health issues and reduced access to resources.
- Adolescent boys, by contrast, are more frequently affected by interpersonal violence, war, and road traffic injuries—largely due to greater involvement in risky behaviors and societal expectations around masculinity.
- Across nearly all regions and age groups, adolescent males have higher mortality rates than females; Africa being the only exception.
- For example, young male drivers are three times more likely than females to die in road accidents, due to both behavioral factors and cultural influences on risk-taking.

Tobacco, alcohol & illicit drugs



- A major concern in countries of all income groups.
- In HICs drug use disorders were among the top five causes of adolescent morbidity and mortality in 2019.
- Substance use and tobacco most commonly begins in adolescence.
- Associated with neurocognitive alterations → behavioral, emotional, social and academic problems in later life.
- Alcohol and drug use contribute to about 3.5 million deaths each year as well as to disabilities and poor health for millions of people.

The Vaping Epidemic in Adolescents

- Electronic cigarettes are battery-operated devices that use an electric pulse to heat and aerosolize a favored liquid that typically contains nicotine.
- E-cigarettes were initially marketed as smoking-cessation tools, but there is no strong evidence supporting their effectiveness for this purpose.
- Delayed regulation allowed these products to become widely available and appealing to adolescents
- Advertising for e-cigarettes has been heavily aimed at adolescents.

The Vaping Epidemic in Adolescents

- Pods come in fun packaging, and the different pods are flavored to be attractive to adolescents, with everything from mint to gummi bear to frosted sugar cookie. This is especially concerning because studies have shown that flavor is one of the most important factors adolescents consider in trying e-cigarettes.
- The devices to aerosolize the pods are designed to look like anything from USBs to pens to inhalers.

The Vaping Epidemic in Adolescents

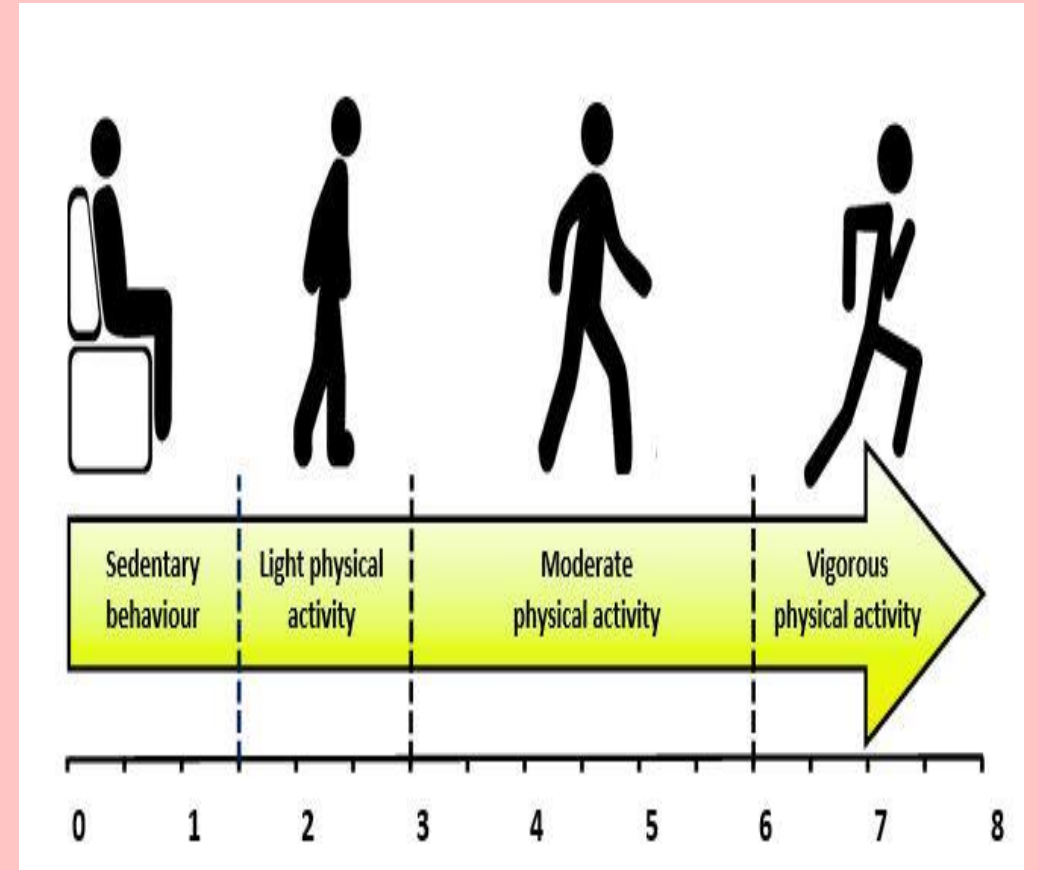
- Nicotine causes numerous problems for the developing brain, and many e-cigarette often containing higher concentrations of nicotine than combustible cigarettes. Exposure during adolescence has been linked to cognitive deficits as well as impairments in memory and executive function.
- flavoring chemicals and additives present their own danger. Testing has demonstrated different carcinogens in e-cigarettes including aldehydes, metals, and others.
- vapes containing cinnamaldehyde for cinnamon flavor were associated with impaired mucociliary function in bronchial epithelial cells.
- Biopsies from chronic vapers demonstrate structural changes in lung tissue.

Poor diet & Physical inactivity

- Physical activity provides fundamental health benefits for adolescents, including improved cardiorespiratory and muscular fitness, bone health, maintenance of a healthy body weight and psychosocial benefits.
- WHO recommends that adolescents engage in a weekly average of at least 60 minutes of moderate to vigorous physical activity per day
- Insufficient physical activity is common among adolescents in all WHO regions, and more common among female adolescents than among males



- WHO guidelines for physical activity and sedentary behavior recommend that school-age children and adolescents limit their sedentary time, particularly their recreational screen time
- Recreational screen time (defined as time spent watching screens) is one of the reasons for the high prevalence of both insufficient physical activity and disturbed sleep.



Poor diet & Physical inactivity

- Some of the key nutrition challenges during adolescence are malnutrition by deficit or excess and micronutrient deficiencies (such as deficiencies in iron, vitamin A or iodine).
- All these important threats to adequate nutrition may relate to socioeconomic circumstances, lifestyle, eating behaviors and underlying psychosocial factors.
- Many boys and girls in lower-income countries enter adolescence undernourished, making them more vulnerable to disease and early death.
- Iron deficiency anemia is the leading nutritional deficiency associated with adolescent morbidity.

- WHO describes overweight and obesity as one of the most serious public health challenges of the 21st century .
- Globally, in 2016 more than one in every 6 adolescents was overweight. Prevalence varied across WHO regions, from less than 10% in Southeast Asia to over 30% in the Americas.
- The wide variation across countries of overweight and obesity among adolescents may be due to differences in food quality and other health risk factors .

Adolescent Mental Health

- Mental health disorders are common during adolescence and are a major cause of illness, disability, and premature death.
- Untreated mental health problems can persist into adulthood, limiting physical health, social functioning, and life opportunities.
- Adolescence is marked by rapid physical, emotional, and social changes that increase sensitivity to mental health problems.
- Exposure to poverty, abuse, violence, stigma, and discrimination further elevates risk.
- Many mental health conditions remain unrecognized and untreated, worsening long-term outcomes.

Major Mental Health Conditions

Emotional disorders: particularly anxiety and depression, commonly emerge and impair education, relationships, and daily functioning.

Behavioral disorders: are more common among younger adolescents than older adolescents. Attention deficit hyperactivity disorder (ADHD), characterized by difficulty paying attention and/or excessive activity and acting without regard to consequences. Conduct disorder involve symptoms of destructive or challenging behaviors. Behavioral disorders can affect adolescents' education and increases the risk of criminal behavior.

Eating disorders: such as anorexia nervosa and bulimia nervosa, commonly emerge during adolescence and young adulthood. Eating disorders involve abnormal eating behavior and preoccupation with food, accompanied in most instances by concerns about body weight and shape. Girls are more commonly affected than boys. Eating disorders can affect physical health and often co-exist with depression, anxiety and substance use disorders. They are associated with suicide.

Major Mental Health Conditions

Suicide and Risk-Taking

- Suicide and self-harm are closely linked to substance use, childhood adversity, stigma, and barriers to care.
- Risk-taking behaviors often begin in adolescence and may reflect maladaptive coping, increasing harm and vulnerability.
- Digital media can either increase risk or support prevention, depending on use.

Thank you!

