موضوع مورنینگ:

- نحوه ارزیابی بلوغ در نوجوان دختر ۱۳ ساله در درمانگاه پزشکی خانواده

ارائه دهنده: پوریا بهارلوئی

استاد راهنما: دکتر درودیان

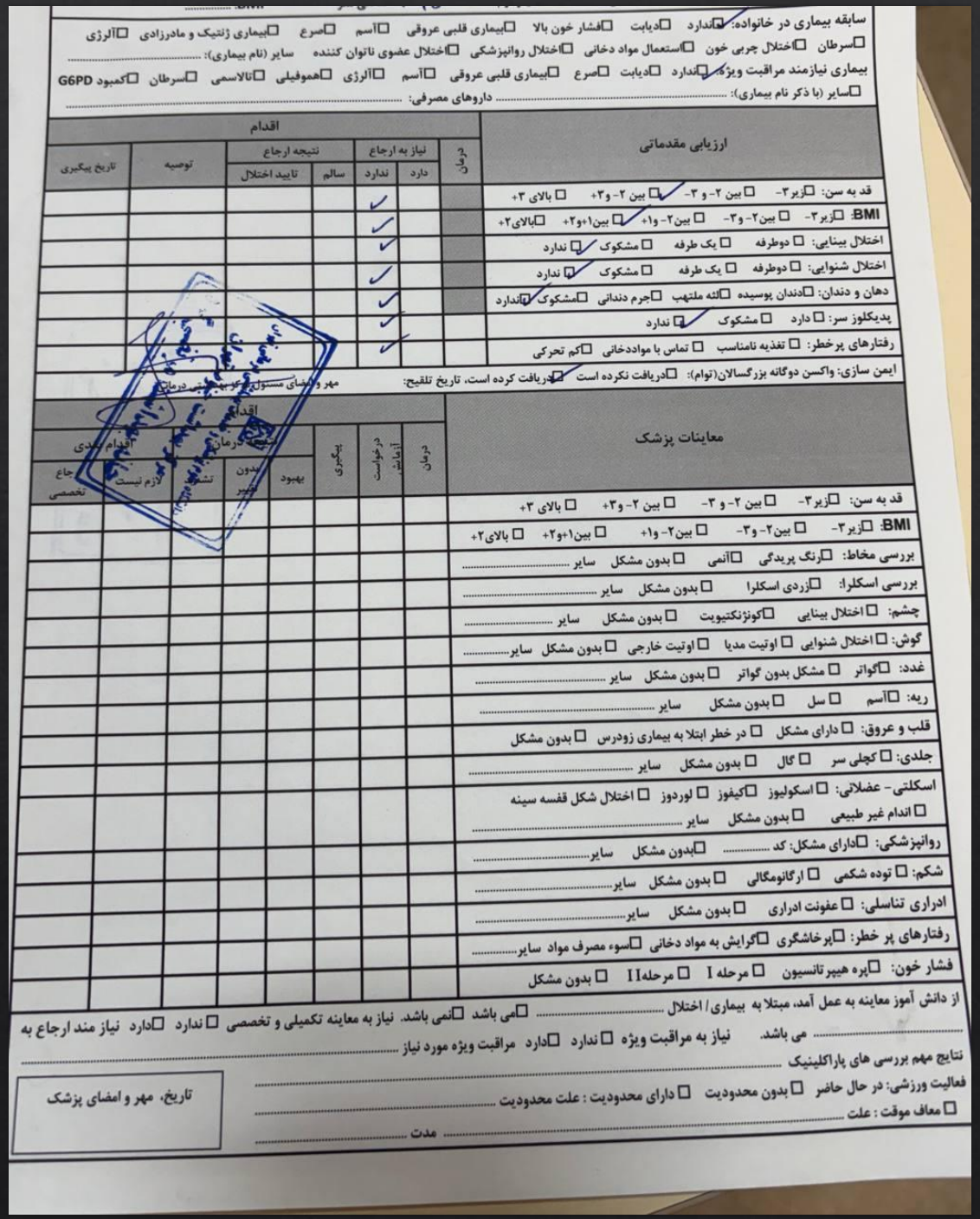
Chief Complaint:

- دختر ۱۳ ساله مراجعه به مرکز خدمات جامع سلامت جهت مراقبت و معاینات مدرسه پایه هفتم

Present Illness:

- دختر ۱۳ ساله فرزند دوم خانواده ۵ نفره دارای یک برادر ۵ ساله و یک خواهر ۱۴ ساله که با پدر و مادرش زندگی میکند جهت ورود به پایه هفتم تحصیلی با برگه ارزیابی سلامت و مراقبت مدارس به درمانگاه مراجعه کردند. تا کنون قاعدگی نداشته.
- PMH : -
- AH : -
- DH : -
- PSH : -
- FH : فشار خون در پدر

نمونه فرم مراقبت مدارس



سابقه بیماری در خانواده: ☐ندارد ☐دیابت ☐فشار خون بالا ☐بیماری قلبی عروقی ☐آسم ☐صرع ☐بیماری ژنتیک و مادرزادی ☐آلرژی
☐سرطان ☐اختلال چربی خون ☐استعمال مواد دخانی ☐اختلال روانپزشکی ☐اختلال عضوی ناتوان کننده سایر (نام بیماری): .....
بیماری نیازمند مراقبت ویژه: ☐ندارد ☐دیابت ☐صرع ☐بیماری قلبی عروقی ☐آسم ☐آلرژی ☐هموفیلی ☐تالاسمی ☐سرطان ☐کمبود G6PD
☐سایر (با ذکر نام بیماری): ..... داروهای مصرفی: .....

ارزیابی مقدماتی	اقدام: درمان	نیاز به ارجاع: دارد	نیاز به ارجاع: ندارد	نتیجه ارجاع: سالم	نتیجه ارجاع: تایید اختلال	توصیه	تاریخ پیگیری
قد به سن: ☐زیر۳- ☐بین ۲- و ۳- ☐بین ۲- و ۳+ ☐بالای ۳+			✓				
BMI: ☐زیر۳- ☐بین۲- و۳- ☐بین۲- و۱+ ☐بین۱+و۲+ ☐بالای۲+			✓				
اختلال بینایی: ☐دوطرفه ☐یک طرفه ☐مشکوک ☐ندارد			✓				
اختلال شنوایی: ☐دوطرفه ☐یک طرفه ☐مشکوک ☐ندارد			✓				
دهان و دندان: ☐دندان پوسیده ☐لثه ملتهب ☐جرم دندانی ☐مشکوک ☐ندارد			✓				
پدیکلوز سر: ☐دارد ☐مشکوک ☐ندارد			✓				
رفتارهای پرخطر: ☐تغذیه نامناسب ☐تماس با موادد‌خانی ☐کم تحرکی			✓				
ایمن سازی: واکسن دوگانه بزرگسالان(توام): ☐دریافت نکرده است ☐دریافت کرده است، تاریخ تلقیح:						مهر و امضای مسئول مربوطه جهت درمان	

معاینات پزشک	اقدام: درمان	در خواست آزمایش	پیگیری	نتیجه درمان: بهبود	نتیجه درمان: بدون تغییر	نتیجه درمان: تشدید	اقدام بعدی: لازم نیست	اقدام بعدی: جا تخصصی
قد به سن: ☐زیر۳- ☐بین ۲- و ۳- ☐بین ۲- و۳+ ☐بالای ۳+								
BMI: ☐زیر۳- ☐بین۲- و۳- ☐بین۲- و۱+ ☐بین۱+و۲+ ☐بالای۲+								
بررسی مخاط: ☐رنگ پریدگی ☐آنمی ☐بدون مشکل سایر								
بررسی اسکلرا: ☐زردی اسکلرا ☐بدون مشکل سایر								
چشم: ☐اختلال بینایی ☐کونژنکتیویت ☐بدون مشکل سایر								
گوش: ☐اختلال شنوایی ☐اوتیت مدیا ☐اوتیت خارجی ☐بدون مشکل سایر.....								
غدد: ☐گواتر ☐مشکل بدون گواتر ☐بدون مشکل سایر								
ریه: ☐آسم ☐سل ☐بدون مشکل سایر								
قلب و عروق: ☐دارای مشکل ☐در خطر ابتلا به بیماری زودرس ☐بدون مشکل								
جلدی: ☐کچلی سر ☐گال ☐بدون مشکل سایر								
اسکلتی- عضلانی: ☐اسکولیوز ☐کیفوز ☐لوردوز ☐اختلال شکل قفسه سینه ☐اندام غیر طبیعی ☐بدون مشکل سایر								
روانپزشکی: ☐دارای مشکل: کد ..... ☐بدون مشکل سایر.....								
شکم: ☐توده شکمی ☐ارگانومگالی ☐بدون مشکل سایر.....								
ادراری تناسلی: ☐عفونت ادراری ☐بدون مشکل سایر.....								
رفتارهای پر خطر: ☐پرخاشگری ☐گرایش به مواد دخانی ☐سوء مصرف مواد سایر.....								
فشار خون: ☐پره هیپرتانسیون ☐مرحله I ☐مرحله II ☐بدون مشکل								

از دانش آموز معاینه به عمل آمد، مبتلا به بیماری/ اختلال ..... ☐می باشد ☐نمی باشد. نیاز به معاینه تکمیلی و تخصصی ☐ندارد ☐دارد نیاز مند ارجاع به ..... می باشد. نیاز به مراقبت ویژه ☐ندارد ☐دارد مراقبت ویژه مورد نیاز .....
نتایج مهم بررسی های پاراکلینیک .....
فعالیت ورزشی: در حال حاضر ☐بدون محدودیت ☐دارای محدودیت : علت محدودیت .....
☐معاف موقت : علت ..... مدت .....

تاریخ، مهر و امضای پزشک

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی تهران
مرکز بهداشت جنوب تهران

بسمه تعالی

تاریخ:۱۴۰۴/۰۵/۱۳
شماره:۱٤۰٤/۱۱/۱۲/٤۰٤۳
پیوست: ندارد
ساعت: ۱۱:۱۸

سرپرست محترم مرکز خدمات جامع سلامت شهری/روستایی

با سلام و احترام

پیرو نامه معاونت محترم بهداشت در تاریخ ۱۴۰۴ /۰۵/۱۳به شماره۱۴۰۴/۱۱/۵۴/۲۰۸۹درخصوص معاینات دوره ای دانش‌آموزان، بدینوسیله به اطلاع می‌رساند معاینات پزشکی دانش آموزان گروه هدف (پایه‌های اول، چهارم، هفتم و دهم) براساس بسته خدمت رایگان می‌باشد. خواهشمند است سرپرستان محترم مراکز خدمات جامع سلامت اطلاع رسانی لازم به پزشکان در این خصوص را به عمل آورند.

دکتر محمدرضا سلمانی ندوشن
رئیس مرکز بهداشت جنوب تهران

#qrcode#

ادرس : خیابان انقلاب ـ خیابان وصال شیرازی ـ نرسیده به خیابان طالقانی ـ کوچه شهید عباس شفیعی پلاک ۲
تلفن : ٤-٦٦٩٧٨٢٠١ فکس :٦٦٩٧٨٠٥٣ادرس الکترونیک : http://sthn.tums.ac.ir
ECE :shabakebehdasht-jonob @sina.tums.ac.ir

Physical Exam:

- دختر با general appearance نرمال که در بررسی های انجام شده:
- سمع قلب و ریه نرمال
- وزن ۵۷ کیلو
- قد ۱۵۵ سانتی متر
- معاینه برست : stage 1 در حد جوانه پستان
- معاینه pubic hair در حد stage 2
- موی زائد صورت و چانه ندارد
- بررسی musculoskeletal نرمال

اقدامات و ارزیابی های بالینی:

- **شرح حال و بررسی خانوادگی:** توجه به تأخیر یا تسریع بلوغ در خانواده، بیماریهای مزمن، تغذیه، فعالیت ورزشی شدید یا مصرف داروها.
- **معاینه فیزیکی دقیق:** ارزیابی تانر، قد، وزن، نسبت قد به سن و شاخص توده بدنی.
- **ارزیابی دستگاه تناسلی:** در دختران فقط اگر جنسی فعال وجود دارد معاینه واژینال انجام شود.
- **بررسی تغییرات پوستی:** جوش، پرمویی، آکنه شدید یا هیپرتریکوز ممکن است نشانه اختلال اندروژنی باشد.
- **ارزیابی رشد استخوانی:** معمولاً با رادیوگرافی مچ دستِ چپ.
- **در صورت شک به اختلال بلوغ:** تستهای آزمایشگاهی هورمونی (LH, FSH, استرادیول، تستوسترون)، تست تحریک GnRH و در مواردی تصویربرداری مغز

INTRODUCTION

- Puberty refers to the physical changes that occur during adolescence. There is also significant cognitive and psychosocial maturation during this time. The physical changes that occur during puberty include growth in stature, changes in body composition, development of secondary sex characteristics, achievement of fertility, and changes in most organ systems.
- **Pubertal physiology** – There are two main physiological events in puberty:
- •**Gonadarche** is the increase in activity of the hypothalamic-pituitary-gonadal axis.
- •**Adrenarche** is the increase in production of androgens by the adrenal cortex.

Pubertal events

- •**Thelarche** is the appearance of breast tissue, which is primarily due to the action of estradiol from the ovaries.
- •**Menarche** is the first episode of menstrual bleeding. This is usually not associated with ovulation; it is typically caused solely by the effects of estradiol on the endometrial lining. Menstrual bleeding with regular ovulatory cycles is initiated by the interaction of estradiol and progesterone produced by the ovaries.
- •**Spermarche** is the first sperm production, which is due to the combined effects of follicle-stimulating hormone, which acts directly on the seminiferous tubules, and luteinizing hormone, which acts indirectly by stimulating high intratesticular concentrations of testosterone.
- •**Pubarche** is the appearance of pubic hair, which is primarily due to an increase in production of androgens from the adrenal gland (adrenarche). The term is also applied to the first appearance of axillary hair, apocrine body odor, and acne.

FACTORS INFLUENCING PUBERTAL TIMING

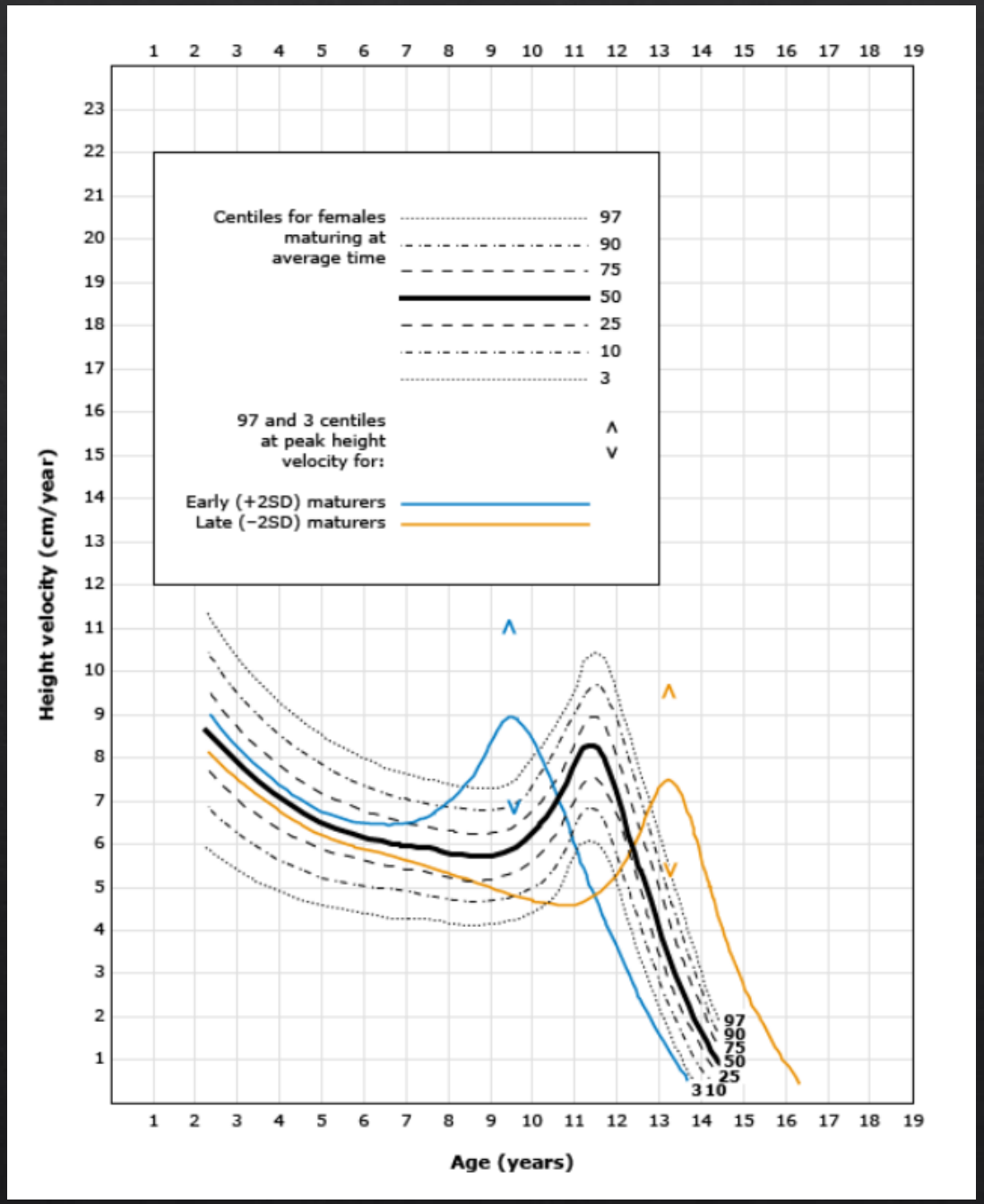
- **Genetic factors:** account for an estimated 50 to 75 percent of the variation in normal pubertal timing. Several genetic loci have now been identified that are associated with age of pubertal onset. A large genome-wide study including more than 370,000 adult **females** identified common variants or single-nucleotide polymorphisms at 389 genetic loci that were associated with age at menarche. A comparable genome-wide association study of timing of male pubertal hallmarks in over 205,000 adult males identified 76 genetic loci associated with male pubertal timing.
- **Body weight:** For children assigned female at birth, obesity or being overweight is associated with earlier pubertal onset and/or pubertal progression. However, for those assigned male at birth, the relationship between pubertal onset and obesity is not clear.
- **race/ethnicity**
- Other factors: overall health (with poor health associated with delayed pubertal onset), social environment (such as family stress or the presence of a nonbiologically related adult male in the household, which are associated with earlier pubertal onset), and high altitude (associated with later pubertal onset)

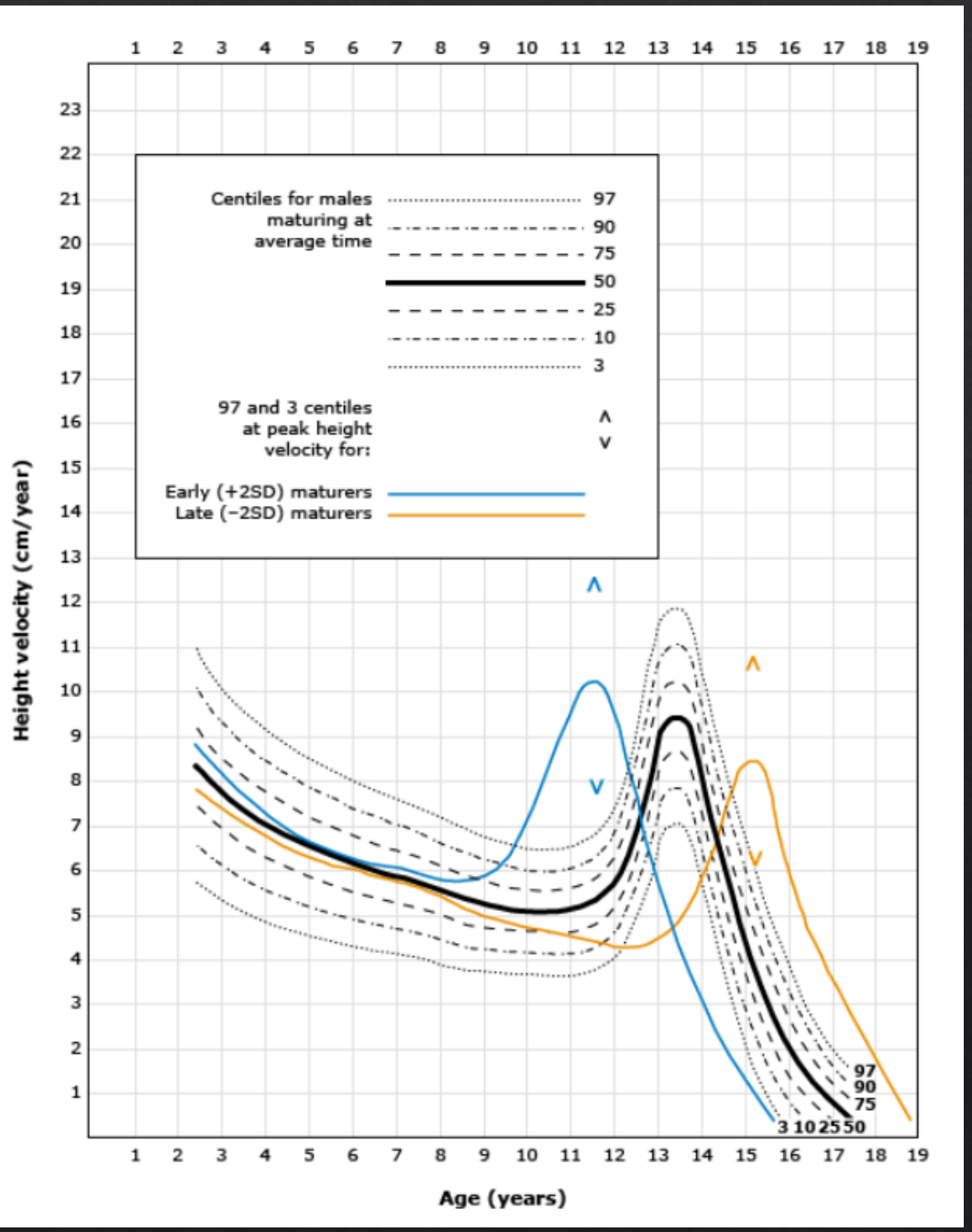
PUBERTAL CHANGES

- **Tanner stages:** also known as Sexual Maturity Rating (SMR), is a system used to assess and track the development of secondary sex characteristics during puberty. It was developed by James Tanner and colleagues through a longitudinal study in England. The staging system objectively classifies pubic hair and genital development in males, and breast and pubic hair development in females.
- **Linear growth spurt:** Approximately 20 percent of adult height is accrued during puberty. The increase in height occurs in both axial (trunk) and appendicular (limb) components. The limbs accelerate before the trunk, with the distal portions of the limbs accelerating before the proximal portions; thus, the adolescent in early puberty is "all hands and feet." In later puberty, however, the growth spurt is primarily truncal. The linear growth spurt typically lasts for approximately two years.

راهنمای روند بلوغ طبیعی

مرحله SMR	طبقه بندی مراحل بلوغ جنسی در دختران		مرحله SMR	طبقه بندی مراحل بلوغ جنسی در پسران		
	موهای زهار	پستان		موهای زهار	پنیس	بیضه ها
۱	قبل از بلوغ	قبل از بلوغ	۱	وجود ندارد	قبل از بلوغ	قبل از بلوغ
۲	کم پشت، کم رنگ، لبه داخلی لابیا صاف	پستان و پاپیلا به صورت گوی کوچک برآمـــــده می شوند، افزایش قطر آرئول	۲	کم پشت، دراز، کم رنگ	بزرگی مختصر	بزرگ تر، بزرگی اسکروتوم، رنگ صورتی، تغییر طرح پوست
۳	رنگ تیره، شروع به حلقوی شدن، مقدار موها کم	بزرگ شدن پستـــــان و آرئول، بدون واضح شدن حدود پستان	۳	رنگ تیره تر، شروع به حلقوی شدن، مقدار موها کم	طول بزرگ تر	بزرگ تر
۴	حلقوی شدن و افزایش مقدار، موها خشن، مجعد، فراوان ولی کم تر از بالغین	آرئول و پاپیلا جوانه ثانویه را تشکیل می دهند.	۴	شبیه بزرگسالان ولی کم مقدار، خشن، مجعد	بزرگ تر، افزایش اندازه گلنس و عرض پنیس	بزرگ تر، اسکروتوم تیره رنگ
۵	مثلث زنانه به فـــرم بالغیـــن و گسترش به طرف سطـوح داخلی ران	به فـــرم کامل رسیدن، برآمده شـــدن نیپل، آرـــئول بخشی از ته پستان می شود	۵	توزیع مثل بزرگسالان، گسترش به سطح داخلی ران	اندازه بالغین	اندازه بالغین


Centiles for females maturing at average time
97
90
75
50
25
10
3
97 and 3 centiles at peak height velocity for:
Early (+2SD) maturers
Late (−2SD) maturers
Height velocity (cm/year)
Age (years)


Centiles for males maturing at average time
97
90
75
50
25
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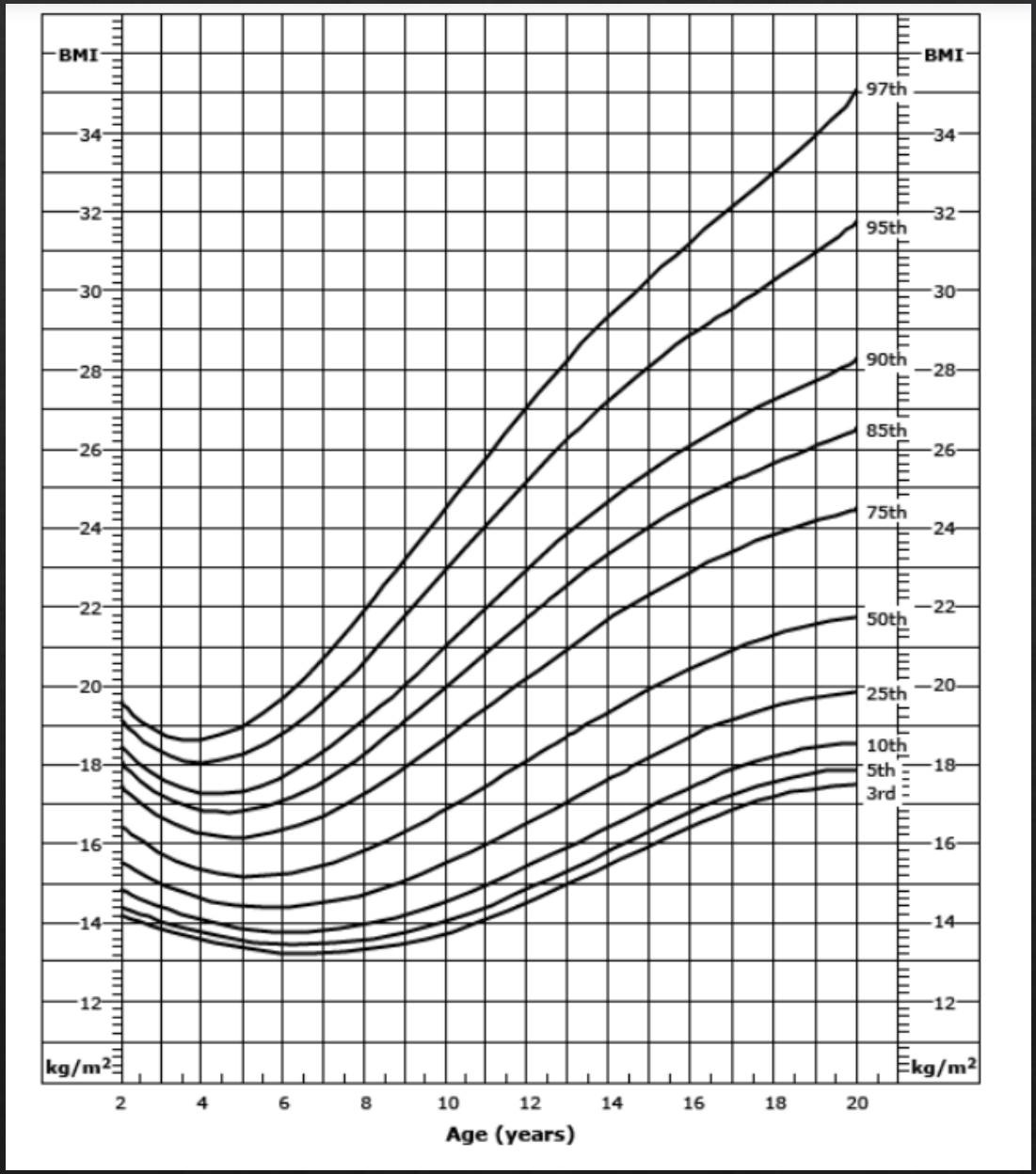
3
97 and 3 centiles at peak height velocity for:
Early (+2SD) maturers
Late (−2SD) maturers
Height velocity (cm/year)
Age (years)

- **Bone mineralization and growth** — Bone growth accelerates during puberty in concert with height velocity, but bone mineralization initially lags behind. Bone growth occurs first in length, followed by width, then mineral content, and finally bone density. The disparity in the timing of bone growth and mineralization may place the growing adolescent at increased risk for fractures. The risk for osteoporosis during adulthood is associated with the timing of puberty. This suggests that there may be a narrow age window of opportunity for pubertal changes to exert maximal effects on peak bone mass. Possible effects of certain hormonal contraceptives on peak bone mass are discussed separately.
- **Weight and body composition** — Puberty is associated with significant changes in body weight and alterations in body composition, especially in lean body mass and the proportion of body fat (adiposity), with different patterns in assigned females compared with assigned males. Growth curves for body mass index (BMI) reflect the typical increase in body mass that occurs during puberty but do not reflect the differences between early-maturing and late-maturing children, nor do they distinguish between changes in lean body mass versus adipose tissue. In early puberty, the increase in BMI is driven primarily by changes in lean body mass. Later in puberty, the increase in BMI tends to be driven by increases in fat mass, with fat mass contributing more to BMI increases in assigned females than assigned males.


BMI
BMI
97th
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85th
75th
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25th
10th
5th
3rd
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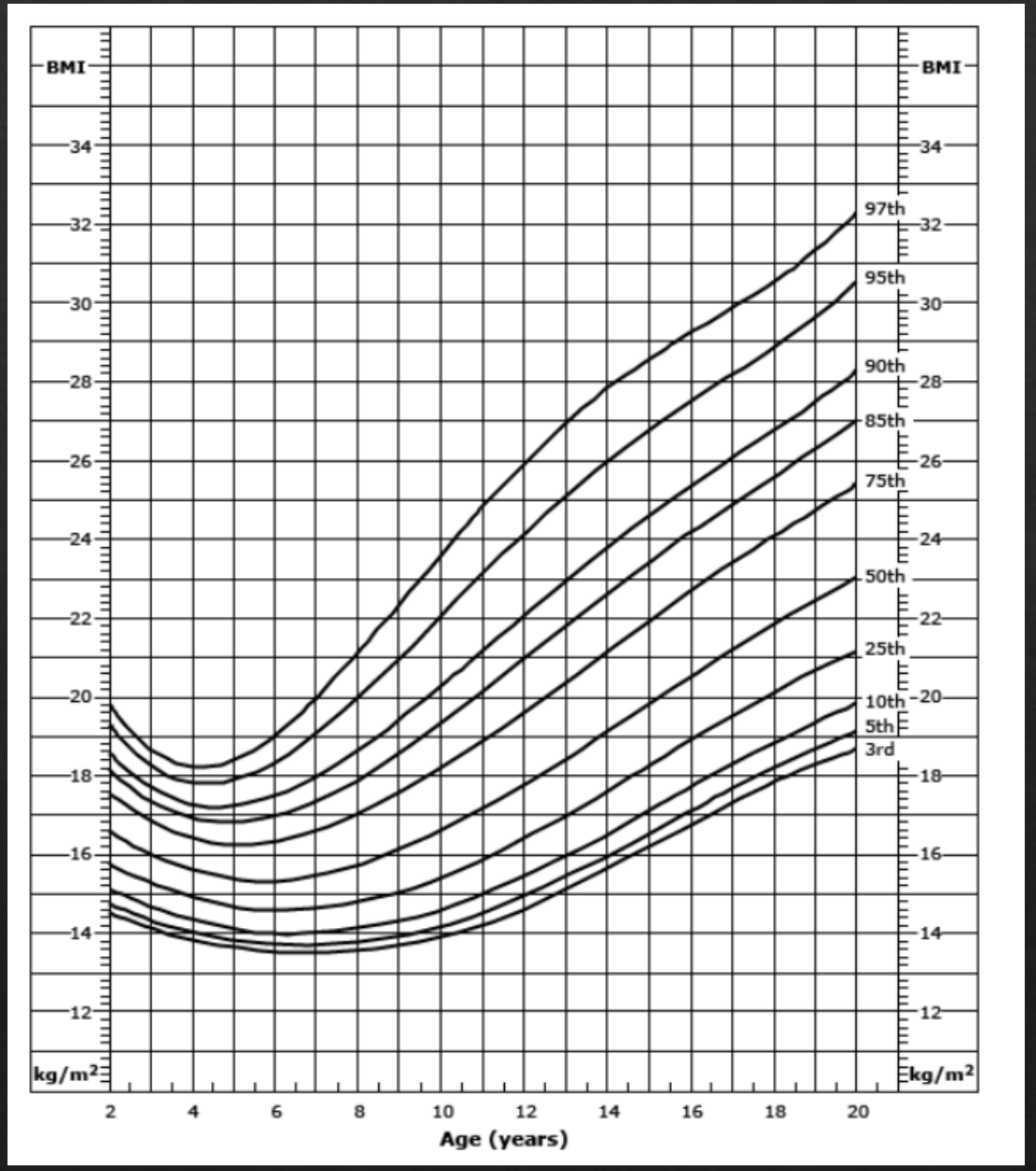
32
30
28
26
24
22
20
18
16
14
12
kg/m²
kg/m²
2
4
6
8
10
12
14
16
18
20
Age (years)


BMI
BMI
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16
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12
kg/m²
kg/m²
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18
20
Age (years)

Changes in children assigned female at birth

- the earliest detectable secondary sex characteristic in most assigned females is breast/areolar development (thelarche) that occurs on average at age 9.3 years. However, 15 to 30 percent develop pubic hair first (pubarche).
- Longitudinal studies from 2000 through 2010 in a large multiethnic cohort of American adolescents reported that the mean age at thelarche varied by race and ethnicity: 8.8 years in Black children, 9.2 years in Hispanic children, 9.6 years in White non-Hispanic children, and 9.9 in Asian children.
- Physiologic leukorrhea, a thin, white, non-foul-smelling vaginal discharge, also typically begins 6 to 12 months before menarche and is caused by estrogen stimulation of the vaginal mucosa.
- Menarche occurs, on average, 2.6 years after thelarche. In a longitudinal cohort study, the mean age for menarche was 12.2 years and varied by race and ethnicity: 11.8 years in Black children, 11.6 years in Hispanic children, 12.0 years in Asian children, and 12.5 years in White non-Hispanic children. Variation in BMI accounted for 11 percent of the variance, and race/ethnicity accounted for 6 percent.

Changes in children assigned male at birth

- The earliest detectable secondary sex characteristic on physical examination in assigned males is an increase in testicular volume, which typically occurs between approximately 9 and 13 years and precedes penile growth and appearance of pubic hair by approximately six months. Before puberty, testicular volumes are typically 2 mL (or lower, in younger children). While a testicular volume of 3 mL generally indicates that puberty has started. Testicular volume is typically estimated using the Prader orchidometer, a series of three-dimensional ellipsoids with volumes from 1 to 25 mL or more.
- Penile length increases during Tanner stages 2 and 3; width begins to increase during Tanner stage 3 and continues through the remainder of puberty.
- Penile length is measured using a straight edge on the dorsal surface in the nonerect state from the pubic ramus to the tip of the glans while compressing the suprapubic fat pad and applying gentle traction to the penis. This measurement is rarely used to monitor pubertal progress because penile growth is not an early event in puberty and accurate measurement is difficult and may be awkward for the adolescent.
- Although there is some temporal variation in the appearance and progression of testicular volume, penile growth, and pubic hair development, a clear discrepancy between these physical findings may indicate a pathologic condition. For example, a finding of low testicular volumes in a fully virilized adolescent may be a sign of Klinefelter syndrome or inappropriate use of exogenous androgens.
- Height velocity begins to increase shortly before testicular enlargement and peaks, on average, two to three years later.

Prader orchidometer

Trends in pubertal timing

- Since the mid-1800s, there has been a clear decrease in age at menarche in industrialized countries; this trend has been attributed to improvements in health and nutrition and was thought to have plateaued in the mid-1900s. However, demographic studies over the last several decades have indicated a continued (albeit slower) trend towards earlier pubertal onset, with larger changes in assigned females than in assigned males. This trend has captured the attention of the lay press, which often exaggerates the findings and/or conflates events that occur in early versus late puberty, such as thelarche versus menarche. While several factors are known to influence pubertal timing, the precise physiologic determinants of pubertal timing and the reason for these trends remain unclear. Factors that may contribute to these trends include endocrine-disrupting chemicals, nutrient intake, and obesity.

Identifying precocious and delayed puberty

- **Precocious puberty** – Precocious puberty is usually defined as breast development prior to eight years of age in assigned females and testicular enlargement before the age of nine years in assigned males.

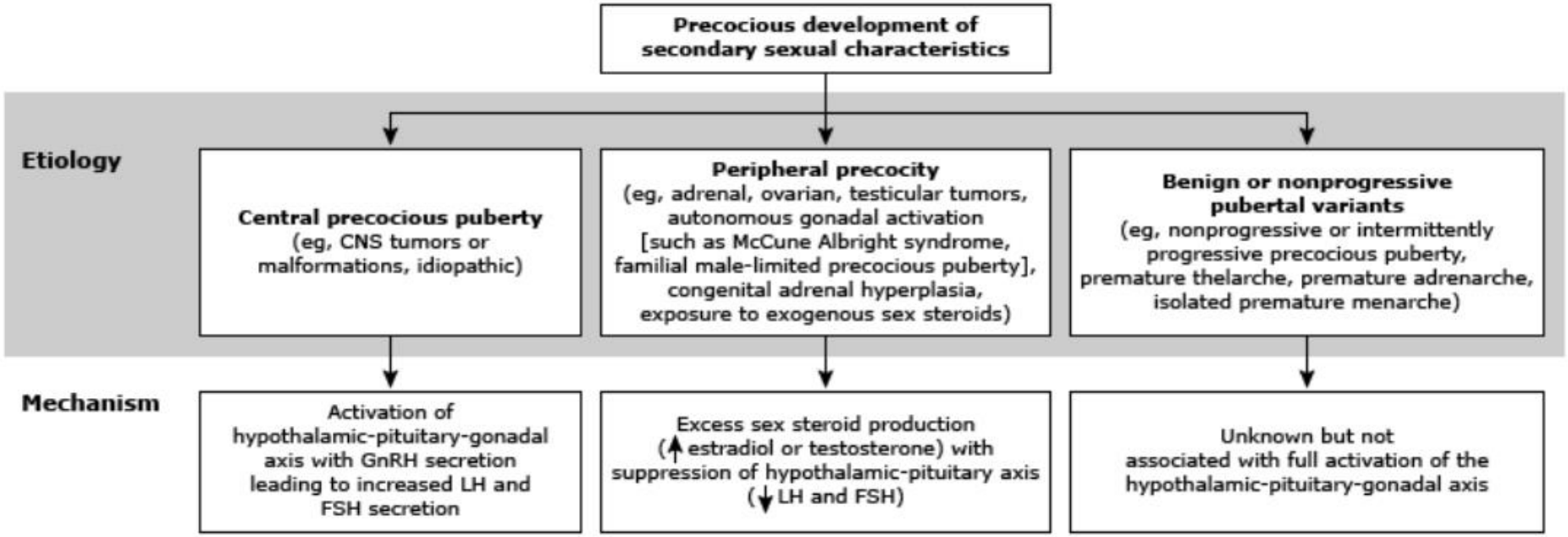
The trend toward earlier onset of puberty in assigned females has important implications for the diagnosis of precocious puberty. In the United States, it has been suggested that a threshold of seven years for thelarche in White children and six years in Black children be used for initiating an evaluation for precocious puberty. However, concerns have been raised that following these suggestions may lead to underdiagnosis of pathological disorders.

- **Delayed puberty** – Delayed puberty is usually defined as lack of breast development by 12 to 13 years of age in assigned females and lack of testicular enlargement by 13 to 14 years of age in assigned males.

Precocious puberty

- **Initial evaluation** – The first step is a focused history and physical examination with pubertal staging. If this evaluation confirms advanced or progressive development of secondary sexual characteristics, additional evaluation is warranted.

Etiology and mechanisms of precocious puberty



CNS: central nervous system; GnRH: gonadotropin-releasing hormone; LH: luteinizing hormone; FSH: follicle-stimulating hormone.

Clinical and laboratory characteristics of different forms of early pubertal development

	Nonprogressive precocious puberty	Central precocious puberty	Peripheral precocity
Physical examination: Advancement through pubertal stages (Tanner stage)	No progression in Tanner staging during 3 to 6 months of observation	Progression to next pubertal stage in 3 to 6 months	Progression
Growth velocity	Normal for bone age	Accelerated (>6 cm per year)*	Accelerated*
Bone age	Normal to mildly advanced	Advanced for height age	Advanced for height age
Serum estradiol concentration (females)[¶]	Prepubertal[Δ]	Prepubertal to pubertal	Increased in ovarian causes of peripheral precocity or with exogenous estrogen exposure
Serum testosterone concentration (males, or females with virilization)[¶]	Prepubertal[Δ]	Prepubertal to pubertal	Pubertal and increasing
Basal (unstimulated) serum LH concentration[¶]	Prepubertal[Δ ◇]	Pubertal[◇]	Suppressed or prepubertal[◇]
GnRH (or GnRH agonist) stimulation test[¶]	LH peak in the prepubertal range[Δ §] Lower stimulated LH:FSH ratio[¥]	LH peak elevated (in the pubertal range)[§] Higher stimulated LH:FSH ratio[¥]	No change from baseline or LH peak in the prepubertal range

CPP: central precocious puberty; LH: luteinizing hormone; GnRH: gonadotropin-releasing hormone; FSH: follicle-stimulating hormone.

* **Unless** the patient has concomitant growth hormone deficiency (as in the case of a neurogenic form of CPP) or has already passed their peak height velocity at the time of evaluation, in which case, growth velocity may be normal or decreased for chronologic age.

Imaging in **Precocious puberty**

Recommendations for imaging depend on the type of precocious puberty:

- •**CPP** – All males with CPP should have brain MRI because of the high prevalence of central nervous system (CNS) lesions in this group. Brain MRI should also be performed in all females with onset of CPP before six years of age; there is ongoing controversy about the need for routine imaging of females with CPP onset between six and eight years of age.
- •**Peripheral precocious puberty** – Males with peripheral precocious puberty may warrant an ultrasound examination of the testes to evaluate for the possibility of a Leydig cell tumor. Females with peripheral precocious puberty may warrant a pelvic ultrasound performed to help identify the presence of an ovarian cyst or tumor.
- In females and males, peripheral precocious puberty and progressive virilization and/or markedly elevated serum adrenal androgens (eg, DHEAS) occasionally is caused by an adrenal tumor. If other diagnoses such as congenital adrenal hyperplasia and exogenous androgen or testosterone exposure have been excluded, such patients should have an ultrasound or computed tomography (CT) of the adrenal glands.

Delayed Puberty

- **Definition** – Delayed puberty is defined clinically by the absence or incomplete development of secondary sex characteristics by 12 to 13 years of age in females and 13 to 14 years of age in males.
- ●**Causes** – Delayed puberty is caused by inadequate production of gonadal hormones (estradiol or testosterone). This may be due to abnormalities of the gonad (primary hypogonadism) or inadequate production of luteinizing hormone (LH) and follicle-stimulating hormone (FSH; secondary hypogonadism)

Causes of delayed puberty

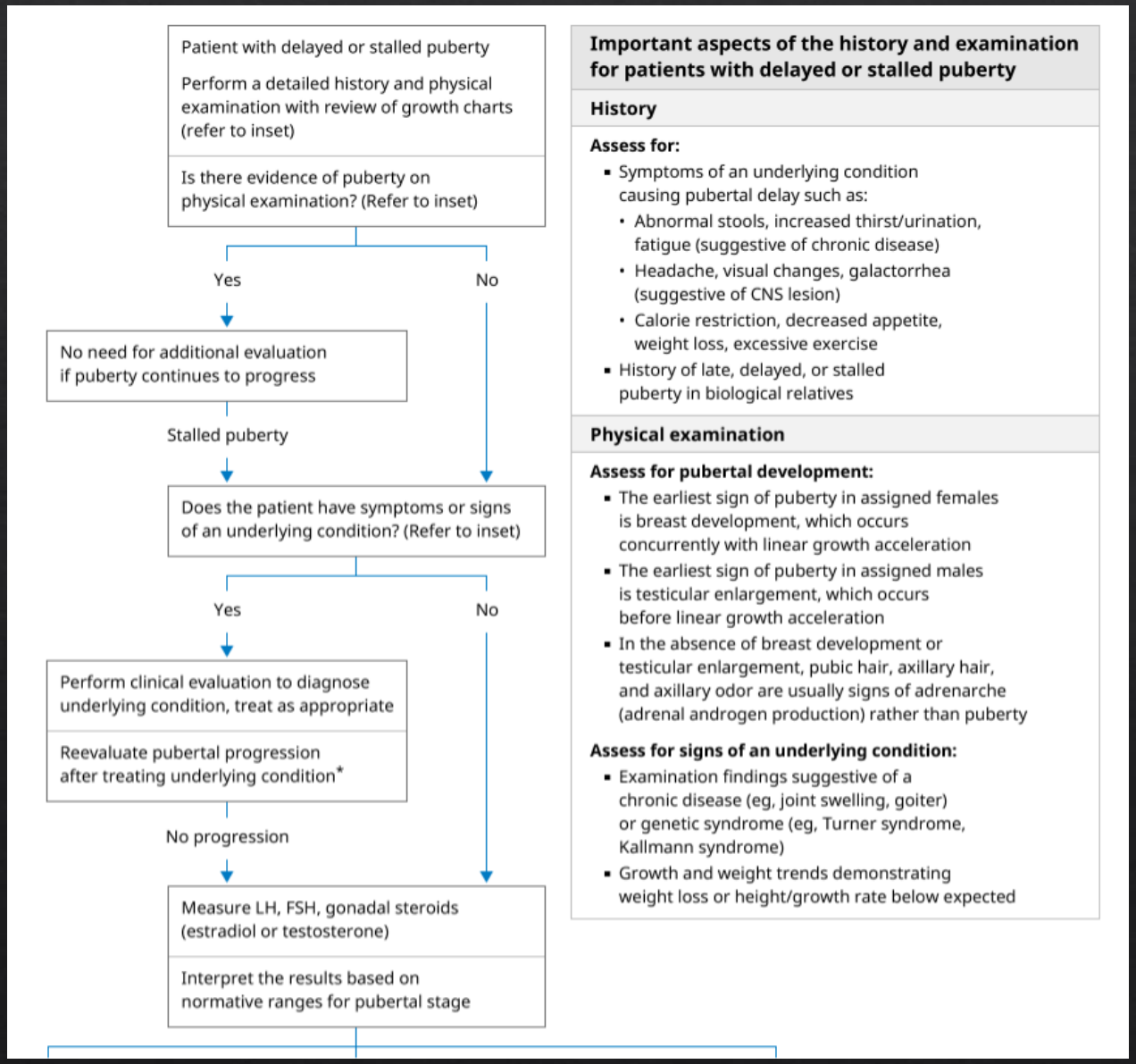
Primary hypogonadism – High FSH and LH
Congenital
Chromosomal abnormalities (Turner syndrome – 45,XO; Klinefelter syndrome – 47,XXY)
Anorchia (vanishing testis)
Acquired
Autoimmune or postinfectious
Following trauma or surgery
Chemotherapy, radiation therapy

Secondary hypogonadism – Low to normal FSH and LH

Acquired
Tumors
Benign tumors and cysts
Craniopharyngiomas
Germinomas, meningiomas, gliomas, astrocytomas
"Functional" gonadotropin deficiency
Constitutional delay of growth and puberty
Chronic systemic disease
Acute illness
Malnutrition
Hypothyroidism, hyperprolactinemia, diabetes mellitus, Cushing's disease
Anorexia nervosa, bulimia
Infiltrative diseases
Hemochromatosis
Granulomatous diseases
Histiocytosis
Head trauma
Pituitary apoplexy
Drugs – Marijuana

Congenital
Isolated GnRH deficiency (also known as idiopathic hypogonadotropic hypogonadism)
Without anosmia
With anosmia (Kallmann syndrome)
Associated with adrenal hypoplasia congenita
GnRH deficiency associated with intellectual disability/obesity
Laurence-Moon-Biedl syndrome
Prader-Willi syndrome
Idiopathic forms of multiple anterior pituitary hormone deficiencies
Congenital brain malformations causing GnRH or gonadotropin deficiencies (often associated with craniofacial anomalies)

Initial evaluation of delayed or stalled puberty



Important aspects of the history and examination for patients with delayed or stalled puberty

History

Assess for:

- Symptoms of an underlying condition causing pubertal delay such as:
  - Abnormal stools, increased thirst/urination, fatigue (suggestive of chronic disease)
  - Headache, visual changes, galactorrhea (suggestive of CNS lesion)
  - Calorie restriction, decreased appetite, weight loss, excessive exercise
- History of late, delayed, or stalled puberty in biological relatives

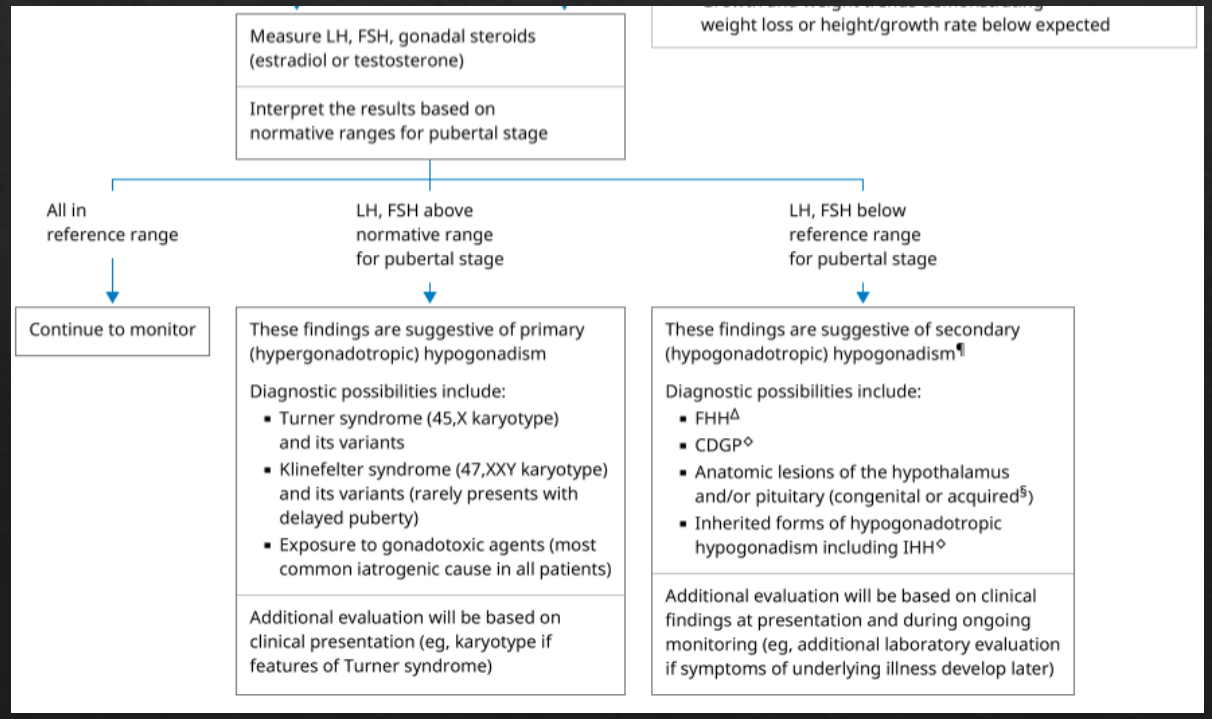
Physical examination

Assess for pubertal development:

- The earliest sign of puberty in assigned females is breast development, which occurs concurrently with linear growth acceleration
- The earliest sign of puberty in assigned males is testicular enlargement, which occurs before linear growth acceleration
- In the absence of breast development or testicular enlargement, pubic hair, axillary hair, and axillary odor are usually signs of adrenarche (adrenal androgen production) rather than puberty

Assess for signs of an underlying condition:

- Examination findings suggestive of a chronic disease (eg, joint swelling, goiter) or genetic syndrome (eg, Turner syndrome, Kallmann syndrome)
- Growth and weight trends demonstrating weight loss or height/growth rate below expected



Management of delayed puberty

- The approach to management is based on the suspected cause of delayed puberty.
- •**Most forms of secondary hypogonadism (transient)** – The most common forms of secondary hypogonadism are transient. In these cases, endogenous puberty will occur after appropriate management.

-**FHH** – When delayed puberty is thought to be a result of underlying illness or undernutrition, the diagnosis is FHH. Treatment is directed at addressing the underlying condition.

-**Suspected CDGP** – For adolescents with suspected CDGP, the two primary management options are supportive monitoring ("watchful waiting") or short-term therapy with sex steroids (testosterone [in males] or estradiol [in females]). Decisions about management should be made only after a discussion addressing patients' and caregivers' goals and the likelihood that each intervention will achieve the desired outcomes.

-Supportive management (watchful waiting) over time is a reasonable option for most younger adolescents (eg, <14 years for males and <13 years for females) and older adolescents who are not experiencing distress.

-For adolescent males ≥14 years and females ≥13 years with suspected CDGP who have had no pubertal progression after 6 to 12 months of supportive monitoring (or stalled puberty) and ongoing psychosocial distress that cannot be alleviated with behavioral health interventions, we suggest short-term therapy with testosterone (in males) or estradiol (in females) (**Grade 2C**). Treatment should be conducted under the supervision of a pediatric endocrinologist.

These medications will lead to the development of some secondary sex characteristics. Referral to a pediatric endocrinologist is also warranted if endogenous puberty has not begun by age 16 in males or 15 in females.

- •**Primary hypogonadism and permanent forms of secondary hypogonadism** – Permanent forms of hypogonadism require testosterone or estradiol therapy to induce puberty and then maintain adult levels of testosterone or estradiol. Ongoing treatment is needed to minimize sequelae of hypogonadism (eg, osteoporosis). Females also will require cyclic progesterone.

سطوح پیشگیری

Primordial Prevention

Primary Prevention

Secondary Prevention

Tertiary Prevention

Quaternary Prevention

1. Primordial Prevention

- جلوگیری از ایجاد عوامل خطر در سطح جامعه قبل از به وجود آمدن مشکل یا ریسک
- آموزش به والدین در مورد تغذیه سالم کودکان (پیشگیری از چاقی → بلوغ زودرس).
- فرهنگ‌سازی در جامعه برای جلوگیری از استرس‌های مزمن در کودکان (کاهش ریسک اختلالات محور هیپوتالاموس-هیپوفیز).
- ارتقای سبک زندگی سالم (ورزش متعادل، خواب کافی).
- جلوگیری از قرار گرفتن زودرس کودکان در معرض محتوای جنسی رسانه‌ها.
- جلوگیری از مصرف مواد مخدر، سیگار یا الکل در نوجوانان (اثر روی بلوغ).

2. Primary Prevention

- عوامل خطر وجود دارند ولی هنوز بیماری/اختلال بروز نکرده.
- واکسیناسیون HPVدر سن مناسب (پیشگیری از مشکلات آینده در سلامت جنسی).
- آموزش به نوجوانان در مورد تغییرات طبیعی بلوغ (کاهش اضطراب، پیشگیری از اختلال تصویر بدنی).
- غربالگری و مدیریت اضافه‌وزن یا سوءتغذیه در کودکان (برای جلوگیری از بلوغ زودرس یا تأخیری).
- مشاوره به والدین در مورد حمایت عاطفی از نوجوان.
- آموزش به نوجوان در مورد بهداشت جنسی و فردی (پیشگیری از رفتارهای پرخطر).

3. Secondary Prevention

- تشخیص زودهنگام و درمان به‌موقع مشکلات بلوغ.
- غربالگری اختلالات رشد و بلوغ (بلوغ زودرس، بلوغ دیررس، اختلالات قاعدگی، ژنیکوماستی پسران).
- ارجاع به متخصص در صورت مشکوک بودن به مشکلات غددی (مانند هیپوگونادیسم یا PCOS).
- پیگیری دوره‌ای قد و وزن، Tanner stagingدر ویزیت‌های سلامت.
- مداخلات به‌موقع برای اصلاح کمبود ویتامین Dیا آهن.

4. Tertiary Prevention

- هدف کاهش عوارض و بهبود کیفیت زندگی وقتی بیماری یا اختلال ایجاد شده
- درمان دارویی یا هورمونی اختلالات بلوغ (مثل GnRHآنالوگ در بلوغ زودرس).
- حمایت روانی و مشاوره برای نوجوانانی که به‌خاطر اختلالات بلوغ دچار اضطراب یا افسردگی شده‌اند.
- توان‌بخشی جسمی و روانی (مثلاً در نوجوانان با اختلالات ژنتیکی و مشکلات باروری).
- آموزش خانواده‌ها برای حمایت و کاهش استیگما.

5. Quaternary Prevention

- جلوگیری از مداخلات غیرضروری پزشکی و آسیب ناشی از پزشکی‌سازی بیش‌ازحد.
- پرهیز از تجویز غیرضروری هورمون‌ها یا مکمل‌ها در نوجوان سالم.
- اجتناب از انجام تست‌های آزمایشگاهی و تصویربرداری بی‌مورد در بلوغ طبیعی.
- آموزش والدین که تفاوت‌های فردی در سن شروع بلوغ طبیعی هستند.
- پرهیز از برچسب‌زنی یا ایجاد اضطراب غیرلازم در خانواده‌ها.

با تشکر