Concepts of Pediatric and Adolescent Gynecology

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A. Approach to the Prepubertal Child
   Genital Inspection

B. Genital Complaints in the Prepubertal Child
   1. Vaginitis - Normal Vaginal Flora
   2. Management of Vulvovagnitis
   3. Vaginal Bleeding
   4. Lichen Sclerosis
   5. Labial Adhesions
ADOLESCENT SEXUALITY AND GYNECOLOGY

DONALD E. GREYDEN
ROBERT P. SHEARIN
External Female Genitalia: Prepubertal
Frog-leg position for genital Exam of Child
Knee-Chest Position
Hymen: Frog Leg vs. Knee Chest—same patient
Normal Hymen—Knee-Chest Position
FIG. 6. Examination of the vulva, hymen, and anterior vagina by gentle lateral retraction (A) and gentle gripping of the labia and pulling anteriorly (B).
6. **Make the Exam as Stress Free as Possible**

- a. Give a Mirror
- b. Encourage Talking, Questions
- c. Colorful Poster on Ceiling & Wall
- d. Delay the Exam if Possible and if Necessary
- e. Defer Direct Visualization if Good Hygiene Works
Change of Hymen with age:

a. **Newborn:**
   - Redundant
   - Estrogenized
   - Thick
   - Elastic
   - Often Prominent Ridge at 6 o’clock
   - White Discharge
b. Prepubertal:

- Unestrogenized
- Thinned out
- Easier to Assess
- pH of Vagina: 6.5-7.5
Normal Hymens in Prepubertal Child

a. Posterior Rim
b. Annular
c. Redundant
d. Sleeve-Like
Congenital Anomalies: 3-4%

a. Microperforate

b. Septate

c. Imperforate

d. Crescentic Hymen
Micro Perforate Hymen—normal variant
Normal Hymen: Labial Traction: Frog Leg Supine Position
Crescentic Hymen
Imperforate Hymen
c. Pubertal:

- Thick
- Elastic
- Estrogenized
- White Discharge
- pH of Vagina: 3.5-4.5
- Increase in Size of Hymenal Orifice with age
Estrogenized Hymen
Pelvic Specula
Graves, Peterson, Infant, Huffman
FIG. 25. Cotton swab used to examine the edge of the hymen.
Evaluation of GYN Problems in the Child

A. History

1. Vaginitis (Vulvovaginitis): (non)-specific
   a. Onset of Symptoms
   b. Color---Odor
   c. Ask About Perineal Hygiene
   d. History of Antibiotic Therapy
   e. Other Infections in the Child/Family
   f. History of Sexual Abuse
2. **Vaginal Bleeding**

   a. Ask About Growth and Development
   
   b. Trauma
   
   c. Odor
   
   d. Previous Vaginal Foreign Bodies
   
   e. Also: Shigella, Group A Beta-Strep IF
3. **Foul-Smelling Vaginal Discharge**

   a. **Foreign Body**
      -- Usually Toilet Paper
      -- Can be Anything!

   b. **Vaginitis**

   c. **Necrotic Tumor (Rare)**
4. **History of Odorless, Bloody Discharge**

   a. Vulvar Irritation (Scratching, Masturbation)
   b. Trauma (Playground Equip, Bikes, Sexual Abuse)
   c. Precocious Puberty
   d. Foreign Body
   e. HPV Infection (Condyloma Acuminata)
   f. Rare: AdenoCA, Sarcoma Botryoides
5. Greenish Vaginal Discharge: Specific IF

a. *Neisseria Gonorrhoea*
b. Group A Beta-Streptococci
c. *H. influenzae*
d. *S. aureus*
e. *Shigella*
f. Foreign Body
f. Look for:

Presence of Pubic Hair

Estrogen Effect

Clitoris Size (>3 mm Transverse Diameter)

Perineal Hygiene

Type of Hymen

Presence of Discharge
Magnification

a. Otoscope
b. Hand Lens
c. Colposcope
d. Vaginoscope
e. Hysteroscope
f. Flex Fiberoptic Scope in Cooperative Child (Can Apply Xylocaine or ?EMLA)
D. Cultures for Vaginal Discharge

Thayer-Martin-Jembec (Scott)
a. Best to Notify Lab this is a Prepubertal Child
b. Need PRECISE Identification of Neisseria Species

Chlamydia CULTURE (not EIA or MicroTrak)
a. Use Male Urethral Swab Specifically for Chlamydia
b. Obtain Vaginal Cells
c. LCR or PCR if Culture not Available—Confirm!
E. Basic Tests

Wet Preps (Saline, 10% KOH on Slides)

Gram Stain

Vaginal Smear: Maturation Index (for Prec. Pub)

Don’t Forget the Pinworm Tape!
FIG. 31. Fresh vaginal smears. (A) *Trichomonas*. (B) Clue cells of bacterial vaginosis. (C) Leukorrhea. (D) *Candida*. A, B, and C are saline preparations; D is a KOH preparation.
Finally, bacteria are often seen on vaginal smears in huge numbers, covering cells and spilling onto the background. The minute dark specks covering the superficial cells in the image below are bacteria.
F. LAST: Rectoabdominal Exam: (If Needed!)

a. Persistent Vaginal Discharge
b. Vaginal Bleeding
c. Pelvic/Abdominal Pain
d. Help Express Unseen Vaginal Discharge
e. Allow Palpation of Hard Vaginal Foreign Body
f. Help Detect Abnormal Masses
Use of Magnification for Defining Anatomy

Colposcope

Used as an aid in Sexual Abuse Eval due to:
- Magnification
- Photography
- Improved Visual Skills & Teaching

Also Good: Otoscope, Hands Lens, 35 mm Camera/Macrolens
1. **Non-Specific Vulvovaginitis (25%-75%)**

   a. **Vaginal Environment:**

   Atrophic  Neutral pH  
   Colonization of Introitus  
   Vulva is Unprotected
Non-Specific Vaginitis
Bacterial Vulvovaginitis: E. coli
HPV: Condyloma acuminata
Human Papillomavirus

*High risk; †Low risk
HPV Warts
HPV WARTS
Cancer Types Attributable to HPV Other Than Cervical Cancer

Estimated percentage of cancer cases attributable to HPV

b. Precipitants: non-specific VV

Hygiene
Shampoos

Bubble Baths

Obesity

Tight clothing:
Leotards
Tights
Bluejeans
c. Others: Upper Respiratory Infections (URIs)
Pinworms (British Study: 32%)

- AM Perineal Cellophane Tape; HS: Worms
  - Masturbation
  - Sexual Abuse

Rare: Ascaris or Trichuris

Change in Vaginal Flora: Fecal Flora or Anaerobes (Issues of Quantity and/or Overpopulation)
2. **Normal Prepub. Vaginal Flora:**

<table>
<thead>
<tr>
<th>Flora</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal flora</td>
<td>100%</td>
</tr>
<tr>
<td>(diphtheroids, alpha-hemolytic strep,</td>
<td></td>
</tr>
<tr>
<td>Lactobacilli)</td>
<td></td>
</tr>
<tr>
<td>Beta-hem. Strep--(Not A or B)</td>
<td>4%</td>
</tr>
<tr>
<td>E. coli</td>
<td>8%</td>
</tr>
<tr>
<td>Group B Strep:</td>
<td>2%</td>
</tr>
<tr>
<td>Coag. + Staph:</td>
<td>2%</td>
</tr>
<tr>
<td>“Yeast:” (<em>Candida tropicalis</em>)</td>
<td>4%</td>
</tr>
<tr>
<td>Bacteroides species:</td>
<td>1/40</td>
</tr>
</tbody>
</table>
Other “Normal” Species:

Peptococcus; Peptostreptococcus
Veillonella parvula; Eubacterium
Proteus; Pseudomonas
Propionibacterium; Candida albicans
“Enterics”
3. Management of Nonspecific VV

a. Improve Hygiene

White Cotton Underpants
Front to Back Wiping!
Loose-Fitting Skirts
NO Nylon Tights or Tight Bluejeans
Void with Legs Apart
Good Handwashing
Management

b. Avoid Drying-Chapping Irritants
   (NO Soaps or Shampoos in Bath Water)

c. No Sleeper Pajamas

d. Skirt/Knee Socks

e. Loose Fitting Clothes

f. RECHECK DIAGNOSIS
g. **Bathing Routine:**

- Sitz Baths Once or Twice Daily 10-15 Minutes

- No Soaps with Bath

- Then, Mild Soap or Cetaphil Lotion to Rest of Body

- Mild Soaps: Unscented Dove, Basis, Neutrogena, Oilatum, Aveeno

- Pat Dry

- Hair Dryer on Cool/Low Setting
H. Medications

A & D Ointment; Desitin

Topical Antibacterial Cream: Sultrin, Bactroban
Clindamycin; Metronidazole Gel

Topical Hydrocortisone 1% (for Acute Vulvitis)

Topical Estrogen Cream (Premarin)
Oral Antibiotics

- Amoxicillin
- Augmentin
- Cephalexin
- Cefuroxime
- Trimethoprim/Sulfasoxazole
- Clindamycin
- Metronidazole
Acute Severe Edematous Vulvitis

a. Sitz Baths q 4 hrs: Plain Water or w/sm Amount
   Aveeno Oatmeal or Baking Soda Added; no Soap/Powders

b. Tucks (Witch Hazel Pads) for Relief & to Avoid TP

c. Apply Calamine Lotion
d. Oral Antibiotics for IF (no Topicals!)
e. **W/ Improvement:** 1% HC Cream, A & D, Antibac Cream (Sultrin Triple Sulfa, Mupirocin)
f. Antipruritics: Atarax or Benadryl
g. Good Hygiene
Specific VV: Resp, Enterics & STDs

a. Also: *Candida albicans*: Common in Teens, not in Prepub. Girls Unless:
   
   - in Diapers
   - Recent Antibiotics
   - Immunosuppressed
   - Diabetes Mellitus
   - Normal Flora Colonization in 3-4%
Candidiasis
C. albicans
C. albicans
b. **Topical Antifungals (TA)**

- **RX:** First: External Genitalia w/ TA

- **Then:** Intravag. or PO Antifungal RX

- Small Urethral Catheter Attached to Syringe w/ Cream

- 1 ml Nystatin (100,000 Units/ml) w/ Eyedropper TID

- **Fluconazole** (If Creams not Helpful or Contraindicated; Immunocompromised pts)
Respiratory Infections

a. Various Microbes:

S. pyogenes (Grp A B-Strep): 7-20% of Vaginitis Series

Staph. Aureus          H. Influenzae
S. Pneumoniae         Branhamella Catarrhalis
N. Meningitides (Rare)
Vaginitis due to S. Pyogenes

- Due to Direct Inoculation: URI, Fetal Carriage, Skin IFs
- Throat Cultures are + in 75%;
  - Only 25% Have Respiratory Symptoms
- Scarlet Fever can be asso. w/ GABS Vaginitis
- Vulva and Perianal Area: Distinctive Bright red Look
- England: Winter Peak: Isolates from Throat & Vagina
- Vaginitis, Perianal Cellulitis; Rare: Protocolitis

RX: **Oral Penicillin** (250 mg TID for 10 days)
  (Perianal IF: 14-21 days)
Staphylococcus Aureus

- Can be Part of the Normal Flora or Cause Vaginitis

- Can be Assoc. with Impetigo:
  Vaginal + Buttocks

- RX: Cephalexin          Dicloxacillin
  Amox-Clavulanate       Cefuroxime axetil
**Hemophilus influenzae**

- Usually a Pathogen if Found
- Amoxicillin for 7 days
- Resistant Strains:
  - amox-clav
  - cefixime
  - cefuroxime axetil
  - Trimeth-sulfa
  - erythromycin-sulfamethoxazole
6. **Enterics: Shigella**

a. **Vaginal Discharge, 25% in Assoc. with Diarrhea**

b. **Mucopurulent, Sometimes Bloody, Leukorrhea**

c. **70%-90% of Shigella: S. Flexneri; Prolonged RX Often nec.**

d. **Anecdotal Cases of Vaginitis with Yersinia Entercolitica**

e. **Bactrim/Septra for 5 Days; Cefixime or Ceftriaxone**

**Unclear if Campylobacter Species are Etiologic**
Sexually Transmitted Diseases (STDs)

a. Ingram, Peds IF, ’92: 1538—Ages 1-12, ’81-‘91

Evaluated for Sexual Abuse:

- *Neisseria Gonorrhoeae*: 2.8%
- *Chlamydia Trachomatis*: 1.2%
- *Trichomonas Vaginalis*: Not Found
- *Herpes Simplex Virus (HSV)*: 0.1%
- *Human Papillomavirus (HPV)*: 1.8%
- *Treponema Pallidum*: 0.1%
b. *Neisseria gonorrhoeae* *(Rarely Asympt)*

- Green, Purulent Vaginal Discharge; Occas: Mucoid

- Crucial to Identify Specific Species From the lab

- Most Cases Found From Culture of Girls w/ Discharge

- Most Cases not From Culture of Abused Girls With no Sympt.
Pre-pubertal Gonorrhea

Fig. 395. Gonorrhoea vulvo-vaginitis of little girls
- 2.8% of 1538 Children Seen for Sexual Abuse: + Neiss. Gon.

- Siblings of Girl With + GC Also at Risk; Clustering Also Seen

- Report + GC in Prepub. Girls to Sexual Abused Authorities

- Rx: **Ceftriaxone** (125 mg IM); Others; + RX for CT
d. **Herpes simplex virus**

- HSV-Type I: Mouth & Vulvar Lesions via Self-Innoculation

- Type 1 & 2 can be due to Sexual Abuse; Usually Type 2

- Recurrent Lesions Usually due to Type 2

- May be Confused with Herpes-Zoster Genital IF

- HPV IF Usually due to Type 6 or 11
Herpes Simplex

First Clinical Episode of Genital Herpes.

- Acyclovir 400 mg PO TID for 7-10 days
  - Or
  - Acyclovir 200 mg PO five times a day for 7-10 days
  - Or
  - Famiciclovir 250 mg PO TID for 7-10 days
  - Or
- Valacyclovir 1-gram PO BID for 7-10 days
Trichomonas Vaginalis (TV) Vaginitis: Perinatal IF

- Evident by 12-18 Months if Acquired at Birth

- Urethritis/Vaginitis Rare; Sexual Abuse; ? Shared Bathing

- Spontaneous Resolution Usually Seen

- Persistent Infection is Unusual as Estrogen Levels Decrease
TRIC
Trichomonas Vaginalis (TV) Vaginitis: Perinatal IF

- Unestrogenized Vagina is Usually Resistant to TV IF

- Mainly Seen in Pubertal Teen; RX: Metronidazole

- Role of Towels/Fomites Controversial
Pinworms (*Enterobius vermicularis*)

- Can Cause Recurrent Vaginitis

- RX: Mebendazole *(Vermox)*; Treat the Family

- One Chewable 100 mg tab; Repeat in 2 Weeks

- Not if Under age 2 Years

- Rare: Ascaris or Trichuris
Parasitic Vulvovaginitis

(*Enterobius vermicularis*: Pinworm)
FIG. 2. Pinworm eggs (*Enterobius vermicularis*).
12. Systemic Disease

Measles
Chickenpox
Scarflet Fever
Mononucleosis
Crohn’s
Kawasaki
Histiocytosis

Stevens-Johnson Syndrome
14. Vulvar Skin Disease:

- Seborrhea
- Psoriasis
- Atopic Dermatitis
- Lichen Sclerosus
- Bullous Diseases
- Scabies
- Zinc Deficiency
- Nickel Allergy
- Bullous Pemphigoid
FIG. 5. Hemangioma of the vulva.
Labial Hematoma due to tight clothes
Vaginal Bleeding in the Prepubertal Girl

A. Causes

1. **Trauma**
   a. Accidental
   b. Sexual Abuse

2. **Vulvovaginitis**
   a. Irritation
   b. Pinworms (*Enterobius Vermicularis*)
   c. Non-Specific
   d. Microbes: *S. pyogenes*; *Shigella*
Endocrine

a. Newborn Bleeding due to Maternal Estrogen withdrawal

b. Isosexual Precocious Puberty

c. Pseudoprecocious Puberty

d. Precocious Menarche

e. Exogenous Hormone Preparations

f. Hypothyroidism
Miscellaneous

a. Dermatoses: Lichen Sclerosis
b. Foreign Body
c. HPV: Condyloma Accuminata
d. Blood Dyscrasia
e. Urethral Prolapse
f. Hemangioma
g. Neoplasm: Benign; Malignant
Most Vaginal Bleeding (Pre-Pub)

a. Major Trauma
b. Vulvovaginitis
c. Scratching due to Pinworms
d. Vaginal Foreign Body
e. Rare: Tumor (Always Consider)
Salient Points in the History

a. Accelerated Height and Weight: Precious Puberty

b. HX of Foreign Bodies: ear, Vagina: FB

c. Foreign Body may be Sign of Sexual Abuse

d. Blood Dyscrasias: Other Signs of Bleeding:
   - Epistaxis, Petechiae, Hematomas

e. Water-Skiing: Major Vaginal Tears
Exam of Child w/ Active Vaginal Bleeding

a. Wipe 2% Lidocaine Jelly Over the cut
b. Place Warm Water in a Syringe to Irrigate Gently
c. And/or Irrigate Using IV Tubing and Solution
d. She can Help by Holding Cool Compresses w/Pressure
e. Irrigation Allows Wash out of Blood & see Site of Bleeding
FIG. 6. Irrigation of the vulva and vagina with saline to identify the source of bleeding.
8. **Management of Active Bleeding**

a. If Oozing, RX w/ice and Compression

b. If nec., use Gelfoam or Surgicel

c. Can use Conscious Sedation for use of a few Stitches

- Lidocaine w/ 1-2% w/Epinephrine
- 25 Gauge Needle
- Use No. 4 Interrupted Sutures
- Chromic or Vicryl
General Anesthesia

- Major Suturing Needed
- Cooperation not Possible
- Hymenal/Intravag. Tear
- Periurethral Laceration
Exam Under Anesthesia
Foreign Body (FB) Vaginitis

a. Intravag. FB: Usually Clumps of Toilet Paper

b. Replace TP with Tucks Pads

c. If Purposeful, Psychosocial Assessment

d. Can be Almost Anything! Can be Sexual Abuse

- Pins
- Paper Clips
- Marker Tips
- Beads
- Crayons
- Tampon Cartons
- Battery
- Pencils
- Pens
FIG. 7. Wad of toilet paper within the vagina, visualized through an irregular hymenal orifice of a prepubertal girl.
FB Vaginitis can Lead to an Irritative Vulvitis

- Sharp Demarcation of Redness on Vulva
- Due to the Chronic Discharge
- Upper Vagina:
  - Papillary Response with Small Projections
  -(1-2 mm)
RX: Foreign Body Vaginitis

a. Outpatient Removal w/ Cooperative PT

b. Soft FB: Twill dry Cotton-Tipped Applicator in the Vagina
(Player in the Lithotomy or Knee-Chest Position)

c. Can do Gentile Irrigation of the Vagina w/ Saline or Water
- Child in the Supine Position
- Use a Small Urethral Catheter or Infant Feeding Tube w/25-ml Syringe
- Angiocatheter Attached to a Syringe
Vaginal Foreign Body
d. Lubricant or Xylocaine Jelly (or) Liquid:  
- Can be Applied to Introitus  
- Helps in Insertion of a Small Catheter

e. Sometimes can Remove Metal Items with Bayonet Forceps (as Safety Pins)

f. General Anesthesia:  
- Uncooperative Patient  
- Failure of Outpatient Attempts

g. Sitz Baths are Used Post-Removal; Occas: Estrogen Cream
Lichen Sclerosis

1. Uncommon in Prepub. Children

2. General Symptoms
   a. Itching
   b. Irritation
   c. Soreness
   d. Bleeding
   e. Dysuria
   f. Occas: Bowel Symptoms; Vaginal Discharge
3. Can see:

a. Painful Defecation

b. Constipation

c. Encopresis

d. Anal Stenosis

e. Vulva + Anus: Hourglass (Figure of 8 Appearance)
4. **Appearance of Vulva**
   
a. **White**

b. **Atrophic**

c. **Parchment-Like Skin**

d. **Chronic Ulceration**

e. **Inflammation**

f. **Subepithelial Hemorrhages**
Lichen Sclerosis
FIG. 3. Vulva of girl with lichen sclerosus.
Lichen Sclerosis

7. **Etiology:** Unknown
   - Genetic Factor: Seen in Monozygotic Twins

8. **R/O Vitiligo:**
   a. See Loss of Pigmentation
   b. No Inflammation or Atrophy

9. **DX:** Appearance and if nec., Biopsy
RX: Mild to Moderate LS

Remove Local Irritants and Improve Hygiene
Use Soaps Only Minimally in Vulvar Area
Cotton Underwear and Loose-Fitting Pants/Skirts

Protective Ointment: A % D Ointment; Child can Apply
1 hr HS: PO Hydroxyzine HCl—Lessen Nocturnal Scratching
If nec: 1-3 Month—1%-2.5% Hydrocortisone
  -Then Months of 1% HC Ointment
Antibiotics for Infection
1. 2-4 wks: mod. Potent Steroid: 0.025% Fluocinoline (Synalar)
   -Then, use 1% HC Ointment

2. Other Potent Steroids Used:
   a. 0.05% Fluocinonide (2 Weeks)
   b. Clobetasol Cream (Temovate)—up to 12 Weeks
   c. Mometasone Furoate (Elocon)—2-4 Weeks
   d. 0.05% Clobetasone Propionate
3. Other Medications

a. Topical Progesterone: 2% Micronized Powder BID-3 mo.

b. Progesterone Solution in Aquaphor

c. Testosterone (2%) Cream in Petrolatum: HS for Months -May Induce Pubic Hair; no Controlled Studies

d. Laser Brushing Under gen. Anesthesia
D. **Final Thoughts: Lichen Sclerosis**

1. **Improves with Puberty in Some Girls**

2. 15 Girls (18 Months-9 Years):
   a. Followed for 43 Months
   b. 7 Improved; 7 no Improvement; 1 Worse
   c. Tendency to Improve with Increased age

3. **Does Absence of Active Lesions Mean Resolution?**

4. **Anec. Cases of Vulvar Malignancy—Link not Clear**
**Imperforate Hymen (IH)**

1. Bulging IH may Present w/Hydro(metro)colpos in the Newborn

2. Hydro MC--Also with a low (not Mid/High) Vaginal Septum

3. IH not Usually Assoc. with Other Anomalies

4. Transverse Vaginal Septum: Usually with Other Anomalies (GI and/or GU)
Imperforate Hymen
C. Labial/Vulvar Adhesions:

1. Agglutination of the Labia Minora: **Labial Adhesions**
2. Agglutination in the Lower Half: **Vulvar Adhesions**
3. Appear Mainly bet. 6 mo to 6 yrs (PUB)
4. Etiol: Poor Hygiene and Vulvar Irritation; ?? Sex Abuse
5. Can Range From Small Adhesions to Nearly Total Fusion
6. Diagnosis: Visual Inspection
FIG. 12. Labial/vulvar adhesions with small opening below the clitoris.
Management: Controversial!

1. Spontaneous Resolution (SR)

2. SR: Small Vulvar Adhes. at Posterior Fourchette + Puberty

3. If Good Vaginal/Urinary Drainage:
   - Labial Lubrication: Bland Ointment (A & D)
   - GENTILE Separation by Mother Over several weeks
   - Show Mother the Adhesion ("Line") and Where to Apply

4. Post-Separation: Good Hygiene, Daily Baths, Ointment HS (6 to 12 Months)
Labial Agglutination
e. If Limited Vaginal/Urinary Drainage: can use **Estrogen Cream**:

- Premarin Cream: BID for 3 wks and Then HS for 2-3 wks

- Adhesion (s) may Lyse in 2-3 Weeks

- Then use A & D Ointment

- Can use Long Cotton-Tipped Applicator to “Paint on”

f. **NO Forceful Separation: Traumatic; can Induce Adhesions**
3. Resistant Adhesions: REFER

a. Adhesions are too Dense & Extensive
b. Separation in the Office After 6 Weeks of Premarin
c. Apply 5% Xylocaine (5 Minutes) or EMLA (30 min)
d. Slide a Calgiswab Along Estrogen-Thinned Adhesions
e. Tease Adhesions Apart in Ant-Posterior Direction
f. If nec: Ambulatory Center with Conscious Sedation
g. General Anesthesia
Adolescent Gynecology

• Vaginal Discharge—Sexually Transmitted Diseases

• Breast disorders

• Amenorrhea – 1° and 2°
• Abnormal vaginal bleeding (DUB)
• Dysmenorrhea

• Pregnancy and Contraception
Puberty

• First sign of female puberty – Breast development (B2); Adrenarche usually follows (some individual and/or ethnic variation)

• Menarche ~ 2 years after thelarche (12.5 yrs)
  – Tanner 3 to 4

• Puberty should be completed within 5 years

• Growth spurt is early – little growth post-menarche
Tanner Stages - Breast

Stage 1: Preadolescent; juvenile breast with elevated papilla and small flat areola.

Stage 2: The breast bud forms under the influence of hormonal stimulation. The papilla and areola elevate as a small mound, and the areolar diameter increases.

Stage 3: Continued enlargement of the breast bud further elevates the papilla. The areola continues to enlarge; no separation of breast contours is noted.

Stage 4: The areola and papilla separate from the contour of the breast to form a secondary mound.

Stage 5: Mature; areolar mound recedes into the general contour of the breast; papilla continues to project.
Normal Female Anatomy

- Uterine tube
- Ovary
- Uterus
- Rectum
- Bladder
- Pubis
- Labia majora
- Labia minora
- Vagina
Bimanual Palpation of the Uterus
Benign Hypertrophy
Imperforate Hymen
Hymenal Septum
US Teen Coital Behavior
2009 CDC Youth Risk Behavior Surveillance

- 46% with lifetime coitus: 49% Male; 43% F
- Ages 17 to 18 years of age: 60%
- 7% under age 13: 9% M vs. 4% F
- 14% with 4 or more partners: 17% vs 11%
- 33% with coitus 3 months before survey
- 40% use no condoms
- 750,000+ Teen Pregnancies each year
Eversion of Uterine Cervix
Ectropion
Sexually Transmitted Diseases

- **2006**: 1 million persons 10-24 years with STDs that includes chlamydia, gonorrhea or syphilis
- **25%** of females 15-19 w/ HPV infection: ’03-’04
- **45%** of females 20-24 years w/ HPV infection
- **22,000** persons 10-14 years with HIV/AIDS
- **105,000** females 10-24 yrs visited with an emergency visit for nonfatal sexual assault between 2004 to 2006
Pubertal Delay

• Females:
  – No breast development by 13
  – No menarche by age 15 to 16
  – No menarche within 4 years of thelarche

• Males: no testicular enlargement by 14

• Is it pubertal delay, growth failure or both?
Pubertal Delay - DDx

- **Constitutional – most common**
- Genetic hypogonadism – Turners (short stature!!); Klinefelter’s
- Acquired hypogonadism – autoimmune, radiation
- Inadequate nutrition (Eat Dis’s, chronic illness)
- Hypothalamic – stress, exercise, ED’s
- Endocrinopathies (thyroid, adrenal)
- CNS irradiation/mass lesion (prolactinoma)
Breast Disorders

• Asymmetry
• Amastia/hypomastia – Poland’s; contralateral breast mass
• Galactorrhea – pregnancy, drugs, prolactinoma
• Breast masses – most common – fibroadenoma; fibrocystic breasts
• Breast cancer RARE in teens
• Breast self-exam - controversial
Patient with polythelia.
Poland Syndrome

- Amastia
- Pectoralis muscle aplasia
- Rib defects
- Webbed fingers
- Radial nerve aplasia
- Brachysyndactyly
- Others
FIG. 2. Two views of significant breast asymmetry in a young woman with Poland's Syndrome. Note small breast, poorly developed nipple-areolar complex, and lack of pectoral contour on affected side. (Courtesy of Craig Vander Kolk, M.D., Johns Hopkins Hospital.)
FIGURE 118-1  Amastia associated with Poland anomaly in a 14-year-old obese female. Note normal nipple development.
Patient with breast asymmetry.
Amenorrhea - 1°

- No periods by 16 in presence of pubertal changes

- Increase gonadotropins – Turner’s gonadal dysgenesis; Ovar Fail
- Decrease gonadotropins – pituitary pathology – craniopharyngioma, prolactinoma

- Hypothalamic – stress, malnutrition, genetic (Kallman)

- Anatomic – outflow tract obstruction (imperforate hymen); Meyer-Rokitansky (vag. agenesis)

- Androgen insensitivity – XY, male testosterone levels

- Pregnancy!
Amenorrhea - 2°

• **Pregnancy**
  - Much overlap with primary amenorrhea

• **Polycystic ovary syndrome** – olig/amenorrhea, anovulation, hyperandrogenism (acne, hirsutism), polycystic ovaries (acanthosis nigricans = insulin resistance); metabolic syndrome associated with PCO/obesity
Irregular/Excessive Menstrual Bleeding

- Normal cycles – 21 to 35 days; duration 2 to 7 days; amount <6 to 8 pads/tampons/day (30 to 80 cc)

- Anovulatory cycles – first 18 to 24 months; painless bleeding; HPO immaturity; unopposed estrogen effect on endometrium

- DDx: pregnancy (ectopic or intrauterine); threatened abortion; endocrinopathy; bleeding dyscrasia (Von Willebrands); trauma, FB, endometritis
DUB - Evaluation

- Hx, PE, ? Pelvic – stigmata of endocrinopathy, pregnancy, bleeding disorders, androgen excess
- HCG, CBC, and platelets
- TSH, prolactin
- PT, PTT, Von Willebrands w/u as indicated
**DUB - Rx**

- **Mild** – Normal Hgb – Fe replacement, menstrual calendar, f/u

- **Moderate** – Mild anemia – Fe replacement; **OCPs** or Provera; f/u

- **Severe** – significant anemia with/without hypovolemia – fluid replacement/transfusion as indicated, high dose combined OCPs, rare – IV estrogen and GYN consult

- D and C RARELY indicated in adolescents
Dysmenorrhea

• Primary – prostaglandin-mediated; associated with ovulatory cycles; crampy lower abdominal pain, radiation to back, thighs, associated HA, N, diarrhea; first 1 to 2 days of menses

• **RX: NSAIDS, OCPs**

• Further evaluation with laparoscopy if no improvement

• Secondary – endometriosis, pelvic infection; IUD
STIs: Sexually Transmitted Infections

- (Physiologic Discharge {Leukorrhea})
- Vulvar lesions
- Vulvovaginitis
- Cervicitis
- Urethritis
- Pelvic Inflammatory Disease
Physiologic Discharge

- Pubertal, pre-menarchal (Tanner 2 to 3)
- Patient usually not sexually active
- Thin, non-irritative, non-malodorous discharge
- Wet prep – vaginal epithelial cells, pH 4; no increase in PMNs
- Rx: Symptomatic
FIG. 31. Fresh vaginal smears. (A) *Trichomonas*. (B) Clue cells of bacterial vaginosis. (C) Leukorrhea. (D) *Candida*. A, B, and C are saline preparations; D is a KOH preparation.
Vulvar Lesions

• Painful
  – HSV (acyclovir, vancyclovir)
  – Chancroid, LGV – rare on US
  – Folliculitis
  – Infestations – scabies, lice

• Painless
  – Syphilis
  – HPV
  – Molluscum Contagiosum

• Vulvar ulcers – Increase risk of HIV
Vulvo-Vaginitis

• **Yeast**: Pruritis, dysuria, thick adherent white d/c; - whiff test; pH <4.5; inc. PMNs, budding yeast/pseudohyphae

• **Bacterial vaginosis**: Thin, homogeneous discharge, inc. in amount; fishy odor; + whiff test; pH >4.5; clue cells

• **Trichomoniasis**: Frothy, malodorous d/c, dysuria, pruritis; yellow-green d/c; +/- whiff test; pH>4.5; inc. PMNs, motile trichomonads
FIG. 31. Fresh vaginal smears. (A) *Trichomonas*. (B) Clue cells of bacterial vaginosis. (C) Leukorrhea. (D) *Candida*. A, B, and C are saline preparations; D is a KOH preparation.
Rx - Vulvovaginitis

- **Yeast** – Topical azole preparations; PO fluconasole – 150 mg x 1

- **BV** – Metronidazole – 500 mg PO bid x 7 (not single dose) – no partner RX

- **Trichomoniasis** – Metronidazole 2.0 gram PO x 1 – partner RX
f. Bacterial Vaginosis: Pubertal Girls

- Alteration of Bacterial Vaginal Flora
  (Increased *G. Vaginalis* & Anaerobes)

- Vaginal Discharge, High Vaginal pH and Clue Cells

- Suspect--Girls w/ Vag Odor & Recent Rape

- Positive “Whiff Text”: Amine (Fishy) Odor-KOH Prep.
Cervicitis/Urethritis

- Chlamydia and gonorrhea – often co-infection
- Often asymptomatic

- Females: Hx spotting; mucopurulent cervical D/C; friability, Increase PMNs on wet prep

- Males: GC – acute onset – purulent d/c; chlamydia – insidious onset – mucoid d/c

- (Perihepatitis – Fitz – Hugh – Curtis)

- (Disseminated Gonococcal Infection)
Rx – Cervicitis/Urethritis

• Azithromycin 1 gram PO x 1 OR
• Doxycycline 100 mg BID x 7 days

_________________AND_________________

• Cefixime 400 mg PO x 1 OR
• Ceftriaxone 125 mg IM x 1
• (2.0 gram Azithromycin PO)
• (Quinolones no longer first-line for GC)
Pelvic Inflammatory Disease

- Polymicrobial infection ascending from cervix to endometrium and tubes

- Gonorrhea, chlamydia, BV pathogens, Anaerobes

- Lower abdominal pain, dyspareunia, vaginal discharge, irregular bleeding, systemic sx

- Sequellae – infertility; chronic pelvic pain
P.I. D. - DDx

- Ectopic pregnancy
- Ovarian cyst (+/- torsion)
- Appendicitis
- Endometriosis
- Pyelonephritis
- Miscarriage/incomplete or septic abortion
- Normal pelvis/functional pain
P. I. D. – Signs and Sx

- Presenting sx – Lower abdominal pain, dyspareunia, vaginal discharge, irregular bleeding, systemic sx

- Physical exam – Abdominal tenderness, +/- peritoneal signs, RUQ tenderness, (FHC), cervical discharge, cervical motion tenderness, uterine and/or adnexal tenderness
P. I. D. – Indications for Hospitalization

• Surgical emergencies cannot be excluded
• Patient is pregnant
• Lack of response to outpatient regimen
• Noncompliance
• Toxicity, fever, nausea and vomiting
• Tubo-ovarian abscess
**PID - Rx**

- **Outpatient** – Cetriaxone 250 mg IM x 1 PLUS doxycycline 100 mg PO q 12 hr for 14 days, with or without metronidazole 500 mg PO BID for 14 days (must see patient back within 48 hours for response to Rx)

- **Inpatient** – Cefotetan 2 gram IV q 12 hr OR cefoxitin 2 gram IV q 6 hr PLUS doxycycline 100 mg IV q 12 hr (add increased anaerobic coverage if TOA)
Teen Pregnancy

- ~800,000 pregnancies (15 to 19 yo) per year. ~15,000 to 10 to 14 yo. After decrease for several years, adolescent pregnancy rate has increased slightly in past 2 years

- Majority of teen pregnancies are unintended

- Of unintended pregnancies, ~50% result in birth, ~35% in abortion and ~15% in miscarriage

- Teens typically delay obtaining BC until 6+ months after initiating SA
Teen Birth Rates in US

- 1970: 66/1000 females 15-19 years age (‘57:96.3)
- 1986: 50.2
- 1990: 60
- 1991: 62
- 1997: 53
- 1998: 51
- 1999: 49.6
- 2000: 48.5
- 2001: 45.9
- 2002: 43.0
- 2006: 40.0
- 2009: 39.1
### Other Countries Teen Birth Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
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<tr>
<td>Netherlands</td>
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<td>England</td>
<td>28</td>
</tr>
<tr>
<td>USA</td>
<td>40+</td>
</tr>
</tbody>
</table>
Teen birth rate hits 70-year low
The birth rate last year for U.S. girls ages 15 to 19 was the lowest since the government began tracking the statistic in 1940. The recent sharp drop is attributed to the recession.

The number of births per 1,000 teenage girls

SOURCE: Centers for Disease Control and Prevention
Adolescent Pregnancy - Outcomes

• Medical outcome usually good with prenatal care

• Decreased educational attainment by teen parents

• Lower SES for families in which mom was a teen at time of giving birth

• Increased subsequent childbearing
Contraceptive Methods for Teens

• Abstinence

• Non-coital sexual expression

• **Combined contraceptive methods** (OCP’s, patch, vaginal ring)
  • Progestin-only pills

• **Injectable/implantable progestins**, (Depo-provera, Implanon)

• Barrier methods – condoms, spermicidal creams, diaphragm

• IUDs** - Mirena, Paragard

• Morning after pill
Contraindications to Estrogen-Containing Methods (Pills, Patch, Ring)

- Thromboembolic disease
- Cerebrovascular and coronary artery disease (including complicated migraine)
- Estrogen-dependent neoplasia
- Active liver disease
- Undiagnosed genital bleeding
- Pregnancy
Non-Contraceptive Benefits of OCPs

• Cycle control – Increase menstrual regularity; Decrease blood loss; Decrease iron deficiency anemia; Decrease dysmenorrhea

• Inhibition of ovulation – Decrease functional cysts; Decrease ectopic pregnancy

• Other – Decrease fibroadenomas/fibrocytic breast changes; Decrease acute PID; Decrease endometrial and ovarian cancer
Maximizing Compliance

• Appropriate method selection

• Newer delivery systems

• For many women, pelvic exam may be a deterrent to coming to clinic – May be judiciously deferred (not if Sx of STD, pelvic pain)

• Quick start

• Simple, focused instructions, verbal and written (“KISS”)
Gay, Lesbian, Bisexual, and Transgender Youth

• Prevalence difficult to determine; 2.5% of youth self-identify as gay, lesbian, bisexual – “prevalence” increases with age as youth come out

• Same-sex attraction by 10 to 11; self-identification by 13 to 15; 1st same-sex experience near time of self-identification
Rating Description: Kinsey Scale of Sexual Orientation

0   Exclusively heterosexual (in sexual behavior and fantasy)

1   Essentially heterosexual--incidental or limited gay HX

2   Largely heterosexual with distinct homosexual history

3   Equal heterosexual and gay orientation ("ambisexuality")

4   Largely homosexual with distinct heterosexual history

5   Essential homosexual with limited heterosexual history

6   Exclusive homosexual (in sexual behavior and fantasy)
Seidman and Reider (Am J Psychiatry, 1994)

- 2% of adult men in the United States are homosexual
- 3% list themselves as bisexual

Diamond, 1993; Sell, 1995:

- 3% to 7% of adult women—lesbian in their sexual behavior
GLBT Youth - 2

- **Health risks** – Verbal, physical abuse, school violence, increased risk of breast CA?; substance abuse, homelessness (survival sex)

- **Increased suicidality** – attempt rate higher than expected for GLBT youth
• Sexual health
  – Increased rates of pregnancy among lesbian, bisexual females
  – STI risk – Males who have sex with males (MSM) – enteric pathogens, HIV, CMV, and efficiently transmitted by anal intercourse (also GC, chlamydia, syphilis, HSV, HPV)
  – As with heterosexual youth, substance use
    • Increased unsafe sex
Henry Wadsworth Longfellow (1807-1882)

- American educator and poet
- Named after a Navy LT (mother’s brother)
- Poetry of lyrical quality
- Read this poem at his Bowdoin College (50th)

*How beautiful is youth! How bright it gleams with its illusions, aspirations, and dreams!*  
*Book of beginnings, story without end!*  
*Each maid a heroine, each man a friend!*  
(Morituri Salutamus, 1875)
Why Should I Care?
Why Should We Care About Teen Preventive Care

• All (even Teens!): inherent health care right
• Caring for children & youth: Moral Imperative
• Prevention of disease is basis of Health Care
• Adolescence is period of major changes
• Adolescence is critical time for health promotion  US National Academy, 2008
• Adult diseases often start in adolescence
• Timely intervention--improves adult health
(US CDC Healthy Peoples 2010; Laraque, JAMA, 2009)