

# GYNECOLOGY

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## HISTORY

- includes ID, CC, HPI, PMH, Meds, Allergies, etc...

### Obstetrical History

- Gravida \_\_ Para \_\_ SAB \_\_ TAB \_\_ L \_\_
- year, hospital, outcome, mode of delivery, sex, gestational age, weight, complications

### Menstrual History

- LNMP, LMP
- age menarche, menopause
- cycle length, duration, regularity
- flow
- associated symptoms
  - pain, PMS
- abnormal menstrual bleeding
  - intermenstrual, post-coital

### Sexual History

- age when first sexually active
- number and sex of partners
- history of sexual assault or abuse

### Contraceptive History

- present and past contraception modalities
- reasons for discontinuing
- compliance
- complications/failure/side-effects

### Gynecological Infections

- STDs, PID (herpes, chlamydia, gonorrhea, etc...)
- vaginitis, vulvitis
- lesions
- include treatments, complications, etc...

### Gynecological Procedures

- last Pap smear
  - history of abnormal Pap
  - follow-up and treatments
- gynecological or abdominal surgery
- previous ectopic pregnancies

## PHYSICAL EXAMINATION

- height, weight, BP
- breast exam
- abdominal exam
- pelvic exam including
  - observation of external genitalia
  - speculum exam +/- smears and swabs
  - bimanual exam
    - cervix size, consistency, os, and tenderness
    - uterus size, consistency, contour, position, shape, mobility, and other masses
    - adnexal mass, tenderness
  - rectovaginal exam
  - rectal exam

## INVESTIGATIONS

### Bloodwork

- CBC
  - evaluation of abnormal uterine bleeding, preoperative investigation
- $\beta$ hCG
  - investigation of possible pregnancy or ectopic pregnancy, work-up for GTN
  - monitored after the medical management of ectopic and in GTN to assess for cure and recurrences
- LH, FSH, TSH, PRL
  - amenorrhea, menstrual irregularities, menopause, infertility, etc...

## Imaging

### ☐ ultrasound

- transvaginal ultrasound provides enhanced details of structures located near the apex of the vagina; i.e. intrauterine and adnexal structures
- may be used for
  - acute or chronic pelvic pain
  - rule in or out ectopic pregnancy, intrauterine pregnancy
  - assess uterine, adnexal, ovarian masses (i.e. solid or cystic)
  - uterine thickness
  - follicle monitoring during assisted reproduction

### ☐ hysterosalpingography

- an x-ray is taken after contrast is introduced through the cervix into the uterus
- contrast flows through the tubes and into the peritoneal cavity if the tubes are patent
- used for evaluation of size, shape, configuration of uterus, tubal patency or obstruction

### ☐ sonohystography

- saline infusion into endometrial cavity under ultrasound visualization expands endometrium, allowing visualization of uterus and fallopian tubes
- useful for investigation of abnormal uterine bleeding, uncertain endometrial findings on vaginal U/S, infertility, congenital/acquired uterine abnormalities (i.e. uterus didelphys, uni/bicornate, arcuate uterus)
- easily done, minimal cost, extremely well-tolerated, sensitive and specific
- more accurate than hysterosalpingography and frequently avoids need for hysteroscopy

## Genital Tract Biopsy

### ☐ vulvar biopsy

- under local anesthetic
- Keye's biopsy or punch biopsy
- hemostasis achieved with local pressure, Monsel solution or silver nitrate

### ☐ vaginal and cervical biopsy

- punch biopsy or biopsy forceps
- generally no anesthetic used
- hemostasis with Monsel solution

### ☐ endometrial biopsy

- in the office using an endometrial suction curette (Pipelle)
  - hollow tube guided through the cervix used to aspirate fragments of endometrium (well-tolerated)
- a more invasive procedure using cervical dilatation and curettage may be done in the office

## Colposcopy

### ☐ diagnostic use

- provides a magnified view of the surface structures of the vulva, vagina and cervix
- special green filters allow better visualization of vessels
- application of 1% acetic acid wash dehydrates cells and reveals white areas of increased nuclear density (abnormal) or areas with epithelial changes
- biopsy of visible lesions or those revealed with the acetic acid wash allows early identification of dysplasia and neoplasia

### ☐ therapeutic use

- cryotherapy
  - tissue destruction by freezing
  - for dysplastic changes, genital warts
- laser
- cervical conization
  - encompasses the cervical transformation zone and into the endocervical canal
  - methods include cold knife, laser excision, or electrocautery

### VAGINAL DISCHARGE

#### Physiological

- normal vaginal discharge (midcycle)
- increased estrogen states, e.g. pregnancy, BCP

#### Infectious

- candida vulvovaginitis (*Candida albicans*)
- trichomonas vaginitis (*Trichomonas vaginalis*)
- bacterial vaginosis (*Gardnerella vaginalis*)
- chlamydia
- gonorrhoea
- Bartholinitis or Bartholin abscess
- PID

#### Neoplastic

- VAIN
- vaginal squamous cell ca
- invasive cervical ca
- fallopian tube ca

#### Other

- allergic/irritative vaginitis
- foreign body
- atrophic vaginitis
- enterovaginal fistulae

### VAGINAL/VULVAR PRURITUS

#### Infectious

- Candida* vulvovaginitis
- Trichomonas* vaginitis
- Herpes genitalis (HSV)

#### Other

- postmenopausal vaginitis or atrophic vaginitis
- chemical vaginitis
- hyperplastic dystrophy
- lichen sclerosis
- vulvar ca

### GENITAL ULCERATION

#### Infectious

- painful
  - herpes genitalis (HSV)
  - chancroid (*Hemophilus ducreyi*)
- painless
  - syphilis (*Treponema pallidum*)
  - granuloma inguinale (*Calymmatobacterium granulomatis*)
  - lymphogranuloma venereum (*C. trachomatis* - serotypes L1-L3)

#### Malignant

- vulvar ca

#### Other

- trauma
- foreign body
- Behcet disease (autoimmune disease resulting in oral and genital ulcerations with associated superficial ocular lesions)

### INGUINAL LYMPHADENOPATHY

#### Infectious

- HSV
- syphilis
- chancroid
- granuloma inguinale (*D. granulomatis*)

#### Malignant

- vulvar ca
- vaginal ca
- anal ca
- lymphoma

### PELVIC MASS

#### Uterus, Asymmetrical

- leiomyomata
- leiomyosarcoma

#### Uterus, Symmetrical

- pregnancy
- adenomyosis
- endometrial ca

#### Adnexal, Ovarian

- corpus luteum cyst
- follicular cyst
- theca lutein cyst
- endometrioma
- inflammatory cyst (tubo-ovarian abscess)
- luteoma of pregnancy
- polycystic ovary
- benign neoplasms
  - dermoid cyst (most common)
- malignant neoplasms
  - granulosa cell tumour (most common)

#### Adnexal, Non-ovarian

- gynecological
  - ectopic pregnancy
  - pelvic adhesions
  - paratubal cysts
  - pyosalpinx/hydrosalpinx
  - leiomyomata or fibroids
  - primary fallopian tube neoplasms
- gastrointestinal
  - appendiceal abscess
  - diverticular abscess
  - diverticulosis, diverticulitis
  - carcinoma of rectum/colon
- genitourinary
  - distended bladder
  - pelvic kidney
  - carcinoma of the bladder

### DYSPAREUNIA

- atrophic vaginitis
- chemical vaginitis
- lichen sclerosus
- Candida* vulvovaginitis
- Trichomonas* vaginitis
- acute or chronic PID
- endometriosis
- fibroids
- adenomyosis
- congenital abnormalities of vagina
  - e.g. septate vagina

- retroverted, retroflexed uterus may cause dyspareunia
- ovarian cysts/tumours
- symptomatic retroverted uterus
- psychological trauma
- vaginismus
- vulvodynia

## PELVIC PAIN

### Acute Pelvic Pain

- gynecological causes
  - ectopic pregnancy
  - abortion - missed, septic, etc...
  - ruptured ovarian cyst
  - torsion of ovary or tube
  - hemorrhage into ovarian cyst, neoplasm
  - degeneration of fibroid
  - torsion of pedunculated fibroid
  - acute PID
  - mittelschmerz (ovulation pain as follicle ruptures into peritoneal space)
- non-gynecological causes
  - appendicitis
  - UTI - cystitis, pyelonephritis
  - renal colic
  - mesenteric adenitis
  - diverticulitis
  - inflammatory bowel disease

### Chronic Pelvic Pain

- refers to pain of greater than 6 months duration
- gynecological causes of CPP
  - chronic PID
  - endometriosis
  - adenomyosis
  - invasive cervical ca (late)
  - leiomyomata
  - uterine prolapse
  - adhesions
  - cyclic pelvic pain
    - primary dysmenorrhea
    - secondary dysmenorrhea
  - ovarian remnant syndrome
  - pelvic congestion syndrome
  - ovarian cyst
- non-gynecological causes
  - referred pain
  - urinary retention
  - urethral syndrome
  - penetrating neoplasms of GI tract
  - irritable bowel syndrome
  - partial bowel obstruction
  - inflammatory bowel disease
  - diverticulitis
  - hernia formation
  - nerve entrapment
  - constipation
  - psychological trauma
    - 20% of CPP is due to history of previous sexual abuse/assault

### ABNORMAL UTERINE BLEEDING

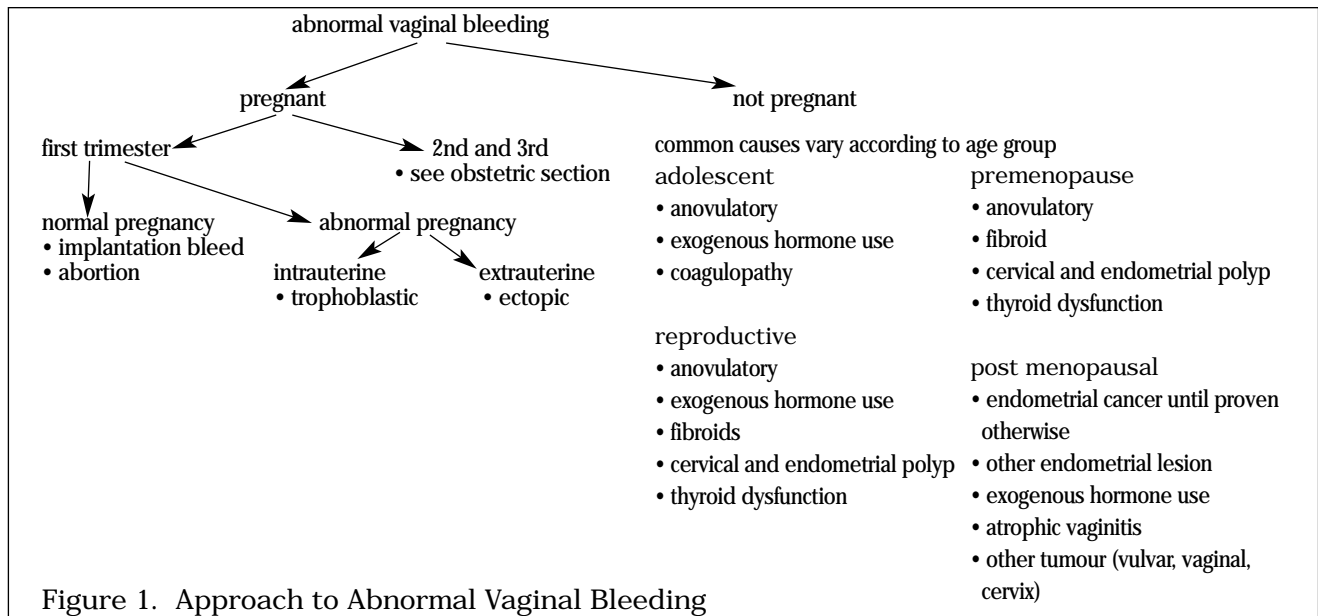


Figure 1. Approach to Abnormal Vaginal Bleeding

#### Gynecological Causes

- ❑ increased bleeding with menses
  - polyps
  - adenomyosis
  - leiomyomata
  - endometriosis
  - IUD
- ❑ bleeding following a missed period
  - ectopic pregnancy
  - abortion - missed, threatened, inevitable, incomplete, or complete
  - implantation bleed
  - trophoblastic disease
  - placental polyp
- ❑ irregular bleeding
  - dysfunctional uterine bleeding
  - polycystic ovarian disease
  - vulvovaginitis
  - PID
  - benign or malignant tumours of vulva, vagina, cervix, or uterus
  - ovarian malignancy
  - anovulation (e.g. stress amenorrhea)
  - oral contraceptive use
  - polyps
- ❑ postmenopausal bleeding
  - endometrial ca until proven otherwise
  - atrophic vaginitis (most common cause)
  - ovarian malignancy
  - benign or malignant tumours of vulva, vagina or cervix
  - withdrawal from exogenous estrogens
  - atrophic endometrium
  - endometrial/endocervical polyps
  - endometrial hyperplasia
  - trauma
  - polyps
  - lichen sclerosis

### Non-Gynecological Causes

- thyroid disease (hyper-/hypo- thyroid)
- chronic liver disease
- von Willebrand disease
- leukemia
- idiopathic thrombocytopenic purpura
- hypersplenism
- rectal or urethral bleeding
- renal failure
- adrenal insufficiency and excess
- drugs: spironolactone, danazol, psychotropic agents
- metastatic cancer

## REPRODUCTIVE ENDOCRINOLOGY

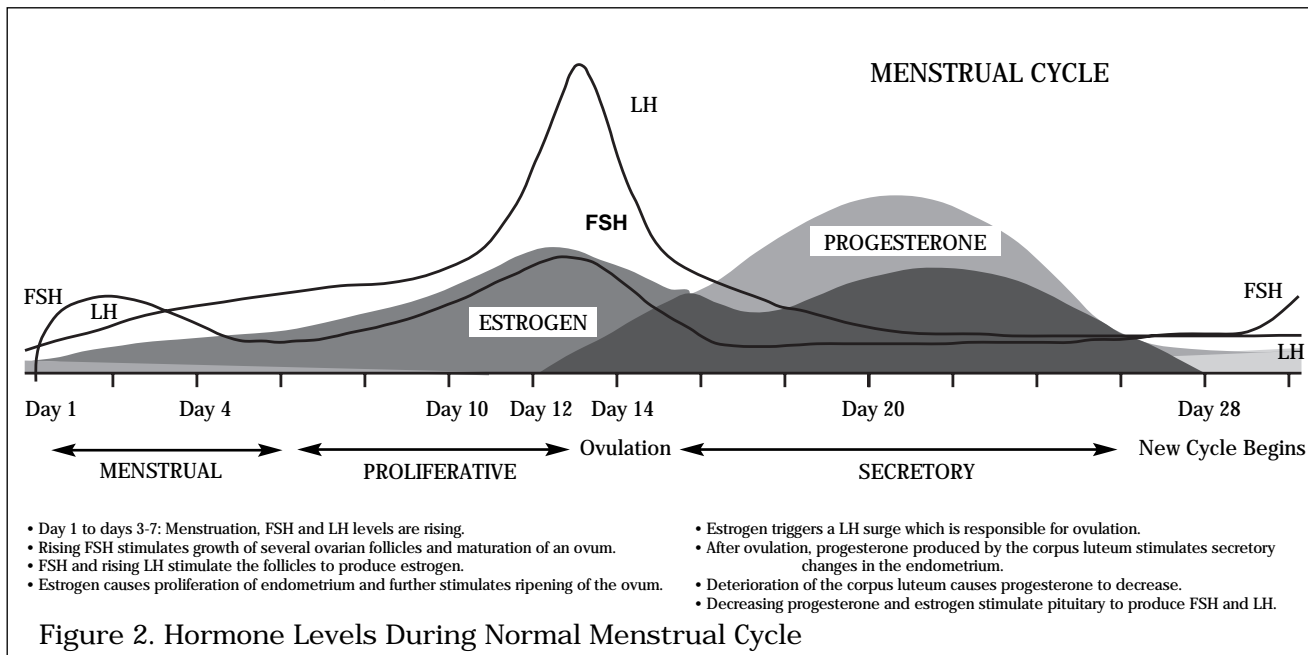
### STAGES OF PUBERTY

1. accelerated growth
2. thelarche (breast budding)
3. pubarche and adrenarche (growth of pubic and axillary hair)
4. maximal growth (peak height velocity)
5. menarche
  - Tanner Staging (see Pediatrics Notes)

### MENSTRUAL CYCLE

#### Characteristics

- menarche at age 11-14
- entire cycle 28 +/- 7 days, with bleeding for 1 - 6 days
- polymenorrhea if < 21 days
- oligomenorrhea if > 35 days
- 25-60 mL of blood loss per cycle



#### Proliferative/Follicular Phase

- first day of menses to ovulation
- variable in length
- low basal body temperature
- estrogenic
- endometrial priming
- ovarian follicular development



## Ovulatory Phase

- LH surge leads to ovulation (14 days before the onset of menses)
- temperature rise (0.5° - 1°)
- increased cervical, acellular mucous with spinnbarkeit (long stretchy threads) and ferning with KOH, seen under the microscope

## Secretory/Luteal Phase

- ovulation to onset of menses
- fixed in length: 14 days
- corpus luteum formation
- progesterone and estrogen secreted from corpus luteum
- progesterone prepares endometrium for embryo implantation
- without pregnancy → progesterone withdrawal → constriction of spiral arteries → ischemia and endometrial necrosis → menses
- while lining is being shed, surface epithelium is already beginning to regenerate

## PRECOCIOUS PUBERTY

### Definition

- onset of puberty before age eight
- 1/10,000 incidence

### Isosexual Precocious Puberty (see Table 1)

- sexual maturation appropriate to genotypic sex of individual
- true vs. pseudopuberty
- due to increased gonadotropin production secondary to premature activation of hypothalamic-pituitary-gonadal axis (HPG-A)
- normal adult hormone levels with development of all secondary sexual characteristics

Table 1. Classification of Isosexual Precocious Puberty

Constitutional (90%)	Central (10%)	Pseudopuberty
<ul style="list-style-type: none"> <li>• Idiopathic premature activation of HPG-A</li> <li>• F:M = 5:1</li> </ul>	<ul style="list-style-type: none"> <li>• Tumour, obstructive lesion, granulomatous disease, infection, neurofibromatosis, head trauma</li> <li>• All interfere with normal inhibition of hypothalamic GnRH release</li> </ul>	<ul style="list-style-type: none"> <li>• Exogenous estrogen or estrogen producing tumour, hypothyroidism, McCune Albright syndrome, Peutz-Jegher Syndrome</li> <li>**no development of normal reproductive function</li> </ul>

### diagnosis

- obtain LH and FSH levels
  - if increased → central pathology
  - if low/normal → exogenous estrogen
- TSH, DHEAS
- bone age
- CT scan

### treatment

- GnRH agonist (Lupron) (negative feedback to downregulate GnRH receptors)

### Heterosexual Precocious Puberty

- development of secondary sexual characteristics opposite to genotypic sex
- e.g. virilizing tumour (ovarian, adrenal), congenital adrenal hyperplasia, exogenous androgen exposure

## DELAYED PUBERTY

### Definition

- absence of normal pubertal events at an age 2.5 SD from the mean
  - absence of thelarche by age 13
  - absence of menarche by age 15

Etiology

- ovarian failure
  - hypergonadotropic hypogonadism
  - +/- abnormal karyotype (e.g. Turner syndrome 45 X0)
- hypothalamic, pituitary failure
  - hypogonadotropic hypogonadism
  - reversible: physiological delay, weight loss/anorexia
  - irreversible: GnRH deficiency, hypopituitarism
- outlet syndromes
  - eugonadism
  - vaginal septum, imperforate hymen

Diagnosis

- history
- previous height and weight charts
- pubertal milestones of siblings and parents
- physical (including height and weight)
- Tanner staging
- rule out anatomical abnormalities (i.e. U/S)
- serum gonadotropins
- bone age
- skull films

AMENORRHEA

APPROACH TO AMENORRHEA

Primary Amenorrhea?

- absence of menses by age 15

OR

Secondary Amenorrhea?

- absence of menses for >6 months after documented menarche

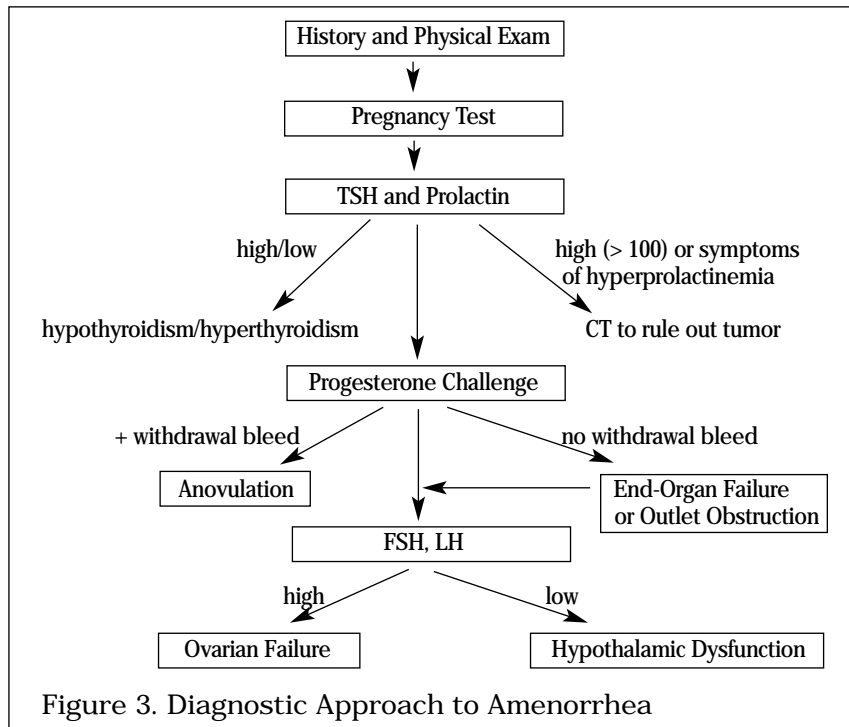
History and Physical

- Tanner staging
- breasts present?
- uterus present?
- r/o possibility of pregnancy

Investigations (see Figure 3)

Table 2. Causes of Primary and Secondary Amenorrhea

Anatomic	Ovarian Failure	Endocrine	Other
<ul style="list-style-type: none"> <li>• pregnancy</li> <li>• adhesion</li> <li>• gonadal dysgenesis (absent uterus, ovaries present)</li> <li>• imperforate hymen</li> <li>• vaginal septum</li> <li>• GTN</li> </ul>	<ul style="list-style-type: none"> <li>• menopause</li> <li>• surgery, radiation, chemotherapy</li> <li>• chromosomal                             <ul style="list-style-type: none"> <li>• Turner Syndrome (XO)</li> <li>• Androgen Insensitivity Syndrome (XY)</li> </ul> </li> <li>• Resistant Ovary Syndrome</li> </ul>	<ul style="list-style-type: none"> <li>• hypothalamic/pituitary tumours</li> <li>• hyperprolactinemia</li> <li>• isolated gonadotropin deficiency</li> <li>• hyperandrogenism                             <ul style="list-style-type: none"> <li>• PCOD</li> <li>• Ovarian/adrenal tumour</li> <li>• Testosterone injections</li> </ul> </li> <li>• hypothyroidism</li> <li>• Cushing Disease</li> </ul>	<ul style="list-style-type: none"> <li>• stress</li> <li>• anorexia</li> <li>• post OCP</li> <li>• illness</li> <li>• exercise</li> </ul>



- progesterone challenge to assess estrogen status
  - medroxyprogesterone acetate (Provera) 10 mg OD for 10 days
  - if withdrawal bleeding occurs → adequate estrogen
  - if no bleeding occurs → hypoestrogenism
- karyotype if indicated
- U/S to rule out cyst, polycystic ovarian disease

#### Treatment

- hypothalamic dysfunction
  - stop drugs, reduce stress, adequate nutrition, and decrease excessive exercise
  - clomiphene citrate (Clomid) if pregnancy desired
  - otherwise BCP to induce menstruation
- hyperprolactinemia
  - bromocriptine
  - surgery for macroadenoma
- premature ovarian failure
  - treat associated autoimmune disorders
  - HRT to prevent osteoporosis and other manifestations of hypoestrogenic state
- hypoestrogenism
  - karyotype
  - removal of gonadal tissue if Y chromosome present
- polycystic ovarian disease
  - see Polycystic Ovarian Disease section

#### ABNORMAL UTERINE BLEEDING

- 90% anovulatory, 10% ovulatory

#### Hypermenorrhea/Menorrhagia

- cyclic menstrual bleeding that is excessive in amount (>80 mL) or duration (> 7 days)
  - adenomyosis
  - endometriosis
  - leiomyomata
  - endometrial hyperplasia or cancer
  - hypothyroidism

#### Hypomenorrhea

- decreased menstrual flow or vaginal spotting
  - BCP

**Oligomenorrhea**

- episodic vaginal bleeding occurring at intervals > 35 days
  - usually associated with anovulation

**Polymenorrhea**

- episodic vaginal bleeding occurring at intervals < 21 days
  - usually associated with anovulation

**Metrorrhagia**

- uterine bleeding occurring between periods
  - organic pathology
  - endometrial/cervical polyps or cancer
  - anovulation
  - estrogen withdrawal

**Menometrorrhagia**

- uterine bleeding irregular in frequency, and also excessive in amount
  - organic pathology
  - endocrine abnormality
  - early pregnancy

**Postmenopausal Bleeding**

- any bleeding > 1 year after menopause
- investigations
  - endometrial sampling - biopsy or D&C
  - sonohystogram with possible ultrasound for endometrial thickness and polyps
  - hysteroscopy

**DYSFUNCTIONAL UTERINE BLEEDING (DUB)**

- abnormal bleeding with no organic cause (diagnosis of exclusion)
- rule out: blood dyscrasias, thyroid dysfunction, malignancy, PCOD, endometriosis, PID, fibroids, unopposed estrogen, or polyps

**Adolescent Age Group**

- DUB due to immature hypothalamus with irregular LH, FSH, estrogen and progesterone pattern

**Reproductive Age Group**

- DUB due to an increase or decrease in progesterone level

**Perimenopausal Age Group**

- DUB due to increased ovarian resistance to LH and FSH
- treatment
  - if anemic, iron supplement
  - mild DUB
    - BCP 1 tab tid for 10 days then 1 tab od for 4-6 months or
    - medroxyprogesterone acetate (Provera) 5-10 mg od on first 10-14 days of each month
  - severe DUB
    - replace fluid losses
    - medroxyprogesterone acetate (Provera) 10 mg for next 7-10 days
    - acute, severe DUB: estrogen (Premarin) 25 mg IV q4-6h
  - surgical
    - endometrial biopsy (for diagnosis)
    - D&C
    - endometrial ablation after pretreatment with danazol or GnRH agonists
    - hysterectomy

**Mid-Cycle Spotting**

- may be physiologic due to mid-cycle fall of estradiol

**Premenstrual Spotting**

- may be due to progesterone deficiency, endometriosis, adenomyosis and fibroids

## POLYCYSTIC OVARIAN DISEASE

## Clinical Presentation

- average age 15-30 years
- anovulation
- hirsutism
- infertility
- obesity
- virilization

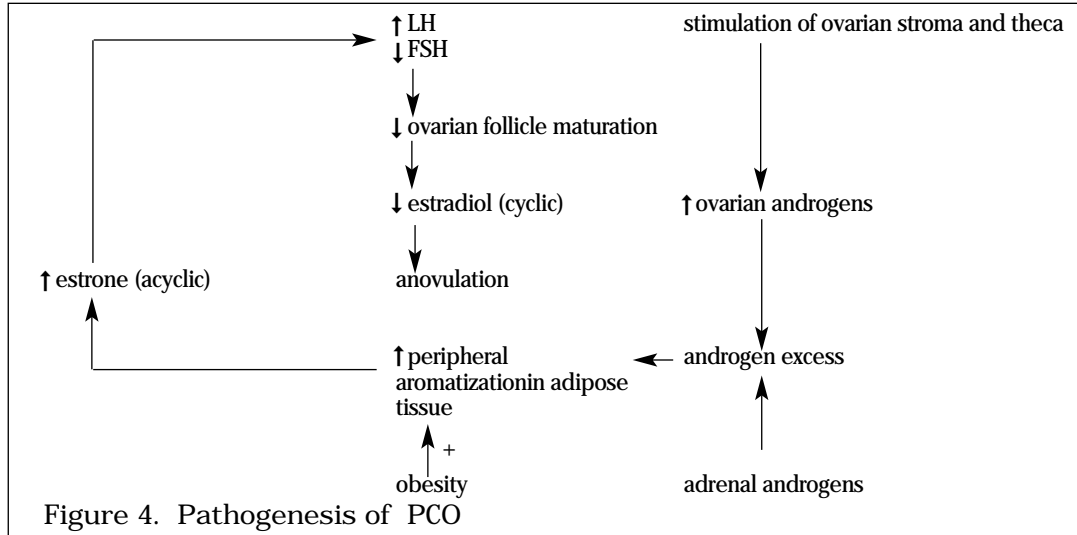


Figure 4. Pathogenesis of PCO

- most common pathologic finding: white, smooth, sclerotic ovary with a thick capsule, multiple follicular cysts in various stages of atresia, hyperplastic theca and stroma
- but ovarian pathology varies and none is pathognomonic so diagnosis is biochemical
- fundamental defect = bad signals to HPA; high androgens + obesity = increased formation of estrone (acyclic estrogen) → acyclic positive feedback on LH + negative feedback on FSH → high LH with plasma LH/FSH > 2 → hyperplasia of ovarian stroma and theca cells → increased androgen production → more substrate for peripheral aromatization → chronic anovulation
- increased incidence of endometrial cancer due to unopposed estrogen

## Treatment

- interrupt the self-perpetuating cycle by:
  - decreasing ovarian androgen secretion: BCP (wedge resections used in past)
  - decreasing peripheral estrone formation: weight reduction
  - enhancing FSH secretion: clomiphene, hMG (Pergonal), LHRH, purified FSH
- to prevent endometrial hyperplasia: progesterone (Provera), BCP
- for pregnancy
  - medical induction of ovulation
  - clomiphene citrate (Clomid)
  - human menopausal gonadotropin (Pergonal)

## DYSMENORRHEA

## Primary

- menstrual pain not caused by organic disease
- may be due to prostaglandin-induced uterine contractions and ischemia
- begins 6 months - 2 years after menarche (ovulatory cycles)
- colicky pain in abdomen, radiating to the lower back, labia and inner thighs
- begins hours before onset of bleeding and persists for hours or days
- associated nausea, vomiting, altered bowel habits, headaches
- treatment
  - PG synthetase inhibitors (e.g. naproxen)
    - must be started before/at onset of pain
  - BCP to suppress ovulation and reduce menstrual flow

## Secondary

- menstrual pain due to organic disease
- begins in women who are in their 20's
- worsens with age
- associated dyspareunia, abnormal bleeding, infertility
- etiology
  - endometriosis
  - adenomyosis
  - fibroids
  - PID
  - ovarian cysts
  - IUD

## PREMENSTRUAL SYNDROME

## Definition

- variable cluster of symptoms that appear to occur on a regular basis prior to each menstrual episode
- more correctly called OVARIAN CYCLE SYNDROME since symptoms depend on ovulation
- etiology is unknown

## Symptoms

- occur 7-10 days before menses and relieved by onset of menses
- 7 day symptom-free interval must be present in first half of cycle
- physical - see Progestin Deficiency and Estrogen Excess Symptoms
- psychological
  - irritability
  - anxiety
  - depression
  - sleep disturbance
  - appetite change
  - libido change
  - fatigue
  - suicidal ideation

## Treatment

- no proven beneficial treatment, only suggested treatment
- psychological support
- diet
  - decreased sodium, fluids, carbohydrates
  - increased protein
  - avoidance of caffeine and alcohol
- medications
  - vitamins - B6 (pyridoxine)
  - BCP
  - progesterone suppositories
  - diuretics for severe fluid retention
  - NSAIDs for discomfort, pain
  - evening of primrose oil (linoleic acid)
  - danazol (Danocrine)
  - SSRI antidepressants in selected cases
- regular exercise

## MENOPAUSE

- physiological (average age 51)
- premature ovarian failure
- surgical

## Definitions

- menopause
  - cessation of menses for > 6 months or 1 year (depending upon source)
- climacteric
  - period characterized by cessation of menses
  - includes vasomotor, endocrine, somatic changes

## Symptoms

- symptoms associated with estrogen deficiency
- vasomotor (hot flashes)

- atrophic changes (vagina, urethra, bladder)
  - dyspareunia, vaginal itching, bleeding
  - urinary frequency, urgency, incontinence
- skeletal (osteoporosis)
- decreased breast size
- skin thinning and loss of elasticity
- sleep/wake disturbances (insomnia)
- mood disturbances
  - depression, irritability, fatigue

#### Diagnosis

- increased levels of FSH (> 40 IU/L)
- decreased levels of estradiol

#### Treatment

- hormone replacement treatment (doses much lower than OCP)
  - transdermal or oral
  - cyclic estrogen (Premarin) 0.625 mg OD 1-25 plus progesterone (Provera) 10 mg OD, day 14 (or 15, 16) to day 25, or
  - long cycling Premarin 0.625 mg daily plus Provera 5 mg for 14 days q3 months, or
  - continuous combined Premarin 0.625 mg plus Provera 2.5 mg daily
  - unopposed estrogen increases the risk of endometrial cancer without the addition of Provera, but Provera is not needed if previous hysterectomy
- calcium supplement
- physical exercise
- evening primrose oil

#### Indications for Hormone Replacement Therapy

- relief of symptoms - see above (vasomotor, atrophy, insomnia)
- protection against osteoporosis
- osteoporotic risk factors
  - caucasian or oriental race
  - thin habitus
  - immobilization or physical inactivity
  - estrogen deficiency/premature menopause
  - drugs: chronic corticosteroid therapy, chronic use of heparin, anticonvulsants, or thyroid replacement
  - diet: low calcium, low vitamin D, high caffeine high alcohol, or high protein
  - other factors: smoking, family history
- cardiovascular protection
  - estrogen significantly reduces risk of CAD
  - decreases LDL and increases HDL

#### Side Effects of HRT

- abnormal uterine bleeding - requires endometrial biopsy if bleeding other than withdrawal bleeding with combined E/P therapy
- mastodynia
- worse in progesterone phase of combined therapy
- edema, weight gain, heartburn, nausea
- controversy with respect to HRT and breast cancer risk

#### Contraindications of HRT

- absolute
  - undiagnosed vaginal bleeding
  - known or suspected cancer of breast or uterus
  - acute liver disease or chronically impaired liver function
  - acute vascular thrombosis or history of severe thrombophlebitis or thromboembolic disease
- relative
  - pre-existing uncontrolled hypertension
  - uterine fibroids and endometriosis
  - familial hyperlipidemias
  - migraine headaches
  - family history of estrogen-dependent cancer
  - chronic thrombophlebitis
  - diabetes mellitus
  - gallbladder disease

- fibrocystic breasts
- obesity
- smoking

#### Selective Estrogen Receptor Modulators (SERMS)

- e.g. raloxifene (Evista)
- mimics estrogen effects on cardiovascular system and bone
- avoids estrogen-like action on breast and uterine tissue
- does not relieve hot flashes (may make them worse)

## INFERTILITY

#### Definitions

- infertility: failure to conceive after one year of regular unprotected intercourse
- primary infertility: no prior pregnancies
- secondary infertility: previous conception

#### Incidence

- 10-15% of couples
- 60% of couples achieve pregnancy within 6 months of trying
- 80% of couples achieve pregnancy within 1 year of trying

#### Etiology

- male factors (40%)
- female factors (50%)
- multiple factors (30%)
- unknown factors (10-15%)
- note: even when fertilization occurs, > 50-70% of resulting embryos are non-viable

#### Male Factors

- inadequate or abnormal production of sperm
  - congenital
  - trauma, e.g. sports injury
  - varicocele
  - infection - usually mumps orchitis
  - smoking, stress, heat, alcohol
  - rare: malignant disease, endocrine disease
- delivery problems
  - bilateral obstruction of epididymis or ducts
  - ejaculatory dysfunction, e.g. retrograde ejaculation
  - erectile dysfunction
  - abnormal position of urethral orifice
- diagnosis
  - semen analysis after 2-3 days of abstinence (2 specimens several weeks apart)
  - normal ejaculate
    - volume: 2-5 mL
    - count: > 20 million sperm/mL
    - motility: > 50%
    - morphology: > 60% normal forms
    - liquefaction: complete in 20 minutes
    - pH: 7.2-7.8
    - WBC: < 10 per high power field
- oligospermia: count < 20 million/mL
- azoospermia: absence of living spermatozoa in the semen
- endocrine evaluation required if abnormal sperm

#### Female Factors

- ovulatory dysfunction (15-20%)
  - etiology
    - hyperprolactinemia (e.g. pituitary microadenoma)
    - polycystic ovarian disease
    - drugs (e.g. cimetidine, psychotropic)
    - systemic diseases e.g. thyroid, hepato-renal disease, Cushing syndrome
    - congenital - Turner syndrome, testicular feminization, gonadal dysgenesis, and gonadotropin deficiency
    - luteal phase defect
    - excessive exercise (even in absence of amenorrhea)
    - premature ovarian failure - autoimmune disease



- diagnosis
  - history of cycle patterns
  - basal body temperature (biphasic)
  - mucous quality (mid-cycle)
  - endometrial biopsy for luteal phase defect (day 24-26)
  - serum progesterone level (day 20-22)
  - serum prolactin, TSH, LH, FSH
  - if hirsute: serum free testosterone, DHEAS
  - ovulation predictor kits
- ❑ tubal factors (20-30%)
  - etiology
    - PID
    - adhesions (previous surgery, peritonitis, endometriosis)
    - tubal ligation
  - diagnosis
    - hysterosalpingogram, day 8-10 = diagnostic and therapeutic (i.e. may open tube just prior to ovulation)
    - laparoscopy with dye injection of tubes
- ❑ cervical factors (5%)
  - etiology
    - hostile, acidic cervical mucous, glands unresponsive to estrogen (e.g. chlamydial infection)
    - anti-sperm antibodies
    - structural defects (cone biopsies, laser, or cryotherapy)
  - diagnosis
    - post-coital test (day 12-14, sperm motility in cervical mucous 2-6 hours after intercourse)
- ❑ uterine factors (< 5%)
  - etiology
    - congenital anomalies
    - intrauterine adhesions (e.g. Asherman syndrome)
    - infection
    - leiomyomata
    - polyps
  - investigation
    - hysterosalpingogram
    - hysterosonogram
    - hysteroscopy

#### Treatment

- ❑ education
  - timing of intercourse (temperature charting)
- ❑ medical
  - bromocriptine if increased prolactin
  - ovulation induction
    - clomiphene citrate (Clomid)
    - human menopausal gonadotropin (Pergonal)
    - urofollitropin (FSH) (Metrodin)
    - followed by  $\beta$ hCG for stimulation of ovum release
- ❑ surgical
  - tuboplasty
  - artificial insemination - donor or husband
  - sperm washing
  - in vitro fertilization
  - GIFT (gamete intrafallopian transfer)
  - ICSI (intracellular sperm injection)

CONTRACEPTION

Table 3. Classification of Contraceptive Methods

Type	Description	Effectiveness
Surgical		
Sterilization (tubal ligation)		99.9%
Vasectomy		99.9%
Barrier Methods		
Condom Alone		90.0%
Condom with Spermicide		95.0%
Spermicide Alone		82.0%
Sponge		90.0%
Diaphragm with spermicide		81.0%
Hormonal		
Oral contraceptives	• See below	98.0-99.5% (depending on compliance)
Norplant (levonorgestrel)	• Six capsules inserted subdermally in arm • Provides protection for up to 5 years • S/E: severe irregular menstrual bleeding, scar in arm	99.9%(per year), 96.0%(over 5 years)
Depo-Provera (medroxyprogesterone)	• 150mg injection q3mths • restoration of fertility may take up to 1-2 yrs • S/E - irregular menstrual bleeding	99%
IUD	• See below	95.0%-97.0%
Physiological		
Withdrawal		77.0%
Rhythm method		76.0%
Chance - No method used		10.0%

- ❑ Intrauterine device (IUD)
  - absolute contraindications
    - current pregnancy
    - undiagnosed vaginal bleeding
    - acute or chronic PID
    - suspected gynecologic malignancy
  - relative contraindications
    - prior ectopic pregnancy
    - menorrhagia, dysmenorrhea
    - congenital abnormalities of uterus or fibroids
    - valvular heart disease
  - side effects
    - pregnancy: ectopic or septic abortion
    - increased blood loss and duration of menses
    - increased risk of PID especially in nulliparous women
    - dysmenorrhea
    - expulsion (5% in the first year)
    - uterine wall perforation (1/5000)

Oral Contraceptives

- ❑ absolute contraindications
  - current pregnancy
  - undiagnosed vaginal bleeding
  - cardiovascular disorders
    - thromboembolic events
    - cerebrovascular disease
    - coronary artery disease
    - moderate-severe hypertension
  - estrogen-dependent tumours
    - breast
    - uterus
    - liver
  - impaired liver function
  - congenital hyperlipidemia
  - age > 35 and smoking
  - obstructive jaundice in pregnancy
  - Wilson disease

- ❑ drug interactions can occur (can decrease efficacy, e.g. antibiotics necessitate backup method of birth control)
  - see CPS for individual drugs
- ❑ health benefits
  - reduces dysmenorrhea, anemia, and helps regulate cycles
  - reduces likelihood of developing benign breast disease and ovarian cysts
  - combined estrogen and progesterone OCP substantially reduces risk of ovarian carcinoma
  - increases cervical mucus which decreases the risk of STDs

Table 4. Side Effects of the Oral Contraceptive Pill	
Estrogen Excess	Progesterone Excess
<ul style="list-style-type: none"> <li>❑ general symptoms                             <ul style="list-style-type: none"> <li>chloasma</li> <li>recurrent monilial vaginitis</li> <li>UTIs</li> </ul> </li> <li>❑ reproductive system                             <ul style="list-style-type: none"> <li>cystic breast changes</li> <li>breast enlargement</li> <li>uterine enlargement</li> <li>uterine fibroid growth</li> <li>dysmenorrhea</li> <li>cervical extrophy</li> <li>mucorrhea</li> <li>breast swelling</li> </ul> </li> <li>❑ cardiovascular system                             <ul style="list-style-type: none"> <li>capillary fragility</li> <li>cerebral vascular accident</li> <li>deep vein thrombosis</li> <li>telangiectasia</li> </ul> </li> <li>❑ pre-menstrual symptoms                             <ul style="list-style-type: none"> <li>bloating</li> <li>dizziness, syncope</li> <li>edema</li> <li>headache (cyclic)</li> <li>irritability</li> <li>leg cramps</li> <li>nausea and vomiting</li> <li>visual changes (cyclic)</li> <li>weight gain (cyclic)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>❑ general symptoms                             <ul style="list-style-type: none"> <li>hypoglycemia</li> <li>increased appetite</li> <li>decreased libido</li> <li>neurodermatitis</li> <li>acne</li> <li>hirsutism</li> <li>non-cyclic weight gain</li> </ul> </li> <li>❑ reproductive system                             <ul style="list-style-type: none"> <li>cervicitis</li> <li>moniliasis</li> <li>decreased flow length</li> </ul> </li> <li>❑ cardiovascular system                             <ul style="list-style-type: none"> <li>hypertension</li> <li>dilated leg veins</li> </ul> </li> <li>❑ miscellaneous                             <ul style="list-style-type: none"> <li>cholestatic jaundice</li> </ul> </li> </ul>
Estrogen Deficiency	Progesterone Deficiency
<ul style="list-style-type: none"> <li>❑ general symptoms                             <ul style="list-style-type: none"> <li>nervousness</li> <li>vasomotor instability</li> </ul> </li> <li>❑ reproductive system                             <ul style="list-style-type: none"> <li>bleeding and spotting                                     <ul style="list-style-type: none"> <li>may be continuous or in first half of cycle</li> <li>no withdrawal bleed</li> </ul> </li> <li>atrophic vaginitis</li> </ul> </li> <li>❑ genitourinary system                             <ul style="list-style-type: none"> <li>pelvic relaxation symptoms</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>❑ reproductive system                             <ul style="list-style-type: none"> <li>breakthrough bleeding and spotting late: day 10-21 on BCP</li> <li>dysmenorrhea</li> <li>heavy flow and clots</li> <li>delayed withdrawal bleed</li> </ul> </li> <li>❑ pre-menstrual symptoms                             <ul style="list-style-type: none"> <li>bloating</li> <li>dizziness, syncope</li> <li>edema</li> <li>headache (cyclic)</li> <li>irritability</li> <li>leg cramps</li> <li>nausea and vomiting</li> <li>visual changes (cyclic)</li> <li>weight gain (cyclic)</li> </ul> </li> </ul>

## Definition

- the proliferation and functioning of endometrial tissue outside of the uterine cavity
- incidence: 15-30% of all premenopausal women
- mean age at presentation: 25-30 years

## Etiology

- unknown
- theories
  - retrograde menstruation theory of Sampson
  - Mullerian metaplasia theory of Meyer
    - endometriosis results from the metaplastic transformation of peritoneal mesothelium under the influence of certain unidentified stimuli
  - lymphatic spread theory of Halban
  - surgical "transplantation"
  - deficiency of immune surveillance

## Predisposing Factors

- nulliparity
- age > 25 years
- family history
- obstructive anomalies of genital tract

## Sites of Occurrence

- ovaries
  - most common location
  - 60% of patients have ovarian involvement
- broad ligament
- peritoneal surface of the cul-de-sac (uterosacral ligaments)
- rectosigmoid colon
- appendix

## Symptoms

- there may be little correlation between the extent of disease and symptomatology
- pelvic pain
  - due to swelling and bleeding of ectopic endometrium
  - unilateral if due to endometrioma
- dysmenorrhea (secondary)
  - worsens with age
  - suprapubic and back pain often precede menstrual flow (24-48 hours) and continue throughout and after flow
- infertility
  - 30-40% of patients with endometriosis will be infertile
  - 15-30% of those who are infertile will have endometriosis
- dyspareunia
  - on deep penetration
- premenstrual and postmenstrual spotting
- bladder symptoms
  - frequency, dysuria, hematuria
- bowel symptoms
  - direct and indirect involvement
  - diarrhea, constipation, pain and hematochezia

## Diagnosis

- truly a surgical diagnosis
- history
  - cyclic symptoms - pelvic pain, dysmenorrhea, dyschezia
- physical examination
  - tender nodularity of uterine ligaments and cul-de-sac
  - fixed retroversion of uterus
  - firm, fixed adnexal mass (endometrioma)
- laparoscopy (see Colour Atlas D1, D2)
  - dark blue or brownish-black implants (mulberry spots) on the uterosacral ligaments, cul-de-sac, or anywhere in the pelvis
  - chocolate cysts in the ovaries (endometrioma)
  - "powder-burn" lesions
  - early white lesions and blebs

## Treatment

- medical
  - pseudopregnancy
    - cyclic estrogen-progesterone (OCP) or medroxyprogesterone (Provera)
  - pseudomenopause
    - danazol (Danocrine) = weak androgen, s/e: weight gain, fluid retention, acne, or hirsutism
    - leuprolide (Lupron) = GnRH agonist (suppresses pituitary GnRH) s/e: hot flashes, vaginal dryness, reduced libido, and osteoporosis with prolonged use
    - these can only be used short term because of osteoporotic potential
- surgical
  - laparoscopic resection and lasering of implants
  - lysis of adhesions
  - use of electrocautery
  - unilateral salpingo-oophorectomy
  - uterine suspension
  - rarely total pelvic clean-out
  - +/- follow-up with 3 months of medical treatment

# ADENOMYOSIS

## Definition

- extension of areas of endometrial glands and stroma into the myometrium
- also known as “endometriosis interna”
- endometrium often remains unresponsive to ovarian hormones
- uterine wall may be diffusely involved

## Incidence

- 15% of females > 35 years old
- 20-40% of hysterectomy specimens
- older parous age group 40-50 years (in contrast to endometriosis)

## Symptoms

- menorrhagia
- dysmenorrhea (secondary)
- pelvic discomfort
- dyspareunia
- dyschezia

## Diagnosis (see Colour Atlas D4)

- uterus symmetrically bulky
- uterus size is rarely greater than 2-3 times normal
- Halban sign: tender, softened uterus on premenstrual bimanual
- definitive diagnosis made at time of pathological examination

## Treatment

- iron supplements as necessary
- D&C to rule out other pathology
- analgesics/NSAIDs
- low dose danazol 100-200 mg daily for 4 months
- GnRH agonists
- hysterectomy

## Definition

- ❑ gestation that implants outside of the endometrial cavity

## Incidence

- ❑ 1/100 clinically recognized pregnancies
- ❑ fourth leading cause of maternal mortality
- ❑ increase in incidence over the last 3 decades

## Etiology

- ❑ obstruction or dysfunction of tubal transport mechanisms
- ❑ intrinsic abnormality of the fertilized ovum
- ❑ conception late in cycle
- ❑ transmigration of fertilized ovum to contralateral tube

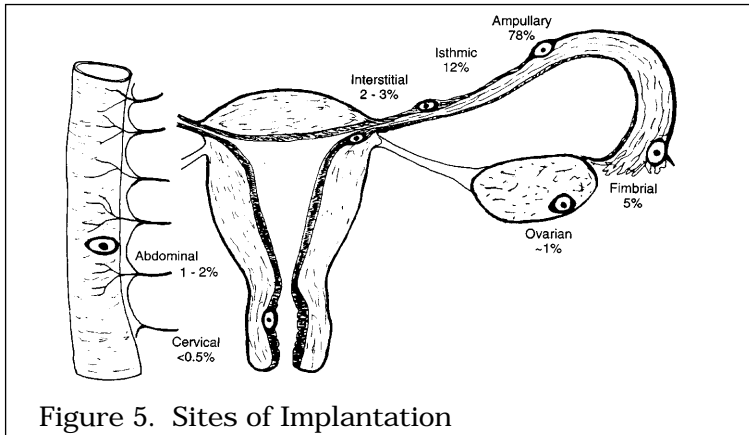


Figure 5. Sites of Implantation

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## Risk Factors

- ❑ history of PID
- ❑ past or present IUD use
- ❑ previous lower abdominal surgery
- ❑ previous ectopic pregnancy
- ❑ endometriosis
- ❑ uterine or adnexal mass
- ❑ assisted reproductive techniques

## Symptoms

- ❑ vaginal bleeding or spotting (most common)
  - due to low BhCG production by the ectopic trophoblast
  - heavy vaginal bleeding rare
- ❑ amenorrhea, other symptoms of pregnancy
- ❑ lower abdominal pain (usually unilateral)
  - abdominal distension
- ❑ adnexal fullness
- ❑ if ectopic pregnancy ruptures
  - acute abdomen
  - abdominal distension
- ❑ symptoms of shock

## Physical Examination

- ❑ firm diagnosis is usually possible in 50% on clinical features alone
- ❑ hypovolemia/shock
- ❑ guarding and rebound tenderness
- ❑ bimanual examination
  - cervical motion tenderness
  - adnexal tenderness (unilateral vs bilateral in PID)
  - palpable adnexal mass (< 30%)
  - uterine enlargement
    - rarely increases beyond equivalent of 6-8 weeks gestation
- ❑ other signs of pregnancy, i.e. Chadwick sign, Hegar sign

## Diagnosis

- serial  $\beta$ hCG levels
  - normal doubling time with intrauterine pregnancy is 1.4-2 days in early pregnancy which increases until 8 weeks, then decreases steadily until 16 weeks
  - prolonged doubling time, plateau or decreasing levels before 8 weeks, implies non-viable gestation but does not provide information on the location of pregnancy
- ultrasound
  - intrauterine sac should be visible when serum  $\beta$ hCG is
    - > 1500 mIU/mL (transvaginal)
    - > 6000 mIU/mL or 6 weeks gestational age (transabdominal)
  - when  $\beta$ hCG is greater than the above values and neither a fetal heart beat nor a fetal pole is seen, it is suggestive of ectopic pregnancy
- culdocentesis (rarely done)
- laparoscopy (for definitive diagnosis)

Differential Diagnosis (see Common Gynecological Complaints Section)

## Treatment

- goals of treatment
  - be conservative
  - try to save the tube
- surgical (laparoscopy)
  - linear salpingostomy or salpingectomy
  - blood loss is replaced if life threatening
  - if patient is Rh negative give anti-D gamma globulin (Rhogam)
  - may require laparotomy
- medical
  - criteria
    - < 3 cm unruptured ectopic pregnancies and no fetal heart activity
    - patient clinically stable
    - compliance and follow-up ensured
  - methotrexate (considered standard care)
    - 1/5 to 1/6 chemotherapy dose, therefore minimal side effects
  - follow  $\beta$ hCG levels
    - plateau or rising levels are evidence of persisting trophoblastic tissue
    - requires further medical or surgical therapy
  - failure rate 5%
    - requires longer follow-up than surgical treatment in order to follow  $\beta$ hCG levels

## Prognosis

- 5% of maternal deaths
- 40-60% of patients will become pregnant again after surgery
- 10-20% will have subsequent ectopic gestation
- prognosis for future pregnancy improves with more conservative treatment

## PHYSIOLOGICAL DISCHARGE

- clear or white discharge
- smear contains epithelial cells
- pH < 4.5
- increases with increased estrogen states: pregnancy, BCP, mid-cycle
- if increased in perimenopausal woman, investigate for other effects of excess estrogen (e.g. endometrial ca)

## NON-INFECTIOUS VULVOVAGINITIS

## Prepubertal Vaginitis

- most common causes
  - foreign objects, trauma (consider child abuse)
  - poor hygiene (e.g. pinworm infection)

## Postmenopausal Vaginitis/Atrophic Vaginitis

- symptoms
  - dyspareunia
  - post-coital spotting
  - mild pruritus
- treatment
  - rule out malignancy
  - estrogen creams
  - oral or transdermal hormone replacement therapy
  - good hygiene

## Chemical Vulvovaginitis

- symptoms and signs of irritation present without infection
- irritants in vaginal contraceptives, bubble baths, soaps, genital deodorants, coloured or scented toilet paper, detergents, and fabric softeners
- frequent minipad or tampon use
- tight synthetic clothing
- pools, hot tubs

## INFECTIOUS VULVOVAGINITIS

## Symptoms

- vaginal discharge
- odor
- pruritus
- lower genital tract pain
- dyspareunia
- dysuria

## Pathophysiology

- normal vaginal flora contains a balance of many bacterial organisms
- flora may be altered by
  - a change in the environment
  - introduction of a new pathogen
- result is an imbalance in the relative number of organisms

## Candidiasis (Moniliasis)

- Candida albicans* (90%), *Candida tropicalis* (< 5%), *Torulopsis glabrata* (< 5%)
- 25% of vaginitis
- symptoms
  - begin in premenstrual phase
  - minimal whitish, curd-like, "cottage-cheese" vaginal discharge
  - intense itch
  - swollen, inflamed genitals
  - vulvar burning, dysuria, dyspareunia
  - asymptomatic (20%)
- predisposing factors
  - pregnancy
  - diabetes
  - BCP
  - antibiotic therapy
  - immunosuppression (primary or secondary)
  - if frequent recurrences, consider AIDS



- diagnosis
  - KOH wet mount reveals hyphae and spores
  - pH < 5
- treatment
  - advise regarding good hygiene (e.g. cotton underwear)
  - clotrimazole, butoconazole, miconazole, ticonazole or terconazole suppositories and/or creams for 1-day, 3-day or 7-day treatments
  - oral fluconazole or ketoconazole
  - symptomatic relief with douching, yogurt, acidophilus
  - treat partners only if symptomatic
  - treatment in pregnancy is nystatin (Mycostatin)

### Bacterial Vaginosis

- *Gardnerella vaginalis* overgrowth in presence of vaginal anaerobes and scant lactobacilli (Bacteroides, Mobiluncus)
- especially susceptible when post-menstrual or post-coital, with IUD
- symptoms
  - fishy odour especially after coitus
  - profuse, thin greyish discharge
  - vulva rarely itchy or inflamed
  - not necessarily sexually transmitted, although can see “ping-pong” transmission
- diagnosis
  - saline wet mount
    - > 20% clue cells = squamous epithelial cells dotted with coccobacilli (*Gardnerella bacilli*)
    - paucity of WBC
    - paucity of lactobacilli
  - amine “whiff” test = rotten, fishy odour with addition of KOH to slide
  - pH 5-5.5
- treatment
  - no treatment required in non-pregnant, asymptomatic women unless scheduled for pelvic surgery or procedure
  - must treat all asymptomatic cases in pregnancy; higher incidence of PTL, PPROM and miscarriage if left untreated
  - oral
    - metronidazole 500 mg bid for 7 days or 2 g once
    - clindamycin 300 mg bid for 7 days
  - topical
    - clindamycin 2% vaginal cream qhs x 7 days
    - flagystatin vaginal suppository (also covers yeast)
  - ampicillin or amoxicillin if pregnant
  - for repeated infection one capsule or tablet of lactobacillus acidophilus daily in vagina
  - controversy exists regarding treatment of partner

### Trichomonas Vaginalis

- a flagellated protozoan, anaerobic
- often co-exists with bacterial forms
- sexually transmitted (men asymptomatic)
- more frequent with multiple sexual partners
- possibly via hot tubs, whirlpools, saunas
- symptoms
  - profuse, thin, frothy yellow-green discharge
  - may be foul-smelling discharge
  - often seen post-menstrual
  - occasionally irritated, tender vulva
  - dysuria
  - petechiae on vagina and cervix (10%)
  - asymptomatic (25%)
- diagnosis
  - saline wet mount
    - many WBC
    - motile flagellated organisms
    - inflammatory cells
  - pH 5 - 6.5
- treatment
  - metronidazole 500 mg bid for 7 days or 2 g once
  - treat partner(s)
  - also topical clindamycin or metronidazole

## GYNECOLOGICAL SEXUALLY TRANSMITTED DISEASES

## Chlamydia

- Chlamydia trachomatis*
- most common STD
- often associated with *N. gonorrhoea*
- risk factors
  - < 25 years old
  - history of previous STD
  - new partner in last 3 months
  - multiple partners
  - not using barrier contraception
  - contact with infected person
- symptoms
  - asymptomatic
  - muco-purulent endocervical discharge
  - urethral syndrome
    - dysuria, frequency, pyuria, no bacteria
  - pelvic pain
  - post-coital bleeding
- complications
  - acute salpingitis, PID
  - infertility - tubal obstruction from low grade salpingitis
  - perinatal infection - conjunctivitis, pneumonia
  - ectopic pregnancy
  - Fitz-Hugh Curtis syndrome (liver capsule infection)
  - arthritis, conjunctivitis, urethritis (Reiter syndrome - male predominance)
- diagnosis
  - cervical culture or monoclonal antibody
  - obligate intracellular parasite - require tissue culture for diagnosis
- treatment
  - doxycycline 100 mg bid for 7 days or azithromycin 1 g orally in a single dose
  - erythromycin 500 mg qid for 7 days if pregnant
  - treat partners
  - reportable disease
- screening
  - high risk groups
  - during pregnancy

## Gonorrhoea

- Neisseria gonorrhoea*
- symptoms and risk factors as with Chlamydia
- diagnosis
  - Gram stain shows gram-negative intracellular diplococci
  - cervical and rectal and throat culture
- treatment
  - single dose of ceftriaxone 250 mg IM or cefixime 800 mg PO or ciprofloxacin 500 mg PO
  - plus doxycycline 100 mg bid for 10 days to treat for concomitant chlamydial infection
  - erythromycin 500 mg qid for 7 days if pregnant
  - treat partner(s)
  - reportable disease
- screening as with Chlamydia

## Condylomata Acuminata (see Colour Atlas D7)

- human papillomavirus (HPV)
- clinical presentation
  - latent infection
    - no visible lesions
    - detected by DNA hybridization tests
    - asymptomatic
  - subclinical infection
    - visible lesion only after 5% acetic acid applied and magnified
  - clinical infection
    - visible wartlike lesion without magnification
    - hyperkeratotic, verrucous or flat, macular lesions
    - vulvar edema
- lesions tend to get larger during pregnancy

- > 60 subtypes of which > 20 are genital subtypes
- classified according to risk of neoplasia and cancer
- types 16, 18, 45, 36 (and others) associated with increased incidence of cervical and vulvar intraepithelial hyperplasia and carcinoma
- diagnosis
  - cytology (Pap smear)
    - koilocytosis = nuclear enlargement and atypia with perinuclear halo
  - biopsy of visible and acetowhite lesions at colposcopy
  - detection of HPV DNA using nucleic acid probes not routinely done
- treatment (see Gynecological Oncology Section)
  - chemical
    - trichloroacetic acid (podophyllin, 5-FU)
  - physical
    - cautery, cryotherapy, laser
- condyloma should be treated early during pregnancy if not successful then C-section should be considered
- cannot be prevented by using condoms

## Molluscum Contagiosum

- epithelial proliferation caused by a growth-stimulating poxvirus (Molluscipoxvirus)
  - mildly contagious
- symptoms
  - occasionally mild pruritis
- clinical presentation
  - multiple nodules up to 1 cm diameter on vulva and perineum with umbilicated center
- treatment
  - chemical
    - carbonic acid, TCA, or silver nitrate
  - physical
    - curette

## Herpes Simplex (see Colour Atlas F12)

- Herpes Simplex virus type II (genital) (90%), type I (oral) (10%)
- initial symptoms
  - present 2-21 days following contact
  - prodromal symptoms
    - tingling, burning, pruritis
  - multiple, painful, shallow ulcerations with small vesicles
    - these lesions are infectious
    - lesions appear 7-10 days after initial infection
  - inguinal lymphadenopathy, malaise, fever often with first infection
  - dysuria and urinary retention if urethral mucosa affected
  - may be asymptomatic
  - recurrent infections
    - less severe, less frequent and shorter in duration
- diagnosis
  - viral culture
  - cytologic smear
    - multinucleated giant cells
    - acidophilic intranuclear inclusion bodies
  - virus seen on electron microscopy
- treatment
  - symptomatic
  - acyclovir 200 mg 5 times a day for 5 days decreases duration and severity of acute phase
  - treat secondary infection
    - famciclovir, less frequent dosing and shorter duration of treatment for recurrent genital herpes
  - consider suppressive therapy if 6-8 attacks per year
  - education regarding transmission
    - avoid contact from prodrome until lesions have cleared
    - use barrier contraception

## Syphilis

- Treponema pallidum*
- primary syphilis
  - painless chancre on vulva, vagina or cervix
  - painless inguinal lymphadenopathy
  - 3-4 weeks after exposure
  - serological tests usually negative
- secondary syphilis (see Colour Atlas F13)
  - 2-6 months after initial infection
  - nonspecific symptoms
    - malaise, anorexia, headache, diffuse adenopathy
  - generalized maculopapular rash
    - palms, soles, trunk, limbs
  - condylomata lata (anogenital, broad-based fleshy grey lesions)
  - serological tests usually positive
- tertiary syphilis
  - may involve any organ system
  - gumma of vulva
  - neurological: tabes dorsalis, general paresis
  - cardiovascular: aortic aneurysm, dilated aortic root
- congenital syphilis
  - may cause fetal anomalies, stillbirths or neonatal death
- latent syphilis
  - no symptoms, positive serology
- natural history
  - if untreated, 1/3 will experience late complications
- diagnosis
  - aspirate of ulcer serum or node
    - spirochetes on dark field microscopy
  - serology
    - VDRL is non-specific
    - MHA-TP is the confirmatory test
    - FTA-ABS is specific
    - TPI is the most specific test, most expensive
- treatment of primary, secondary, latent syphilis of < 1 year duration
  - benzathine penicillin G 2.4 million units IM
  - treat partners
  - reportable disease
- treatment of latent syphilis > 1 year duration
  - benzathine penicillin G 2.4 million units IM once per week x 3 weeks
- screening
  - high risk groups
  - in pregnancy

## Chancroid

- Hemophilus ducreyi*
- symptoms
  - painful soft ulcer with or without pus
  - tender regional lymphadenopathy = buboe
- diagnosis
  - culture
  - Gram stain
    - Gram-negative bacilli in rows
- treatment
  - erythromycin 500 mg qid for 7 days
  - ceftriaxone 250 mg IM once

## Granuloma Inguinale (Donovanosis)

- Calymmatobacterium granulomatis*
- symptoms
  - painless nodule → ulcer → intact pseudobuboes
- diagnosis
  - Donovan bodies with Giemsa stain
- treatment
  - tetracycline 500 mg qid for 14 days
  - erythromycin 500 mg qid for 14 days if pregnant

## Lymphogranuloma Venereum

- Chlamydia trachomatis* serotypes L-1, L-2, L-3

- symptoms
  - papule/vesicle → painless ulcer → discharging buboe
  - rectal ulceration or stricture
  - inguinal lymphadenopathy
- diagnosis
  - serology
  - immunofluorescent test
- treatment
  - doxycycline 100 mg BID for 21 days

#### Less Common STDs

- Sarcoptes scabiei* - genital scabies
- Phthirus pubis* - pediculosis pubis
- Mycoplasma - non-specific urethritis

#### BARTHOLINITIS

- infection of an obstructed Bartholin gland
- 5 and 7 o'clock positions at vaginal introitus
- usually sterile but causative organisms may include
  - *S. aureus*, *S. fecalis*, *E. coli*, *N. gonorrhoea*, *C. trachomatis*
- treatment
  - sitz baths
  - antibiotics and heat (rarely help)
  - incision and drainage with placement of Word catheter for 2-3 weeks
  - marsupialization for recurrent abscesses

#### PELVIC INFLAMMATORY DISEASE

##### Definition

- an infection of the upper genital tract or salpingitis
- also includes endometritis, tubo-ovarian abscess, pelvic peritonitis
- acute febrile illness
- usually bilateral

##### Causative Organisms (in order of frequency)

- C. trachomatis*
- N. gonorrhoea*
- GC and Chlamydia often co-exist
- endogenous flora
  - anaerobic organisms (e.g. *Bacteroides sp.*)
  - a cause of recurrent PID
  - associated with instrumentation
- actinomyces
  - in 1-4 % of PID associated with IUDs
- others (TB, gram-negatives, etc...)

##### Risk Factors

- risk factors as for Chlamydia and GC
- history of salpingitis
- vaginal douching
- IUD (unilateral disease)
- infertility (instrumentation)

##### Clinical Presentation

- symptoms
  - low abdominal or pelvic pain
  - metrorrhagia
  - intermenstrual and/or post-coital bleeding
  - vaginal discharge
  - deep dyspareunia
  - exacerbated by menses and coitus
- signs
  - fever
  - abdominal tenderness
  - signs of peritoneal irritation
  - endocervical discharge
  - cervical motion tenderness
  - adnexal tenderness
  - adnexal mass

- acute disease
  - cervicitis, salpingitis, endometritis, myometritis, peritonitis
  - pelvic cellulitis
  - tubo-ovarian abscess
  - pelvic abscess
- chronic disease
  - constant pelvic pain
  - dyspareunia
  - palpable mass
  - often due to Chlamydia
  - very difficult to treat, may require surgery

Differential Diagnosis (see Common Gynecological Complaints Section)

#### Investigations

- Gram stain
  - Gram-negative intracellular diplococci (GC)
- cervical culture
  - aerobic and anaerobic bacteria as well as Chlamydia (obligate intracellular parasite)
- ultrasound
  - may be normal
  - fluid in cul-de-sac
  - pelvic or tubo-ovarian abscess
  - hydrosalpinx
- laparoscopy
  - for definitive diagnosis
  - for tubal cultures and endometrial biopsy

#### Diagnosis

- must have
  - lower abdominal pain
  - cervical motion tenderness
  - adnexal tenderness
- plus one or more of the following
  - temperature > 38.0°C
  - WBC > 10.5
  - mucopurulent cervicitis or pus on culdocentesis (rarely done)
  - pelvic abscess or inflammatory mass on US or bimanual
  - elevated ESR or C-reactive protein (not commonly used)
  - positive culture for *N. gonorrhoea*, *C. trachomatis*, *E. coli* or other vaginal flora
  - high risk partner
  - elevated ESR or C-reactive protein (not commonly used)

#### Consequences of Untreated PID

- chronic pelvic pain
- abscess, peritonitis
- adhesion formation
- ectopic pregnancy
- infertility
  - 1 episode of PID → 13% infertility
  - 2 episodes of PID → 36% infertility
- bacteremia
  - septic arthritis, endocarditis

#### Treatment

- must treat with polymicrobial coverage
- inpatient if:
  - atypical infection
  - adnexal mass, tubo-ovarian or pelvic abscess
  - moderate to severe illness
  - unable to tolerate oral antibiotics
  - immunocompromised
  - pregnant
  - surgical emergency cannot be excluded
  - PID is secondary to instrumentation
  - recommended treatment
    - cefoxitin 2 g IV q6h or cefotetan 2 g IV q12h + doxycycline 100 mg IV q12h, or
    - clindamycin + gentamicin + doxycycline

- continue IV antibiotics for at least 48 hours after symptoms have improved
- then doxycycline 100 mg PO bid to complete 14 days
- percutaneous drainage of abscess under US guidance
- when no response to treatment, laparoscopic drainage
- if failure, treatment is surgical (salpingectomy, TAH-BSO)
- outpatient if
  - typical findings
  - mild to moderate illness
  - oral antibiotics tolerated
  - compliance ensured
  - follow-up within 48-72 hours possible
  - recommended treatment
    - ceftriaxone 250 mg IM + doxycycline 100 mg bid for 14 days
- remove IUD after a minimum of 24 hours of treatment
- reportable disease
- treat partner(s)
- re-culture for cure 2 weeks later

#### HIV IN WOMEN (see Infectious Disease Section)

- 8% of AIDS occurs in women
- incidence in women increasing
- greatest risk factor is IV drug use, followed by contact with high risk male
- suspect if refractory moniliasis
- risk of vertical transmission to the fetus is 25% – this can be reduced to 8% when AZT given during pregnancy, labor, delivery and to the neonate
- Pap smear every six months as can have increased incidence of cervical dysplasia

#### TOXIC SHOCK SYNDROME

- multiple organ system failure due to *S. aureus* exotoxin
- rare
- associated with:
  - tampon use
  - diaphragm, cervical cap or sponge use
  - wound infections
  - post-partum infections
- early recognition and treatment of syndrome is imperative as incorrect diagnosis can be fatal

#### Clinical Presentation

- sudden high fever
- sore throat, headache, diarrhea
- erythroderma
- signs of multisystem failure
- refractory hypotension
- exfoliation of palmar and plantar surfaces of the hands and feet 1-2 weeks after onset of illness

#### Management

- remove potential sources of infection
  - foreign objects and wound debris
- debridement of necrotic tissues
- adequate hydration
- penicillinase-resistant antibiotics - cloxacillin
- steroid use controversial but if started within 72 hours, may reduce severity of symptoms and duration of fever

#### SURGICAL INFECTIONS AND PROPHYLAXIS

##### Post Operative Infections in Gynecological Surgery (see General Surgery Notes)

- urinary tract infections
- respiratory tract infections
- phlebitis
- wound infections
- necrotizing fasciitis
- pelvic cellulitis
  - common post hysterectomy

- erythema, induration, tenderness, discharge involving vaginal cuff
- treat if fever and leukocytosis with broad spectrum antibiotics, i.e. clindamycin and gentamycin
- drain if excessive purulence or large mass
- intraabdominal and pelvic abscess

#### Prophylactic Antibiotics for Gynecologic Surgery

- aim to decrease numbers below critical level for infection
- benefit in: vaginal hysterectomy, TAH, D&C, and abortion
- cefazolin for most procedures (IV bolus 30 minutes before procedure and repeat if surgery > 2-3 hours long)
- bowel prep for procedures in which fecal contamination is possible
  - Go-Lytely, etc..., to clear bowel
  - ampicillin + gentamicin IV or IM 30 minutes before procedure and q8h
  - vancomycin + gentamicin for penicillin-allergy
  - amoxicillin PO 1hour before procedure if low-risk patient
  - cefoxitin IV pre-op and q4h if emergency
  - clindamycin, ampicillin, and cephalosporins are most often associated with *C. difficile* colitis

## PELVIC RELAXATION

- due to weakness or defect in the cardinal and uterosacral ligaments which normally assist in maintaining the uterus in an anteflexed position and prevent it from descending through the urogenital diaphragm (i.e. levator ani muscles)
- related to
  - trauma of childbirth
  - aging
  - decreased estrogen
  - following pelvic surgery
  - increased abdominal pressure, e.g. obesity, chronic coughing, and constipation
  - rarely congenital

## PROLAPSE

### UTERINE PROLAPSE

#### Symptoms

- mass or bulge at introitus
- back pain due to stretching of uterosacral ligaments
- feeling of heaviness in the pelvis
  - worse with standing, lifting
  - relieved by lying down

#### Classification

- 0 = No descent
- 1 = Descent between normal position and ischial spines
- 2 = Descent between ischial spines and hymen
- 3 = Descent with hymen
- 4 = Descent through hymen

Procidentia: failure of genital supports and complete prolapse of uterus

#### Treatment

- conservative
  - vaginal pessary
  - estrogen therapy
  - pelvic muscle exercises (Kegels)
- surgical
  - prosthetic slings in cases associated with urinary incontinence
  - vaginal hysterectomy ± anterior + posterior repair

### VAULT PROLAPSE

- follows hysterectomy, vagina turns inside out



Treatment

- conservative
  - vaginal pessary
  - estrogen therapy
- surgical
  - vaginal vault suspension (can be very complicated)

**CYSTOCELE**

- prolapse of bladder into the upper anterior vaginal wall

Symptoms

- frequency, urgency, nocturia
- stress incontinence
- incomplete emptying bladder
- increased incidence of UTIs

Treatment

- conservative
  - vaginal pessary, Kegels exercises
- surgical
  - anterior colporrhaphy (“anterior repair”)
- plication of pubocervical fascia to support bladder and urethra

**RECTOCELE**

- prolapse of large bowel in lower posterior vaginal wall

Symptoms

- constipation
  - constant straining may increase rectocele

Treatment

- conservative
  - laxatives and stool softeners
  - vaginal pessary usually not helpful
- surgical
  - posterior colporrhaphy (“posterior repair”)
- plication of endopelvic fascia and perineal muscles approximated in midline to support rectum/perineum

**ENTEROCELE**

- prolapse of small bowel in upper posterior vaginal wall
- usually associated with rectocele

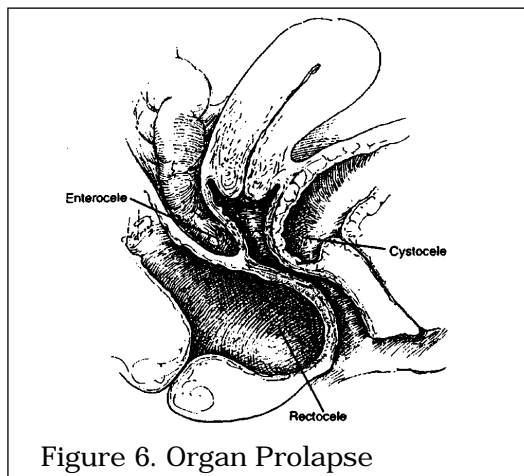


Figure 6. Organ Prolapse

Printed with permission from *Obstetrics and Gynecology, 2nd ed.* Beckman, Charles *et al.* (eds.) Williams and Wilkins, 1995

**STRESS INCONTINENCE**

- consider medical causes, e.g. infection, delirium, depression, medications

**Etiology**

- birth process causing denervation of urethra
- hypoestrogen of menopause causing decreased vascularity, urethral muscle atrophy
- usually lose only a few drops of urine
- occurs with increased intra-abdominal pressure (i.e. sneezing, coughing)
- best type of incontinence on which to operate (best success)

**Mechanism**

- proximal urethra drops below pelvic floor and transmission of increased intra-abdominal pressure is not distributed evenly
  - bladder pressure > urethral pressure

**Degrees**

- mild - sneezing, coughing
- moderate - leaks when walking
- severe - leaks when standing up

**Diagnosis**

- by clinical presentation
- stress test
  - demonstrate urinary incontinence
- cystoscopy
- urodynamics

**Treatment**

- medical
  - Kegels exercises (pelvic diaphragm exercises)
  - estrogen for atrophic urethritis
- surgical
  - vaginally or abdominally
  - see Urology Notes

**TOTAL INCONTINENCE**

- constant loss of urine
- vesico-vaginal fistula
  - previous pelvic surgery and radiation account for 95%

**Diagnosis**

- instillation of methylene blue dye into bladder or IV indigo-carmin dye with leakage of dye into vaginal packing

**Treatment**

- surgical

**URGENCY INCONTINENCE**

- loss of urine associated with an uncontrollable urge to void
- secondary to
  - detrusor instability or dyssynergia
  - involuntary contraction and overactivity of detrusor
  - chronic irritation or infection (i.e. interstitial cystitis)
- functional impairment (i.e. mobility problems)
- UTIs common
- see Urology notes for figure of bladder innervation

**Diagnosis**

- by clinical presentation
- urodynamics
  - uninhibited contractions if unstable bladder
  - small bladder capacity if irritable bladder

**Treatment**

- bladder training (timed voiding patterns)
- anticholinergics (propantheline)
  - inhibits the parasympathetically innervated detrusor muscle

- antibiotics
- estrogen creams, ring used vaginally (Estring)
- estrogen raises sensory threshold for involuntary detrusor contractions decreasing urgency, frequency

### OVERFLOW INCONTINENCE

- overdistension of bladder and loss of urine
- results from neurogenic bladder
- underactivity of detrusor or hypotonic bladder
  - associated with
  - lower motor neuron disease
  - spinal cord injury
  - autonomic neuropathy (i.e. diabetics)
- can also occur with outflow obstruction

### Diagnosis

- urodynamics
  - large bladder capacity

### Treatment

- cholinergic agents bethanechol (Urecholine) to increase bladder tone and contractility
- intermittent self-catheterization

## GYNECOLOGICAL ONCOLOGY

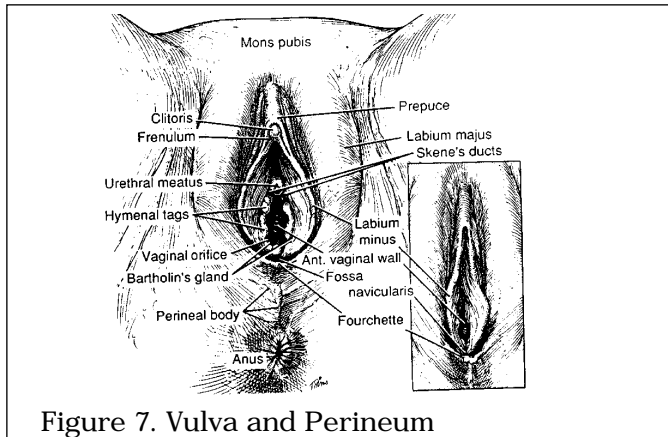


Figure 7. Vulva and Perineum

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- incidence of malignant lesions
  - endometrium > cervix > ovary > vulva > vagina

### VULVA

- any suspicious lesion of the vulva should be biopsied
- multiple biopsies are needed

### Benign Vulvar Lesions

- malignant potential (< 5%)
  - greatest risk when cellular atypia found on biopsy
- squamous cell hyperplasia (hyperplastic dystrophy)
  - post-menopausal
  - pruritus
  - thickened raised lesions with whitish plaques
  - may have cellular atypia on biopsy
  - treated with corticosteroid cream
- lichen sclerosus
  - mostly post-menopausal
  - pruritus
  - dyspareunia

- burning
- atrophic vulva with fusion of labia
- not associated with increased incidence of malignancy
- treated with testosterone cream or progesterone cream in petroleum
- ❑ lichen sclerosis with epithelial hyperplasia (mixed dystrophy)
  - burning
  - pruritus
  - dyspareunia
  - increased incidence of cellular atypia
  - treated with corticosteroid cream followed by testosterone cream
- ❑ papillary hidradenoma
  - sharply circumscribed nodule, usually on labia majora or interlabial folds
  - tendency to ulcerate (gets confused with carcinoma)
  - identical in appearance to intraductal papillomas of breast
- ❑ condylomata acuminatum (3 forms) (see Gynecological Infections Section)

### Malignant Vulvar Lesions

- ❑ characteristics
  - 3-4% of genital tract malignancies
  - most commonly squamous cell carcinoma
  - 50% of invasive lesions are associated with current or previous vulvar dystrophy
  - usually post-menopausal women
  - patient usually presents late or is biopsied late
  - 5% are VDRL positive
    - occurs at younger age and has a worse prognosis
  - etiological association with HPV
    - VIN = precancerous change which presents as multicentric white or pigmented plaques on vulva
    - 90% of VIN contain HPV DNA, specifically types 16, 18
    - increased incidence associated with obesity, hypertension, diabetes, atherosclerosis, long-term steroid treatment
- ❑ sites of origin
  - labia minora (40-45%)
  - labia majora (35-40%)
  - clitoris (10-15%)
  - perineum, anus (3%)
  - Bartholin gland (1%)
  - multifocal (5%)
- ❑ spread
  - locally
  - ipsilateral groin nodes
    - superficial inguinal → pelvic nodes
- ❑ clinical features
  - localized pruritus, pain
  - raised red, white or pigmented plaque
  - ulcer
  - bleeding, discharge
  - dysuria
- ❑ diagnosis
  - physical examination
  - ALWAYS biopsy
  - +/- colposcopy

Stage	Description	Treatment
0	intraepithelial neoplasia (VIN) carcinoma in situ	local excision laser superficial vulvectomy
1	< 2 cm no suspicious groin nodes	wide local excision simple or radical vulvectomy nodal dissection
2	> 2 cm no suspicious groin nodes	individualized local surgery +/- radiation
3	local extension to adjacent structures suspicious or positive unilateral groin nodes	as for stage 2
4	fixed bilateral groin nodes distant spread	as for stage 2

- prognosis
  - depends on nodal involvement and tumour size
  - node status is most important
  - lesions > 3 cm associated with poorer prognosis
  - overall 5 year survival rate: 70%
    - 90% if no nodes
    - < 70% if nodes involved

**VAGINA**

**Benign Vaginal Lesions**

- VAIN (Vaginal Intra-Epithelial Neoplasia)
  - pre-malignant
  - grades: progression through VAIN1, VAIN2, VAIN3
  - diagnosis
    - Pap smear
    - colposcopy
    - Schiller test (normal epithelium takes up iodine)
    - biopsy
  - treatment
- VAIN1: often regress and recur therefore manage conservatively with regular follow up
- VAIN2: laser ablation, electrosurgical cautery
- VAIN3: ablation, excisional biopsy should be considered to rule out invasion

**Malignant Vaginal Lesions**

- assessment
  - cytology (Pap smear)
- 10-20% false negative rate
- increased incidence in patients with prior history of cervical and vulvar cancer --> extra vigilance in performing Pap smear in patient with prior hysterectomy for cervical cancer
  - colposcopy
  - Schiller test
  - biopsy, partial vaginectomy
  - staging (see Table 6)
- squamous cell carcinoma
  - 2% of gynecological malignancies
    - most common site is the upper 1/3 of posterior wall of vagina
  - symptoms
    - asymptomatic
    - vaginal discharge (often foul-smelling)
    - vaginal bleeding especially during coitus
    - urinary symptoms secondary to compression
  - treatment
    - radiotherapy if a primary
    - hysterectomy and vaginectomy

- ❑ adenocarcinoma
  - most are metastatic, usually from the cervix, endometrium ovary, or colon
  - most primaries are clear cell adenocarcinomas
    - 2 types: non-DES and DES syndrome
  - management as for SCC
- ❑ diethylstilbestrol (DES) syndrome
  - most existing cases have already been documented
  - maternal use and fetal exposure to DES predisposes to cervical or vaginal clear cell carcinoma
  - < 1 in 1,000 risk if exposed
  - DES opposes the process of squamous metaplasia
  - clinical presentation
    - adenosis or the replacement of normal squamous epithelium of vagina by glandular epithelium
      - occurs in 30-95% of exposed females
      - adenosis usually transforms via metaplasia to normal squamous epithelium
    - malformations of upper vagina, cervix, and interior of uterus (T-shaped)
    - cockscomb or hooded cervix, cervical collar
    - pseudopolyps of cervix

Table 6. Staging Classification of Vaginal Cancer (Clinical Staging)

Staging	Description
0	intraepithelial neoplasia (VAIN) carcinoma in situ
1	limited to the vaginal wall
2	involves subvaginal tissue, but no pelvic wall extension
3	pelvic wall extension
4	extension beyond true pelvis or involvement of bladder or rectum

CERVIX

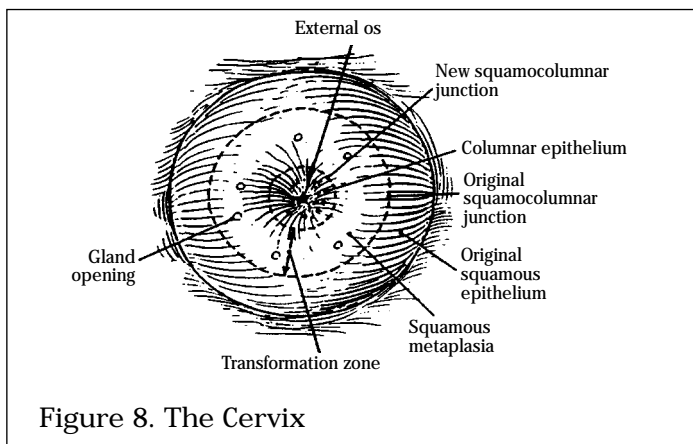


Figure 8. The Cervix

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Benign Cervical Lesions

- ❑ endocervical polyps
  - common post-menopause
  - treatment
    - polypectomy
    - +/- D&C

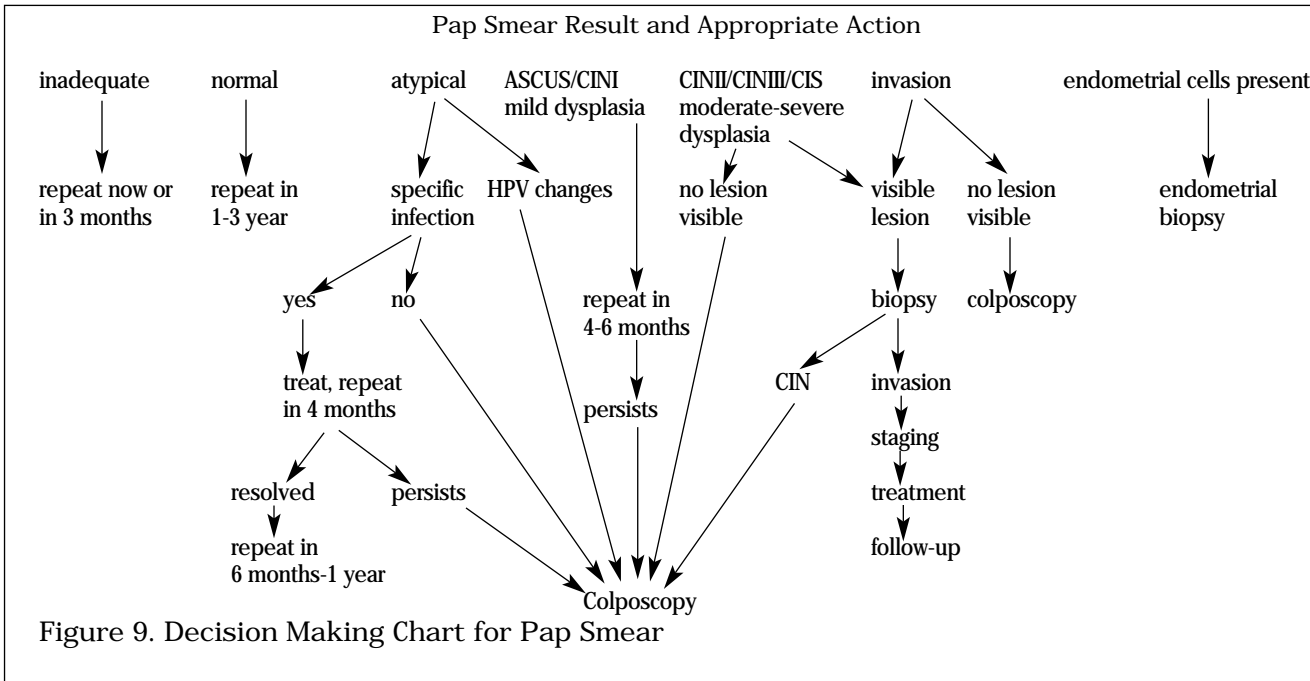
Malignant Cervical Lesions

- ❑ SSC (95%), adenocarcinoma (5%)
- ❑ 8 000 deaths annually in North America

- ❑ annual Pap test reduces a woman's chances of dying from cervical cancer from 4/1000 to 5/10 000
- ❑ average age 52 years old
- ❑ etiology
  - at birth the vagina is covered with squamous epithelium, and the columnar epithelium covers only the endocervix and the central area of the ectocervix (original squamocolumnar junction)
  - during puberty, estrogen causes a single columnar layer to become everted (ectopy) thus exposing it to the acid pH of the vagina, leading to metaplasia (columnar to squamous)
  - since the metaplastic squamous epithelium covers the columnar epithelium, a new squamocolumnar junction is formed closer to the external os
  - the transformation zone (TZ) is an area of squamous metaplasia located between the original and the new squamocolumnar junction (Figure 8)
  - the majority of dysplasias and cancers arise in the TZ of the cervix
  - epithelium may also become susceptible to mutagenic agents leading to dysplasia
  - must have active metaplasia + inducing agent to get dysplasia
  - TZ is higher up in the endocervical canal in postmenopausal women
- ❑ risk factors
  - HPV infection
    - see Gynecological Infections section
    - high risk associated with types 16, and 18
    - low risk associated with types 6, and 11
    - 90% of cervical cancers contain one of the high risk HPV types
  - smoking
  - high risk behaviour
    - multiple partners
    - other STDs
    - early age first intercourse
    - high risk male partner
- ❑ clinical presentation
  - squamous cell carcinoma
    - exophytic, fungating tumour
  - adenocarcinoma
    - endophytic, with barrel-shaped cervix
- ❑ symptoms
  - early
    - asymptomatic
    - discharge, initially watery, becoming brown or red
    - post-coital bleeding
  - late
    - spontaneous irregular bleeding
    - pelvic or back pain
    - bladder symptoms
    - bowel symptoms
- ❑ signs
  - usually obvious unless lesion is in canal or very small
  - raised, reddened area
  - friable
- ❑ pathogenesis
  - dysplasia → CIS → invasion
  - slow process (years)
  - growth is by local extension
  - metastasis uncommon and occurs in late disease
- ❑ screening (Pap smear)
  - endocervical and exocervical cell sampling, TZ sampling
  - false positives 5-10%, false negatives 10-40%
  - identifies squamous cell carcinoma, less reliable for adenocarcinoma
  - yearly, starting when sexually active until age 69
  - a woman should have at least three consecutive negative smears before being released from screening
  - after three consecutive negative smears, screening intervals may be increased up to every three years at the physician's discretion (according to The Walton Report)

Bethesda Grading System	Classic System/CIN Grading System
<ul style="list-style-type: none"> <li>• within normal limits</li> <li>• infection</li> <li>• reactive and reparative changes</li> <li>• squamous cell abnormalities                             <ul style="list-style-type: none"> <li>• atypical squamous cells of undetermined significance</li> </ul> </li> <li>• low grade squamous intraepithelial lesion (SIL)</li> <li>• high grade squamous intraepithelial lesion (HIL)</li> <li>• squamous cell carcinoma</li> <li>• adenocarcinoma</li> </ul>	<ul style="list-style-type: none"> <li>• normal</li> <li>• inflammatory atypia (organism)</li> <li>• squamous atypia of uncertain significance</li> <li>• HPV atypia or mild dysplasia      CIN I</li> <li>• moderate dysplasia      CIN II</li> <li>• severe dysplasia      CIN III</li> <li>• carcinoma in situ</li> <li>• squamous cell carcinoma</li> </ul>

- ❑ diagnosis (colposcopy) (see Colour Atlas D6)
  - using acetic acid to uncover white lesions
  - endocervical curettage (ECC) if entire lesion not visible or no lesion visible
  - cervical biopsy
- ❑ cone biopsy if
  - unsatisfactory colposcopy
  - abnormal endocervical curettage
  - discrepancy between pap smear results and punch biopsy
  - Pap smear shows adenocarcinoma in situ
  - microinvasive carcinoma
- ❑ complications (low incidence)
  - hemorrhage
  - infection
  - cervical stenosis or incompetence
  - infertility





- ❑ treatment of abnormal Pap smear and cervical cancer
  - CIN 1 (LGSIL)
    - observe with regular cytology (every 6 months)
    - many lesions will regress or disappear (60%)
    - colposcopy if positive on 2 consecutive smears
    - lesions which progress should have area excised by either LEEP, laser, cryotherapy or cone biopsy with LEEP tissue is obtained for histological evaluation
  - CIN 2 and CIN 3 (HGSIL)
    - LEEP, laser, cryotherapy, cone excision
    - hysterectomy
      - only for CIN 3 with no desire for future childbearing
  - Stage 1A
    - cervical conization if future fertility desired
    - simple abdominal hysterectomy if fertility is not an issue
  - Stage 1B
    - radical (Wertheim) hysterectomy and pelvic
    - ovaries can be spared
  - Stage 2, 3, 4
    - radiotherapy

Table 8. Staging Classification of Cervical Cancer (Clinical Staging)

Stage	Description
0	carcinoma in situ
1	confined to cervix
1A	microinvasive
1B	all others
2	beyond cervix but not to the pelvic wall, does not involve lower 1/3 of vagina
3	extends to pelvic wall, involves lower 1/3 of vagina
4	beyond true pelvis +/- distant spread, bladder, and/or rectum involved

- ❑ prognosis
  - 5 year survival figures
    - Stage 0: 99%
    - Stage 1: 75%
    - Stage 2: 55%
    - Stage 3: 30%
    - Stage 4: 7%
    - Overall: 50-60%

Abnormal Pap Smears in Pregnancy

- ❑ incidence
  - 1/2200
- ❑ Pap test and biopsy of any suspicious lesion should be performed at initial prenatal visit (refer to colposcopy)
- ❑ if a diagnostic conization is required it should be deferred until T2 to prevent complications (abortion)
- ❑ microinvasive carcinoma
  - followed to term and delivered vaginally or by cesarean section depending on degree of invasion
- ❑ stage 1B carcinoma
  - depending on patient wishes
  - recommendations in T1 for external beam radiation with the expectations of spontaneous abortion
  - recommendations in T2, delay of therapy until viable fetus and delivery
- ❑ follow-up with appropriate treatment

## UTERUS

### Benign Uterine Lesions

#### Leiomyomas (fibroids) (see Colour Atlas D5)

- epidemiology
  - 20% of women > 35 years
  - more common in black women
  - most common indication for major surgery in females
- pathogenesis
  - arise from smooth muscle
  - estrogen-dependent benign tumour
  - degenerative changes include
    - red degeneration
    - hyaline degeneration
    - cystic degeneration
    - fatty degeneration
    - calcification
    - sarcomatous degeneration
- clinical presentation
  - general symptoms
    - asymptomatic
    - abdominal swelling
    - pelvic pain, pressure and/or heaviness
    - menorrhagia
    - abnormal bleeding pattern
    - difficulty voiding, defecating
  - locations (see Figure 10)
  - intramural
    - initial growth commences in myometrium
    - abdominal swelling
    - menorrhagia
    - infertility
  - submucosal (most symptomatic)
    - further extension of growth inwards, into uterine cavity
    - menorrhagia is common
    - dysmenorrhea
    - infertility
    - recurrent abortions
    - can be pedunculated (on a stalk)
  - subserosal
    - extension of growth outwards
    - asymptomatic unless large
    - can be pedunculated
    - torsion may occur
  - cervical
    - rare
    - early pressure effects in region of bladder neck
    - bleeding
    - infection
    - dyspareunia
    - infertility
  - extrauterine

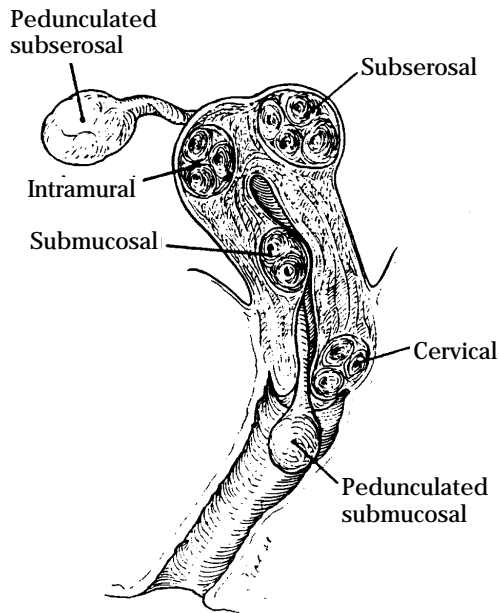


Figure 10. Possible Anatomic Locations of Uterine Leiomyomata

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#### □ diagnosis

- physical examination
  - asymmetrically enlarged uterus, mass
- ultrasound
- hysteroscopy
- fractional D&C to rule out uterine cancer

#### □ treatment

- only if symptomatic, rapidly enlarging, large amount of blood loss
- treat anemia if present
- conservative approach advocated if:
  - symptoms absent or minimal
  - tumours < 6-8 cm or stable in size
  - not submucosal (i.e. submucosal fibroids are more likely to be symptomatic)
  - virtually all postmenopausal patients would fall into this category
- medical approach
  - GnRH agonist (e.g. leuprolide (Lupron) or danazol (Danocrine) to facilitate surgery (reduces menorrhagia and fibroid size)
  - antiprostaglandin or OCP therapy for control of pain/bleeding in young patients or in those who do not want surgery
- surgical approach
  - myomectomy (hysteroscopic or transabdominal approach)
  - abdominal hysterectomy if fibroid > 12 weeks gestational size (i.e. obscures adnexa) and child-bearing completed
  - embolization of fibroid blood supply (new therapy)
- expectant management in pregnancy
- never operate on fibroids during pregnancy

#### Endometrial Carcinoma

##### □ epidemiology

- most common gynecological malignancy (40%)
- 1 in 100 women
- mean age = 60 years
- 20% mortality

- ❑ types
  - adenocarcinoma
  - adenosquamous carcinoma
  - papillary serous adenocarcinoma
- ❑ risk factors
  - nulliparity
  - unopposed estrogens
    - endogenous - PCOD, anovulation, obesity
    - exogenous - estrogen in HRT without progesterone (and presence of a uterus)
  - late menopause
  - history of breast, colon, or ovarian cancer
  - diabetes mellitus, hypertension are cofactors
- ❑ clinical presentation
  - postmenopausal bleeding
    - 70-80% present at Stage 1
    - 10-15% present at Stage 2
  - abnormal uterine bleeding

Table 9. Staging of Endometrial Cancer (Surgical Staging)

Stage	Description
0	atypical adenomatous hyperplasia
1	confined to corpus
1A	tumor limited to the endometrium
1B	invades through < one half of myometrium
1C	invades through > one half of myometrium
2	involves corpus and cervix
2A	endocervical glandular involvement only
2B	cervical stromal invasion
3	outside of uterus but not beyond true pelvis
4	outside of true pelvis, involving bowel and bladder

- ❑ diagnosis
  - office endometrial biopsy
  - D&C
- ❑ treatment
  - based on tumour grade and depth of myometrial invasion
  - surgical
    - TAH-BSO and pelvic washings
  - radiotherapy
    - adjuvant radiation is given to selected patients based on depth of myometrial invasion, tumour grade, and/or lymph node involvement
  - hormonal therapy
    - progestins for distant or recurrent disease
  - chemotherapy
    - may be tried if disease progresses on progestins

Uterine Sarcoma

- ❑ rare
- ❑ arise from stromal components
  - endometrial stroma, mesenchymal or myometrial tissues
- ❑ more advanced at diagnosis
- ❑ greater tendency to disseminate hematogenously
- ❑ 5-year survival: 35%
- ❑ leiomyosarcoma
  - uncommon
  - average age of presentation = 55
  - clinical presentation
    - abnormal vaginal bleeding
    - feeling of pelvic fullness and/or pressure
    - rapidly enlarging uterus
  - spread
    - via local invasion, hematogenous and lymphatic

- treatment
  - TAH-BSO
  - no adjuvant therapy given if disease confined to uterus and mitotic index is low
  - radiation if high mitotic index or tumour spread beyond uterus (not used in Toronto)
  - chemotherapy generally not useful
- ☐ endometrial stromal sarcoma
  - clinical presentation
    - menometrorrhagia
    - postmenopausal bleeding
    - pelvic pain
    - 50% have metastatic disease at time of presentation, especially liver and/or lung mets
  - treatment
    - TAH-BSO
    - hormonal therapy (progestogens)
    - rarely use radiotherapy
- ☐ mixed Mullerian sarcoma
  - most common uterine sarcoma
  - treatment
    - same as leiomyosarcoma
    - use of adjuvant radiotherapy for low stage disease

OVARY

Table 10. Characteristics of Benign vs. Malignant Ovarian Tumours	
Benign	Malignant
<ul style="list-style-type: none"> <li>• reproductive age group (epithelial cell)</li> <li>• very large tumors</li> <li>• unilateral</li> <li>• freely mobile</li> <li>• capsule intact, smooth surface, cystic, unilocular</li> <li>• no ascitic fluid</li> <li>• smooth peritoneal surfaces</li> </ul>	<ul style="list-style-type: none"> <li>• very young (germinal cell) or older (epithelial cell) age groups</li> <li>• bilateral</li> <li>• fixed, adherent to adjacent organs</li> <li>• multiloculation, thick septa, disruption of solid areas</li> <li>• ascites</li> <li>• peritoneal seeding e.g. cul-de-sac and bowel serosa</li> </ul>

Benign Ovarian Tumours

Functional Tumours

- ☐ follicular cyst
  - follicle fails to rupture during ovulation
  - seldom measures more than 6-8 cm
  - usually unilocular, lined by granulosa cells
  - clinical presentation
    - usually asymptomatic
    - may rupture, bleed, twist, and infarct
    - can resemble PID or ectopic pregnancy clinically
  - treatment
    - if < 6 cm, wait 6 weeks then re-examine as cyst may regress with next cycle
    - ovarian suppression with OCP
    - aspiration via laparoscopy
- ☐ lutein cyst
  - corpus luteum fails to regress after day 14, becoming cystic or hemorrhagic
  - usually slightly larger and firmer than follicular cyst
  - may rupture, bleed, twist, and infarct and cause mild to severe pain
  - may delay onset of next period
  - treatment
    - same as for follicular cyst
- ☐ theca-lutein cyst
  - due to atretic follicles stimulated by abnormally high blood levels of hCG

- classically associated with hydatidiform or invasive mole
- can also occur with polycystic ovaries, diabetes, erythroblastosis, multiple pregnancy, large fetus, and ovulation induction with gonadotropins or clomiphene
- treatment
  - conservative
  - cyst will regress as BhCG level falls

- ❑ endometrioma
  - see Endometriosis section

#### Germ-Cell Tumours

- ❑ cystic teratoma (dermoid cyst) (see Colour Atlas D3)
  - single most common benign ovarian neoplasm
  - elements of all tissues represented in a well-differentiated form
  - most commonly contains dermal appendages (i.e. sweat and sebaceous glands, hair follicles and teeth)
  - 20% occur outside the reproductive years
  - 20% bilateral
  - 5-10 cm usually (seldom larger than 20 cm)
  - smooth-walled, mobile, often unilocular
  - often anterior to broad ligament
  - may rupture or twist and infarct
  - may cause pelvic discomfort/pressure if large enough
  - diagnosis
    - ultrasound may show calcification
  - treatment
    - cystectomy

#### Epithelial Ovarian Tumours

- ❑ increasing frequency after age 20-25
- ❑ believed to be derived from the mesothelial cells lining the peritoneal cavity
- ❑ most common group of benign ovarian tumours
- ❑ types
  - serous
    - serous cystadenomas are common
    - often multilocular
    - lining similar to fallopian tube epithelium
  - mucinous
    - less common
    - often multilocular
    - may grow to reach enormous size
    - cytologically resembles the endocervical epithelium
  - endometrioid
    - cytologically resembles the endometrium
    - occasionally, tumours made up of ciliated endosalpingial tissue
    - does not demonstrate the invasive characteristics of endometriosis
    - rare
  - Brenner tumour
    - solid neoplasm with large fibrotic component
    - usually benign
    - associated with mucinous epithelial elements in 1/3 of cases
- ❑ treatment
  - cyst aspiration
  - cystectomy
  - unilateral salpingo-oophorectomy

#### Sex Cord-Stromal Ovarian Tumours

- ❑ fibromas
  - non-functioning, does not secrete steroids
  - firm, smooth, rounded tumour with interlacing fibrocytes
  - occasionally associated with ascites
  - transudation of ascitic fluid into right pleural cavity via lymphatics → Meig syndrome
    - ascites + right hydrothorax in association with an ovarian fibroma
  - treatment is surgical resection of tumour
- ❑ granulosa-theca cell tumours
  - occur in any age group
  - estrogen-producing → feminizing effects
    - precocious puberty
    - menorrhagia
    - post-menopausal bleeding

- ❑ Sertoli-Leydig cell tumours
  - androgen-producing → virilizing effects
    - hirsutism
    - deepening of voice
    - clitoromegaly
    - recession of frontal hairline

### Malignant Ovarian Tumours

- ❑ epidemiology
  - 15% of all ovarian tumours are malignant
  - lifetime risk 1/100
  - in women > 45 years, 1 in 2500/year will develop ovarian ca
  - in women > 50 years, more than 50% of ovarian tumours are malignant
  - highest mortality rate of all gynecological carcinomas due to late detection
  - fourth leading cause of cancer death in women
- ❑ risk factors
  - family history
  - caucasian
  - age > 40
  - late menopause
  - nulliparity
  - delayed child-bearing
  - BCP is protective
- ❑ clinical features
  - asymptomatic since grows insidiously and painlessly
  - abnormal vaginal bleeding (30%)
  - post-menopausal bleeding
  - urinary frequency
  - constipation
  - dyspareunia
  - abdominal pain, swelling, or fullness
  - ascites
  - coughing, secondary to pleural effusions
- ❑ diagnosis
  - pelvic exam
    - painless adnexal mass
    - enlarged uterus
  - lab
    - CA-125
  - radiology
    - chest x-ray
    - abdominal and pelvic ultrasound
    - +/- CT or MRI for investigation of nodal involvement
  - laparotomy
    - for staging and treatment
- ❑ screening
  - no effective method of mass screening
  - routine CA-125 level measurements not recommended
  - in high risk groups:
    - familial ovarian cancer (> 1 first degree relative affected)
    - other cancers i.e. endometrial, breast, colon
    - yearly pelvic exam, CA-125, pelvic ultrasound
    - may recommend prophylactic bilateral oophorectomy after age 35 or when child-bearing is completed
- ❑ types of malignant ovarian tumours
  - epithelial tumours
    - 80%-85% of all ovarian tumours (includes benign, malignant or borderline)
    - histological classification of epithelial malignancies
    - serous type (50%)
    - endometrioid (10%)
    - mucinous types (10%)
    - clear cell type (5%)
    - undifferentiated (10-15%)
  - germ cell tumours
    - 2-3% of all ovarian malignancies
    - younger women
    - often produce  $\beta$ hCG or AFP which serve as tumour markers
    - includes dysgerminomas and immature teratomas

- sex cord-stromal tumours
  - granulosa cell tumours - estrogen-producing
  - associated with endometrial cancer in adult, pseudoprecocious puberty in child
  - Call-Exner bodies - histological hallmark
  - Sertoli-Leydig tumours - androgen-producing
- metastatic ovarian tumours
  - 4-8 % of ovarian malignancies
  - from GI tract, breast, endometrium, lymphoma
  - Krukenberg tumour = metastatic tumour from GI tract with "signet-ring" cells
  - most of these tumours originate from stomach
  - often bilateral

**Table 11. FIGO Staging for Primary Carcinoma of the Ovary (Surgical Staging)**

Stage I	Growth limited to the ovaries
Stage IA	1 ovary
Stage IB	2 ovaries
Stage IC	1 or 2 ovaries with ascites
Stage II	Growth involving one or both ovaries with pelvic extension
Stage IIA	Extension to uterus/tubes
Stage IIB	Extension to other pelvic structures
Stage III	Tumour involving one or both ovaries with peritoneal implants outside the pelvis and/or positive retroperitoneal or inguinal nodes Superficial liver metastasis equals stage III Tumour is limited to the true pelvis, but with histologically proven malignant extension to small bowel or omentum
Stage IV	Distant metastasis

**Table 12. Treatment According to Stage**

Stage IA & B surgical	TAH-BSO (consider alternatives if wish to child-bear) <ul style="list-style-type: none"> <li>• peritoneal washings</li> <li>• staging laparotomy</li> </ul>
Stage IC & II surgical	TAH-BSO <ul style="list-style-type: none"> <li>• peritoneal washings</li> <li>• staging laparotomy + adjuvant therapy</li> <li>• radiotherapy</li> <li>• limited to small subset of patients without evidence of residual disease</li> <li>• effectiveness is controversial</li> <li>• chemotherapy                     <ul style="list-style-type: none"> <li>• cisplatin</li> <li>• carboplatin</li> <li>• cyclophosphamide</li> </ul> </li> <li>• follow-up with serial US and CA-125</li> </ul>
Stage III, IV surgical	TAH-BSO <ul style="list-style-type: none"> <li>• peritoneal washings</li> <li>• staging laparotomy with omentectomy</li> <li>• debulking + chemotherapy 3-6 months</li> </ul>

- prognosis
  - 5-year survival
    - Stage I: 80-90%
    - Stage II: 60-70%
    - Stage III: 15-30%
    - Stage IV: 5-15%
  - overall 5 year survival: 30-35%
  - majority present late as Stage III
    - death from ovarian cancer usually results from progressive encasement of abdominal organs (i.e. bowel obstruction)

**FALLOPIAN TUBES**

- least common site for carcinoma of female genitalia
- usually adenocarcinoma
- more common at extremes of age, < 20 or > 40
- 80% are benign



- ❑ clinical presentation
  - watery discharge (most important)
  - vaginal bleeding
  - lower abdominal pain
- ❑ treatment
  - as for malignant ovarian tumours

**GESTATIONAL TROPHOBLASTIC NEOPLASIA (GTN)**

- ❑ refers to a spectrum of proliferative abnormalities of the trophoblast
- ❑ incidence
  - 1/ 1200 pregnancies
  - marked geographic variation: in Asians (1/800)
  - more common in extremes of childbearing age
  - risk increases ten-fold following one GTN
- ❑ characteristics
  - 80% benign
  - risk of malignant sequelae greater in women > 40 years, para ≥ 3
  - 15% locally invasive
  - 5% metastatic
- ❑ clinical and pathological classification
  - see Figure 11

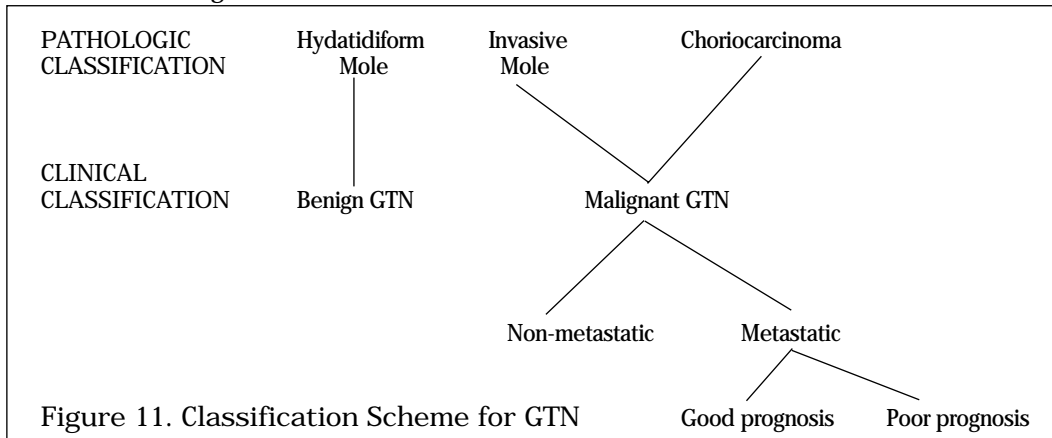


Figure 11. Classification Scheme for GTN

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**Hydatidiform Mole (Benign GTN)**

- ❑ complete mole
  - a proliferative or neoplastic trophoblast, hydropic swelling of chorionic villi, no fetal tissues or membranes
  - most common type of hydatidiform mole
  - 46 XX of paternal origin
  - 2 sperm fertilize empty egg
  - high malignant potential (15-20%)
  - marked edematous and enlarged villi
  - disappearance of villous blood vessels
- ❑ partial (or incomplete) mole
  - hydropic villi and focal trophoblastic hyperplasia are associated with a fetus or fetal parts
  - often triploid (XXY)
  - single ovum fertilized by two sperm
  - often associated with severe hypertension
  - low malignant potential (4%)
  - clinical features often less severe as compared with those of a complete mole
  - often associated with fetus that is clinically growth restricted and has multiple congenital malformations
- ❑ clinical presentation
  - vaginal bleeding (most common)
  - typically diagnosed as threatened abortion because of passage of tissue and vaginal bleeding (95%) and uterine cramps
  - uterus size large for dates (50-5 %)
  - hyperemesis gravidarum (25-30%)
    - early hypertension (15-20%)

- bilateral theca lutein cysts (10-20%)
- hyperthyroidism (5-10%)
  - due to elevated TSH
- anemia
- anorexia
- no fetal heart sound detectable
- uterus may be tender and doughy
- ❑ diagnosis
  - clinical
  - ultrasound
    - vesicles seen
    - no fetus
    - multiple echogenic regions corresponding to hydropic villi and focal intra-uterine hemorrhage
  - $\beta$ hCG levels
    - abnormally high (> 80 000)
- ❑ treatment
  - suction D&C with sharp curettage + oxytocin
    - 2% risk of respiratory distress secondary to trophoblastic embolization
    - 80-85% have complete remission
    - 15% develop persistent disease or metastases
  - hysterectomy
    - for local control, does not prevent metastasis
  - oral contraception to prevent pregnancy for 1 year
- ❑ follow-up
  - serial  $\beta$ hCGs while patient on BCP
    - every 1-2 weeks until negative x 3
    - usually takes 3-10 weeks
    - then every two weeks for 2-3 months
    - then monthly until one year from D&C
    - partial moles need to be followed for six months
    - pregnancy should be avoided until follow-up completed
  - chest x-ray

#### Malignant GTN

- ❑ malignant GTN can be metastatic or non-metastatic
  - metastatic disease refers to outside the uterus
- ❑ types
  - invasive mole or persistent GTN
    - extensive local invasion
    - excessive proliferation of trophoblastic tissue (can be variable)
    - morbidity and mortality related to tumour penetrating through myometrium into pelvic vessels resulting in hemorrhage
    - villous structures persist with metastases
    - metastases are rare
    - diagnosis made by rising or a plateau in  $\beta$ hCG, development of metastases after D&C for molar pregnancy
  - choriocarcinoma
    - highly anaplastic
    - no chorionic villi, just elements of syncytiotrophoblast and cytotrophoblast
    - may follow molar pregnancy, abortion, ectopic, or normal pregnancy
    - tumour is highly malignant
    - invades myometrium and local vasculature to disseminate hematogenously to lungs, liver, brain, vagina, kidneys, and GI tract
    - tumour is dark hemorrhagic mass on uterine wall, cervix, or vagina and leads to extensive ulceration with increasing spread on surface or myometrial penetration
    - uterine perforation and hemorrhage common
    - infrequent occurrence - 1:20 000 pregnancies (in U.S.)
- ❑ clinical presentation
  - vaginal bleeding (most common)
  - amenorrhea

- metastases usually appear early
  - may present with respiratory symptoms, neurological symptoms, etc...
  - 1/3 cases choriocarcinoma presents with symptoms related to metastases
- vagina and vulva appear as dark hemorrhagic nodules
- increasing emaciation, weakness, and anemia as disease progresses
- diagnosis
  - as for benign GTN
  - metastatic work-up
    - pelvic exam
    - blood work (CBC, renal and hepatic function tests)
    - pre-evacuation  $\beta$ hCG
    - chest x-ray
    - CT head, thorax, abdomen

Table 13. Classification of Metastatic GTN
Good Prognosis
<ul style="list-style-type: none"> <li>• short duration                             <ul style="list-style-type: none"> <li>• disease present &lt; 4 months from the antecedent pregnancy</li> </ul> </li> <li>• low pre-treatment <math>\beta</math>hCG titre                             <ul style="list-style-type: none"> <li>• &lt; 100 000 IU/24 hour urine or &lt; 40 000 mIU/mL of blood</li> </ul> </li> <li>• no metastases to brain or liver</li> <li>• no significant prior chemotherapy</li> </ul>
Poor Prognosis
<ul style="list-style-type: none"> <li>• long duration                             <ul style="list-style-type: none"> <li>• &gt; 4 months from antecedent pregnancy</li> </ul> </li> <li>• high pre-treatment <math>\beta</math>hCG titre                             <ul style="list-style-type: none"> <li>• &gt; 100 000 IU/24 hour urine or &gt; 40 000 mIU/mL of blood</li> </ul> </li> <li>• brain or liver metastases</li> <li>• significant prior chemotherapy</li> <li>• metastatic disease following term pregnancy</li> </ul>

Table 14. Management and Outcome of Metastatic GTN		
Type	Treatment	Outcome
• Good Prognosis	<ul style="list-style-type: none"> <li>• medical treatment with methotrexate (course of 4 IM injections q48 hours with folinic acid rescue; repeated q2-3 weeks unless side effects; stop when <math>\beta</math>hCG is undetectable in blood on 3 consecutive weeks)</li> <li>• avoid pregnancy for 1-2 years</li> <li>• surgical treatment with hysterectomy considered if chemotherapy is unsuccessful or if childbearing not desired</li> </ul>	<ul style="list-style-type: none"> <li>• 90-95% cured</li> </ul>
• Poor Prognosis	<ul style="list-style-type: none"> <li>• combination chemotherapy with methotrexate, actinomycin, chlorambucil</li> <li>• radiation used in patients with brain or liver metastases</li> <li>• follow <math>\beta</math>hCG for 5 years</li> <li>• avoid pregnancy for 1-2 years</li> </ul>	<ul style="list-style-type: none"> <li>• 50-70% cured</li> <li>• death due to brain and liver metastases</li> </ul>

### LAPAROSCOPY

#### Indications

- diagnostic
  - evaluation of infertility, pelvic pain, small pelvic masses, congenital anomalies, small hemoperitoneum, and endometriosis
- therapeutic
  - tubal ligation
  - lysis of adhesions
  - fulguration of endometriotic implants
  - aspiration of small cysts
  - retrieval of lost IUDs
  - tuboplasty
  - lymphadenectomy
  - myomectomy
  - ectopic pregnancy removal
  - also increasingly used for major surgeries such as cystectomies, salpingo-oophorectomy, hysterectomy, and treatment of stress incontinence

#### Contraindications

- bowel obstruction
- large hemoperitoneum with hypovolemic shock

#### Complications

- insufflation of the preperitoneal abdominal wall
- perforation of a viscus, especially bowel; if this occurs a laparotomy may be necessary
- poor intra-abdominal hemostasis
- coagulation burns of a viscus (bowel burns may result in perforation with peritonitis)
- inadvertent entry of iliac vessels with trochar
- damage to ureters, bladder (entered, burned)

### HYSTEROSCOPY

- use inert medium (i.e. glycine, carbon dioxide, cystosol) to distend endometrial cavity

#### Indications

- AUB
  - ablation of endometrium (pre-treatment with GnRH agonist)
  - excision of endometrial polyps, submucous fibroids
  - directed endometrial biopsy
- infertility
  - division of endometrial adhesions (e.g. Asherman)
  - uterine septum resection

#### Difficulties Encountered

- acute and chronic upper genital tract infections
- profuse bleeding
- cervical stenosis
- recent uterine perforation

#### RELATED ANATOMY (may be useful in preparation for OR)

- uterosacral ligament
- broad ligament
- cardinal ligament
- round ligament
- infundibulopelvic ligament
- ovarian artery
- inferior epigastric arteries
- layers of the rectus sheath

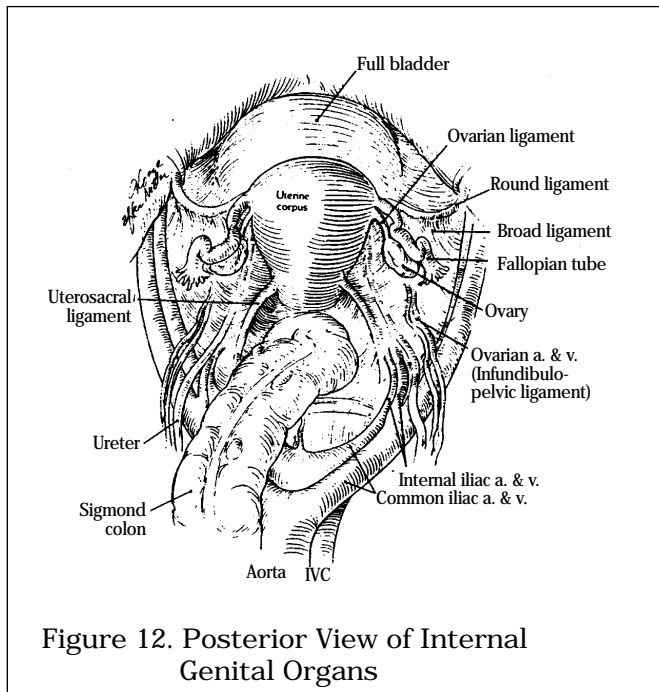


Figure 12. Posterior View of Internal Genital Organs

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## VIOLENCE AGAINST WOMEN

- on average, women suffer abuse 40x before disclosing
- physician often first person to get disclosure

### Epidemiology

- 1/10 to 3/10 women living with a man suffers physical or sexual abuse in their relationship
- wife assault leading cause of homicide for Canadian women
- occurs in families and in relationships of all socioeconomic, educational and cultural backgrounds
- increased incidence in: pregnancy, disabled women, age group 18-24
- 80% of male batterers abused as children and/or had witnessed wife abuse in their families as children
- 67% of battered women witnessed their mothers being abused

### Physicians' Role

- recognizing the problem
  - high index of suspicion, especially when injuries do not fit with the history
- physical indicators: serious bleeding injuries (especially in central regions of body), bruises, welts, burns (electrical, cigarette, acid), dislocated and broken bones, torn ligaments, perforated eardrums, dental injuries
  - constant visits to the physician with nonspecific complaints such as headache, insomnia, palpitations, hyperventilation, stomach pain, chest pain, pelvic pain
- psychological indicators: anxiety attacks, severe crying spells, feelings of being unable to cope, depression, suicidal thoughts, drug and/or alcohol abuse
  - injuries are often minimized by the woman and/or her partner

- ❑ evaluation
  - question and examine the woman alone
  - use nonjudgemental and nonthreatening style of history-taking followed by very direct questions
  - reinforce that wife assault is a crime
  - don't blame the woman
  - ask about the safety of the children
  - 40% of abuse incidences are witnessed by children, if they are at risk, you must inform the Children's Aid Society
  - women most at risk for homicide when attempting to leave home or following separation
- ❑ documentation
  - document physical trauma
  - document psychological symptoms and complaints
  - quote the patient directly
- ❑ referral
  - know local referral resources, keep a list of phone numbers available for patients --> social work
  - ensure the patient has a safe environment to go to after disclosure
  - marital counselling is not appropriate until woman is safe and violence is under control

(Source: OMA Reports on Wife Assault (Jan. 1991))