Abnormalities of Menstruation

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Normal Menstruation

- Cyclic uterine bleeding starts by age 13 and continues until age 45-50
- Menstrual cycle length may vary between 21-35 days
- Duration of the menstrual period lasts from 3-7 days
- Average menstrual flow is 30-50 ml

Normal Menstruation

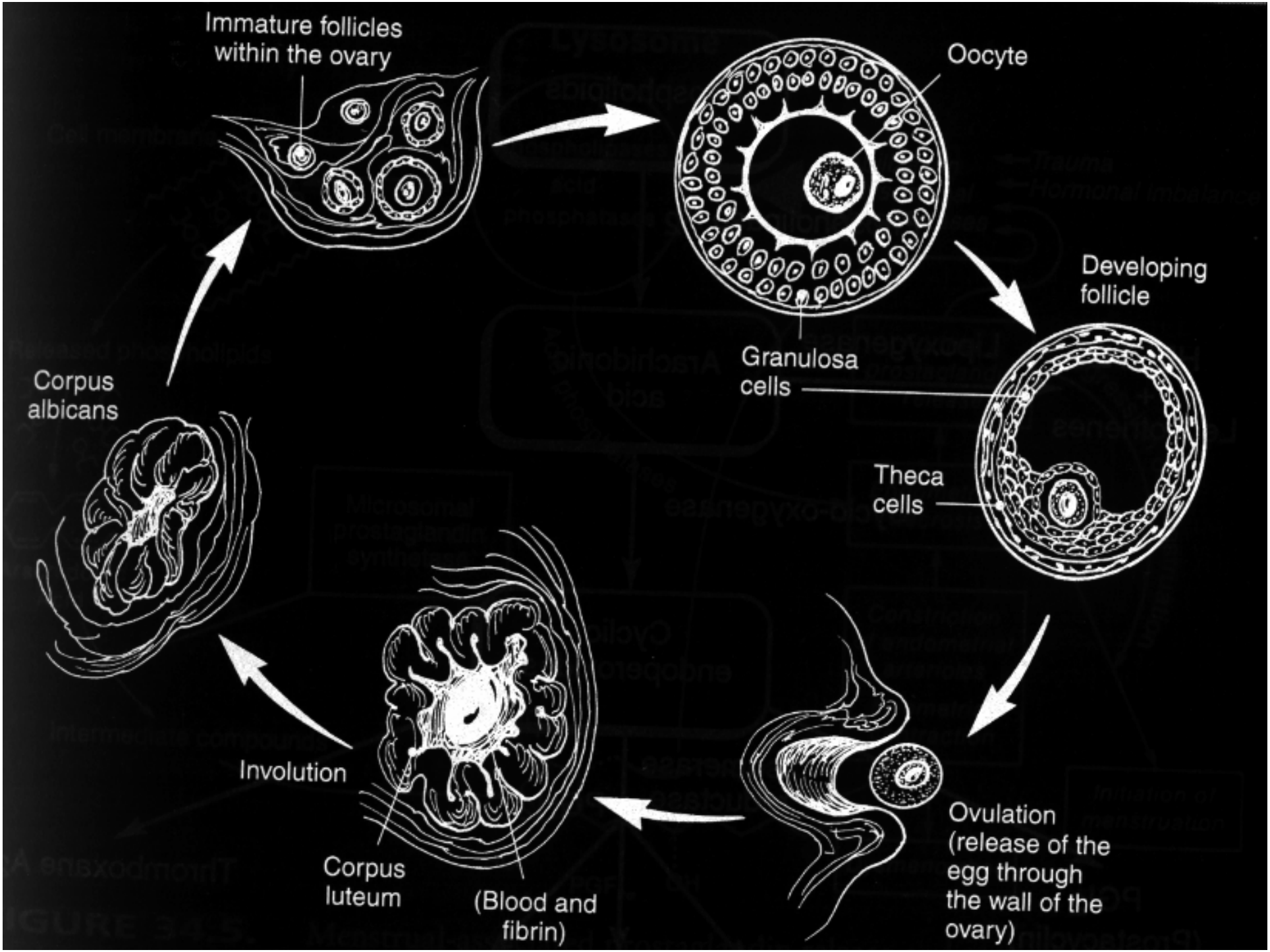
- Regulation of menstruation depends on the interaction of hormones
  - From the hypothalamus: gonadotropin releasing hormone (GnRH)
  - From the pituitary: follicle stimulating hormone(FSH), and luteinizing hormone (LH)
  - From the ovary: estradiol and progesterone

Normal Menstruation

- GnRH is released in pulses and stimulates the secretion of FSH and LH from the pituitary
- FSH and LH are released in pulses from the anterior pituitary
- Estradiol is secreted from the ovary in response to FSH
  - Estradiol will in turn decrease or inhibit FSH secretion from the pituitary

Reproductive Cycle

- Phase 1: Menstruation and Follicular Phase
  - During menstruation the endometrium is shed in response to the withdrawal of progesterone from the previous cycle
  - FSH rises 2 days before menstruation and causes a new follicles to mature
  - Estradiol rises during this time
  - The higher levels of estradiol lead to decreased FSH and increased LH

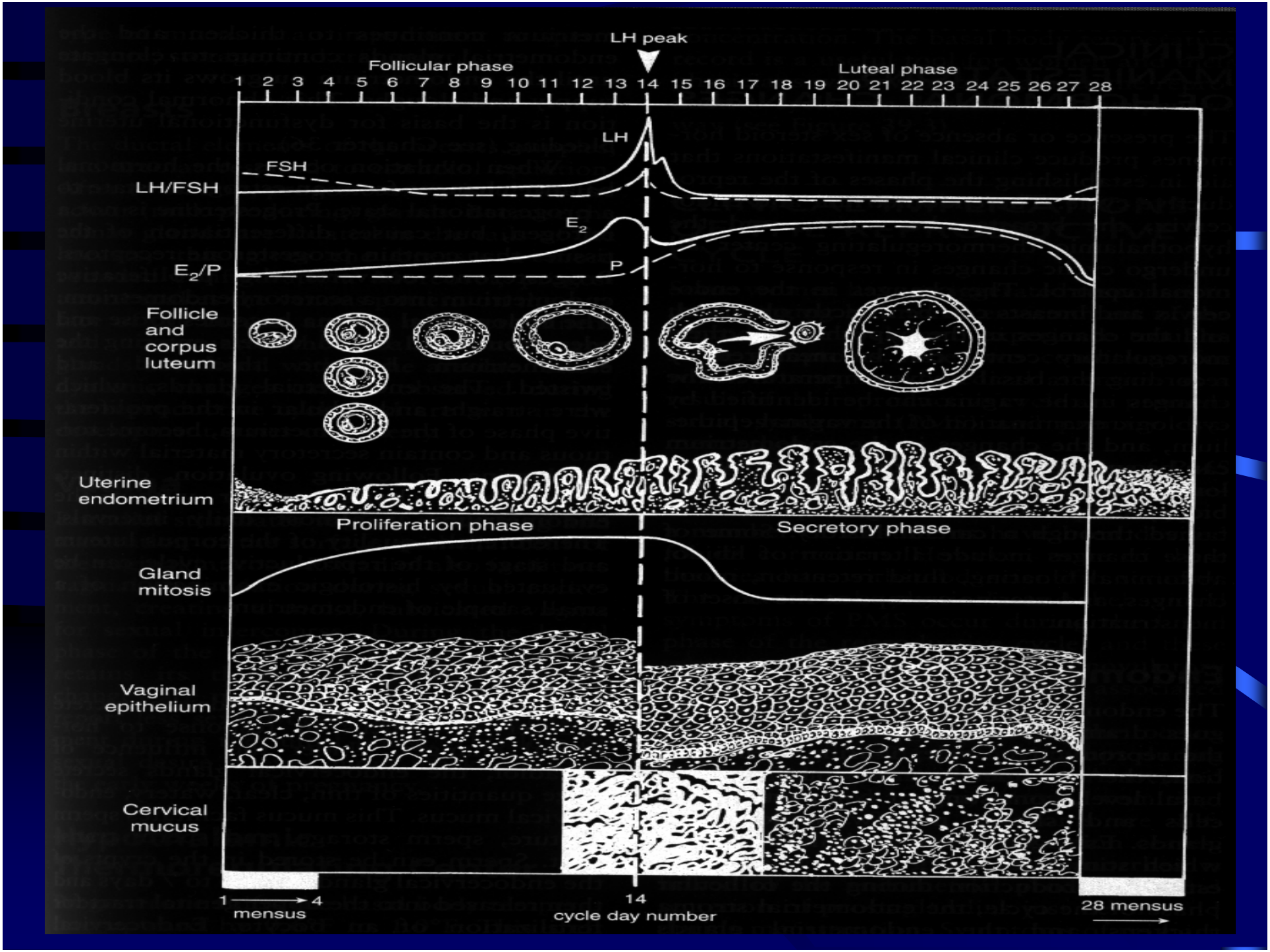

Immature follicles within the ovary
Oocyte
Developing follicle
Granulosa cells
Theca cells
Ovulation (release of the egg through the wall of the ovary)
Involution
Corpus luteum
(Blood and fibrin)
Corpus albicans

Reproductive Cycle

- Phase 2: Ovulation
  - LH rises sharply by day 11-13 of the menstrual cycle which stimulates one dominant follicle to rupture and release the oocyte
  - Many women will have a pain in their flank at the time of ovulation

Reproductive Cycle

- Phase 3: Luteal Phase
  - Cells in the follicle start to make progesterone and the corpus luteum is formed from the ruptured follicle
  - The corpus luteum produces progesterone for 11 days after ovulation
    - if fertilization of the oocyte takes place, the corpus luteum continues to make progesterone throughout the first trimester of pregnancy


LH peak
Follicular phase
Luteal phase
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
LH
FSH
LH/FSH
E_2
E_2/P
P
Follicle and corpus luteum
Uterine endometrium
Proliferation phase
Secretory phase
Gland mitosis
Vaginal epithelium
Cervical mucus
1 → 4
mensus
14
cycle day number
28 mensus

Amenorrhea

- Primary amenorrhea: A young woman who has never menstruated
- Secondary amenorrhea: Woman who stops menstruating for at least 6 months

Amenorrhea

- Causes
  - Pregnancy: the most common cause
  - Hypothalamic-pituitary dysfunction
  - Ovarian dysfunction
  - Alteration of the genital outflow tract

Amenorrhea

- Hypothalamic-pituitary dysfunction
  - If the pulsatile secretion of GnRH is disrupted, FSH and LH will not be released and amenorrhea will result
  - Weight loss, large weight gain, brain tumors, head injuries and chronic medical illnesses can cause dysfunction of the hypothalamus or pituitary and lead to amenorrhea

Amenorrhea

- Ovarian failure
  - Ovarian follicles become resistant to FSH and LH or are exhausted
  - Women with ovarian failure will have hot flushes from estrogen deficiency
    - This is different than the women with hypothalamic or pituitary causes of amenorhea
  - Caused by chromosomal problems, autoimmune diseases (such as Lupus), or chemotherapy for cancer

Amenorrhea

- Obstruction of the Genital Outflow Tract
  - Congenital causes include and imperforate hymen or absence of the uterus or vagina
  - Acquired causes include Asherman's syndrome which is scarring of the uterine cavity
    - usually caused by infection or dilation and curettage for retained pregnancy tissue

Amenorrhea

- Treatment
  - Make sure patient is not pregnant
  - Give progesterone for 10 days orally if anovulation from pituitary or hypothalamus is suspected
    - Patient should have a menstrual period within 7 days of finishing the medication
  - If ovarian failure is suspected, estrogen should be given with progesterone

Abnormal Uterine Bleeding

- Bleeding is either irregular, heavy or prolonged
- History should be helpful in determining whether patient is ovulating
  - If patient is ovulatory, she will have monthly bleeding episodes
  - If patient is not ovulatory, bleeding will occur at irregular and unpredictable intervals
- Have patient keep a menstrual calendar or diary

Abnormal Uterine Bleeding

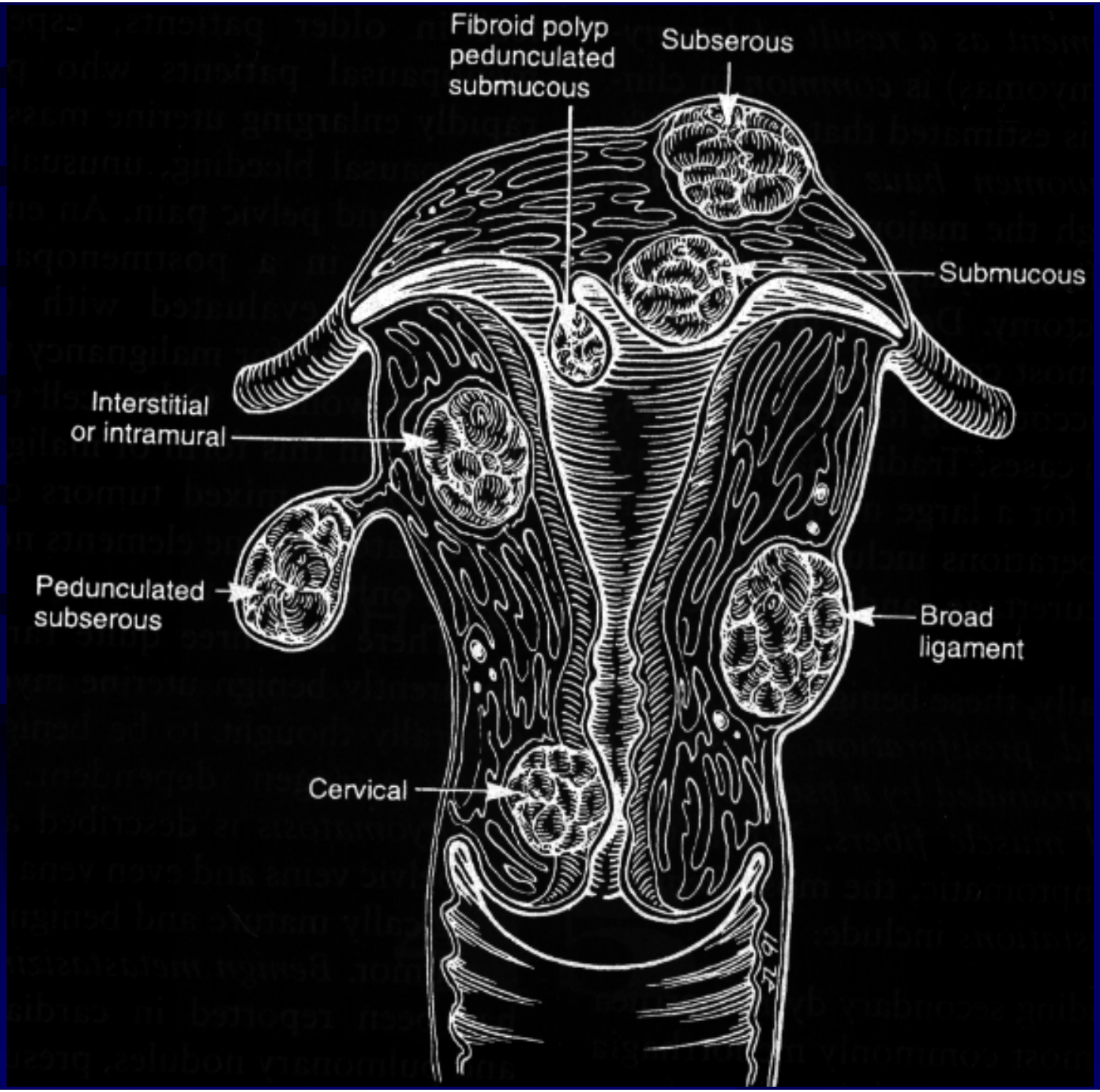
- Anovulatory bleeding
  - Caused by lack of progesterone production by the ovary
  - Patient will not have normal withdrawal bleeding monthly
  - Menses may be delayed for several months and then be very heavy
  - Hypothyroidism is a commonly associated with heavy menses and intermenstrual bleeding
    - Examine thyroid, check thyroid function

Abnormal Uterine Bleeding

- Anovulatory bleeding
  - Patients who have long intervals between menses are at risk for developing hyperplasia of the endometrium
  - Treat these patients with progesterone monthly so they will have withdrawal bleeding

Abnormal Uterine Bleeding

- Ovulatory abnormal bleeding
  - Characterized by monthly menses that are heavy or prolonged
    - interval between periods is normal
    - if bleeding is heavy enough, iron deficiency anemia may develop
  - Causes
    - Uterine leiomyomas, uterine polyps, adenomyosis (growth of the endometrium into the myometrium), infection of the uterus, cancer of the cervix or endometrium


Fibroid polyp
pedunculated
submucous
Subserous
Submucous
Interstitial
or intramural
Pedunculated
subserous
Broad
ligament
Cervical

Abnormal Uterine Bleeding

- Diagnosis
  - Examine cervix, look for tumors or polyps or ulcers
  - Examine the uterus, evaluate the size and shape
    - an irregularly shaped, enlarged uterus occurs when leiomyomas are present
  - Biopsy the endometrium if possible to rule out cancer or polyps

Abnormal Uterine Bleeding

- Treatment
  - Give iron supplements if iron deficiency anemia is present
  - Use oral contraceptives or estrogen and progesterone together to reduce the amount and duration of bleeding
  - Removal of uterus is curative but reserved for the most serious cases