Ominous Signs, “Red Flags” and others: Clinical Diagnosis and Management

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medical group

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Date: 02-18-2020

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Library of Congress Cataloging-in-Publication Data

Collins, R. Douglas
Differential diagnosis in primary care.

Rev. ed. of: Dynamic differential diagnosis.
1981.
Includes index.
1. Diagnosis, Differential. I. Collins, R. Douglas.
Dynamic differential diagnosis. II. Title. [DNLM:
1. Diagnosis, Differential WB 141. 5 C712d]
RC71.5.C62 1987 616.07'5 86-27365
ISBN 0-397-50816-6

Abstract

In both the chronic and acute care setting the presentation of concerning clinical signs and symptoms can create a diagnostic and management quandary. If ongoing the presentation may simply need to be watched and monitored, if new or exacerbated the presentation may require acute work up and emergent care. The purpose of this presentation is to discuss the most common concerning presentations and describe their management. Additionally the charting and documentation of these conditions are discussed.

Outline

- Overview
  - What is covered
  - What is not
  - Where can I find more information
- Major Concerning Signs and Symptoms
  - Constitutional
  - Hematological
  - Dermatological
  - EENT
  - Cardio-pulmonary
  - Abdomen
  - Neurological
- Patient Management
  - Communication
- Charting and documentation

Next Webinars

All are Tuesday PM – 5:30 – 7:00 PM Pacific Time

NOTE – All are third Tuesday of the month unless noted "*"

02-18-2020

03-16-2020 ** MONDAY

04-21-2020

05-19-2020

06-16-2020

Past Webinars Available

1. EBV diagnosis and Treatment
2. Histamine – CNS
3. Cortisol
4. Iodine & T3
5. Biofilms (#1)
6. Desiccated Thyroid
7. Autoimmunity
8. Histamine – Peripheral
9. Mitochondria
10. ReDox and Inflammation
11. IV and Injection Q&A
12. Sulfation Pathways
13. Antidepressant Rx and Taper
14. Pediatric Rx and dose adjustment
15. Renal Rx and Dose adjustments
16. Biofilms #2
17. Cardiac Rx dosing and tapering
18. Steroids and Respiratory Med's
19. Autoimmunity-2: Management
20. Chronic Infections – Testing, assessment and re-assessment
21. Lyme Illness – A top down approach
22. Chronic Infection Bundle
23. Oral Chelation
24. Pain Medication Weaning
25. Assessment of Chronic Cases
26. Nutrigenomic basics
27. IV Therapy Q&A and Latest Updates
28. ADHD Medications and Weaning
29. Seizure Medications and Weaning
30. Low Dose Naltrexone – pharmacology, uses and cases
31. Medical Cannabinoids
32. Neurological Inflammatory Therapies
33. Food Allergy and Sensitivity
34. Hyperbaric Oxygen Therapies
35. Kidney and Liver Functions – Effect on Rx and Labs
36. Organic Acid Testing
37. Migraine
38. PCOS
39. Fluoroquinolone Toxicity
40. GI Absorption and Rx
41. Dysautonomia and EDS
42. Low Dose Immunotherapy
43. Detox of Unusual Metals
44. NAD
45. Lab testing for B6, B12 and Folates
46. Acute Use of Thyroid and Adrenal-Rx
47. Assessing the Complex Patient
48. Optimizing 21st Century ND/Integrative Medicine
49. Nasal & Respiratory Therapies
50. USP-FDA 2019 Update
51. Bipolar Medications
52. HBOT-2 Cancer and Neuro
53. Neuro-AI Part-1
54. Neuro AI Part-2
55. Interrelationships in Chr-Dz
56. Neuro Manifest. Chron. Illness
57. Benzodiazepine Rx and Management
58. Anti-ID Rx Pharmacology
59. Eclectic and Low Dose Botanicals
60. Natural Medicines for Chronic Infections
61. Metabolic Toxins
62. Adrenal Assessment and Therapeutics: Clinical Diagnosis and Management

Notes about the information in the DDX section here:

1. Abbreviated and Quick in this webinar
2. If you want a deeper discussion go to the FREE Clinical Science Board Review Series https://www.consultdranderson.com/courses/

Constitutional Symptoms

Fever

Fever versus Hyperthermia

1. Fever – a normal physiologic response that increases the hypothalamic heat regulating set point
2. Hyperthermia – increased temperature that over rides or bypasses the normal homeostasis mechanism

Temps >105.8 F (>41 C) are rarely physiologic

- Heat stroke
- Malignant Hyperthermia
- Central Nervous system disorders
- Drug induced
- Serotonin syndrome
- Endocrine disorders-Hyperthyroid, Pheochromocytomas

What can trigger Pyrogenic Cytokines

1. Infections of all types of microorganisms
2. Tissue injury-✉Inflammation
3. Malignancies
   - Lymphomas
   - Leukemia
   - Carcinoma
4. Any disorder associated with inflammation

Fever Patterns

1. Normal diurnal variation
2. Rigors, true shaking chills-✉think mainly bacterial
   - Can see in some viral infections, drug reactions and transfusion reactions
3. Wide swings in fever
   - Abscess
   - Disseminated TB
   - Collagen Vascular Disease
4. Relapsing fevers-✉malaria

Etiology

1. Neoplasm (7-31%)
- Lymphomas, Hodgkin's disease
- Leukemias
- Liver, renal and lung CA
2. Infectious disease (23-36%)
- TB
- Bacterial endocarditis
- Intra-abdominal infections
3. Collagen-vascular diseases (9-20%)
- Vasculitis
- Polymyalgia rheumatica
- Systemic Lupus erythematosus
- Rheumatoid arthritis

4. Drugs (5-7%)
- Barbiturates
- Antibiotics
- Antihypertensives
- Antiarrhythmics
- Phenytoin (dilantin)
- Antihistamines, salicylates, cimetidine

5. Miscellaneous (17-24%)
- Factitious fever
- Pulmonary emboli
- Inflammatory Bowel disease
- Subacute thyroiditis

Causes of Fever of Unknown Origin in Children†

Infectious Disease

Bacterial
Brucellosis
Bacterial endocarditis
Leptospirosis
Liver abscess
Mastoiditis (chronic)
Osteomyelitis
Pelvic abscess
Perinephric abscess
Pyelonephritis
Salmonellosis
Sinusitis
Subdiaphragmatic abscess
Tuberculosis
Tularemia

Viral
Cytomegalovirus
Hepatitis viruses
Epstein-Barr virus (infectious mononucleosis)

Chlamydial
Lymphogranuloma venereum
Psittacosis

Rickettsial
Q fever
Rocky Mountain spotted fever

Fungal
Blastomycosis (nonpulmonary)
Histoplasmosis (disseminated)

Parasitic
Malaria
Toxoplasmosis
Visceral larva migrans

Unclassified
Sarcoidosis

Collagen Vascular Disease
Juvenile rheumatoid arthritis
Polyarteritis nodosa
Systemic lupus erythematosus

Malignancies
Hodgkin disease
Leukemia/lymphoma
Neuroblastoma

Miscellaneous
Central diabetes insipidus
Drug fever
Ectodermal dysplasia
Factitious fever
Familial dysautonomia
Granulomatous colitis
Infantile cortical hyperostosis
Nephrogenic diabetes insipidus
Pancreatitis
Periodic fever
Serum sickness
Thyrotoxicosis
Ulcerative colitis

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Fatigue

Differential Diagnosis

1. **Psychiatric (>50%):** Depression, anxiety, situational life stress, physical/sexual abuse, occupational stress

- Key presentation – fatigue is typically chronic, not improved with rest, can improve with activity
- Physical symptoms without positive findings: sleep disturbance, headaches, digestive complaints, myalgia, loss or increase in appetite, palpitations, chest pain , decreased libido
- Mental picture – sad, feelings of guilt, hopelessness, crying spells, withdrawal, irritability, restlessness, dissatisfaction

2. **Pharmacologic**:
- Sedatives
- Antidepressants
- Antihypertensives

3. **Sleep disturbances/Lack of sleep/disruption:**
- Sleep apnea – consider in obese individuals, people who snore
- Restless leg syndrome
- Bruxism
- Esophageal reflux

4. **Endocrine-Metabolic:**

- Hypothyroidism – weight gain, cold intolerance, constipation, alopecia, menstrual changes, decreased cognitive function, depression, enlarged thyroid, slow achilles reflex
- Hyperthyroidism – weight loss with increase appetite, heat intolerance, tachycardia, palpitations, anxiety, sleep disturbance, tremors, diarrhea, exopthalamus, enlarged thyroid
- Adrenal Insufficiency – Addison's presents with weight loss, diarrhea, hypotension and *pigment changes (hyperpigmentation)*

5. **Neoplastic and Hematological**:

- Anemia's – Pallor including conjunctiva, skin, orthostatic hypotension with lightheadedness, dyspea with exertion
- Leukemias – pallor, fever, easy brusing, bleeding gum, epitaxis, petechia, infections
- Lymphomas – diffuse adenopathy
- Occult neoplasms – unexplained weight loss, fever

6. **Cardio-pulmonary disease:**

- Congestive heart failure – dysnea, tachycardia, edema, extra heart sounds
- Valvular disease
- COPD (Chronic obstructive pulmonary disease)- Dyspnea, wheezes

7. **Infectious:** fever, with acute onset

- Viral syndromes – Mononucleosis (cervical lymphadenopathy, pharyngitis), hepatitis (nausea, GI complaints, Jaundice), HIV, CMV

8. **Collogen Vascular disease**: arthralgia, arthritis, rashes
9. Fibromyalgia – 90% are women presenting with non-articular rheumatism and non restorative sleep.

Weight Loss

Unintended Weight Loss

Definition: weight loss > 5%of total body weight over a period of six months is considered abnormal.

Pathophysiology: weight loss results when caloric intake is less than caloric expenditure.

1. <u>Diminished Intake:</u>

- Loss of interest in food
- Inability to obtain food
- Attenuated awareness of hunger pain associated with food
- Early satiety

2. Malabsorption syndromes:

- Hepatic
- Pancreatic
- Intestinal disorders

3. Loss of Nutrients:

- Recurrent vomiting
- Diarrhea
- Glycosuria
- Proteinuria

4. Increased Nutrient Demand/increased metabolic rate:

- Chronic infections
- Hyperthyroidism / Adrenal tumor (pheochromocytoma)
- Excessive Exercise
- Malignancy

Differential Diagnosis

- A physical cause for weight loss can be found in > 65% of patients
- Psychiatric causes equal about 10% with depression the most common cause, next with substance abuse
- 25% of patients the cause is not found
- Need to distinquish between anorexia (loss of desire to eat) and true unintended weight loss (Seller's)

1. Involuntary weight loss is most commonly caused by:

- Gastrointestinal disorders – gastritis, ulcers, Inflammatory bowel disease, Celiac
- Cancers – typically seen later in the disease except for pancreatic cancer but *most common cause in unexplained weight loss*
- Dysphagia
- Chronic Disease – CHF, Renal disease, etc.

2. Psychiatric (weight loss with anorexia):

- Depression – weight loss with anorexia
- Anorexia nervosa
- Anxiety

3. Weight loss with normal appetite:

- Diabetes Mellitus
- AIDS
- Hyperthyroidism
- Decrease intestinal absorption – Celiac, parasites, IBD

4. Anorexia and weight loss occurs frequently in the elderly

- Loose dentures
- Poverty
- Medications
- Dementia
- Loss of taste and smell
- depression

“Ominous” Signs

- Cancer is always a potential diagnosis. It becomes more likely in the presence of certain signs and symptoms;
- IF UNEXPLANABLE:
  - Weight Loss
  - Night Sweats
  - Fever
  - Fatigue
  - Pain
  - Lymphadenopathy / Hepato-Splenomegaly

  (And many others that are process specific)

Hematology

Hematology: Malignancy

Polycythemia

- Relative / Reactive Polycythemia
  - Reaction to increased erythropoietin
    - Renal arterial hypoxia, emphysema, tumors, tetralogy of Fallot
  - Also may have high WBC, platelets & RBC's
    - Later may have marrow fibrosis or acute myelogenous leukemia

- Polycythemia Vera
  - Absolute increase in red cell mass
    - Fatigue, weakness, dizziness, headaches and visual problems
    - Itching after warm bath
    - Easy bruising or bleeding with little or no injury

Waldenstrom's Macroglobulinemia

- A malignant disease of B lymphocytes with overproduction of monoclonal macroglobulin
  - Increase IgM causes hyper viscous blood and peripheral vascular compromise.
- Affects people over 50 years old
- Overproduction of IgM causes a marked increase in the viscosity of the blood
- 5 in 100,000 express this disease

Multiple Myeloma

- **Characterized by neoplastic proliferation of single clone of plasma cell engaged in the production of a monoclonal immunoglobulin, usually monoclonal IgG or IgA**

- **Symptoms**
  - **Bone and back pain; unexplained fractures**
  - **Bleeding problems**
  - **Aggravation of arrhythmias**

- **Signs and tests**
  - **Bence-Jones proteinuria**
  - **Hypercalcemia**
  - **Bone marrow biopsy**
  - **Bone X-rays show fractures, hollowed out (“punched out”) bone lesions**

- **Acute Lymphocytic Leukemia (ALL)**
  - 80% of acute leukemia in childhood
    - (peak 3-5 years)
  - Present with fever, bone pain, hepatosplenomegaly
  - Associated with Down Syndrome, Radiation and Viral infections.
  - **ALL:** In children 3-6 month survival without treatment; treatment 90% complete remission

- Acute Myeloblastic Leukemia:
  - AKA: Acute Nonlymphocytic Leukemia
  - 8 types

- Most common leukemia in adults 15-39
  - Often presents with Splenomegaly
  - May present with bleeding disorders
  - May present with high (>50,000) WBC
  - Auer rods in cytoplasm pathognomonic for AML

- Poorly differentiated neoplasm, live 1 yr with chemotherapy, cure rate 10 – 15%.

Chronic Myleogenous Leukemia (CML)

- **The median age is about 45 yr**
  - Median survival is 4 to 6 years
  - **It is uncommon before 10 yr of age.**
- Well-differentiated granulocytic leukemia
  - May include any cell line
- Slow for 3 yrs then ‘blast crisis’ (accelerated phase) when 85% die.
- Signs and Symptoms
  - Hepatosplenomegaly
  - Fatigue
  - Generalized LA
  - Weakness
  - Anorexia or weight loss
  - 95% of patients have a distinctive cytogenetic abnormality: **The Philadelphia (Ph) chromosome**

Chronic Lymphocytic Leukemia (CLL)

- Most often affects adults over the age of 55
- Patients die from cytopenia secondary to bone marrow replacement or from infections
- May be found incidentally on routine CBC
  - Increase in WBC count
  - (> 15,000, but typically 50,000 – 250,000)
    - A mature appearing lymphocyte that is morphologically no different than normal counterpart
- Symptoms
  - None
  - Enlarged lymph nodes, liver, or spleen
  - Fatigue
  - Abnormal bruising (occurs late in the disease)
  - Excessive sweating, night sweats
  - Loss of appetite
  - Unintentional weight loss

So:

What do we think when we see Hepatosplenomegaly??

Hodgkin’s Lymphoma

- **20 YO - OR - 60 YO age predominance**
- **Curable, familial, prognosis depends on stage**
- **Symptoms**:
  - A painless swelling in the lymph nodes in the neck, underarm, or groin. “**Single / asymptomatic node, then spreads.”**
  - Unexplained recurrent fevers “**intermittent spiking fever”**
  - Night sweats
  - Unexplained weight loss
  - Lymphocytopenia may occur early and become pronounced with advanced disease
  - Reed-Sternberg cell seen with Hodgkin's disease

Non-Hodgkin’s Lymphoma

- Most common Lymphoma.
- More deadly than Hodgkin’s
  - prognosis based on grade
- Associated with Burkitt’s and Immunoblastic Lymphomas.
  - Malignant monoclonal proliferation of lymphoid cells in sites of the immune system, including lymph nodes, bone marrow, spleen, liver, and GI tract
  - Non-Hodgkin's lymphoma is a malignant (cancerous) growth of B or T cells
  - NHL occurs more often than Hodgkin's disease

Burkitt's Lymphoma

- B-lymphocyte tumor
  - LA in the maxilla or mandible
  - Association with EBV infection in US
  - Associated with Malaria in Africa
  - May predispose patient to NHL

So:

How about asymptomatic lymph nodes that spread??

Common Differential Diagnoses in Hematology

- Pain:
  - Macrocytic Anemias
  - Leukemias
  - Sickle Cell Anemia
  - Multiple Myeloma

- Fatigue:
  - Microcytic and Macrocytic Anemias
  - Leukemias
  - Mono
  - Lymphomas

- Purpura:
  - Senile Purpura
  - ITP / TTP
  - True clotting disorders: VWF, Hemo.a&b

- GI Complaints:
  - Pernicious Anemia

- Lymphadenopathy:
  - Lymphomas
  - Mono

- Hepatomegaly / Splenomegaly:

Basic Workup:

- Physical exam & Hx:
  - Signs of Pallor
  - Hx of Fatigue, Pain…
- Labs:
  - CBC, Differential, PLT
  - Reticulocyte count
  - Ferritin, TIBC

Follow up or basic additional testing:

- Macrocytosis:
  - MMA
  - Neutrophil segmentation
  - B-12 and Folate levels
- Microcytosis:
  - Iron studies
  - RBC morphology
  - Reticulocyte counts
  - Erythropoetin levels
- Lymphadenopathy:
  - WBC Morphology
  - EBV and CMV Virus studies
  - Bone marrow studies
- Hemolysis:
  - Indirect and Direct bilirubin
  - RBC morphology and membrane studies
  - Reticulocyte indices
- Pain:
  - Consider B12 anemias
  - Urine electrophoresis (Bence Jones Protein…)
  - R/O Hemolytic Anemias
- Neurological Sx:
  - First thought would be Macrocytic Anemia work up

Dermatology

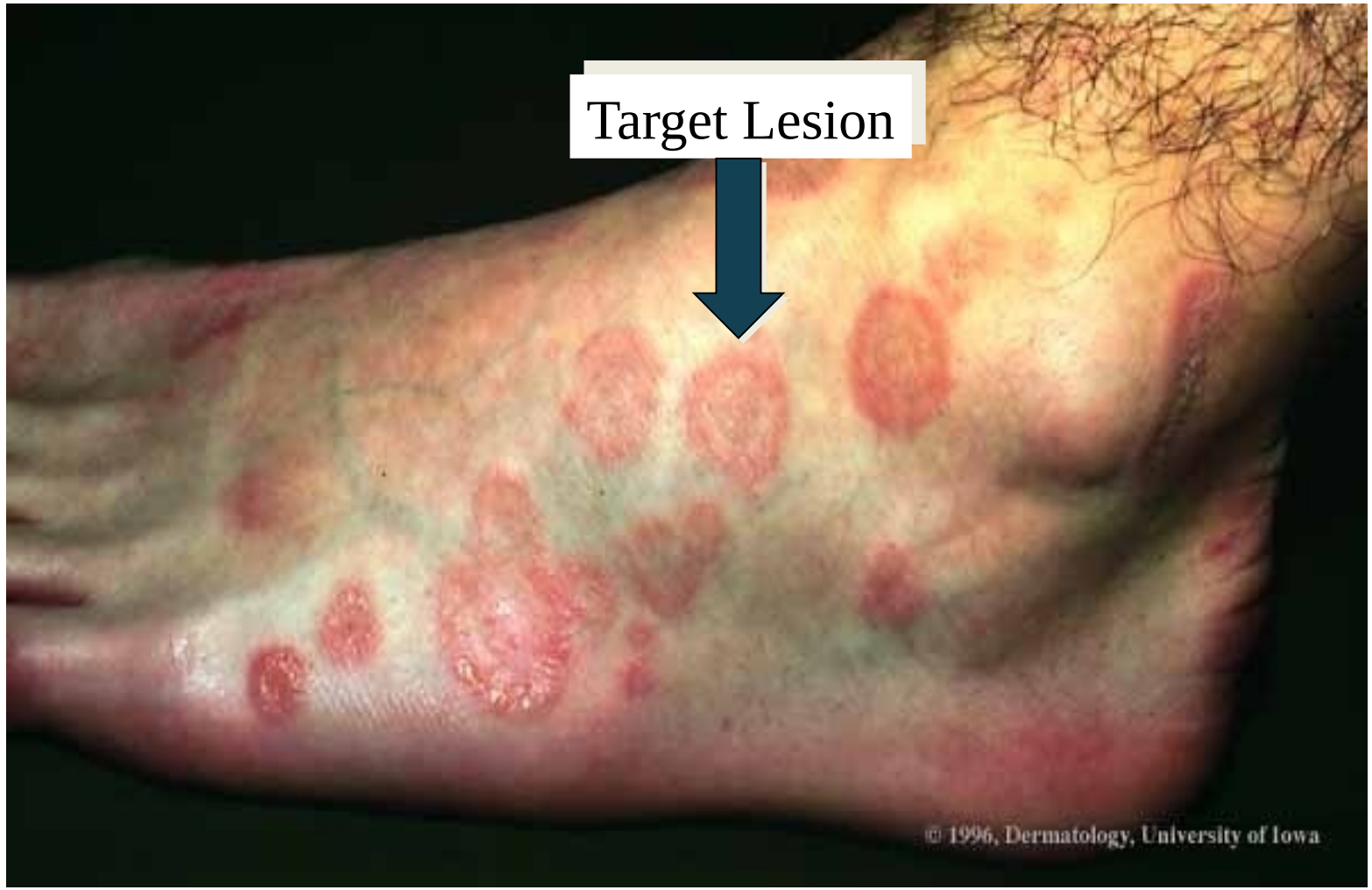
Dangerous Derm Presentations:

Erythema multiforme

- Acute illness; hypersensitivity; drugs
- Round lesions on forearms, hands, knees or feet
  - lesions appear like a target with fluid filled blister in center
- **Major:** less common, involves the eyes, mouth or genitals (**Stevens-Johnson Syndrome - Week 3 notes**)
- **Minor:** common, self-limiting
- **DX:** Clinical or biopsy

Erythema multiforme

- May occur with herpes simplex Immune complex formation in cutaneous microvasculature
- May be preceded by malaise, fever or itching and burning
- Target lesions and papules common
  - Centrifugal spread of red maculo-papule to a circumference of 1-3 cm
  - Center becomes cyanotic

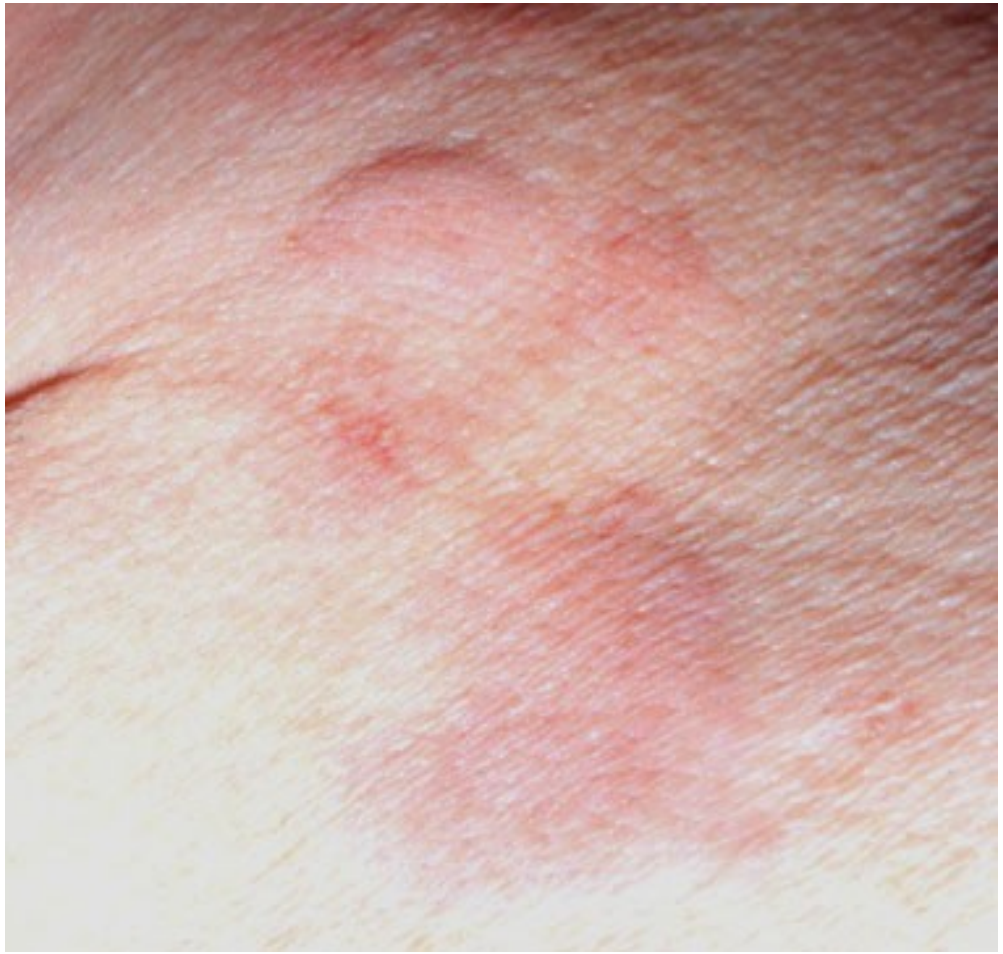


Erythema multiforme

Drug Eruptions

- Onset within one day to three weeks of drug therapy.
  - Depends upon prior sensitization in most cases.
- Urticarial variety is the most common.
  - Eczema may be in the DDX but should itch more severely than a drug rash.

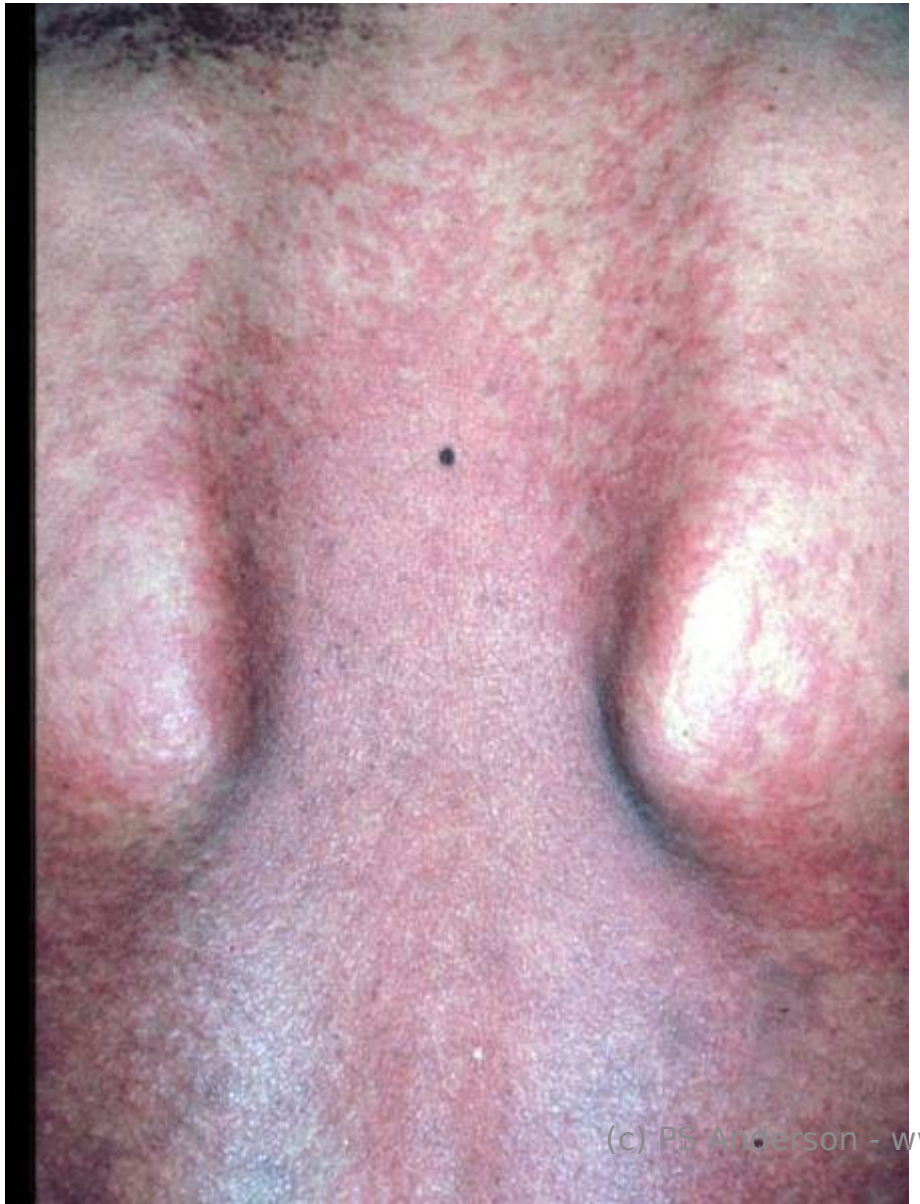
Urticarial (hive) drug reaction



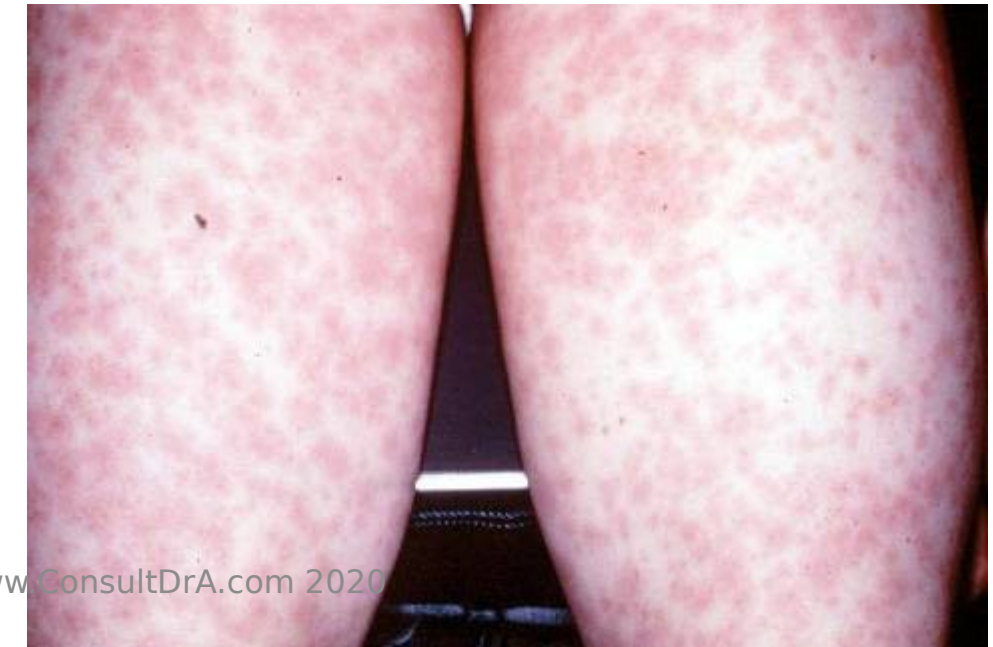
- Drugs (e.g., penicillins) are a common cause of urticaria, but urticaria can be precipitated by other internal and external factors
- Primary lesion is a *wheal,* a flesh-colored to pink, well circumscribed plaque caused by dermal edema; itchy!
- Individual lesions last only a few hours, never more than 24 hours
- When caused by drugs, may be IgE mediated, triggering mast cell granule release; or drug may directly cause mast cell granule release

Morbilliform drug eruption

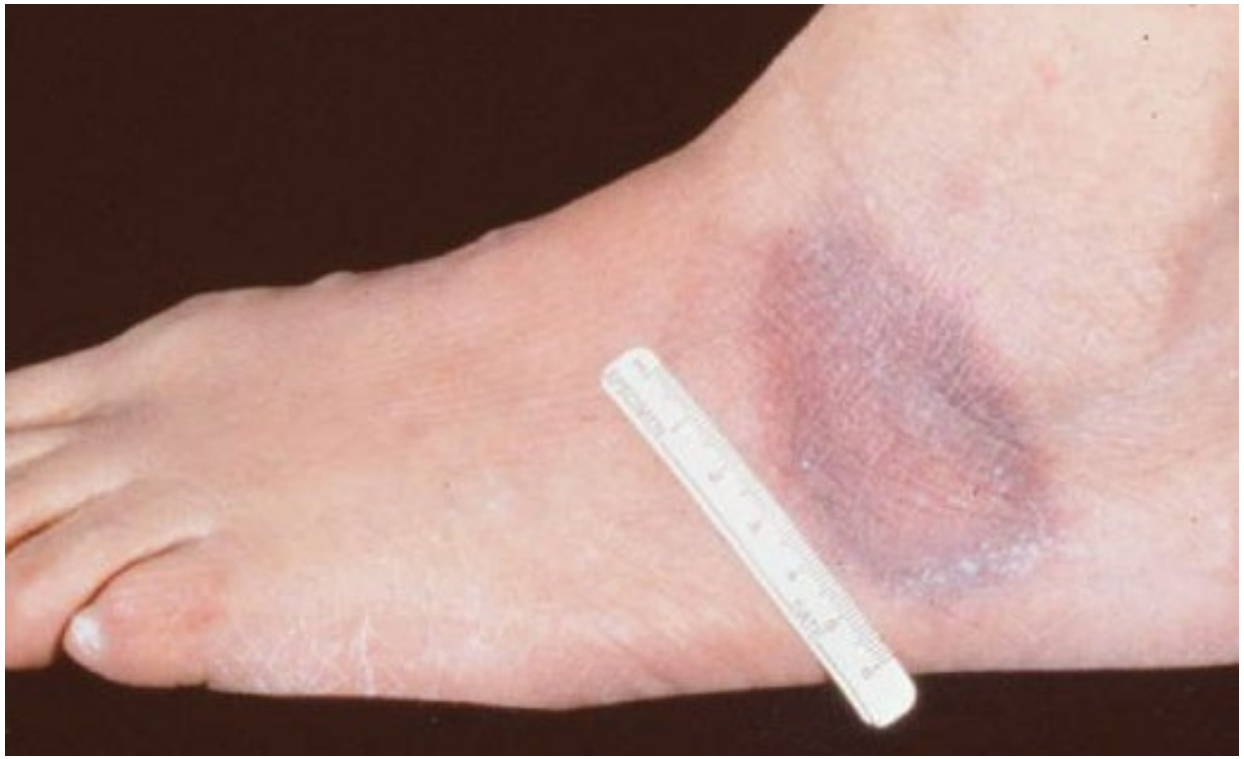
(exanthematous drug eruption, maculopapular drug eruption):



- "morbilliform" refers to a resemblance to the rash of measles (morbilli is Latin for measles); measles is a rare disease now, but morbilliform eruptions are common
- a morbilliform eruption is symmetrically distributed on the trunk and proximal extremities, and consists of bright pink macules and slightly raised papules ("maculopapular")



Fixed drug eruption

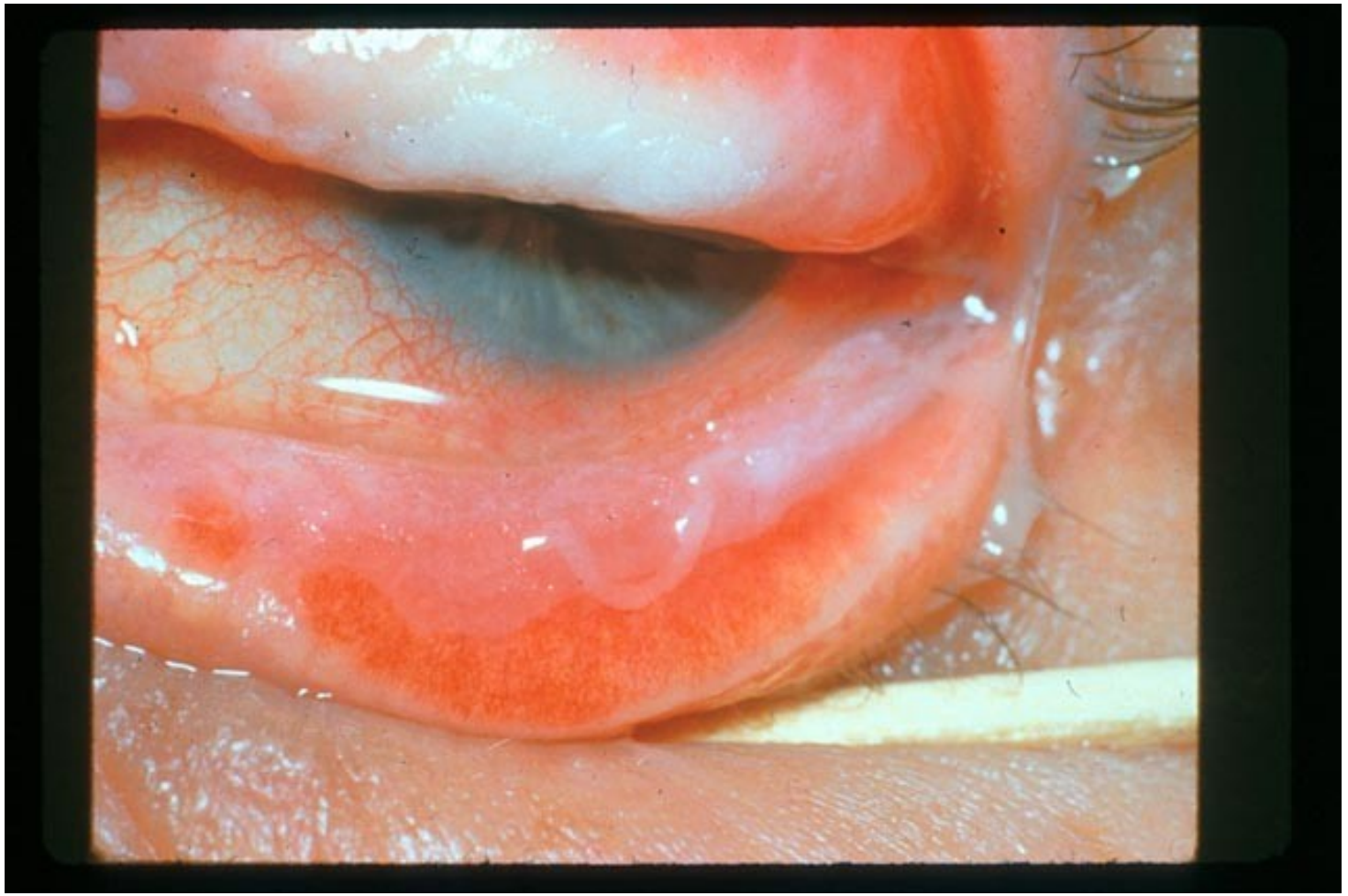


- “Fixed" in that it occurs at same sites with each episode
  - OTC drugs containing phenolphthalein, pseudoephedrine, etc. common culprits
  - tetracyclines, barbiturates, phenothiazines, sulfonamides
  - oval, itchy or burning dusky red plaque

Toxic Epidermal Necrolysis / Stevens-Johnson Syndrome

- Severe life threatening blistering disorder
- Patients normally have fever, pruritis, conjunctivitis…
- May also appear as an erythema-multiforme type rash
- 30% Fatal
- Almost always due to a drug reaction
- Tx: Emergent referral
  - Electrolyte replacement
  - Maybe high dose IV steroids (2 mg / kg)

SJS



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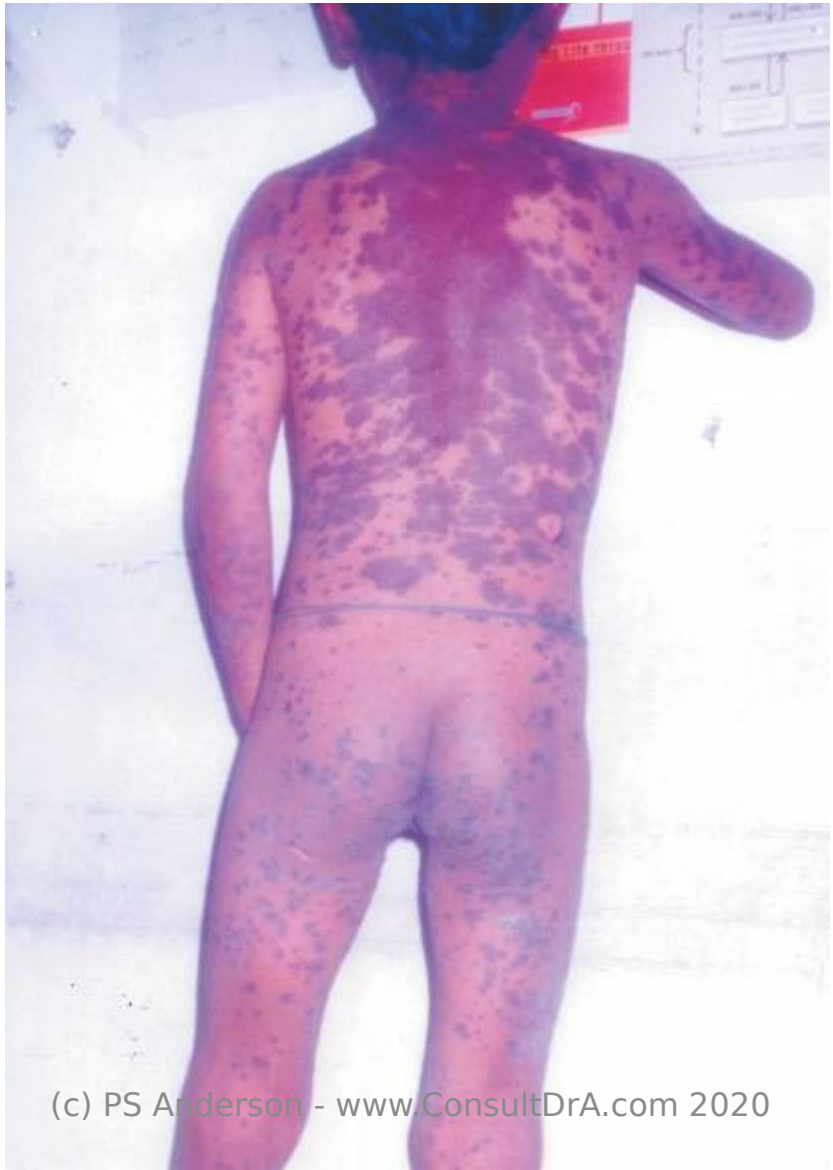

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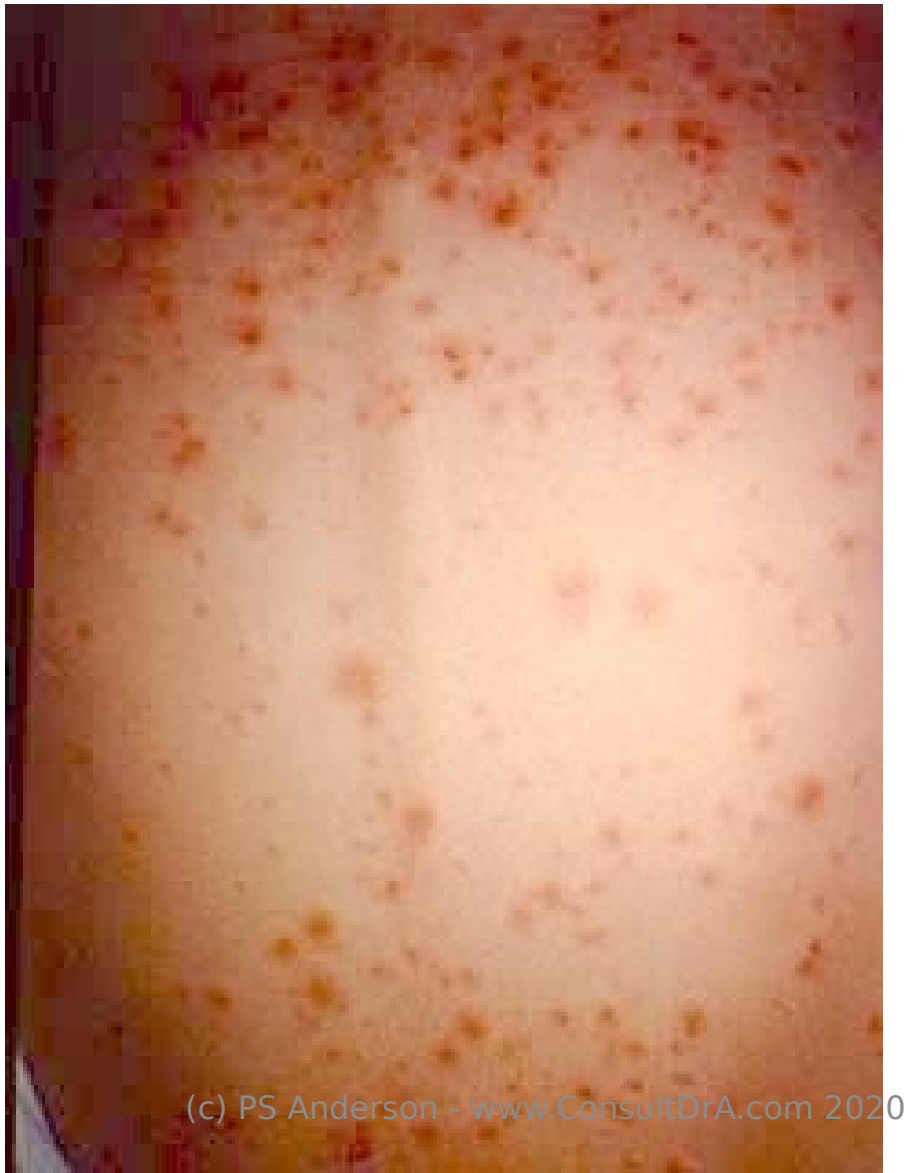
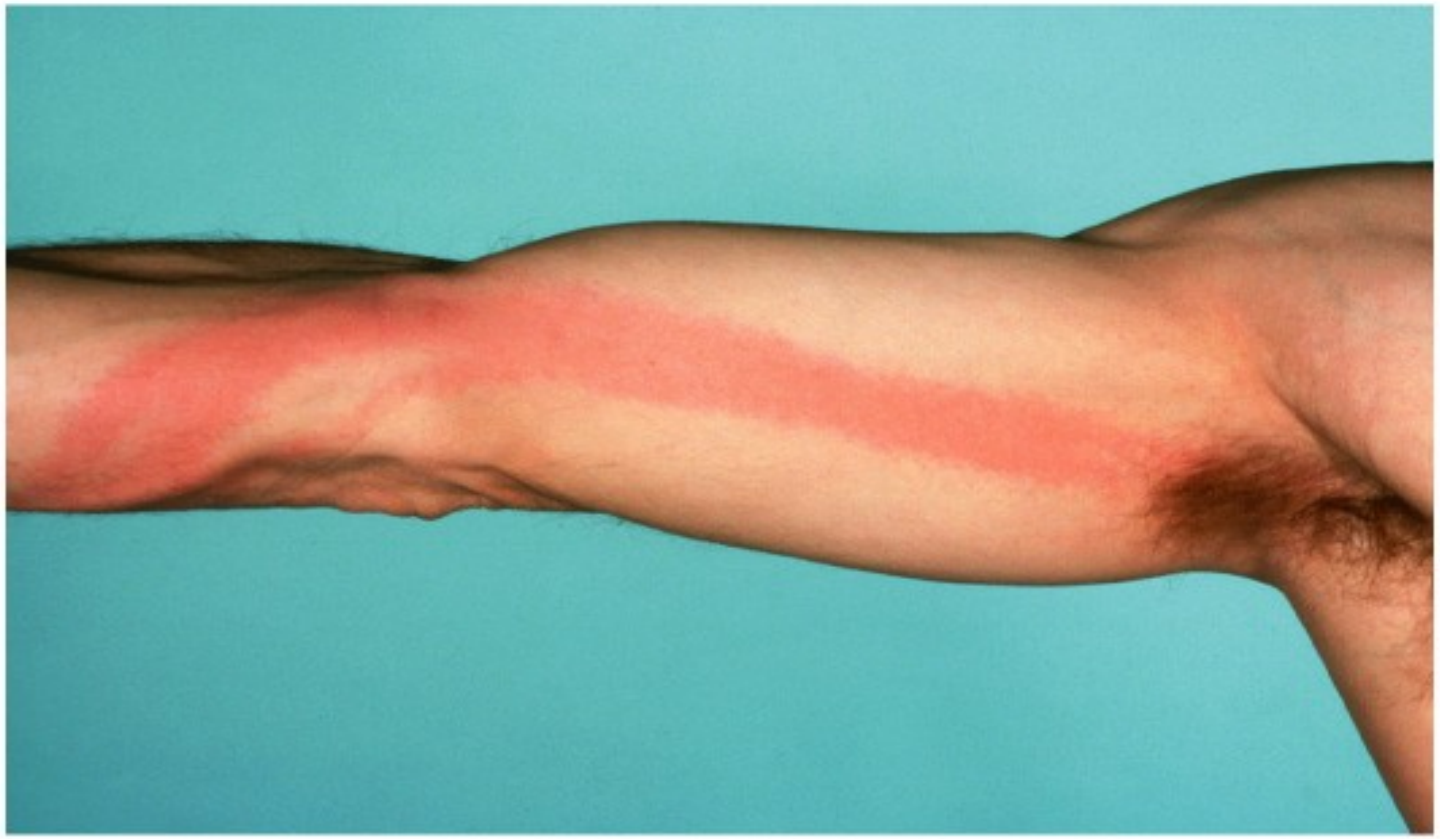


Lymphangitis

- A sign that a bacterial infection is worsening.
  - Red streaks from infected area to the armpit or groin (may vary in intensity.)
  - Throbbing pain along the affected area
  - Fever (100 to 104)
  - Rigors / Chills
  - Myalgia
  - Headache
  - Loss of appetite

Lymphangitis



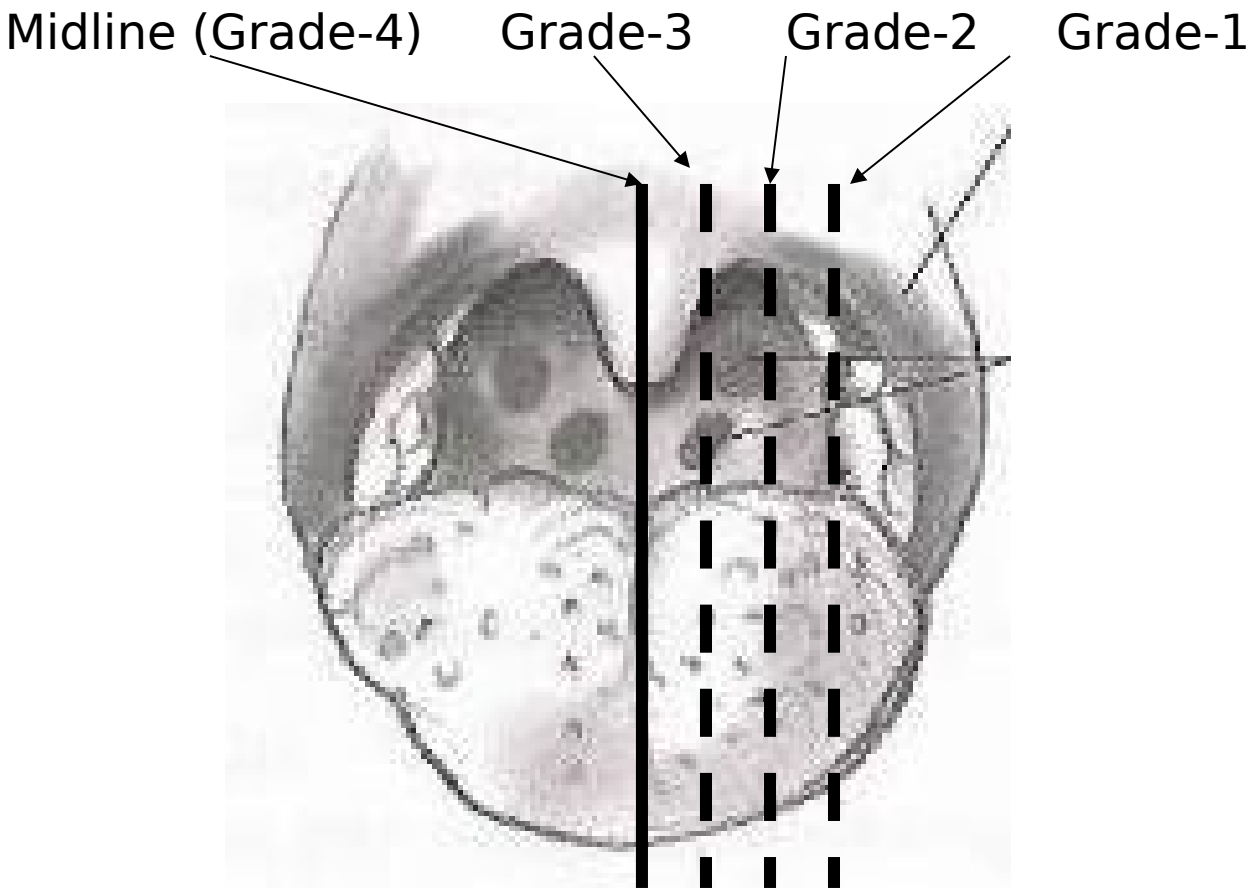
EENT

Pharyngeal and Tonsil Abnormalities

- Tonsillitis
  - Tonsil inflammation (lymphatic tissue)
  - Recall the three tonsillar tissues
    - Lingual
    - Palatine
    - Pharyngeal (‘Adenoid’)

- Pharyngitis
  - Inflammation of the pharynx and potentially tonsillar tissues
- Abscess
  - Dangerous infections in deeper tissues

Tonsillar Swelling Grades



- Grade 0 = no swelling or flat,
- Grades 1,2,3,4; Each is equal to 25% of the oropharyngeal opening
- At Grade-4 the tonsils touch in the center

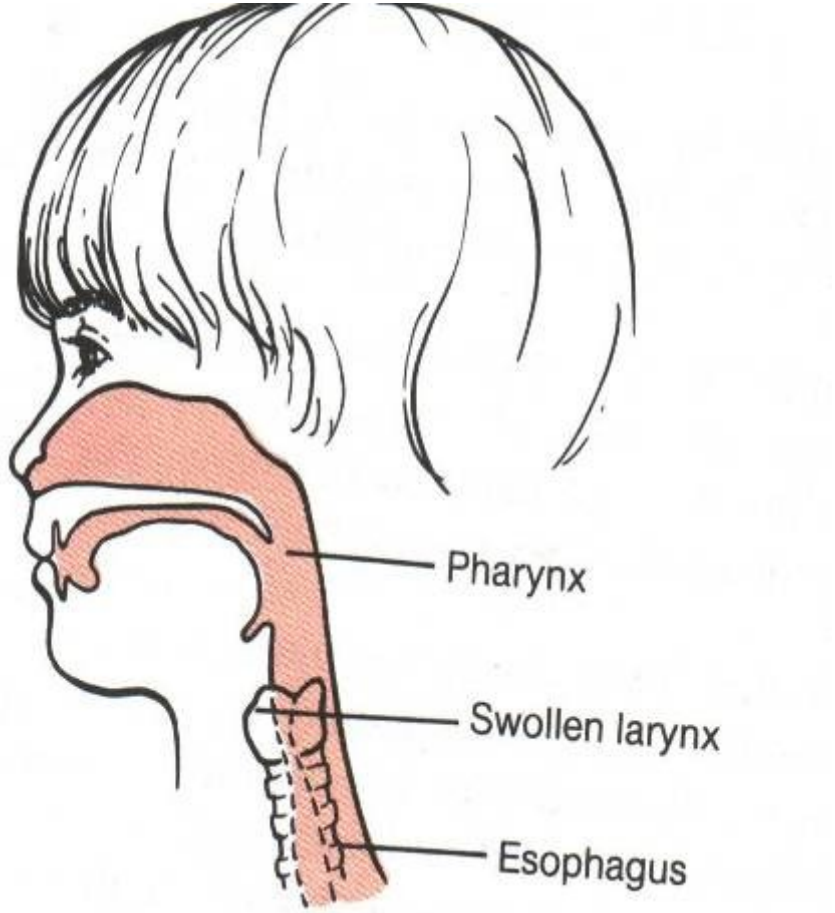
Upper Airway Obstruction

- All Patient presentations include inspiratory and/or expiratory **Stridor** (high pitched sounds)
- Possible retractions of the thorax
  - Intercostal, suprasternal, supraclavicular
- Cyanosis (later stage)
- Drooling (common in pediatrics)
- LOC with full obstruction

Upper Airway Obstruction:Tx

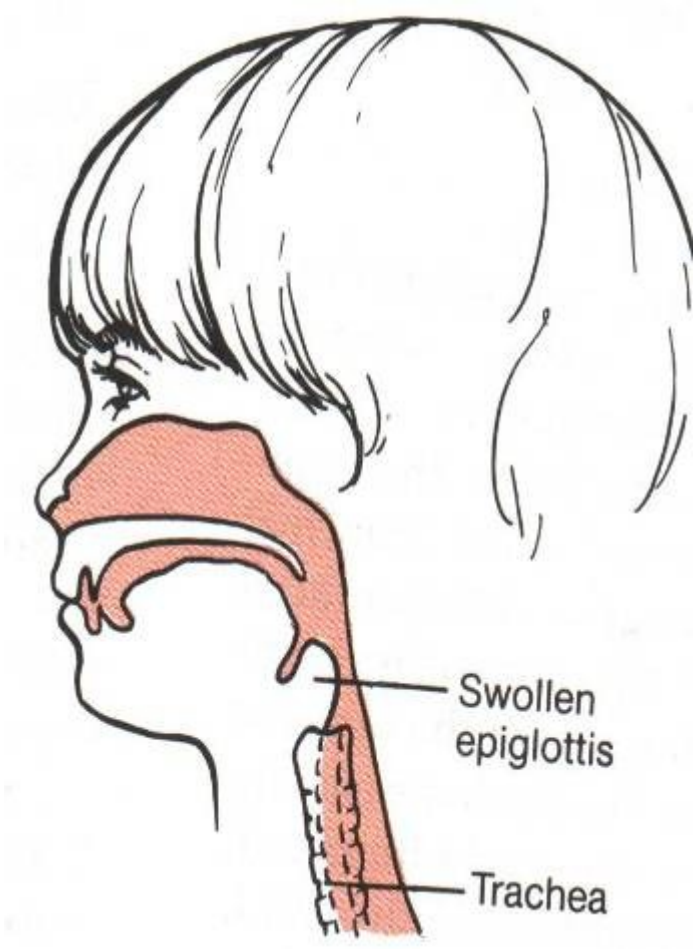
- Determine if obstruction is mechanical or infectious!
- If mechanical; Do **Heimlich procedure**
- If infectious; consider **Epiglottitis**
  - Usually found in pediatrics
  - Sudden onset
  - Pt can’t swallow properly/Drooling common
  - Tripod position
  - Swollen airway, infectious signs of fever/malaise

Croup – inflammation of the larynx, trachea, and bronchi



- Usually between 3 months and 3 years
  - Usually while asleep
- Complication of viral infection
- Difficulty breathing
- Crowing sound on inspiration (inspiratory stridor)
- Seal-like barking cough
- Breath cool moist air for 5 minutes
  - If no improvement after 5 minutes continue to monitor
  - If condition worsens transport to hospital

Epiglottitis



- Usually between 3 –10 years
- Caused by H. influenza (or occasionally a beta hemolytic Strep) infection
- High fever / Toxic Child
- Difficulty breathing
- Inspiratory stridor
- Drooling
- Try moist air breathing
- Will need antibiotics and Airway management!
  - Do not move neck or open mouth
  - EMS Transport to ER

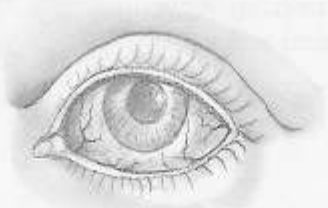
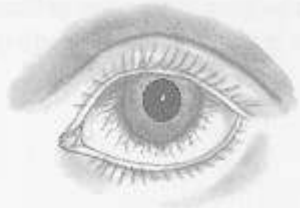
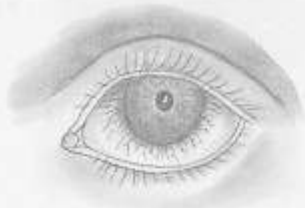
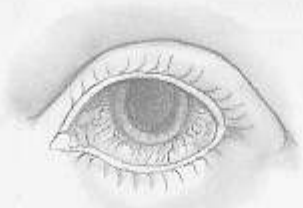
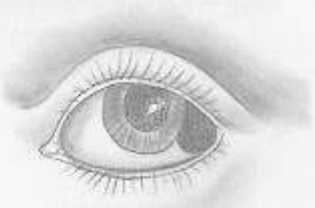
COMPLICATED UPPER AIRWAY INFECTIONS

	CLINICAL PRESENTATION	DIAGNOSIS	TREATMENT
Epiglottitis	Sudden onset of fever, drooling, tachypneic, stridor, toxic appearing	Lateral cervical radiograph (thumb-printing sign)	Urgent ENT (e throat) consult airway manage Helium-O_2 mix Cefuroxime an therapy
Retropharyngeal abscess	Usually child or if adult (trauma) Fever, sore throat, stiff neck, no trismus	Lateral cervical radiograph or CT imaging	Stabilize airwa Surgical draina Antibiotics (pe and metronidaz
Ludwig angina	Submaxillary, sub-lingual, or sub-mental mass with elevation of tongue, jaw swell-ing, fever, chills, trismus	Lateral cervical radiograph or CT imaging	Stabilize airwa Drain abscess Antibiotics (pe and metronidaz
Peritonsillar abscess	Swelling in the peritonsillar region with uvula pushed aside, fever, sore throat, dys-phagia, trismus	Cervical radio-graph or CT imaging Aspiration of the region with pus	Abscess draina Antibiotic ther (penicillin and metronidazole)

The “Red Eye”

- What findings should you key in on?
  - Pattern of injection
    - Conjunctival, Ciliary or Hemorrhagic
  - Level of (or presence of) PAIN
    - Is it constant, with blinking, on eye movement
  - Visual Disturbance
  - Presence of or Level of Photophobia

Red Eye

	CONJUNCTIVITIS	CORNEAL INJURY OR INFECTION	ACUTE IRITIS	ACUTE GLAUCOMA	SUBCONJUNCTIVAL HEMORRHAGE
					
PATTERN OF REDNESS	Conjunctival injection: diffuse dilatation of conjunctival vessels with redness that tends to be maximal peripherally	Ciliary injection: dilatation of deeper vessels that are visible as radiating vessels or a reddish violet flush around the limbus. Ciliary injection is an important sign of these three conditions but may not be apparent. The eye may be diffusely red instead. Other clues of these more serious disorders are pain, decreased vision, unequal pupils, and a less than perfectly clear cornea.			Leakage of blood outside of the vessels producing a homogeneous, sharply demarcated, red area that fades over days to yellow and then disappears
PAIN	Mild discomfort rather than pain	Moderate to severe, superficial	Moderate, aching, deep	Severe, aching, deep	Absent
VISION	Not affected except for temporary mild blurring due to discharge	Usually decreased	Decreased	Decreased	Not affected
OCULAR DISCHARGE	Watery, mucoid, or mucopurulent	Watery or purulent	Absent	Absent	Absent
PUPIL	Not affected	Not affected unless iritis develops	Small, and with time often irregular	Dilated	Not affected
CORNEA	Clear	Changes depending on cause	Clear or slightly clouded	Steamy, cloudy	Clear
SIGNIFICANCE	Bacterial, viral, and other infections; allergy; irritation	Abrasions and other injuries; viral and bacterial infections	Associated with many ocular and systemic disorders	Acute increase in intraocular pressure—an emergency	Often none. May result from trauma, bleeding disorders, or a sudden increase in venous pressure, as from cough.

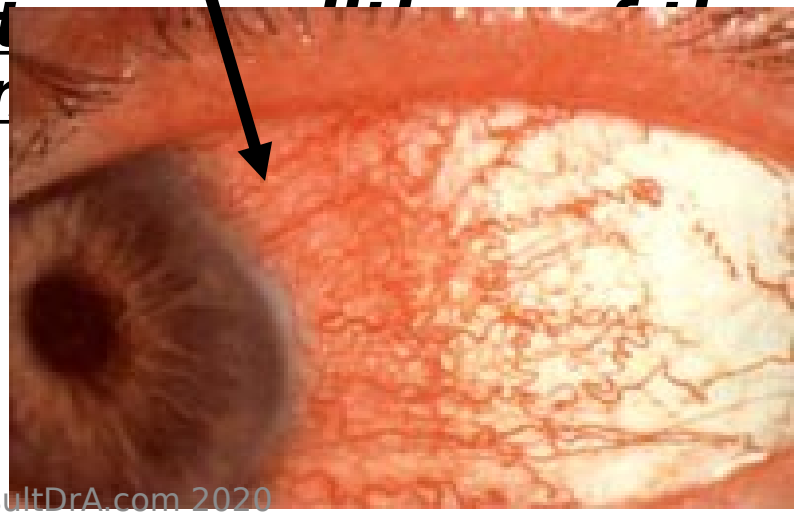
Know the difference between Conjunctival and Ciliary Injection

Anatomic basis of “ciliary flush” injection

The ophthalmic artery also gives off the ciliary arteries, which divide into the anterior, short posterior, and long posterior ciliary arteries. The anterior supply the rectus muscles and form the posterior conjunctival arteries. The short posterior supply the bulk of the choroid. The long posterior pass forward to supply the ciliary body and the iris.

The long posterior also anastomoses with the limbal branches of the posterior conjunctival arteries, forming the vascular basis of ciliary injection (flush) in inflammat

Non-ciliary flush (for comparison.)



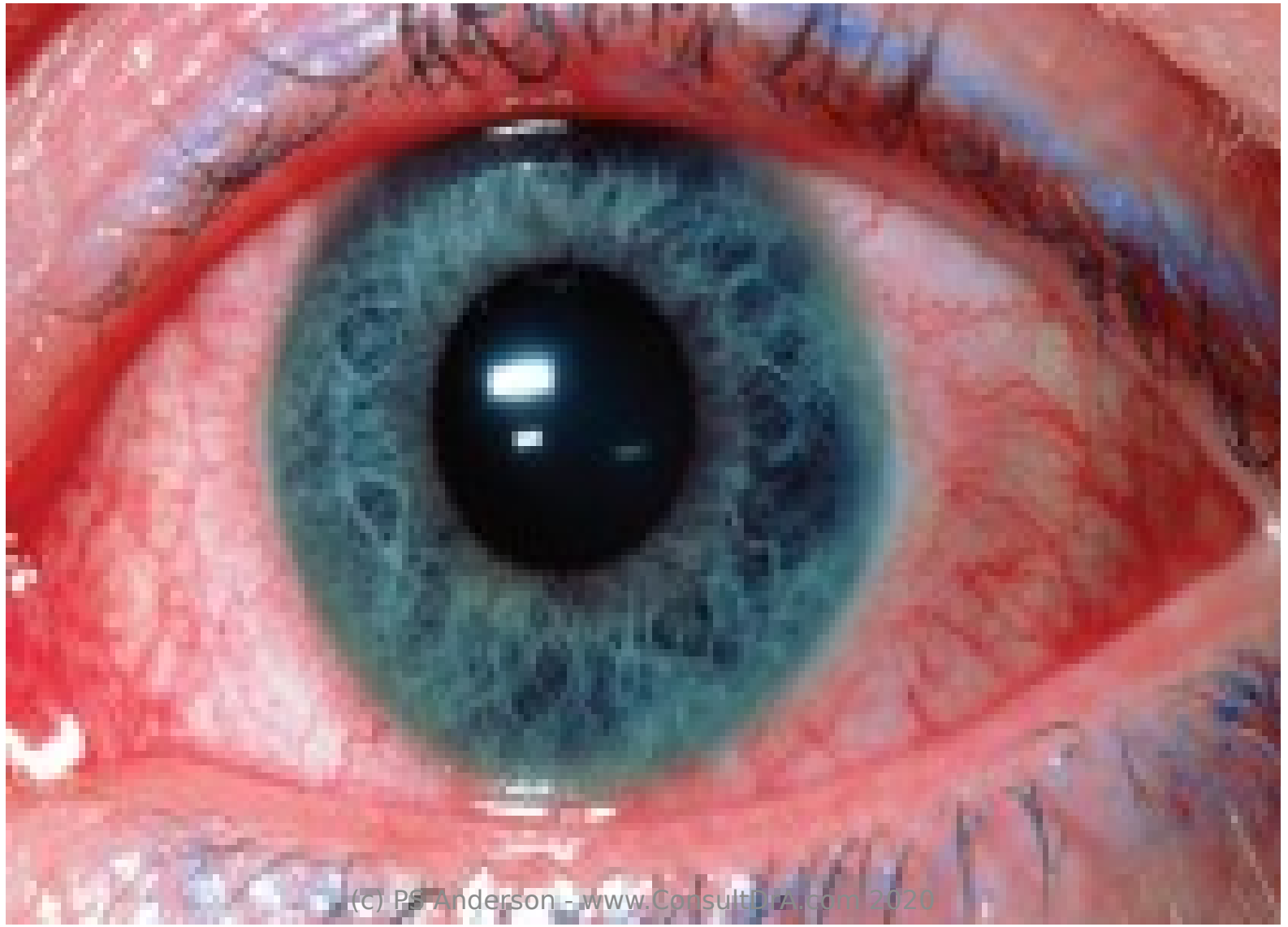
The “Red Eye”

- What are your common differential diagnoses?
  - Conjunctivitis
    - Viral, Bacterial, Allergic, Toxic
  - Conjunctival Hemorrhage
  - Keratitis (Corneal Inflamation)
  - Corneal Injury
    - Abrasion, Ulcer, Puncture
  - Iritis / Uveitis
  - Acute Glaucoma Attack

Injection	Pain	Vision	Photophobia
CONJ.	0 – +	0	+ - ++
HEMM	+ / +++	0 (?)	0
CILIARY	++++	+++	++++
CILIARY	++++	+++	++++
CILIARY	++++	++ / +++	+++ / ++++
CILIARY	++++	++++	++++

Red Eye

Viral Conjunctivitis:



Red Eye

Acute anterior uveitis with plasmoid aqueous and hypopyon in a patient with ulcerative colitis.

UVEITIS / IRITIS

- Uveitis is inflammation of the uveal tract, most commonly in the iris and ciliary body portions**.**
  - **The uveal tract is the functional lymphatic channel of the eye, and thus is prone to inflammation.** Uveitis can be either acute or chronic.
    - Acute uveitis is due to either trauma, inflammation in an adjacent tissue (secondary uveitis), or an acute episode of a chronic condition (ie Crohns Disease).
    - Chronic uveitis is most often associated with systemic diseases such as **Bechet's, IBD, Juvenile RA, Reiters, Sarcoidosis, Syphilis, Tuberculosis, and Lyme's disease.**
- The chronic nature of the disease is probably due to deposition of antigen / antibody complexes in the uveal tract (Type III Hypersensitivity) as well as stimulation of immunologically sensitive eye cells which can become reactive during systemic inflammatory disease.

UVEITIS IRITIS : Diagnostic information

A. **Sn / Sx:** Photophobia, pain, excessive tearing, boring eye pain, foreign body sensation, and periorbital radiating pains. Visual acuity may be unaffected, but accommodation is typically painful. Ciliary injection is present, as well as protein and inflammatory cell matter in the aqueous.

B. **DDX: Conjunctivitis, Glaucoma, Acute toxic exposure (ie. Chemical).**

C. **Lab Dx:** For systemic disease processes.

Referral information: These patients will be in an acutely painful state which needs to be addressed, along with the inflammatory response. If you do not have the pharmacological means to do this, refer them out and treat their systemic complaints when the acute situation is resolved.

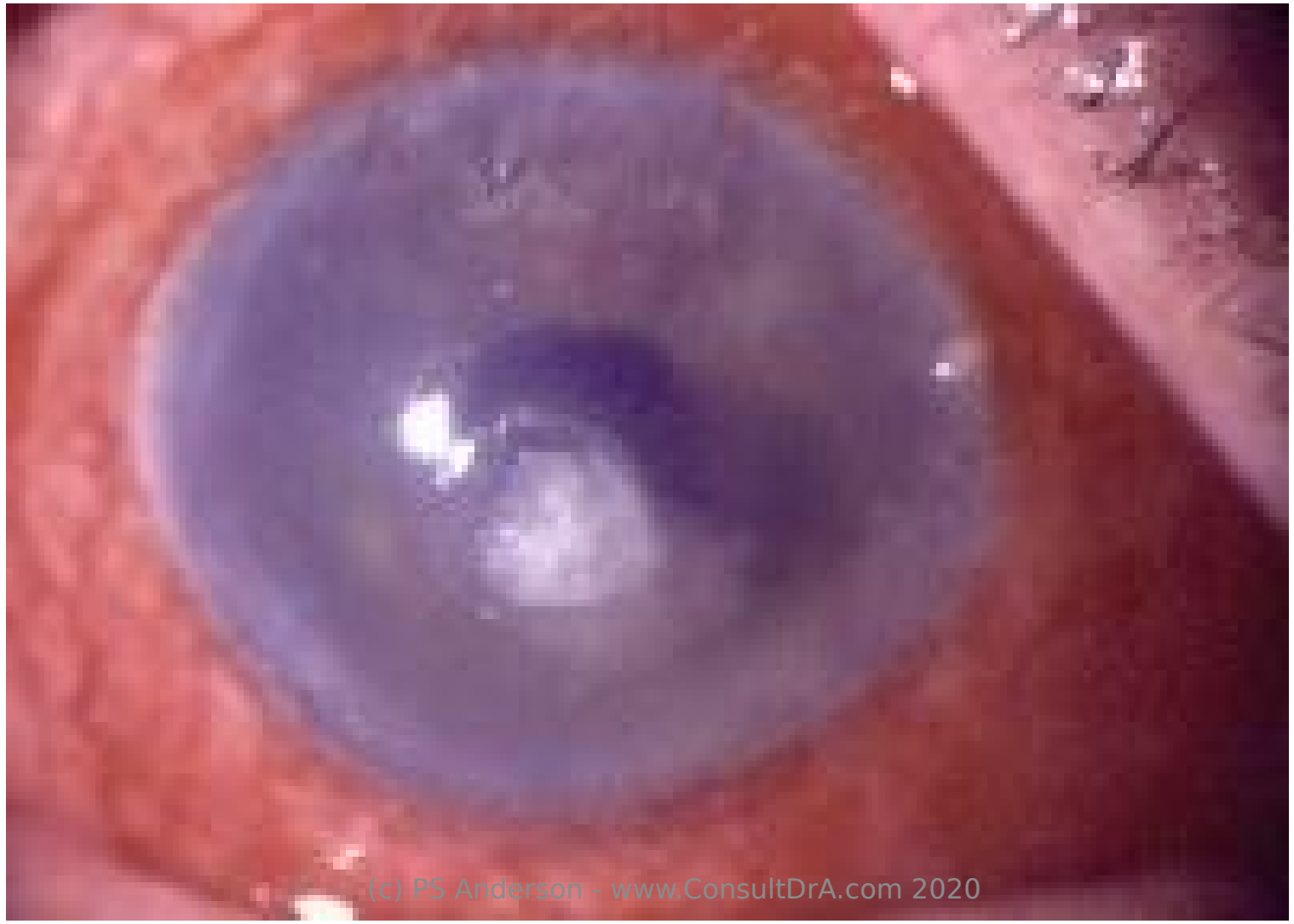
Standard treatment: #1 Immobilize the iris and ciliary body with Homatropine, Scopolamine, or Atropine cycloplegics**. #2** Stop the inflammatory cycle with a topical steroid @ q2h. A loading dose of oral Prednisone 60 to 80 mg (with subsequent tapering) may be necessary**.**

Uveitis / Iritis clinical thinking:

- Eye exam
  - VA, External & Media, Flourescein, EOM, Adnexa
- Patient History
  - PMH (Other inflammatory Dz's?)
  - Meds (any inflammatory Dz's being "masked"?)
  - HPI (Remember, someone with systemic inflammatory disease CAN "Just" have conjunctivitis)
    - Level and nature of pain?
    - Any exposure to conjunctivitis?
    - Allergies acting up?
- Always keep these patients on short follow-up if you are the primary treating doctor!

Red Eye

Acute angle-closure glaucoma with corneal clouding and diffuse conjunctival injection



Angle Closure Glaucoma

Acute or chronic angle closure –

The fluid drain becomes blocked. The anterior chamber is shallow, the filtration angle is narrowed and the iris may *obstruct* the entrance of the canal of Schlemm or the pupil may become blocked. It is rare.

***Symptoms*:**

Unilateral, severe pain and rapid loss of vision, possibly accompanied by nausea & vomiting.

Prodromal symptoms may present as transitory episodes of diminished visual acuity, colored halos around lights and pain in eye and head.

Signs:

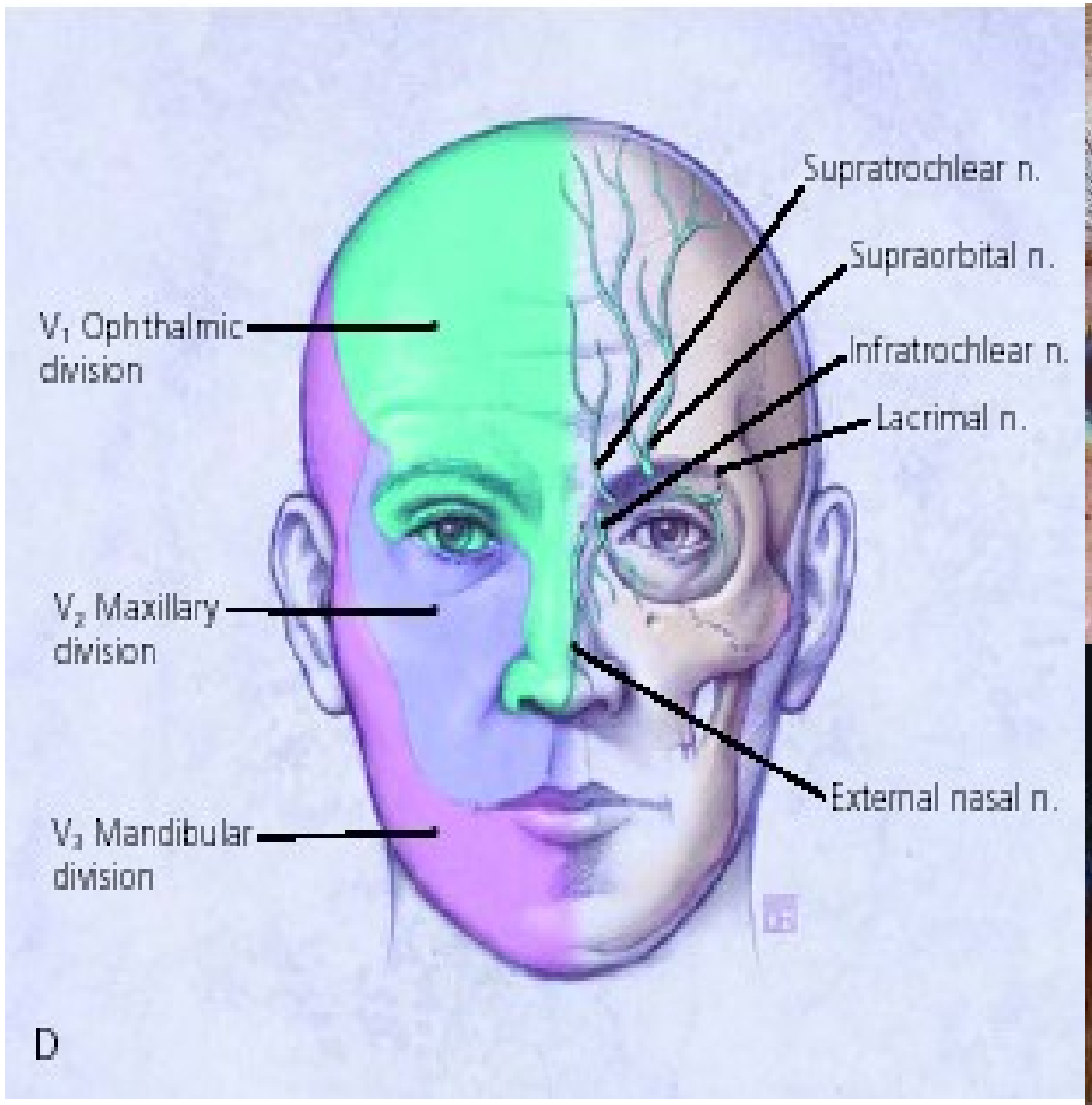
Hazy cornea (Hypopion), fixed mid-dilated pupil, eye is usually firm to palpation

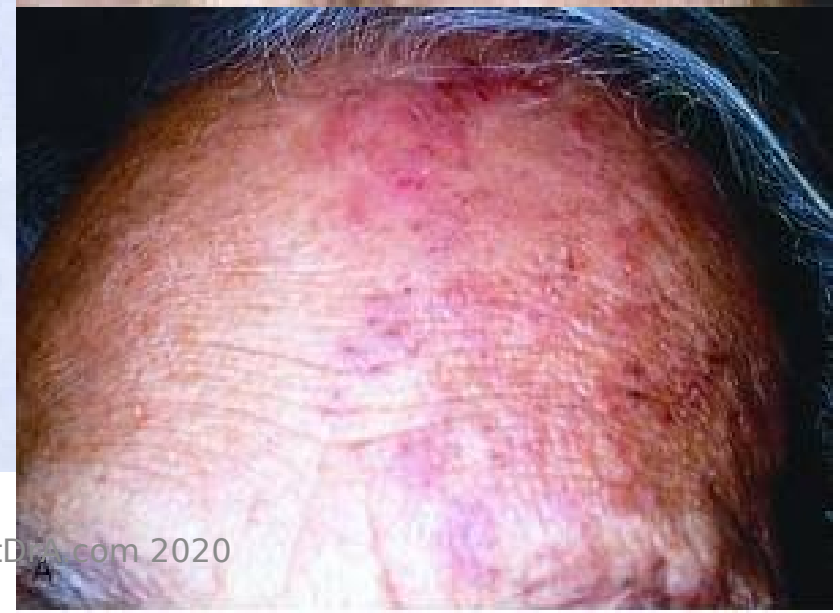
OTHER Types:

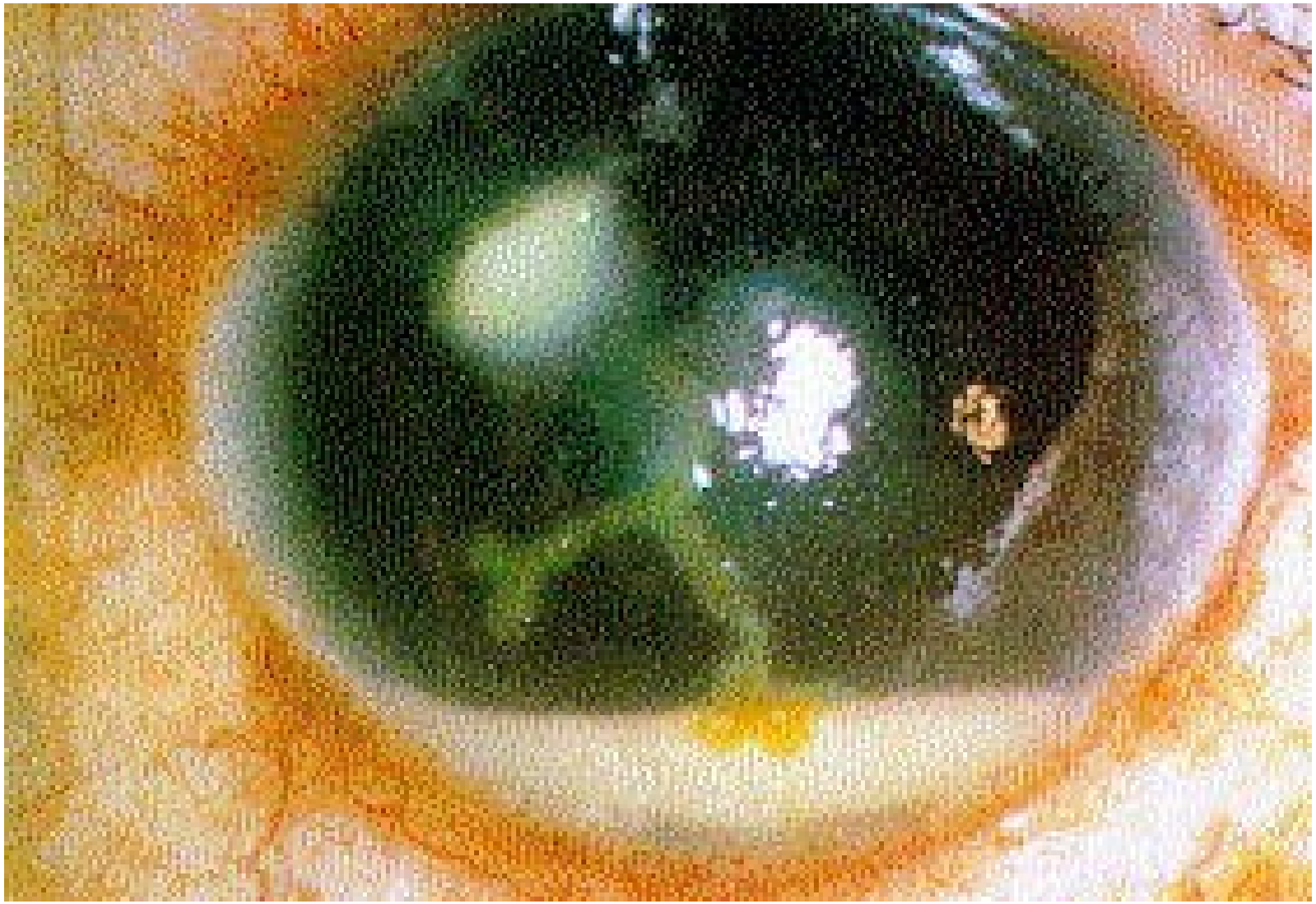
Secondary – from pre-existing ocular diseases such as uveitis, intraocular tumor or enlarged cataract. Prolonged corticosteroid use can produce an increased pressure.

Absolute – Last stage of any uncontrolled glaucoma.

HERPES ZOSTER OPHTHALMICUS



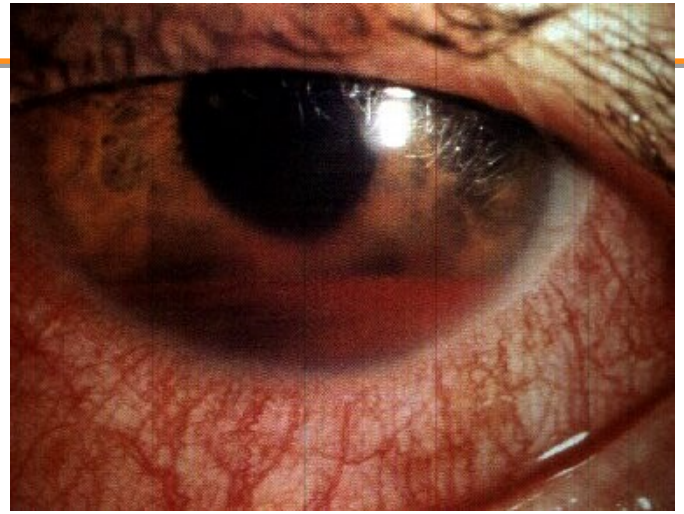




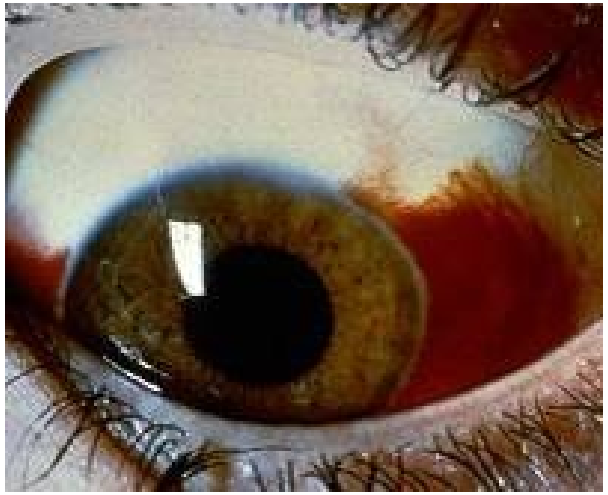
Herpes dendritic keratitis (fluoroscein stain) with hypopyon

- HSV may also produce a necrotizing stromal inflammation (with no overlying ulcer) or endothellitis (keratic precipitates on the corneal endothelial surface)

Hyphema

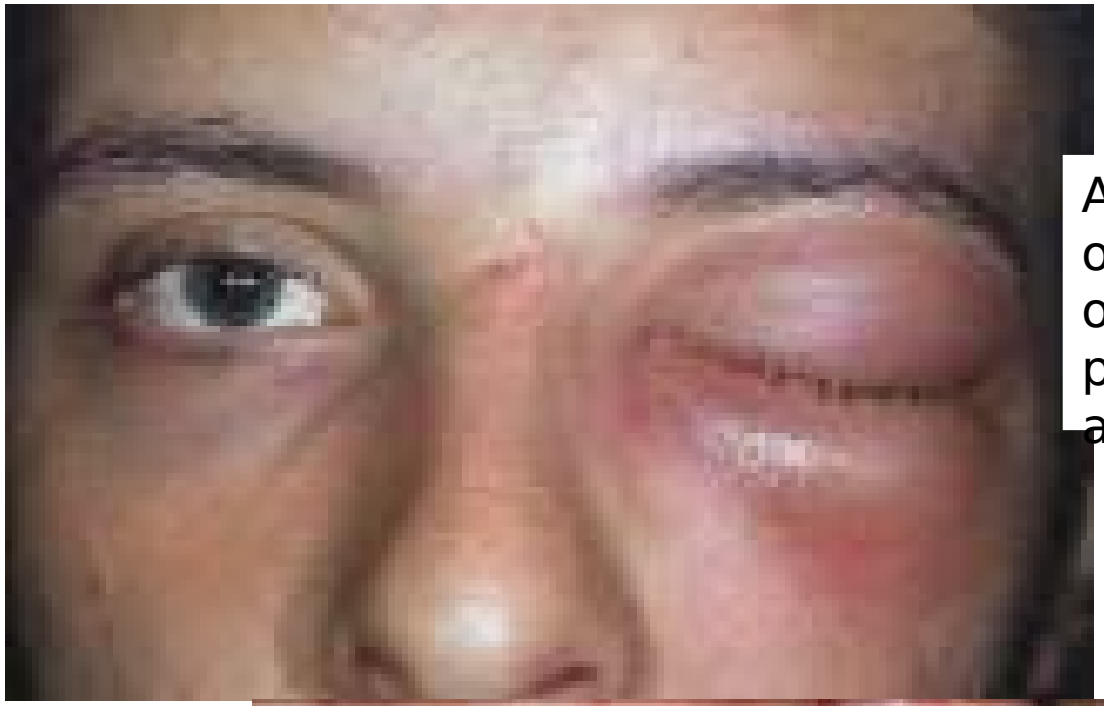


Subconjunctival Hyperemia

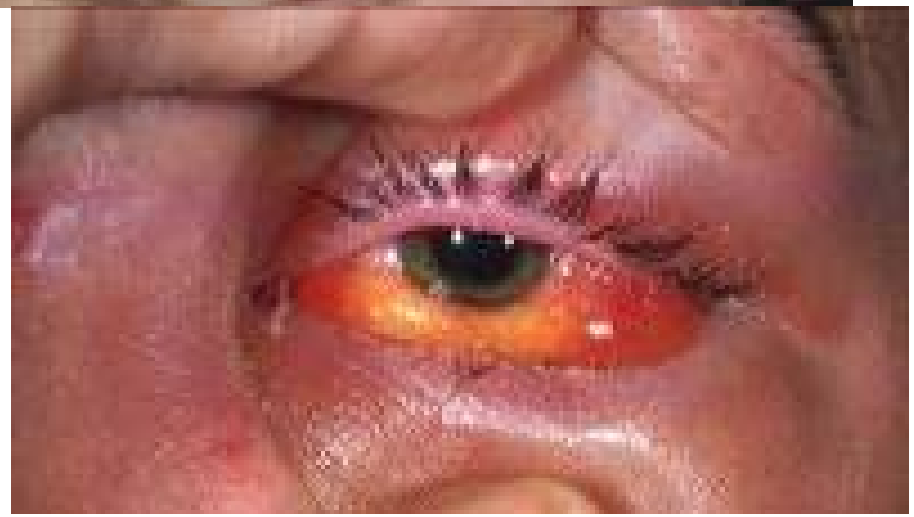


Orbital Cellulitis

- Inflammation and potential infection around the eye, extending to the retrobulbar space.
  - **Dangerous, as this space communicates with the cranial cavity. Infection can spread quickly and easily to the brain.**
  - **Hallmarks are systemic signs and symptoms of infection, and lid / EOM dysfunction.**
- DDX is Preseptal Cellulitis (Inflammation anterior to the orbital septum).
  - This condition will not typically have fever / systemic toxicity or lid / EOM dysfunction.



A male with orbital cellulitis with proptosis, ophthalmoplegia, and edema and erythema of the eyelids. The patient also exhibited pain on eye movement, fever, headache, and malaise.

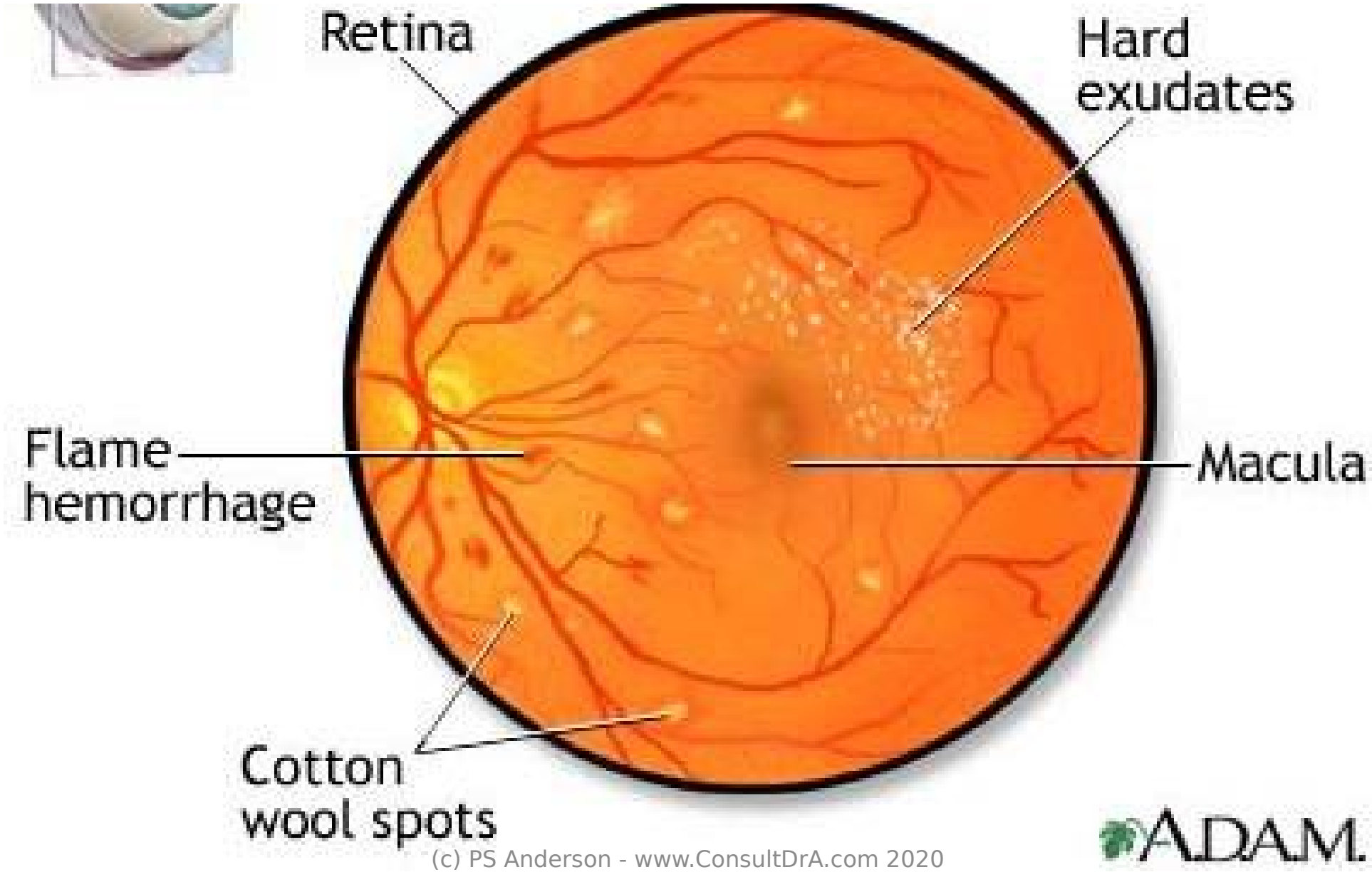


The same patient exhibited chemosis and resistance to retropulsion of the globe.

Other Pathology noted in painful EOM function

- Retrobulbar (Optic) Neuritis
  - Pain on eye rotation
  - Inflammatory disorder
  - Typically self limiting
    - MD Tx often is NSAIDS
  - May indicate systemic disease
    - Orbital Cellulitis (includes swelling)
    - Other Neuritides
- Ocular or Atypical Migraine Headache
  - May exhibit pain with eye movement
  - May include photophobia
    - DDX by doing EOM in darkened room

Hypertensive Retinopathy



The Nerve Head with Papilledema Indicates Grade-4 Hypertensive Retinopathy

PAPILLEDEMA, DUE TO SEVERE HTN

Cardio-Pulmonary

Chest Pain Syndromes

- All chest pain is an MI until proven otherwise!

Angina Pectoris

Clinical syndrome caused by
Myocardial ischemia
(usually from CAD)

Angina Pectoris

- Transient precordial pain, brought on by exertion and relieved by rest
- Pain may be vague or crushing; may radiate to left shoulder, jaw, throat, teeth, arms
- Pain may be worse after meal or in cold weather; may change as collateral circulation builds up
- Usually relieved with sublingual nitroglycerin (NTG) within 2-3 min.
- EKG often normal with attacks
  - exercise test may show ST abnormalities that help with diagnosis (ST depression = ischemia)

Unstable Angina

- More severe form of angina
- Same etiology as exertional angina
- Variant angina (Prinzmetal's angina) = angina at rest with ST segment elevation during attack
- May occur at same time of day
- Felt to be from coronary artery spasm

Acute Myocardial Infarction

- When insufficient coronary blood supply persists after myocardial energy reserves have been depleted, the myocardial cells become irreversibly ischemic and the process of necrosis termed “myocardial infarction”
- Pain not relieved with NTG
- Apprehension and sense of “doom”
- Most MI’s occur at 9 a.m. on Mondays

Five major signs and symptoms of MI

- pain or discomfort in the jaw, neck, or back
- feeling weak, lightheaded, or faint
- chest pain or discomfort
- pain or discomfort in the arms or shoulder
- and shortness of breath

MI

- All symptoms typically come and go on a 3-5 minute cycle.

- In women the signs may be:
  - More significant nausea
  - Back pain (above the kidney area)
  - No neck or arm pain, often little chest pain
  - These signs and symptoms cycle on a 3-5 minute rate as well

Table 2-4

HISTORY AND PHYSICAL IN THE EVALUATION OF POSSIBLE ACS

Increases likelihood that chest pain is from CHD	Decreases likelihood that chest pain is from CHD
Pressure-like quality	Pleuritic quality
Radiation to either arm, neck, or jaw	Constant pain for days
Diaphoresis	Pain lasting less than 2 minutes
Third heart sound	Discomfort localized with one finger
Pain that is similar to prior MI pain	Discomfort reproduced by movement or palpation

All scans:
"Case Files in Internal Medicine"; Lange Publishing; 2007

Table 20–2

DIFFERENTIAL DIAGNOSIS OF CHEST PAIN

DISORDER	SYMPTOMS/FINDINGS	STUDIES
Angina	Substernal pressure for duration <30 min Radiation to arm, neck, jaw ± dyspnea, N/V, diaphoresis ↑ with exertion; ↓ with rest and NTG	EKG, CXR, serum values
MI	Anginal symptoms but duration >30 min	EKG, CXR, serum values
Pericarditis	Sharp pain radiates to trapezius ↑ with respiration; ↓ with sitting forward	Friction rub, EKG, ± pericardial effusion
Aortic dissection	Sudden onset of tearing pain with radiation to back	CXR, widened mediastinum CT, TEE, MRI
Heart failure	Exertional chest pain and dyspnea (uncommon cause of angina, but often patients may also have CAD)	CXR, displaced apical impulse, edema (pulmonary, lower extremities), JVD, cardiac gallop, murmurs

Pneumonia	Dyspnea, fever, and cough; pleuritic pain	CXR, egophony, dullness to percussion
Pneumothorax	Unilateral sharp pleuritic pain of sudden onset, CXR findings	Unilateral ↓ breath sounds and/or hyperresonance
Pulmonary embolism	Sudden onset of pleuritic pain, tachycardia, tachypnea, hypoxemia	D-dimer, V/Q scan, CT chest, pulmonary angiogram
Gastroesophageal reflux	Burning epigastric/substernal pain, acid taste in mouth, ↑ with meals; ↓ with PPIs or antacids	Endoscopy, esophageal pH probe
Peptic ulcer disease	Epigastric pain ↓ with antacids and PPIs	Endoscopy *Helicobacter pylori* test
Pancreatitis	Severe epigastric and back pain	↑ amylase and lipase, abdominal CT

Table 20–2

DIFFERENTIAL DIAGNOSIS OF CHEST PAIN

DISORDER	SYMPTOMS/FINDINGS	STUDIES
Costochondritis	Localized pain that is easily reproducible, tender to palpation	Tenderness to palpation
Anxiety	"Tightness" sensation of chest. SOB, tachycardia	Ask screening questions for anxiety and panic
Herpes zoster	Pain often presents prior to rash	Unilateral pain in dermatomal distribution

Abbreviations: ↓, Decreasing; ↑, increasing; CAD, coronary artery disease; CT, computed tomography; CXR, chest x-ray; EKG, electrocardiogram; JVD, jugular venous distension; MI, myocardial infarction; MRI, magnetic resonance imaging; NTG, nitroglycerin; N/V, nausea and vomiting; PPI, proton pump inhibitor; SOB, shortness of breath; TEE, transesophageal echocardiogram.

PERICARDITIS

- Usually more localized, sternal or over cardiac apex
- sharp, stabbing, knife-like pain
- lasts hours to days
- aggravated by deep breathing or lying supine and relieved by sitting up and leaning forward
- may auscultate friction rub

Inflammatory Pericarditis

- Most cases are idiopathic or have a viral etiology
- Patients typically complain of sharp central chest pain that worsens with recumbency and is relieved by leaning forward
- Pain may be pleuritic in nature and may radiate to the trapezius muscle
- Patients may reveal the pathognomonic finding for pericarditis: the **pericardial friction rub**
- ECHO is a more accurate test

Table 18–1
COMMON CAUSES OF ACUTE PERICARDITIS

Idiopathic pericarditis: specific diagnosis unidentified, presumably either viral or autoimmune and requires no specific management
Infectious: viral, bacterial, tuberculous, parasitic
Vasculitis: autoimmune diseases, postradiation therapy
Hypersensitivity/immunologic reactions, e.g., Dressler syndrome
Diseases of contiguous structures, e.g., during transmural myocardial infarction
Metabolic disease, e.g., uremia, Gaucher disease
Trauma: penetrating or nonpenetrating chest injury
Neoplasms: usually thoracic malignancies such as breast, lung, or lymphoma

Data from Spodick DH. Acute pericarditis: Current concepts and practice. JAMA 2003; 289:1150–1153.

Considerations

In patients with chest pain, one of the primary diagnostic considerations is always myocardial ischemia or infarction. This is particularly true when the ECG is abnormal with changes that may represent myocardial injury, such as ST elevation. However, other conditions may produce ST elevation, such as acute pericarditis. ECG findings can help distinguish between these two diagnoses.

APPROACH TO ACUTE PERICARDITIS

Acute pericarditis is an inflammation of the pericardial sac surrounding the heart. It can result from a multitude of disease processes, but the most common causes are listed in Table 18–1.

There is a wide spectrum of clinical presentations, from subclinical or inapparent inflammation, to the classic presentation of acute pericarditis with chest pain, to subacute or chronic inflammation, persisting weeks to months. Most patients with acute pericarditis seek medical attention because of **chest pain**. The classic description is a sudden onset of substernal chest pain, which worsens on inspiration and with recumbency, that often radiates to the trapezius ridge and is improved by sitting and leaning forward. Other clinical features vary according to the cause of the pericarditis, but most patients are thought to have viral infection and often present with low-grade fever, malaise, or upper respiratory illness symptoms.

Table 18–2

PERICARDITIS VERSUS MYOCARDIAL INFARCTION

ECG	ACUTE PERICARDITIS	ACUTE MI
ST-segment elevation	Diffuse: in limb leads as well as V_2–V_6	Regional (vascular territory), e.g., inferior, anterior, or lateral
PR-segment depression	Present	Usually absent
Reciprocal ST-segment depression	Absent	Typical, e.g., ST-segment depression inferiorly with anterior ischemia (ST elevation)
QRS complex changes	Absent	Loss of R-wave amplitude and development of Q waves

DISSECTING AORTIC ANEURYSM

- anterior chest pain, may radiate to back
- excruciating, tearing pain; sudden onset, lasts hours to days
- pain unrelated to anything
- BP lower in left arm

Aortic Dissection

- Occurs in ascending aorta; caused by a break in the intima allowing blood to flow in a plane between the media and adventitia
- Pain is severe, chest or neck; may radiate to back and later to abdomen
- Peripheral pulses and BP may be unequal
- Syncope, hemiplegia or paralysis of the lower extremities may occur
- CT and transesophageal echocardiography

A 42-year-old man is brought to the emergency room by ambulance after a sudden onset of severe retrosternal chest pain that began an hour ago while he was at home mowing the lawn. He describes the pain as sharp, constant, and unrelated to movement. It was not relieved by three doses of sublingual nitroglycerin administered by the paramedics while en route to the hospital. He has never had symptoms like this before. His only medical history is hypertension, for which he takes enalapril. There is no cardiac disease in his family. He does not smoke, drink alcohol, or use illicit drugs. He is a basketball coach at a local high school, and is usually very physically active.

On physical examination, he is a tall man with long arms and legs who appears uncomfortable and diaphoretic; he is lying on the stretcher with his eyes closed. He is afebrile, with a heart rate of 118 bpm, and blood pressure of 156/100 mmHg in the right arm and 188/94 mmHg in the left arm. His head and neck exam is unremarkable. His chest is clear to auscultation bilaterally, and incidental note is made of pectus excavatum. His heart rate is tachycardic and regular, with a soft, early diastolic murmur at the right sternal border. His abdominal exam is benign, and neurologic exam is nonfocal. His chest x-ray shows a widened mediastinum.

- **What is the most likely diagnosis?**

Table 6–1

CLINICAL MANIFESTATION OF AORTIC DISSECTION

Horner syndrome	Compression of the superior cervical ganglion
Superior vena cava syndrome	Compression of the superior vena cava
Hemopericardium, pericardial tamponade	Thoracic dissection with retrograde flow into the pericardium
Aortic regurgitation	Thoracic dissection involving the aortic root
Bowel ischemia, hematuria	Dissection involving the mesenteric arteries or renal arteries
Hypertension, different blood pressures in arms	Thoracic dissection involving brachiocephalic artery
Hemiplegia	Carotid artery involvement

Pneumothorax

- Air may enter the pleural space through the chest wall or mediastinum, but usually from rupture of visceral pleura
- If large, may have chest pain of affected side with dyspnea; if small, no sx
- ↓ breath sounds with hyperresonance to percussion
- ABGs show hypoxemia; CXR shows free air and **contralateral shift of mediastinal structures**

Atelectasis

- A shrunken and airless state of all or part of the lung often accompanied by infection
- Chest exam reveals absent lung sounds and dullness over affected area (large)
- Eventually both types develop a cough
- X-ray shows airless area of lung; size and shape will depend upon the bronchi involved; trachea, heart and **mediastinum will deviate toward affected side** in large amount of atelectasis

Noncardiac causes of chest pain

- **GI disorders**: peptic ulcer, esophageal reflux, hiatal hernia, cholecystitis; pain usu burning, cramping, aching; worse supine; may be meal related
- **Musculoskeletal disorders**: variable location; aching pain, made worse with movement or palpation; touching surface of chest aggravates the pain.
- **Spontaneous Pneumothorax**: unilateral location; sharp, localized; sudden onset lasting many hrs; dyspnea, SOB, painful breathing

Noncardiac causes of chest pain

- **Pulmonary Embolism**: pleurisy type pain, dyspnea, pleural rub, pain over area of infarction; hemoptysis with lg infarction
- **Pulmonary Hypertension**: substernal pain, pressure, dyspnea, accentuated pulmonary second heart sound
- **Anxiety States**: localized pain, sharp, burning; moves from place to place, brief duration, ↑ with emotional situations; frequent sighing

Cough Syndromes

Consolidation

- Is a loss of air in alveoli without overall loss of volume of lung tissue
- Alveolar air is replaced by blood or inflammatory exudate, so the volume does not change.
- Bronchi in the consolidated area are patent

Pleuritis

- Pain localized, sharp and ↑ with cough, sneeze, deep breath or movement
- Old term is “pleurisy”
- Frequent causes are viral respiratory inf or pneumonia
- Friction rubs can be heard with auscultation; may have a “leathery squeak” component

Pleural effusion

- Abnormal accumulation of fluid in pleural space; 5 major types occur:
- **Transudate**—seen in CHF
- **Exudate**—seen in infections
- **Empyema**—walled off infection
- **Hemorrhagic** (hemothorax)—seen with pulmonary embolus
- **Chyliform** (chylothorax)—due to lymph fluid

Pneumonia

- Pathogens Strep pneumo, H. flu, Gram (-) bacteria, Moraxella catarrhalis, Staph aureus
- Remember Klebsiella pneumonia is common in chronic alcoholics
- E. coli is almost always assocaited with diabetes

CLINICAL PEARLS

Elderly patients often have fewer or less-severe symptoms or atypical presentations of pneumonia. Consider pneumonia in the differential diagnosis of altered mental status in the elderly.

Appropriate use of influenza and pneumococcal vaccination reduces the risk of pneumonia in susceptible populations.

Consider the diagnosis of empyema in patients with pneumonia and a pleural effusion, especially if the patients continue to have fever despite appropriate antibiotic therapy.

Lung Abscess

- Majority are bacterial (65% of these are anaerobes)
- 50% of lung abscesses are due to aspiration of bacteria when pt is recumbent e.g. coma, anesthesia, substance abuse or stroke or those with problems swallowing or coughing
- Symptoms include fever, chills, pain, weakness, wt loss and in 75% of cases foul or musty-smelling sputum mixed with blood

Asthma

- Asthma is easily recognized by episodic dyspnea, nonproductive cough and/or wheezing in the absence of COPD; an increased responsiveness of the tracheobronchial tree to a variety of stimuli.
- Wheezing is usually reversible with therapy
- Lung function is normal between flare-ups, but some develop chronic and fixed airflow obstruction.

Conditions that can mimic asthma

- CHF
- PE
- GE reflux
- Foreign body aspiration
- Upper airway obstructions that cause stridor e.g. tumors, tracheal stenosis

Asthma

- Airway obstruction due to mucosal edema from inflammation, smooth muscle contraction and mucous plugging.
- Basic pathology is a chronic desquamating eosinophilic bronchitis involving bronchial walls of small and medium caliber airways
- Eosinophilia is seen commonly

Asthma

- The worst complication of asthma is respiratory arrest.

- People die every year from poorly treated asthma. Roughly 4000-5000 in US annually.

GUIDELINES FOR DIAGNOSIS AND MANAGEMENT OF ASTHMA

CLASSIFICATION	STEP	DAYS WITH SYMPTOMS	NIGHTS WITH SYMPTOMS	DAILY MEDICATION	QUICK RELIEF MEDICATION
Severe persistent	4	Continual	Frequent	High-dose inhaled steroids and long-acting inhaled β_2-agonist; if needed, add oral steroids	Short-acting inhaled β_2-agonist, as needed; oral steroids may be required
Moderate persistent	3	Daily	>1/week	Low-to-medium–dose inhaled steroids and long-acting β_2-agonist (preferred) or medium-dose inhaled steroids or low-to-medium–dose inhaled steroids and either leukotriene modifier or theophylline	Short-acting inhaled β_2-agonist, as needed; oral steroids may be required
Mild persistent	2	>2/week, but <1 time/day	>2/month	Low-dose inhaled steroids (preferred) or cromolyn, leukotriene modifier, or nedocromil, or sustained-release theophylline to serum concentration of 5–15 μg/mL	Short-acting inhaled β_2-agonist, as needed; oral steroids may be required
Mild intermittent	1	<2/week	<2/month	No daily medications	Short-acting inhaled β_2-agonist, as needed; oral steroids may be required

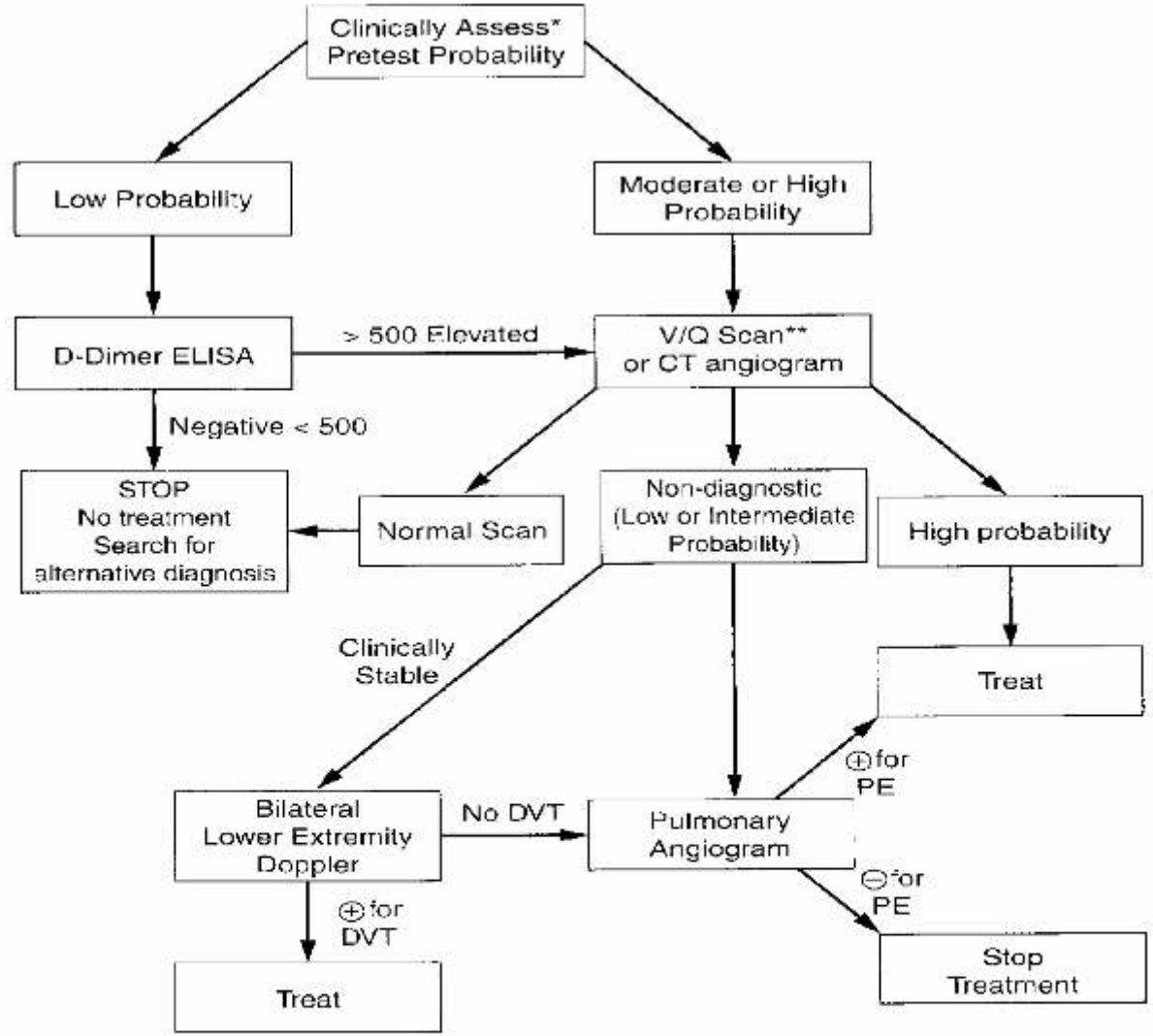
Hemoptysis

- Hemoptysis is:
  - TB or
  - Lung Cancer
  - Until proven otherwise!

A 48-year-old woman calls 911 and is brought to the emergency room complaining of a sudden onset of dyspnea. She reports she was standing in the kitchen making dinner, when she suddenly felt as if she could not get enough air, her heart started racing, and she became lightheaded and felt as if she would faint. She denied chest pain or cough. Her medical history is significant only for gallstones, for which she underwent a cholecystectomy 2 weeks previously. The procedure was complicated by a wound infection, requiring her to stay in the hospital for 8 days. She takes no medications regularly, only for acetaminophen as needed for pain at her abdominal incision site.

On examination, she is tachypneic with a respiratory rate of 28 breaths per minute, oxygen saturations 84% on room air, heart rate 124 bpm, and blood pressure 118/89 mmHg. She appears uncomfortable, diaphoretic, and frightened. Her oral mucosa is slightly cyanotic, her jugular venous pressure is elevated, and her chest is clear to auscultation. Her heart rhythm is tachycardic but regular with a loud second sound in the pulmonic area, but no gallop or murmur. Her abdominal examination is benign, with a clean incision site without signs of infection. Her right leg is moderately swollen from mid-thigh to her feet, and her thigh and calf are mildly tender to palpation. Laboratory studies including cardiac enzymes are normal, her ECG reveals only sinus tachycardia, and her chest x-ray is interpreted as normal.

Pulmonary Embolism



* Clinical clues:

1. Sudden onset of dyspnea or worsening of chronic dyspnea
2. Pleuritic chest pain or pleural rub
3. Hypoxemia (SaO_2 < 92%)
4. Hemoptysis
5. Recent surgery or immobilization
6. Prior Hx of DVT or PE

Figure 37–1. Diagnostic algorithm for suspected pulmonary embolism. DVT = deep venous thrombosis; ELISA = enzyme-linked immunoabsorbent assay; PE = pulmonary embolism; V/Q = ventilation/perfusion.

CLINICAL PEARLS

Acute onset of dyspnea or hypoxemia with a normal chest X-ray should be considered a pulmonary embolism until proven otherwise.

Diagnosis of pulmonary embolism is usually established using non-invasive testing (V/Q scan or CT angiography) considered in the light of pretest probability.

The primary therapy of DVT or PE is anticoagulation, with the goal of preventing recurrence.

Bronchogenic Carcinoma

- Bronchogenic carcinoma refers to a group of aggressive malignant tumors of the lung
- Most common cause of death due to cancer in the U.S. for both men and women (30% and 23%)
- Tobacco smoking most important cause; “Second-hand” tobacco smoke increases risk by 40-70%

Bronchogenic Carcinoma

- Bronchogenic carcinoma begins as an area of in situ
- Common symptoms and signs (cough, dyspnea, wheezing and hemoptysis)
- Hemoptysis, any change in the pattern of cough, unexplained chest pain, recurrent pain, unintentional weight loss with anorexia or hoarseness in a 2 pack/day smoker over 40 yrs of age
- Chest pain is a late symptom

Clinical Features of Bronchogenic Carcinoma			
Tumor	Incidence	Radiologic Findings	5-Year Survival
Adeno-carcinoma	35%	Peripheral mass, solitary nodule	27%
Squamous cell	30%	Hilar mass, atelectasis or post-obstructive pn.	37%
Large cell	15%	Large peripheral mass	27%
Small cell	20%	Hilar mass, adenopathy	<1%

Syncope

- “Partial or complete loss of consciousness with interruption of awareness of oneself and ones surroundings. When the loss of consciousness is temporary and there is spontaneous recovery, it is referred to as syncope or, in nonmedical quarters, fainting. Syncope accounts for one in every 30 visits to an emergency room.” ***(medterms.com)***
  - Most causes are NON-CARDIAC – but, because the cardiac causes have significant mortality and morbidity they must be worked up.
- Cardiac causes include:
  - Abnormal heart rhythms.
  - Abnormalities of the heart valves (aortic stenosis or pulmonic valve stenosis).
  - High blood pressure in the arteries supplying the lungs (pulmonary artery hypertension).
  - Tears in the aorta (aortic dissection).
  - Widespread disease of the heart muscle (cardiomyopathy).

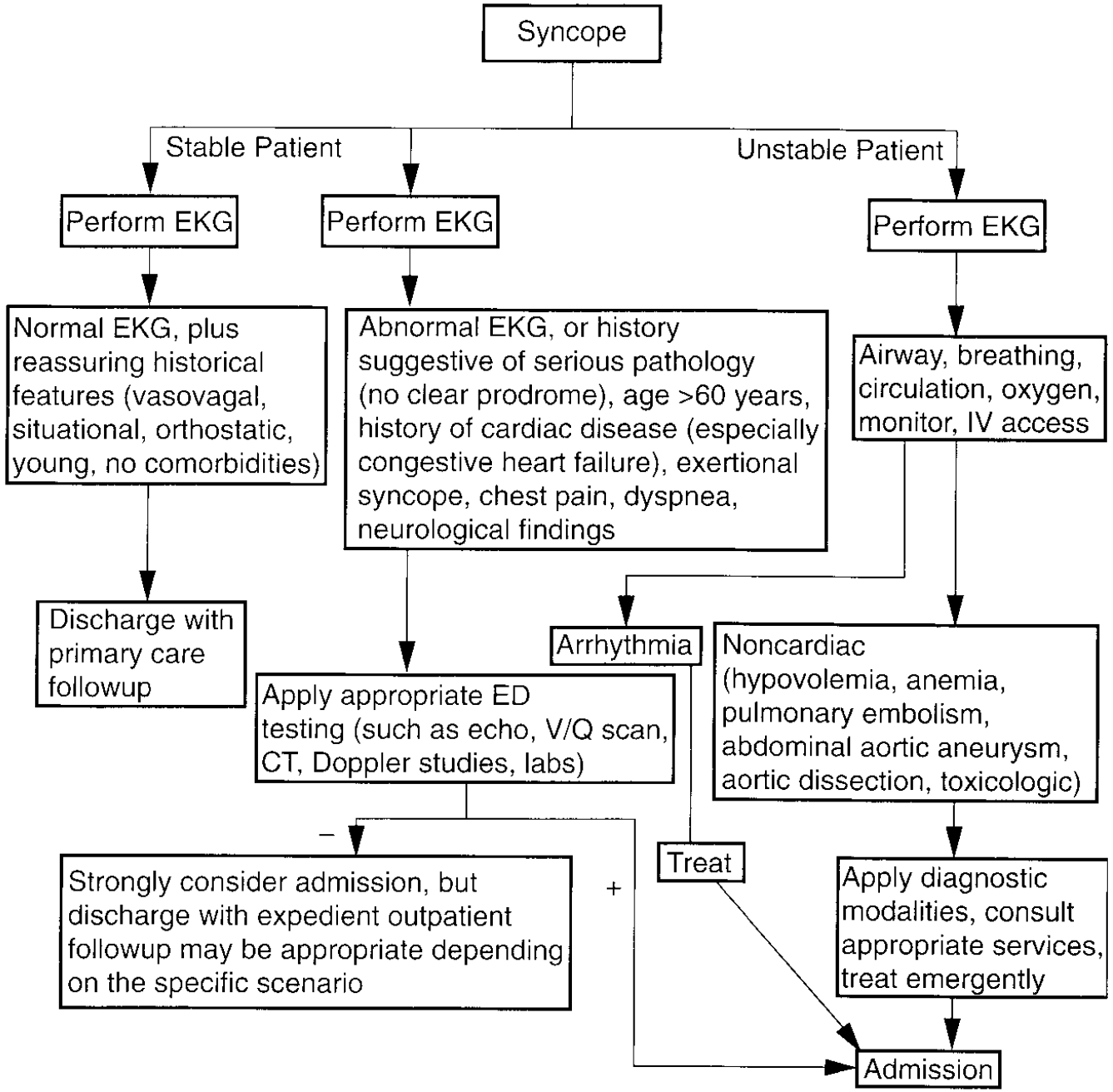


Figure 13-1. Algorithm of syncope evaluation.

Hypertensive Encephalopathy

- Diastolic pressure over 120
- Grade 4 retinal changes (next slide)
- Syncope, confusion, drowsiness, h/a, nausea
- May lead to rupture and hemorrhage of CNS vasculature.
- Acute Tx: Next slide - and EMS

Agent	Dosage	Onset/Duration of Action (after discontinuation)	Precautions
Captopril	25 mg PO; repeat as needed; SL, 25 mg	15-30 min/6-8 hr SL 10-20 min/2-6 hr	Hypotension, renal failure, bilateral renal artery stenosis
Clonidine	0.1-0.2 mg PO, repeat hourly as required to total dosage of 0.6 mg	30-60 min/8-16 hr	Hypotension, drowsiness, dry mouth
Labetalol	200-400 mg PO; repeat every 2-3 hr	1-2 hr/2-12 hr	Bronchoconstriction, heart block, orthostatic hypotension
Amlodipine	2.5-5 mg	1-2 hr/12-18 hr	Tachycardia, hypotension

The Nerve Head with Papilledema Indicates Grade-4 Hypertensive Retinopathy

PAPILLEDEMA, DUE TO SEVERE HTN

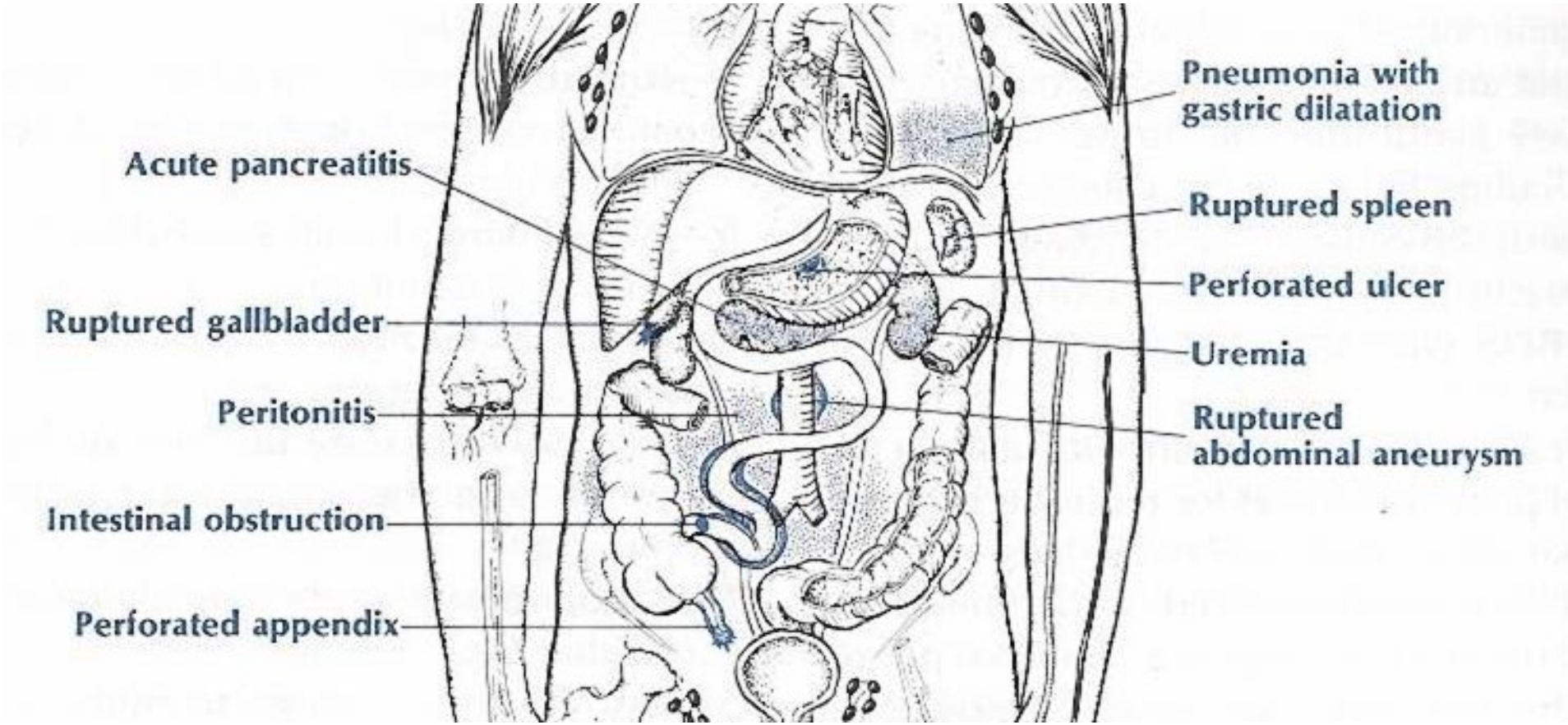
Abdomen

We aren’t spending much time on acute abdomen, but the slides are here for reference

Referred Pain Patterns

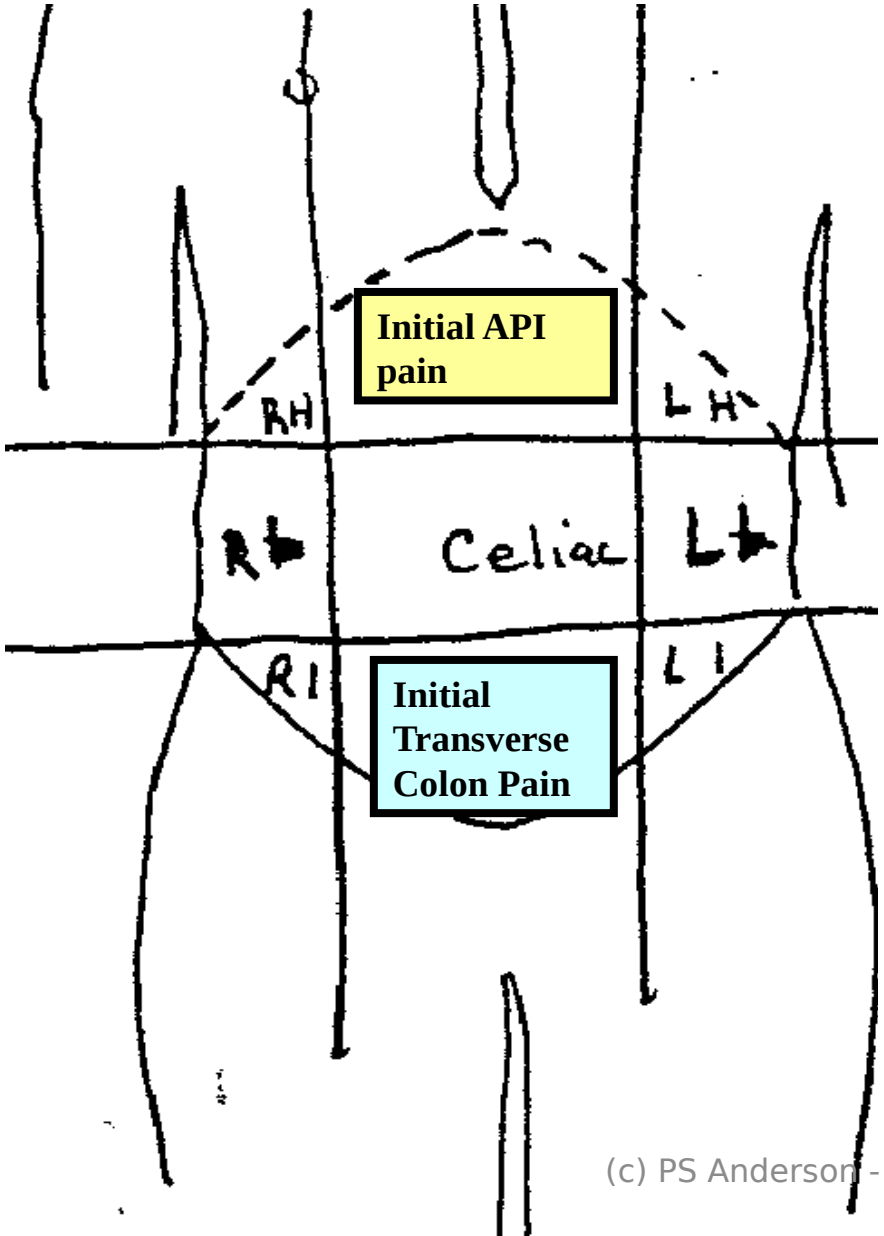
- **Stomach** - 5th Rib (Left) - to - Mid Lumbar Region, Midline to Left Lateral Border : Dorsal & Ventral Epigastric area
- **Liver** - Same position as Stomach on Right half of Body. Dorsal and Ventral. Right Scapula.
- **Gallbladder** - Murphy's Point, Right Upper Quadrant, Right Scapula
- **Appendix** – McBurney's Point, Right Lower Quadrant, Right Dorsal Flank, Celiac area
- **Colon, Small Intestine** - Celiac, Local area of Large Intestine
- **Rectum** - Suprapubic area, Sacral area
- **Kidneys** - Costovertebral Area, Bilateral Dorsal Flanks, Right & Left Dorsal Iliac Crests
- **Ureters** - Left Inferior Iliac Crest, Left Inguinal Area, Left Labia/Testicle

Differential Diagnosis



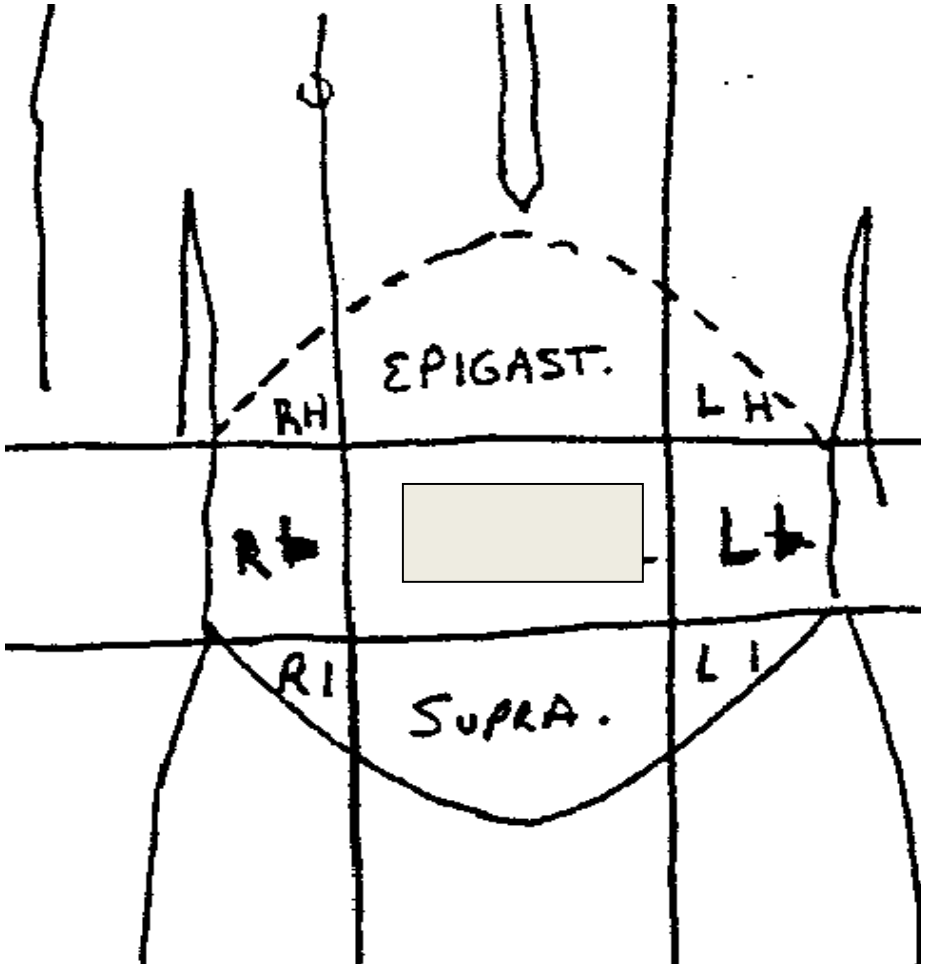
Generalized Abdominal Pain

Initial pain is often remote!



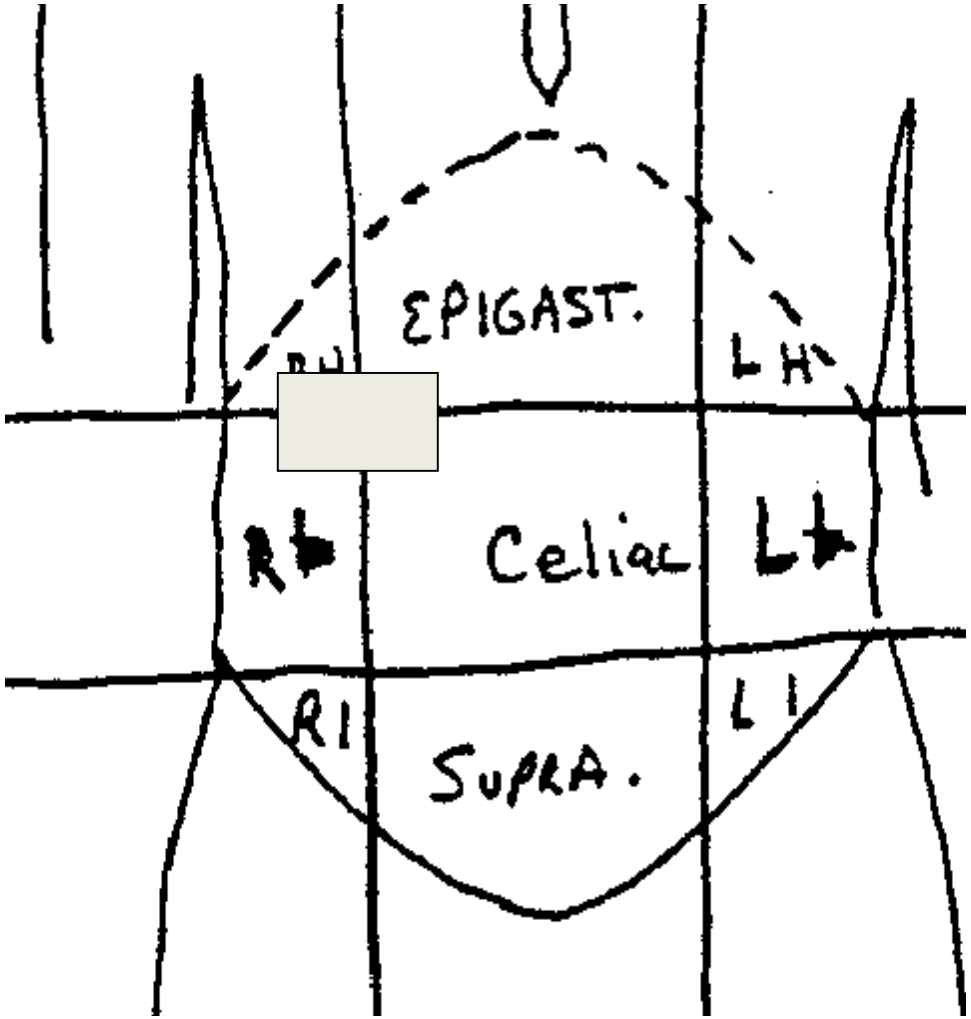
- API (appendicitis) pain may start high
- Transverse colon pain may start low

Central / Celiac pain



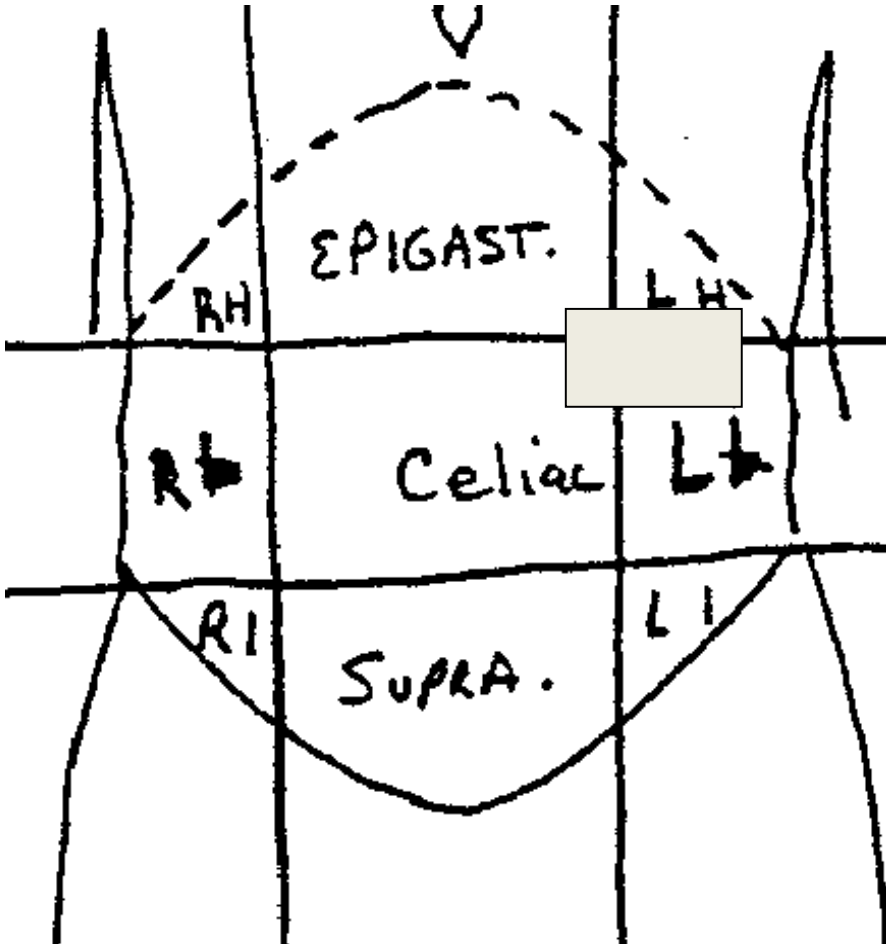
- Acute / Early API
- Acute small bowel obstruction
- Acute gastritis
- Acute pancreatitis
  - May also be Epigastric
- Acute intestinal colic

RUQ / Right Hypochondrium



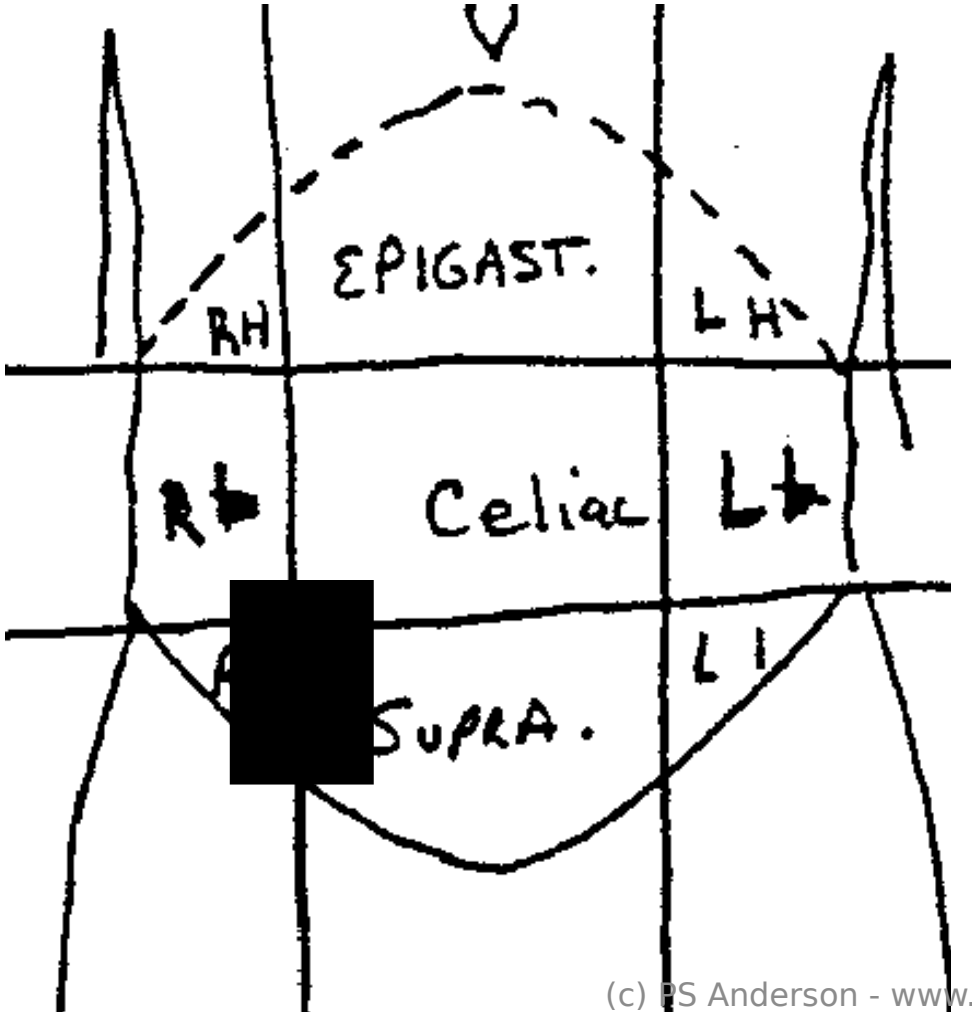
- Pleuritic pain
- Acute API (high organ)
- Acute cholecystitis
- Leaking duodenal ulcer
- Subphrenic abscess

LUQ / Left Hypochondrium



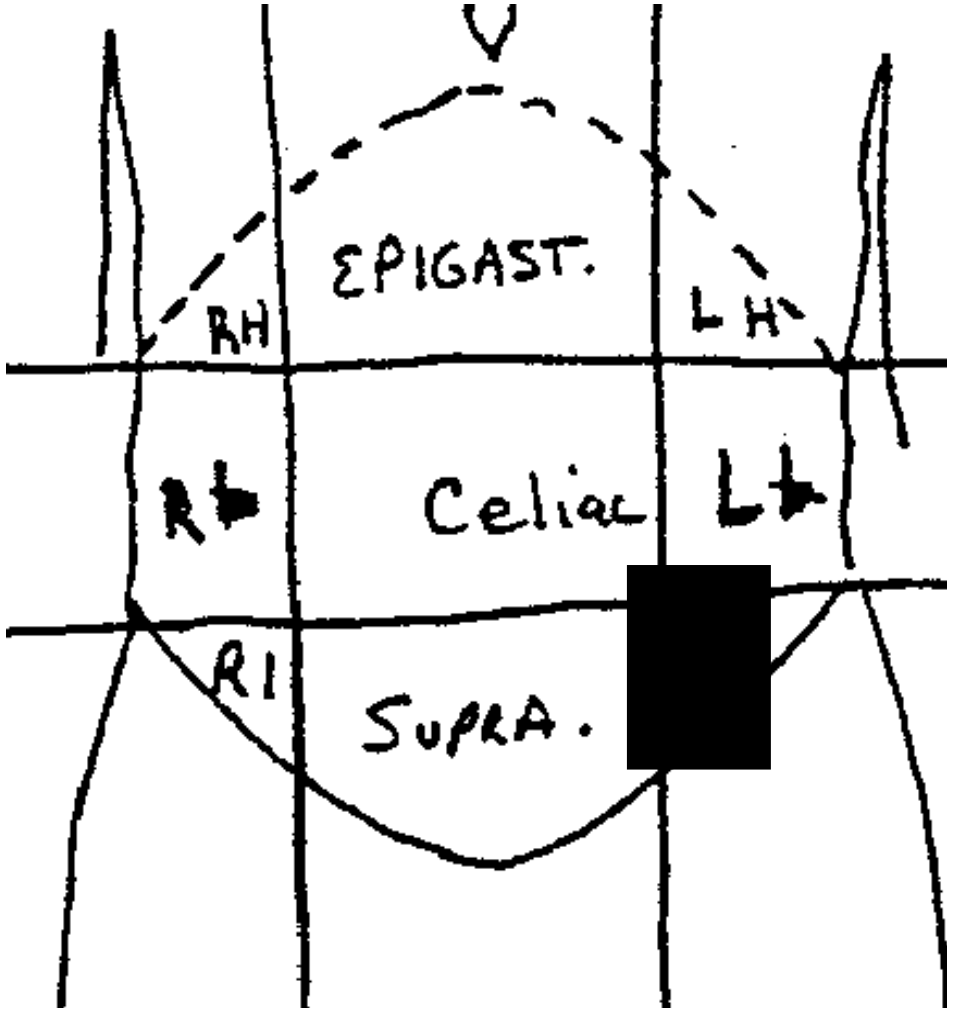
- Spleen
  - Pain
  - Rupture
  - Artery aneurysm
- Subphrenic abscess
- Perforated gastric ulcer
- Jejunal diverticulitis

Right iliac pain



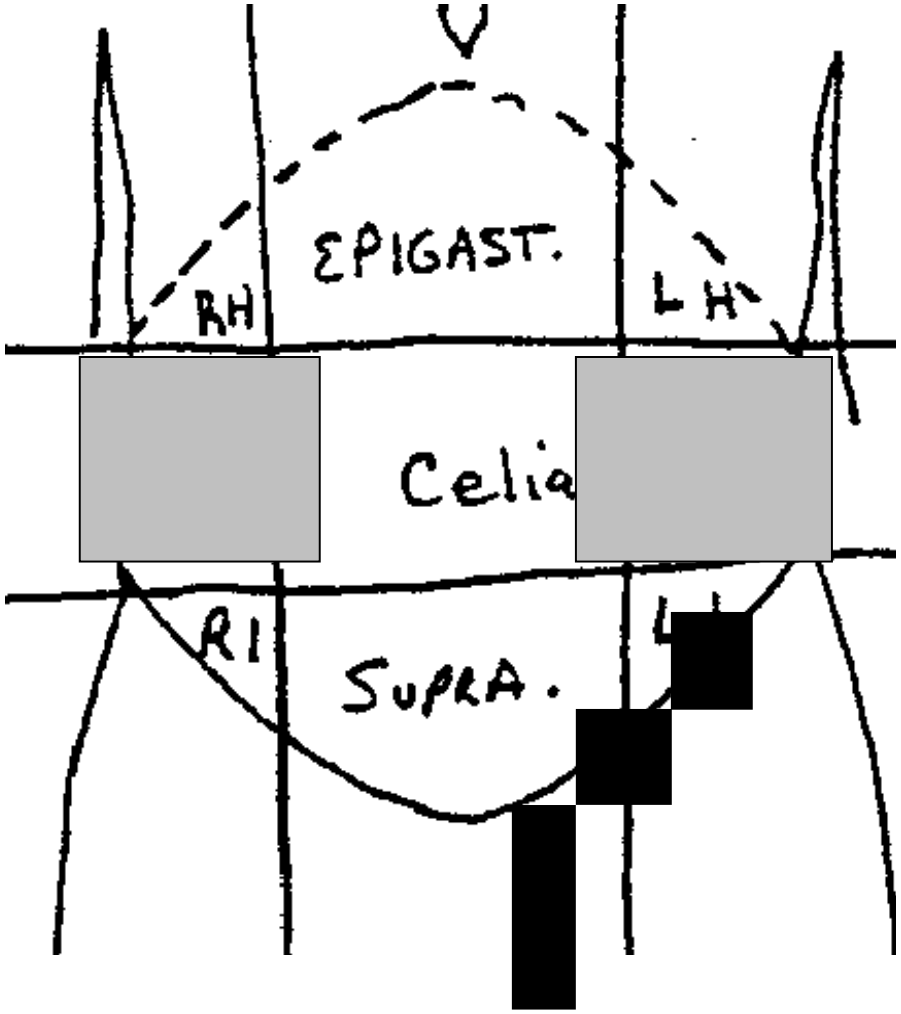
- Major:
  - API
  - Crohn’s
  - Mesenteric Adenitis
  - Leaking duodenal ulcer

Left iliac pain



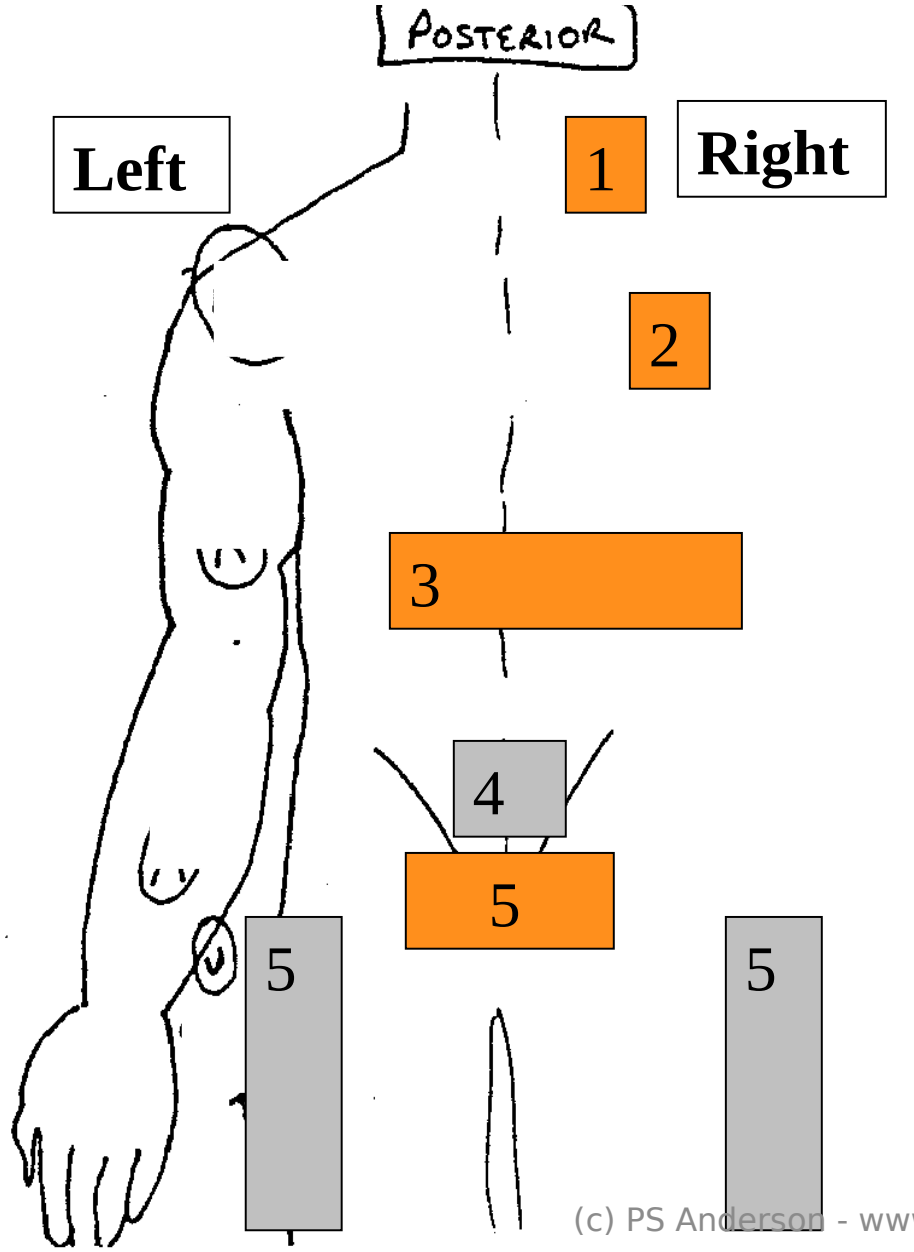
- <u>DIVERTICULITIS</u>
- Peritonitis (spreading)
- Pericolitis (around colon cancer)

Flank & Left Inguinal / Iliac pain

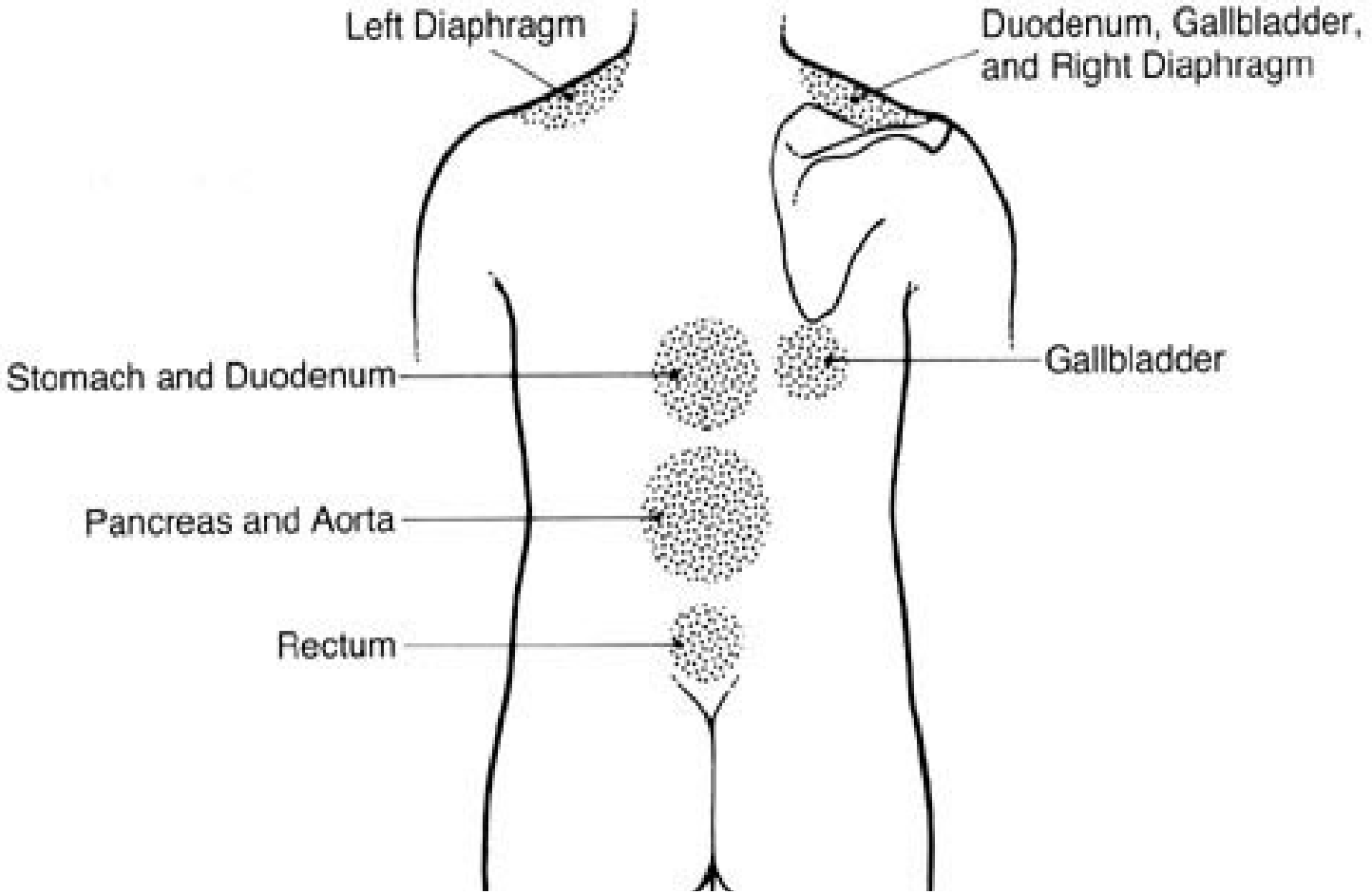


- Black:
  - Ureteric pain
  - Can be either side
- Grey:
  - Kidney pain

Posterior pain patterns



1. Perforated duodenal ulcer
2. Biliary colic
3. Acute Pancreatitis / Renal colic
4. Uterine / Rectal pain
5. Colon pain



GI Chest Pain

- Esophageal spasm
  - May mimic MI or angina
  - May respond to nitrates, IV Glucagon, or calcium-channel blockers

- Gastritis/esophagitis
  - Burning chest pain
  - Demulcent / anesthetic po (orally) will usually decrease or stop pain

Esophageal Reflux

- **Diagnosis**
  - **By history**
    - **Response to demulcents…**
  - **Esophagoscopy** will show esophagitis.
  - Barium swallow may show reflux from stomach to esophagus

Peptic Ulcer Disease

- Gastric Ulcer
  - 25% of all PUD
  - Male = Female
  - H.pylori ~ 75% of cases
    - Blood type A / NSAIDS / Smoking / Bile reflux
  - Lesser curvature (Gr. Curvature Incr. CA risk)
  - Complications: Perforation / Bleeding.
  - Burning epigastric pain post-eating. Pain **WORSE with food** intake better antacid/milk/fish
- Duodenal Ulcer
  - 75% of all PUD
  - Male/ Female 2:1
  - Burning epigastric pain, 1-3 hours after eating, **better EATING**, Antacids.
  - H.pylori >90% of cases
    - Blood group O / Multiple Endocrine Neoplasia

Pancreatitis

- Etiology: many but two most common
  - Alcohol and gallstones (>90%)
- Symptoms:
  - Epigastric sharp to boring pain w/ ½ patients having radiation to back
  - Alleviated by sitting up or fetal position
  - Aggravated by movement
  - Assoc w/ nausea, vomiting and anorexia
- Diagnosis: confirmed by
  - Lab: elevated amylase and lipase
  - Abdominal x-ray vs CT scan

Cholelithiasis

- **Symptoms**
  - Nausea, vomiting, abdominal pain, RUQ tenderness
  - Variable fever, leukocytosis, mild elevation of bilirubin, elevated alkaline phosphatase

- **Physical Exam and Lab**
  - Murphy’s sign may be present
  - Involuntary guarding of right-sided abdominal muscles
  - Ultrasound

Cholecystitis

- Acute inflammation of the gallbladder wall
- 95% of those with cholecystitis will have cholelithiasis

- **Symptoms**
  - Similar to biliary colic (nausea, vomiting, abdominal pain, RUQ tenderness)
  - Variable fever, leukocytosis, mild elevation of bilirubin, elevated alkaline phosphatase
  - Amylase elevation suggests (but does not confirm) gallstone pancreatitis

Hepatitis

- Classified into acute hepatitis (self-limited liver injury of <6 months) and chronic hepatitis (hepatic inflammation >6 months).
- Acute Hep often Hep-A infection (fecal – oral), drug reaction etc.

Signs and Symptoms

- Fever, nausea, vomiting, anorexia, vague RUQ abdominal pain, jaundice, headache, myalgia and/or arthralgia

- Smokers may find tobacco tastes bad

- Pronounced elevation of liver enzymes in acute hepatitis and variable increase with chronic

Ascites

- **Ascites** is a pathologic accumulation of serous fluid within the abdomen

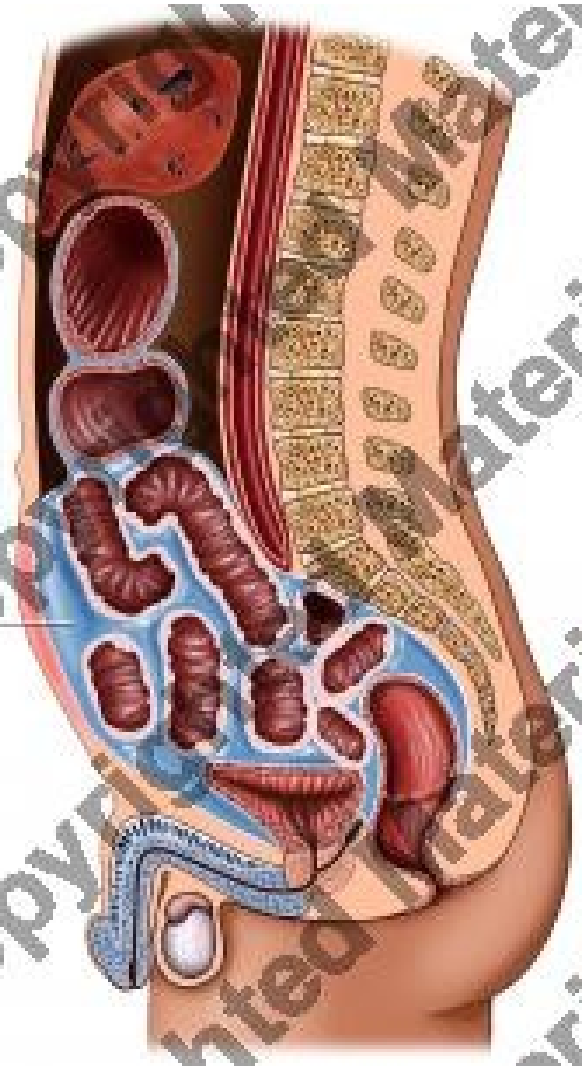
- Think: Intra-abdominal masses (CANCER), Liver disease

- **Signs and Symptoms**
  - Percussion of the flanks helps reveals dullness
  - Fluid will shift upon rotating the patient in the right or left lateral positions
  - Shifting dullness indicates the presence of at least 1.5 liters of ascites

Ascites

© ADAM

Increased amount of fluid between abdominal structures



Gastric Cancer

- Adenocarcinoma 95% of cases
- The chance of getting stomach cancer is higher if the patient:
  - has had an infection of the stomach caused by Helicobacter pylori
  - is older
  - is male
  - smokes cigarettes
  - frequently eats a diet that includes lots of dry, salted foods

Gastric Cancer (Symptoms)

- Unintended weight loss and lack of appetite
- Abdominal pain
- Vague discomfort in the abdomen
- A sense of fullness in the upper abdomen
- Heartburn, indigestion, or ulcer-type symptoms
- Nausea
- Vomiting, with or without blood
- Swelling of the abdomen due to

Appendicitis

- Appendicitis is a common cause of abdominal pain
  - most common in adolescence and young adult years
- **Signs and Symptoms:**
  - periumbilical or epigastric pain that migrates to right lower quadrant
  - ***Pain may be felt in flank (retrocecal appendix, pregnancy), testicle (retroileal appendix), or bladder***

Appendicitis

- **Diagnosis:**
  - CBC with differential
  - UA
  - pregnancy test should be obtained on women with lower abdominal pain
  - Mild to moderately elevated WBC with left shift is typical but **WBC is normal in 10%.**

Diverticulosis/Diverticulitis

- **Diverticulum (plural, diverticula)**
  - Outpouching of the bowel wall usually between 0.1 to 1 cm in diameter
  - Most occur in the sigmoid and descending colon
- **Diverticulosis**
  - Presence of multiple diverticula. Does not imply a pathologic condition. In industrialized countries, up to half of the population older than 50 years of age has colonic diverticulosis
- **Diverticulitis**
  - Inflammation and infection in one or more diverticula

Diverticulosis/Diverticulitis

- **THINK "Left-Sided Appendicitis"**
- **Signs and Symptoms (Diverticulitis):**
  - Abdominal tenderness to palpation with possible rebound tenderness
  - A palpable mass may be present, representing an abscess or inflammatory phlegmon
  - Bowel sounds may be active if there is partial obstruction; hypoactive or absent if peritonitis has developed
  - CT scan is the imaging procedure of choice especially if the diagnosis is uncertain
  - Sigmoidoscopy may be performed cautiously
  - Colonoscopy is contraindicated in the case of acute diverticulitis

A 61-year-old man comes to the emergency room complaining of 3 days of worsening abdominal pain. The pain is localized to the left lower quadrant of his abdomen. It began as an intermittent crampy pain and now has become steady and moderately severe. He feels nauseated, but he has not vomited. He had a small loose stool at the beginning of this illness, but he has not had any bowel movements since. He has never had symptoms like this before, nor any gastrointestinal illnesses.

On examination, his temperature is 100.2°F, heart rate 98 bpm, and blood pressure 110/72 mmHg. He has no pallor or jaundice. His chest is clear, and his heart rhythm is regular without murmurs. His abdomen is mildly distended with hypoactive active bowel sounds and marked left lower quadrant tenderness with voluntary guarding. Rectal examination reveals tenderness, and his stool is negative for occult blood.

Laboratory studies are significant for a white blood cell (WBC) count of 11,800/mm^3 with 74% polymorphonuclear leukocytes, 22% lymphocytes, and a normal hemoglobin and hematocrit. A plain film of the abdomen shows no pneumoperitoneum and a nonspecific bowel gas pattern.

Clinical Presentation The **typical presentation of bowel obstruction involves pain, emesis, constipation, obstipation, distension, tenderness, visible peristalsis, and/or shock.** The presence or absence of these signs and symptoms are dependent on the severity of the obstruction. Pain associated with bowel obstruction is generally severe at the onset and is characterized as intermittent and poorly localized. With progression of a small-bowel obstruction, spastic pain decreases in intensity and frequency. However, continuous pain may develop as the result of ischemia or peritonitis.

In **large-bowel obstruction, pain frequently presents as postprandial crampy pain**. With chronic large-bowel obstruction, some patients may describe this pain as indigestion. Continuous pain may also develop with the progression of marked distension, ischemia, or perforation. Emesis is a symptom found commonly in patients with intestinal obstruction. In general, patients with proximal obstruction of the small bowel report the most dramatic episodes, whereas patients with distal obstructions do not experience as much emesis. The quality of the material vomited may help indicate the level of obstruction, as obstruction in the distal small bowel may produce feculent vomitus. Contrary to common beliefs, **obstruction of the large bowel often is not associated with vomiting**, because the presence of a competent ileocecal valve (found in 50 to 60 percent of individuals) may contribute to a closed-loop obstruction.

Absence of bowel movements and flatus are suggestive of a high-grade or complete obstruction. With the stimulation of peristalsis at the initiation of an obstructive episode, it is not unusual for a patient to describe having bowel movements. The presence of a recent bowel movement does not rule out the diagnosis of a bowel obstruction. The classic description of decreased stool caliber is not frequently reported by patients with large-bowel obstruction, and when reported, this finding is not specific for colonic obstruction. On the other hand, diarrhea is frequently reported by patients with progressive large-bowel obstruction. Presumably, with increased narrowing of the bowel lumen, passage of the solid and semisolid contents are blocked, therefore the stools become more liquid in character. Distension to some degree is generally found in most patients with intestinal obstruction; however, this finding may be absent in patients with obstruction of the proximal small bowel, therefore the absence of distension does not eliminate the possibility of intestinal obstruction.

Aneurysms

- Local dilation of the aorta resulting from weakness of the wall with distention
- Most common etiology is atheroma; more recently evidence of Chlamydia pneumoniae has been found
- 90% of aortic aneurysms are abdominal
- Best noninvasive method is ultrasound (98% accurate on determining size)

Rupture rate of aneurysm at 5 yrs

Size of aneurysm	% rupture rate
7 cm or greater	75%
6-7 cm	35%
5-6 cm (less than 5 cm)	25% (insufficient data)

Signs and Symptoms of AAA

- Aneurysms < 5 cm are usu asymptomatic
- Pain in abdomen or low back
- Pulsatile mass (many thin patients will have a pulsatile mass that is normal)
- Tenderness over the pulsatile mass
- Bruit over the mass (also can be heard in normals)

Neurological

Neurological Event Types: Also NEVER good…

- TIA
  - Sn/Sx of stroke that last LESS than 24 hrs.

- RIND
  - Sn/Sx of stroke that last longer than 24 hours, BUT resolve completely!

- Stroke!

Transient Ischemic Attack (TIA)

- Focal neurological abnormalities of sudden onset and brief duration secondary to transient ischemia of the brain
- Acute onset; last 2-30 min; abate with no permanent sequelae
- 90% affect carotid→ipsilateral blindness/contralateral hemiparesis that are temporary
- Neurological exam is normal when seen

Stroke

- Infarction of brain tissue manifested by neurologic deficits of varying severity
- Atherothrombotic: sudden, gradual, stepwise or fluctuating.
- Cardiac embolus: sudden onset. High Risk-atrial fibrillation, prosthetic valve, mural thrombus, dilated cardiomyopathy, M I in previous 4 wks.
- Risks:
  - Hyperlipidemia; smoking

CLINICAL PEARLS

Strokes can present in many different ways. Besides asking about actual symptomatology, the clinician must take a careful history of the time of onset of symptoms and sequence of events prior to presentation.

The most urgent diagnostic studies are a bedside blood glucose and CT scan of the head.

Treatment is aimed at stabilizing the ABCs, evaluating for administration of thrombolytics, if appropriate, and addressing comorbid conditions such as hypertension.

Unless the blood pressure is markedly elevated, hypertension should not be lowered in stroke patients.

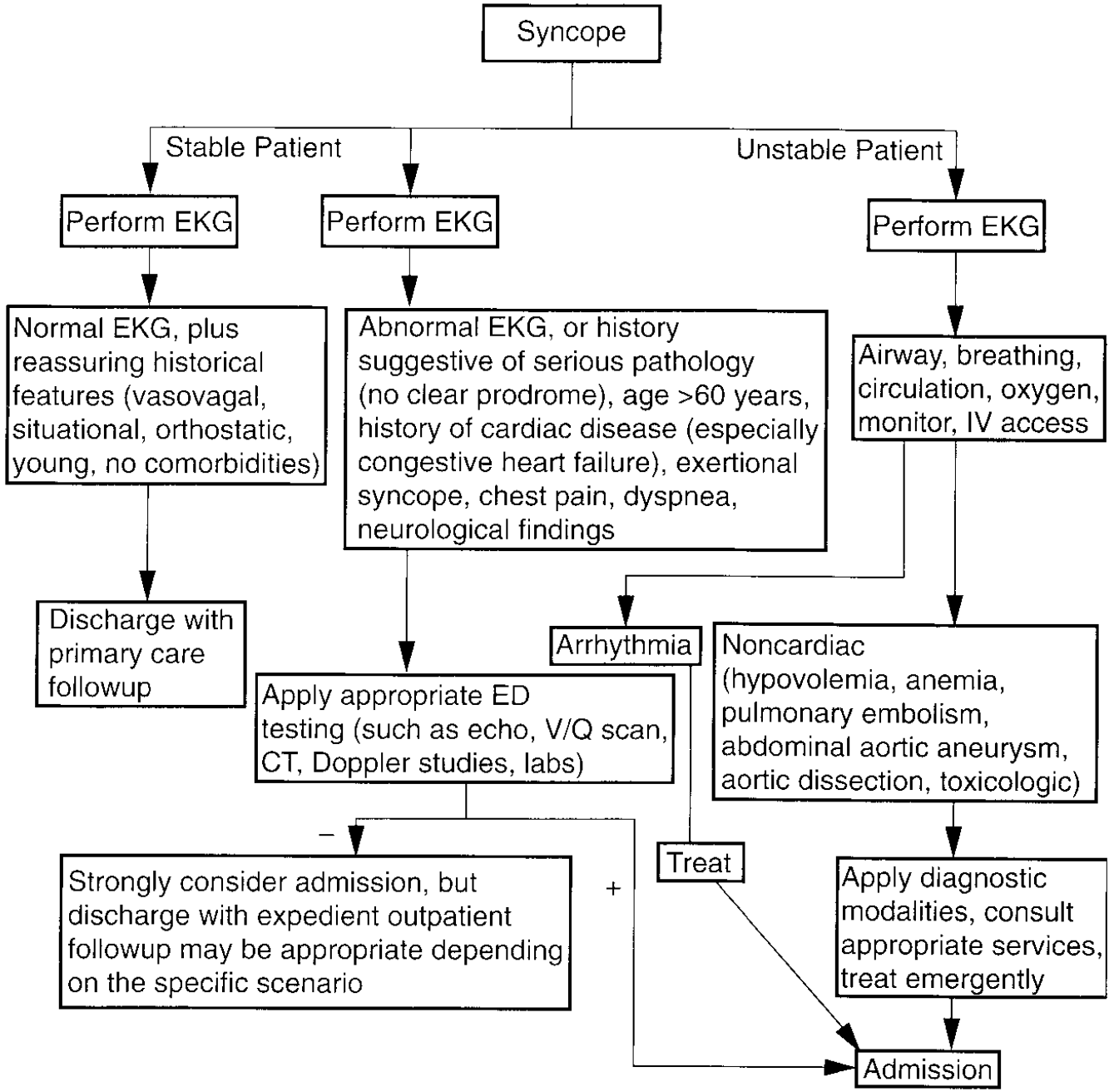


Figure 13-1. Algorithm of syncope evaluation.

Guillain-Barrė Syndrome (GBS)

- Symmetric weakness with paresthesias, beginning in legs and moving upward
- DTR's lost, sphincter control maintained
- 50% have facial involvement
- 90% reach maximum paralysis in 2 to 3 wks
- Lab shows ↑ CSF protein
- DDX: botulism

Botulism

- Neuromuscular poisoning from Clostridium botulinum toxin, an anaerobic bacterium
  - Spore forming bacteria reactivates
- Found in contaminated home canned food, wounds and in the intestine of susceptible infants.
- Sudden onset in a previously healthy person usu within 18-36 hrs of ingestion

Symptoms of Botulism

- Dry mouth, diplopia, ptosis, loss of accommodation and pupillary light reflex
  - G.I. Sx precede neuro sx and include n/v, cramps and diarrhea
- No fever
- **Descending paralysis (the reverse of G.B.)**
  - Sensation is normal

Multiple Sclerosis (MS)

- Chronic remitting dis characterized by demyelination of patches in the brain and spinal cord that result in multiple neurological symptoms
  - Onset between 20 and 40
  - GLOVE AND STOCKING PARESTHESIAS!!
  - Weakness, numbness, tingling, unsteadiness, spasticity, diplopia, sphincter disturbance
- MRI best test to show plaques
  - Paraventricular white matter lesions

Myasthenia gravis - 1

- Autoimmune disorder caused by antibodies to the **acetylcholine receptor** of skeletal muscle
  - Women mostly in their 20's;
  - Men mostly in 40-50's
    - DDX: Myasthenic Syndrome: Basically same Dz with different autoimmune target (sub class of Ca channel).
- Primary symptoms:
  - weakness, particularly of ocular, bulbar, pharyngeal, respiratory, **proximal** extremities
  - Weakness on exertion!

Myasthenia gravis - 2

- Onset may be gradual or sudden Weakness worse after exercise; helped by rest.
- No sensory loss
  - 1/3, usually those patients with symptoms limited to ocular muscles, improve spontaneously and have protracted remissions
  - Those with generalized MG may develop potentially fatal respiratory failure
- Edrophonium (Tensilon) test is pos if a ↓ in muscle weakness occurs after this cholinesterase inhibitor is given iv

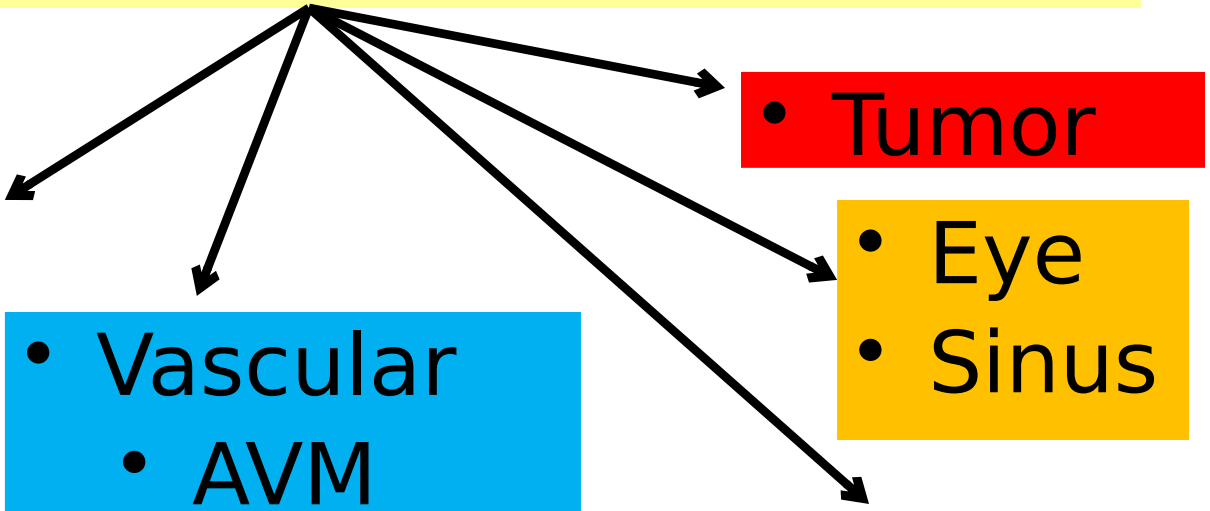
Diagnosis of epilepsy

- Best tool is the history
- Attacks are rarely witnessed by the doctor

- CT / MRI / LP can rule out secondary causes
  - MRI is image of choice
    - Must be done to r/o tumor or other organic disease
  - LP may be done in some cases

- EEG may help, but 20% of pts will be normal (AND 5% of normal people have abnormal EEG)

Headache – As a Sign:



- Infectious
  - Encephalitis
  - Meningitis
- Vascular
  - AVM
  - Aneurism
  - HTN
  - Giant Cell Arteritis
- Tumor
- Eye
- Sinus
- Cluster
- Tension
- Migraine
- [Trigeminal Neuralgia]

Headache Comparison

Feature	Cluster	Migraine	Tension
Gender	male	female	equal
Age/onset	20-50 yrs	10-40 yrs	Any age
Frequency	1-8/d	1-8/mo	daily
Duration	½-4 hrs	4-72 hrs.	steady
Intensity	severe	moderate	Dull ache
Location	unilateral	Unilat/bilat	bilateral

Headache Comparison

Feature	Cluster	Migraine	Tension
Nasal con	70%	none	none
Teary eye	common	none	rare
N and V	rare	common	rare
nocturnal	common	rare	rare
Behavior	restless	hibernates	hibernates
Family Hx	7%	90%	+ with stress

RED FLAG	DIFFERENTIAL DIAGNOSIS	WORK-UP STUDIES
Sudden-onset headache	Subarachnoid hemorrhage, pituitary apoplexy, hemorrhage into a mass lesion or vascular malformation, mass lesion	Neuroimaging first; lumbar puncture if neuroimaging negative
Headaches increasing in severity and frequency	Mass lesion, subdural hematoma, medication overuse	Neuroimaging, drug screen
Headache beginning after age 50 years	Temporal arteritis, mass lesion	Neuroimaging, Erythrocyte sedimentation rate level
New-onset headache in patient with risk factors for HIV infection or cancer	Meningitis, brain abscess (including toxoplasmosis), metastasis	Neuroimaging first; lumbar puncture if neuroimaging negative
Headache with signs of systemic illness (fever, stiff neck, rash)	Meningitis, encephalitis, Lyme disease, systemic infection, collagen vascular disease	Neuroimaging, lumbar puncture, serology
Focal neurologic signs or symptoms of disease (other than typical aura)	Mass lesion, vascular malformation, stroke, collagen vascular disease	Neuroimaging, collagen vascular evaluation (including antiphospholipid antibodies)
Papilledema	Mass lesion, pseudotumor cerebri, meningitis	Neuroimaging, lumbar puncture
Headache subsequent to head trauma	Intracranial hemorrhage, subdural hematoma, epidural hematoma, posttraumatic headache	Neuroimaging of brain, skull, and cervical spine

Adapted from South-Paul JE, Matheny SC, Lewis EL, et al. Current diagnosis and treatment in family medicine. New York: McGraw-Hill, 2004:330.

ETIOLOGY	DIAGNOSTIC TESTS	TREATMENT
Subarachnoid hemorrhage	CT scan, lumbar puncture (LP) if CT negative (look for xanthochromia)	Neurosurgical consult, control hypertension, analgesia, nimodipine
Meningitis	LP	IV antibiotics
Hypertensive encephalopathy	CT scan, rule out other end-organ damage	Control hypertension (nitroprusside, labetalol)
Migraine		Nonsteroidal antiinflammatory drugs (NSAIDs), antiemetics (metoclopramide, prochlorperazine), serotonin agonists (sumatriptan), ergot alkaloids (DHE); narcotics if refractory.
Cluster		Oxygen (nonrebreather), 4% intranasal lidocaine, oral triptans, DHE
Temporal arteritis	Erythrocyte sedimentation rate; consider temporal artery biopsy	Steroids to prevent blindness; NSAIDs
Brain tumor	CT scan; consider CT with contrast or MRI	If elevated intracranial pressure, neurosurgical consultation, hyperventilation, osmotic agents, steroids
Pseudotumor cerebri	LP with opening pressure	Repeated LPs, steroids, acetazolamide
Tension-type		Stress reduction, NSAIDs, muscle relaxants; narcotics if refractory
Postlumbar puncture		Hydration, lying flat, NSAIDs, narcotics, caffeine, epidural blood patch

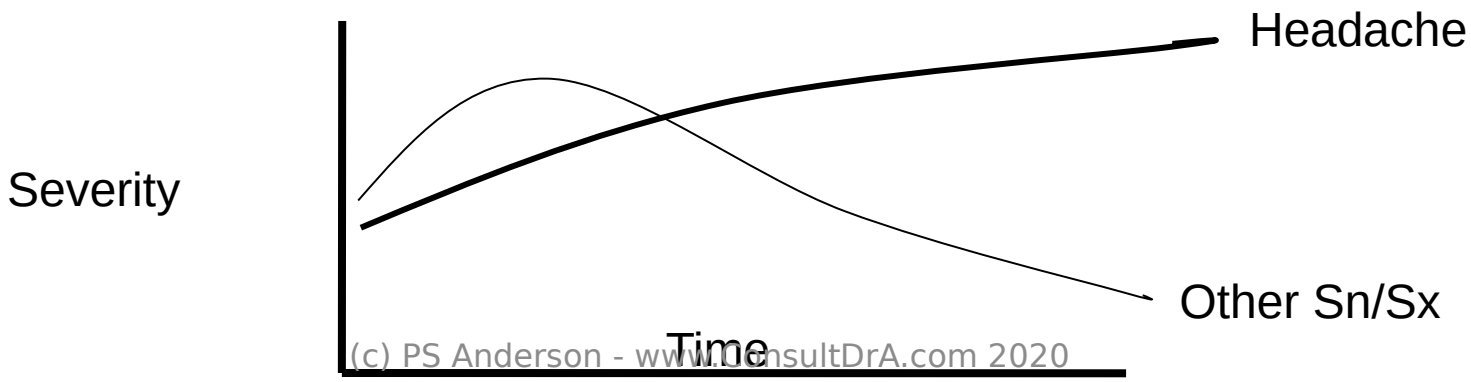
Infection (meningitis, encephalitis)

- Usually gradual onset of headache, severe nuchal rigidity present with meningitis. Often no focal neuro deficit.

  Encephalitis presents with focal neuro deficit more commonly.
- Diagnosis **made by L.P**.
  - MRI, CT
- Fever usually present, plus other findings of infection

Encephalitis

- Severe:
  - Headache with systemic sn/sx (fever, n/v…)
  - Often focal neurological deficit
- Sub-acute:
  - Like a severe viral illness.
  - Headache PERSISTS even as the systemic sn/sx wane.



Giant cell arteritis

- Symptoms include malaise, proximal muscle pain, jaw claudication, tender scalp arteries
- **Untreated, blindness results in 50% of pts who present with headache**
- Lab shows **ESR over 100/+** biopsy of artery

Neurological Infections: NEVER Good!

- **Routes of Spread of Infection:**
  - Blood: via arteries or **veins** of face
  - Direct injury or trauma
  - Extension of other infection (Spinal cord, Sinus, Mastoid…)
  - PNS Herpes, Rabies, Other
- **Bacterial Meningitis:**
  - E. coli, H. flu, Meningococcus
  - Headache
  - Purpuric rash on trunk (Meningococcal)
  - Nuchal rigidity (not always present in pediatric patients)
  - Obtundation
  - Toxic appearance

Considerations

The **classic symptoms of fever, headache, neck stiffness, or nuchal rigidity are often absent in infants, especially in neonates.** Nonspecific signs, such as poor feeding, inconsolability, and/or excessive somnolence may be the physician's only clue that an infectious process is at work. Sometimes the clues can be very subtle and may be nothing more than the parents stating that "my child just isn't acting the right." Given the need for prompt initiation of antibiotics to reduce mortality and to prevent neurological sequelae, a high index of suspicion is essential when dealing with the very young and the possibility of serious bacterial infection.

APPROACH TO SUSPECTED BACTERIAL MENINGITIS

Bacterial meningitis in children and adults is a medical emergency. A delay in diagnosis leads to increased morbidity and mortality; therefore, a high index of suspicion should be maintained. Early administration of intravenous antibiotics can be critical and should be initiated prior to the completion of confirmatory studies including a lumbar puncture. Meningitis

Diagnosis

The diagnosis of bacterial meningitis is made by lumbar puncture. Fever, headache, vomiting, neck stiffness, lethargy, irritability, and seizures may or may not be present in the setting of bacterial meningitis. In the neonatal period, poor feeding and lethargy may be the only presenting complaints. Adults, as well as infants, can present with nonspecific signs and symptoms. Physical exam may reveal nuchal rigidity, Kernig sign (inability to completely extend the leg when the hip is flexed to 90 degrees) or Brudzinski sign (severe neck stiffness and pain causes a patient's hips and knees to flex when the neck is flexed), papilledema, or focal neurological deficits. The presence of even a single petechiae may be the only finding in early meningococcemia and should be taken very seriously! Highlighting the difficulty of making this diagnosis, a normal exam is often the case. Hence, these findings are poorly validated and their absence should not deter the physician from initiating antibiotics and performing a lumbar puncture (LP).

Table 28-1

PATIENT AGE, LIKELY ORGANISM, AND EMPIRIC ANTIBIOTIC CHOICE

PATIENT AGE	MOST COMMON ORGANISMS	EMPIRIC ANTIBIOTIC(S)
0–4 weeks	Group B streptococcus, *E. coli*, *Listeria monocytogenes*	Ampicillin + cefotaxime
4–12 weeks	*S. pneumoniae*, group B streptococcus, *E. coli*, *L. monocytogenes*	Ampicillin + third-generation cephalosporin
3 months–18 years	*S. pneumoniae*, *N. meningitidis*, *H. influenzae*	Third-generation cephalosporin
18 years–50 years	*S. pneumoniae*, *N. meningitidis*	Third-generation cephalosporin
>50 years	*S. pneumoniae*, *N. meningitidis*, *L. monocytogenes*, aerobic gram-negative bacilli	Third-generation cephalosporin + ampicillin

Some authors now suggest the addition of vancomycin for patients in whom physicians suspect infection with penicillin-resistant *S. pneumoniae*.

Table 28-2

INDICATIONS FOR CT SCAN BEFORE LUMBAR PUNCTURE IN SUSPECTED BACTERIAL MENINGITIS

Depressed mental status	History or evidence of head trauma*
Evidence of papilledema	Recent seizure
Focal neurological deficit	

*Recent or remote head trauma

Table 28-3

ANALYSIS OF CEREBROSPINAL FLUID

TEST	NORMAL VALUE	SIGNIFICANCE OF ABNORMALITY
Cell count	< 5 WBC/mm^3	Increased WBC in all meningitis
	<1 PMN/mm^3	Increased PMNs suggest bacterial etiology*
	<1 eosinophil/mm^3	Any eosinophil is considered abnormal
Gram stain	no organisms	Identified 80% in bacterial meningitis Identified 60% if patient pretreated
Protein	15–45mg/dL	Elevated in acute bacterial/fungal meningitis
CSF-to-serum glucose	0.6 :1	Depressed in pyogenic meningitis Depressed in hyperglycemia
India ink	Negative	Positive in 33% of cryptococcal meningitis
Cryptococcal antigen	Negative	90% accuracy for cryptococcal disease
Lactic acid	Negative	Elevated in bacterial and tubercular meningitis
Acid-fast stain	Negative	Positive in 80% of tuberculosis meningitis

Abbreviations: CSF, cerebrospinal fluid; PMN, polymorphonuclear leukocyte; WBC, white blood cells

*The typical profile in cases of viral meningitis is a lymphocytic pleocytosis; however, PMNs predominate in the first 48 hours of viral meningitis.

A 20-year-old college student is your next patient in the emergency room. When you walk into the room, he is lying on the examination table, on his side, with his arm covering his eyes. The light in the room is off. You look down on his intake form and see that the nurse recorded his temperature as 102.3°F, heart rate 110 bpm, and blood pressure 120/80 mmHg. When you gently ask how he has been feeling, he says that for the past 3 days he has had fever, body aches, and a progressively worsening headache. The light hurts his eyes and he is nauseated, but he has not vomited. He has had some rhinorrhea, but no diarrhea, cough, or nasal congestion. He has no known ill contacts. On examination, he has no skin rash, but his pupils are difficult to assess because of photophobia. Ears and oropharynx are normal. Heart, lung, and abdomen examinations are normal. Neurologic examination is nonfocal, but flexion of his neck worsens his headache.

Patient Care Considerations

Patient motivation and safety: Keeping patients safe, motivated and on same page while recognizing that complex illness can take a long time to improve.

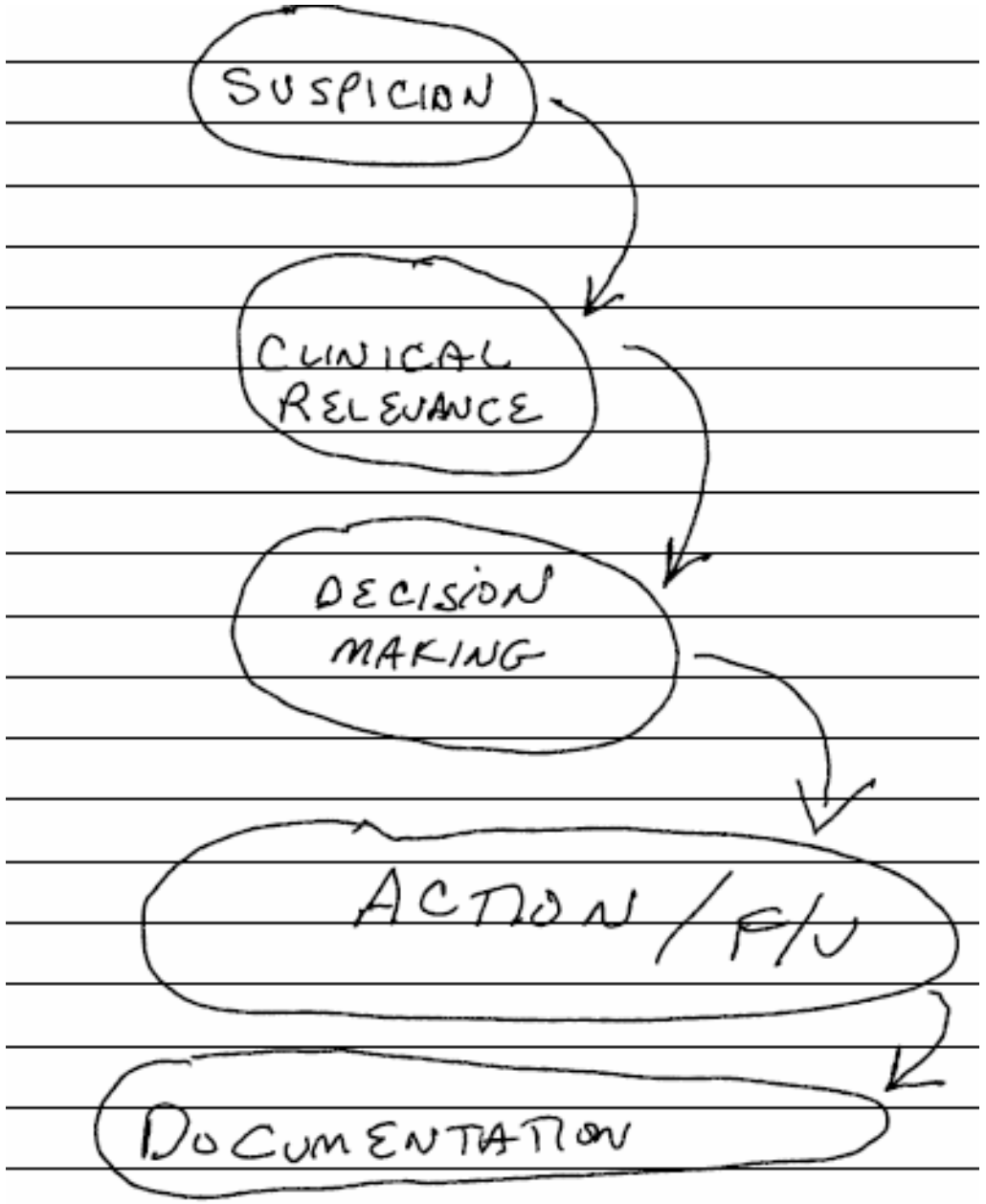
Medico-legal issues such as charting to justify medical necessity, “Standards of Care”, lab orders and more.

Money and Finance: Finding patient agreement with the process and setting patient expectations. Discussing costs of care, options if unaffordable and tradeoffs for other therapies and approaches.

Safety: What to consider first before calling it a “complex chronic illness”. How to assess when you have reached your limit and it is time to refer out, co-manage or other structure?

OK: Let’s look at this directly from my mind:

Clinical Thinking and Documenting Sn/Sx of Concern:



Suspicion; What raised the Concern and why?

- Hx - pt. report
- Exam finding
- Etc.

Clinical Relev.: Where does it fit?

- Extension of past Sn/Sx
- Past Sn/Sx with new features
- Completely New

Decision Making:

- Urgent or Emergent
- Close Monitoring
  - What changes
  - What Stays the Same
  - Reaction to therapies
- Watch and Wait
  - With what criteria?

Action + Follow Up:

- Based on "Decision Making"
- Include Change Options
  - IF IT Increases ...
  - IF THIS NEW Sx ...

DOCUMENTATION:

- EVERYTHING ABOVE MUST Have a paper trail in your chart.

SUSPICION: IN "CC" OR "S"

Clin. Relev.: IN "S" AND "O"

DECISION MAKING: IN THE "A"

ACTION + F/U: IN THE "P"

CC: Ongoing care for X, Y, Z
New increase in headaches
(Suspicion)

S: - Sn/Sx of X, Y, Z are
Stable and progressing
As Expected with therapies
- Incr. Headache:
  - Pt reports unilateral
  Right sided pain which is
  Focused over the temple
  and Eye. Mild Vision
  changes and sees "sparkles"
  in Right eye.
  - Upon Questioning Pt reports
  No other new Sn/Sx in
  Body systems — — — —

("S+O" Clin. Relev.)

O: Limited Exam today related to general health and new onset headache=

Vitals: Afebrile, HR-66 - RR 16 BP 118/68

CV: Lungs CTA. Ht RRR

MS: Ambulatory. No guarding $\overline{c}$ Movement. Gait Unchanged C-Spine ROM full and without Aggravation to Neck & head Pain

ABD: Non tender to palp. Aortic Pulse is normal and WIDTH IS UNDER 2.5 - 3.0 cm.

Neuro: Grip strength = Bilat DTR are 0-1 upper/1-2 Lower And all DTR are = Bilaterally CN 2-12 INTACT.

Fundus: c/o 0.1-OU Vessels Show A/V 4/5 with NO Abnormal Crossing. Anterior Chamber is clear and Angle IS OPEN. VA = 20/20 OU

A: (Decision Making)

Ongoing Conditions X, Y, Z

- Normal treatment response
- Appears that all therapies may continue as originally planned in treatment plan of ——— 2020.

- New HA:
  - Pattern fits migraine
  - Sx is new for patient which raises suspicion of other Etiology than purely migraine.
  - Musc.-skel and neuro Exam are WNL and nonfocal.
  - Experience with ongoing treatment of X, Y, Z shows migraine like phenomena are common when Rx ——— effects on/off ———

P: (Action + F/U)

1. No change in Rx For Conditions X, Y, Z from treatment plan of ___ 2020
2. Regarding New headache And based on the Hx/PE Any Assessment above:
   A. IF PAIN OR VISION change IN INCREASED direction OF more pain or less vision PATIENT WILL _____
      [Call me / Go to ER / Etc]
   B. Adjunctive Rx OF _____ Given today. Pt to report to me Via Phone or Portal Regarding EFFECT ON HA IN _____ Time.
3. Follow UP IS 1 Week IN OFFICE And as Above

P: (Action + F/U)

2. Regarding new headache And based on the Hx/PE Any Assessment above =

A. IF PAIN OR VISION change IN INCREASED direction OF more pain or less vision PATIENT WILL _____

[Call me
Go to ER
ETC]

B. Adjunctive Rx OF _____ GIVEN today. Pt to report to me via Phone or Portal Regarding EFFECT on HA IN _____ TIME.

How Do I Know These Things?

Your first Job is "Do No Harm"
And to provide good medicine.

- Use Good Clinical thinking.
- Document all of it

"If it isn't documented the patient assertion is automatically considered the truth"

- Show you have:
  - Documented the complaint
  - Clinically Assessed it
  - Have a Plan + DDx
  - Have Safe options for the Pt if things worsen.
- Follow Up

In the Chart - usually
Assessment or Plan =

① IF You Say "Rule Out"
- You must show HOW that
is happening. Lab, PE,
referral etc.

② IF You Say "Consider"
It is "Lighte" than "Rule Out"
And is used for Sn/Sx that
are less concerning (typically).

"Based on the Hx and Presentation
and the Exam .... above the new
Sn/Sx _____ is likely treatment
effect and thus will likely resolve.
IF it persists CONSIDER further
Workup for _____ with
_____ _____ _____."

Past Webinars Available

1. EBV diagnosis and Treatment
2. Histamine – CNS
3. Cortisol
4. Iodine & T3
5. Biofilms (#1)
6. Desiccated Thyroid
7. Autoimmunity
8. Histamine – Peripheral
9. Mitochondria
10. ReDox and Inflammation
11. IV and Injection Q&A
12. Sulfation Pathways
13. Antidepressant Rx and Taper
14. Pediatric Rx and dose adjustment
15. Renal Rx and Dose adjustments
16. Biofilms #2
17. Cardiac Rx dosing and tapering
18. Steroids and Respiratory Med's
19. Autoimmunity-2: Management
20. Chronic Infections – Testing, assessment and re-assessment
21. Lyme Illness – A top down approach
22. Chronic Infection Bundle
23. Oral Chelation
24. Pain Medication Weaning
25. Assessment of Chronic Cases
26. Nutrigenomic basics
27. IV Therapy Q&A and Latest Updates
28. ADHD Medications and Weaning
29. Seizure Medications and Weaning
30. Low Dose Naltrexone – pharmacology, uses and cases
31. Medical Cannabinoids
32. Neurological Inflammatory Therapies
33. Food Allergy and Sensitivity
34. Hyperbaric Oxygen Therapies
35. Kidney and Liver Functions – Effect on Rx and Labs
36. Organic Acid Testing
37. Migraine
38. PCOS
39. Fluoroquinolone Toxicity
40. GI Absorption and Rx
41. Dysautonomia and EDS
42. Low Dose Immunotherapy
43. Detox of Unusual Metals
44. NAD
45. Lab testing for B6, B12 and Folates
46. Acute Use of Thyroid and Adrenal-Rx
47. Assessing the Complex Patient
48. Optimizing 21st Century ND/Integrative Medicine
49. Nasal & Respiratory Therapies
50. USP-FDA 2019 Update
51. Bipolar Medications
52. HBOT-2 Cancer and Neuro
53. Neuro-AI Part-1
54. Neuro AI Part-2
55. Interrelationships in Chr-Dz
56. Neuro Manifest. Chron. Illness
57. Benzodiazepine Rx and Management
58. Anti-ID Rx Pharmacology
59. Eclectic and Low Dose Botanicals
60. Natural Medicines for Chronic Infections
61. Metabolic Toxins
62. Adrenal Assessment and Therapeutics: Clinical Diagnosis and Management

CE Accreditation Note:

ALL of these webinars will have AANP CE Accreditation.

- The **certificate at the end (last slide)** will have the total and Pharm hours.
- The AANP Accreditation has applied for ALL US States to date.
- All webinars for the past 12 months have active AANP CE (for example this is 02-2020 so 03-2019 through this webinar are all active).
- Past webinars will be re-accredited based on their viewership due to the high cost of re-accreditation of all the webinars. WE WILL DENOTE THIS ON THE WEBSITE AS WE RE-ACCREDIT WEBINARS.

Next Webinars

All are Tuesday PM – 5:30 – 7:00 PM Pacific Time

NOTE – All are third Tuesday of the month unless noted "*"

02-18-2020

03-16-2020 ** MONDAY

04-21-2020

05-19-2020

06-16-2020

New Educational Platform

New “MasterClass” Series at DrA-Academy.com

Emergency Medicine for the Medical Office

4.5 Total AANP CME of which 2.0 are Pharmacology

And More Series to Come

(Medical Laser, HBOT, etc.)

Website Updates

TAB – DrA's IV Monographs:

WWW.ConsultDrA.com

Tell your friends we have lots of **free** content…

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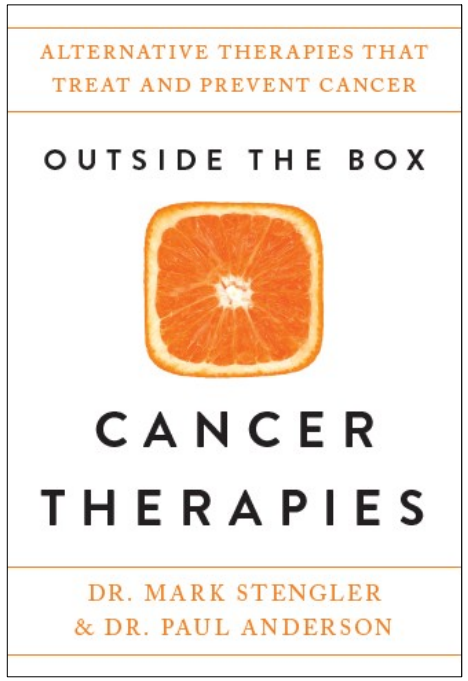
And

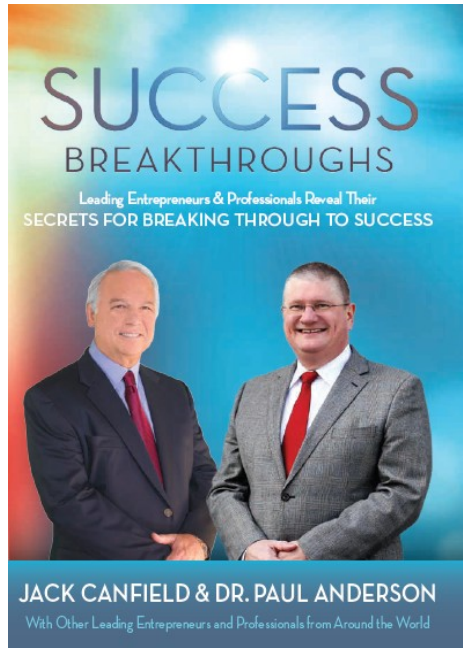
Some changes in subscription benefits



AND
A NEW BOOK:

The mental-emotional aspects of navigating a cancer diagnosis

IN THE WORKS



AAMP Scottsdale 2020

May 29, 30 and 31 (Friday through Sunday)

Advanced Applications in Chronic Digestive Disorders

Topical Areas

- Crohn’s disease
- Ulcerative Colitis
- GI Infectious disease
- GI Cancers
- The role of various forms of biofilms in GI disease
- “Irritable Bowel” and other non-specific diagnoses
- SIBO / SIFO
- Food allergy and Intolerance
- GI inflammation, immune system and relationships to systemic health
- Histamine and other inflammatory mediators
- Post-antibiotic post-surgical and post-infectious repair strategies
- The gut-brain connection
- POTS / MCAS
- And others

Daily Focus Areas:

FRIDAY: GI Assessment and Treatment in the Chronically Ill Patient

- From signs and symptoms to testing and diagnosis – Latest Updates and Best Practices
- Infectious Diseases
- Autoimmune Diseases
- Other Inflammatory Syndromes
- Cancers

SATURDAY: SIBO – SIFO and Dysbiotic Overgrowth Syndromes

- Making sense of SIBO-SIFO: How do I reliably assess and treat a patient?
- When to think of “Overgrowth” in a chronic case
- Diet Changes and Therapies
- Prescription and Natural Therapy Strategies
- End the day feeling updated and confident in managing overgrowth syndromes

SUNDAY: Allergy – Sensitivity – GI Repair

- MCAS – POTS: Latest concepts in assessment and treatment
- Food Allergy and Sensitivity: What’s the latest science and their clinical implications
- GI Repair: Best practices during and after intensive GI therapies

More Information:

https://aampscottsdale.com/

Thank You – Questions?