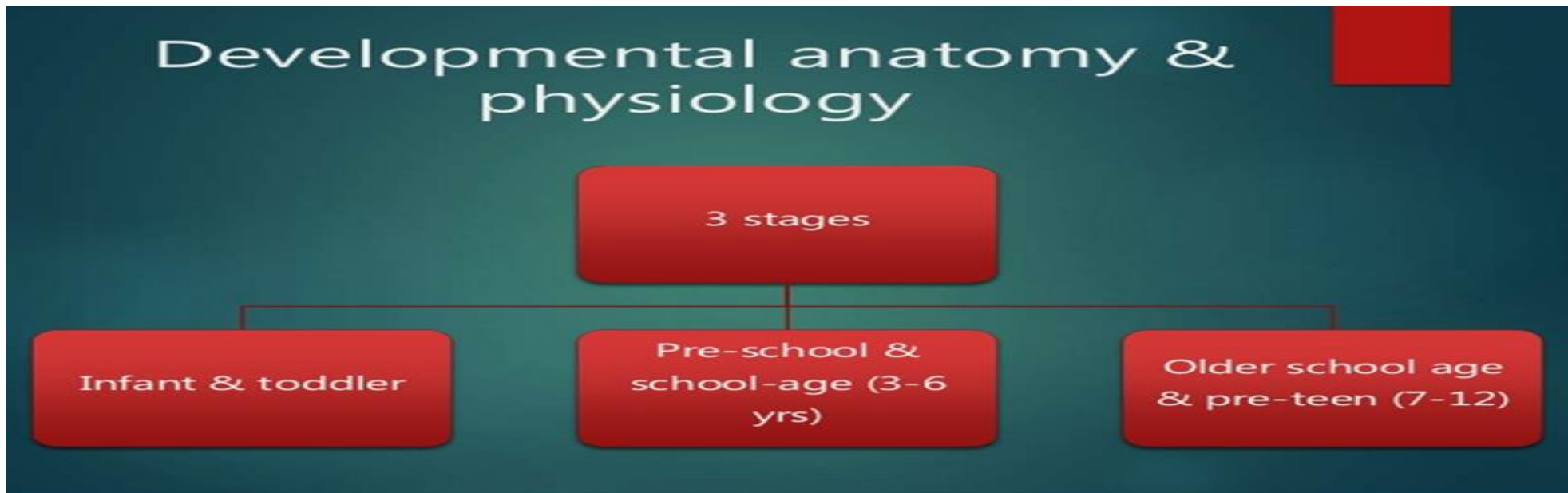


Childhood and adolescent gynecology

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- Gynecological problems in the child and at adolescence can create anxiety in parents, but fortunately very few of these disorders could be considered common or serious.
- Management is through simple means, with education and sympathetic approach.
- **It** deals with the health of the vagina, vulva, uterus, and ovaries of infants, children, and adolescents.



- **At birth:**

FSH and LH concentrations rise abruptly in response to the fall in placental estrogen levels and are highest in the first 3 months of life.

transient rise in gonadotropin levels is followed by an increase in gonadal steroid concentrations, which is thought to explain instances of neonatal:

breast budding, minor bleeding from endometrial shedding, short-lived ovarian cysts, and transient white vaginal mucous discharge.

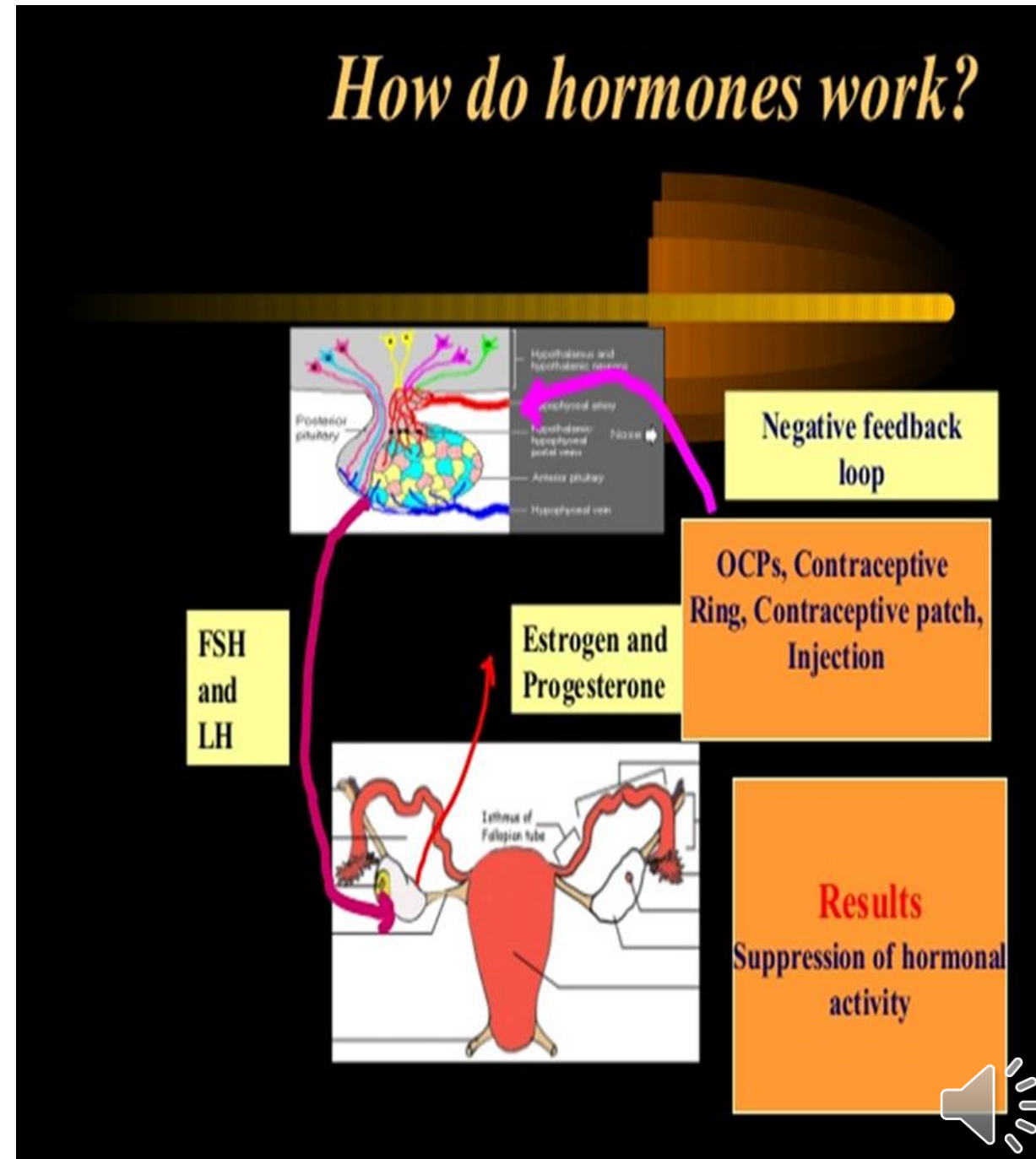
- **Following these initial months:**

gonadotropin levels gradually decline to reach prepubertal levels by age 1 to 2 years.

childhood years are thus characterized by low plasma levels of FSH, LH, and estradiol.

The ovaries are small in neonates and grow throughout childhood to a volume of 2–4 cubic centimeters

During childhood, ovaries undergo active follicular growth and oocyte atresia. As a result of this attrition, by puberty, only 300,000 to 500,000 oocytes remain.



Anatomy:

In the neonate the cervix is larger than the fundus, the neonatal uterus is typically spade-shaped, contains fluid 25% of the time, and often has a visible endometrial stripe. This is normal and due to the hormones that have passed to the neonate across the placenta.

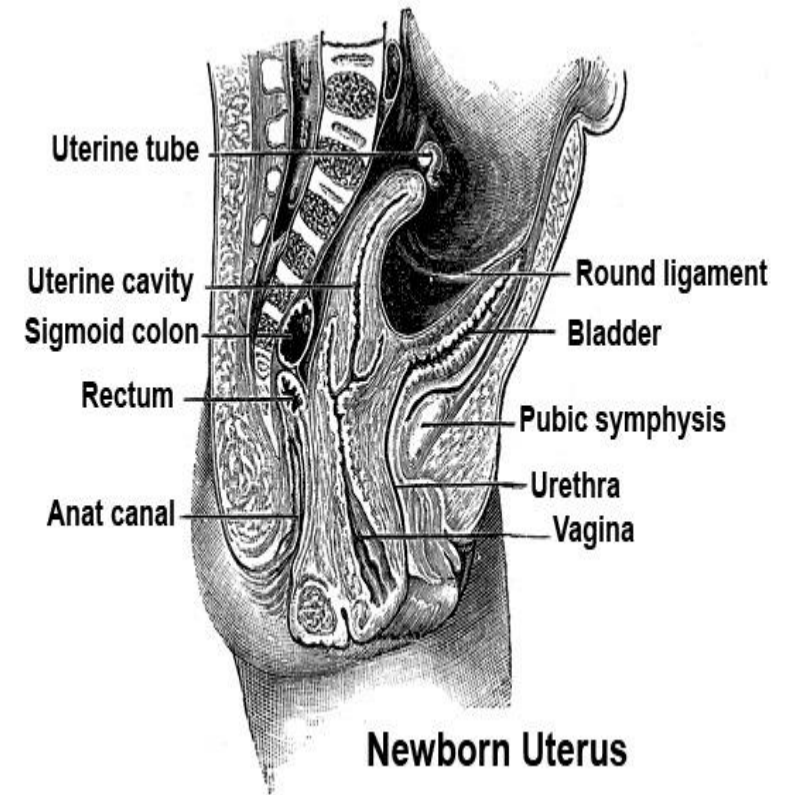
During childhood, the uterus is tubular as a result of the cervix and fundus becoming equal size. The ovaries increase in size as childhood progresses.

Puberty marks the normal physiologic transition from childhood to sexual and reproductive maturity.

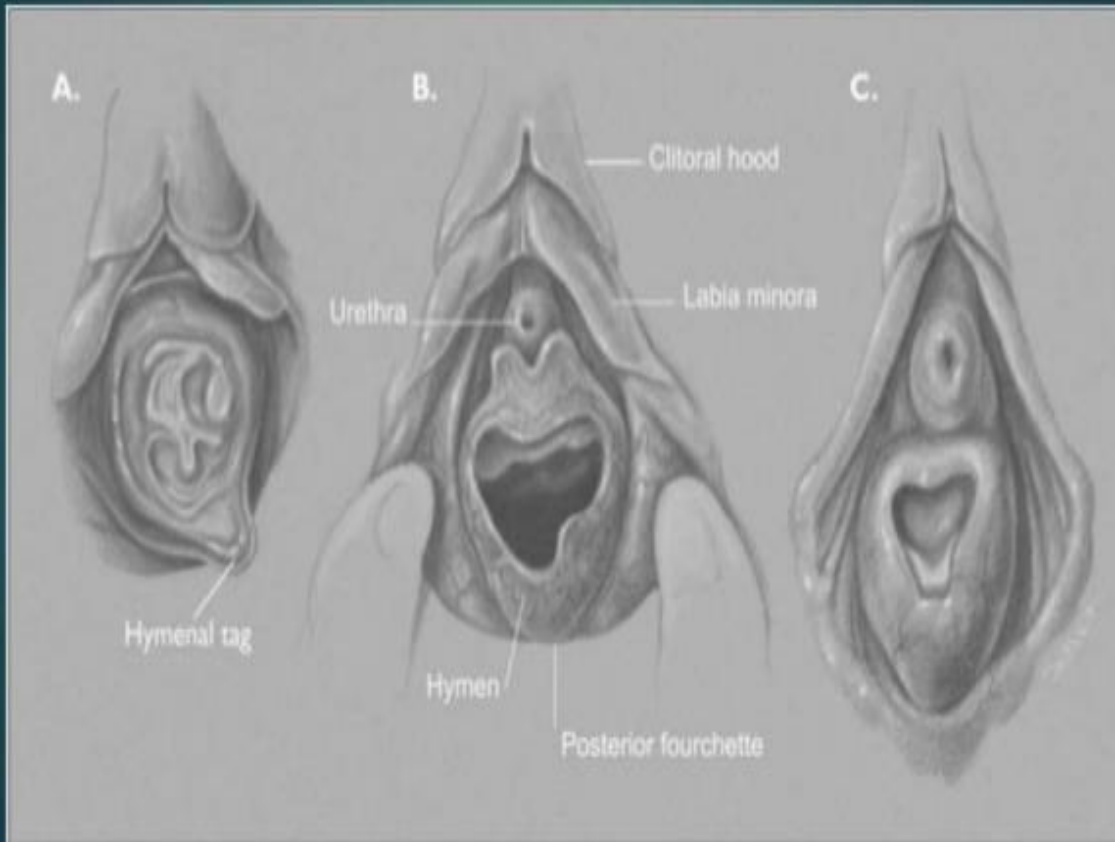
The primary sexual characteristics of the hypothalamus, pituitary, and ovaries initially undergo maturation process.

This maturation leads to the complex development of secondary sexual characteristics involving the breast, sexual hair, and genitalia, in addition to a limited acceleration in body growth.

Initial pubertal changes begin between ages 8 and 13 years.



Normal Developmental Anatomy



Developmental changes in genital morphology. A. Infant: Hymen circumferential and redundant. B. Preschool through school age: Rudimentary labia minora, thinner hymen. C. Early puberty: Labia minora develop, hymen thickens.

▶ Anatomy:

- ▶ Clitoral hood is prominent, urethra maybe obscured by redundant hymenal tissue
- ▶ Long hymenal tags, normally extending outside vestibule
- ▶ Hymen surrounds vaginal orifice & appears circumferential



- Prepubertal anatomy

The vaginal mucosa in prepubertal children is markedly different from that of post pubertal adolescents; it is thin and red colored.

Older school age & pre-teen (7-12)

- ▶ Labia minora become a separate layer & join at the posterior commissure years after onset of menarche
- ▶ Vestibular mucosa thickens & gains cobble stone app
- ▶ Hymen thickens & develops fimbriations
- ▶ **PHYSIOLOGICAL** leucorrhea precedes menses by **3-6 months**



Preschool & school age (3-6 yrs)

- ▶ H-P-G axis becomes suppressed, hormonal effect on genital structures recede
- ▶ Labia becomes flatter, clitoris less prominent, hymen becomes thinner & recedes to give a **crenate appearance**
- ▶ **Normally:**
 - ▶ Some maintain thickened redundant configuration
 - ▶ Single or multiple hymenal tags



Puberty

- During puberty, the vaginal mucosa becomes estrogenized and becomes a dull pink color and gains moisture.
- Secondary sex characteristics develop under the influence of estrogen on the hypothalamic-pituitary-gonadal axis, typically between the ages of 8 and 13.
- These characteristics include breast buds, pubic hair, and accelerated growth.
- Higher body mass index is correlated with earlier puberty.



Examination

- ▶ Gain trust of **PARENT**, if parent is uneasy, child will be uncomfortable
- ▶ **Position:** frog leg position either on table or on parent's lap
- ▶ **Technique:**
 - ▶ Labial separation or traction
 - ▶ **Prone knee-chest position**

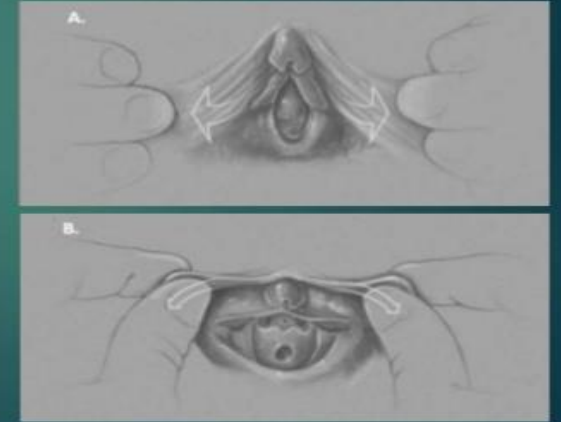


Better visualize vaginal vault because of concern for a foreign body



Examination

- ▶ Should engage the child in a **distracting** conversation
- ▶ In toddlers examine when as if changing diaper on parents lap
- ▶ **Position:**
 - ▶ Hips are flexed and abducted, Dr's hands placed on each thigh
- ▶ **Technique:**
 - ▶ Labial separation
 - ▶ Labial traction



Gently grasps the labia minora with thumb & forefinger & pull forward & out to better visualize entire introitus

- **Two main positions** for examination can be used, depending on the patient's preference and the specific examination being performed including:
 - the frog-leg position (with the head of the examination table raised or lowered),
 - the lithotomy position with stirrups, or either of these with a parent holding the child.
- A hand mirror can be provided to allow the child to participate and to educate
- Anesthesia or sedation should only be used when the examination is being performed in an emergency situation;
- Cases where an internal examination is necessary include vaginal bleeding, retained foreign bodies, and potential tumors.



Gynecological conditions in childhood

The disorders fall into two groups:

-those related to pre-puberty

-and those of adolescence.



All prepuberty

vaginal bleeding

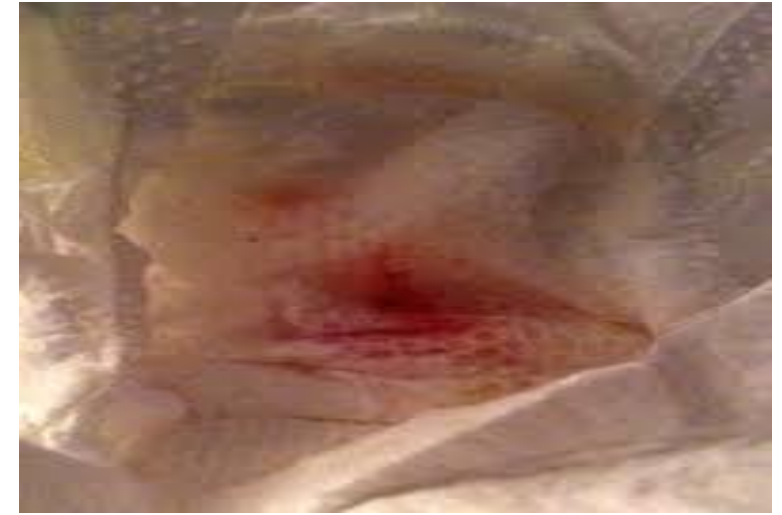
- **Three percent of newborn girls** are estimated to have visible vaginal bleeding in the first week of life.
- According to one study, the peak day for bleeding is the fifth day of life.
- These “mini-periods” are due to the sudden withdrawal of maternal hormones (specifically estrogen).
- Her bleeding is likely normal and should resolve without treatment.
- recommend evaluation by doctor.



- newborn girl's genitals have been exposed to many hormones in the uterus. Among other things, these hormones may have:
- Made the outside of the vagina ("labia majora" and the "clitoris") a little swollen and prominent
- Caused a thick, milky discharge in the vagina
- Most dramatically, at 2 or 3 days of age, may have a little bit of bleeding from her vagina. This is perfectly normal; it is caused by the withdrawal of the hormones she was exposed to in the womb.



- During pregnancy, a surge in maternal estrogen levels **can** stimulate a **female** fetus's uterus.
- Within the first week of life, it's not uncommon for **baby girls to have** a mini **period** in which the uterus sheds a little blood.



• **Vaginal bleeding** In childhood is extremely rare and should always be treated with suspicion. The causes of genital bleeding in childhood include:

a vaginal foreign body,

trauma,

a neoplasm,

premature menarche or urethral prolapse

and the diagnosis can almost always be made on clinical inspection. Treatment should be appropriate but if trauma is suspected, sexual abuse must always be considered.



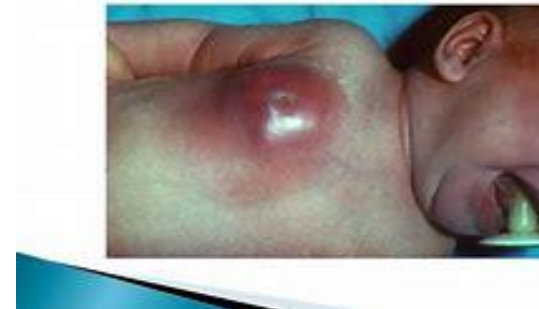
- **Breast abnormalities**

- An abnormal mass in a child's developing breast or early development of breast tissue may prompt concern. Neonates can have small breast buds at birth or white discharge (witches' milk), caused by exposure to transplacental hormones in utero. These phenomena are not pathological and typically disappear over the first weeks to months of life. Accessory nipples (polythelia) occur in 1% of children along the embryonic milk line and are benign in most cases. They may be removed surgically if they develop glandular tissue and cause pain, have discharge, or develop fibroadenomas.

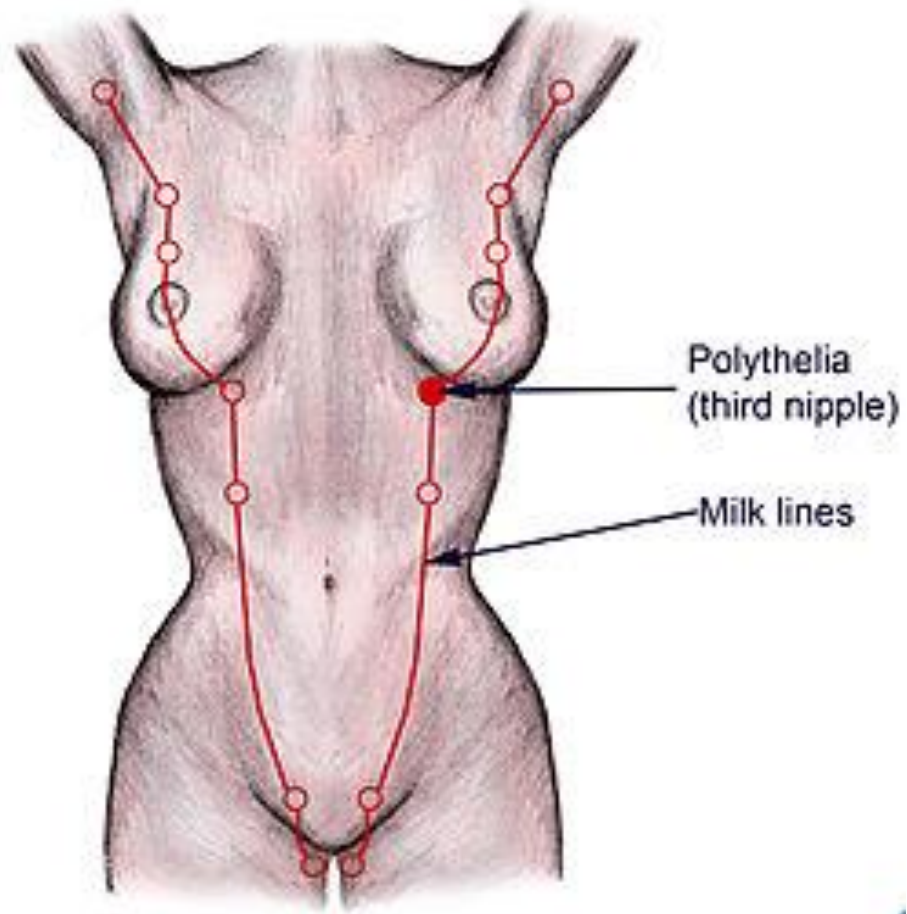
- Some asymmetric breast growth is normal in early adolescence, but asymmetry may be caused by trauma, fibroadenoma, or cysts.
- More than 99% of breast masses in children and adolescents are benign, and include fibrocystic breast changes, cysts, fibroadenomas, lymph nodes, and abscesses. Fibroadenomas make up 68–94% of all pediatric breast masses, and can be simply observed to ensure their stability, or excised if they are symptomatic, large, and/or enlarging.

- **Mastitis**

- Mastitis, infection of the breast tissue, occurs most commonly in neonates and children over 10, though it is rare overall in children. Most often caused by *S. aureus*, mastitis in children is caused by a variety of factors, including trauma, nipple piercing, lactation and/or pregnancy, or shaving periareolar hair.

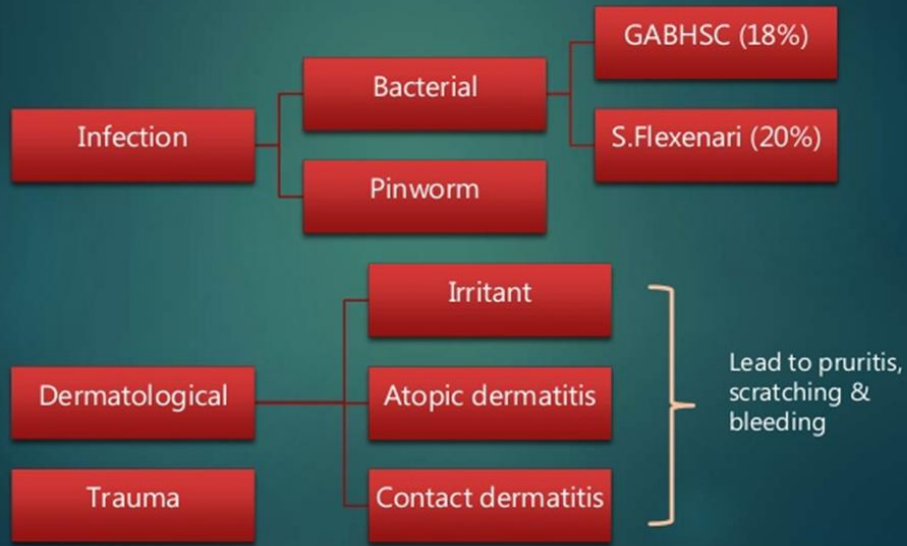


Embryonic milk line



Vulvovaginitis

▶ VV is the **most common** gynecological problem in PP girls



Vulvovaginitis: This is the only gynaecological disorder of childhood which is thought of as common. Its aetiology is based on opportunistic bacteria colonizing the lower vagina and inducing an inflammatory response.

At birth the vulva and vagina are well oestrogenized. This causes thickening of the vaginal epithelium, which is entirely protective.

However, within 2–3 weeks of delivery the resultant hypo-oestrogenic state leads to vulval skin and vaginal epithelium thinning.

The vulval fat pad disappears and the vaginal entrance becomes unprotected. It occurs most commonly between ages of 2- 7 years.



- Vulvovaginitis in children may be "nonspecific", or caused by irritation with no known infectious cause, or infectious, caused by a pathogenic organism.
- Nonspecific vulvovaginitis may be triggered by fecal contamination, sexual abuse, chronic diseases, foreign bodies, non estrogenized epithelium, chemical irritants, eczema, seborrhea, or immunodeficiency.
- It is treated with topical steroids; antibiotics may be given in cases where itching has resulted in a secondary infection.

- Infectious vulvovaginitis can be caused by:

group A beta-hemolytic Streptococcus (7–20% of cases), Haemophilus influenzae, Streptococcus pneumoniae, Staphylococcus aureus, Shigella, Yersinia, or common STI organisms (Neisseria gonorrhoeae, Chlamydia trachomatis, Trichomonas vaginalis, herpes simplex virus, and human papillomavirus).

- Symptoms and treatment of infectious vulvovaginitis vary depending on the organism causing it.



Vulvovaginitis

1. Bacterial

	Group A β-hemolytic streptococci	Shigella Flexinari
Spread	Oral-digital to genital area (auto-inoculation)	GIT to genital region
History	Upper RTI	Diarrhea is absent in most patients
Symptoms	Vaginal discharge (92 %) Itching (45%) Redness (30%) Dysuria (19%) Pain (8%) Bleeding (5%)	Mucopurulent, malodorous, bloody discharge

Vulvovaginitis



- **Vulvitis**

- Vulvitis, inflammation of the vulva, can have a variety of etiologies in children and adolescents, including allergic dermatitis, contact dermatitis, lichen sclerosus, and infections with bacteria, fungi, and parasites.
- Dermatitis in infants is commonly caused by a soiled diaper being left on for an extended period of time. Increasing the frequency of diaper changes and topical application of emollients are sufficient to resolve most cases. is treated with preventing exposure and encouraging sitz baths with baking soda as the vulvar skin heals. Other treatment options for vulvar dermatitis include oral hydroxyzine hydrochloride or topical hydrocortisone.
- Lichen sclerosus is another common cause of vulvitis in children, Treatment for vulvar lichen sclerosus may consist of topical hydrocortisone
- Though pinworms mainly affect the perianal area, they can cause itching and irritation to the vulva as well. Pinworms are treated with albendazole.
- Vulvar Candida infections are uncommon in children, and generally occur in infants after antibiotic therapy, and in children with diabetes or immunodeficiency. *Candida* infections cause a red raised vulvar rash with satellite lesions and clear borders, and are diagnosed by microscopically examining a sample treated with potassium hydroxide for hyphae. They are treated with topical butoconazole, clotrimazole, or miconazole.
- *Streptococcus* infections are characterized by a dark red discoloration of the vulva and introitus, and cause pain, itching, bleeding, and dysuria. They are treated with antibiotics



- **Foreign body** Foreign bodies are occasionally found in the vagina and may lead to vaginal discharge. In case of persistent vaginal discharge despite treatment, an ultrasound scan may detect a foreign body.

Foreign body

- ▶ Purulent , foul, bloody discharge
- ▶ Does **not** respond to ABs
- ▶ Commonly toilet paper
- ▶ Vaginal irrigation or EUA Vaginoscopy for removal
- ▶ **Investigations:** WBC is urine & **NEGATIVE** urine culture



- **Labial adhesions:** Are usually an innocent finding, but its importance is that it is misdiagnosed as congenital absence of the vagina. They occur most between 3 months and 3 years. It is believed that labial adhesions result from vulva inflammation in a hypo-estrogenic environment. The labia minora stick together in the midline, usually from posterior to anterior until only a small opening is left through which urine is passed. There are usually no symptoms associated with this condition, although older children may complain that there is some spraying when they pass urine.

As late childhood ensues and ovarian activity begins, there is spontaneous resolution of the problem in 80% of children. In the majority of cases no treatment is required. If there are some clinical problems, local estrogen cream is applied for 2 weeks. In the case of failure of estrogen treatment, topical betamethasone 0.05% may be used. In the small minority of unresolved cases, surgical separation may be needed but this is extremely rare and should be avoided if possible as recurrence rates are high.

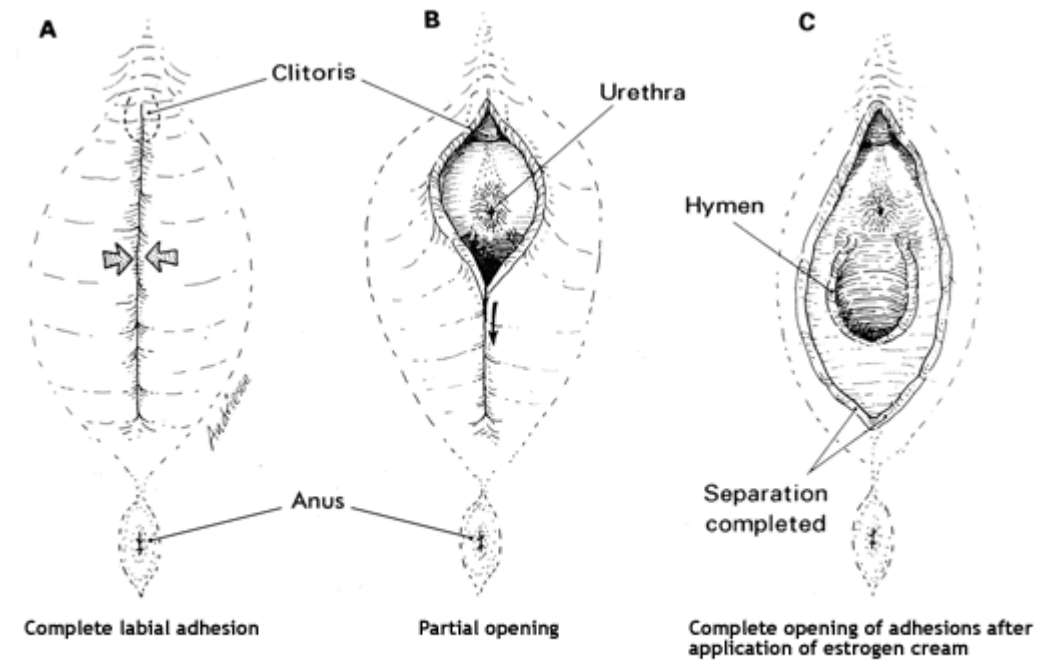
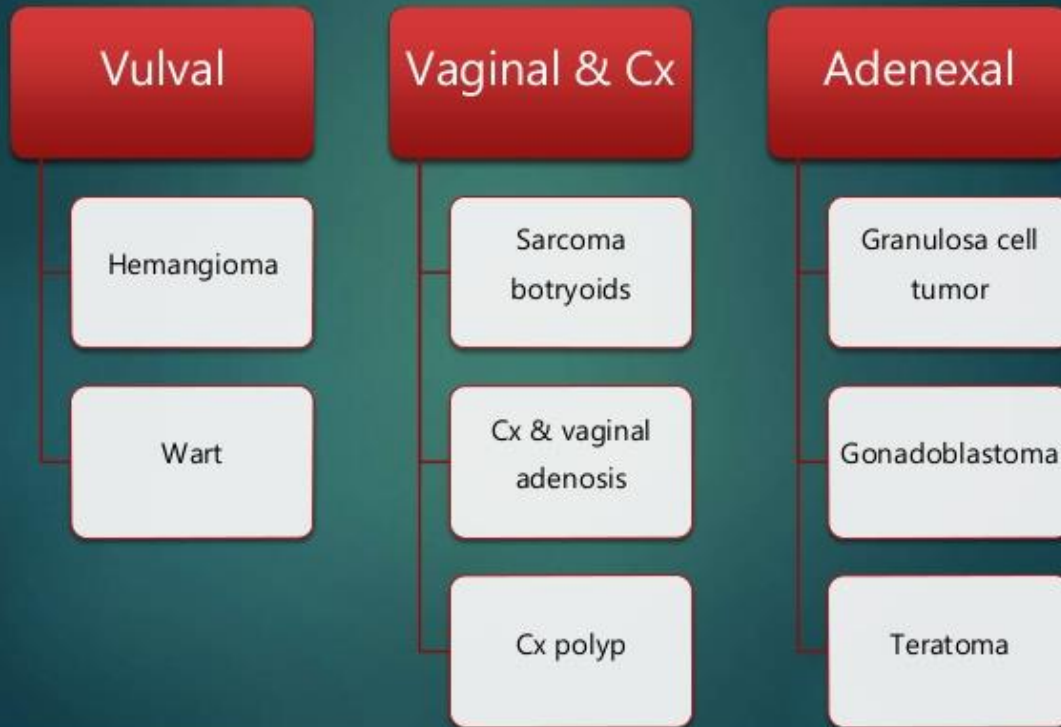


Image adapted with permission from Emans, Laufer, Goldstein. *Pediatric and Adolescent Gynecology*, 5th Ed, Lippincott Williams & Wilkins, Philadelphia, 2005.



Genital tumors



Vulval tumors

Vulval hemangioma



Vulval Wart



Vulval tumors

Vulval hemangioma



Vulval Wart



Sarcoma botryoides



- **B// Adolescence** The adolescent gynaecological patient usually presents with one of three disorders: problems associated with the menstrual cycle and menstrual dysfunction, primary amenorrhoea and teenage hirsutism.

Menstrual problems: Menstrual cycles are rarely established as normal ovulatory cycles from the beginning of puberty. It is usual for cycles to be irregular, as the management of these cases is usually not active treatment but support and explanation to the mother and daughter. Normal menstrual loss should not exceed 80mL during a period. The best way to establish which of these is the case is by measuring the haemoglobin., Some girls will require menstrual suppression.



- Many **teens have bleeding** or **spotting** between periods. A number of things can cause abnormal vaginal **bleeding**, including:

hormone problems,

stress,

ovulation,

changes in weight,

strenuous exercise,

and some kinds of birth control. ...

Rarely, infection, cancer, or other serious conditions can cause **bleeding**.



The most common causes of DUB in an adolescent

- Anovulation
- Infections
- Do not forget to check a pregnancy test!

Differential Diagnosis

- Anovulation (most common)
 - Due to immaturity of the hypothalamus
 - Hypothalamic dysfunction
 - Polycystic ovarian syndrome

Strickland J, Gibson EJ, Levine SB. "Dysfunctional uterine bleeding in adolescents," J Pediatr Adolesc Gynecol. 2006; 19(1):49-51.



Primary dysmenorrhea: Defined as pain in association with menstrual bleeding. The management in the teenager is no different from that in the adult. The use of both non-steroidal anti-inflammatory drugs and the oral contraceptive pill is pertinent in teenagers.

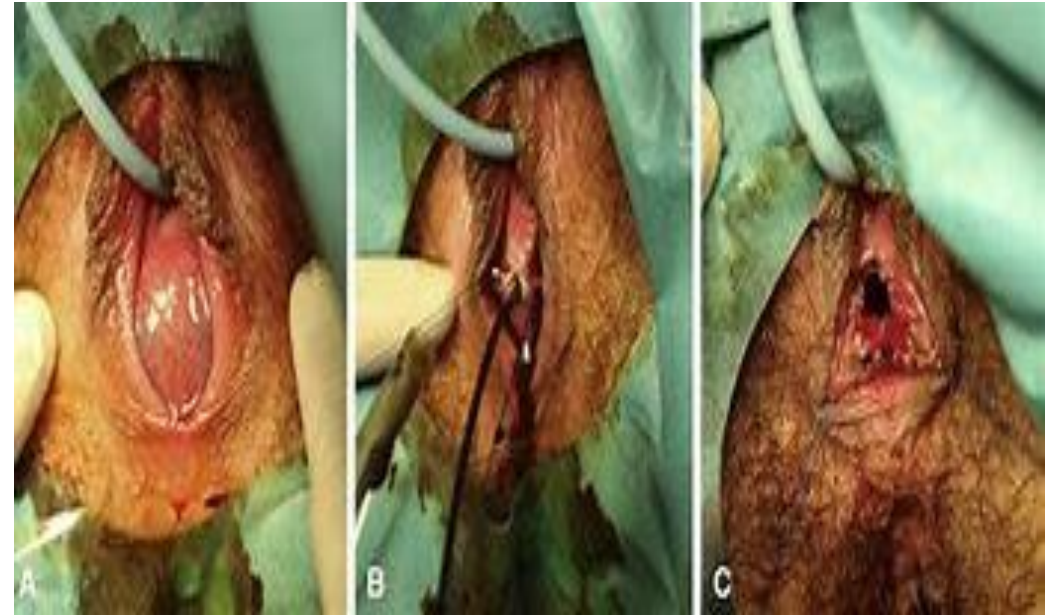
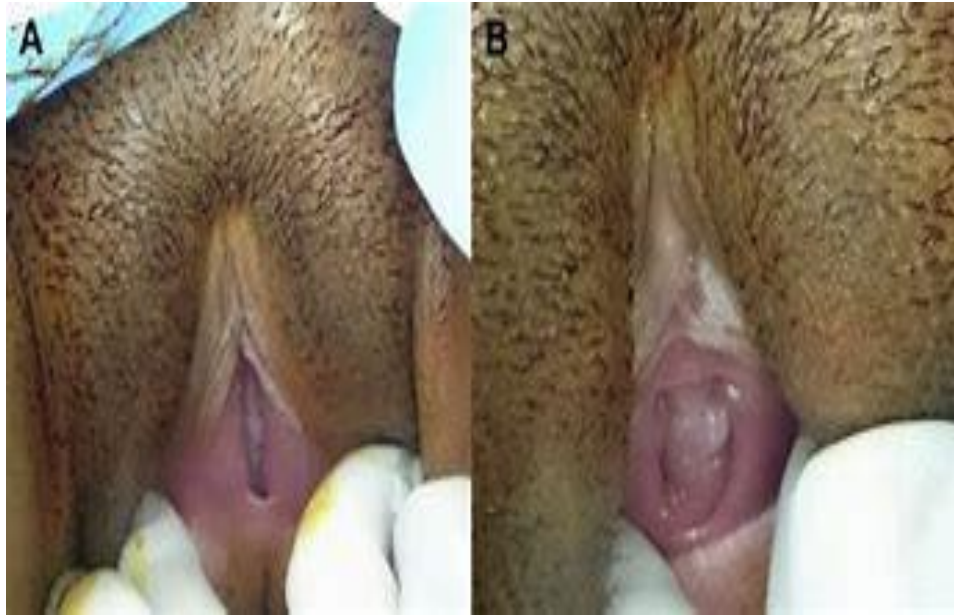
Premenstrual syndrome: This is a difficult problem in adolescence as the psychological changes that are occurring during this time in a woman's life are often complex and stressful.

Hirsutism: Hair follicles cover the entire body and different types of hair are found in different sites. Androgens affect some areas of the human body and increase hair growth rate and also the thickness of terminal hairs. Androgens are also involved in sebum production This may also be associated with acne, which may occur not only on the face but also on the chest and back.



Intersex conditions

Amenorrhea Amenorrhea, imperforate hymen is the presence of a hymen that completely covers the introitus. Müllerian agenesis affecting the uterus, cervix, and/or vagina; obstructed uterine horn; the presence of a transverse vaginal septum.



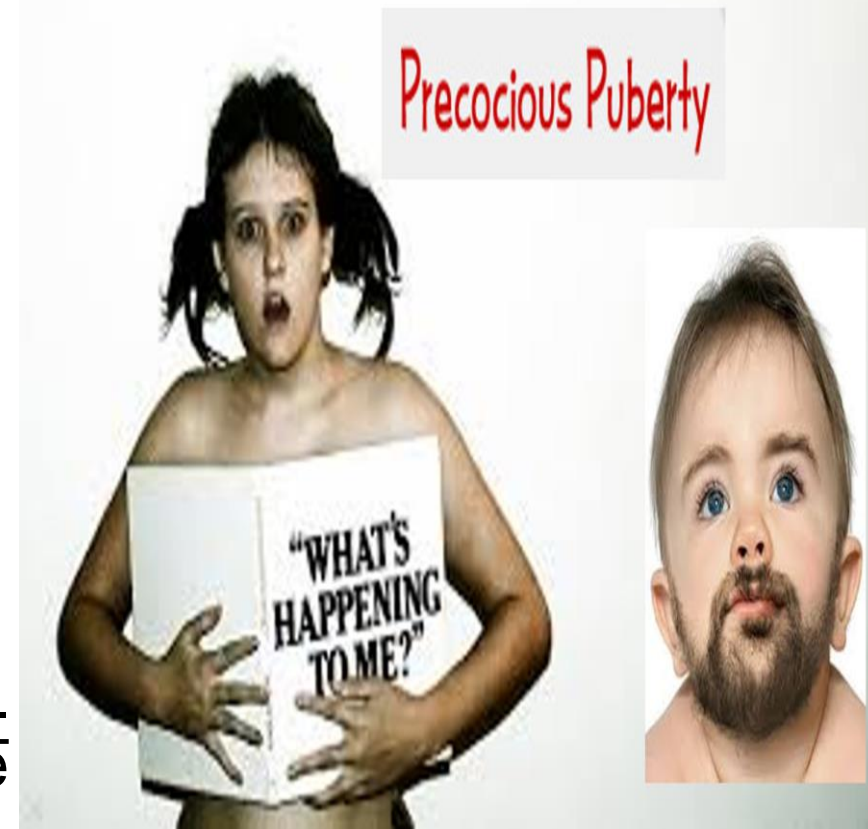
- **Precocious puberty**

occurs when children younger than 8 experience changes indicative of puberty, including development of breast buds (thelarche), pubic hair, and a growth spurt. Thelarche before 8 is considered abnormal.

Though not all precocious puberty has a specific pathological cause, it may indicate a serious medical problem and is thoroughly evaluated. In most cases, the cause of precocious puberty cannot be identified. “

Central precocious puberty” or “true precocious puberty” stems from early activation of the hypothalamic-pituitary-ovarian axis. It occurs in 1 in 5,000 to 1 in 10,000 people and can be caused by a lesion in the central nervous system or have no apparent cause. “

Peripheral precocious puberty” or “GnRH independent precocious puberty” does not involve the hypothalamic-pituitary-ovarian axis, instead, it involves other sources of hormones. The causes of peripheral precocious puberty include adrenal or ovarian tumors, congenital adrenal hyperplasia, and exogenous hormone exposure.



Precocious puberty

- ▶ **Definition:** appearance of 2nd sexual characters before 8 years of age or menarche before 10 yrs

Central	Peripheral	Isolated premature menarche
Physiologically normal pubertal dev occurring at an early age	Dt inappropriate sex H. secretion or exposure to exogenous sex steroids	Excessive sensitivity of the target tissue to low levels of sex steroids
GnRH dependent	GnRH independent	
1. Idiopathic 80-90% 2. CNS TR 3. CNS dysfunction	1. Functioning ovarian tumors or cysts 2. Adrenal tumors, CAH 3. Chr 1 st hypothyroidism 4. McCune-Albright synd	1. Spontaneous regression of ovarian cysts 2. Hypothyroidism 3. McCune Albright Synd

Rx of CPP: Rx of cause & GnRH analogues

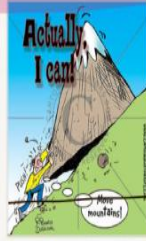


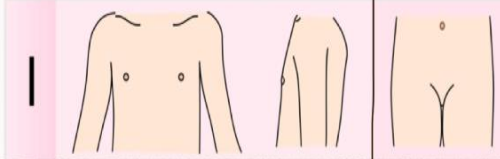
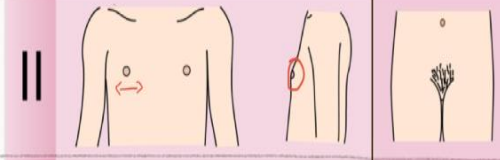
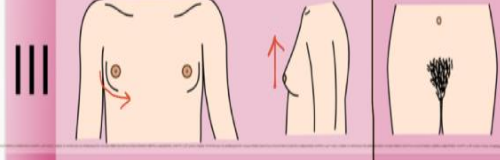

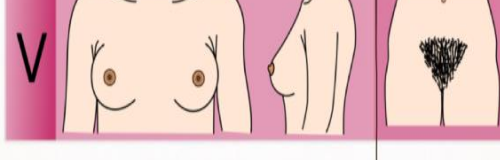



• Premature thelarche

Premature development of breast tissue is not necessarily indicative of precocious puberty; if it occurs without a corresponding growth spurt and with normal bone age, it does not represent pubertal development. It is associated with low birthweight and slightly elevated estradiol.

Most premature breast development regresses spontaneously, and monitoring for other signs of precocious puberty is usually the only necessary management

Tanner Stages of Development Mnemonics

	<p>Nobody Elevates 2 mountains in Adulthood</p>	<p>She's Not a Small CAT </p> <p><small>→ pussy</small></p>	
<p>No glandular tissue</p>	<p>I</p> 	<p>No hair</p>	
<p>Breast bud forms + small glandular tissue + areola widens</p>	<p>II</p> 	<p>Small amount of downy hair + labia pigmentation</p>	
<p>Breast > Elevated + extends beyond borders of areola</p>	<p>III</p> 	<p>Coarse & curly + extends laterally</p>	
<p>Areola + papilla = Secondary mound > size, > elevation</p>	<p>IV</p> 	<p>Adult-like hair + spares thighs</p>	
<p>Final Adult Size</p>	<p>V</p> 	<p>Thighs not spared</p>	



Ovarian mass

- Ovarian masses in children are typically cystic, but 1% are malignant ovarian cancers.
- 30–70% of neonates with ovaries have cysts; they are caused by transplacental hormones *in utero* or by the postnatal spike in gonadotropins. Neonatal ovarian cysts usually affect one ovary, do not cause symptoms, are classed as simple, and disappear by the age of 4 months. In rare cases, neonatal ovarian cysts may result in ovarian torsion, autoamputation of the ovary, intracystic hemorrhage, rupture, and compression of surrounding organs.
- Cysts smaller than 5 centimeters in diameter may be monitored with ultrasonography; larger cysts are more likely to cause complications and are either drained by percutaneous aspiration or surgically removed.
- In older children, cystic ovarian masses may cause a visible change in body shape, chronic pain, and precocious puberty; complications with these cysts cause acute, severe abdominal pain. Transabdominal ultrasonography can be used to diagnose and image pediatric ovarian cysts, because transvaginal probes are not recommended for use in children.
- Complex cysts are likely to be benign mature cystic teratoma, whereas the most common malignancies in this age group are malignant germ cell tumors and epithelial ovarian cancer.



