602 Midterm Study Guide week 1-4

Primary Care Of The Childbearing (Chamberlain University)

NR 602: MIDTERM STUDY GUIDE

Signs of pregnancy (presumptive, probable, positive)

- Presumptive Signs of Pregnancy: Symptoms that are suggestive of pregnancy are considered "presumptive signs" which means that they are the least objective or subjective signs which can also be caused by many other conditions other than pregnancy.
  - Amenorrhea: Highly suggestive of pregnancy in a healthy female with regular & predictable periods. Difficult to determine in a female who have irregular periods or in those who do not keep track of their menstrual cycles
  - Nausea & vomiting: Common symptom (~50% of pregnancies) typically occurring between 2-16 weeks gestation
  - Breast engorgement & darkening of the areolas: Occurs as early as 6-8 weeks gestation
  - Breast tenderness
  - Fatigue
  - Urinary Frequency
  - Slight increase in body temperature: Rise in temperature coincides with luteal phase and is the result of increased progesterone
  - "Quickening": Mother feels the baby's movements for the 1st time; starts at 16 weeks.
- Probable signs of pregnancy: mean that there is a high likelihood of pregnancy but there are still other conditions that may cause the findings.
  - Pregnancy tests are considered probable because β-hCG also presents in molar pregnancies and ovarian cancer.
- Positive Signs of Pregnancy: The most reliable and most objective signs of positive pregnancy are those where the provider can confirm the presence of a fetus
  - Palpation of the fetus by the health care provider
  - Ultrasound and visualization of the fetus
  - Fetal Heart Tones (FHT) auscultated by the health care provider

Pregnancy and fundal height measurement

- Fundal height can provide valuable information on assessing the gestational age of the fetus as well as to monitor fetal growth.
  - 12 weeks: Uterine fundus first rises above the symphysis pubis
  - 16 weeks: Uterine fundus is between the symphysis pubis and umbilicus
  - 20 weeks: Uterine fundus is at the level of the umbilicus
  - 25-35 weeks: Measure the distance between the upper edge of pubic symphysis and the top of the uterine fundus with a tape measure. Fundal height in centimeters equals the number of gestational weeks (+/- 2cm). For example, a 28 week gestation fetus should have a fundal height that measures between 26 and 30cm.

* Between 25-35 weeks the fundal height should measure equally to the number of gestational weeks (+/- 2cm).

Naegele's rule

- The EDD is calculated by adding seven days to the first day of the last menstrual period, subtracting three months and adding one year.
  *For example, if the patient's last menstrual period, LMP, was on August 10, 2019, the EDD would be calculated as follows. LMP equals August 10, 2019 plus seven days. August 17, 2019, minus three months. May 17, 2019 plus one year and that equals May 17, 2020.

Hematological changes during pregnancy-See Table 29.2 p. 777

- blood volume increases by 30% to 50%, or 1,100 to 1,600 mL and peaks at 30 to 34 weeks' gestation.
- The increase in blood volume improves blood flow to the vital organs and protects against excessive blood loss during birth.
- Fetal growth during pregnancy and newborn weight are correlated with the degree of blood volume expansion.
- Of the blood volume expansion occurring during pregnancy, 75% is considered to be plasma
- There is also a slight increase in red blood cell volume (RBC).
- The blood volume changes result in hemodilution, which leads to a state of physiologic anemia during pregnancy.
- As the RBC volume increases, iron demands also increase.
- Leukocytosis occurs in pregnancy, with white blood cell counts increasing to as much as 14,000 to 17,000 cells per mm^3 of blood (**Table 29-3**).
- Clotting factors increase as well, creating a risk for clotting events during pregnancy.
- Systemic vascular resistance is reduced due to the effects of progesterone, prostaglandins, estrogen, and prolactin.
- This lowered systemic vascular resistance, in combination with inferior vena cava compression, is partly responsible for the dependent edema that occurs in pregnancy.
- Epulis of pregnancy, or hypertrophy of the gums accompanied by bleeding, may also occur and is due to decreased vascular resistance and increase in the growth of capillaries during pregnancy

Indications and contraindications for prescribing combined estrogen vs. progesterone-only birth control: See Appendix 11-A p. 248

- Most COC formulations now contain between **20 to 35 mcg of ethinyl estradiol** plus one of 8 available progestins.
- Consider the "quick start" method when initiating oral contraceptives.
    - If last menstrual period (LMP) was within the last 5 days, the method can be started immediately.
    - In unprotected sex within last 2 weeks, start the contraceptive method today and advise patient to return to the clinic for a pregnancy test in 3 weeks.
    - Instruct women who are using the pill, patch, ring, injection, or implant to use backup contraception for the first 7 days.
    - Research shows that there are no significant differences in the number of bleeding-spotting days or any other bleeding parameter between the immediate and conventional starters.
- Indications:
    - Women with dysmenorrhea and menorrhagia
    - Women who want to regulate menses
    - Women who will use a daily method consistently
- Benefits of COC
    - Decreased blood loss and anemia
    - Decreased menstrual cramps and pain with more predictable menses
    - Can be used to manipulate the timing of menses
    - Decreases risk of ovarian cancer and endometrial cancer
    - Reduces risk of ectopic pregnancy
    - Effective to treat acne, hirsutism and other androgen excess/sensitivity states
    - Reduced vasomotor symptoms and effective contraception in perimenopausal women
    - Increased bone mineral density
    - Decreased pain and frequency of sickle cell disease crises
- Disadvantages of COC
    - Decreased libido and anorgasmia is unusual, but possible
    - Mood changes, depression, anxiety, irritability
    - No protection against STDs or HIV
    - Nausea & vomiting, especially in the first few cycles
    - Breast tenderness or pain
    - Headaches may increase
- Special Situations for COC
    - Endometriosis-continuous use are most effective in reducing severe symptoms (skip placebo week); must use monophasic pills
    - Functional ovarian cysts-higher dose estrogen COCs may be slightly more effective
    - Breastfeeding women-progestin-only method
- Contraindications of COC:
    - Multiple risk factors for arterial cardiovascular disease, such as smoking, diabetes, hypertension
    - Known thrombogenic mutations
    - Current or history of current ischemic heart disease, history of stroke, history of or

current deep venous thrombosis or pulmonary embolism
- Vascular disease
- Complicated valvular heart disease
- Hypertension (systolic ≥160 or diastolic ≥ 100)
- Smoking (>15 cigarettes/day and age 35 or older)
- Migraine headache with aura
- Major surgery with prolonged immobilization
- Current breast cancer
- Active viral hepatitis
- Severe cirrhosis
- Benign or malignant liver tumors
- Breastfeeding <6 weeks postpartum

"Mini-pills," progestin-only pills

- There are currently two formulations**--norethindrone (Micronor) and norgestrel (Ovrette).**
- Candidates:
  - Progestin-only pills are useful for women who want immediately reversible hormonal contraception but for whom estrogen is contraindicated because of breastfeeding, cardiovascular disease, and migraine with aura, for example.
- Advantages:
  - Progestin-only pills (COCs also are used) can be used to correct dysfunctional uterine bleeding.
  - no estrogen-related side effects that COCs have, such as nausea, headache, and bloating, but they do cause irregular vaginal bleeding.
  - These pills protect against cancer of the uterus and ovaries, benign breast disease, and pelvic inflammatory disease.
- Contraindication:
  - The only contraindication to taking progestin-only pills is current breast cancer.
- Disadvantages:
  - The primary side effect is irregular menstrual bleeding, including spotting or breakthrough bleeding, amenorrhea, or shorted cycles. Irregular bleeding decreases in many users by cycle 12. Less common side effects are headache, breast tenderness, and dizziness.
- Counseling:
  - The pill must be taken at the same time each day.
  - If a pill is **more than 3 hours** late, a backup method of contraception should be used for at least the next 48 hours. Inform women about emergency contraception.

Menstrual cycle physiology

- The initiation of menstruation, called menarche, usually happens between the ages of 12 and 15.
- Menstrual cycles typically continue to age 45 to 55, when menopause occurs.
- Changes in menstruation are one of the most frequent reasons why women visit their clinician.

- The ratio of total body weight to lean body weight is probably the most relevant factor, and individuals who are moderately obese (i.e., 20–30% above their ideal body weight) tend to have an earlier onset of menarche
- the normal menstrual cycle is 21 to 35 days with a menstrual flow lasting 4 to 6 days, although a flow for as few as 2 days or as many as 8 days is still considered normal
- The amount of menstrual flow varies, with the average being 50 mL; nevertheless, this volume may be as little as 20 mL or as much as 80 mL.
- Menstrual cycles that occur during the first 1 to 1.5 years after menarche are frequently irregular due to the immaturity of the hypothalamic–pituitary–ovarian axis

Hypothalamus

- The hypothalamus controls anterior pituitary functions via the secretion of releasing and inhibiting factors.
- Together with the pituitary, it manages the production of hormones that serve as chemical messengers for the regulation of the gynecologic system.
- The hypothalamus initially releases gonadotropin-releasing hormone (GnRH) in a pulsatile manner.
- On average, the frequency of GnRH secretion is once per 60 to 100 minutes during the early follicular phase, increases to once per 60 to 70 minutes during the middle of the menstrual cycle, and then decreases during the luteal phase
- The release of GnRH stimulates the pituitary gland to produce follicle-stimulating hormone (FSH) and luteinizing hormone (LH).
- Two other hormones necessary for gynecologic health, estrogen and progesterone, are secreted by the ovaries at the command of FSH and LH.

Pituitary

- The oval-shaped, pea-sized pituitary gland is located in a small depression in the sphenoid bone of the skull. It is controlled by the hypothalamus, which secretes releasing factors into a special blood vessel network (hypothalamic–hypophyseal portal system) that feeds the pituicytes. These releasing factors either stimulate or inhibit the release of pituitary hormones that travel via the circulatory system to target organs.
- The anterior pituitary synthesizes seven hormones:

  - Growth hormone (GH)
  - Thyroid-stimulating hormone (TSH)
  - Adrenocorticotropin (ACTH)
  - Melanocyte-stimulating hormone (MSH)
  - Prolactin (PRL)
  - Follicle-stimulating hormone (FSH)
  - Luteinizing hormone (LH)

- FSH and LH (both gonadotropins) are responsible for regulating gynecologic organ activities.
- FSH targets the ovaries, where it stimulates the growth and development of the primary follicles and results in the production of estrogen and progesterone.
- The release of FSH from the pituitary is governed by a negative feedback mechanism involving these steroids.

- In contrast, LH targets the developing follicle within the ovary; it is responsible for ovulation, corpus luteum formation, and hormone production in the ovaries.
- Prolactin is responsible for preparing the mammary gland for lactation and brings about the synthesis of milk

Ovaries and Uterus

- Complex changes occur in the ovaries and the endometrium as a result of the cyclic fluctuations of gonadotropic hormones.
- The endometrium emulates the activities of the ovaries; thus whatever happens in the uterus during the menstrual cycle is precisely correlated with whatever is occurring in the ovaries.
- The objective of the ovarian cycle is to produce an ovum, while the objective of the endometrial cycle is to prepare a site to nourish and maintain the ovum if it becomes fertilized.
- The ovarian cycle includes three distinct phases: See pg 89
  - the follicular phase,
  - ovulation,
  - luteal phase.
- The endometrial cycle can be divided into: See pg 91
  - the proliferative phase,
  - the secretory phase,
  - menstruation

Vaccines during pregnancy

- **A pregnant woman should get vaccinated against whooping cough and flu** during each pregnancy to protect herself and her baby, with immunity for the first few months of life.
- Influenza-Can be given anytime during pregnancy; Do not give live vaccine
- Tdap- should be given during every pregnancy between 27-36 weeks

Emergency contraception

- Sperm can live for up to 5 days in the female reproductive tract, and pregnancy can occur with intercourse 5 days prior to ovulation.
- The highest risk of pregnancy is in the 48 hours immediately preceding ovulation. However, due to the uncertainty of ovulation timing, emergency contraception is offered if unprotected intercourse (UPI) occurs at any time in the menstrual cycle.
- The Yuzpe, levonorgestrel, and ulipristal acetate emergency contraceptive pill (ECP) regimens as well as the copper IUD may all be used within 120 hours of UPI.
  *The Yuzpe and levonorgestrel methods have a dramatic decline in their effectiveness with time and should be used as soon as possible after an event of UPI.
  - The Yuzpe regimen consists of combined ECPs that must contain at least 100 mcg of ethinyl estradiol and 0.50 mg of levonorgestrel, repeated in 12 hours. A dedicated combined ECP product is not available in the United States, but numerous COCs can be used as combined ECPs (see Table 11-1, footnote i). COCs containing norgestrel are preferable to those with norethindrone, as failure rates are slightly higher with norethindrone (Zieman et al., 2015). Because the high dose of ethinyl estradiol causes unpleasant side effects, this regimen has largely fallen out of favor.

- Until recently, the most widely used emergency contraception method was levonorgestrel ECPs, which contain either a 1.5-mg single dose (Plan B One-Step) or two doses of 0.75 mg taken 12 hours apart (Next Choice and Plan B). Women can take both doses in the two-dose products (Next Choice and Plan B) as a single dose. Levonorgestrel ECPs are available over the counter to women and men age 17 and older; women 16 and younger need a prescription to obtain them. Levonorgestrel ECPs are more effective than the Yuzpe regimen and have fewer side effects.

- Ulipristal acetate (ella), a selective progesterone receptor modulator provided as a single 30-mg dose, is the most effective oral emergency contraception method. The effectiveness of this medication does not decline within the 120-hour window after UPI, as is the case for levonorgestrel and combined ECPs. Ulipristal acetate is available only by prescription.
- The copper IUD can be inserted as long as 5 days after unprotected intercourse. Some contraceptive guidelines recommend its use up to 7 days after UPI. This method is rarely utilized as emergency contraception in the United States; however, recent evidence suggests some women might choose the copper IUD if it is offered as an option. It has the advantage of being highly effective in obese women and providing ongoing contraception.

Tier 1, 2 & 3 methods of contraception and efficacy

- Tier 1 methods includes the most effective methods of contraception, generally those with a failure rate of less than 1%.
  - IUD
  - Depo
  - Progestin Implants
  - Sterilization (tubal/vasectomy)
- The tier 2 methods have a failure rate somewhere between 2-3%, depending upon your reference
  - Combined oral contraceptive (COC) pills- estrogen and progesterone
  - Oral contraceptive pill- progestin only "Minipill"
  - Emergency contraception
  - Transdermal patch
  - Ring
- Tier 3 methods are the least reliable methods which have a failure rate of up to roughly 20%.
  - Tier 3 methods include all of your barrier methods, natural family planning and coitus interruptus.
  - These methods are the least effective in terms of preventing pregnancy with variable rates between them which are outlined in your textbook.
  - The biggest advantage that the barrier methods offer in addition to preventing pregnancy is that they offer protection in preventing STDs.

Etiology, diagnosis, and treatment of amenorrhea: See table 24-7 p 596

- Amenorrhea simply means absence of menses and is part of the spectrum of ovulatory disorders classified as AUB-O.
- The most common causes of amenorrhea are pregnancy, hypothalamic amenorrhea, and PCOS
- women meeting any of the following criteria should be evaluated for amenorrhea:
    - No menses by age 14 in the absence of growth or development of secondary sexual characteristics
    - No menses by age 16 regardless of the presence of normal growth and development of secondary sexual characteristics
    - In women who have menstruated previously, no menses for an interval of time equivalent to a total of at least three previous cycles, or 6 months
- Primary amenorrhea is the failure to begin menses by the age of 16.
- Secondary amenorrhea is defined as 3 months without a menses once menses has been established.
- Ovarian function abnormalities are the most common cause of amenorrhea, and estrogen production is the most reliable measure of ovarian function.
- Athletic women, particularly long-distance runners, gymnasts, and professional ballet dancers, are at risk for amenorrhea, as are women who have anorexia and other eating disorders
- Women with a low BMI and low percentage of body fat combined with a high level of intensive physical activity have the highest risk for amenorrhea
- Laboratory tests to assess estrogen production include serum estradiol levels, progestogen challenge test, measurement of endometrial thickness, and serum FSH concentration.
- A random serum estradiol level that is greater than 40 pg/mL indicates functioning ovaries. If the level is low, the woman may be amenorrheic because of ovarian failure or have hypothalamic amenorrhea.
    - A progesterone challenge test that produces withdrawal bleeding is indicative of functioning ovaries, because bleeding will occur only if a sufficient amount of circulating estrogen is present. A progesterone challenge can be accomplished by administering micronized progesterone (Prometrium) 400 mg daily for 7 to 10 days or medroxyprogesterone acetate (Provera) 10 mg daily for 7 to 10 days. Withdrawal bleeding should occur within 7 to 10 days after the progesterone is discontinued if the level of endogenous estrogen is appropriate to produce a withdrawal bleed and the outflow tract is patent.
        - If the response to the progesterone challenge is positive (withdrawal bleeding occurs), the woman does not have galactorrhea, and her prolactin level is normal, the possibility of a pituitary tumor is effectively ruled out.
        - In this case, the diagnosis is anovulation, and the treatment is a progestogen for the first 10 days of each month or a combined contraceptive (pill, patch, or vaginal ring).
        - The woman should also be evaluated for PCOS.
        - If the woman does not have a positive progestogen challenge, then a physician consult is warranted for further evaluation and management options.
    - Serum FSH indirectly measures ovarian function, with lower levels of FSH indicating normally functioning ovaries. In contrast, an elevated result may indicate ovarian function disorder or disease and warrants further investigation.

        - If the tests reveal that the ovaries are producing estrogen and the FSH level is normal, the diagnosis is chronic anovulation
    - Thyroid disease and hyperprolactinemia are also common causes of anovulation. A TSH level can detect either hypothyroidism (TSH is elevated) or hyperthyroidism (TSH is low), both of which can cause amenorrhea. Menstrual cycles almost always return to normal once the thyroid level is normalized.
    - Hyperprolactinemia is not always accompanied by galactorrhea (discharge from the nipples), but can be diagnosed by obtaining a serum prolactin level in women with amenorrhea.
        - Some medications, including antidepressants, opiates, calcium-channel blockers, and estrogens, can cause an elevated prolactin level; therefore, it is important to ask about medications when obtaining the health history.
        - Hyperprolactinemia has many causes (see Chapter 16), but if it and the accompanying amenorrhea cannot be attributed to medication or another condition, then further evaluation to rule out pituitary tumors and hypothalamic mass lesions is necessary
        - A dopamine agonist is the treatment of choice for hyperprolactinemia
    - Ovarian failure is diagnosed when low estrogen production is identified while the serum FSH is high. Premature ovarian failure can be due to many causes, including genetic conditions.
    - Functional hypothalamic amenorrhea is characterized by "the absence of menses due to the suppression of HPOA in which no anatomic organic disease is identified"
        - The typical picture of a woman diagnosed with functional amenorrhea is the adolescent who is underweight, overexercises, and is experiencing a great deal of stress.
        - In this setting, an energy deficit occurs, with a resultant negative impact on the HPOA
        - Treatment generally focuses on weight gain and exercise reduction, although psychological counseling may also be helpful.
        - A goal of treatment is to offset the bone loss that occurs during the estrogen-deficient periods of time
- All women with anovulation require management of this condition: If left untreated, endometrial cancer can occur, regardless of the woman's age.
- Typically treatment consists of inducing menses using a progestogen such as medroxyprogesterone acetate 5 to 10 mg daily for the first 12 to 14 days of the cycle.

Etiology, diagnosis, and treatment of dysmenorrhea (primary vs. secondary)

- Dysmenorrhea—defined as painful cramps that occur with menstruation—is the most commonly reported menstrual disorder, affecting as many as 81% of women
- Etiology-- The pain of dysmenorrhea originates from intense uterine contractions during the menstrual phase of the cycle, triggering endometrial prostaglandin production and release.
    - The excessive amount of prostaglandins causes the uterus to contract further, reducing uterine blood flow and causing ischemia and pain.

  - While the etiology of dysmenorrhea is not completely understood, studies support the hypothesis that uterine inflammation with menstrual cycles may also promote cross-organ pain sensitization, a mechanism by which dysfunction in one organ elicits neurogenic inflammation in another organ
  - The uterus lies in close proximity to the bladder, the bowel, and the peritoneum, and its contraction may elicit pain in those structures during the menstrual cycle.
  - This theory, along with the current knowledge about prostaglandins' major role in dysmenorrhea, may help explain the chronicity of pain that may occur throughout the pelvic area during the menstrual cycle.
- Primary (absence of pelvic pathology)
  - more common than secondary dysmenorrhea,
  - often begins 6 to 12 months after menarche.
  - Typically symptoms are experienced with the onset of bleeding and continue for 8 to 72 hours into the menstrual cycle.
  - Increased endometrial prostaglandin production is believed to be the cause of the associated pain
  - It is associated with multiple symptoms, including abdominal cramps, headache, backache, general body aches, continuous abdominal pain, and other somatic discomforts.
  - The difference between primary dysmenorrhea and normal somatic and psychological changes prior to menses is that primary dysmenorrhea is perceived as more severe, with chronic, sometimes debilitating symptoms.
  - There is no evidence of organic pathology in the uterus, fallopian tubes, or ovaries with primary dysmenorrhea.
  - Women usually report repeated symptomology with each cycle.
  - When charting their cycles, it is evident that that pain, bleeding, and disruption of lifestyle occur at regular times in the cycle.
  - There is a higher prevalence of depression and anxiety in women who experience pelvic pain or dysmenorrhea
- Secondary (occurring from identifiable organic pathology).
  - Diagnosis of secondary dysmenorrhea includes pelvic pathology such as adenomyosis, leiomyomata, irritable bowel syndrome, interstitial cystitis, and endometriosis
  - Almost any process that can affect the pelvic viscera and cause acute or intermittent recurring pain might be a source of cyclic premenstrual pain, including urinary tract infection, pelvic inflammatory disease, hernia, and pelvic relaxation or prolapse
  - Clinical findings may differ from primary dysmenorrhea in that they may include reports of dyspareunia (pain with intercourse), postcoital bleeding, and abnormal uterine bleeding.
  - The pelvic pain associated with secondary dysmenorrhea may occur before, during, or after menses.
  - The most common cause of secondary dysmenorrhea is endometriosis—a chronic condition in which the endometrial lining is implanted outside the uterus.
  - Another cause of secondary dysmenorrhea is uterine fibroids (leiomyomas, myomas).

- The pain associated with either primary or secondary dysmenorrhea may be similar, although pain that has increased over time is more often associated with secondary dysmenorrhea.
- Treatment
    - **Nonpharmacologic Treatments**
        - Heat
        - Lifestyle changes
        - Vitamins and herbal supplements
        - Acupuncture
    - **Pharmacologic Treatments**
        - NSAIDS: start taking 2-3 days before the start of menses; more likely to be effective for primary dysmenorrhea than for secondary dysmenorrhea because of the associated underlying pathology that often accompanies the latter
        - Oral contraceptives
        - Progestin implants
        - Progestin IUD
        - Depo Medroxyprogesterone Acetate
        - Surgical intervention—extreme measure

Differentiate between PMS & PMDD

- Premenstrual syndrome (PMS) describes the cyclical recurrence of symptoms that impair a woman's health, relationships, and occupational functioning.
    - PMS can be defined as a cluster of mild to moderate physical and psychological symptoms that occur during the late luteal phase of menses and resolve with menstruation
- Premenstrual dysphoric disorder (PMDD) is a diagnostic label that applies to a much smaller number of menstruating women experiencing severe PMS with predominantly negative affective symptoms.
    - PMDD encompasses cognitive, behavioral, emotional, and negative symptomatic changes that severely impair daily functioning, relationships, parenting, and ability to work in the late luteal menstrual phase

  The diagnostic criteria for PMDD are as follows:
    - In the majority of cycles, five or more symptoms, including affective and physical symptoms, are present during the week before menses and are absent in the follicular phase.
    - One (or more) of the following symptoms is present: irritability, depressed mood, marked anxiety, tension, or affective lability.
    - One or more of the following symptoms must additionally be present (the combination of symptoms in I and II must total five): decreased interest in usual activities, difficulty concentrating, fatigue, appetite change (decreased or increased), changes in sleep patterns (hypersomnia or insomnia), sense of feeling overwhelmed, physical symptoms such as breast tenderness, joint or muscle pain, bloating, or weight gain.
    - The symptoms markedly interfere with occupational or social functioning.
    - The symptoms are not due to an exacerbation of another disorder.

- The preceding criteria have been confirmed by prospective daily ratings over at least two menstrual cycles

TABLE **23-1 Symptoms of Premenstrual Syndrome and Premenstrual Dysphoric Disorder**

Symptoms	PMS	PMDD
Physical symptoms	Abdominal bloating and pain Mild weight gain from water retention Constipation followed by diarrhea at the onset of the menses Headache Pelvic pain and cramping Fatigue Extremity edema Nausea/food cravings	Physical: same as PMS but may be more severe Symptoms can begin immediately after ovulation Abdominal bloating and pain Headache Pelvic pain and cramping Fatigue Extremity edema Nausea/food cravings
Psychologic symptoms	Depression Anxiety Anger/irritability Insomnia Changes in libido Confusion, decrease in mental sharpness Social withdrawal Feelings of low self-esteem/poor self-image	Marked affective lability Marked irritability or anger or increased interpersonal conflicts Markedly depressed mood, feelings of hopelessness, or self-deprecating thoughts Marked anxiety, tension, feelings of being “keyed up” or “on edge” Decreased interest in usual activities Subjective sense of difficulty concentrating Lethargy Insomnia or hypersomnia A subjective sense of being overwhelmed or out of control
Diagnostic criteria	Symptoms begin up to 7 days prior to menses Remission of symptoms occurs from cycle days 4–13 Symptoms are significant enough to impair activities of daily living Symptoms are charted in at least 2 cycles Symptoms are not due to another disorder	Symptoms are associated with clinically significant distress or interference with work, school, social activities, or relationships with others The disturbance is not an exacerbation of the symptoms of another disorder (e.g., major depressive disorder) Criteria should be confirmed by prospective daily ratings during at least 2 symptomatic cycles (the diagnosis may be made provisionally prior to this confirmation) Symptoms are not due to the direct physiological effects of a substance (e.g., drug abuse, medications other than treatment) or a general medical condition

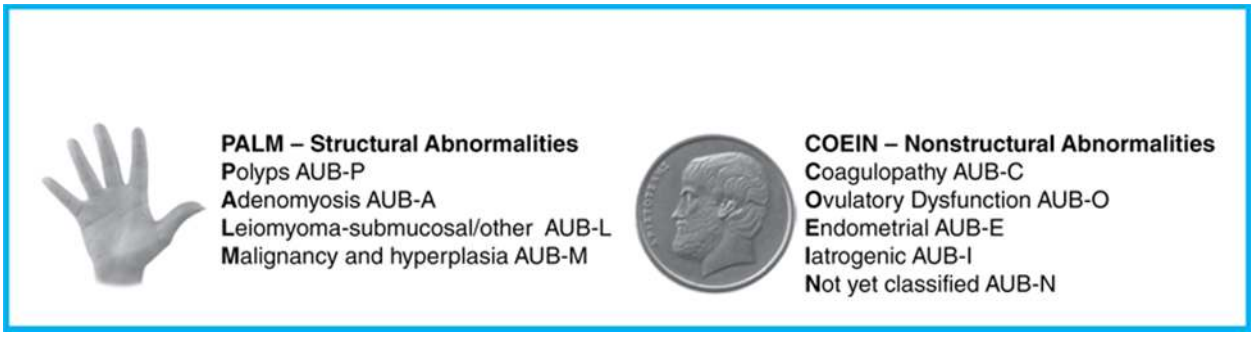
Abnormal uterine bleeding terminology

*In women of reproductive age, the most common cause of a bleeding pattern that suddenly differs from a woman’s established menstrual pattern is a complication of pregnancy, including threatened or incomplete abortion, ectopic pregnancy, retained products of conception, or gestational trophoblastic disease

**As a consequence, clinicians treating women of childbearing age who present with AUB—especially adolescents who may not be forthcoming about their sexual activity—should always first exclude pregnancy or a complication of pregnancy as a cause of the bleeding.

Menorrhagia: heavy or prolonged menstrual bleeding
Metrorrhagia: "irregular" intermenstrual bleeding or bleeding between menstrual periods
Menometrorrhagia: "irregular" and heavy intermenstrual bleeding
Post-Coital: bleeding that occurs after intercourse
Post-Menopausal: bleeding that occurs after a menopausal woman has not had a period for at least 12 months

Structural vs. Nonstructural etiologies of abnormal uterine bleeding



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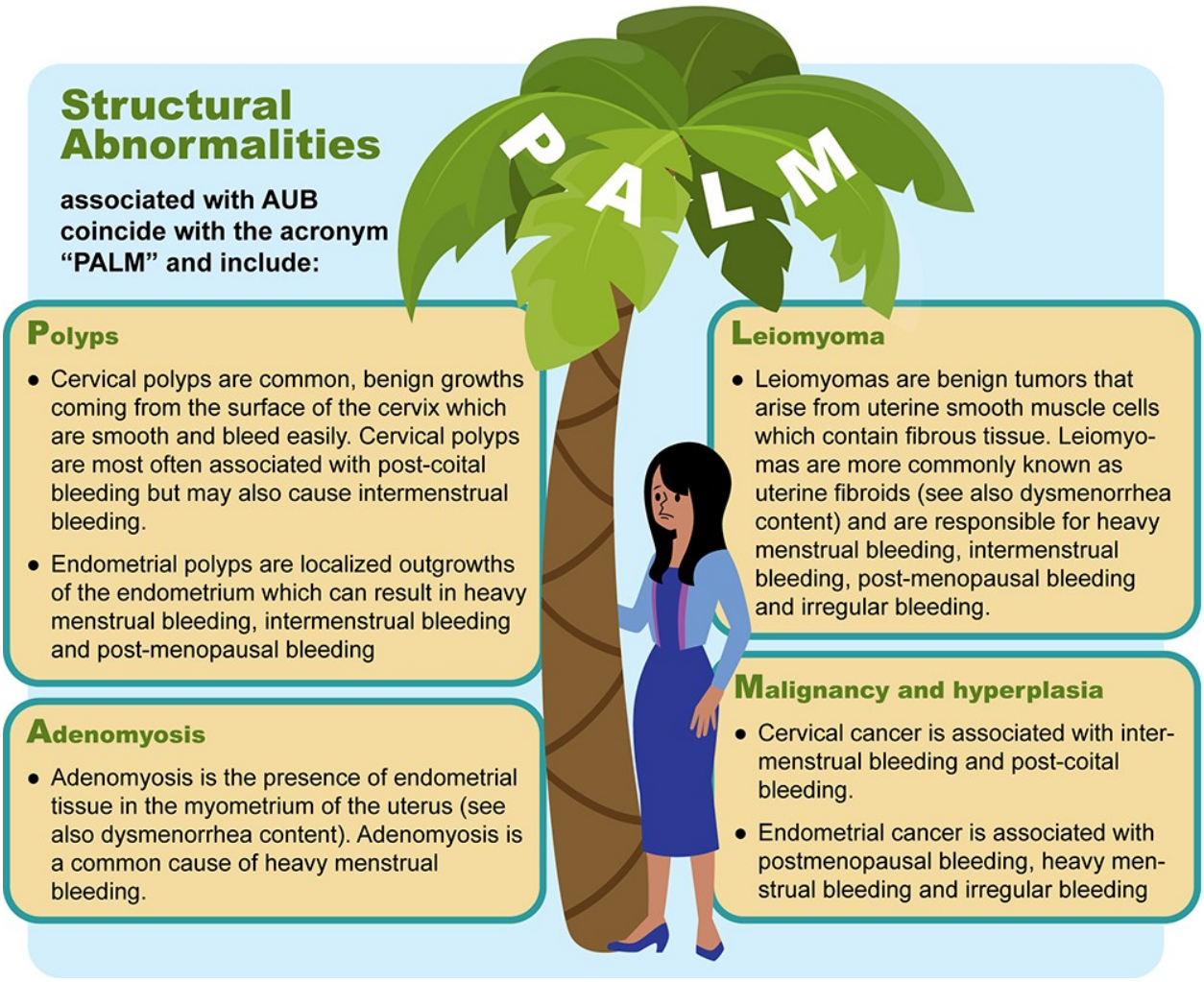

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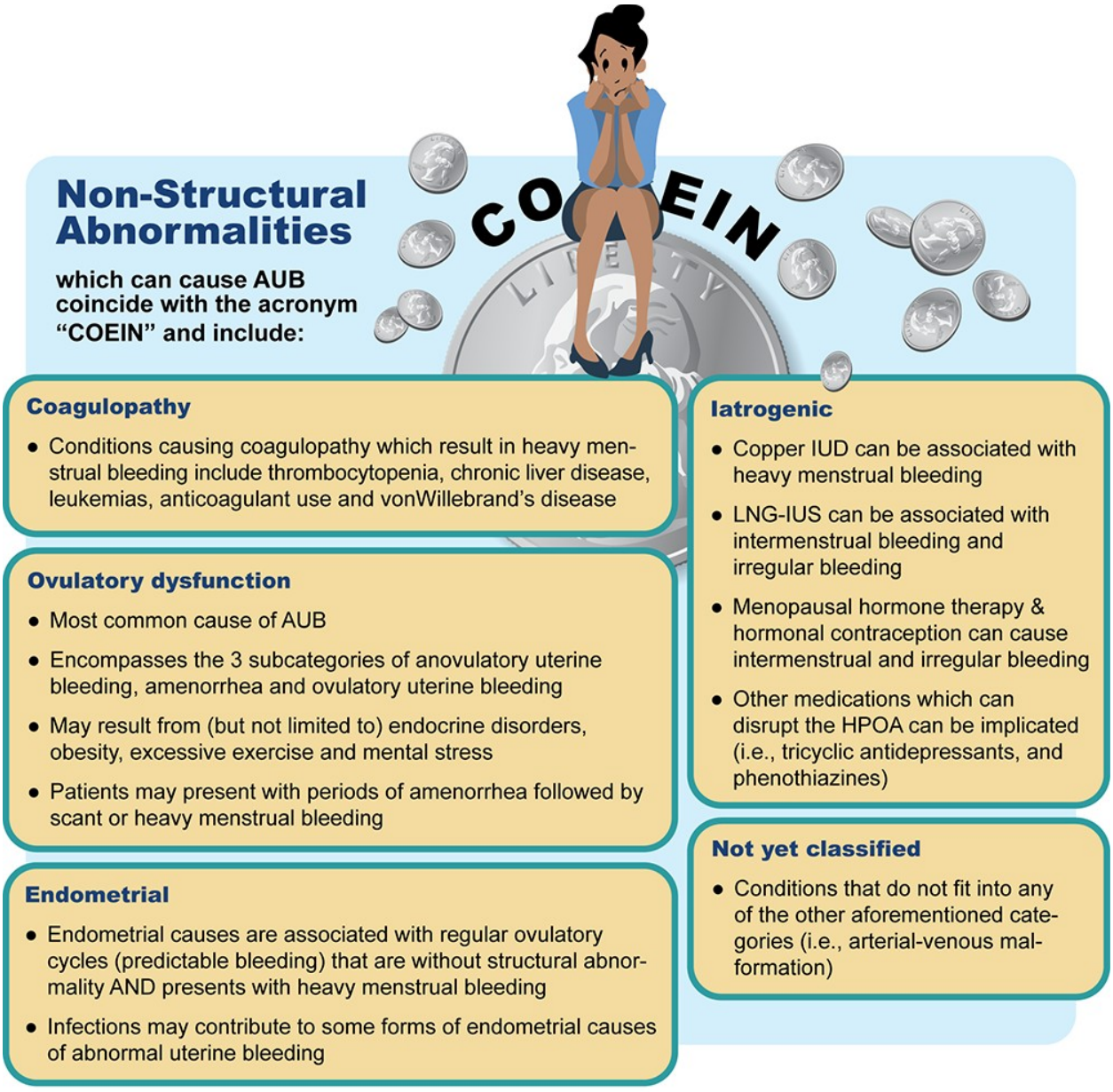


Evaluation and management of abnormal uterine bleeding: **See Week 2 lesson Material**

- Management: Management goals for treating AUB are to (1) normalize the bleeding, (2) correct any anemia, (3) prevent cancer, and (4) restore quality of life.
    - The clinician should always consider the woman's choice of treatment when developing a plan of care.
    - Concomitant therapy may be necessary to achieve these goals, particularly if the bleeding is severe and threatens hemodynamic stability.
    - Estrogen therapy will provide rapid growth of a denuded endometrium.
    - Once the acute bleeding is under control, additional treatment options such as oral contraceptives, use of the levonorgestrel intrauterine system, and progestin therapy (among others) are available for long-term treatment

- If testing reveals that the woman is anemic because of the bleeding, she will need iron therapy.
- Table 24.5 pg 591: Pharmacological management: A variety of pharmacologic choices are available for women with HMB, including combined oral contraceptives (COCs), progestogen-only therapy, and levonorgestrel-releasing intrauterine devices
- Nonsteroidal anti-inflammatory drugs are useful for ovulatory–idiopathic HMB. The heavier the bleeding, the better the effectiveness of NSAIDs,
- surgical management options for HMB include D & C, endometrial ablation, uterine artery embolization, and hysterectomy. In the presence of a thin endometrium, medical therapy for excessive uterine bleeding is reasonable.

Breast mass types and diagnostic studies

Fibroadenomas

- Benign neoplasms which occurs most frequently in young women, usually within the first 20 years after puberty.
- The frequency is a slightly higher and tends to occur at an earlier age in the African American population than in Caucasian women.
- They are usually discovered accidentally and typically present as solid, well-defined masses which are non-tender and mobile. Multiple fibroadenomas are possible.
- The incidence of fibroadenomas decrease with age but may still occur in menopause.
- Etiology is unknown but a hormonal relationship is likely since they can increase in size during pregnancy or with estrogen therapy.

Cysts

- Benign fluid-filled sacs that are encapsulated within the breast.
- Single or multiple cysts may be present occurring in one or both breasts.
- Cysts are most common in women between the ages of 35 and 50, prior to menopause but can be found in women of any age pre- and post-menopause.

Lipomas

- Fatty tumors that can appear anywhere in the body, including the breast. They are usually not tender and occur in the later reproductive years.

Hamartoma

- Overgrowth of mature breast cells which may contain fatty, fibrous and/or glandular tissue.
- Hamartomas are smooth and painless masses.

Fat Necrosis

- Usually the result of breast trauma or surgery.
- Tenderness may or may not be present.
- Sometimes indistinguishable from carcinoma.
- If left untreated, fat necrosis masses usually gradually disappear without intervention.

Phyllodes tumors

- Rare benign breast tumor arising from the fibroepithelial cells.
- The tumors tend to grow very quickly and become very large.
- The lesion can be, but rarely is, malignant.
- Requires biopsy

Diagnostic Studies

- It is very important to differentiate between a screening mammogram and a diagnostic mammogram.
- Screening mammogram
  - Performed usually with 2 radiographic views.
  - Secondary prevention measure in asymptomatic female to detect the presence of early breast cancer.
- Diagnostic mammogram
  - Performed to evaluate a palpable mass
  - Offers several radiographic views which are best in detecting calcifications and anatomical distortions.
- If a mass is present the provider MUST ORDER A DIAGNOSTIC MAMMOGRAM, not a screening mammogram
- Mammograms have less sensitivity in women under the age of 30 because the breast tissue is more radiodense resulting in a less meaningful evaluation
- A breast ultrasound should be ordered in conjunction with a diagnostic mammogram which can differentiate between solid and cystic masses
- Nipple discharge should be collected on a slide and sent for cytology according to recommended laboratory collection procedures
- Finally, a referral for fine needle aspiration, biopsy, ductal endoscopy or specialized MRI in some cases may be necessary

Differential diagnosis for pelvic pain

- Pelvic pain is a broad term encompassing a number of etiologies, within or across body systems.
- Such pain can be acute, chronic, cyclic, or noncyclic and may or may not be related to gynecologic organs.
- It may be symptomatic of an underlying cause, or it can be a syndrome unto itself.
- Pelvic pain can be so severe that it adversely affects a woman's normal functioning, keeping her from maintaining her normal lifestyle.
- Although seeking treatment for pelvic pain is one of the most common reasons women come to a clinician for care, diagnosing its cause and prescribing the appropriate treatment is often difficult because of the complexity of the pathophysiology and the myriad contributing factors.

TABLE **28-1 Differential Diagnoses for Pelvic Pain p. 719**
TABLE **28-2 Acute Pelvic Pain of Gynecologic Origin (Noncyclic): Common Differential Diagnoses and Signs, Symptoms, and Location of Pain p. 720**
TABLE **28-3 Acute Pelvic Pain of Nongynecologic Origin: Common Differential Diagnoses, Signs, Symptoms, and Location of Pain p. 721**
TABLE **28-4 Common Noncyclic Gynecologic Causes of Chronic Pelvic Pain: Signs, Symptoms, Diagnosis, and Management p. 724**

Etiology, diagnosis, and treatment of common breast disorders

Mastalgia/Mastodynia

- Mastalgia, or mastodynia, are other words used for breast pain, which is a relatively common phenomenon in females once they reach the reproductive years.
- Breast pain can be classified into 3 different categories:
  - cyclical breast pain
  - non-cyclical breast pain and
  - extramammary (chest wall) pain.
- Although most breast symptoms have benign causes, mastalgia can cause significant anxiety and concern for a female due to fear of cancer.
- The majority of cases of breast pain however are benign, and breast pain is rarely a primary symptom of a developing cancer.
- The likelihood of mastalgia as a symptom of cancer increases though when a woman reaches menopause where there is lack of hormonal influence.

Cyclical Mastalgia

- The majority of breast pain is cyclic and coincides with the menstrual cycle which induces breast engorgement and tenderness.
- Symptoms occur most often in the 2 weeks before the onset of menses (luteal phase) and are at their worst right before menses begins.
- The pain is usually bilateral and poorly localized and is often described as dull or achy.
- Breast size does not seem to influence the occurrence or perception of pain and cyclical pain is more likely to affect pre-menopausal women.

Fibrocystic Breast Changes

- Fibrocystic breast changes are the most common cause of cyclic breast pain in women of reproductive age and is characterized by painful, multiple mobile masses in the breast.
- Fibrocystic changes are usually seen bilaterally and the pain and size of the masses typically increase during the luteal phase of the menstrual cycle.
- Fibrocystic changes commonly occur in the 3rd decade of life and are benign.
- Fluctuations in size and rapid appearance or disappearance of a breast mass help to differentiate these lesions from carcinoma but imaging and referral is necessary is a dominant mass is present.

Non-cyclical Mastalgia

- Non-cyclic breast pain is less common and is unrelated to the menstrual cycle, so it is not hormone influenced.
- Pain generally presents in 1 specific location and is constant or intermittently painful.
- Pain is usually described as a tightness, burning or general soreness and is more commonly experiences by post-menopausal women.
- Etiologies may include periductal mastitis, stretching of cooper's ligament, trauma, cyst, inflammatory cancer (ductal cancer) or idiopathic.

Extra-mammary Mastalgia

- Chest wall pain is unrelated to the breast and referred from another source such as torn or strained muscles in the chest or shoulders, inflammation of the costal cartilage and rib injuries.

Nipple Discharge

- Nipple discharge is also a common breast complaint among women and it is likely that you will encounter a patient presenting to your office for evaluation.
- Nipple discharge is categorized into 3 types:

1. normal lactation
2. benign physiologic nipple discharge (galactorrhea)
3. pathologic nipple discharge

Physiologic Nipple Discharge

- Galactorrhea is a considered a physiologic nipple discharge because it is frequently the result of an excess of prolactin from the pituitary gland which stimulates milk production.
- Galactorrhea is usually bilateral (but may be unilateral), multi-ductal and milky in appearance in the non-lactating adult. It can occur in males as well as females.
- In females, absent or irregular menstrual periods are likely.

Pathologic Nipple Discharge

- Pathologic nipple discharge on the other hand is non-milky, spontaneous, and most often unilateral and uniductal.
- Nipple discharge with a bloody appearance is more suggestive of intraductal malignancy or a benign intraductal papilloma and should raise a red flag to the provider.
- Mammary duct ectasia, on the other hand, is another source of non-milky discharge.
- Ectasia is the result of mammary duct dilation with surrounding inflammation and fibrosis.
- It can present with variable colors (green, brown or black) and may be seen in both breast and/or multiple ducts.

Treatment

- Once a benign diagnosis or normal findings have been established by biopsy or imaging, simple reassurance is often all that is needed. Symptomatic treatment for mastalgia may also include the following recommendations:
- Wear a sports or supportive, wire-free bra
- Minimizing caffeine may provide anecdotal relief
- NSAIDs
- Evening primrose oil and vitamin E supplementation-their utility is controversial since benefits have not been shown consistently in research
- Danazol, bromocriptine and tamoxifen have been found effective and used for severe cases but the significant side effects have limited the acceptability of their use
- Changing to contraceptive pill or hormone replacement therapy with less estrogen or progesterone may offer some relief associated with cyclic mastalgia

Clinical signs and symptoms of ectopic pregnancy

- Ectopic pregnancy is the implantation of a fertilized ovum in locations other than the uterine cavity.
- It is the second leading cause of maternal mortality in the United States.
- Approximately 95% of all ectopic pregnancies occur in the fallopian tube
- Growth of the fetus in the fallopian tube puts the woman who is pregnant at high risk for pregnancy loss, tubal rupture, excessive blood loss, and future infertility due to tubal scarring. **Box 31-1** summarizes risk factors associated with ectopic pregnancy.

Signs/Symptoms

- Pelvic and abdominal pain and unexplained vaginal bleeding are the primary symptoms experienced by most women with ectopic pregnancy.

- The pain may be described as vague, sharp, diffuse, or unilateral.
- The woman may have had a time of amenorrhea, and pregnancy may or may not already be diagnosed.
- A ruptured ectopic pregnancy is characterized by a sudden onset of vaginal bleeding and sharp, severe, unilateral abdominal pain.
- Following rupture, symptoms of significant blood loss and resulting shock may include hypotension, shoulder pain, and breast tenderness.

Physical findings include

- cervical motion tenderness,
- a uterus that is not enlarged,
- adnexal mass, and
- adnexal tenderness.
- Diagnosis may take several steps and should be managed by a maternal–fetal specialist.

Diagnostics

- Immediate data to collect to aid in the diagnosis include a transvaginal ultrasound to determine the contents of the uterus, pregnancy test, complete blood count, and β-hCG levels.
- Differential diagnoses include appendicitis, pelvic inflammatory disease, bowel irritability or obstruction, cholecystitis, pyelonephritis, and ovarian torsion.

Breast cancer risk factors

BOX 15-1 Risk Factors for Breast Cancer

- Female
- Advancing age
- Personal history of invasive breast cancer, ductal carcinoma in situ, or lobular carcinoma in situ
- Family history of invasive breast cancer, ductal carcinoma in situ, or lobular carcinoma in situ, especially in first-degree relatives
- Inherited detrimental genetic mutations
- Biopsy-confirmed proliferative breast lesions with atypia
- Dense breast tissue on mammogram
- High-dose radiation to chest, especially during puberty or young adulthood
- Menarche before age 12 years
- Menopause at age 55 years or older
- Nulliparity
- First full-term pregnancy after age 30 years
- Current use of combined oral contraceptives (likely due to detection bias of regular screening)
- Use of combined estrogen–progestogen hormone therapy after menopause
- Weight gain leading to overweight or obese status after age 18 years
- Physical inactivity
- Consumption of one or more alcoholic beverages per day
- Jewish ancestry (Ashkenazi)
- Place of birth (North America and Northern Europe versus Asia and Africa)

Breast cancer screening guidelines (USPSTF)

https://www.uspreventiveservicestaskforce.org/home/getfilebytoken/hPPj9vB9ZvPmUMG7Wnvcjp

Population	Women aged 40 to 49 y	Women aged 50 to 74 y	Women aged ≥75 y
Recommendation	The decision to start screening should be an individual one. Grade: C	Screen every 2 years. Grade: B	No recommendation. Grade: I statement (insufficient evidence)

Risk Assessment	These recommendations apply to asymptomatic women aged ≥40 y who do not have preexisting breast cancer or a previously diagnosed high-risk breast lesion and who are not at high risk for breast cancer because of a known underlying genetic mutation (such as a *BRCA1* or *BRCA2* gene mutation or other familial breast cancer syndrome) or a history of chest radiation at a young age. Increasing age is the most important risk factor for most women.		
Screening Tests	Conventional digital mammography has essentially replaced film mammography as the primary method for breast cancer screening in the United States. Conventional digital screening mammography has about the same diagnostic accuracy as film overall, although digital screening seems to have comparatively higher sensitivity but the same or lower specificity in women age <50 y.		
Starting and Stopping Ages	For women who are at average risk for breast cancer, most of the benefit of mammography results from biennial screening during ages 50 to 74 y. While screening mammography in women aged 40 to 49 y may reduce the risk for breast cancer death, the number of deaths averted is smaller than that in older women and the number of false-positive results and unnecessary biopsies is larger. The balance of benefits and harms is likely to improve as women move from their early to late 40s.		
Screening Interval	For most women, biennial mammography screening provides the best overall balance of benefit and harms.		
Balance of Benefits and Harms	The net benefit of screening mammography in women aged 40 to 49 y, while positive, is small.	The net benefit of screening mammography in women aged 50 to 74 y is moderate.	Evidence on mammography screening in women aged ≥75 y is insufficient, and the balance of benefits and harms cannot be determined.
Other Relevant USPSTF Recommendations	The USPSTF has made recommendations about the use of medications to reduce women's risk for breast cancer, as well as risk assessment, genetic counseling, and genetic testing for *BRCA1*- or *BRCA2*-related cancer (including breast cancer). These recommendations are available on the USPSTF Web site (www.uspreventiveservicestaskforce.org).		

Screening Method	Primary screening with DBT	Adjunctive screening with breast ultrasonography, MRI, DBT, or other methods in women who have dense breasts
Recommendation	No recommendation. Grade: I statement (insufficient evidence)	No recommendation. Grade: I statement (insufficient evidence)

Benefits	From the limited data available, DBT seems to reduce recall rates (i.e., follow-up for additional imaging or testing) and increase cancer detection rates compared with conventional digital mammography alone.	Limited data suggests that ultrasonography or MRI will detect additional breast cancer in women who have dense breasts. DBT also detects additional breast cancer in the short term.
Harms	As currently practiced in most settings, DBT exposes women to about twice the amount of radiation as conventional digital mammography. Current study designs cannot determine the degree to which the additional cases of cancer detected would have become clinically significant (i.e., the degree of overdiagnosis).	Most positive adjunctive breast cancer screening test results are false positive.
Balance of Benefits and Harms	Evidence is insufficient, and the balance of benefits and harms cannot be determined.	Evidence is insufficient, and the balance of benefits and harms cannot be determined.

Diagnosis and treatment of non-STI vaginitis (vulvovaginal candidiasis, bacterial vaginosis)

Vulvovaginal candidiasis, caused by *Candida* species and commonly called a "yeast" infection, affects most females at some time in their lives, with the highest incidence during the reproductive years.

Clinical findings

- Vulvovaginal candidiasis classically presents with symptoms such as pruritus (the most common symptom), vaginal soreness, dyspareunia, vulvar burning, external dysuria, and abnormal vaginal discharge.
- Vulvar and labial erythema, fissures, and satellite papular lesions may be present.

- Symptoms associated with vulvovaginal candidiasis tend to flare prior to the onset of menses.
- Vaginal discharge is usually described as thick, white, and clumpy ("cottage-cheese-like"), but it may be watery, minimal, or not present, and there is typically little, if any, associated odor.

DIAGNOSTIC METHODS

- The clinical symptoms of vulvovaginal candidiasis overlap with other causes of vaginitis, so diagnostic evaluation is recommended. Most patients with symptomatic vulvovaginal candidiasis can be readily diagnosed on the basis of a microscopic examination of vaginal secretions.
    - Vaginal pH: The vaginal pH should be normal (3.8 to 4.5) in the setting of candidiasis. If the pH is abnormally high (greater than 4.5), it suggests an alternative diagnosis of bacterial vaginosis or trichomoniasis, or a mixed infection.
    - Potassium Hydroxide (KOH) and Saline Wet Mount Preparation and Microscopy: Visualization under microscopy of pseudohyphae (mycelia) and/or budding yeast (conidia) on 10% KOH wet prep examination or saline wet mount can confirm the diagnosis of vulvovaginal candidiasis

Treatment of Uncomplicated Vulvovaginal Candidiasis Infections

- The 2015 STD Treatment Guidelines recommend a variety of short-course intravaginal antifungal agents to treat uncomplicated vulvovaginal candidiasis
- Many of the treatment options are available in over-the-counter formulations, and prescription intravaginal medications are also available.
- The recommendations include one option for patients who prefer oral therapy: fluconazole 150 mg orally in a single dose.
- The short-course topical formulations are effective in treating uncomplicated vulvovaginal candidiasis and azole drugs are more effective than topical nystatin.
- An estimated 80 to 90% of patients with vulvovaginal candidiasis who complete treatment with an azole have a relief in symptoms and negative cultures.

Treatment of Recurrent Vulvovaginal Candidiasis

- For patients who develop recurrent vulvovaginal candidiasis (four or more episodes within 1 year), the 2015 STD Treatment Guidelines recommend a strategy of using a longer 7 to 14 day initial course of therapy to achieve clinical remission, followed by a 6 month maintenance regimen.
- The longer course initial therapy options include topical therapy for 7 to 14 days or oral fluconazole given as a 100 mg, 150 mg, or 200 mg oral dose every third day (day 1, 4, and 7) for a total of 3 doses; the goal of the intensive initial therapy is to achieve mycologic remission before using maintenance therapy.
- The preferred maintenance therapy consists of oral fluconazole (100, 150, or 200 mg) given weekly for 6 months); maintenance therapy has been demonstrated to reduce episodes of vulvovaginal candidiasis, but symptoms recur in about 30 to 50% of women once maintanence therapy is stopped.
- For patients who cannot take oral fluconazole maintenance therapy, topical azole therapy given intermittently can be used as an alternative.

Treatment of Severe Vulvovaginal Candidiasis

- Severe disease, which can involve significant skin breakdown, fissuring, and edema, requires treatment with 7 to 10 days of topical azole therapy or two doses of oral fluconazole 150 mg given 72 hours apart. Low-dose topical steroid preparations may also provide immediate symptomatic relief.

Bacterial Vaginosis

Bacterial vaginosis is a gynecologic condition that is related to alterations in the normal vaginal flora and is the most common cause of vaginitis among reproductive-age women.

CLINICAL MANIFESTATIONS

- Up to half of all women with bacterial vaginosis have no symptoms.
- If symptomatic, most women with bacterial vaginosis will have a malodorous (“fishy odor”), homogenous, clear, white or gray vaginal discharge that is reported more commonly after sexual intercourse and after completion of menses; labial and/or vulvar swelling and other signs or symptoms of inflammation are typically absent.
- Symptoms may remit spontaneously.
- Qualitative studies have shown that bacterial vaginosis can negatively impact self-esteem, sexual relationships, and quality of life.

Diagnostic criteria

- Amsel’s criteria--The presence of three of the following four criteria provides sufficient evidence for a clinical diagnosis of bacterial vaginosis:
  - Vaginal pH greater than 4.5, which is the most sensitive but least specific sign.
  - The presence of “clue cells” (bacterial clumping upon the borders of epithelial cells) on wet mount examination. To meet the criteria for positive clue cells, the clue cells should constitute at least 20% of vaginal epithelial cells viewed on saline microscopy (an occasional clue cell does not fulfill this criterion).
  - Positive amine, "whiff" or "fishy odor" test (liberation of biologic amines with or without the addition of 10% KOH).
  - Homogeneous, nonviscous, milky-white discharge adherent to the vaginal walls.

Treatment of Bacterial Vaginosis in Nonpregnant Women

- The 2015 STD Treatment Guidelines recommend treatment in symptomatic women with bacterial vaginosis.
- Recommended regimens include metronidazole 500 mg orally twice daily for 7 days; metronidazole gel 0.75%, 2 grams intravaginally once a day for 5 days; or clindamycin cream 2%, 2 grams intravaginally at bedtime for 7 days;
- alternative regimens include oral tinidazole, oral clindamycin, or intravaginal clindamycin ovules
- The use of probiotics that target repletion of Lactobacillus species are an attractive concept, but further data are required, and at least one product is under study.
- Patients should be counseled that consuming alcohol while taking metronidazole or tinidazole could precipitate a disulfiram-like reaction.
- In addition, patients should not drink alcohol for 24 hours after the last dose of metronidazole and for 72 hours after the last dose of tinidazole.

Treatment of Women During Pregnancy: The 2015 STD Treatment Guidelines recommend treating symptomatic pregnant women with the same oral and intravaginal treatment options as non-pregnant women, except that tinidazole is not recommended during pregnancy due to evidence of fetal harm in animal studies. Metronidazole crosses the placenta and is excreted in breast milk, but it has not been linked to teratogenic effects. Treating symptomatic infection in pregnancy reduces symptoms and may reduce certain adverse obstetrical outcomes, such as late miscarriage. For breastfeeding mothers with symptomatic bacterial vaginosis, metronidazole can be used; some experts recommend deferring breastfeeding ("pump and dump") for 24 hours after treatment with the higher (2 grams) single dose of metronidazole.

Treatment of Recurrent Bacterial Vaginosis: Bacterial vaginosis recurs in approximately 30% of women within the three months following treatment, and in up to 50% of patients after 6 to 12 months. Women with recurrence can be treated with either the same recommended regimen, or a different recommended regimen. If, however, a woman experiences multiple recurrences, options include (1) metronidazole intravaginal gel twice weekly for 4 to 6 months or (2) oral metronidazole 500 mg twice daily (or tinidazole 500 mg twice daily) for 7 days, followed by intravaginal boric acid 600 mg daily for 21 days, followed by intravaginal metronidazole gel (0.75%) twice weekly for 4 to 6 months. Very little is known about antimicrobial resistance with pathogens that cause bacterial vaginosis and clinical experience suggests that treatment failure from antimicrobial resistance is uncommon.

Etiology, incidence, transmission, clinical findings, diagnosis, associated risks and treatment of STIs

Etiology

- The term *sexually transmitted infection* does not refer to any one specific disease, but rather refers to "a variety of clinical syndromes caused by pathogens that can be acquired and transmitted through sexual activity
- This term has replaced the older designation of *venereal disease*, which primarily described gonorrhea and syphilis.
- STIs may be caused by a wide spectrum of bacteria, viruses, protozoa, and ectoparasites (organisms that live on the outside of the body, such as a louse).
- Historically, many STIs were considered to be symptomatic illnesses usually afflicting men; however, women and children can have more severe symptoms and sequelae from these infections than do men.

Incidence

- Sexually transmitted infections (STIs) are a major public health issue in the United States, with approximately 20 million new STIs occurring every
- As many as 50% of Americans will contract one or more reportable STIs during their lifetime, and as many as 80% will be infected with a nonreportable STI such as genital herpes or the human papillomavirus (HPV)

Transmission

- The chance of contracting, transmitting, or suffering complications from STIs depends on multiple biologic, behavioral, social, and relationship risk factors
- That is, a myriad of microbiologic, hormonal, and immunologic factors influence individual susceptibility and transmission potential for STIs.
- These factors are partially influenced by a woman's sexual practices, substance use, and other health behaviors. Health behaviors, in turn, are influenced by socioeconomic factors and other social influences
- Risk Factors for Sexually Transmitted Infections and HIV
  - Previous or current sexually transmitted infection
  - Sex with multiple or new partners
  - Initiating sex at a young age
  - Unprotected sex
  - Sex with high-risk partners
  - Sex with a partner who has HIV
  - Sex in exchange for money or drugs
  - Sex while intoxicated
  - Illegal drug use
  - Injection drug use
  - Mental illness
  - Age < 25 years
  - Living in an area with high sexually transmitted infection/HIV prevalence
  - Residing in a detention or correctional facility
- Biological Factors
  - Women are biologically more likely to become infected with STIs than men.
  - Women are also more likely than men to acquire an STI from a single heterosexual sexual encounter.
  - For example, the risk of a woman contracting gonorrhea from a single act of intercourse is 50% or greater, whereas the corresponding risk for a man is 20% to 30%. In addition, men are 2 to 3 times more likely to transmit HIV to women than the reverse
  - This difference arises because the vagina has a larger amount of genital mucous membranes exposed and is an environment more conducive to development of infections than the penis.
  - Further, risk for trauma is greater during vaginal intercourse for women than for men
  - STIs are frequently asymptomatic in women and, therefore, are more likely to go undetected than the same infections in men
  - Additionally, when or if symptoms develop, they are often confused with those of other conditions that are not transmitted sexually, such as bacterial vaginosis, vulvovaginal candidiasis, and urinary tract infections.
  - The prevalence rates of many STIs are highest among adolescents, whose lack of immunity and biologic susceptibility are contributing factors to their vulnerability to such infections
  - Compared to older women prior to menopause, female adolescents and young women are more susceptible to cervical infections, such as chlamydial infections, gonorrhea, and HIV, because of the ectropion of the immature cervix and resulting larger exposed surface area of cells unprotected by cervical mucus.

- As women age, these cells eventually recede into the inner cervix.
- Nevertheless, women who are postmenopausal also are at increased risk because of the thin vaginal and cervical mucosa that occurs as estrogen levels decline.
- Further, women who are pregnant have a higher cervical ectropion area due to the influence of estrogen levels in pregnancy
- Other biologic factors that may increase a woman's risk of acquiring, transmitting, or developing complications of certain STIs include vaginal douching, risky sexual practices, use of hormonal contraceptives, and bacterial vaginosis
- The risk for contracting infections that can lead to PID may be increased with vaginal douching, and risk for PID may also increase with greater frequency of douching
- Certain sexual practices—for example, anal intercourse, sex during menses, and vaginal intercourse without sufficient lubrication (dry sex)—may also predispose a woman to acquiring an STI; the bleeding and tissue trauma that can result from these practices facilitate invasion by pathogens
- an increased risk of HPV, chlamydia, and herpes simplex virus (HSV) among high-risk female sex workers who use oral contraceptive pills (OCPs) and an increased rate of chlamydia infection in the general population of women who use OCPs

- Social Factors
  - Societal factors such as poverty, lack of education, social inequity, immigration status, and inadequate access to health care may all indirectly increase the prevalence of STIs in at-risk populations.
  - Persons with the highest rates of many STIs are often those with the least access to health care, and health insurance coverage influences whether and where a woman obtains STI treatment and preventive services

Clinical Findings

- All women who are sexually active should be screened for STIs regularly through history, physical examination, and laboratory studies based on risk factors.

See book for diagnosis and treatment of different STI's Chapter 20

Diagnosis and treatment of vaginal masses

- Vulvar cancer is often asymptomatic. If signs and symptoms do become apparent, however, the most common presentation is a woman's report of a vulvar lump or mass that may or may not be painful.
- There is often a prolonged history of vulvar pruritus, and vulvar bleeding, discharge, and dysuria may be present
- On physical examination, the lesion is usually raised, and may be ulcerated, warty, or fleshy in appearance; alternatively, it may appear to be an area of squamous cell hyperplasia (see Chapter 26).
- Lesions may be single or multiple in number, and color can vary from white to gray, red to brown, or black.
- Most squamous cell carcinomas occur on the labia majora, although the labia minora, clitoris, and perineum are other possible primary sites.

- Women with advanced disease may present with a lump in the groin related to lymph node metastasis
- Diagnosis of vulvar cancer is made by identifying a lesion through visual inspection and then obtaining confirmation with a biopsy.
    - Colposcopy may assist in defining the extent of disease
    - Additional diagnostic testing may include colposcopy of the cervix and vagina because of the association of vulvar cancer with other gynecologic neoplasia.
    - A CT scan, magnetic resonance imaging (MRI), or positron emission tomography (PET) scan of the pelvis and groins may be helpful in detecting any enlarged lymph nodes or erosion of underlying bony structures, and may assist in staging the cancer (if detected)

Etiology

- The majority of vulvar malignancies are squamous cell carcinomas. Less common forms include malignant melanomas, adenocarcinomas, and basal cell carcinomas.
- Research suggests that squamous cell vulvar cancer evolves from two separate types of vulvar intraepithelial neoplasia (VIN) that differ in terms of their etiology, pathogenesis, and clinical significance:
    - Usual-type VIN (warty, basaloid, and mixed) is related to human papillomavirus (HPV) infection in most cases, and tends to occur in younger women. It may be associated with similar lesions of the cervix and vagina
    - Differentiated-type VIN is usually diagnosed in women 65 to 75 years of age and is associated with vulvar dermatologic conditions such as lichen sclerosus, squamous cell hyperplasia, and Paget's disease of the vulva

Differential Diagnoses

- When establishing differential diagnoses for vulvar disorders, the clinician should consider basic vulvar changes and move up in complexity to inflammatory conditions and neoplasia. The following are potential differential diagnoses to consider prior to making a diagnosis of vulvar cancer:
    - Papillomatosis
    - Lichen simplex chronicus
    - Vulvar psoriasis
    - Lichen planus
    - Lichen sclerosus
    - Vulvar nevi, melanosis, or melanoma
    - HPV infection
    - Paget's disease
    - Vulvar neoplasia

Prevention

- The quadrivalent HPV vaccine, which protects against HPV genotypes 6, 11, 16, and 18, is indicated to prevent intraepithelial cancers of the vulva, cervix, anus, and vagina.

- With increasing use of HPV vaccination, it is expected that there will be a significant reduction in the incidence of VIN, usual type, as well as incidence of invasive vulvar cancer in women who are premenopausal.
- The CDC recommends that the HPV vaccine routinely be given to females and males ages 11 to 12 years.
- The vaccine may be given to individuals as young as 9 years, and catch-up vaccination is recommended until an individual is 26 years old.
- Cigarette smoking is strongly associated with the development of usual-type VIN, and smoking cessation should be encouraged. Identification and treatment of vulvar dermatologic disorders such as lichen sclerosis may also reduce the risk of differentiated-type VIN and subsequent cancer

Management/Treatment

Referral

- Patients presenting with symptoms or questionable lesions need to be referred to a gynecologist or gynecologic oncologist who has expertise in cancer surgery. Treatment is recommended for all women with vulvar cancer and for those with either type of precancerous VIN. When invasion is not a concern, VIN can be treated with surgical therapy, laser ablation, or medical therapy (American College of Obstetricians and Gynecologists, 2011a). Management of invasive cancer is highly individualized and emphasis is on selecting the most conservative and appropriate treatment consistent with cure of the disease (Hacker et al., 2012).

Pharmacologic Treatment

- Topical therapy with imiquimod, which is an immune modulator, or chemotherapeutic agents such as 5-fluorouracil (5-FU) may be used for women who have VIN that has not progressed to invasive disease. Topical therapy may have adverse skin effects and may be less effective than other treatment modalities (ACS, 2015d).

Laser Treatment

- Laser excision is also an acceptable option for the treatment of precancerous VIN. It can be used for single or multifocal lesions, although the risk of recurrence may be higher than with surgical wide excision. Regular follow-up is important because women treated for VIN are considered to remain at risk for recurrent VIN and vulvar cancer throughout their lifetime (American College of Obstetricians and Gynecologists, 2011a, reaffirmed 2014; NCI, 2015b; Preti et al., 2014).

Surgical Treatment

- Surgical resection is the standard treatment for patients with vulvar cancer regardless the stage of the disease
- Radical vulvar excision with removal of inguinal and femoral nodes may be required in women who are diagnosed with stage III–IV vulvar cancer. Chemotherapy and radiation treatment options for vulvar cancer have been limited to adjuvant use for locally advanced or metastatic disease, but both are being increasingly used in patients with earlier stages of the disease

Nationally reportable infections

- Accurate identification and timely reporting of STIs are integral components of successful infection control efforts.

- Clinicians are required to report certain STIs to their state public health officials, who in turn report these infection rates to the CDC.
- Nationally notifiable STIs include chancroid, chlamydia, gonorrhea, hepatitis, HIV, and syphilis (CDC, 2015d).
- A full list of all nationally notifiable STIs can be found at the National Notifiable Diseases Surveillance System (NNDSS) website: http://www.cdc.gov/nndss/default.aspx.
- The requirements for reporting other STIs differ from state to state, and clinicians need to be aware of reporting laws in their practice area.
- Clinicians are legally responsible for reporting all cases of those infections identified as reportable.
- Additionally, individuals with STIs should be asked to identify and notify all partners who might have been exposed to the infection.

Pelvic exam cytology (classification and treatment)

Abnormal cervical cytology, previously called dysplasia, is now referred to as Cervical Intraepithelial Neoplasia (CIN). CIN lesions are categorized into 3 groups (CIN 1, 2, & 3) which are based on their presence and depth into the epithelial layer of the cervix.

- CIN 1 lesions involve the initial 1/3 of the epithelial layer
- CIN 2 lesions involve 1/3 to less than 2/3 of the epithelial layer
- CIN 3 lesions involve 2/3 of the epithelial layer to full thickness

Atypical Squamous Cells of Undetermined Significance (ASCUS)

- Term used when cells do not appear normal, but the cause is unknown
- Does not exclude CIN 1-3 and cancer
- Reflex testing for HPV on abnormal PAP results and repeat testing is based on those results

Atypical Glandular Cells (AGCs)

- More common in older women (ages 40-69 years)
- 1/3 of cases are associated with pre-malignancy or malignancy
- Risk of cancer increases with age
- Refer for Endometrial Biopsy

Low-Grade Squamous Intraepithelial Lesions (LSIL)

- Cervical cells are mildly abnormal
- Usually caused by a low risk HPV infection
- Appropriateness of repeat screening vs. referral for diagnostic testing is largely dependent upon whether or not the woman is HPV + and age

High-Grade Squamous Intraepithelial Lesions (HSIL)

- Abnormal cervical cells which are more likely to be associated with premalignancy and malignancy.
- Refer immediately for cervical biopsy and treatment (Colposcopy or LEEP procedure)

Clinical findings, diagnosis, associated risks and treatment of pelvic inflammatory disease

Findings

- PID occurs in the upper female genital tract and includes any combination of endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis
- Historically, the abrupt onset of acute lower abdominal pain following menses has been considered the characteristic presenting symptom of PID.
- More recently, it has been recognized that symptoms of this infection can be very mild and nonspecific.
- Commonly reported symptoms include abdominal, pelvic, and low back pain; abnormal vaginal discharge; intermenstrual or postcoital bleeding; fever; nausea and vomiting; and urinary frequency.
- Women may report levels of pain ranging from minimal discomfort to dull, cramping, and intermittent pain to severe, persistent, and incapacitating pain.
- Pelvic pain is usually exacerbated by the Valsalva maneuver, intercourse, or movement. Symptoms of STIs in a woman's partners also should be noted.

Diagnosis

- A clinical diagnosis of PID is often made based on findings of pelvic organ tenderness and signs of lower genital tract infection, including mucopurulent cervicitis and cervical friability.
- There is no single laboratory test that can be used to detect upper genital tract infections. Instead, a pH test and wet mount of the vaginal secretions should be performed, along with tests for chlamydia and gonorrhea, although negative results do not rule out these infections' presence in the upper genital tract.
- Other laboratory tests that are not needed for diagnosis but are recommended for women with clinically severe PID are a complete blood count (CBC) and erythrocyte sedimentation rate (ESR), which, if positive, increase the specificity of the PID diagnosis.
- All women with PID should be offered testing for syphilis and HIV as well. Laboratory data are useful only when considered in conjunction with the history and physical examination findings. Pelvic ultrasound should be performed in women requiring hospitalization and those with a pelvic mass found on examination

Differential Diagnoses

- Symptoms of PID may mimic those associated with other conditions such as ectopic pregnancy, endometriosis, ovarian cyst with torsion, pelvic adhesions, inflammatory bowel disease, and acute appendicitis

BOX **20-7 Diagnosing Pelvic Inflammatory Disease**

Empiric treatment of PID should be initiated in sexually active young women and other women at risk for STIs if they are experiencing pelvic or lower abdominal pain, if no cause for the illness other than PID can be found, and if one or more of the following minimum criteria are present on pelvic examination:

- Cervical motion tenderness
- Uterine tenderness
- Adnexal tenderness

One or more of the following additional criteria can be used to enhance the specificity of the minimum criteria and support a diagnosis of PID:

- Oral temperature > 101°F (38.3°C)
- Abnormal cervical or vaginal mucopurulent discharge
- Presence of abundant numbers of white blood cells on saline microscopy of vaginal fluid
- Elevated erythrocyte sedimentation rate
- Elevated C-reactive protein level
- Laboratory documentation of cervical infection with *N. gonorrhoeae* or *C. trachomatis*

The most specific criteria for diagnosing PID include the following conditions:

- Endometrial biopsy with histopathologic evidence of endometritis
- Transvaginal sonography or magnetic resonance imaging techniques showing thickened, fluid-filled tubes with or without free pelvic fluid or tubo-ovarian complex, or Doppler studies suggesting pelvic infection (e.g., tubal hyperemia)
- Laparoscopic abnormalities consistent with PID

Prevention

- Primary prevention consists of education about avoiding STIs, whereas secondary prevention involves prompt treatment of lower genital tract infections to prevent ascension to the upper genital tract.
- Instructing women in self-protective behaviors such as practicing safer sex and using barrier contraceptive methods is critical (see **Box 20-4** and **Table 20-2**).
- Also important is the detection of asymptomatic gonorrheal and chlamydial infections through routine screening of women with risk factors. Partner notification when an STI is diagnosed is essential to prevent reinfection

TABLE **20-6 Treatment of Pelvic Inflammatory Disease**

Parenteral Regimens	Oral/Intramuscular Regimens
Cefotetan 2 gm IV every 12 hours **plus** Doxycycline 100 mg orally or IV every 12 hours **or** Cefoxitin 2 gm IV every 6 hours **plus** Doxycycline 100 mg orally or IV every 12 hours **or** Clindamycin 900 mg IV every 8 hours	Ceftriaxone 250 mg IM in a single dose **plus** Doxycycline 100 mg orally 2 times a day for 14 days **with[a] or without** Metronidazole 500 mg orally 2 times a day for 14 days **or**

Parenteral Regimens	Oral/Intramuscular Regimens
plus Gentamicin loading dose IV or IM (2 mg/kg of body weight), followed by a maintenance dose (1.5 mg/kg) every 8 hours. Single-day dosing (3–5 mg/kg) may be substituted. ***Alternative parenteral regimen:*** Ampicillin/sulbactam 3 gm IV every 6 hours **plus** Doxycycline 100 mg orally or IV every 12 hours	Cefoxitin 2 gm IM in a single dose and probenecid 1 gm orally administered concurrently in a single dose **plus** Doxycycline 100 mg orally 2 times a day for 14 days **with or without** Metronidazole 500 mg orally 2 times a day for 14 days **or** Other parenteral third-generation cephalosporin (e.g., ceftizoxime or cefotaxime) **plus** Doxycycline 100 mg orally twice a day for 14 days **with[a] or without** Metronidazole 500 mg orally twice a day for 14 days

Special Considerations

Pregnancy

- Pregnant women who have PID are at significant risk for maternal morbidity and preterm birth. They should be hospitalized and treated as inpatients with parenteral antibiotics. Doxycycline is known to discolor teeth and should be avoided in the second and third trimesters. Consultation with an infectious disease specialist is warranted when a woman has multiple antibiotic allergies (**CDC, 2015d**).

Women Using an Intrauterine Device

- Many women use either copper-containing or levonorgestrel-releasing IUDs for contraception (see **Chapter 11**). An increased risk of PID is seen in the first 21 days after IUD insertion.
- If a woman who is using either type of IUD is also diagnosed with PID, the device does not need to be removed immediately; indeed, it often does not need to be removed at all.
- Treatment should be initiated with a recommended antibiotic regimen. If no improvement is seen with 48 to 72 hours after beginning treatment, the IUD should be removed

Cervical cancer screening guidelines (USPSTF)

American Academy of Family Physicians (AAFP) and US Preventative Services Task Force (USPSTF)

• Start screening at age 21; women less than 21 years should not be screened regardless of risk factors including sexual activity with liquid based cytology or convention PAP test

- Women ages 21-29 years should have cervical cytology performed every 3 years
- Women ages 30-65 years should have cervical cytology performed every 3 years
- HPV co-testing in women less than 30 years is not recommended; women who want to extend their screening interval, HPV co-testing every 5 years is an option
- Primary high-risk HPV testing, as an alternative to co-testing or cytology alone is recommended every 5 years for women ages 30-65 years
- Women older than 65 can stop screening
- Women who have had a hysterectomy with cervical removal (not due to cancer) can stop screening as long as she has had no history of CIN 2, CIN 3 or adenocarcinoma in situ.
- Women who have been vaccinated for HPC should continue to be screened according to the guidelines

Primary vs. suppression therapy for HSV

- Genital herpes is a chronic and recurring condition for which there is no known cure. Systemic antiviral drugs may partially control the symptoms and signs of HSV infections when used for primary or recurrent episodes, and they may completely control symptoms when used as daily suppressive therapy. These drugs do not cure the infection, however, nor do they alter the subsequent risk, frequency, or rate of recurrence after discontinuation.

TABLE 20-4 Treatment of Genital Herpes

Primary Infection[a]	Recurrent Infection	Suppressive Therapy
Acyclovir 400 mg orally 3 times a day for 7–10 days or Acyclovir 200 mg orally 5 times a day for 7–10 days or Famciclovir 250 mg orally 3 times a day for 7–10 days or Valacyclovir 1 gm orally 2 times a day for 7–10 days	**Acyclovir 400 mg orally 3 times a day for 5 days or Acyclovir 800 mg orally 2 times a day for 5 days or Acyclovir 800 mg orally 3 times a day for 2 days or Famciclovir 125 mg orally 2 times a day for 5 days or Famciclovir 1,000 mg orally 2 times a day for 1 day or Famciclovir 500 mg orally once, followed by 250 mg 2 times a day**	**Acyclovir 400 mg orally 2 times a day or Famciclovir 250 mg orally 2 times a day or Valacyclovir 500 mg orally once a day (may be less effective than other valacyclovir or acyclovir dosing regiments in patients who have 10 or more episodes per year) or Valacyclovir 1 gm orally once a day**

Primary Infection[a]	Recurrent Infection	Suppressive Therapy
	for 2 days or Valacyclovir 500 mg orally 2 times a day for 3 days or Valacyclovir 1 gm orally once a day for 5 days	

Anticipatory Guidance - birth to adolescent

- The aim of primary care for children is to promote health, growth, and development.
- One mechanism for addressing safety issues and parental concerns ahead of problems is to institute standard anticipatory guidance.
- Standard anticipatory guidance should be a routine part of well-childcare, and many resources exist for current anticipatory guidance information, such as the Bright Futures program.
- The website is noted below. Anticipatory guidance should be age appropriate and deal with common concerns that can be anticipated at upcoming ages.
- Anticipatory guidance can be organized into areas of injury and violence prevention, nutrition, sleep, and developmental or behavioral issues and categorized by visit date.
- The American Academy of Pediatrics recommends well-child visits at 2 weeks and then at 2, 4, 6, 9, 12, 15, 18, and 24 months, annually up to age 6, and every 2 years from age 6 through adolescence.
- Topics and needs of anticipatory guidance can vary according to family needs.
- For example, limiting media time and pediatric obesity education may be needed for one family, while another may need more education on discipline.
- Careful history taking is key.
- Clinicians must take the time to address all standard areas and additional parent concerns, keeping in mind that handouts often go unread by families.
- Standard anticipatory guidance forms per visit can be found at the Bright Futures website.

Growth and development –birth to age 17

Routine measurement and tracking of growth and development cannot be emphasized enough. In the primary care setting, not only should charts and graphs be kept of children's weight and height gains, but also of BMI and head circumferences. Children should always be measured more than once to confirm results when there are concerns about accelerated or delayed growth. Shoes and extra clothing, such as coats and accessories should be taken off during weighing and measuring children. Office personnel should be trained in proper weighing and measurement of children. A diagnosis of growth problems should not be made on a single measure at a single visit. When children are referred for delay or acceleration in height or weight to the pediatric specialist best suited based on associated symptoms,

then all measures of height and weight along with plotted growth charts of several visits should be sent to the specialist.

The growth curve is more than just a chart to document the child's height, weight, head circumference and/or BMI against population norms, it allows the primary care provider to predict trajectories of growth. For example, the patient with precocious puberty may be taller than others at a younger age but will stop growing soon after puberty and thus be shorter than originally projected. One of the reasons for medically intervening and delaying puberty is to achieve full potential height.

To accurately assess growth at each visit, key principles must always be employed.

- Each child must be weighed and measured at each visit.
- For infants, clothing must be removed.
- Recumbent height measurement (when the child is lying down) is utilized until 2 years of age.
- Head circumference should be measured until age 3.
- Infants should be weighed with no clothes or diaper.
- In older children, height must be with shoes off, against a wall, and with heels to the wall at every visit.
- Height and head circumference should be measured three times for congruence and the highest number used.
- Physical growth parameters should be plotted at each visit and an ongoing record kept.
- For premature infants born at less than 36 weeks' gestation, height and weight documentation should be corrected for by a documented gestational age assessment, completed in the first 24 hours.

Review growth charts within your Burn's Pediatric Primary Care textbook. The same age appropriate growth charts are also available at the Centers for Disease Control and Prevention's (CDC) website, under National Center for Health Statistics.

- **Video Review**

Review the Growth Curves video at: https://www.youtube.com/watch?v=lNE8jSL7WQk

The following are some basic principles of human growth and development.

- Human growth is cephalocaudal (head to tail) and from the center of the body to the periphery.
- Human growth is linear and should follow established patterns for physical, cognitive, and motor growth and development.
- Physical growth during childhood should follow a smooth curve if measured every 6 to 12 months.
- Growth or height velocity per year can and should be calculated when there are concerns in linear growth. The formula for growth velocity = change in height since last visit times 12 months divided by months since last visit.
- The process of physical growth and development takes almost 2 decades to complete.
- Development depends on psychosocial maturation and cognitive learning.
- Cognitive development occurs from simple to complex (concrete to abstract).

- Each child is unique, with different environments, history, exposures, and genetic make-up that will affect growth and development.
- No single measure should be a concern for growth, but serial measures for at least 6 to 12 months should be recorded.

Review (Burns et al., 2020)

- Table 10.4 Developmental Red Flags: Newborns and Infants
- Table 11.12 Red Flags of Early Childhood Development

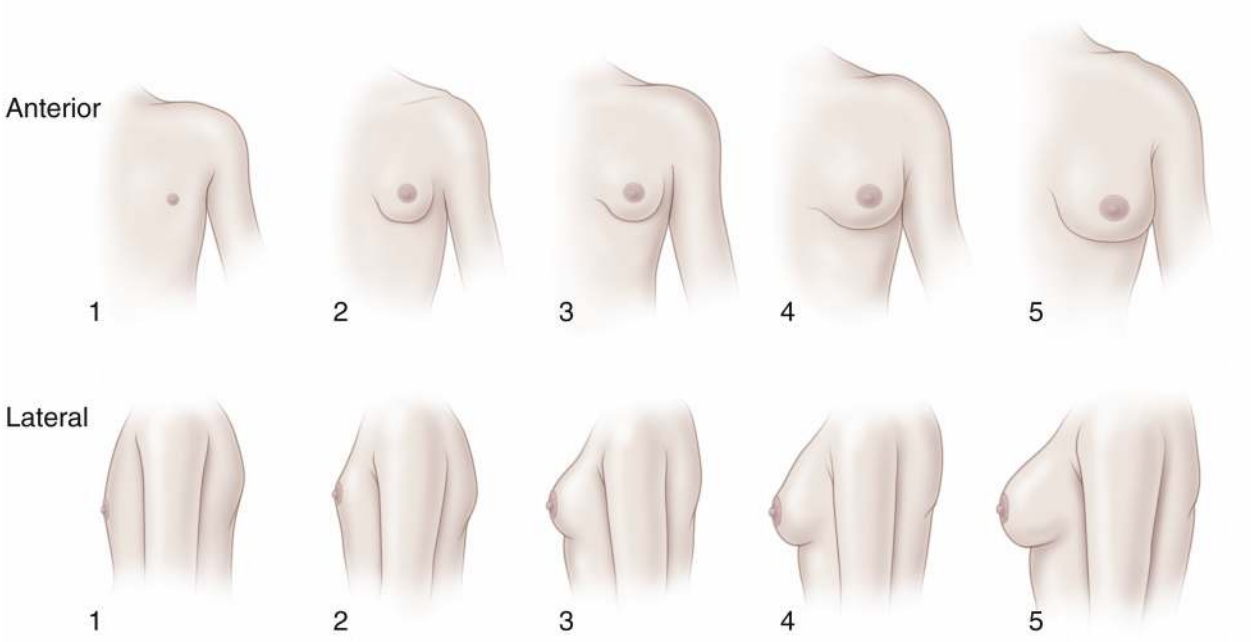
Tanner Staging

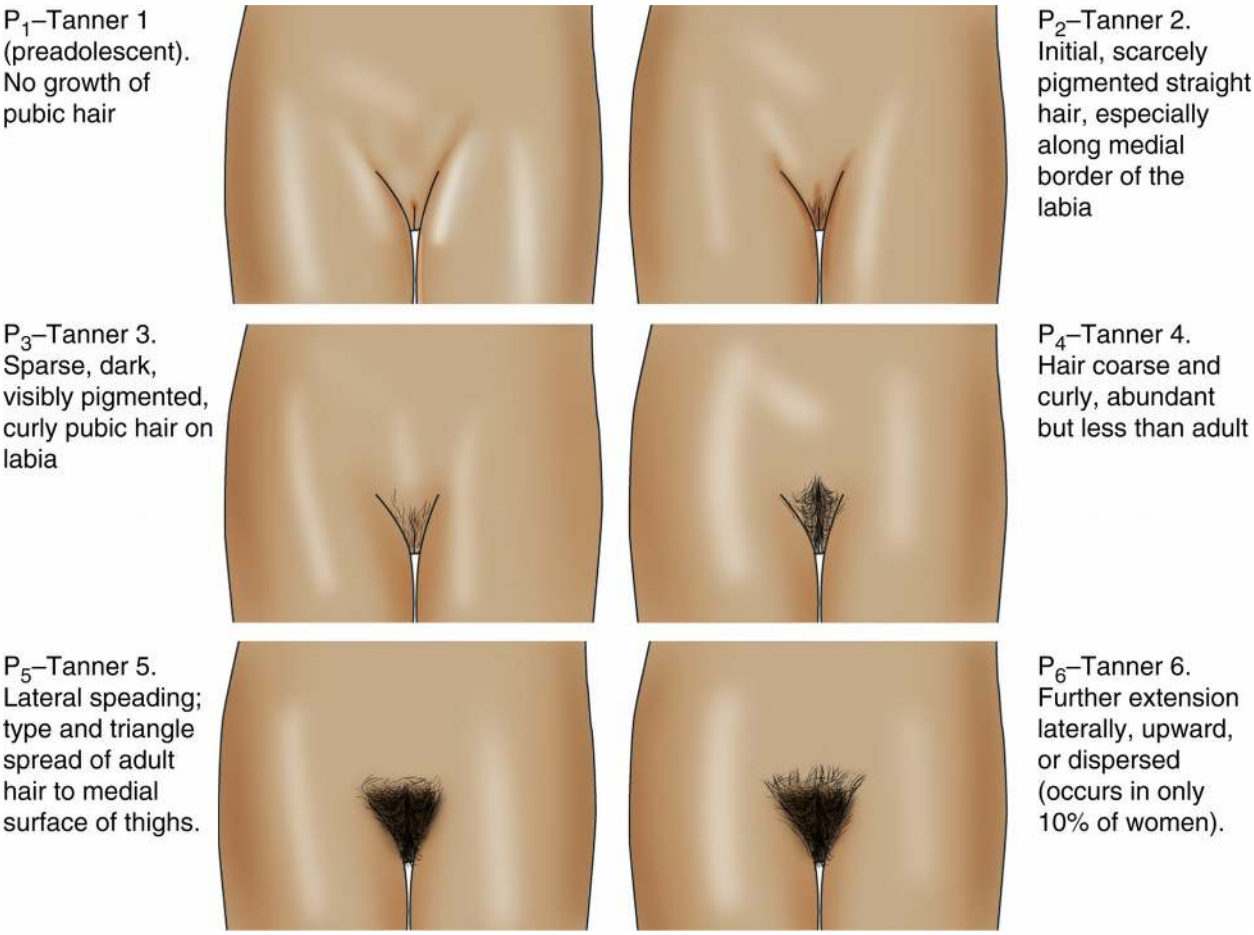
Tanner Staging, also known as Sexual Maturity Rating (SMR), is an objective classification system used to assess and track the physical development and sex characteristics associated with pubertal growth and maturation of children (Emmanuel & Bokor, 2018).

- In females, the normal onset of puberty ranges from 8 to 13 years old, averaging age 10 years in White Americans and age 8.9 years in African-Americans
- Menarche, the onset of menses, arrives on average at age 12.5 (usually occurs 2.5 yrs after entering stage 2)
- In males, the onset of puberty ranges from 9 to 14 years of age.
- Spermarche, the counterpart of menarche in females, is the development of sperm in males and typically occurs during genital Tanner Stage 4.

Review (Burns et al., 2020)

- Figure 13.3 Normal female breast development
- Figure 13.4 Normal female genitalia development
- Figure 13.5 Normal male genitalia development





P_1–Tanner 1 (preadolescent). No growth of pubic hair

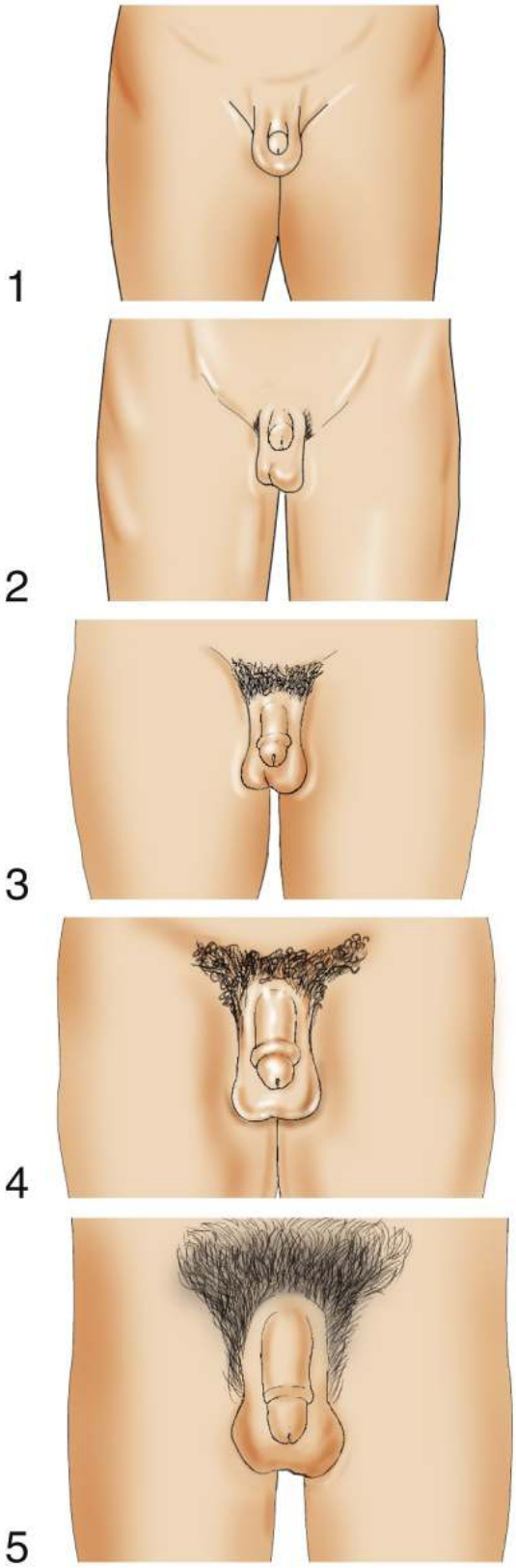
P_2–Tanner 2. Initial, scarcely pigmented straight hair, especially along medial border of the labia

P_3–Tanner 3. Sparse, dark, visibly pigmented, curly pubic hair on labia

P_4–Tanner 4. Hair coarse and curly, abundant but less than adult

P_5–Tanner 5. Lateral speading; type and triangle spread of adult hair to medial surface of thighs.

P_6–Tanner 6. Further extension laterally, upward, or dispersed (occurs in only 10% of women).



For all three sites of development, Tanner Stage 1 corresponds to the pre-pubertal form with progression to Tanner Stage 5, the final adult form. Breast and genital staging, as well as other physical markers of puberty such as height velocity, should be relied on more than pubic hair staging to assess pubertal development because of the independent maturation of adrenal axis.

Pubic Hair Scale (both males and females)

- **Stage 1: No hair**
- **Stage 2: Downy hair**
- **Stage 3: Scant terminal hair**
- **Stage 4: Terminal hair that fills the entire triangle overlying the pubic region**
- **Stage 5: Terminal hair that extends beyond the inguinal crease onto the thigh**

Female Breast Development Scale

- **Stage 1: No glandular breast tissue palpable**
  -Puberty is begins at the entry of stage 2
- **Stage 2: Breast bud palpable under areola (1st pubertal sign in females)**
- **Stage 3: Breast tissue palpable outside areola; no areolar development**
- **Stage 4: Areola elevated above contour of the breast, forming "double scoop" appearance**
- **Stage 5: Areolar mound recedes back into single breast contour with areolar hyperpigmentation, papillae development and nipple protrusion**

Male External Genitalia Scale

- **Stage 1: Testicular volume < 4 ml or long axis < 2.5 cm**
- **Stage 2: 4 ml-8 ml (or 2.5-3.3 cm long), 1st pubertal sign in males**
- **Stage 3: 9 ml-12 ml (or 3.4-4.0 cm long)**
- **Stage 4: 15-20 ml (or 4.1-4.5 cm long)**
- **Stage 5: > 20 ml (or > 4.5 cm long)**

Well child visit

- Health supervision (routine well-child) visits are a core component of pediatric primary care because they provide ongoing opportunities to assess the health and function of the child and family.
- Each visit typically includes a health history, physical exam, screenings, and sharing of anticipatory guidance.
- Unlike ill-child encounters, during which the aim is to attend to the presenting malady, the health supervision visit is multifaceted, focusing on health promotion and anticipatory guidance, disease prevention, and disease detection.
- Each pediatric health supervision visit is guided by knowledge of growth patterns, developmental milestones, individual and age-related disease risk factors, and parent/family priorities and needs.
- Through ongoing assessment, the health and developmental trajectory for each child can be plotted and compared with normative data, much like length/height and weight, and any variation can be quickly attended to.
- The timing and focus of health supervision visits are typically aligned with the American Academy of Pediatrics (AAP) Periodicity Schedule (https://www.aap.org/en-us/Documents/periodicity_schedule.pdf), which serves as a general guideline.

- Embedded in each visit is ongoing disease detection, which involves two techniques: surveillance and screening.
    - *Surveillance* is the systematic collection, analysis, and interpretation of data for the purpose of prevention, because findings from health surveillance guide *primary* prevention measures. Surveillance is a continuous, long-term process, which may/may not include screenings.
    - *Screenings* are targeted systematic actions at a single point in time that are designed to identify a preclinical condition or disease in individuals suspected of having or being at risk for the specific health impairment. Screening is recommended when the individual will benefit from early treatment or intervention and are part of *secondary* prevention measures.
    - *Universal* screening is conducted on all children at defined time intervals or ages, whereas *selective* screening is conducted only on those children for whom a risk assessment suggests follow-up. Specific details about health supervision for each pediatric age group are included in Unit II.

BOX 5.1 Well-Child History (Comprehensive, Ongoing)

Patient-identifying information/statement
- Identify if this is a new or established patient/family
- Child age, sex/gender
- Accompanying adult(s)

Reason for the visit
- Highlight parental (and child) concerns/priorities

Date of last visit
- Interval history (with an established patient/family, seek an "update" of the comprehensive history on record)

Past health/medical history
- Prenatal/birth/neonatal history
- Childhood illness/injury
- Hospitalization/surgery/procedures
- Allergies (food, medication, environment)
- Immunizations
- Medications (prescription, OTC, folk/herb, complementary/alternative therapies)

Prior screening/results

Review of systems—begin with global questions in each system; pursue areas of concern in further detail

Current health
- General habits/day-to-day functioning—nutrition, sleep, activity, elimination
- Development/milestones—affective, cognitive, physical
- Preventative health history—screenings, immunizations, health protection activities

Family history
- Family structure/function
- Parenting
- Family health history
- Family ethnic/cultural beliefs/practices
- Family health habits (e.g., literacy, smoking, seatbelts, helmets, guns)

Household/environment

• Family function—identify family members, role strain, or significant family changes.
• Safety/risks—injury, exposure to violence, adverse childhood experiences, toxic exposures, social determinants of health, housing, and food security

Breastfeeding

- Human milk and breastfeeding are the optimal choice for newborn and infant nutrition and the normative method of feeding.
- Breast milk supports infant nutrition essential for optimal growth and development. In addition to healthy nutrients, breast milk contains many immune substances that protect the newborn against infections.
- Breastfeeding also offers parents and infants physical, psychological, and emotional benefits that last a lifetime.
- Breastfeeding should be promoted and supported whenever possible.
- Promoting breastfeeding is the responsibility of all pediatric healthcare providers.

Recommendations:

- Recommend breastfeeding exclusively for the first 6 months of life and then continued breastfeeding in combination with other nutrients for at least the first year

Baby-Friendly Hospital Initiative

- In 1991 the Baby-Friendly Hospital Initiative (BFHI) was developed by the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) to recognize hospitals that provide optimal lactation support.
- This worldwide initiative trains providers and hospitals to promote breastfeeding internationally
- The 10 criteria to meet a "baby-friendly hospital" standard are outlined in the original joint WHO/UNICEF statement and are used to assess the quality of a lactation program. Every facility that provides maternity services and cares for newborn infants should:

  • Have a written breastfeeding policy that is routinely communicated to all health care staff.
  • Train health care staff in skills necessary to implement this policy (18 hours of formal training are recommended).
  • Inform pregnant women about the benefits and management of breastfeeding.
  • Support initiation of breastfeeding within hour of birth.
  • Show mothers how to breastfeed and maintain lactation even if they are separated from their infants.
  • Give newborn infants no food or drink other than breast milk, unless medically indicated.
  • Practice rooming in (i.e., allow mothers and infants to remain together) 24 hours a day.
  • Encourage unrestricted breastfeeding.
  • Give no artificial teats or pacifiers (also called *dummies* or *soothers*) to breastfeeding infants until breastfeeding is established, typically at 4 weeks of age.
  • Foster the establishment of breastfeeding support groups; refer mothers to them on discharge from the hospital or clinic.

Benefits of Breastfeeding

- With rare exception, breast milk is the ideal food for the human infant.
- It is a living fluid rich in vitamins, minerals, fat, proteins (including immunoglobulins and antibodies), and carbohydrates (especially lactose).
- It contains enzymes and cellular components, including macrophages and lymphocytes, in addition to many other constituents that offer ideal support for growth and maturation of the human infant.
- Amazingly, as the infant grows and develops, the properties of breast milk change.
- The sequence of colostrum, transitional milk, and mature milk meets the shifting nutritional needs of the newborn and infant.
- The milk of a mother of a newborn contains different concentrations of fat, protein, and carbohydrates and different physical properties, such as pH, when compared with the milk of the mother of a 1-month-old or 9-month-old infant.
- Premature infants in particular benefit when receiving colostrum from their own mothers or from a donor with an infant who matches the gestational age of the preemie because of the specific properties of preterm colostrum.
- In addition, some of the constituent properties in the milk are different from one time of the day to another. Breast milk has a higher composition of water in the morning when the milk has been in the breast for longer periods of time.
- breastfeeding confers many short- and long-term health benefits to infants.
- Initiation of breastfeeding at the time of birth allows the growth of protective bacteria necessary for a healthy microbiome.
- Continuation of breastfeeding promotes further growth of these bacteria, immunoglobulin A (IgA) secretion and decreased inflammation in the intestinal epithelial cells and underlying tissues.
- A protective barrier in the intestines is created that prevents penetration of the intestine and may be able to inactivate some viral organisms.
- A review of studies examining the effect of breastfeeding on infant health revealed a lower risk of nonspecific bacterial infections, necrotizing enterocolitis, acute otitis media in early childhood, asthma, excessive weight gain, type 2 diabetes, and sudden infant death syndrome (SIDS)
- Many of the benefits of breastfeeding become more pronounced with a breastfeeding duration of at least 6 months.
- There are also benefits for the mother that include establishment of the strong bond associated with successful nursing and decreased risk for breast and ovarian cancer
- In addition, breastfeeding is associated with short-term and long-term benefits that protect against cardiovascular risks associated with metabolic syndrome type, hypertension, and cardiovascular disease Breastfeeding also provides an economic incentive as a free and plentiful source of excellent infant nutrition. The cost of formula and other necessary supplies exceeds several thousand dollars each year for a family

Contraindications to Breastfeeding

- Although rare, contraindications to breastfeeding occur in some unique situations.
- Certain infections and many drugs or medications can be passed to the infant via breast milk.

- A small number of infant conditions also preclude breastfeeding.
- Contraindications to breastfeeding include the following:

  • Infant with classic galactosemia
  • Maternal diagnosis of human T-cell lymphotropic virus type I or II
  • Maternal diagnosis of untreated brucellosis
  • Maternal diagnosis of cancer and treatment
  • Maternal human immunodeficiency virus (HIV) infection (except in some areas, see WHO recommendations [Box 16.1]; breastfeeding for HIV-infected mothers is not recommended in developed countries)
  • Herpetic lesions on the mother's nipples, areolas, or breast (expressed breast milk can be fed to the infant)
  • Maternal use of cocaine, phencyclidine (PCP), and cannabis

Special Situations

Additional circumstances require special consideration regarding the advisability or management of breastfeeding. These circumstances include the following:

• Significant maternal or infant illness affecting the ability to feed
• Invasive breast surgery, in particular breast reduction in which the areola is removed and reattached