Pediatric Telehealth Rounds

Today's topic:
Menstrual Disorders

Speaker:
Dr. Hannah Wigle

Oct 16, 2015

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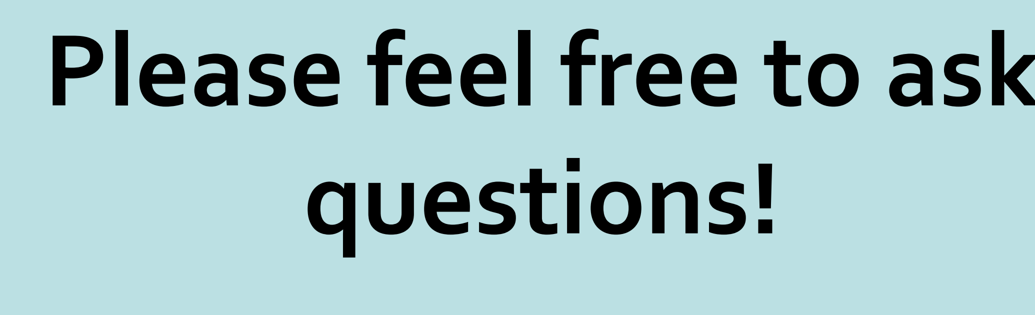
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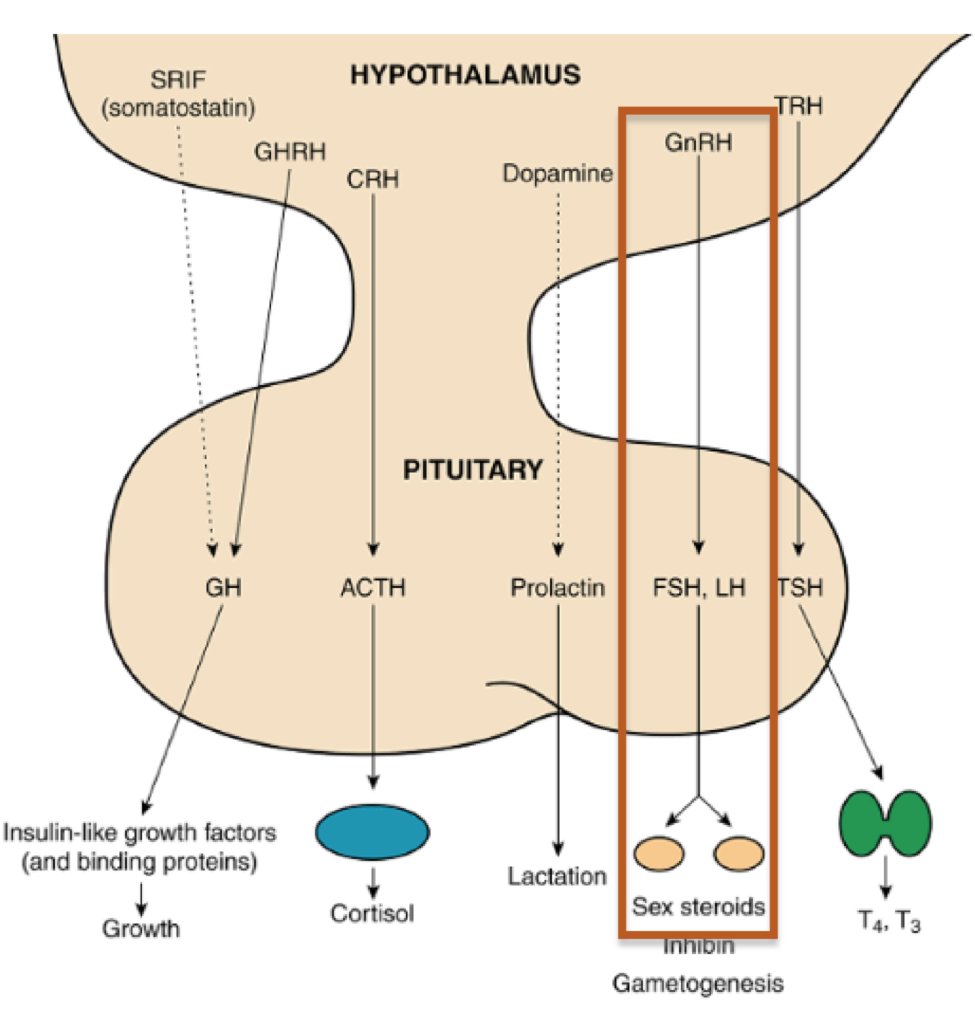
Objectives

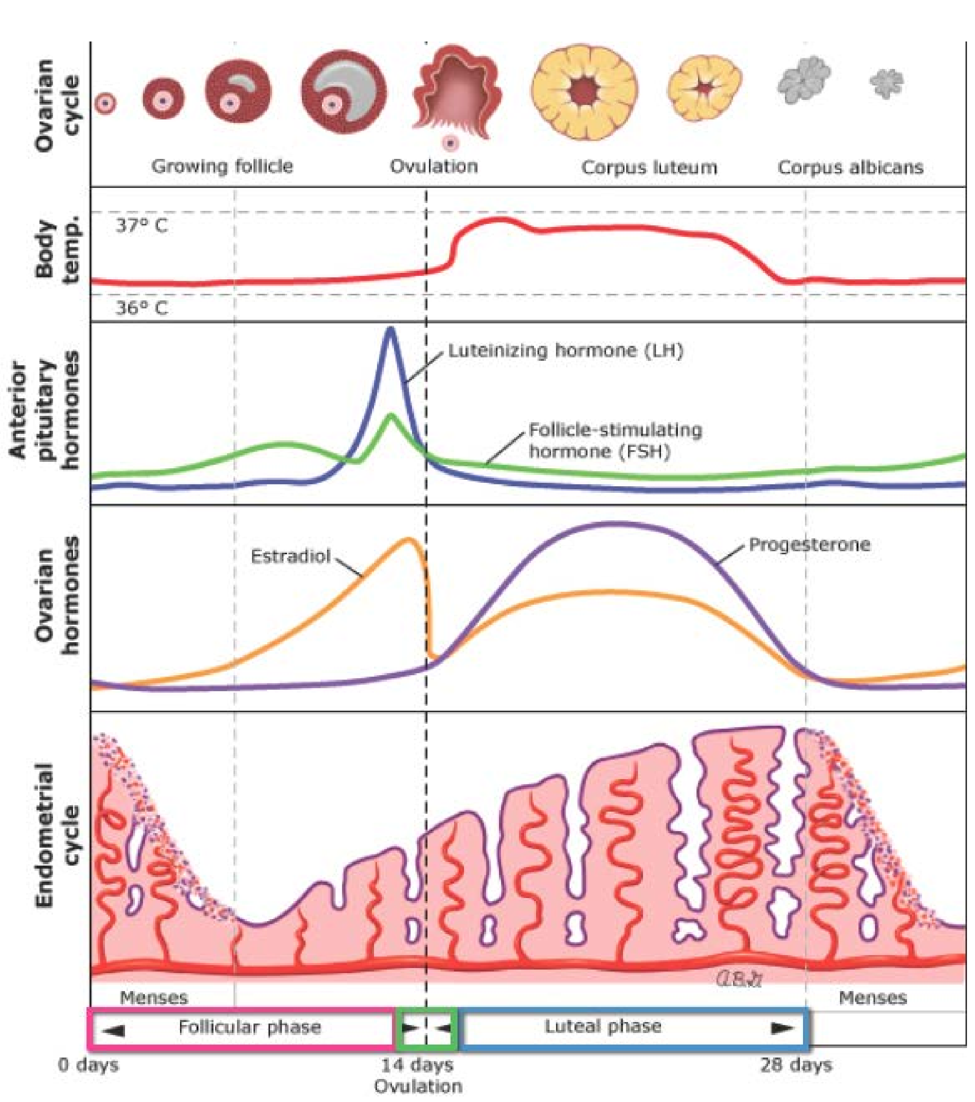
- 1. Review normal menstrual physiology
- 2. Overview of common menstrual disorders
  - Amenorrhea
  - Dysmenorrhea
  - Abnormal uterine bleeding
- 3. Discuss PCOS as a common cause of amenorrhea and abnormal uterine bleeding in adolescent females

Normal Menstrual Physiology

Hypothalamic Pituitary Ovary Axis



Menstrual Physiology



Menstrual Cycle

- Cycle Duration: 21-45 days
- Menstruation Duration: 3-7 days
- Menstrual Blood Loss: 30-40mL per menstruation

Menstrual Disorders

- 1. Amenorrhea
- 2. Abnormal Uterine Bleeding
- 3. Dysmenorrhea

Amenorrhea

Amenorrhea: Definitions

- Primary
  - No menarche by 16 years
  - No menarche by 14 years with no signs of breast development
- Secondary
  - Cessation of menses for more than 3 consecutive months, anytime after menarche

Amenorrhea: DDx

- Brain?
  - Hypothalamic hypopituitarism
- Ovaries?
  - Hyperthalamic hypopituitarism
- Uterus/Outflow?
  - Structural anomaly? Obstruction?
- Others?
  - Pregnancy? Endocrinopathy?

Amenorrhea: DDx

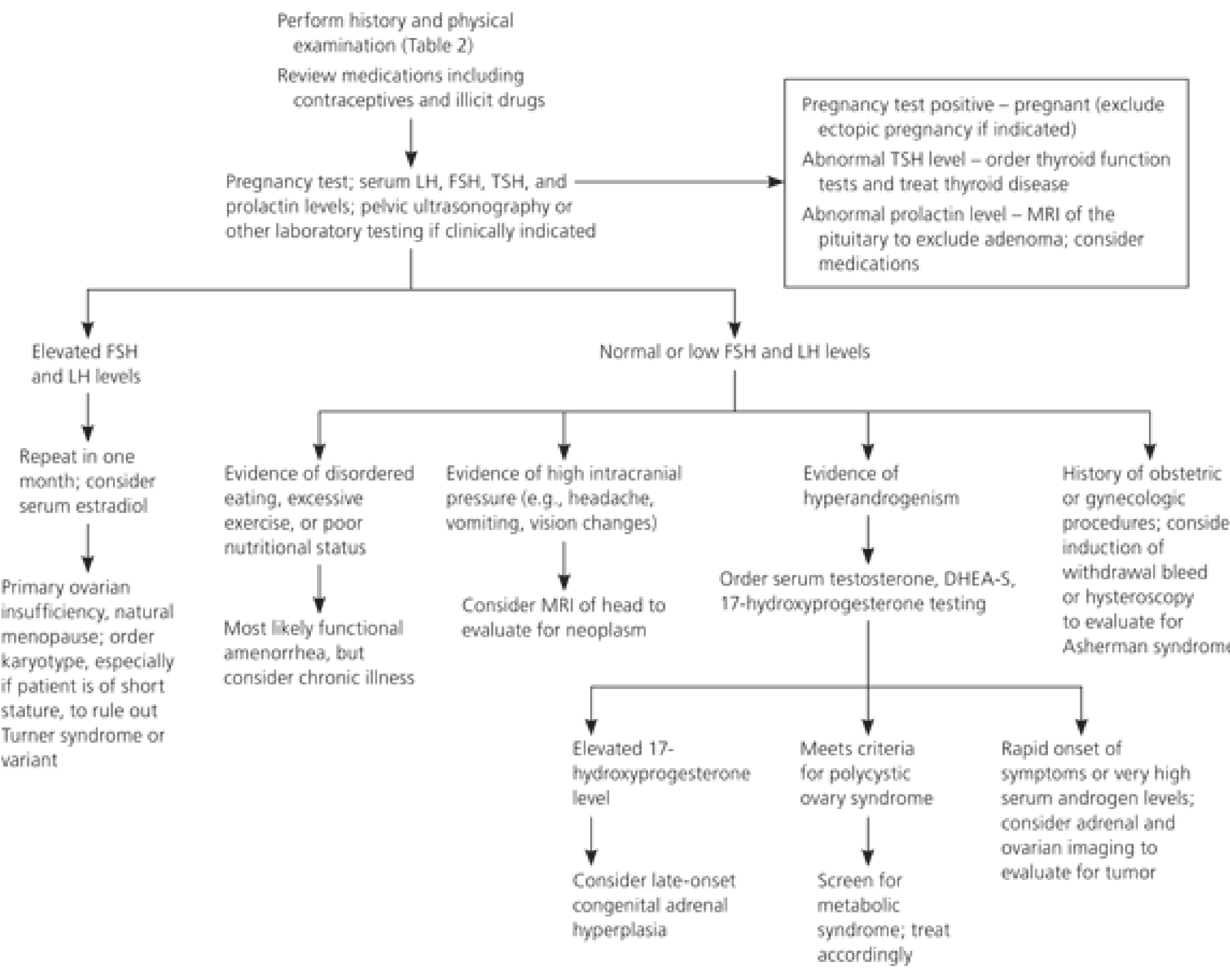
	Primary Amenorrhea	Secondary Amenorrhea
Central (hypothalamus/pituitary; hypogonadotropic hypogonadism with low FSH)	Constitutional delay[a] Chronic illness[a] Functional hypothalamic amenorrhea[a] Kallmann syndrome Laurence-Moon-Biedl and Prader-Willi syndromes Tumors (craniopharyngioma and prolactinoma) Infiltration (hemochromatosis) Infarction Iatrogenic (radiation, surgery) Congenital hypopituitarism	Functional hypothalamic[a] amenorrhea Chronic illness Tumors (prolactinoma)
Ovarian (hypergonadotropic hypogonadism with high FSH)	Turner syndrome[a] Gonadal dysgenesis Primary ovarian insufficiency Oophoritis Galactosemia Tumor Radiation, chemotherapy	Primary ovarian insufficiency Oophoritis Radiation, chemotherapy
Genital outflow tract	Imperforate hymen[a] MRKH[a] Transverse vaginal septum Vaginal agenesis Androgen insensitivity Intersex disorders	Uterine synechiae (Asherman syndrome)
Other	Pregnancy PCOS (uncommon) Thyroid disease Cushing syndrome Addison disease	Pregnancy[a] PCOS[a] Contraceptive use Hyperprolactinemia due to medication or illicit drug use Thyroid disease Late-onset congenital adrenal hyperplasia Cushing syndrome Addison disease

[a]Most common diagnosis in each category; the other diagnoses are not listed in order of prevalence.

Amenorrhea: Work-Up

- Primary
  - U/S
  - FSH/LH
  - Karyotype
  - Serum hCG
- Secondary
  - Serum hCG
  - FSH/LH
  - TSH, FT4, PRL
  - Androgens
    - 17-OHP

Amenorrhea: Algorithm



Dysmenorrhea

Dysmenorrhea: Definition

- Primary
  - Recurrent, crampy pain occuring with menses in absence of identifiable pelvic pathology
    - Mediated by prostaglandins
    - Begins 1-3 years after menarche
    - Lasts for 24-48 hours
    - Other symptoms:
      - Nausea, vomiting, diarrhea
      - Low back pain, thigh pain
      - Headache, fatigue

Dysmenorrhea: Definition

- Secondary
  - Menstrual pain caused by underlying pelvic pathology
  - Common adolescent causes
    - Endometriosis
    - Adenomyosis
    - Obstructive malformations of genital tract

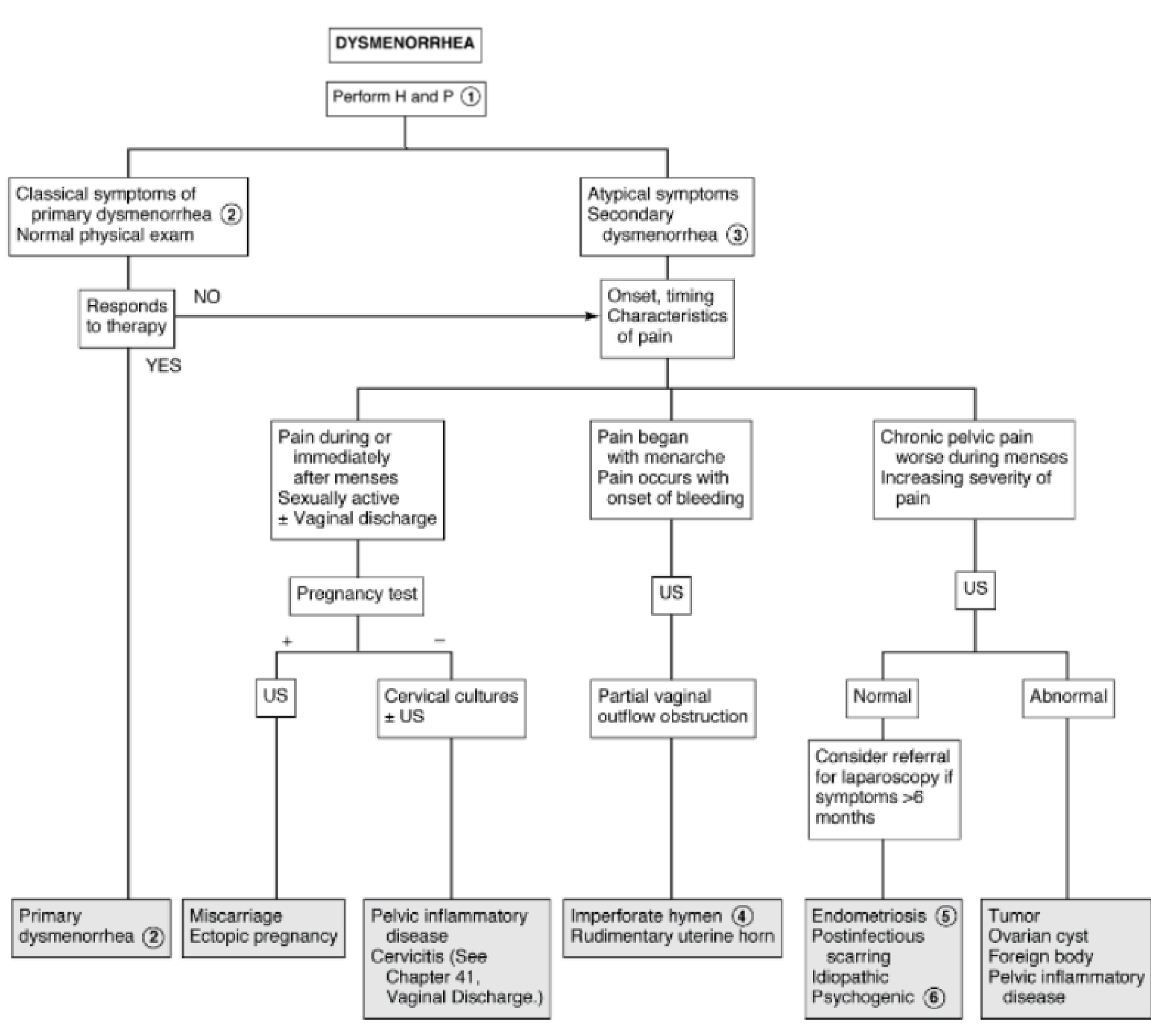
Dysmenorrhea: Work-Up

- If consistent with primary dysmenorrhea, no work-up required
- Ultrasound indicated if:
  - Dysmenorrhea within 6mo of menarche
  - Dysmenorrhea with anovulatory cycles
  - Primary dysmenorrhea unresponsive to first line therapy
  - Clinical abnormality on pelvic exam
  - Unable to do pelvic exam deemed necessary

Dysmenorrhea: Management

- Non-pharmacologic
  - Exercise
  - Healthy diet
  - Reduce stress
  - Topical heat
- Pharmacologic
  - NSAIDs (early administration)
  - Combined Contraceptives
  - Progestins

Dysmenorrhea: Approach



Abnormal Uterine Bleeding

AUB: Definitions

CLINICAL DIMENSION	DESCRIPTIVE TERM	DEFINITION
Frequency	Frequent menstrual bleeding	<21 days/cycle
	Infrequent menstrual bleeding	>35 days/cycle
Regularity	Amenorrhea	Absent for 6 months or more
	Irregular menstrual bleeding	>20 day variation in cycle length
Duration	Prolonged menstrual bleeding	>8 days of flow
	Shortened menstrual bleeding	<2 days of flow
Flow	Heavy menstrual bleeding	>80 cc loss
	Light menstrual bleeding	<5 cc loss
Intermenstrual bleeding		Bleeding between normally timed periods

AUB: Etiologies

- Anovulation is most common etiology of AUB in adolescents
- Immature HPO Axis
  - 6mo – 3yrs after menarche
  - Inadequate negative feedback
  - Inadequate LH surge
    - Continuous, unopposed estrogen production
      - Over-proliferation of endometrium
        - Breakthrough bleeding

AUB: Causes of Anovulation

- Pregnancy
- Androgen Excess
  - PCOS/CAH/Adrenal tumours
- Endocrinopathies
  - Thyroid disease
  - Cushing syndrome
  - Hyperprolactinemia
- Chronic disease/Stress
- Female Athlete Triad
- Ovarian Failure
  - Premature
  - Radiation/Chemotherapy
- Medications

AUB: Work-Up

- Anovulatory vs. Ovulatory?
  - Symptoms of Premenstrual Molimina (PMS)?
    - Breast tenderness
    - Headaches
    - Cyclic mood changes
    - Regular cycles

AUB: Work-Up

- Ovulatory
  - Pregnancy?
    - bHCG
  - Bleeding Diathesis?
    - CBC, Ferritin
    - INR/PTT
  - Infection?
    - STI Testing
  - Structural Abnormality?
    - Pelvic U/S
- Anovulatory
  - Pregnancy?
    - bHCG
  - Endocrinopathy?
    - TSH, FT4, PRL
    - FSH, LH
    - PCOS?
      - Androgens
      - Pelvic U/S

AUB: Management

- Treat Underlying Cause
- Symptoms-Based Management

Table 1
Medicinal treatment options for problematic menstrual bleeding (symptom based)

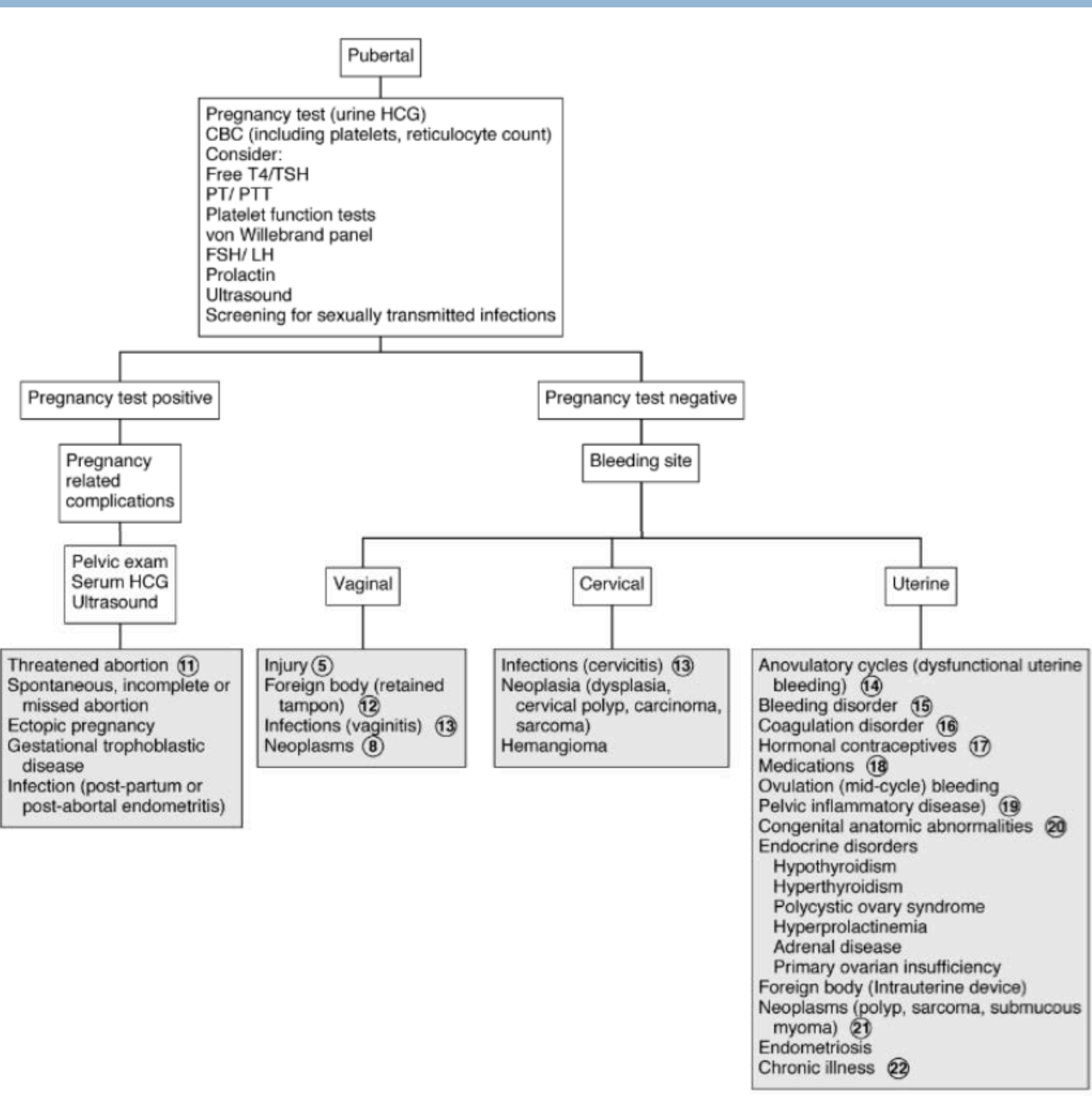
Heavy (and/or Prolonged) Flow	Irregular: Infrequent and Unpredictable	Irregular: Frequent (± Prolonged)	Painful/ Crampy
CCs	CCs	CCs	CCs
Antifibrinolytic	Cyclic oral progestins	Antifibrinolytic	—
NSAIDs (proactive)	Maybe do nothing if $\geq$4 cycles/y	—	NSAIDs ± acetaminophen
LAP	—	LAP	LAP
Course of oral progestin (if isolated prolonged bleed; discussed later)	—	—	—

Options need not be tried in the order listed.

Antifibrinolytics are tranexamic acid or aminocaproic acid.

Abbreviations: CCs, combined contraceptives (eg, oral pill, transdermal patch, vaginal ring); LAPs, long-acting progestins (ie, depomedroxyprogesterone acetate or levonorgestrel intrauterine system); NSAIDs, nonsteroidal antiinflammatory drugs.

AUB: Approach



Polycystic Ovarian Syndrome

PCOS: Epidemiology

- Most common cause of infertility in women
- Often first manifests in adolescents
- One of most common causes of secondary amenorrhea or abnormal uterine bleeding in adolescent girls

PCOS: Clinical Manifestations

- Androgen Excess
  - Hirsutism
  - Acne
  - Balding
- Ovarian Abnormalities
  - Amenorrhea
  - Oligomenorrhea
  - Anovulatory abnormal uterine bleeding
- Metabolic Features
  - Obesity
  - Manifestations of Insulin resistance
    - Acanthosis nigricans
    - Metabolic syndrome
    - Sleep-disordered breathing
    - Nonalcoholic fatty liver

PCOS: Diagnosis

- Rotterdam Criteria 2003
  - Oligo/anovulation
  - Hyperandrogenism (clinical or biochemical)
  - Polycystic ovaries on ultrasound)

PCOS: Management

- Lifestyle Modification
  - Healthy diet and exercise
- Combined Contraceptives
  - Menstrual regulation
  - Reduce hyperandrogenism
  - Contraception
- Monitoring for Metabolic Syndrome

Case #1: Alice

- Alice is a 15 year old girl who has not yet had menarche. Physical exam reveals no evidence of breast development and short stature.

Case #2: Annalise

- Annalise is a 16 year old ballet dancer who has skipped several periods over the last year. LMP was 4 months ago now.

Case #3: Diana

- Diana is a 14 year old girl who has been missing significant amounts of school over the last 6 months due to “menstrual cramps”. Menarch was at 12.5 years. She denies heavy flow or irregular cycles.

Case #4: Penelope

- Penelope is a 13 year old girl who just had menarche. She has had profuse vaginal bleeding for several hours and is now feeling lightheaded and dizzy.

Case #5: Polly

- Polly is a 12 year old girl who is having irregular menses and can't predict when her next cycle will begin. Menarche was at 11.5 years. Menses are heavy and prolonged when they do occur, lasting sometimes 3 weeks!

Case #6: Petra

- Petra is a 14 year old girl who has prolonged, heavy menstrual cycles for the last 6 months. She is overweight and admits to shaving her upper lip and cheeks because of facial hair growth.

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October 30, 2015