**Location**: Office

**Presenting complaint:** A 25-year old white female presents with burning micturition.

**Vitals:** Pulse: 80/min , B.P: 130/80 mm Hg , Temp: $99^0$F, R.R: 14/min, Height: 67 inches (167.5 cm) , Weight: 79 Kg (173.8 lbs).

**HPI:** A 25-year-old personal secretary at a local office presents with the complaints of three days of burning micturition, urgency, and frequency. She had to pass urine 10 times yesterday. She also complains of suprapubic discomfort. There is no vaginal discharge, fever, hematuria, or flank pain. She has no previous history of STD or UTI. ROS is unremarkable. She has no known allergies. Medications: None. SH: She is a personal secretary at a l ocal office. She has been married for five years and has no children. She has been smoking 10 cigarettes for the last seven years and drinks alcohol on weekends. She is sexually active in a monogamous relation with her husband . They have not been practicing contraception. Her last menstrual period was 3 weeks ago.

**How do you approach this case?**

This young female has dysuria. Her dysuria may be due to acute pyelonephritis, acute cystitis, acute pelvic inflammatory disease, acute urethritis, or acute cervicitis. You should come up with the differential diagnosis of a dysuria in a young woman. Now, perform a focused physical examination on this patient.

**Order physical examination:**
Abdominal
Pelvic exam

**Here are the findings:**
Suprapubic tenderness present
Normal Pelvic examination
No Urethral and vaginal discharge
No costovertebral angle tenderness

**Small discussion:**
This is probably a straightforward case of acute cystitis. The patient has no systemic signs of infection. So, she probably does not have acute pyelonephritis. A patient with pyelonephritis usually presents with a history of fever, chills, and flank pain. For acute uncomplicated pyelonephritis, oral ciprofloxacin for out-patients or IV ceftriaxone for hospitalized patients is appropriate therapy. The duration of treatment is usually 14 days. This patient is in a monogamous relationship with her husband and there is no history of vaginal discharge, so conditions like acute urethritis, cervicitis or acute PID are highly unlikely. A single oral dose of azithromycin or a 7-day course of doxycycline can be administered for chlamydial genital tract infections. For gonococcal genital tract infections, a single IM injection of ceftriaxone is the treatment of choice. Begin therapy for acute cystitis after confirming the diagnosis of acute cystitis by demonstrating pyuria on urine analysis. Cultures are generally not required for acute uncomplicated cystitis. Treatment with 3-day TMP-SMZ is appropriate.

The most important part of this case is whether your order pregnancy test or not. This patient is not using contraception and her LMP was 3 weeks ago. She might be a pregnant from the past 5-7 days. So, order serum pregnancy test before prescribing antibiotics.

**ORDERS:**
Urine analysis, routine
Serum pregnancy test, stat

**RESULT:**
Serum pregnancy test is positive

| | |
|---|---|
| Urine appearance | Turbid/ yellow |
| pH | 5.6 (normal 4.1-8.0) |
| Specific Gravity | 1.016 (normal 1.003-1.030) |
| Bilirubin | Negative |
| Ketones | Negative |
| Glucose | Negative |
| Blood | Negative |
| Leukocyte Esterase | Positive |
| Nitrite | Positive |
| Protein | Negative |

**Microscopic Analysis:**

| | |
|---|---|
| Epithelial cells | - |
| Bacteria | 20-30/hpf |
| RBC/WBC Casts | - |
| WBC | 30-40/hpf |
| RBC | 3/hpf |
| Crystals | - |
| Mucus | - |

**Review order:**
Oral Amoxicillin continuous (for 7 days)
Followup for prenatal assessment
Prenatal vitamin

**Consider counseling about the following :**
Smoking cessation
Limit alcohol
Regular exercise
Use of seat belt
Medication compliance
Patient education

**Primary Diagnosis:**
Uncomplicated acute cystitis and Pregnancy

**Treatment of uncomplicated cystitis:**
Normal healthy women ♋ 3 day TMP-SMZ
Diabetic women, symptoms for >7 days, recurrent UTI, >65 yrs age group ♋ 7 day TMP-SMZ
Pregnancy ♋ 7-day amoxicillin; if the patient is allergic to penicillin – 7-day nitrofurantoin

**Location**: office

**Presenting complaint:** A 75-year-old white male presents with forgetfulness.

**Vitals:** Pulse: 75/min, B.P: 110/75, Temp: 98.6 F, R.R: 16/min, Height: 72 inches (180 cm) , Weight: 65kg (143 lbs).

**HPI:**
A 75-year-old white male is brought to the outpatient clinic by his son with the complaint of forgetfulness for the last two years. He reports that his forgetfulness was mild initially but it has gradually worsened and now he cannot continue his routine activities of daily life. He has also developed paranoid features and accuses his son of mixing poison in his food. He eats and sleeps well, does not take any recreational drugs, smoke or drink alcohol. He has been sexually inactive since the death of his wife 15 years ago. There is no history of CAD or stroke. An older sister has a history of dementia. He has no known allergies. He takes docusate for constipation. FH: Father died of MI at 68 and mother died of breast cancer at 55. His rest of the ROS are unremarkable.

**How to approach this case?**
This patient has presented with progressive memory loss, which is most likely due to dementia. Complete physical examination to detect some occult/atypical medical illness should be performed. Neurological examination is of special consideration, which may help us detect focal neurologic deficits due to stroke; rigidity or tremors due to Parkinson's disease. Patient with Alzheimer's does not present with motor deficits.

**Perform the physical examination:**
General
HEENT /Neck
Neuropsychiatric examination
Chest/lung examination
Heart/CVS examination
Abdominal examination
Rectal examination
Genital examination
Lymph node examination
Extremities
Skin

**Results of the physical examination:**

| | |
|---|---|
| General | The patient is alert but appears poorly groomed. |
| HEENT | Thyroid gland is normal, no other abnormality found. |
| Abdominal examination | WNL |
| Rectal examination | Normal sphincter tone and prostate; brown colored stools with no evidence of occult blood; no palpable masses. |
| Chest/lungs | WNL |
| CVS | WNL |
| Lymph node examination | No lymphadenopathy |
| Neuropsychiatric examination | On Mini-mental state examination he can't spell 'world' backwards, calculate, copy designs, recall objects or follow 3-stage commands. |

**Discussion:**

- The major dementia syndromes include Alzheimer's disease, Parkinson's and Lewy body dementia, vascular dementia, frontal lobe dementia, and reversible dementia.

DSM-IV criteria for the diagnosis of Alzheimer's disease:

    - Gradual impairment of cognitive function resulting in social or occupational dysfunction;
    - Impaired recent memory with one or more of the following: impaired executive function, impaired visual processing, impairment of skilled motor activities;
    - Absence of other psychiatric, neurologic or systemic diseases;
    - Occurrence of deficits not exclusively in the setting of delirium

- Vascular dementia is suggested by the presence of abrupt onset of symptoms with stepwise deterioration, focal neurologic findings on examination, and presence of infarcts on CT scan.
- If dementia is due to Parkinson's disease, typical features like rigidity, tremor and bradykinesia will be evident. The recurrent graphic visual hallucinations and delusions are the most characteristic feature of associated dementia.
- In frontal lobe dementia there is impairment of executive function, behavior is disinhibited, and cognitive function is normal or minimally abnormal. These patients don't have insight of their problem.
- Many causes of dementia are reversible and they include the followings: medication induced; metabolic disorders like vitamin B12 deficiency, thyroid problems, hyponatremia, hypercalcemia; alcohol related; hepatic, and renal dysfunction; normal pressure hydrocephalus, and CNS disorders like tumors and hematomas.
- The American Academy of Neurology recommends routine non contrast CT/MRI of the head, vitamin B12 level, and TSH level in all patients with dementia. There are no clear evidence to support or refute ordering "routine" laboratory studies such as a CBC, BMP. and LFTs. Screening for neurosyphilis is done only when there is high index of suspicion. Test for HIV should be considered in a high-risk patient, but it is not a routine part of investigations .

Thus, we will order the following tests

**Order routine:**
CBC with differential, routine
BMP (Na, K, Cl, $Co_2$, BUN, Cr, Blood glucose, Ca), routine
LFTs
Serum TSH
Serum B12
Serum folic acid
Non-contrast CT scan of head

**Result of Labs:**

| | |
|---|---|
| CBC | WBC counts of 12,000/micro-L with 85% neutrophils |
| BUN | 11 mg/dL |
| Serum creatinine | 0.7 mg/dL |
| Blood glucose | 110mg/dL |
| Serum calcium | 9.5 mg/dL |
| Serum TSH | Normal |
| Serum electrolytes | Na is 140 meq/L, K is 4.0 meq/L, Cl is 100 meq/L. |
| LFTs | WNL |
| CT scan of head | Moderate to severe cortical atrophy |

So based on the history, examination and lab results, the most likely diagnosis in this patient is Alzheimer's disease.

**Order review :**
Oral Donepezil, continuous (As cholinesterase inhibitors can improve cognitive function in patients with AD)
Oral olanzapine, continuous for treatment of delusions in AD, atypical antipsychotics are preferred. The older low potency typical neuroleptics like chlorpromazine are highly sedating, and have anticholinergic side effects (May worsen memory). High potency neuroleptics like haloperidol are associated with high incidence of extra pyramidal side effects.

**Counsel patient:**
Advance directives
Alzheimer's support group
Patient education
Family counseling about safety plan regarding cooking, driving, and falls.
Supportive care
SSRI (Fluoxetine) antidepressants if depression is present
Buspirone if patient has anxiety
Temazepam is the drug of choice if the patient has sleep problems. Do not use short acting sedatives like triazolam as they exacerbate mental confusion.

**Primary Diagnosis:**
Alzheimer's disease

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**Location:** Emergency room

**Vitals:** Pulse: 80/min; B.P: 145/90 mm Hg; Temp: 98.8 F; R.R: 16/min; Height: 72 inches (180 cm); Weight: 72 Kg (158.4 lbs) .

**CC**: Severe chest pain

**HPI**: A 60-year old white male comes to E.R with a two- hour history of severe central chest pain that began while relaxing on the couch at home. The patient denies any exertional activity prior to the onset of symptoms. The pain is constant, 9/10 in severity, crushing in quality, and radiates to the left side of the jaw and left shoulder. There is associated nausea without vomiting. Over the past two months he has experienced several episodes of exertional chest pain while at work. The pain is usually relieved with rest. He did not seek any medical attention thinking that the pain was work related muscle spasms. Medical problems include hypertension for which he has been taking hydrochlorothiazide the past 10 years. He has no known allergies. FH: His father died of MI when he was 55. Mother is 85 yrs old and healthy. SH: He has been married for 34 years and has two sons. He is not sexually active. He has a 30-pack per year smoking history. He drinks moderate amounts of alcohol on weekends, but denies the use of recreational drugs. He is a truck driver. ROS: Denies headaches, vision changes, tinnitus, or vertigo. Denies muscle tenderness, joint pain, stiffness, or weakness. Rest of ROS is unremarkable.

**How to approach this case?**
This patient has come to the ED with chest pain of recent onset which has many causes and some of them may cause sudden death. Therefore, all such patients should be transported to ED immediately. Oxygen, IV access, cardiac monitoring, and EKG need to be done as soon as possible. Aspirin is given if MI is likely.

Therefore, we should order the following:

**Order:**
Continuous supplemental oxygen
Oral Aspirin
Sublingual nitroglycerin 0.4 mg every 5 minutes x 3 as needed for chest pain
Continuous pulse-oximetry
Intravenous access
Continuous cardiac monitoring
Continuous BP monitoring
EKG, 12 Lead, stat

The history and physical examination complemented by selected tests such as chest X-ray, EKG, cardiac enzymes allow the physician to accurately diagnose most causes of chest pain, especially CAD. Therefore, we will also do the following

**Physical Exam:**
General appearance
HEENT/Neck
Heart examination
Lung examination
Abdomen
Rectal exam (As this patient may require Heparin for CAD)
Musculoskeletal (for possible DVT)

**Order:**
Chest X-ray, PA, portable, stat
Cardiac enzymes, CK-MB and troponin-T, stat and every 8 hours x 2,

**Results:**

| | |
|---|---|
| Chest/lungs | The chest wall is normal. The diaphragm and chest move equally and symmetrically with respiration. No abnormality is detected on percussion and auscultation. |
| CVS | Normal S1 and S2. No murmurs, rubs, gallop, or extra sounds. Pulses are normal. There is no jugular venous distension. Blood pressure is equal in both arms. |
| EKG | Normal sinus rhythm with 3 mm ST depression and T wave inversion in lead II, III and AVF. |
| Pulse oximetry | Shows $O_2$ saturation of 96% on 2-lit nasal cannula & 92% on room air. |
| Cardiac enzymes and CXR | Pending |
| Cardiac monitor | No change of vitals from the time of admission. |
| Heme occult | Negative |

Patient is still complaining of pain. His history, CAD risk factors such as smoking, HTN, family history, and the EKG findings of T wave inversion suggest the diagnosis of either unstable angina or non-Q wave infarction. In cases of unstable angina, troponins or CK-MB are not elevated but they are elevated in cases of non-Q wave infarcts. However, even in cases of non-Q wave infarcts, troponins levels may not be detectable at initial presentation. We will start heparin and anti-ischemic therapy in this patient.

**Order review:**
Shift to ICU
PTT/PT stat
IV heparin, continuous with every 6 hours PTT or Enoxaparin Q12 hours without frequent PTT monitoring
IV nitroglycerin, continuous (blood pressure should be monitored as hypotension may develop)
IV Metoprolol 5mg x 3 (5 minutes apart)
Bed rest, complete
NPO, as this patient may require emergency catheterization
Input and output charts
CBC with differential, stat and daily to monitor heparin-induced thrombocytopenia
Basic metabolic panel (BMP), stat and daily

**Results:**
Cardiac enzymes are within normal limits.

**Discussion:**
The guidelines for the management of USA/NSTEMI are:

- Bed rest with continuous ECG monitoring in patients with ongoing rest pain.
  NTG, sublingual, followed by intravenous administration, for the immediate relief of ischemia.
  Aspirin should be given as early as possible. Clopidogrel is used in patients who are unable to take ASA because of allergic reactions or major gastrointestinal intolerance.
  Pulse oximetry and/or ABG
  Supplemental oxygen for patients with cyanosis or respiratory distress

IV Morphine when the chest pain is not immediately relieved with NTG or when acute pulmonary congestion and/or severe agitation is present.

- IV beta-blocker followed by a oral dose provided there are no contraindications. The goal of the treatment is to bring the heart rate down to 60-70/min. If there are any contraindications for beta blockers and the patient is having continuous or frequently recurring, a nondihydropyridine calcium antagonist (e.g., verapamil or diltiazem) can be used as initial therapy in the absence of severe LV dysfunction or other contraindications.

- Routine use of ACEI to all patients with USA/NSTEMI is a class II recommendation. However, an ACEI is used when hypertension persists despite treatment with NTG and a beta-blocker, in patients with LV systolic dysfunction and in diabetic patients.

- Anticoagulation with LMWH or intravenous unfractionated heparin should be added to antiplatelet therapy with ASA and/or clopidogrel. Enoxaparin is the best studied of all. Heparin should be given for at least 2 days.

- A platelet GP IIb/IIIa antagonist (Tirofiban or eptifibatide) should be administered, in addition to ASA and heparin, to patients in whom catheterization and PCI are planned.

- Early invasive therapy is indicated for high-risk patients with UA. Patients with refractory ischemia, recurrent symptoms, ST segment depression, and hemodynamic instability are at high risks. These patients should be referred for angiography and revascularization. In the absence of these findings, either an early conservative or an early invasive strategy in hospitalized patients without contraindications for revascularization.

- Role of statin therapy is conflicting. However, in the acute setting the mechanism of benefit from statin therapy probably involves anti-inflammatory effects rather than the lipid lowering. The other added benefit is, studies have shown that the long term compliance is better if the statins are started before the discharge.

- Thrombolytic therapy is not indicated in the treatment of USA/NSTEMI and should not be used.

**Order review:**
Shift to ward and continue the above treatment.
Repeat 12 lead EKG
Order fasting lipid panel
LFTs (for baseline before you start statins)
Trans thoracic echocardiography
Cardiac catheterization
Obtain TSH if the patient has abnormal lipids especially elevated triglycerides.

**Order review:**
Aspirin, continuous
Sublingual nitroglycerin, continuous as needed
Atenolol, oral, continuous
Parvastatin, continuous
Patient education
Cessation of cigarette smoking
Limit alcohol
Exercise program
Medication compliance

Relaxation techniques
Low sodium diet
Follow up visit at two to six weeks

**Diagnosis:**
Unstable angina

**Location:** Office

**Presenting complaint**: A 24-year-old married female presents with nausea and vomiting

**Vitals:** Pulse: 82/min, Temp: 98.6 F, R.R: 15/min, B.P: 130/70 mm Hg, Height: 162cm, Weight:
kg (136.4lbs)

**HPI:**
A 24-year-old Asian female presents with complaints of nausea and vomiting for the last seve
days. She feels more nauseated in the morning and also complains of breast pain. Her la
menstrual period was 7 weeks ago and before that her menstrual periods have always be
regular with a 28-29 day cycle. She was married 8 months ago, is sexually active with h
husband, and has never been pregnant. The patient denies abdominal pain, fever or vagi
discharge. She has been a one pack per day smoker since her teenage years. She is not on a
medications, does not drink or use recreational drugs. The patient migrated to the United Sta
5 years ago and does not recall her vaccination history. There is no history of sexua
transmitted disease, but she has never been tested for STDs. Recently, she has be
experiencing some constipation, other wise her bowel and bladder functions are regular. She
doing well at her office where she works as a secretary and has no emotional stresses. ROS a
unremarkable.

| Hospitalization/Procedures | Never |
|---|---|
| Other Medical Problems | None |
| Allergies | None |
| Current Medications | None |
| Vaccinations | See HPI |
| Family History | Father is healthy at 55; mother is healthy at 45. Maternal grandmother died of breast cancer at 60. She has one older sister who is healthy. |
| Social history | See HPI |
| Recreational history | Attending social events and watching movies |

**How to approach this case?**
This young sexually active female has presented with nausea, vomiting and amenorrhea, wh
are most likely due to pregnancy. Therefore do complete physical examination, which shou
include abdominal, breast and genital examination to look for signs of pregnancy and order
pregnancy test.

Here are the results:
Breast examination: Mild breast tenderness bilaterally.
Abdominal examination: Normal
Pelvic examination: Bluish discoloration of vulva and vagina present; no vaginal discharge;
vaginal or cervical lesions, uterus is globular and soft; no adnexal masses or adnexal tenderne
noted.
Rest of the examination is within normal limits.

**Labs:**
Urinary beta-HCG, routine

The "gold standard" for diagnosis of pregnancy is the detection of the beta subunit of hum
chorionic gonadotropin (hCG) by immunologic techniques in blood or urine. When performed i
clinical laboratory, the sensitivity and specificity for both blood and urine pregnancy tests a
between 97 and 100 percent.

**Results:**
Urinary beta-HCG: positive

**Discussion:**
There are many signs of pregnancy, which can be grouped into presumptive, probable and positive categories. Presumptive signs are associated with skin and mucous membrane changes. The dark discoloration of vulva and vagina noted in this woman is called Chadwick's sign. Probable signs are associated with changes in uterus. Globular shape and softer consistency of uterus is one of the probable signs. Positive signs of pregnancy are the detection of fetal heart sounds and the recognition of fetal movements. Doppler techniques enable us to detect fetal heart sounds as early as 9 weeks of gestation while the stethoscope can detect at 16 weeks. Recognition of fetal movements by an observer is possible at 20-24 weeks.

Positive pregnancy testing coupled with findings on history and examination is suggestive of pregnancy. Next, confirm her pregnancy by ultrasound and start antenatal care. Ultrasound will also help us determine gestational age.

A standard panel of laboratory tests should be obtained on every pregnant woman at the first prenatal visit. Additional testing of women at risk for specific conditions can augment this panel. The initial laboratory tests recommended by the American College of Obstetricians and Gynecologists are

Blood type
Antibody screen
Rhesus type
CBC with differential
Basic metabolic panel
Pap smear
Rubella status
Syphilis screen
Urinary infection screen
Hepatitis B surface antigen
HIV counseling and testing
Chlamydia

**Additional laboratory tests commonly performed in at-risk individuals include:**
Gonorrhea
Tuberculosis
Red cell indices to screen for thalassemia
Hemoglobin electrophoresis to detect hemoglobinopathies (e.g. sickle cell, thalassemias)
Hexosaminidase A
Cystic fibrosis carrier testing
Serum phenylalanine level
Toxoplasmosis screen
Hepatitis C antibodies

The first prenatal visit is a good time to discuss the patient's responsibilities and the expected course of pregnancy and delivery. Patients should be given information regarding the general plan of management for the pregnancy.
Number and frequency of prenatal visits

- Recommendations for nutrition, weight gain, regular exercise (limited), rest, and sexual activity
- Routine pregnancy monitoring

- Listeria precautions
- Toxoplasmosis precautions
- Abstinence from alcohol, cigarettes, and illicit drugs
- Information on the safety of commonly used nonprescription drugs
- Recommendation to continue wearing seat belts during pregnancy
- Potential problems related to plans for travel, work outside of the home, or hobbies
- Childbirth classes and breastfeeding recommendations
- Confidentiality issues

Therefore, we will do order the following in this patient

**Order Routine:**
Blood type and antibody screen
Atypical antibody titer
CBC with differential
Basic metabolic panel
Pap smear
Rubella antibodies
RPR
Urinalysis
Urine culture and sensitivity
Hepatitis B surface antigen, serum
Anti-HIV by ELISA, serum
Transvaginal ultrasound
Chlamydia, culture cervix

**Medications:**
Vitamin, prenatal, oral
Iron sulfate, oral
Folic acid, oral (0.4 mg)
High calorie diet
Regular moderate exercise
Patient education
Smoking cessation
Safety plan
Safe sex
No illegal drug use
No alcohol
Drive with seat belt
Follow up in 4 weeks

U/A and Urine culture are very important because 5-10 % of pregnant patients may have asymptomatic bacteriuria and untreated patients may develop pyelonephritis.

**Follow up visits:**
Every 4 weeks until 28 weeks
Every 2 weeks between 28 to 36 weeks
Every week between 36 to delivery

**Follow up visits:**
Complete physical examination
Wt. Measurement
Vitals especially BP
Complete urinalysis
Fundal measurement
Fetal heart rate (110—160/min=N) measurement

**Glucose screening:**
In the United States all pregnant women will get 50 gm 1 hr glucose tolerance test between 24-28 wks gestational age.  Results >135 is abnormal.
If the patient has risk factors, she should be screened at 1st prenatal visit.

**Indications for glucose screening on 1st prenatal visit:**
Age> 25years
Obesity
Family History of DM
Previous infant Wt > 4000 gm
Previous still born
Previous congenitally deformed child
Recurrent spontaneous abortions

**Advise from 2nd Trimester:**
Promotion of breast-feeding
Childbirth classes
Danger signs of pregnancy
Preterm labor education

**Primary Diagnosis:**
Pregnancy

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**Location:** Office

**C.C:** A 28-year-old white male presents with bleeding per rectum.

**Vitals:** Pulse: 76/min , B.P: 120/70 mm Hg , Temp: 98.5 F , R.R: 16/min , Height: 72 inches (180 cm) , Weight: 72 Kg (158.4 lbs).

**HPI:**
A 28-year-old white male presents with the complaint of having blood per rectum (BRBPR) for a week. His stools are streaked with blood. They are loose, watery, and contain mucus. He has mild colicky pain and a feeling of incomplete evacuation after defecation. He denies any history of nausea, vomiting, fever, weight loss, recent travel, or ill contacts with diarrheal illness. He has been smoking 20 cigarettes a day for the last seven years. He drinks alcohol occasionally and does not use illegal drugs. ROS are unremarkable. He has never been admitted to the hospital. He is not on any medications. He has no allergies. FH: Mother died at the age of 60 due to MI. An older brother has ulcerative colitis. Father is alive and healthy at the age of 65. SxH: Sexually active with his wife. He is a restaurant manager.

**Approach to the patient:**

- Differential diagnosis of rectal bleeding include ulcerative colitis, Crohn's disease, infectious colitis, medication induced (NSAIDs, antibiotics), radiation colitis, ischemic colitis, internal hemorrhoid, anal fissure etc. The common infections include Campylobacter, Escherichia coli 0157:H7, Salmonella, Shigella etc. Consider CMV infections and Kaposi's sarcoma in an immunocompromised patient. C.difficle can sometimes present with bleeding per rectum. It should be considered in all patients who have been on antibiotics. NSAIDs can exacerbate the underlying IBD.

- Whenever there is visible rectal bleeding in adults an evaluation, either in an inpatient or outpatient setting is necessary depending on the degree of risk. Low risk patients (e.g. self limited rectal bleeding in an otherwise healthy young patient is most likely due to an internal hemorrhoid) can be followed as outpatient.

- High risk patients, such as those with acute abdomen, hemodynamic instability, or persistent bleeding need to be resuscitated and hospitalized. GI consult should be obtained as soon as possible. After assessing the stability of the patient, the next step is to determine the source of the bleeding. When the left colon is the source, the blood is usually bright red. Dark maroon bleeding or blood mixed with stool is probably from the right colon. Some times the source of the hematochezia is upper GI (in about 11% of patients) and therefore nasogastric lavage should be done in all cases to rule out an upper GI source.

- In this patient, who is clinically stable, there is no need for resuscitation. This patient is stable, and he is a potential candidate to have ulcerative colitis. So he needs a complete physical examination including rectal.

**Results of your exam:**
Complete physical examination is unremarkable except rectal examination, which is significant for blood stained stool.

This patient is most likely suffering from ulcerative colitis based on his presenting complaints,

family history and findings on examination. However, other similar conditions need to be ruled out.

**Discussion:**
Typical history coupled with characteristic findings on endoscopy establish the diagnosis of UC, which is confirmed by a biopsy. The presence of ulcerative colitis, in a first-degree relative, is an extremely important clue. Flexible sigmoidoscopy documents the extent of inflammation as well as establishes the diagnosis. Colonic biopsy is particularly helpful when the findings on sigmoidoscopy are equivocal. A barium enema can confirm the diagnosis but is usually not necessary. Colonoscopy is usually not required unless the diagnosis is uncertain. The other problem with colonoscopy is it can cause perforation in a severely ill patient with extensive disease.

**Order Routine:**
CBC with differential, routine
BMP, routine
Stool examination for ova and parasites
Fecal leukocytes
Stool bacterial culture
Liver function tests
PT, PTT
Flexible Sigmoidoscopy
Rectal biopsy

**Results of labs:**
CBC with differential, an BMP are within normal limits.
Stool for ova and parasites is negative .
Stool bacterial culture shows normal flora.
LFTs are within normal limits.
PT, and PTT are within normal limits .
Sigmoidoscopy, and rectal biopsy are consistent with the diagnosis of ulcerative colitis involving the rectum, and distal sigmoid colon.

**Management of ulcerative colitis:**
Treatment depends on the severity and extent of the disease.

- **Topical therapy** with 5-ASA compounds is the treatment of choice (not steroid enemas) for **mildly** active proctitis or proctosigmoiditis. They are very effective in inducing and maintaining remission. For proctitis, 5-ASA suppositories are used and enemas are recommended for proctosigmoiditis. 5-ASA enemas are significantly superior in inducing remission and have less side effects compared with steroid enemas. Although the symptomatic improvement will be seen within a few days, treatment should be continued for at least four to six weeks. Doses should be tapered off during this time as complete healing takes place.

- **Oral therapy** with sulfasalazine or with newer 5-aminosalicylates is the treatment of choice for **moderately** active proctosigmoiditis. Newer 5-aminosalicylates like mesalamine are more costly but have fewer side effects. Folic acid supplementation should be given to patients on sulfasalazine. Steroids are used when these 5-aminosalicylates compounds fail to induce remission. Steroids should not be used for maintenance of remission. Immunomodulator drugs like azathioprine or 6-MP are used when patient becomes steroid dependent or he is refractory to steroids.

- Patients with s**evere disease** need to be hospitalized and resuscitated with IV fluids and electrolytes. They are kept NPO and given parenteral nutrition. It's very important to monitor the patient for complications that might develop. Abdominal examination, vital signs, and plain abdominal films are used for this purpose. **IV steroids** are the most important treatment modality. Role of antibiotics is controversial in this patient population. However, many physicians consider giving broad spectrum antibiotics if the patient has fever, leukocytosis, or any indication of sepsis. Surgery is considered for refractory cases.

- Antidiarrheal agents like loperamide may be used for symptomatic treatment of diarrhea, and anticholinergic agents for abdominal cramps. Antidiarrheal agents need to be avoided in severely ill patients.

- Antidepressants or anxiolytics may be required in some cases. Dietary counseling is important in all cases.

**ORDER REVIEW:**
5-ASA suppositories
Loperamide, prn
Dicyclomine, prn
Diet and nutrition consult
Counsel about cessation of cigarette smoking and injury prevention

**PRIMARY DIAGNOSIS:**
Ulcerative colitis, mild case involving rectum and distal sigmoid colon

**Location:** Office

**Presenting complaint:** A 28-year-old man presents with two months of abdominal pain, and altered bowel.

**Vitals:** Pulse: 72/min, B.P: 130/75 mm Hg, Temp: 98.7$^{0}$F, R.R: 17/min, Height: 70 inches (175 cm), Weight: 70 Kg (154 lbs)

**HPI:**
A 28-year-old white male presents with the complaints of abdominal pain and altered bowel habits for the last three months. The pain is colicky in nature. It is located in the lower abdomen. The pain does not radiate, is 5/10 in severity, worsens postprandially, and relieves with defecation. For the last three months he has been suffering with diarrhea alternating with constipation. For the last three days, he has been having diarrhea. Stools contain mucus but not blood. Symptoms occur during the day and do not interfere with his sleep or work. His weight and appetite are normal. He is not taking any prescribed or recreational drugs. He smokes 10 cigarettes per day for the last 10 years and drinks alcohol only on weekends. He is currently sexually active with his wife and always uses condoms. He has no other medical problems or known allergies. He is not on any medications. FH: No H/O IBD or colon cancer in the family. SH: Married for 5 years and has a 2 year old daughter. Works at a local university. ROS are unremarkable.

**How to approach this case?**
This patient has alternating diarrhea and constipation. This may be due to infectious causes like amebiasis or giardiasis, which are very rare. Irritable bowel syndrome is another possible cause. Bowel obstruction may present with alternating diarrhea and constipation. Colon cancer may also present in this manner, but is unlikely in a 28 year old with no family history of bowel cancer.

**Order:** A complete physical examination, including rectal, is appropriate in this setting.

**Results:** Completely normal physical examination

**Now, order the following:**
CBC with differential, routine
Serum TSH, routine
BMP, routine (diarrhea is associated with electrolyte abnormalities)
FOBT
Stool examination for ova and parasites
Stool for white cells
Stool cultures
24-hour stool collection
24-hour fecal fat estimation

**Results of labs:**
WBC count is 8,000/micro-L, hemoglobin is 15.6g/dL, and platelet count is 200,000/micro-L
Serum TSH is 1 micro-U/L
BMP is normal
FOBT is negative
Stool does not contain any ova, parasites, or white cells.
Stool culture – No growth
24 hour fecal fat is WNL.

**Order review:**

Counsel the patient
Reassurance
Lactose free diet
High fiber diet
Loperamide, orally, PRN
Counseling about cessation of cigarette smoking, limitation of alcohol intake, safe sex practices, and driving with seat belt
Follow up visit in 2 weeks

**Discussion:**
**Clinical features:**
Irritable bowel syndrome is a diagnosis of exclusion. Abdominal pain and altered bowel habits are the most characteristic features of this entity. Abdominal pain is crampy, located in lower abdomen, aggravated by stress, and relieved by defecation. Patients with IBS have diarrhea, constipation or diarrhea alternating with constipation. Stools contain mucus but no blood. Clinical features that suggest disease other than IBS include fever, weight loss, bloody diarrhea, large volume diarrhea, nocturnal diarrhea, nocturnal pain, anorexia and anemia.

**Diagnosis:**
When a clinical presentation is typical of IBS, only a few investigations are ordered. They include CBC and routine chemistry panel in all; thyroid hormones, and stool for ova, parasites, and leukocytes in patients with diarrhea; and flexible sigmoidoscopy in patients over 40, and in patients who have persistent diarrhea. When all the fore mentioned studies are normal, symptomatic treatment is started and patient is reevaluated after 4-6 weeks. If symptoms progress, more detailed studies are warranted.

**Treatment:**
A lactose free diet and high fiber diet are considered. A diet that produces gas is discouraged. Anticholinergic drugs for abdominal pain and loperamide for diarrhea are given on a 'as needed basis'. Prokinetic drugs may be used for constipation. Benzodiazepines are used only in cases of acute situational anxiety. Behavioral treatment is a consideration for patients who have some sort of stressor.

**PRIMARY DIAGNOSIS:**
IBS

**Location:** Emergency room

**Presenting complaint:** A 65-year-old male presents with a chief complaint of severe breathlessness .

**Vitals:** Pulse: 88/min , regular, B.P: 120/70 mm Hg, Temp: 100.5 F, R.R: 25/min , Height: 72 inches (180 cm), Weight: 72 Kg (158.4 lbs).

**HPI:**
A 65-year-old white male, with a two-year history of COPD, presents to the ER with an acute onset of severe breathlessness, wheezing, and chest tightness. He also states that his cough has become more severe the past two days and the sputum production has increased in quantity and become yellowish. Other complaints include fever and malaise. He denies any chest pain and does not use supplemental oxygen at home. He continues to smoke 2-5 cigarettes/day. He does not drink alcohol or use illegal drugs. He has no allergies. His current medications are albuterol 2 puffs as needed for SOB. He has no other medical problems. Vaccinations are up to date. He was admitted once in the hospital for exacerbation of COPD.

**REVIEW OF SYSTEMS:**

| | |
|---|---|
| Skin | No complaints |
| HEENT | No vision changes, epistaxis, or sore throat |
| Musculoskeletal | Easily fatigued, chronic left knee pain |
| Cardio respiratory | Frequent productive cough, wheeze, and dyspnea |
| Genitourinary | No history of STD or UTI. |
| Neuropsychiatric | Not asked |
| Abdominal | Occasional heartburn, denies nausea, vomiting, or diarrhea |

**How to approach this case?**
Based on his history, this is most likely an exacerbation of COPD.

- Features suggestive of COPD exacerbation include increase in the severity of dyspnea, and a change in the color and quantity of sputum. To assess the severity of exacerbation, ABGs and pulmonary function tests are performed.
- CXR is done to rule out disorders that mimic COPD exacerbation. ECG is done to detect RVH, arrhythmia and ischemia. CBC is performed to detect polycythemia or bleeding. Serum chemistry may point towards some metabolic cause of COPD exacerbation. Sputum gram staining, culture, and sensitivity are indicated when COPD exacerbation with a purulent sputum fails to respond to empiric antibiotic treatment.
- PaO2 of < 60 mm Hg and/or SaO2 <90 on room air indicates respiratory failure. PaO2 <50 mm Hg, PaCO2 >70 mm Hg, and pH <7.30 indicate a life-threatening respiratory failure and requires mechanical ventilation with ICU management.
- A PEF <100 L/min or an FEV1 <1.00 L also indicates a severe exacerbation.

**Start with the physical examination:**
General
HEENT
Neck
Heart examination
Lungs examination
Abdomen
Extremities

**Results of your examination:**
The patient is in obvious respiratory distress, sitting upright and using his accessory muscles of respiration.
Increased AP diameter of chest, decreased air entry on both sides, and generalized bilateral rhonchi and wheezing.
Heart exam: Regular rate, and rhythm,; loud $P_2$ but no murmurs.
There is no edema, calf tenderness, or Jugular venous distension.
Rest of the examinations is within normal limits.

**Routine Orders:**

Sit upright (Head elevation)
Pulse-oxy, stat and continuous
Supplemental oxygen continuous
Intravenous line capped
Connect cardiac monitor
FEV1, stat and every hour
PEFR, stat and every hour
EKG, 12 lead, stat
CXR, PA, lateral, stat
ABG, stat

**Lab results:**
PEFR: 0.9L/min
FEV1: 0.85L
Oxygen saturation: 86% on room air and 94% on 2-litre oxygen via nasal cannula
CXR shows hyperinflation of both lung fields and a small infiltrate on the right lower lobe
EKG is within normal limits.

**Start treatment:**
Nebulized albuterol
Nebulized ipratropium
Prednisone, IV
Levofloxacin (preferred) or amoxicillin, oral, continuous
CBC, with differential, stat
BMP, stat

**Lab results:**
ABG:

- pH: 7.38
- PaO2: 53
- PaCO2: 53 mm Hg

CBC shows WBC count of 12,000/micro-L with 8% bands.
BMP are normal
Patient is feeling better and his pulmonary function has improved now after 4 hours of therapy.

**Review orders:**
Shift to floor/ward
Ambulate as tolerated
Input and output chart
Vitals Q 4 hours
Regular diet
Serum theophylline levels if patient is on theophylline
Pulmonary toilet (suction upper airway): If the patient is having lot of secretions and is unable to clear them
Diuretics are given in cases of cor pulmonale
Phlebotomy (> 50 hematocrit)
Low sodium diet in cases of cor pulmonale
Discontinue the cardiac monitor if the patient's vitals are stable and the acute episode is over

**DISCUSSION:**

- Pharmacological agents used to treat acute exacerbation of COPD include inhaled beta-adrenergic agonists, inhaled anticholinergics, antibiotics, and steroids.
- Inhaled beta-adrenergic agonists like albuterol are the main stay of treatment for acute exacerbation of COPD and are given via a nebulizer or MDI.
- Anticholinergic bronchodilators like ipratropium are sometimes used along with beta-agonists when more bronchodilation is required.
- Even though there is no clear evidence, parenteral corticosteroids may be used in hospitalized patients for severe exacerbation.

- Methylxanthines like theophylline are used for patients who fail with inhaled bronchodilators. It may improve dyspnea, airway function, mucociliary clearance, and central respiratory drive. However, theophylline has narrow therapeutic window and may cause tachyarrhythmias.
- Antibiotics are indicated when COPD exacerbation is caused by infection. Empiric treatment is done with levofloxacin, amoxicillin, TMP-SMZ or doxycycline. Gram staining and culture of sputum is required in refractory cases.
- Adequate oxygenation must be maintained by giving supplemental oxygen with goal arterial oxygen tension of >55-60 mmHg and the oxygen saturation of above 88-90%.
- Noninvasive positive pressure ventilation (NIPPV) should be tried initially in selected patients with respiratory failure. However, it is contraindicated in patients with hemodynamic instability (eg, hypotension, serious cardiac arrhythmias). Criteria to use NIPPV include moderate to severe dyspnea, PaCO2 of > 45 mmHg or pH of < 7.35 or RR of >25/minute.

**Review order:**
Patient is asymptomatic and his pulmonary function tests have reached his personal best after 2 days of inpatient therapy.

**Discharge:**
Send the patient home
Follow-up visit at 2 weeks
Smoking cessation
Alcohol, advice the patient to limit intake
Counsel patient, no illicit drugs
Patient education
Oxygen therapy at home (when PaO2 is less than 55 mm Hg or SaO2 is less than 88 percent, oxygen therapy and cessation of cigarette smoking improves prognosis)
Oral amoxicillin/Levofloxacin for total of 10 days
D/C nebulization of albuterol and ipratropium (Switch to metered dose inhalers)
Ipratropium inhalation, as needed
Albuterol inhalation, as needed
Influenza vaccine
Pneumococcal vaccine

**Primary diagnosis:**
Acute exacerbation of COPD

**Location:** office

**Presenting complaint:** A 40-year-old female with complaints of insomnia, easy fatiguability, and feelings of worthlessness presents to the outpatient medicine clinic.

**Vitals:** Pulse: 75/min, B.P: 110/75mm Hg, Temp: 98.6 F, R.R: 16/min, Height: 72 inches (180 cm) , Weight: 55kg (121 lbs).

**HPI:**
A 40-year-old female comes to the clinic with the complaint of insomnia, easy fatiguability, and feeling worthless. She states that she has been "feeling low" for the last two months. She no longer finds pleasure in any of her normal activities. She can't sleep. There is loss of appetite. Her weight has decreased by 20 pounds in two months. The patient has feelings of guilt, hopelessness, and inability to concentrate. She is finding it difficult to continue her job as a librarian and has decided to take a leave of absence. Prior to the onset of symptoms, she was doing well, both at home and in the office. She is married, has two children, and her husband is very loving. Because of her lack of interest in sex, they have been sexually inactive for the past two months. Generally, the patient has always been in good health. She doesn't smoke, drink alcohol, or use drugs. She has a history of cluster headaches. Her last cluster headache was six years ago. ROS are unremarkable. FH: Mother is 65 and has HTN. Father is 70 and healthy. Vaccinations are up-to-date. She is not on any medications. She has no known allergies.

**How do you approach this case?**
This patient has classic clinical features of depression. A number of medical conditions may present with depression, including stroke, diabetes, dementia, cancer, hypothyroidism, chronic fatigue syndrome (see Fatigue below), fibromyalgia, systemic lupus erythematosus (SLE), coronary heart disease, corticosteroid use, anxiety and panic disorders, hypercalcemia, Sjögren's syndrome, increased bone loss, and seizure disorders in older adults.

Perform a complete physical and psychiatric examination. An assessment of the presence of suicidal ideation is essential in all depressed patients.

**Physical examination:**
Complete physical examination

**Results of PE :**
General: Well developed, well nourished, middle aged female, in no acute distress.
HEENT, lungs, heart, abdomen, and the rectal exam is completely normal .
No lymph nodes palpable.
Neuro/psychiatric examination: Neurological examination is non-focal. She is alert and oriented though her speech is somewhat slow. She expresses feelings of worthlessness and lack of energy. She denies having delusions or hallucinations. There are no suicidal ideations. Her cognitive functioning is normal.

**How would you approach this patient?**
In cases of depression, limited laboratory testing that may help rule out associated disorders includes measurement of thyroid function (TSH), serum electrolytes/basic metabolic panel, folate, vitamin B12, and an electrocardiogram.

Other tests may be ordered based on the findings of history and physical examination include:

1. ANA when SLE is suspected

2. HIV testing and VDRL in cases of high risk sexual behavior

3. Urine and blood toxicology screening in cases of suspected substance abuse

4. Dexamethasone suppression test for suspected Cushing's disease

5. Cosyntropin stimulation test for suspected Addison's disease

**Order review:**
In this case, no associated medical illness is suspected based on history and examination.

Routine Orders:
CBC with differential, routine
BMP, routine
Serum TSH, routine
12 Lead EKG, routine
Serum B 12, routine
Serum folate, routine

**Result of Labs:**
EKG: normal rate, rhythm and axis, no evidence of ischemia or hypertrophy.
Serum TSH: 1microU/mL
BMP: Na is 140 meq/L, K is 4.0 meq/L, Cl is 100 meq/L; calcium, $CO_2$, BUN, creatinine, B 12 and Folate are normal.

**Discussion :**
Based on the history and examination, this patient is likely suffering from major depression. There are four major types of depression: adjustment disorder with depressed mood; depressive disorders; bipolar disorders; and mood disorders secondary to illness and drugs.

These need to be differentiated from grief and bereavement, which are normal responses to a loss.

The DSM-IV criteria for major depression:
At least five of the following symptoms should present for a period of two-weeks. One of the symptoms must be depressed mood or loss of interest. The symptoms should not be the result of an organic factor or substance. The disturbance should not occur within 2 months of the loss of a loved one.

Depressed mood most of the day

1. Markedly diminished interest or pleasure in almost all activities nearly every day (anhedonia)

2. Significant weight loss or weight gain

3. Insomnia or hypersomnia

4. Psychomotor agitation or retardation

5. Fatigue or loss of energy nearly every day

6. Feelings of worthlessness and/or excessive or inappropriate guilt

7. Impaired concentration or indecisiveness

8. Suicidal ideation

A history of a prior manic episode in addition to these criteria suggests the diagnosis of bipolar disorder.

- Dysthymia is defined as mild, chronic depression which lasts for at least two years or longer. It is characterized by poor appetite, insomnia, low energy or fatigue, low self-esteem, impaired concentration, and anhedonia. Long-term psychotherapy is frequently helpful.

- Mild to moderate major depression is treated with either psychotherapy or pharmacotherapy. Patients with moderate to severe depression should be treated initially with either pharmacotherapy or ECT.

- SSRIs are the drugs of choice. Patients should have a follow-up appointment at least every one to two weeks for six to eight weeks during the initiation phase of treatment. Patients with severe depression should be seen weekly. Less severely ill patients should be seen every 2 weeks.

- Patients with associated anxiety symptoms and difficulty sleeping should be offered a short acting benzodiazepine like lorazepam for 1-2 weeks with tapering doses.

- Patients with suicidal behavior and severe functional impairment should be admitted in the hospital and treated with ECT.

When to obtain a psychiatry consultation?
Psychiatric consultation is needed

- When the first line medication produce no improvement in 6-8 weeks period

- Patients with severe suicidal ideation

- Patients with associated psychiatric or medical or substance abuse disorders

When to add antipsychotics?
If the patient experiences the associated psychotic symptoms with depression, a small dose of atypical antipsychotics like resperidol can be added.

- As this patient has moderate to severe depression and she does not reveal any history of suicidal ideation, psychotic symptoms and anxiety, we can treat her with antidepressants alone.

**Order review:**
Oral, fluoxetine
Counsel patient
Suicide contract

Seat belt use
Patient education
Follow up visit after 10 days

**Primary Diagnosis:**
Major depression

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**Location:** Emergency room

**Presenting complaint:** A 55-year-old male presents with recent onset confusion, blurry vision and headache.

**Vitals:**
Pulse: 75/min, B.P: 215/150 mm Hg, Temp: 98.8 F, R.R: 16/min, Height: 72 inches (180 cm), Weight: 72 Kg (158.4 lbs)

**HPI:**
A 55-year-old white male comes to the E.R with a 2-hour history of confusion, blurred vision, headache, nausea, one episode of vomiting, and breathlessness. He was doing his routine office job when symptoms developed. The headache started this morning, was 1-2/10 in severity but now it is 6-7/10. He denies weakness, sensory disturbances, dysphasia, dysarthria, leg swelling, chest pain or palpitations. Bowel and bladder functions are intact. Diagnosed 5 years ago with hypertension, he was prescribed atenolol, however he is poorly compliant. There is no history of DM, CAD or hyperlipidemia. He has a 25-pack-year smoking history and rarely drinks alcohol. He has no known allergies. FH: Mother is 80 and is hypertensive, father died of MI at 65. One brother is diabetic. Sh: Married 30 years, has two sons and one daughter. He is a business executive. SxH: he is sexually active with his wife and does not use condoms. ROS are unremarkable.

**How to Approach this case:**
This hypertensive male presents with recent onset of confusion, blurred vision and headache. He is most likely suffering from hypertensive encephalopathy, a hypertensive emergency. Other possible causes include subarachnoid hemorrhage, intra-parenchymal brain hemorrhage, acute MI or migraine. Hypertensive emergency or hypertensive crisis is characterized by very high blood pressure with impairment of end organs like CNS, heart or kidney. CNS manifestations include confusion, blurring of vision, headache, weakness and fatigue. CVS involvement results in congestive heart failure, angina, MI or aortic dissection. Renal manifestations are hematuria and/or proteinuria and impaired renal function.

Immediate examination is crucial in this patient,

**Order:**
General
Neuropsychiatric
HEENT
Neck
CVS
Lungs
Abdominal
Extremities

**Order:**
Intravenous line, capped
Nasal oxygen, continuous
Pulse oxymetry, stat and continuous
Continuous cardiorespiratory monitoring
Continuous BP cuff
12 Lead EKG, stat
Bed rest, complete
NPO

**Results:**
Patient is disoriented and neurological examination is otherwise non-focal. Fundoscopy shows arteriolar narrowing and AV nicking. There is mild papilledema, and soft exudates. There is no neck stiffness. CVS examination is significant for S4 gallop. Lungs are clear to auscultation bilaterally. Abdominal examination is normal. Extremities show no evidence of edema.

Before starting treatment, rule out the possibility of stroke. Treating high BP is detrimental in patients with stroke especially those who with increased intracranial pressure, i.e. papilledema. First order CT scan of the head without contrast.

**STAT Order:**
CT scan of head without contrast (to look for edema, hemorrhage, infraction)

**Results:**
CT is negative for stroke.
Pulse oxy is 97% on 2 lit.
Vitals are same as before.
12 lead EKG has evidence of Left ventricular hypertrophy.

**Now start treatment:**
IV nitroprusside, (monitor the patient for hypotension)
After starting treatment, order basic labs to assess the end organ involvement.
CBC with differential, stat (for microangiopathic hemolytic anemia)
BMP, stat (for possible renal involvement)
Urinalysis, stat (for possible renal involvement)
CXR-PA view, stat (to look for the evidence of pulmonary edema)

**Order review:**
BP is under control and patient is symptom free. Always check the BP frequently (in the exam) as continuous infusion of nitroprusside can cause hypotension and try to wean nitroprusside and add an oral agent.
Shift the patient to the medicine floor/ward
D/C cardiac monitor, oxygen, pulse oxy
Vitals Q 4 hours
Oral atenolol, continuous
Allow ambulation
Low salt diet
Once the blood pressure is controlled with oral antihypertensive agents, the patient can be sent home with the following orders

**Order review:**
Fasting lipid profile
Patient education
Home BP monitoring
Regular exercise
Regular follow-ups
Smoking cessation
Alcohol, advice patient to limit intake
Seat belt use
No illegal drugs

**Discussion:**

- Diastolic blood pressure of more than 120 is considered as hypertensive crisis. The presence of end organ damage further classifies it as hypertensive emergency and lack of

end organ damage classifies it as hypertensive urgency.

- The most common cause of hypertensive crisis is inadequately treated essential hypertension. The other common causes include renovascular hypertension and renal parenchymal diseases and rarely form pheochromocytoma or primary hyperaldosteronism.
- Careful physical exam to differentiate hypertensive urgency form emergency should be done. The main components of the exam are funduscopy, CVS, CNS and BP in both upper extremities and at least one lower extremity.
- Basic labs, which include CBC with peripheral smear, U/A, BUN, Cr, EKG, and CXR, should be ordered.

Treatment:

- In hypertensive emergency blood pressure should be lowered within one hour to limit the end organ damage. In hypertensive urgency the aim is to reduce the diastolic blood pressure to about 100-105 mm hg with in a period of 2-6 hours. The maximum initial fall should not be more than 25 mm Hg. More aggressive reduction of BP decreases the blood pressure below the auoregulatory range and may cause ischemic events like stroke. Once the goal is reached, the patient should be switched to oral medications. The diastolic pressure should be lowered to 85-90 over a period of 2-3 months.

- IV nitroprusside is the drug of choice for hypertensive crisis. It acts within seconds and it has a very short half-life. The patient BP should be monitored with intra-arterial line. Prolonged infusion i.e. >48 hrs may cause cyanide toxicity, especially in patients with renal insufficiency. It is not a first line medication in pregnant women. The other good alternatives to nitroprusside are IV labetalol and hydralazine. Hydralazine is the drug of choice in pregnant patients.

- IV phentolamine is the drug of choice in pheochromocytoma.

- Esmolol is an IV beta-blocker and is effective in acutely lowering BP when used in conjunction with a vasodilator. Myocardial ischemia is an important indication for its usage.

Management of hypertension varies in certain situations:

- Rapid reduction for blood pressure is detrimental in patents with cerebrovascular accident. These patients can be differentiated form hypertensive emergency by the abrupt onset of focal neurological findings.

- Patients with acute pulmonary edema are best treated with combination of nitroprusside or nitroglycerine and loop diuretic. Drugs like hydralazine or beta-blockers or labetalol should be avoided.

- Patients with acute coronary syndromes are best treated with IV nitroglycerine or IV labetalol or IV nitroprusside.

- Aortic dissection: The primary goal is to decrease both the systemic BP and cardiac contractility. The best regimen is a combination of IV nitroprusside and an IV beta-blocker either a labetalol or metoprolol. Nitroprusside alone should not be used without a beta-blocker.

- Rebound hypertension secondary to abrupt withdrawal of short acting sympathetic

blockers such as clonidine is best treated by re-administration of the discontinued rug and if necessary with IV phentolamine.

- The rare causes include 1. Pheochromocytoma 2.Cocaine intoxication 3. Interaction of MAOI and tyramine containing foods can also cause hypertensive crisis. This is best treated with IV phentolamine.

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**Location:** Emergency room

**Presenting complaint:** A 7-month-old boy presents with severe breathlessness of sudden onset

**Vitals:**
Pulse: 100/min, B.P: 80/55 mm Hg, Temp: 98.7$^0$F, R.R: 40/min, Weight: 6.8 kg (15lbs), Height: 53 cm

**HPI:**
A 7-month-old boy is brought to the ER with severe cough, stridor, and breathlessness. His 6-year-old brother went to school leaving peanuts near him. Mom found the child in respiratory distress and rushed him to the hospital. There is no family history of asthma. The infant was healthy prior to this incident. Developmental milestones are being achieved at the appropriate ages. He has no allergies. Vaccinations are up-to-date. FH: Father is 32 and healthy; mother is 28 and has DM. He has one elder brother who is healthy. ROS are unremarkable.

**How to approach this case:**
This child presents with acute dyspnea due to upper airway obstruction. Stridor is one of the important clinical signs of upper airway obstruction. There are a number of causes of upper airway obstruction in the pediatric population. Etiologies vary according to the age of the patient. Careful history, and examination as well as lateral and PA chest X-rays should be done in all such patients.

**First**
General examination
HEENT/Neck
Chest/lungs
CVS

**Results of PE**

General examination: The baby is crying, and in obvious respiratory distress.
hest/lungs: The child is tachypneic with nasal flaring, suprasternal, and intercostal retraction. Inspiratory stridor is noted. Air entry is reduced, and percussion note is resonant bilaterally.
VS: Normal S1 and S2. No murmurs, rubs, or gallops. Pulses are normal. No jugular venous distension. Blood pressure is equal in both arms.

**Review orders:**
Start the patient on supplemental inhaled oxygen
Gain IV access, stat
Pulse oxymetry, stat and continuous
Cardiac monitoring, stat
CXR-PA/lateral views, portable, stat
X-ray neck lateral views, portable, stat
CBC with differential, stat

**Results of Labs:**
CBC: normal.
CXR PA and lateral views: No abnormality found.
Pulse oxymetry: oxygen saturation is 91 percent on room air, and 97% on 2-lit oxygen.
Cardiac monitoring: no abnormality of rate or rhythm.

**Discussion:**

This child has sudden and dramatic onset of symptoms. He had peanuts in the vicinity before he developed symptoms. Based on these findings, symptoms are most likely due to aspiration of a foreign body. The next step in this case would be bronchoscopy, which will confirm the diagnosis and aid in the removal of aspirated foreign body. Before bronchoscopy, IV steroids and IV antibiotics may be used to help reduce the chances of edema and infection. Other important causes of upper airway obstruction include croup, laryngitis, epiglottitis, retropharyngeal abscess, angioedema, peritonsillar abscess, and laryngeal papilloma. Croup is common in children aged 6 months to three years and it develops insidiously as an upper respiratory tract infection. Patients with croup have a characteristic barking cough. Laryngitis occurs in children aged greater than five, the voice is hoarse, and there is no stridor. Epiglottitis is more frequent in children aged 2-6 years. There is a short prodrome, drooling is noted, and the patient feels better when leaning forward. Patients with retropharyngeal abscess are usually younger than 6 years, and they do not have stridor. The voice is muffled and they are found to be drooling. Angioedema can occur at any age, onset is sudden, and clinical features of stridor, retractions of intercostal muscles, and facial edema are found. Peritonsillar abscess occurs in children greater than 10 years of age, onset is gradual but with sudden worsening, and there is no stridor. Laryngeal papilloma is encountered in patients of ages 3 months to 3 years, onset is chronic and voice is hoarse.

The majority of foreign bodies are not visible by plain films. So, a normal radiograph can never rule out aspirated foreign body in a highly suspicious patient like this.

**STAT orders:**
IV methylprednisolone, one dose
IV cefazolin, one dose
Stat consult otorhinolaryngology (ENT) subspecialty for confirmation and removal of aspirated foreign body by bronchoscopy

**Primary Diagnosis:** Foreign body aspiration

**Location**: Office

**Presenting complaint:** A 40-year old female patient presents with lump in her left breast.

**Vitals:** BP: 130/80 mm Hg , Pulse: 86/min , Temp: $98.7^0$F , R.R: 16/min , Height: 162.5cm , Weight: 55 kg (12lbs).

**HPI:**
A 40-year-old white female presents with mass in the upper outer quadrant of her left breast. She first noted this mass two months ago, the mass is painless and its size does not change pre or post-menstrually. There is no nipple discharge. She does not give a history of breast lumps. There is no family history of breast cancer. She is a 10-pack year smoker and drinks alcohol socially. She is married and uses oral contraceptives. The patient denies recreational drug use. Her age at menarche was 13 and her menses have always been regular. LMP was 10 days ago. She is gravida 2, para 2, one at the age of 23 and the other at 27. Both deliveries were spontaneous vaginal. Her mother is 65 and is diabetic; her father is 70 and has angina. The rest of her ROS are unremarkable.

**How to approach this case:**
This 40-year old female has presented with a lump in her breast. Careful examination of breasts and lymph nodes especially supra clavicular and axillary should be performed when any woman presents with a breast lump.

**First order the physical examination:**
General examination
HEENT/Neck
Heart examination
Lung examination
Abdomen examination
Breast examination
Lymphnode examination

**Here are the results of examination:**
General, HEENT/Neck, heart, lung, and abdomen examination is WNL.
Breast examination: There is a 2 cm size solid, mobile, firm, non-tender mass with distinct margins, located in the left upper and outer quadrant. There is no nipple discharge. There are no skin changes.
Lymphnode examination: There is no palpable lymphadenopathy.

**Discussion:**
Based on the history and examination, this patient most likely has benign breast disease. There are multiple causes of benign breast disease.
Fibroadenoma: Typically a 15-30 yr old female presents with firm, painless, mobile, (breast mouse) and well-circumscribed lumps.
Fibrocystic changes: Multiple and bilateral cystic breast swellings, which are noted to be particularly painful and tender premenstrually.
Papillomas: C/O bloody nipple discharge (Non-bloody nipple discharge is usually benign).
Duct ectasia: Presents with fever, greenish cheesy discharge, pain, and tenderness.
Mastitis: Patients complain of the sudden onset of pain, fever, chills, and local erythema, tenderness, and induration.
Breast cancer: Consider risk factors first - elderly age, family history of breast cancer, early

menarche, late pregnancy, nulliparity, and late menopause. On examination you have to look for the characteristics of cancerous lesion (Single, hard, immobile lumps with irregular borders and a size of more than 2cm).

Diagnosis:

The best way of making the diagnosis is by using a combination of physical examination, mammography, and fine needle aspiration cytology/biopsy (triple diagnosis). Interpretation should be followed as.

- If all three, suggest a benign lesion - Follow the patient with 3 to 6 monthly physical exam for 1 year to make sure the mass is not enlarging.

- If all three, suggests malignancy - Refer to definitive therapy.

- If any one of the three suggests malignancy - Perform excisional biopsy.

**Women younger than age 35:**

- Mammogram is not useful in this age group, as the breast tissue is very dense. However, it can be done in very high-risk patients.

- If you find a lump and appears to be cystic, perform FNAB/FNAC. If the aspirated fluid is non-bloody, the patient can be reassured and followed in four weeks to check for recurrence. If it recurs then the patient should be referred to surgical specialty. If the fluid is bloody, send it for cytology.

- If the mass is not cystic, obtain an ultrasound. If ultrasound shows a solid mass, the patient should undergo biopsy (Core biopsy or excisional biopsy).

**Women age 35 and older:**

- The only difference from the above age group is all these patients should undergo bilateral mammogram along with clinical exam.

- Management is similar to the above group.

Upto 15% of palpable breast cancers will not be visualized by mammogram. So, a negative mammogram doesn't eliminate the need for biopsy in a patient with palpable mass.
We will follow triple diagnostic approach here, and will perform mammography and FNAB.

**Order Review :**
Mammography, Bilateral
FNAB
Ask her to come with the results

**Results:**
Mammography and FNAB are consistent with the diagnosis of fibroadenoma. In this patient, the fibroadenoma is small; therefore it does not need to be excised. The patient can be followed every three to six months for one year to assess the size of the mass.

**Order review:**

Reassure the patient
Follow up visit at 3 months
Screening of cervical cancer by Pap smear
Counsel the patient

- Patient education
- Contraception
- Safe sex
- Smoking cessation
- Limit alcohol intake
- Safety plan
- Seat belt use

**Diagnosis:**
Fibroadenoma of the left breast

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**Location**: Emergency room

**Vital signs:** BP: 90/60 mmHg, HR: 128/min regular, Temp: 100.0° F, R.R: 30/min rapid and shallow

**C.C:** Vomitings and abdominal pain.

**HPI:**
A 20-yr-old woman presents to E.R with 5 episodes of vomiting, abdominal pain, weakness and increasing drowsiness of one-day duration. During the last 2 months she has noticed increased thirst and increased urination. The abdominal pain is diffuse, 4-5/10 in severity, constant, non-radiating and there are no aggravating or relieving factors. Vomiting is non-bloody. She has no other medical problems. She has no known drug allergies. She is not on any prescription or over the counter medications. She is not a smoker or alcoholic, and denies IV drug abuse. She has a family history positive for Type 1 Diabetes Mellitus. Her father, and paternal uncle and grandfather are all diabetics.

**Review of systems:**
She denies weight changes, fever, chills, night sweats, diarrhea, constipation, skin, hair, or nail changes, blurry vision, acute bleeding, easy bruising, indigestion, dysphagia, changes in bowel movements, bloody stools, burning on urination, recent travel, ill contacts, vaginal discharge or itch, pregnancy, heat or cold intolerance, drug or alcohol use. Last menstrual period ended four weeks ago, was normal in flow and duration.

**How do you approach this case?**
First quickly examine the patient
General
HEENT
Neck
Heart
Lungs
Abdomen
Extremities

**Here are the results of the exam:**
General: Patient is in mild to moderate abdominal pain and appears very distressed.
HEENT: Very dry mucus membranes, no JVD, EOM are intact. Rest is unremarkable.
Lungs: Clear to auscultation B/L.
Heart: Completely normal except tachycardia.
Abdomen: Soft, non tender, normal bowel sounds and no guarding or rigidity.
Extremities: No edema, calf tenderness, but week peripheral pulses.

**Discussion:**
Now, make a mental checklist of differential diagnosis, i.e.

Abdominal pathology like appendicitis, gastroenteritis, pancreatitis, acute intestinal obstruction etc.
Menstrual symptoms or pregnancy related complications
DKA (Based on the family history and presenting clinical features)
Nonketotic Hyperosmolar state
Alcoholic ketoacidosis
Drug intoxication

**Order the following stat:**
Pulse oxy, stat and continuous
Oxygen, nasal canula 2 lit, continuous
NS 0.9%, bolus, stat (This patient is severely dehydrated. She is hypotensive and tachycardic.

So, she needs IV fluids.)
NS 0.9%, continuous, stat
Finger stick glucose test, stat
Urine pregnancy test, stat
CBC with differential, stat
BMP, stat
EKG, stat
Serum amylase, stat
Serum lipase, stat
Blood alcohol, stat
Blood acetaminophen, stat
Urine toxicology screen, stat
Abdomen KUB, stat
U/A, stat

**Ok here are the results:**
Pulse oxymetry showed 96% on room air
Finger stick glucose shows 600mg/dL
Urine pregnancy test is negative
WBC 10,000/μL and normal differential
Sodium is 129, Potassium is 5.0, Chloride is 90, $Co_2$ is 14, calcium is 8.0, and a blood sugar of 600mg/dL
EKG sinus tachycardia, nothing concerning
Serum Amylase - mildly elevated
Serum Lipase WNL
Serum alcohol not present
Serum acetaminophen - Negative
Urine tox screen is – Negative for substance abuse
Abdomen KUB is negative for obstruction, and no intraabdominal pathology is seen
U/A showed 4+sugar, but no evidence of infection

**How do you approach this case?**
So this patient most likely has either DKA or Non-ketotic hyperglycemia. The diagnosis is based on clinical features, elevated blood sugars, and increased anion gap. To confirm the diagnosis we need to order serum ketones and serum osmolality. She has pseudohyponatremia i.e. secondary to elevated blood sugars. Treatment of hyperglycemia resolves her hyponatremia.

**Now order:**
Stat serum osmolality, stat
Serum ketones, qualitative, stat
Give regular insulin 15 units (bolus), stat
Followed by regular insulin, IV, continuous
Put the patient on cardiac monitor
ABG, stat
Serum Phosphate levels
Serum Mg levels

**Here are the results:**
Serum Osmolality 305
Serum Ketones - high
Serum Phosphate 3.2 (WNL)
ABG showed metabolic acidosis, compensated by respiratory alkalosis (pH of 7.3)

**Review orders:**
Admit the patient to the intensive care unit
Nothing by mouth

Bed rest
Vitals as per ICU protocol
Strict input and urine out chart
Add potassium 20 - 30 meq to each liter of IV fluids
HbA1C level
Follow the patient with

1. BMP Q 2-4 hours, then Q 8-12hours, then Q day
2. ABG Q 2 hoursx2

After 4 hrs

1. Stop 0.9% NS and give ½ Normal saline, IV, continuous

Monitor potassium deficiency and add IV potassium chloride as needed
Consider antibiotics if the precipitating cause is an infection, get a chest X-ray, sputum gram stain, and culture/sensitivity; obtain blood cultures, U/A and urine cultures.
Once nausea is decreased, start oral fluids.
Once the patient is stabilized transfer to ward/floor.

**During discharge:**
D/C IV insulin
Start Insulin, SQ
Diabetic diet (Diet, American diabetic association)
Diabetic teaching
Consult ophthalmology
Diabetic foot care consult
Home glucose monitoring, instruct patient
Lipid profile
Age appropriate vaccination
Cessation of alcohol
Smoking cessation
Exercise program
Seat belts
Follow up appointment in 10 days

**Discussion:**
Diagnosis of DKA is based on an elevated blood glucose (usually above 250mg/dl), a low serum bicarbonate level (usually below 15 mEq/L), and elevated anion gap, and demonstrable ketonemia. Both amylase and lipase are often elevated in patients with DKA by an unknown mechanism (do not to confuse with pancreatitis).

Diagnosis of Hyperosmolar hyperglycemic is based on: serum glucose levels in excess of 600 mg/dl, serum osmolality greater than 330 mOsm/kg, absent or minimal ketonemia, arterial pH above 7.3, and a serum bicarbonate above 20 mEq/L. Hyperosmolar hyperglycemic state is characterized by severe fluid and electrolyte depletion due to the osmotic diuresis produced by the extreme levels of glucose in the serum (often >1000 mg /dL).

Hydration: Patients with DKA are profoundly dehydrated and foremost in the treatment of DKA is restoration of the intravascular volume. Estimates of fluid deficits in the decompensated diabetic is 4 to 10 liters (usually 5-6 liters). Initially, one to two liters of normal saline is given as bolus, followed by 500 mL/h for the first four hours followed by 250 mL/h for the next several hours. This initial management should be guided by the patient's general condition and response, with more or less fluid as indicated. After the first 3-4 hours, as the clinical condition of the patient improves, with stable blood pressure and good urine output, fluids should be changed to 1/2 normal saline at 250-500cc an hour for 3-4 hours. Ongoing reassessment is critical.

Insulin: The standard insulin dose is an initial bolus of 10 to 15 units of regular insulin followed

by a continuous infusion at a rate of 8 to 15 units per hour. When the glucose levels begin to approach 250 mg/dl, insulin infusions are continued, but the fluid composition is changed to include 5-10% dextrose in water to avoid hypoglycemia.

Potassium: Potassium: Regardless of the serum potassium level at the initiation of therapy, during treatment of DKA there is usually a rapid decline in the potassium concentration in the patient with normal kidney function.

Potassium replacement is indicated in all patients with the following features: K of <6, no EKG changes, and normal renal function.

Bicarbonate Therapy: The use of bicarbonate in the treatment of DKA is highly controversial. Current recommendations for bicarbonate therapy are as follows. Use of bicarbonate is considered unnecessary when the blood pH is greater than 7.1.

Phosphate is normally an intracellular substance that is dragged out of the cell during DKA. Similarly to potassium, at presentation the serum level may be normal, high, or low while the total body supply is depleted. Despite this depletion, replacement of phosphate has not been shown to affect patient outcome and routine replacement is not recommended.

**Primary diagnosis:**
DKA

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**Location:** Emergency room

**Vitals:** BP 100/60 mm Hg; HR is 50/min, regular; RR is 10/min; Temp. 37C(98.6).

**HPI:**
28-yr old white female is brought to ER in unconscious state. Family reports that she is a very healthy female, has no medical problems, not on any medications, and did not find any empty bottles. She has no allergies. She doesn't smoke or drink alcohol. She has a boyfriend. She has never been pregnant. Her father is very healthy except borderline hypertension. Mother has diabetes. No other history is available. How do you approach this patient?

**Discussion:**
Step I: Emergent management: This patient is hemodynamically unstable, so A, B, C, D is the most important component of the management of this patient.
A: Airway suction, pulse oxy, stat, and continuous monitoring, O2
B: Endotracheal intubation is indicated in patients who cannot protect their airway or if O2 saturation does not improve with O2 nasal/face mask, or PaO2<55, or PCO2>50 on ABG.
C: IV access; continuous cardiac monitor; place a Foley; obtain a finger stick glucose.
D: Drugs: Administer thiamine, dextrose 50%, and naloxone - all are IV bolus one time dose

**Exam:**
Respiratory (assess the breathing pattern)

**Order review:**
Suction airway
Pulse oxy, stat and continuous
Oxygen via mask, stat or Intubation
IV access, stat
Connect to cardiac monitor
Finger stick glucose, stat
Thiamine, IV stat
Dextrose 50%, stat
Naloxone, IV stat
ABG, stat

Step II: Physical Examination:
General
HEENT/Neck
Heart/CVS
Skin
Chest/Lung
Abdomen
Extremities
Neurological exam

Results:
On examinations she found to have pinpoint pupils. She is very drowsy.
So, she has bradycardia, hypotension, and pinpoint pupils, which are classic symptoms for narcotic overdose.

Step III: Diagnostic Investigations:
EKG 12 lead, stat
CBC with differential, stat
BMP, stat

CXR, portable
LFT's, stat
PTT/PT, stat
U/A, stat
Urine toxicology screen
Serum acetaminophen level
Serum CK
B-HCG, stat

Initial Treatment:
Order gastric lavage gets the result (which revealed pill fragments)
Order activated charcoal
Started naloxone drip

**Interval history and brief physical**
Step IV:
Decision about changing patient location
Move patient to ICU
Check electrolytes again
DC Intubation if patient has improved
DC NG Tube
Cont cardiac/ox pulse 24 hrs
DC Naloxone

Step V: Educate patient and family:
Psych consult (result will tell, the history consistent with suicidal attempt)
Order suicide precautions
Move patient to psychiatry ward
DC IV line
Start regular diet
Start patient on antidepressant if needed

Step VI: Final Diagnosis: Narcotic overdose

**Discussion:**

- Orthostatic hypotension resulting from mild peripheral vasodilation is common. However, persistent or severe hypotension should raise the suspicion of co-ingestants.
- In all patients with moderate-to-severe toxicity, it is important to obtain baseline studies, including a CBC with diff, basic metabolic panel, LFT's, ABG, and CK (Creatine kinase level).
- Positive urine drug screens are observed up to 36-48 hours postexposure.
- A 12 lead EKG should be obtained on all patients with intentional overdose, as there is always a possibility of cardiotoxic co-ingestants.
- Chest x-ray is important to rule out any pulmonary edema or aspiration especially in a patient with an unprotected airway.
- Naloxone should be given to patients with significant CNS and/or respiratory depression.
- Continuous IV infusion of naloxone is very safe in patients who were not opioid dependent. However, in patients who are opioid dependent this practice is dangerous and may

precipitate withdrawal symptoms.

- Activated charcoal should be administered to all patients with opiate intoxication following ingestion. Because of the delayed gastric emptying produced by opiate intoxication, it is effective even in patients who present late following ingestion. Orogastric lavage is indicated if the patient presents within one hour of ingestion.

- All patients with significant respiratory depression, recurrent sedation should be observed in the hospital for at least a period of 12-24 hours. Most physicians admit the patients if they require a second dose of naloxone. Patients should have continuous cardio respiratory monitoring.

**Location:** Emergency room

**Vitals:** BP 150/90 mm Hg, HR 70/min, RR 16/min, and Temperature 37C.

**HPI:**
A 65 yr old white male is brought to the ER by his wife after he dropped a glass on the floor. His speech became slurred and he was unable to understand what she was saying. She asked him to write something. He wrote a couple of sentences that didn't make any sense. The episode lasted a few hours. She brought her husband to ER. He denies any residual weakness or sensory changes. He also denies any visual changes, headache, nausea, vomiting, bowel, or bladder dysfunction. His other medical problems include hypertension, hypercholesterolemia, and DM. He takes enalapril 10 mg po QD, Simvastatin 10 mg po QD, and metformin 500 mg BID. He has no allergies. He has been smoking one PPD for the past 30 years. He occasionally drinks alcohol. His father died with MI at the age of 68. His mother died from a stroke. He has no known allergies.

**How do you approach this patient?**
Consider the D.D:
Thrombotic or embolic TIA
Subdural hematoma
Seizure
Hypoglycemia
Brain tumors
Labyrinthine disorders

**Step I: Emergent management:**
A, B, C, D- Not needed.

**Step II: Physical Examination**
General appearance, HEENT/Neck, Heart/CV, Lymph Nodes, Skin, Chest/Lung, Abdomen, Extremities, Neuro.
A loud bruit was auscultated over the left carotid, no murmurs, rubs, or bruits were heard over pericardium. Neuro was nonfocal. Rest of the exam is within normal limits.

**Step III: Diagnostic Investigations:**
CBC with differential, stat
BMP, stat
ECG 12 lead, stat
CT head/brain without contrast, stat

CT: NEGATIVE for acute cerebrovascular event. (Most of the time CT scan will not show any deficits in the first 24 hours.)

Diagnosis: Considering history, physical, & the test you have done: this patient most likely had a TIA. TIA by definition, deficit lasting <24hrs.
There is a bruit on left carotid. It might represent a plaque that sent a small embolus to the brain.

**Step IV: Decision about changing the patient’s location**
Admit to ward
Vitals Q 12 hours
Diabetic diet

Allow ambulation
Continue his home medications
Accu-checks BID
Carotid doppler
Tele monitoring
2D-Echocardiogram
Aspirin, oral, once daily

**Results**:
>70% stenosis in left carotid artery
No arrhythmia
No valvular disease, no evidence of thrombus, normal left ventricular function, normal atrial size

**Treatment Plan:**
Vascular surgeon consult for elective CEA

**Step V: Educate patient and family:**
Stop smoking
Better BP control (exercise, diet, and pharmacological)
DM control (exercise, diet, and pharmacological)
Continue aspirin

**Step VI: Final Diagnosis:**
Transit Ischemic Attack.

**Discussion:**
Basically TIA has three pathophysiologic subtypes :

Large artery low flow TIA (true TIA)
Embolic TIA,
Lacunar TIA

- The best way of differentiating these entities is by good history. Low flow TIAs are brief (lasts minutes to few hours), recurrent, and stereotyped. The underlying pathology is some kind of atherosclerotic stenosis in cerebral vascular system, most likely the internal carotid artery. On the other hand, embolic TIAs are characterized by discrete, usually single, and more prolonged (several hours) episodes of focal neurologic symptoms.

- All patients with suspected TIA require urgent evaluation. Routine inpatient evaluation following TIA is controversial. American Heart Association does not recommend inpatient evaluation following TIA, unless the time to obtain the basic tests takes longer as an outpatient. Initial evaluation should include good history, physical examination, and some basic tests. CBC with differential and BMP should be obtained to exclude the hematologic (thrombocytosis) and metabolic causes (hypoglycemia, hyponatremia) of neurologic symptoms. ECG is useful to diagnose an unsuspected atrial fibrillation and a recent MI. CT of the head without contrast and carotid doppler should be performed on all patients. MR angiography is used primarily to diagnose abnormalities in the posterior cerebral circulation.

- Patients with embolic TIA should have a cardiac evaluation, preferably with transesophageal echocardiogram. Most of the emboli are <3mm and transthoracic echocardiogram cannot visualize these. TEE is also useful for suspected atrial thrombi. However, TTE can be considered in elderly patients with H/O CHF or previous MI since the

left ventricular apex is not well seen with TEE (This is a common site for left ventricular thrombi.). In general, we proceed with TTE because it is noninvasive. TEE is indicated if the TTE is negative and the decision of the management depends on TEE findings.

Treatment:

- Aspirin is the mainstay of therapy regardless of the pathophysiology of the TIA. Patients who cannot tolerate aspirin should be treated with either clopidogrel or ticlopidine. There is no evidence that the combination use has superior results than aspirin alone. However, the combination therapy can be considered in patients who have a TIA while on aspirin alone.

- Further therapy depends on weather the TIA is: 1. Atherothrombotic 2. Embolic.

Atherothrombotic:

- If a large vessel, like internal carotid artery, is involved carotid endarterectomy should be performed. A Multidisciplinary Consensus Statement from the American Heart Association concluded that carotid endarterectomy is of proven benefit for symptomatic patients with 70% to 99% stenosis, provided the surgical risk is less than 6%. The presence of 100% carotid stenosis, previous stroke with persistent neurologic symptoms, and presence of multiple co morbid medical conditions are contraindications for CEA.

- There are no indications to give either warfarin or heparin to this patient population, unless they have an associated H/O atrial fibrillation.

- Risk factor management includes treatment of hypertension, diabetes mellitus, smoking, dyslipidemia, and hyperhomocysteinemia.

Embolic:

- There is definitive evidence that patients with obvious cardiac source of embolism will benefit from antithrombotic therapy. The use of heparin is controversial in patients with acute TIA and has an evidence of atrial fibrillation. However, all patients should be treated with warfarin unless there are contraindications.

- If the patient is on warfarin because of atrial fibrillation and develops a stroke/TIA, low dose aspirin can be added while maintaining the patient on warfarin with a target INR.

**Location**: Emergency room

**Presenting complaint:**
A 22-year-old woman presents with fever and pelvic pain

**Vitals:** Pulse: 102/min, Temp: 102.5F, R.R: 19/min, B.P: 125/80mm Hg, Height: 162.5cm, Weight: 60 kg (132lbs).

**HPI:**
A 22-year-old female presents to the ED with a one-day history of severe lower abdominal and pelvic pain with high-grade fever and chills. The pain is dull and aching and does not radiate. Movement and coitus make the pain worse. This type of pain is completely new for the patient. Her last menstrual period was 4 weeks ago but there is an ongoing slight vaginal bleed. The patient is also nauseated and has vomited on three occasions. She is sexually active with her boyfriend and uses hormonal contraception. She has never been pregnant. She has no known allergies. She has no other medical problems. She is not on any medications other than OC pills. Her vaccinations are up to date. FH: Father is 50 and has diabetes; mother is 47 and has asthma. She has one older sister who is healthy. SH: She does not smoke; however she drinks alcohol daily. She denies recreational drug use. She is un-married and has no children. ROS are unremarkable.

**How to approach this case:**
This young woman presents with pelvic and abdominal pain and high-grade fever. Based on the history, she is most likely has PID. Another possible cause is appendicitis, which needs to be ruled out in all cases of acute abdomen. Pregnancy related problems are likely when the duration of the LMP is greater than 6 weeks. In patients of age greater than 35, MI, cholecystitis and pancreatitis must be considered. Therefore, do the following:

**Order physical examination:**
General examination
HEENT/Neck
Heart and lungs examination
Abdominal examination
Genital/pelvic examination
Rectal examination
Extremities

**Here are the results of examination:**
General examination: Patient appears ill and in moderate pain.
Heart and lung examination is within normal limits.
Abdominal examination: There is bilateral lower abdominal tenderness, normal bowel sounds, no hepatosplenomegaly. No rebound or rigidity. No evidence of abdominal distention.
Genital examination: There is bilateral adnexal tenderness as well as cervical motion tenderness. Mild bloody discharge is present on the cervical os.
Rectal examination: Sphincter tone is normal; heme negative brown colored stools; no palpable masses.
Extremities: no edema, calf tenderness, rashes, or joint swellings.

**Discussion:**
The following minimal clinical criteria has been suggested for the diagnosis of PID: adnexal tenderness, abdominal tenderness and cervical motion tenderness plus fever of 38C or greater

or Leukocytosis or evidence of pus in the peritoneal cavity or evidence of pelvic abscess or sexual contact with someone who is infected with chlamydia or gonococcus.

This patient meets the clinical diagnostic criteria for PID. Obtain a CBC, gonococcal and chlamydial cultures as well as gram stains to increase the specificity of the diagnosis. Other non-specific tests, which can be ordered, are ESR and C-reactive protein. Urinalysis is appropriate to rule out a co-existent UTI. Pregnancy testing should be done in every sexually active female of childbearing age. An abdominal ultrasound is appropriate when pregnancy related problems are considered (LMP is greater than 6 weeks).

**STAT Order review:**
IV access, stat
CBC with differential, stat
Basic metabolic panel, stat
Urinalysis, stat
Urine culture and sensitivity, stat
Gram stain, cervix, stat
Gonococcal culture, cervix
Chlamydial culture, cervix
PAP smear
ESR, stat (Optional; usually we don't do in real time practice)

Meanwhile, start the management of this patient of acute PID. This patient needs inpatient treatment, as she is nulliparous, has GI complaints, and fever greater than 102.2F. Other criteria for inpatient treatment include elevated WBC, adolescence, peritoneal symptoms, uncertain diagnosis, failure to respond to 48 hours of outpatient management, inability to tolerate outpatient treatment, pregnancy and immunodeficiency.

Antibiotic treatment is empirical. The inpatient regimen is IV cefoxitin or IV cefotetan plus oral or IV doxycycline administered until at least for 48 hours after clinical recovery. Then continue oral doxycycline for 14 days.
(Or)
IV clindamycin and a loading dose of IV gentamycin. Continue IV clindamycin for 24 hours after the clinical recovery. Give oral doxycycline treatment for 14 days.

Outpatient treatment is a single oral dose of cefoxitin or a single IM injection of ceftriaxone plus a single oral dose of Probenecid and oral doxycycline for 14 days.

**Order review:**
Shift the patient to ward
NPO status as she is vomiting
Bed rest with bathroom privileges
Vitals: Every 4 hours
IV normal saline, continuous
IV Metaclopropamide, continuous
Pain control
Cefoxitin, IV continuous
Doxycycline, IV continuous
Acetaminophen 1gm po Q 6 hrs prn (as needed)

**Result of Labs:**
CBC with differential:
WBC counts: 12000/mm3

RBC counts: 5.1 million/mm3
Hemoglobin: 15.9 g/dl
Platelet counts: 200,000/mm3
MCV 86cu micron
MCH: 27 pg/RBC
MCHC: 33 g Hb/dL
Red cell distribution width: 12

WBC differential:
Segmented neutrophils: 85
Juvenile neutrophils: 3
Lymphocytes: 6
Monocytes: 3
Eosinophils: 2
Basophils: 1

Peripheral blood smear:
Normochromic normocytic erythrocytes
Leukocytes and platelets normal in number and morphology

ESR: 25 mm/hr
Urinalysis: normal
Gram-staining: no bacteria found
Gonococcal cultures: pending
Chlamydial culture: pending

The patient is pain free, afebrile and her condition remains improved for 48 hours.

**Order review:**
Stop Metaclopropamide
Stop IV fluids
Start regular diet as soon as she is able to take
D/C IV Cefoxitin
D/C IV Doxycycline
Oral doxycycline, continuous
VDRL, routine
HIV serology, routine
Safe sex counseling
Smoking, cessation
Advise patient to limit alcohol use
Send her home

**Primary Diagnosis:**
Acute PID

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**Location**: office

**Presenting complaint:** A 25-year-old African-American male presents with jaundice.

**Vitals:** Pulse: 95/min, B.P: 110/75 mm Hg, Temp: 98.8 F, R.R: 16/min , Height: 72 inches (180 cm), Weight: 72 Kg (158.4 lbs)

**HPI:** A 25-year-old African-American male presents to the outpatient clinic with the sudden onset of jaundice and dark colored urine. He complains of back pain and fatigue. The patient is afebrile and denies recent travel. He does not smoke, drink alcohol or use recreational drugs and uses condoms whenever he engages in sexual activity. On further questioning, it is revealed that he took TMP-SMZ for diarrhea a few days ago. An uncle has a history of some type of blood disorder.

| | |
|---|---|
| Hospitalization/Procedures | None |
| Other Medical Problems | None |
| Allergies | NKDA |
| Current Medications | None |
| Vaccinations | Up to date |
| Family History | Mother died at the age of 60 yrs due to MI. Father is alive and healthy at the age of 65 yrs. No sibling. |
| Social History | He is single but has a girl friend. Denies tobacco, alcohol and drug use. |
| Sexual History | He is sexually active with his girl friend. |
| Occupational History | Restaurant owner. |
| Recreational | He plays basketball and enjoys traveling. |

**Review of Systems:**

| | |
|---|---|
| General | see HPI |
| Skin | pallor, itch, no rashes |
| HEENT | Icterus |
| Musculoskeletal | No muscle aches or joint stiffness |
| Cardio respiratory | Without complaint |
| Genitourinary | Dark colored urine, denies dysuria |
| Abdominal | see HPI |

**How to approach this case:**
This is a presentation of jaundice. Jaundice can be due to hemolytic causes and disorders involving the liver or biliary tracts.

**First perform a physical examination:**
General examination
Skin
Lymph nodes
HEENT/Neck
Heart exam
Lung exam
Abdominal examination
Extremities
Neuro

**Results of PE:**
General: Icterus is noted on sclera; He also appears pallor..
Abdominal examination: no masses, tenderness, or organomegaly. Normal bowel sounds.
Rest of the exam is WNL

**Routine Orders:**
CBC with differential, routine
Basic metabolic panel, routine
Peripheral smear, routine
LFTs, routine
Prothrombin time, routine

**Results of Labs:**

| | |
|---|---|
| WBC counts: | 8200/mm3 |
| RBC counts: | 1.8 million/mm3 |
| Hemoglobin: | 9 g/dl |
| Hematocrit: | 33 % |
| Platelet counts: | 200,000/mm3 |
| MCV: | 98 cu microns |
| MCH: | 28pg/RBC |
| MCHC: | 35 g Hb/dL |

**WBC differential:**

| | |
|---|---|
| Segmented neutrophils: | 72% |
| Juvenile neutrophils: | 2% |
| Lymphocytes: | 18% |
| Monocytes: | 5% |
| Eosinophils: | 2% |
| Basophils: | 1% |

**Peripheral blood smear:**
Normochromic normocytic erythrocytes, bite cells are also present. Leukocytes and platelets are normal in number and morphology.

LFTs

| | |
|---|---|
| Bilirubin, serum, total | 5 mg/dL |
| Bilirubin, serum, direct | 0.5 mg/dL |
| Aspartate transaminase, serum | 25U/L |
| Alanine transaminase, serum | 20U/L |
| Alkaline phosphatase, serum | 182U/L |
| Protein, serum, total | 7.2 g/dL |
| Prothrombin time | 11 sec |

**Discussion:**
This patient has no history of fever or abdominal pain and also no risk factors for hepatitis. Thus, acute cholangitis or hepatitis is unlikely as a cause of his jaundice. Normal abdominal examination with absence of tenderness further excludes liver or biliary tract pathology. The presence of pallor, and dark colored urine suggests an intravascular hemolytic cause of the jaundice. Other points to elicit are positive family history and exposure to sulpha drugs.

Normal LFTs rule out liver or biliary tract disease. Elevated levels of indirect bilirubin are a clue towards hemolysis. CBC shows anemia and presence of bite cells on peripheral smear. This suggests that the jaundice is due to hemolysis. Next do the following tests to confirm the

presence of hemolysis and to determine if it is intravascular or extravascular.

**Routine Order review:**
Admit the patient in floor/ward
IV access
Start IV NS, continuous
Diet: Regular diet (avoid fava beans)
Activity - allow ambulation
Type and cross 2 units of blood
Reticulocyte count (to confirm that jaundice is hemolytic as reticulocyte count is elevated in cases of hemolysis)
Calculate reticulocyte production index (to correct reticulocyte count for the degree of anemia)
Serum haptoglobin
Serum LDH (it is elevated in intravascular hemolysis)
Urinalysis (to detect hemoglobin or hemosiderinuria)
Repeat Hb and hematocrit in 12 hours

**Results:**

| | |
|---|---|
| BUN | 12 mg/dL |
| Serum creatinine | 0.6 mg/dL |
| Rest of the BMP | WNL |
| Serum LDH | 400 IU/L |
| Serum haptoglobin | 20 mg/dL |
| Urinalysis | normal |

Elevated reticulocyte count confirms the presence of hemolytic anemia and elevated LDH with low haptoglobin indicate that the hemolysis is intravascular. A positive family history, history of exposure to sulpha drugs and presence of bite cells on peripheral smear are all suggestive of G6PD deficiency anemia. G6PD deficiency is confirmed by G6PD assay. Other hereditary causes of hemolytic anemia are sickle cell anemia, thalassemias and hereditary spherocytosis.

In sickle cell anemia, peripheral smear shows sickle shaped RBCs and in hereditary spherocytosis RBCs exhibit a loss of central pallor. Thalassemias produce a microcytic picture with target cells. For thalassemias and sickle cell anemia, hemoglobin electrophoresis provides useful diagnostic information. Autoimmune hemolytic anemia is an important non-hereditary cause and in such cases coomb's test is an important diagnostic tool. Intravascular hemolysis can also be a part of thrombotic thrombocytopenic purpura, but in such cases fragmented RBCs are found on peripheral smear and platelet counts are also low along with renal impairment. Regarding treatment of G6PD deficiency anemia, all affected individuals should avoid exposure to drugs with oxidant potential. Heterozygous females should also avoid exposure to such drugs during pregnancy and lactation as they may trigger hemolysis in the fetus or neonate. Transfusions are needed when anemia is very severe due to impaired compensatory erythropoiesis.

**Routine Order:**
RBC G6PD assay

**Result:** G6PD levels are low (levels can be normal during or immediately after the acute hemolytic episode, therefore you can repeat the test to confirm the diagnosis)

**Order review:**
Schedule an appointment after 2 months and at that time re-evaluate G6PD assay
Reassurance

Patient education
Limit alcohol use
Regular exercise
Safe sex counseling

**Primary Diagnosis:**
G6PD deficiency anemia

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**Location:** Office

**Presenting complaint:** A 2-year-old boy is brought with complaints of failure to gain weight and loose stools.

**Vitals:** Pulse: 100/min, B.P: 80/56 mm Hg, Temp: 101.2 F, R.R: 18/min, Height: 27.2 inches (68cm), Weight: 7.2 Kg (16 lbs)

**HPI:**
A 2-year-old Caucasian child is brought to the doctor's office by his parents for an evaluation of loose greasy stools and failure to gain weight despite adequate nutrition. His other problems are intermittent productive cough and rhinorrhea. The parents state that he has been wheezing and coughing up a purulent expectoration for 4 days. They deny fever or chills. He has had pneumonia 4 times since birth. Delivery of the child and neonatal course were uncomplicated. He was breast-fed until the age of 4 months. There is a history of CF in the family of both of his parents.

**Review of Systems:**

| | |
|---|---|
| General: | |
| Skin: | No rashes or lesions |
| HEENT: | Nasal discharge |
| Musculoskeletal: | No joint swelling |
| Cardio respiratory: | see HPI |
| Genitourinary: | No complaints |
| Abdominal: | see HPI |
| Development: | Delayed |
| Vaccinations: | Up-to-date |

**How to approach this case:**
This child presents with failure to thrive. Failure to thrive has both organic and non-organic causes. The etiology of failure to thrive in this child is most likely cystic fibrosis. Clues to cystic fibrosis in this patient are positive family history, repeated chest infections and malabsorptive diarrhea.

**Order:**
Complete physical examination

**RESULTS:**
The child seems to be emaciated; his height and weight are lower than expected for his age. Chest examination shows generalized hyper-resonance and scattered crepitations bilaterally. He also has wheezing especially during expiration.

**ORDER REVIEW:**
Admit to the ward, stat
Pulse ox, stat
Intravenous access, capped, stat
Sputum gram stain and culture, stat

Blood cultures, stat
CBC with differential, stat
BMP, stat
CXR-PA/Lateral, stat
X-ray PNS, routine
Sweat chloride, routine
24 hr fecal fat estimation, routine

**Treatment:**
Nasal oxygen, continuous (If saturation are <92% on room air)
Amoxycillin and Clavulonic acid, oral, continuous
Nebulized Albuterol, QID (4 times a day)
Multivitamin tablets, oral, once daily
Consult respiratory therapist, reason: Chest physiotherapy, every 2 hours
Vitals Q 6 hours
IV fluids D5NS, continuous
High calorie diet
Ambulation at will

**RESULTS:**
CBC shows neutrophilic leukocytosis
Sweat chloride is 85 meq/L
BMP showed low sodium and potassium
CXR shows hyperinflation of both lung fields.
X-ray PNS shows opacification of paranasal sinuses.
Gram staining of sputum does not show any predominant organism.
Sputum culture is pending.
24 hr fecal fat estimation is pending

**DISCUSSION:**
Cystic fibrosis is an autosomal recessive disorder commonly affecting Caucasians. Its clinical manifestations include acute or persistent respiratory symptoms, failure to thrive, meconium ileus, diarrhea, rectal prolapse, nasal polyps, electrolyte or acid-base disorders and hepatobiliary disease. Diagnosis of cystic fibrosis is made when evidence of CFTR dysfunction is present along with typical clinical features or positive family history. Elevated sweat chloride on two separate occasions is an evidence of CFTR dysfunction. Other important tests are gram stain, culture and sensitivity of the sputum, chest X-ray, X-ray of the para nasal sinuses. 24 hour fecal fat estimation should be used to diagnose the malabsorption.

All children who are suspected to be suffering from CF should be admitted to the hospital. Evaluation should include baseline testing, accurate diagnosis, initiation of treatment and education of the patient and parents. Follow-up should be done every 2-3 months for monitoring. History, physical examination and staining and culture of sputum or pharyngeal swab are required on each follow-up visit. Prophylactic immunization against influenza, measles, and pertussis should be given.

Treatment:

- Antibiotics are given when a patient of CF develops acute or sub-acute increase in sputum production, cough, dyspnea and/or fever. Antibiotics are selected according to the results of sputum culture. Sputum cultures are performed at least on yearly basis to help identify the bacteria, which are chronically inhabiting the respiratory tract. Oral antibiotics are used when exacerbation is mild, while IV antibiotics are used when exacerbation is severe and when bacteria are resistant to oral antibiotics. For S. aureus, oral antibiotics used are cephalexin, dicloxacillin or amoxicillin-clavulanate. For P. aeruginosa, ciprofloxacin is used as an oral antibiotic. IV regimen for P. aeruginosa is a combination of tobramycin and anti-pseudomonal penicillin like piperacillin.
- Bronchodilators like albuterol or salmeterol are used in patients with airflow obstruction.
- DNase is usually prescribed for those with daily productive cough plus airflow obstruction.
- Combination of physiotherapy and exercise should be considered in patients with more retained purulent secretions.
- Inhaled glucocorticoids can be used in patients of CF who have clinical evidence of airway hyperactivity.
- Oxygen therapy should be considered in all patients who have evidence of hypoxemia at night or rest or pulmonary HTN.
- Lung transplantation is the only definitive treatment in patients with severe infections and grossly damaged lungs with a FEV1 of 30% or less of the predicted value.
- Nutrition: Recommended diet is one with high protein and high calories. Vitamin supplementation of fat-soluble vitamins and pancreatic enzyme replacement are also very important.

**Results review:**

24 hr fecal fat is elevated.

Sputum culture grew staphylococcus aureus, sensitive to cephalexin.

**ORDER REVIEW:**

D/C Amoxycillin and Clavulonic acid

Stat cephalexin, oral, continuous

Influenza vaccine

Pneumococcal vaccine

Consult dietitian

Pancreatic enzymes, oral, continuous

Genetic counseling

Follow up at 2-3 months

**PRIMARY DIAGNOSIS:**

Cystic fibrosis

**Location**: Office

**Presenting complaint:** A 26-year old female presents with amenorrhea and abdominal pain.

**Vitals:** PR: 84/min; Temp: 98.9$^0$F; R.R: 17/min; B.P: 125/80mm Hg; Height: 162.5cm; Weight: 60 kg (132lbs).

**HPI:**
A 26-year-old white female presents to your office with a one-day history of lower abdominal pain. The pain is dull and aching, 4/10 in severity, and does not radiate. She feels nauseated but has not vomited. Her last menstrual period was 7 weeks ago. Previously, her menstrual cycles have always been regular, 29-30 days in duration. Now, she complains of slight vaginal bleeding. The patient is sexually active with her husband and uses safe period for contraception. Her history includes two episodes of PID. She has never been pregnant and does not smoke or drink alcohol. She has no known allergies. She is not on any medications. FH: Father is 50 and has COPD; mother is 46 and healthy. She has two older sisters who are healthy. ROS are unremarkable.

**How do you approach this case?**
This young woman presents with amenorrhea, abdominal pain, and vaginal bleeding. Differential diagnosis includes: ectopic pregnancy, abortion, molar pregnancy, degenerating leiomyoma, adnexal torsion, ruptured corpus luteum, PID, acute diverticulitis, pyelonephritis, or IBD.

The triad of amenorrhea, abdominal pain, and vaginal pain suggests ectopic pregnancy. The condition of this patient is stable; therefore we can safely proceed towards a complete examination. Stable patients require continuous monitoring for signs of rupture like increasing abdominal pain, or tenderness, shock, and bleeding. In addition to doing a focused examination, also perform a pregnancy test, which will help us include or exclude conditions related to pregnancy. If the patient is unstable, as indicated by hypotension and tachycardia, obtain immediate IV access, administer normal saline, type and cross match blood and start the blood transfusion along with continuous BP monitoring followed by consultation with Surgery/Obstetrics & Gynecology for possible laparotomy.

Start with the following orders
General examination
HEENT/Neck
Heart examination
Lungs examination
Abdominal examination
Genital examination
Rectal examination
Extremities

**Result of examination:**
General examination: Well nourished, well developed woman in pain and appears sick.
Abdominal examination: abdominal tenderness in left lower quadrant; normal bowel sounds; no bruits; spleen and liver are not palpable; no hernias.
Genital examination: Uterus is slightly enlarged and feels boggy. A small amount of dark brownish-red blood is coming from cervical os. There is mild left adnexal tenderness.
Rectal examination: Sphincter tone is normal; stool is brown colored without occult blood; no palpable masses.
Rest of her exam is unremarkable.

**Order:**

HCG, beta, urine quantitative, stat

**Result of Labs:**
Positive urinary beta-HCG

**Discussion:**
Positive urinary beta-HCG testing coupled with the classic triad of abdominal pain, amenorrhea, and vaginal bleeding is highly suggestive of ectopic pregnancy. But other pregnancy related problems like spontaneous abortion, molar pregnancy, and ruptured corpus luteum are included in the differential. They can all be excluded by ultrasonography. With molar pregnancy, there may be a history or evidence of passage of vesicles, hyperemesis gravidarum, large for date pregnancy, very high serum beta-HCG levels, or a snowstorm pattern on pelvic ultrasonography. With incomplete or compete abortion there is a history of vaginal passage of products of conception. To confirm the presence of ectopic pregnancy, perform a **quantitative serum HCG** plus **transvaginal ultrasonography**.

Progesterone measurement add nothing to the information already obtained by quantitative serum HCG and transvaginal U/S. Therefore, they need not be performed routinely.

Perform coagulation studies, blood typing, and cross matching, as well as cervical culture for Gonococcus and Chlamydia.

LFTs and renal function tests are important studies to perform, as impaired functioning of these organs is an important contraindication to the use of methotrexate. Methotrexate can be used as a medical treatment for ectopic pregnancy.
Culdocentesis will show any blood in the cul-de-sac but this information can be obtained by transvaginal ultrasonography.

Laparoscopy is used mostly for treatment purposes as diagnosis is often established by ultrasound and hCG measurements.

Admit the patient to the ward
NPO
Intravenous line
IV NS, continuous
Bed rest, complete
Vitals every 1-hour
Transvaginal ultrasonography, stat
Quantitative serum beta-HCG levels, stat
Blood typing and cross matching, stat
CBC with differential, routine
PT, routine
PTT, routine
BMP, routine
Gonococcal culture, cervix
Chlamydia culture, cervix
PAP smear (if not documented before)

**Discussion:**
If beta-hCG level is greater than 1500 IU/L and TVS shows an intrauterine pregnancy, ectopic pregnancy is ruled out. If beta-hCG level is greater than 1500 IU/L and TVS does not show any intrauterine pregnancy, EP is very likely. When beta-hCG level is less than 1500 IU/L and there is no intrauterine or extrauterine pregnancy on TVS, repeat these tests within two to three days. If there is an adnexal mass along with beta-hCG level greater than 1500 IU/L, EP is almost certain.

**Results of labs:**

Transvaginal ultrasonography: A non-specific left adnexal mass is observed, 2.2 cm in size.
Quantitative serum beta-HCG levels: 2000 IU/L
Blood typing and cross matching: A-positive

**CBC with differential, stat:**

WBC count: 8200/mm3
RBC count: 5.1 million/$mm^3$
Hemoglobin: 15.9 g/dl
Platelet count: 200,000/$mm^3$
PT, stat: 9.5 sec
PTT, stat: 24 sec
LFTs: Within normal limits
BMP: Within normal limits
Cervical culture: Pending

**Discussion:**

- Presence of an adnexal mass along with elevated serum beta-HCG levels confirms the presence of ectopic pregnancy. Treatment can now be started. The available treatment options are medical therapy with methotrexate, laparoscopic surgery, laparotomy, and expectant management.
- Laparotomy is indicated when the patient is in shock and when the size of ectopic pregnancy is greater than 3.5 cm. When the patient is hemodynamically stable and the size of gestation is less than 3-3.5 cm, she can be treated with either methotrexate or laparoscopy.
- MTX treatment can be employed successfully in those who are asymptomatic, whose serum beta hCG level is less than 5000 IU/L, US shows that tubal size is less than 3 cm, and there is no fetal cardiac activity. Post treatment compliance is also an important consideration in these patients. There are some contraindications to the use of MTX like renal failure, liver failure, hypersensitivity to MTX, and breast-feeding.
- Some patients who are asymptomatic, stable, and have un ruptured EP can be managed expectantly.
- Patients of ectopic pregnancy who are Rh negative should receive Rh immunoglobulin.
- The patient here is stable hemodynamically, the size of her gestation is smaller than 3 cm, and there is no contraindication to the use of methotrexate therapy; therefore treat with either MTX or laparoscopic surgery.

**Order Review:**

OBGYN consult
Methotrexate IV, stat, one time
Send her home with follow up visit at 4 days for quantitative serum beta-HCG.
Safe sex counseling
Contraceptive counseling
Patient education

**Primary Diagnosis:**

Ectopic pregnancy

**Location:** office

**Presenting complaint:** A 5-year-old boy presents with continuous oozing of blood after dental extraction two days ago.

**Vitals:** Pulse: 80/min B.P: 110/70 mm Hg Temp: 98.7$^{0}$F R.R: 16/min Height: 103cm Weight: 18.0 kg

**HPI:** A 5-year-old boy is brought to the physician's office by his mother complaining that there is continuous oozing of blood from the site of his extracted tooth. He underwent tooth extraction two days ago. The bleeding stopped initially but restarted spontaneously a few hours later and continues to bleed. Mom denies, cough, SOB, vomiting, fever, epistaxis, bleeding per rectum, easy bruising, petechiae or other illnesses. The child takes no medicines. The mom has one brother who is a hemophiliac.

| | |
|---|---|
| Hospitalization/Procedures | None |
| Other Medical Problems | None |
| Allergies | NKDA |
| Current Medications | None |
| Vaccinations | Up to date |
| Family History | Father is healthy at 28; mother is 24 and has asthma. |
| Developmental history | He attends kindergarten. He achieved all developmental milestones at the appropriate ages. One sister who is healthy |

**Review of Systems:**
General:

| | |
|---|---|
| Skin | No rashes |
| HEENT | No complaints |
| Musculoskeletal | Stiff right elbow |
| Cardio respiratory | No complaints |
| Genitourinary | Wets the bed |
| Abdominal | Denies complaints |

**How to approach this case:**
This child presents with a probable bleeding disorder. His bleeding is minor and his condition is stable. Assess his general condition, skin and oral cavity for evidence of blood loss. Bleeding problems may be due to the disorders of blood vessels, platelets or clotting factors.

**ORDER**
Complete physical examination

**Labs:**
CBC with differential, stat (to determine platelet count as low platelet counts result in disorders of primary hemostasis)
Basic metabolic panel, stat
Bleeding time, stat (bleeding time is prolonged in disorders of primary hemostasis)
Prothrombin time, stat (PT is prolonged in disorders of extrinsic pathway of coagulation cascade)

Partial thromboplastin time, stat (PTT is prolonged in disorders of intrinsic pathway of coagulation cascade)
Peripheral smear, stat

Liver function tests, stat

**Results of PE:**
General examination: well developed and well nourished.
Skin examination: no petechiae, warm, pink, normal turgor, no lesions, hair and nails normal
HEENT: normocephalic, normal vision and fundus, hearing and ears are normal. Blood is oozing from the site of the extracted tooth. No abnormality detected in nose or oropharynx.
The remainder of the examination is WNL.

**Results of Labs:**

| | |
|---|---|
| WBC counts: | 8200/mm3 |
| RBC counts: | 5.6 million/mm3 |
| Hemoglobin: | 15.5 g/dl |
| Hematocrit: | 45% |
| Platelet counts: | 200,000/mm3 |
| MCV: | 90 cu microns |
| MCH: | 28pg/RBC |
| MCHC: | 35 g Hb/dL |

**WBC differential:**

| | |
|---|---|
| Segmented neutrophils: | 72% |
| Juvenile neutrophils: | 2% |
| Lymphocytes: | 18% |
| Monocytes: | 5% |
| Eosinophils: | 2% |
| Basophils: | 1% |

**Peripheral blood smear:**
Normochromic normocytic erythrocytes, Leukocytes and platelets are normal in number and morphology
Bleeding time: 5 minutes
Prothrombin time: 12.2 seconds
Partial thromboplastin time: 50 seconds

**DISCUSSION:**
Bleeding disorders may be divided into two broad categories of primary and secondary hemostasis. Primary hemostasis involves interaction of platelets with the vessel wall and secondary hemostasis requires clotting factors. Thus vessel wall abnormality or reduced or dysfunctional platelets result in disorders of primary hemostasis. These disorders present with skin or mucosal bleed and labs show prolonged bleeding time. Mucosal bleeding may manifest as epistaxis, hematuria, hematochezia or metrorrhagia. Cutaneous bleeding manifests as petechiae or superficial ecchymoses. Bleeding after trauma is immediate as apposed to delayed bleeding in disorders of secondary hemostasis. Bleeding in disorders of secondary hemostasis is deep-seated resulting in large hematomas and cutaneous bleeds are large palpable ecchymoses. Labs show pronged clotting time.

Here we are dealing with a child who has delayed post-traumatic bleed, which is usually a manifestation of a disorder of secondary hemostasis, which is further confirmed by prolonged clotting time. This patient has a prolonged PTT with normal PT. Prolonged PTT with normal PT may be due to a number of hereditary or acquired causes involving the intrinsic coagulation pathway. Inherited disorders include deficiency of factor VIII (hemophilia), factor IX (Christmas disease) or factor XI. This patient is most likely has hemophilia, as one of his maternal uncles is also a hemophiliac. Von Willebrand's disease may also cause prolonged PTT with normal PT. Antiphospholipid syndrome is an important acquired disorder, which prolongs PTT, however, it is

associated with thrombosis. Heparin therapy prolongs PTT. Prolonged PTT and prolonged PT are due to inherited deficiencies of the clotting factors of the common pathway of the clotting cascade. Acquired causes include DIC, vitamin K deficiency and liver disease. Normal PTT with prolonged PT is due to factor VII deficiency.

REVIEW ORDER
Factor VIII, plasma
Factor IX, plasma

**Results of Labs:**
Factor VIII: 3%
Factor IX: normal

REVIEW ORDER
Factor VIII, therapy
Counsel patient
Counsel parents
Consult, genetics (for carrier detection and future pregnancies)
Exercise program
No aspirin

Patients with hemophilia should be given monoclonal purified or recombinant factor VIII to prevent viral infection and exposure to other proteins. Counsel about the avoidance of aspirin as it may cause bleeding by inhibiting platelet aggregation. Before surgery every hemophiliac should be screened for factor VIII inhibitor and if it is not present, he needs to be given factor VIII before surgery. Before tooth extraction, hemophiliacs should also receive factor VIII and they need to be started on EACA, which is an antifibrinolytic agent that stabilizes clot formation. Genetic counseling and carrier detection should also be done. The patient can engage in exercise and sports but should avoid contact sports.

**Primary Diagnosis:**
Hemophilia

**Location:** E.R

**C.C:** Severe shortness of breath

**Vitals:** Pulse: 130/min ,Temp: 99° F, B.P: 120/70 with pulsus paradoxus , R.R: 34/min

**HPI:**
A 36-year-old asthmatic man is brought to the ED by his co-workers with complaints of severe shortness of breath, cough, wheezing, chest tightness, and diaphoresis. He is unable to speak in phrases and his speech is restricted to single syllables between breaths. He was doing his routine work when he developed breathless and wheezing. He used his prescribed as needed inhalers twice, but his condition deteriorated. The patient has never been intubated or mechanically ventilated for asthma. Other components of history couldn't be obtained. He denies any chest pain, fever, chills, and hemoptysis. His other ROS are unremarkable.

**ROS:**
Skin: No rashes, sore, itchy patches, or nail changes
HEENT: Denies head trauma, vision changes, hearing loss, tinnitus, swollen or stiff neck, sore throat or hoarseness.
Musculoskeletal: Denies weakness, joint stiffness, or pain.
Cardiac: Denies palpitations and chest pain.
Respiratory: Positive shortness of breath, wheezes, and cough. Denies sputum production or hemoptysis.
Genitourinary: No dysuria, penile discharge or hematuria.
Neuro psychiatric: No complaints.

**PMH:**
Bronchial asthma

**FH:**
Mother has H/O bronchial asthma
Father is healthy

**Social History:**
Married for 12 years. No children. Smokes 10 cigarettes for the last 10 years and drinks alcohol occasionally.

**Allergies:**
Pollen and dust

**Medications:**
Albuterol 2 puffs Q 4 hrs prn

**Vaccinations:**
Up to date

**How would you approach this patient?**
Dyspnea alone doesn't signify pulmonary disease; it may be present in cardiovascular and pulmonary diseases. This patient has severe dyspnea. The management in such patients depends upon identifying the cause of dyspnea. The patient is a known asthmatic. Start with a broad differential diagnosis. Dyspnea in a patient with known asthma may be due to:

Asthma exacerbation
Status asthmaticus
Pneumonia
Pneumothorax

And few causes in the context of any case of acute dyspnea;
Pulmonary Embolism
Cardiogenic pulmonary Edema
Cardiac tamponade
Upper airway obstruction (foreign body aspiration, anaphylaxis)

On the basis of history and vitals, we cannot rule out the possibilities of pneumothorax, or pulmonary embolism; however most likely cause of acute dyspnea in this patient is Asthma exacerbation. Now proceed to physical examination.

**Order:**
Stat pulse oxymetry, and continuous
Head elevation
IV access

**Order examination:**
HEENT
Physical examination of Chest/Lung
Heart
Abdomen
Extremities

**Results of Physical Examination:**
Pulse oxy showed 89% $O_2$ saturations on room air
HEENT: WNL, no JVD
LUNG/CHEST: Patient is agitated and unable to recline. He is gasping for breath and using his accessory muscles. Respiratory rate is 34/min. Percussion note is resonant in all lung fields. On auscultation of lungs, air entry is bilaterally equal. Loud inspiratory and expiratory wheezing is audible in all lung fields.
CVS: Decrease in systolic B.P. on inspiration is 20 mmHg (pulsus paradoxus). There is no pedal edema.
Abdomen: Benign
Extremitas: NO calf tenderness, edema

**How do you approach now?**
Pneumothorax is unlikely in the presence of breath sounds in all lung fields.
Cor pulmonale refers to acute right heart failure due to pulmonary disease. Pulmonary embolism is mostly responsible for the acute decompensation of right heart. Pulmonary embolism is unlikely in the absence of chest pain, any predisposing factor such as orthopedic surgery. Wheezing may be present in such patients due to reflex bronchospasm.
Pulsus paradoxus again is non-specific for pericardial tamponade. It may be present in asthma and severe COPD.
Pneumonia is unlikely in the absence of fever and productive cough. Respiratory examination didn’t reveal any crackles or bronchial breath sounds.

**Order review:**
Stat Oxygen via facemask or nasal cannula
Arterial Blood Gas (ABG)

Peak expiratory flow rate (PEFR)
EKG 12 lead, stat
CXR PA view (to determine infectious exacerbation of asthma and rule out other causes)
Albuterol nebulization, stat and repeat for every 20 minutes
IV methyl prednisolone, stat and Q 6-8 hours
CBC with diff, stat ((to determine infectious exacerbation of asthma)
Basic metabolic panel, stat

**Results:**
ABG shows
pH 7.35
$pO_2$ 60 mmHg
$pCO_2$ 40 mm Hg

PEFR 40% of the documented personal best
CXR shows hyperinflation, no infiltrate, no pneumothorax or effusions
EKG is unremarkable for new changes except sinus tachycardia

**Review orders:**
Vitals and PEFR q hour
Pulse Oximetry, continuous
Fluid replacement may be necessary due to volume depletion secondary to diaphoresis
Monitor the patient's condition frequently

**Order review:**
Transfer the patient to floor/ward
Regular diet
Ambulation as tolerated
Switch IV to Oral steroids; Prednisone for 5 days and then taper the dose
Start ranitidine 150 mg po BID (for gut prophylaxis from high dose steroids)
Educate the patient (about self management and early recognition of recurrent episode)
D/C albuterol nebulization
Start albuterol metered dose inhalers 2puffs Q4 hrs
Smoking cessation
Limit Alcohol
Regular exercise
Use of seat belt
Medication compliance

Change Location:
Send home
Ask to follow-up with primary care in 1week

Primary diagnosis:
Acute exacerbation of bronchial asthma

**Summary:**
Carefully assess the patient for degree of severity
Use Beta agonists early
Monitor the patient frequently and assess the response
Recognize features of impending respiratory failure and act accordingly
Do not forget to taper steroids
Emphasis on post exacerbation care plan (medication compliance, use, follow-up, recognition

and self-management of attack)

Who should be hospitalized?
Patients who do not respond to initial treatment should be hospitalized. Generally patients who do not respond to 3 doses of bronchodilators are considered as non-responders. Other factors such as severity of attack, severity of airflow obstruction, duration of symptoms, and past history of such episodes
Response to initial treatment is a better predictor for the need of hospitalization in a patient than is a severity of an attack

What are the features of impending respiratory failure?
Impending respiratory failure is very important to identify. Patient will become mute and respiratory muscle fatigue will lead to paradoxical respiratory efforts. Chest will be silent and there will be no wheezes due to reduced air entry. Patient will be confused. PEFR will be less than 50% of personal best

What is the role of antibiotics?
In most cases, which are usually due to viral infection, antibiotics have no role. Antibiotics are prescribed to patients with fever, leukocytosis and pulmonary infiltrate on CXR.

Is there a role of anxiolytics?
Anxiolytics are contraindicated in patients with status asthmaticus due to concomitant respiratory depressant action.

Is there a role of mucolytics?
Mucolytics are not useful in asthmatic patients as it may worsen airway obstruction.

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**Location:** Office

**Vitals signs:** B.P: 110/70 mmHg; HR: 88/min, regular; Temp: 37.8 C; R.R: 16/minute.

**C.C:** Constipation

**HPI:**
A 62-year-old Caucasian male, who has a 15-year history of Type 2 diabetes, taking insulin, presents for evaluation of recent onset of constipation. The patient reports that he has been having only one or two bowel movements per week for the last four to six weeks. He has been experiencing intermittent constipation for the last four or five years but usually has three to four bowel movements per week. He also reports abdominal bloating and distention, especially after eating meals, but denies abdominal pain. He denies any nausea, vomiting, history of abdominal surgery, trauma, weakness in the limbs, or prolonged immobility. He describes the stools as very hard, and he must strain to defecate. His diet consists primarily of red meat. He has no known allergies.

**PMH:**
Is significant for diabetes. He takes a total of 20 units of NPH and 10 units of regular insulin every day. He was diagnosed with congestive heart failure following an acute MI two years ago. At that time, lisinopril 10 mg QD, furosemide 80 mg BID, and isosorbide dinitrate were prescribed. He says that his blood sugar has been under control for the last 15 years. He admits to regular exercise. His other medications include aspirin 81 mg po QD, simvastatin 20 mg po QD, and KCL 40 mg PO QD. He never had colon checked.

**FH** is significant for heart disease in his mother.

**SH:** Quit smoking when he had an MI. Occasionally takes alcohol. Denies IV drug abuse.

**How would you approach this patient?**
He is a 62-year old man with a past medical history of Type 2 diabetes and congestive cardiac failure, presents with progressively worsening constipation.

Consider the common causes of constipation. The causes of chronic constipation include: irritable bowel syndrome; poor bowel habits; inadequate fiber or fluid intake; systemic diseases such as diabetes mellitus, neurologic gut dysfunction as seen in spinal cord injury, Parkinsonism, or Multiple Sclerosis. Hypothyroidism or medications like narcotics, calcium channel blockers, antidepressants, and anticholinergics can be responsible for constipation. (This patient does not use any of these medications.) Approximately 10 to 20 percent of the general adult population report symptoms compatible with irritable bowel. Other causes to consider are: chronic pseudo-obstruction due to slow colonic transit; megacolon, obstruction of rectal evacuation caused by Hirschsprung's disease; pelvic floor dysfunction; rectal mucosal prolapse; or rectocele. Also, evaluate the patient for eating disorders and depression. The common causes of recent onset constipation are: colonic obstruction, which could be due to a neoplasm stricture; diverticular disease; anal sphincter spasm resulting from anal fissure, painful hemorrhoids or medications.

**Order:**
Complete physical examination

**Here are the results of your physical examination:**
On general examination, the patient appears alert, awake, oriented times three, and not in any

distress. No thyroid abnormalities. Heart examination is within normal limits. Abdomen is soft, but mildly distended. Bowel sounds are active in all quadrants. There is no guarding, rebound, or tenderness. Examination of the extremities does not reveal any edema or ulcerations. The neurological examination does not show any weakness or changes in sensation. Rectal examination shows normal prostate, normal sphincter tone, no fissure, but the rectal vault is empty.

**How would you proceed from here?**
Order the initial investigations on an outpatient. This patient could have constipation because of electrolyte disturbances, especially hypokalemia, due to prolonged use of furosemide.

CBC with differential, routine
BMP including calcium, routine
TSH, routine
Magnesium, routine
Phosphate, routine (Hypermagnesemia, hypercalcemia, and hypokalemia can all cause constipation)
Hemoglobin A1C, routine
Hem-occult
LFTs (He is on simvastatin, which can cause elevation of LFTs)

Advise the patient to: begin a high fiber diet; increase water intake; exercise regularly; do frequent Accu-Checks; keep tight control of blood sugar. Ask him to return with the results of the lab tests.

**Order:**
High fiber diet
Plenty of fluids
Regular exercise
Accu-Checks QID (4 times a day)
Patient education
Metamucil 2 tsp 3 times a day
Return to clinic in one week

On return to your office, the rectal examination does not reveal any anal fissures, hemorrhoids, or an enlarged prostate. The rectal vault is empty. Thyroid function tests, magnesium level, CBC with differential, and BMP are all within normal limits. Hemoglobin $A_{1C}$ is 6. The patient has tried increased bulk and water intake. He is exercising and his blood sugar is under control. However, he is still constipated.

**How would you proceed?**
This patient likely has an underlying GI problem that requires further evaluation. The next step for this patient should be colonoscopy. You could choose to do a barium enema with sigmoidoscopy but a colonoscopy is more appropriate, especially if you want biopsies of possible mucosal lesions.

**Order:**
NPO past midnight
Colon preparation
GI consult: Reason 'Colonoscopy'

**Treatment:**
First make sure that the patient does not have nausea, vomiting, abdominal pain or fecal

impaction. Docusate is used prophylactically to prevent constipation, especially when the patient is bedridden or on narcotic medications. Magnesium containing compounds (milk of magnesium or magnesium sulfate) can be used in patients without renal insufficiency. Osmotic laxatives, alone or in combination with fiber supplements, should be tried before more expensive nonabsorbable carbohydrates like lactulose or sorbitol are used. For nonresponsive patients consider giving enemas, either Fleets or tap water. Oral Lactulose 30 cc PO Q4-6H, until bowel movements begin, is another option. In the initial investigations get abdominal and chest x-rays to rule out obstruction. Colonic transit studies, anorectal manometry, and pelvic floor studies are usually reserved for patients who have resistant constipation without any organic explanation.

**Diagnosis:**
Constipation secondary to ?

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**Location:** Emergency room

**Vitals:** BP: 120/70, HR: 70/min, regular, RR: 28 min, Temperature: afebrile

**C.C:**
Shortness of breath

**HPI:**
A 64 yr old Caucasian male with a history of orthopnea and PND presented to the ER at 7 PM with a complaint of 2 months of progressively increasing shortness of breath. His condition has acutely become worse over the past 2 days such that he now has shortness of breath at rest. The SOB is slightly relieved when he sits upright. He denies any chest or abdominal pain. He complains of mild cough with deep inspirations that are associated with occasional pink frothy sputum. He has a 20-pound weight gain since the symptoms began. He is also complaining of easy fatigability, swollen legs, and decreased appetite. He denies any fever, chills, nausea, vomiting or headache. Bowel movements are regular and he denies urinary problems.

**PMH:**
He is a known hypertensive and diabetic of 19 yrs. He had a Q wave MI 6 yrs ago that was treated with thrombolytic therapy. He also has a history of hypercholesterolemia.

**Medications:**
He is on metoprolol, lisinopril, glyburide, simvastatin, aspirin, and isosorbide dinitrate.

**Allergic history:**
NKDA

**SH:**
The patient has smoked 1 PPD for the past 40 years.
Occasionally drinks alcohol on the weekends.
He denies use of recreational drugs.
He is retired and lives at home with his wife.

**FH**:
Father died of a heart attack at the age of 70.
Mother died at the age of 68 from breast cancer metastasis.

**How would you approach this patient?**
Elevate the patient's head
Pulse oximetry, stat and continuous
Oxygen, nasal canula
IV access
12 lead EKG, stat
Cardiac monitor

**Results:**
Pulse oximetry shows oxygen saturation of 89% on 3 liters oxygen
Monitor pulse oxy continuously for the oxygen saturations

**Now do the physical examination:**
General

HEENT
Heart
Lungs
Abdomen
Extremities

**Here are the results of the Examination:**
HEENT: PEARL, EOM intact, moderate JVD+, Mucosa is moist.
Lungs: Bilateral decreased breath sounds with bibasilar crackles.
Heart: Rate and rhythm is regular. S1 and S2 heard. S3 gallop present.
Abdomen: Soft, Right upper quadrant tenderness is present. Liver is 1 cm below the right costal margin. Bowel sounds are present. No free fluid clinically.
Extremities: 3 + bilateral pitting edema, no calf tenderness, no cyanosis

**So how would you approach this case?**
So basically the issue here is the differential diagnosis of progressive shortness of breath. Again in the CCS all cases are really straightforward.

As we said this is a straightforward case of congestive heart failure, but you should consider 2 other things in this pt. One is renal failure due to diabetes and hypertension and liver failure due to some other reason (for example; alcoholism, hepatitis etc) even though they are unlikely. So always start with a relevant broad differential diagnosis and then work from there because the CCS people expect this from you.
You should be considering why he is having CHF recently even though he had an MI 6 yrs ago. One possibility is another MI, which may be silent because he is a diabetic patient (autonomic neuropathy).

**Order the following.**
IV furosemide, immediately
D/C his metoprolol
CBC with differential, stat
BMP, stat
U/A
EKG, repeat in the morning
CK-MB and Troponin T at least 1 set (usually 3 sets)
Chest- X ray PA and lateral views, stat
LFTs
HbA1C
Lipid profile
Heme Occult test

**General measures:**
Put the patient on telemetry (continuous cardiac monitoring)
Admit the patient to the ward
Daily weights
DVT prophylaxis (Intermittent pneumatic compressions) –
Diet – diabetic and cardiac diet
Strict charting of inputs and outputs
Activity – Out of bed as tolerated
Patient education on diabetes, CHF and hypertension
Daily BMP
Daily CBC with differential

**Always ask yourself, why are we admitting this patient?**

The reason is to determine the cause of his decompensation? So assess the left ventricular function, titrate the dose of diuretics and tightly control the blood sugar.

**Ok, here are the results?**
EKG shows an old Q wave with no significant changes from the old EKG.
CK-MB and Troponin-T are normal.
U/A is positive for proteinuria
CBC and differential is normal
BMP shows Na 136 (dilutional hyponatremia), K – 4.0, Chloride, CO2 and Ca are WNL.
Blood glucose is 380.
LFTs are normal except for mild elevation of alkaline phosphatase
Chest – X ray is consistent with bilateral pulmonary edema
HbA1C and lipid profile - pending
Heme occult is negative

**Start medications:**
Glyburide, po, continuous
Furosemide, IV continuous
KCL 10 meq PO BID
Aspirin 325 mg po QD
Simvastatin 10 mg po QD
Sublingual nitroglycerine, prn
Morphine 2 mg Q 4 hrs IV, prn
Sliding scale insulin
Heparin 5000 units SQ Q12 (DVT prophylaxis)
Start lisinopril/Enalapril PO low dose
Digoxin, loading dose followed by daily dose

**Ok now we know that this most likely due to CHF. So what do you do for this pt?**
Determine the LV function by obtaining a 2D echocardiogram
Continue IV furosemide along with oral potassium because furosemide will cause hypokalemia.
Order daily BMP and CBC with diff.
Continue lisinopril (ACE inhibitors should be added if the pt is not on ACEIs)
The use of metoprolol is controversial in the setting of heart failure. It should be stopped in acute heart failure.
Digoxin is optional. It is particularly indicated if the pt is having atrial fibrillation or severely symptomatic.
Start insulin– order NPH and sliding scale insulin
Continue aspirin
Continue simvastatin

**You have admitted the patient. The next day is the day two. What is the plan?**
Examine the patient
Consider converting IV to oral diuretics
Determine if the patient stable for discharge?
Ambulate the patient.
Assess the need for oxygen therapy. The goal saturation is 92 to 96%. Wean the oxygen if his pulse oxygen shows saturations of >92.

At the time of discharge consider the following
Patient education
Cardiac rehabilitation
Low salt diet
Physical therapy and occupational therapy

Smoking cessation program
Alcohol cessation program
Regular exercise
Follow up in 2 weeks

**Primary diagnosis:**
Exacerbation of CHF

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**Location:** Emergency Room

**Vitals:** BP: 102/68 in both arms , HR: 110/min regular rhythm , RR:16/minute , Afebrile

**C.C**:
A 75 yr old nursing home patient with decreased urine out put and altered mental status.

**HPI**:
A 75-year-old Nursing home patient is brought to ER for one day of altered mental status and decreased urine output. The patient is unable to give any history. The nursing home staff says that he has been having watery stools for the last 4 days. He has 7-10 loose bowel movements per day. Stools have no foul smell, no mucous or blood. He has been drinking fruit juices and oral formula for the last 3 days, but has not urinated in the last 12 hours. They denied any history of fever, chills, chest pain, shortness of breath and abdominal pain.

**PMH:**
His past medical history is significant for type II DM, hypertension and osteoarthritis.

**SH:**
The patient does not smoke or drink alcohol.

**FH:**
Father died at the age of 90 with Alzheimer's disease and mother died in motor vehicle accident. One brother has diabetes.

**Medications:**
Current medications are lisinopril 5mg once daily, NPH insulin 10 U in the morning and 15 U in the evening, metoprolol, simvastatin, aspirin, ibuprofen and multi vitamins. His vaccinations are up-to-date.

**All:** Iodine and shellfish.

**How would you approach this case?**
Based on the history you may consider decreased urine output secondary to acute renal failure. Also consider dehydration leading to acute prerenal failure, diabetes causing possible intrinsic renal cause (DM), and post-renal obstruction (BPH). The other possible causes of altered mental status in this patient include DKA, hypoglycemia, hypertensive crisis, stroke etc.

**Order:**
Complete physical examination

**Results of the physical examination:**
HEENT: PEARL, EOM intact, mucosa is dry, no JVD and moderately dehydrated.
Heart and lungs are normal to auscultate.
Abdomen: Scaphoid, soft, non tender, BS are hyperactive, no organomegaly
Rectal: Prostate is normal in size, sphincter tone normal, no gross blood, and no masses.
CNS: Patient is not alert and not oriented to time, place or person. Otherwise there are no focal sensory or motor deficits.
Extremities: There is no edema, cyanosis or clubbing.
Skin is dry with poor turgor, no rash, petechiae or bruises.

**Now how would you approach this patient?**
This patient is dehydrated, so the primary things to order are:

- Pulse oxy, stat
- STAT IV line placement
- STAT NS fluid bolus followed by continuous drip
- STAT Foley catheter, you are not sure of bladder residual volume in this elderly patient
- 12 lead EKG, stat
- ABG, stat
- CBC with differential, stat
- Mg and Phosphate, stat
- BMP (Na, K, Chloride, HCO3, BUN, Cr, Blood sugar, and Ca) stat and Q 8 hrs
- Urine analysis, stat
- Urine culture and sensitivity, stat
- Urine sodium and creatinine, stat

The Foley is placed; 30 ml of residual volume is noted. NSS IV fluid is running. What do you do now?
Your initial assessment of the patient

1) What is the hemodynamic status?
Dehydrated patient should be hydrated. A volume overloaded patient should be given diuretics. CVP (central venous pressure should be recorded by placing an order for central venous line in unstable patients)

2) What is the type of renal failure?
Prerenal, renal or post renal - will decide the main mode of treatment.

3) Is there a need for urgent hemodialysis?
The indications for urgent hemodialysis are refractory acidosis, refractory electrolyte disturbances, intoxicants, volume overload (pulmonary edema), pericardial rub, uremic encephalopathy, bleeding tendencies, and arrhythmias.

4) What is the most likely etiology?
Labs reveal a BUN of 90, creatinine of 2.3, potassium of 5.6 and mild protenuria. So how would you proceed?

- If the BUN (Normal is 7-20) and creatinine (0.6 to 1.2) is elevated, then the diagnosis of renal failure is confirmed. Check the electrolytes that are part of the BMP. If the potassium level is elevated (normal is 3.5 to 5) then give D5/Insulin and re-check the

potassium level. If the potassium is high always get the EKG. If the potassium is low, then replace the potassium cautiously and recheck the level.

- If the patient is taking nephrotoxic drugs like NSAIDs, stop the drugs immediately. Ibuprofen is an NSAID and it aggravates the renal failure. ACEIs are indicated in DM type 2 for their renal protective effect, but in established renal failure with a creatinine of more than 2.0 to 2.5 their use should be restricted.

- Now it's the time to determine the cause of the renal failure. 1st determine whether the cause is low renal perfusion (prerenal) (or) disorders of parenchyma (renal) (or) obstructed urine flow (post renal).

- There are 3 ways to differentiate prerenal from renal causes. The best way of assessing is by calculating $F_E Na$ (Fractional Excretion of Sodium).

Prerenal:

- $F_E Na < 1$
- Spot urine sodium <20 meq/L
- Disproportionate increase of BUN/Cr ratio >20:1

Renal:

- $F_E Na > 1$
- Spot urine sodium >20 meq/L
- Proportionate increase of BUN/Cr ration < 20:1

A short explanation to understand the causes:

- Prerenal azotemia can lead to ATN, which is the most common cause of the acute renal failure. Two basic mechanisms:
- a) Decreased effective intravascular volume (includes third space loss)
- b) Decreased cardiac output.
- Renal causes have specific etiologies ranging from infectious to toxin mediated and can be treated with specific etiology directed therapy.
- Post renal or obstructive must be promptly treated to avoid any damage to the kidney. Two most common are BPH and nephrolithiasis.
- Here the case scenario is of a pre renal failure most probably due to dehydration resulting from diarrhea.

**Order routine:**

- Discontinue lisinopril
- Discontinue ibuprofen
- Continue rest of his current medications
- Transfer to the floor/ward
- Vitals q2h
- 24hr urine protein
- Diabetic and renal diet with 100% hand assistance (Only if the patient is awake)
- Complete bed rest until his mental status returns to baseline
- Heparin 5000 U SQ Q12 hrs to prevent DVT
- Renal ultrasound, routine. Stat order is placed only if you suspect an infective/renal/obstructive cause.
- Daily weights
- Strict input and output
- Acu checks (blood sugar), QID (4 times a day)
- HBA1C levels, routine
- Sliding scale insulin

Finally treatment:

- In prerenal the goal of the treatment is to increase the renal blood flow. If the patient is dehydrated continue I.V hydration. If the patient does not respond to fluids, start Lasix (furosemide) to increase the urine output. If the cause of the renal hypoperfusion is heart failure you can start dobutamine and dopamine.
- The use of sodium bicarbonate (type NaHCO) is rarely needed unless the patient is in severe acidosis i.e. pH of <7.2.

**Review orders:**
Once the patient's mental status is improved

- Discontinue (D/C) bed rest
- Out of bed to chair
- D/C Foley catheter
- Continue renal diet

- Plenty of oral fluids

**Other considerations:**

- Pericardial rub or rales – Chest X- ray (Both PA and lateral view)

- Fever – Blood cultures, Immediate renal ultrasound, urine culture and start antibiotics (Ciprofloxacin)

- Treat hypertension

- Obstruction - order urology consult. Before getting a consult please order urgent renal ultrasound and don't forget to catheterize.

- Patient may take days to weeks to recover

- Recovery diuresis should be treated with half (0.45%) NS and frequent electrolyte monitoring.

**Primary diagnosis:**
Acute renal failure or prerenal azotemia

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**Location:** office

**PRESENTING COMPLAINT:**
A 16-year-old girl presents with heavy menstrual bleeding.

**Vitals:** Pulse 86/min, Temp 98.7 F, R.R 16/min, Height: 162.5cm, Weight: 55 kg (12lbs)

**HPI:**
A 16-year-old girl presents with the complaints of irregular and heavy menstrual bleeding for the last two months. She started menstruating at 13 and her cycles have been regular until 2 months ago. She has been sexually active with her boyfriend for the last month and they have always used condoms. She denies any burning on urination or vaginal discharge. She uses no medications. Her appetite and weight are normal. She is doing well at school and has no emotional stressors.

Hospitalization/Procedures: none
Other Medical Problems: none
Allergies: Penicillin
Current Medications: Allegra 60 mg po QD
Immunization history: Up to date
Family History: Father is healthy at 43; mother is 38 and has asthma. Maternal grandfather died of colon cancer at 60. She has one younger brother who is healthy.
Social history She does not smoke, drink alcohol or use recreational drugs.
Recreational history Attending parties and watching movies

**Review of Systems:**
General: Denies weight changes or fatigue
Skin: Facial acne and a tattoo of her name on her left forearm
HEENT: Frequent allergic nasal stuffiness
Musculoskeletal: Denies muscle or joint pain
Cardio respiratory: No cough, shortness of breath, palpitations, or edema
Genitourinary: No frequency or hematuria
Neurologic: No history of fainting spell or seizures
Psychiatric: Denies depression, moodiness or anxiety
Abdominal Denies nausea, vomiting, diarrhea, constipation or abdominal pain

**How to approach this case:**
This young woman presents with abnormal uterine bleeding. In adolescent females and in perimenopausal women, dysfunctional uterine bleeding is in most cases due to anovulation thus it exposes the endometrial lining to unopposed estrogen stimulation. DUB is a diagnosis of exclusion, therefore other causes of abnormal uterine bleeding need to be ruled out. Any woman of reproductive age with DUB, pregnancy must be suspected. Reproductive tract problems like Leiomyoma, adenomyosis, endometriosis, PID and sexually transmitted diseases may be responsible. Polycystic ovary disease is another important cause. There may be endocrine causes like hypothyroidism, hyperthyroidism and hyperprolactinemia. Liver disease and other coagulation disorders may also be responsible. Therefore, careful history and examination as well as certain lab tests need to be performed before a diagnosis of DUB can be made.

**ORDER Examination:**
Skin examination (especially for pallor, petechiae)

HEENT (especially for thyroid enlargement and visual field defects)
Genital examination (for vaginal discharge, enlarged uterus, adnexal masses etc.)
Heart exam
Abdominal exam
Extremity

**Labs:**
Urine beta-HCG, routine (for ectopic pregnancy, abortion)
Pap smear, routine (pap smear should be performed when sexual activity is initiated even in a female younger than 18)
Serum TSH, routine (hypo or hyperthyroidism)
Serum prolactin, routine
CBC with differential, routine (to determine platelet count as low platelet counts result in disorders of primary hemostasis, to look for anemia due to chronic blood loss)
PT, routine (for disorders of secondary hemostasis)
PTT, routine (for disorders of secondary hemostasis)

There are other tests, which can be performed, in selected patients. If alcoholic or viral hepatitis is suspected and other features of liver disease are found, LFTs need to be performed. In perimenopausal women, endometrial biopsy must be performed to rule out endometrial cancer. Pelvic ultrasound may be needed in cases of PCOS, in cases where pelvic examination is suboptimal due to obesity and in suspected cases of ovarian tumor. Generally patients with DUB can be managed without imaging studies.

**Result of examination:**
**Skin**: no petechiae, no pallor, and no hirsutism
**HEENT**: normal eyes, normal visual fields, normal vision, ears are normal set and normal hearing. Thyroid gland is normal.
**Genital**: normal female genitalia, no vaginal discharge, no vaginal or cervical lesions, uterus is of normal size, no adnexal masses or adnexal tenderness.
Rest of her exam is WNL.

**Result of Labs:**
Urinary beta-HCG, qualitative: negative
Pap smear: normal
Serum TSH: 1microU/mL
Serum prolactin: 5ng/mL

CBC with differential:
WBC counts: 8200/mm3
RBC counts: 5.1 million/mm3
Hemoglobin: 15.9 g/dl
Platelet counts: 200,000/mm3
MCV 86cu micron
MCH: 27 pg/RBC
MCHC: 33 g Hb/dL
Red cell distribution width: 12

WBC differential:
Segmented neutrophils: 67
Bands: 1
Lymphocytes: 20
Monocytes: 5
Eosinophils: 4

Basophils: 1

Peripheral blood smear:
Normochromic normocytic erythrocytes
Leukocytes and platelets normal in number and morphology
PT: 10 sec
PTT: 25 sec

Normal PE and normal lab tests exclude other causes of abnormal uterine bleeding and DUB is the most likely cause in this patient. When contraception is desired, oral contraceptives are usually used to treat DUB. They make the cycle more predictable and decrease the amount of menstrual flow. When bleeding is prolonged or severe, estrogen alone is used in high doses. If bleeding is not controlled by high dose estrogen therapy, D & C is indicated. Endometrial ablation is an option for those patients who have completed their family and are unresponsive to hormonal treatment.

**Review order:**
OCP, low estrogen, low progestin, continuous
Reassure the patient
Safe sex counseling
Counsel patient, medication compliance

**Primary Diagnosis:**
Dysfunctional uterine bleeding

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**Location:** Emergency Room.

**Vitals:**
Temperature 38.0, respirations 30 per minute, blood pressure 101/68, heart rate is 90/min.

**HPI:**
The patient is a 16-month-old male who is accompanied by his mother who provides the history. This patient began to get ill two days prior to coming to the Emergency Room with a runny nose and mild cough. The mother reports that she thought he had a low-grade fever because he felt subjectively hot; however, she did not take his temperature. The patient has continued with his regular activities and is eating, drinking and urinating as usual. However, on the evening of presentation, the patient began to have a more severe, harsh, barking-like cough that has increased in severity over the past ten hours. The patient has become increasingly hoarse and has, according to mother, "noisy breathing." REVIEW OF SYSTEMS is negative except for some complaints of sore throat, although it is difficult to determine because of the patient's age. Mother denies the patient getting into any small objects which he may have ingested.

**PMH:**
The patient was born by normal spontaneous vaginal delivery. He had a circumcision. He went home with his mother after 24 hours. He is up to date on all of his immunizations including DTaP, Haemophilus influenza B, and pneumococcal conjugate vaccines. He has had one episode of otitis media in the past year.

**Social history**: He attends daycare three times a week. His lives with his mother, father, and seven-year-old sister. They have no pets in the house.

**How do you approach this patient:**
Pulse oxy, stat

**Result:**
O2 saturation is 98% on room air,

**Perform physical examination:**
General
HEENT
Lymph nodes
Lungs
Heart
Abdomen
Extremities
Skin
Neurologic

**Here are the results:**
In general, the patient is in no acute distress. He is sitting on his mother's lap and is somewhat playful, although he does have a harsh barking cough. HEENT: Mucous membranes are moist. There is no perioral cyanosis. Oropharynx shows erythema without any exudate. The neck is supple. There are a few scattered shotty nodes on the anterior cervical chain. Conjunctivae are slightly injected. Coryza is present. Tympanic membranes are pale with normal light reflex bilaterally without any bulging of the tympanic membranes. Cardiovascular: The patient has a

regular rate and rhythm without murmurs, rubs or gallops. Lungs are clear to auscultation bilaterally, although there is a harsh barking cough, and there are chest wall retractions. There is slightly diminished air entry bilaterally. No crackles, rhonchi or wheezes. Abdomen is soft, nontender, nondistended with positive bowel sounds in all four quadrants. Extremities show capillary refill of less than two seconds. The extremities are pink and well perfused with 2+ pulses in all four extremities. Neurologic: The patient is awake and alert. He gets upset during the exam but is easily consoled by his mother.

**Discussion:**
The differential diagnosis for this patient's problem includes:
Viral croup.
Bacterial croup.
Spasmodic croup.
Epiglottitis.
Foreign body ingestion.
Bacterial tracheitis.
Angioneurotic edema.

The case presentation and history are more consistent with a viral etiology for the patient's croup. The most common viruses are parainfluenza 1, 2, and 3, but croup can also be caused by adenovirus, respiratory syncytial virus, and influenza A and B viruses. Influenza A in particular can cause a fairly severe croup syndrome. Children with croup can also become secondarily infected and develop a bacterial tracheitis. It is important to recognize which children have a benign viral picture compared to those who have a bacterial etiology necessitating antibiotics to cover for the most common pathogens, which are Strep. pneumoniae, Staphylococcus aureus, Haemophilus influenza, Moraxella catarrhalis as well as Streptococcus pyogenes.

In general, the child with viral croup is going to look less toxic than the child who has bacterial croup or bacterial tracheitis. In the latter two disorders, fever is usually higher, the severity of respiratory symptoms is worse and the child may have a more toxic appearance. Since the introduction of the Hib vaccine, very few cases of epiglottitis have been seen in the United States; however, in an unimmunized child this diagnosis should still be considered. In general, epiglottitis is a more rapidly progressive disorder evolving over the course of 4-12 hours and presenting with high fevers and a more toxic appearance. The child is usually in more respiratory distress, shows drooling, leans forward and is much more apprehensive, probably secondary to hypoxemia and airway obstruction.

In cases of viral croup, the diagnosis is made clinically. Neck X rays can be obtained and they may show a classic steeple sign with subglottic narrowing. However, in children in whom the tracheal cartilage is still soft, there can be a false steeple sign secondary to the respiratory phase as the trachea slightly collapses on expiration. Therefore, a good inspiratory film is necessary to evaluate steeple sign in children.

Acute angioneurotic edema is a rare cause of upper airway obstruction in children and they usually have other evidence of swelling in their face and neck area. Aspiration of a foreign body should also always be considered in the differential diagnosis. Usually these children have no preceding upper respiratory symptoms prior to having their upper airway obstructive symptoms, so history is the most important part in the evaluation.

**Laboratory workup:**
Croup is a clinical diagnosis and laboratory studies are usually not very helpful; however, a CBC may show an elevated white count around 10 with a predominance of polymorphonuclear leukocytes on the differential. Pulse oximetry usually reveals normal oximetry as this is not a

lower airways disease and air exchange is good.

**Treatment:**
The first line of treatment is to start the child on cool humidified mist. This simple treatment can relieve airway edema and decrease the viscosity of tracheal mucus so that patients can clear their secretions better. Many children's croup will be relieved just with cool mist treatment. However, patients should be monitored during cool mist treatment because it may induce or exacerbate bronchospasm in susceptible children. In most cases, however, at least a trial of cool mist treatment is warranted and further treatment is warranted if there is improvement.

The next line of treatment is oral or IV steroids. Decadron (Dexamethasone) is the most extensively evaluated corticosteroid used in the treatment of croup. The usual dose is 0.6 mg/kg of dexamethasone up to a maximum of 10 mg. This can be given orally or intramuscularly and clinical trials of dexamethasone have shown that it has improved symptoms of croup compared to placebo. The use of nebulized racemic or L-isomer epinephrine is also used to treat severe croup symptoms. Epinephrine is thought to increase fluid resorption in the airway vessels within the bronchial tree and reduce capillary leakage from interstitial space and therefore decrease mucosal edema. A predictable side effect, however, of epinephrine is tachycardia and therefore it should not be used in patients who have a history of congenital heart defects in whom tachycardia can be deleterious, including those children with tetralogy of Fallot or those with ventricular outlet obstruction. Children with moderate to severe croup should be treated with the cool mist as well as nebulized epinephrine. There is some concern for rebound mucosal edema after nebulized epinephrine treatment and therefore children should receive a dose of Decadron prior to or shortly after receiving the epinephrine in order to decrease rebound edema. The patient should also be monitored for approximately four hours in the Emergency Room prior to discharge home. If they have no stridor at rest, normal air entry bilaterally, normal color and normal level of consciousness, and they have received their dose of Decadron, they can then be safely discharged from the Emergency Room.

Other management options for children with croup that is severe include heliox which is a mixture of helium and oxygen. This can be used in croup because the children usually do not have significant hypoxemia. Heliox can be used when the amount of oxygen being provided to the patient is 40% or less. The heliox mixture allows for laminar flow through the airways and provides better delivery of oxygen. It may be used in children who have laryngotracheitis which has extended into the bronchii and small airways causing a pneumonitis. These children are usually sicker and require inpatient management.

In those children in whom possible secondary bacterial infection is suspected, treatment should be directed at the most common pathogens which were noted above and initial treatment can be with a second generation cephalosporin such as cefuroxime or a combination of a semi-synthetic penicillin like Nafcillin or oxacillin and a third generation cephalosporin.

Most cases of croup, however, are viral in nature and supportive therapy is all that is required.

**Primary diagnosis:**
Viral croup

**Location:** Ambulatory Clinic.

**Vitals:**
Temperature 38 rectally, heart rate 155/min, blood pressure 95/55mm Hg. The patient's weight is 7.2 kg.

**C.C:** Vomitings and diarrhea

**HPI:**
The patient is a six-month old white female who is brought in by her mother for evaluation of a three-day history of vomiting and profuse diarrhea and low-grade temperatures. Mother brings her to the clinic today because the infant has become increasingly irritable and fussy when she is awake and today has become much more somnolent and does not want to feed. She has not had any wet diapers since the evening before. However, she still is having bowel movements. Mother reports that the patient has had approximately eight to ten bowel movements a day for the past two days. She has been giving the infant an increased number of breast feeds at approximately three-hour intervals; however, the child frequently vomits the milk and also has runny diarrhea. The baby has refused to take any of the rice cereal which she has been introduced to for the past month. Mother reports that the vomiting is nonbilious. It mainly consists of partially digested milk. It is not projectile and it is nonbloody. The diarrhea is watery and yellow and there does not appear to be any blood or mucus in the stool. The mother reports that the baby's temperature has been as high as 101. The mother reports that at her visit to the doctor's about three weeks ago for her immunizations she was almost 8 kg.

**PMH:**
The patient was delivered at 40 weeks gestation by normal spontaneous vaginal delivery. She had no birth complications and was discharged home with her mother. This patient has been meeting her developmental milestones appropriately. She is able to roll over front to back and back to front. She babbles and coos and can sit upright for brief periods with minimum support.

IMMUNIZATIONS are up to date. She just had her six-month vaccinations about two and a half weeks ago.

**Social history:**
She lives with her mother and father and a three-year-old sibling (brother) who attends daycare one day a week. The parents are nonsmokers. There are sick contacts in the house as the older brother had a diarrheal illness earlier last week. The family has city water. They have not traveled.

**REVIEW OF SYSTEMS**: is positive for irritability, decreased urine output, decreased PO intake, increased somnolence, and decreased physical activity. Review of systems is otherwise negative.

**How do you approach this baby:**
General
HEENT
Neck
Lungs
Heart
Abdomen
Genitourinary

Skin
Extremities
CNS

**Here are the results:**
In general, the patient is a well-developed, well-nourished white female lying somewhat listlessly in her mother's arms. She does not fight against the examiner during the physical examination. HEENT: Anterior fontanel is open and depressed. Posterior fontanel is closed. Mucous membranes are dry. Eyes are slightly sunken with dark circles underneath them. Tympanic membranes are pale with good light reflex bilaterally. Neck is supple. There is no evidence of meningeal irritation to neck flexion or extension. There is no cervical lymphadenopathy. Pupils are equal, round and reactive to light. Oropharynx is clear. Cardiovascular: Heart rate is regular rhythm but somewhat tachycardic. There is a II/VI systolic ejection murmur along the left sternal border. Lungs are clear to auscultation bilaterally. Abdomen is soft, nondistended and nontender. There are hyperactive bowel sounds in all four quadrants. Extremities: Pulses are +2 in all four extremities. Capillary refill is about 3-4 seconds. GU: Normal female genitalia, mild diaper dermatitis present. Neurologic: The patient is somewhat listless and irritable but after a time is able to be consoled. Skin shows decreased turgor. There are no rashes.

DIFFERENTIAL DIAGNOSIS for this child with acute diarrhea as well as vomiting: At the top of the list is an infectious gastroenteritis with the two main groups being viral gastroenteritis--with etiologies including rotavirus, enterovirus, adenovirus and Norwalk agent--and the bacterial enterocolitis agents including Shigella, Salmonella, Yersinia, Campylobacter, enteroinvasive E. coli, enteropathogenic E. coli, and C. difficile colitis. Other possible etiologies of acute diarrhea include extraintestinal infections such as otitis media and urinary tract infections, and GI causes including intussusception, appendicitis, and hyperconcentrated infant formula. Other causes include antibiotic-induced diarrhea, vasculitides such has Henoch-Schonlein purpura, renal diseases including hemolytic uremic syndrome and toxic ingestions including iron, mercury, lead and fluoride ingestion.

This patient's clinical presentation includes (1) a sick contact with a three-year-old sibling who had self-limited gastroenteritis symptoms the prior week, (2) low-grade temperature, (3) the lack of any preceding use of antibiotics, and (4) nonbloody stools. The most common cause for this picture is acute viral gastroenteritis.

**How do you proceed:**
LABORATORY STUDIES: Depending on how dehydrated the patient appears clinically, one might forego any laboratory studies and just treat her symptomatically with either oral electrolyte replacement solutions or IV rehydration in the clinic setting. However, based on her change in weight, it appears that she has lost about 7-10% of her body weight and is showing clinical signs that she is significantly dehydrated. Therefore, appropriate labs to obtain would be a basic metabolic panel and a CBC with differential. Stool should be heme checked and if it is positive, then stool samples could be sent for culture. If there had been a past history of antibiotic use, then a C. difficile antigen could be sent to rule out C difficile colitis. If the patient is being seen during the winter months, then stool can be sent for rotazyme assay since rotavirus can cause up to 65% of infant diarrhea during winter months. Stool can also be sent for fecal leukocytes, which also help to indicate that it is an infectious or inflammatory process. Because this child is moderately dehydrated, a urinalysis should also be sent to look for urinary tract infection.

ORDERS: Labs as above. The patient should be given a fluid bolus with normal saline 20cc/kg IV until the labs come back. A repeat fluid bolus can be given as well. The patient should be allowed to feed as tolerated. In this case, the patient is breast-fed so orders for breast-feeding ad lib would be appropriate. It can be helpful if the mother can feed the infant in smaller more

frequent feedings whether breast-fed or bottle-fed. In addition, bottle fed infants can also be given an oral electrolyte solution; again small frequent feedings are preferable to decrease stomach irritation and reflex vomiting.

**Review orders:**
IV access
CBC with diff, stat
BMP, stat
Urine analysis
IV NS, bolus
IV NS, continuous
Stool heme check
Stool for leukocytes
Stool culture
Breast-feeding ad lib

**Here are the results:**
Laboratory studies return. CBC shows a white blood count of 11, hemoglobin 14, hematocrit 42.1, platelets 370, differential shows segmented cells 52%, lymphocytes 20%, monocytes 5%, eosinophils 10%. Basic metabolic panel shows a sodium of 131, chloride 106, potassium 3.2, CO2 18, BUN 22, creatinine 0.6, calcium 9.8, glucose 87. A catheterized urine specimen yielded a scant amount of dark amber clear fluid. Specific gravity 1.032, negative for esterase, negative nitrates, no blood, 1-5 white blood cells, 0 red blood cells, no casts. Culture eventually is negative.

DISPOSITION: This patient should be admitted to the hospital for IV fluid rehydration because she is greater than 5% dehydrated, not taking enough oral fluids to meet her maintenance needs, and showing a declining mental status with irritability and listlessness.

**Review orders:**
Admit in ward/floor
IV Potassium
Vitals Q 4 hours
Recheck the BMP next day
Repeat physical exam for every 4-6 hours
Once the patient is adequately hydrated and the BMP is normal, discharge the patient to home.

**DISCUSSION:** Acute gastroenteritis is a very common pediatric problem and because many of the etiologies are self-limited, the clinician should direct attention to the patient's overall fluid and electrolyte status as top priorities in management. Attention should be paid to the patient's vital signs looking for tachycardia and evidence of weight loss. The physical exam should focus on hydration status by looking at mucous membranes, sunken eyes, skin turgor and capillary refill, which in normal children is less than two seconds. Abdominal exam should focus on whether there is any distention, tenderness or masses; frequently bowel sounds are hyperactive in viral or bacterial gastroenteritis. Direct inspection of the stool can be helpful as bloody or mucous stool is more often associated with bacterial pathogens and would direct investigations towards those etiologies. One would send a stool culture for Shigella, Campylobacter, Salmonella and Yersinia as well as the enteroinvasive E. coli. Pathogens that will require more than just supportive treatment with fluids and electrolytes include Campylobacter jejuni infection, which is treated with erythromycin; C difficile colitis, which is treated with metronidazole; and systemic salmonellosis, which is treated with fluoroquinolones or azithromycin or third generation cephalosporins such as ceftriaxone or cefotaxime. Bactrim may also be started empirically, but there is increasing resistance of Salmonella to Bactrim. In those children whose diarrhea is due to Giardia, a variety of drugs are used: metronidazole,

furazolidone, or quinacrine, for example.

History taking should include questions about travel, well water (since Giardia can contaminate well water), immunization status, sick contacts, and daycare attendance (since Campylobacter outbreaks have been found in daycare centers). One should also ask about the duration of symptoms, fever, and the number, character, and color of the stools, particularly whether there is any blood or mucus in the stools.

**Primary diagnosis**
Acute gastroenteritis

**Location:** Emergency department

**Vitals:** Temperature 38.4, blood pressure 101/62 mm Hg, heart rate 95/min, and respirations 14/min.

**HPI:**
The patient is a nine-year-old African-American male who presents to the ER with his mother with a 16-hour history of fever, poor eating, and abdominal pain. The mother reports that the patient only picked at his dinner the night before and then went to bed early. During the middle of the night, she noted that he was hot to the touch but she did not take his temperature. In the morning, the patient had emesis one time, did not eat any breakfast and complained to his mother of abdominal pain. She then made an appointment to bring him to the clinic for further evaluation. You see the patient walking down the hallway of the clinic to go to his room and note that he is slightly bent forward and walking very carefully without lifting his feet very far off the ground. He looks ill. The history from the patient reveals that he has abdominal pain which he poorly localizes and points to the center of his stomach as to the site of the pain. He had one loose bowel movement this morning but otherwise denies any diarrhea, constipation, melena, bright red blood per rectum, dysuria, and frequency. He also denies sore throat, cough, rashes and joint complaints. Mother reports that the patient had been in his usual state of health until about suppertime the prior evening.

REVIEW OF SYSTEMS is as above and otherwise negative.

**PMH:**
The patient is a healthy nine-year-old boy with no past medical history. He attends the fourth grade. His immunizations are up to date. He has never been hospitalized. Past surgeries only include circumcision which was uncomplicated.
Development: He is in fourth grade, a B student. He does well socially and plays Little League baseball.

**SH:**
The patient lives with his mother and five-year-old sister. There are no sick contacts in the house. There are no smokers in the house. They have city water.

**How do you approach this patient?**
General
HEENT
Neck
Heart
Lungs
Abdomen
Rectal
Extremities
Skin
Genitourinary

**Here are the results:**
PHYSICAL EXAM: In general, the patient is alert and oriented, in moderate distress, lying very still on the exam table with both knees bent up. He's cooperative with the exam, but appears apprehensive. HEENT: No abnormalities detected. Cardiovascular exam shows regular rate and rhythm without murmurs, rubs or gallops. Lungs are clear to auscultation bilaterally.

Abdomen: Decreased bowel sounds. No hepatosplenomegaly. The patient has voluntary guarding during the exam. He points to the periumbilical area when asked to define where the location of the pain is. On palpation of the left lower quadrant, he complains of pain on his right lower quadrant. He has moderate voluntary guarding over the right lower quadrant. There is no distention and no tympany. Upon palpation of the right lower quadrant, there is rebound tenderness. Extension of the right leg from its flexed position where the patient has kept it elicits increased pain and the patient resists the extension manuever. GU: Tanner I circumcised male. Testes are descended bilaterally. There are no hernias appreciated. Femoral pulses are +2. Rectal is heme negative. No masses are palpated nor does exam elicit any further tenderness. Extremities reveal +2 pulses in all four extremities with good capillary refill. Skin is without rashes or signs or trauma.

**Order:**
Pulse oxy, stat
CBC with diff, stat
BMP, stat
LFTs, stat
PT/INR, stat
PTT, stat
FOBT
Abdominal x-ray, stat
NPO
IV fluids, NS
Abdominal ultrasound, stat

**Next order:**
Surgery consult, stat
Analgesia, stat (once the diagnosis is confirmed)
IV cefazolin, stat
IV metronidazole, stat

**Discussion:**
This patient's presentation is strongly suspicious for acute appendicitis. However, in some children a Strep throat infection can also cause abdominal symptoms. In the absence of any history of sore throat and with this patient's presentation, one probably does not need to order a rapid Strep test. Any child who does have any complaint of sore throat, however, probably should have a rapid Strep done before going to surgery for an appendicitis. Other labs to order include basic metabolic panel, CBC with differential, heme check the stool, plain film of the abdomen. A urinalysis is frequently obtained to rule out a urinary tract infection. Results can be confusing since the inflamed appendix is often in close proximity to the bladder and ureter; as a result, microscopic hematuria and pyuria are found in up to one-third of patients with acute appendicitis. Pelvic cultures may be useful in sexually active, menstruating women. A beta-HCG is mandatory to rule out an ectopic pregnancy. Further imaging studies depend on what the initial laboratory results show and include an abdominal ultrasound to see if there is any fluid collection. However, ultrasound on pediatric patients is sometimes difficult to interpret because of the lack of qualified technicians to perform the study. Spiral CT scan is another diagnostic modality that can be used in equivocal cases. Frequently appendicitis is a clinical diagnosis.

DISCUSSION: The most common age range for appendicitis in children is between the ages of 10 and 15 years of age. This child is nine years old and a little bit outside of the range. Less than 10% of children with appendicitis are under five years of age and those children who are under two years of age are frequently missed and often have a perforated appendix before they are diagnosed. Other causes of abdominal pain that can mimic an appendicitis include enterocolitis caused by Campylobacter and Yersinia. They both can have right lower quadrant

abdominal pain and tenderness.

**Here are the results:**
A basic metabolic panel may just show an elevated BUN, suggesting some dehydration. A CBC may show an elevated white blood count with a left shift, although the white count usually is not above 20,000. The plain film of the abdomen may show a fecalith, although this is not very frequent. An abdominal ultrasound may sometimes show the inflamed appendix. CT of the abdomen with oral contrast may show the enlarged dilated appendix.

DISCUSSION: For any child in whom one suspects appendicitis, an early surgical consult should be obtained as these patients need to be taken to surgery expeditiously. The risk for perforation increases markedly after 24 hours and those who are not diagnosed prior to 36 hours have a very high risk of perforation. Perforation carries with it the increased risk of abscess formation and diffuse peritonitis with higher morbidity and mortality. The role of antibiotics for an unperforated appendix just includes perioperative antibiotics (We prefer a combination of cefazolin and metronidazole; Postoperative antibiotics are unnecessary); for those who have perforated, triple antibiotics with ampicillin, gentamicin and metronidazole would be appropriate.

**Primary diagnosis:**
Acute appendicitis

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**Location:** Outpatient clinic

**Vitals:** His temperature 37.8, pulse 145, respiratory rate 33, blood pressure 88/52.

**HPI:**
The patient is a three-month-old infant who is brought to the clinic by his mother because of a two to three day history of runny nose with congestion, low-grade fever, and poor eating. He also vomited several times and the emesis is usually mucus mixed with some of his feeds. He is more irritable and has difficulty feeding but appears to be still taking in his usual amount of formula. Mother reports, however, instead of feeding the formula over 15 minutes, it is taking the baby 35-40 minutes to finish his usual bottle of formula. The patient's temperature has been a maximum of 100.6. He has two older school age siblings who had upper respiratory infections during the past week. Mother is concerned because the baby's breathing is much more noisy.

**ROS:**
Somewhat increased irritability but consolable. Urine output is normal. No diarrhea. No constipation. Vomiting as noted above. No episodes of cyanosis or apnea episodes or rashes.

**PMH:**
The patient was born via normal spontaneous vaginal delivery. He was circumcised and had no bleeding diathesis. He went home with his mother after 48-hour hospital stay. He has had his two-month immunizations including DTAP, HIB, second hepatitis B, pneumococcal conjugate vaccine, and IPV.

Development: He has been meeting his milestones. His eyes track to 180 degrees bilaterally. He moves all of his arms and legs well. He does not yet roll over. He has a fair degree of head control. He has a social smile and interacts well with his family.

**SH:**
He lives with his parents and two older siblings. They have two cats in the house. They have well water. The patient does not attend any daycare. There is no smoking in the home.

**FH:**
Family history is positive for allergic rhinitis and is otherwise negative. Mother was Group-B Streptococcal infection positive and received prophylactic antibiotics intrapartum.

**How do you approach the baby?**
Pulse oximetry, stat

**Result:**
O2 saturation is at 95% on room air,

**Order physical exam:**
General
HEENT
Neck
Lungs
Heart
Abdomen
Extremities

Skin

**Here are the results of physical exam:**
The patient weighs 6.3 kg and is in the 75th percentile for length and 50th percentile for head circumference. In general, the patient is awake, alert, and in no acute distress. HEENT: Pupils are equal, round and reactive to light. Extraocular eye movements are intact. The patient follows past the midline. His mucous membranes are moist. Neck is supple without lymphadenopathy. There is occasional nasal flaring. Nares are patent bilaterally but the mucosa is edematous. There is a profuse clear rhinorrhea. Tympanic membranes are pale with good light reflex bilaterally. Anterior fontanel is open, flat and soft. Heart is within normal limits (WNL). Lungs show bilateral diffuse wheezes and rhonchi in all lung fields. There are mild subcostal retractions but no paradoxical abdominal movement with breathing. Abdomen is within normal limits. Extremities show +2 pulse in all four extremities. The capillary refill is about two seconds. GU: Normal circumcised male. Testes are descended bilaterally. Anus is appropriately positioned.

**Orders:**
Admit the patient in ward/floor
Continuous cardiorespiratory monitoring
Pulse oxy, Q 1hour
ABG, stat (for baseline)
Chest X-ray ( Mainly to rule out any coexisting pneumonia, which requires antibiotics)
Humidified oxygen (40%), continuous
IV NS, continuous
Suction, Q 1 hour (Nasal and posterior pharyngeal)
Chest PT, Q 2 hours
Epinephrine, nebulization, prn (as needed)
Albuterol, nebulization, Q 2-4hours

**Discussion:**
This is a classic presentation of bronchiolitis and it should be suspected in any child who presents with coryza, cough, dyspnea, prominent wheezing, and hyperinflation of lungs. Evaluation should include assessment of hydration and respiratory distress. Management of bronchiolitis respiratory infections in children is somewhat controversial. Agreed upon therapy includes oxygen therapy for those children who are hypoxic and severely distressed as well as inpatient monitoring for worsening respiratory distress. Children who cannot maintain good fluid intake or who do not have reliable caretakers to monitor their status should also be admitted to the hospital for observation. The role of bronchodilators and corticosteroids is not fully clear in these patients. Most clinicians will give a trial of bronchodilators to see if it improves the patient's wheezing. These nebulizers such as albuterol can then be continued to improve wheezing and hypoxemia associated with bronchoconstriction. Judicious use of epinephrine nebulizers can also help temporize the patient's symptoms probably by decreasing edema and allowing better airflow. The use of corticosteroids is not clear. Aggressive pulmonary toilet is necessary for these children with frequent nasal and posterior pharyngeal suctioning, frequent chest percussion therapy to help relieve the congestion secondary to excessive secretions. Nasal washings for respiratory syncytial virus and viral culture for parainfluenza and adenoviruses should be part of one's work up.

Etiologies for this patient's bronchiolitis are mainly viral in origin and include respiratory syncytial virus, parainfluenza viruses 1, 2, and 3, influenza viruses A and B and adenovirus.

For infants who need to be hospitalized, orders should include continuous cardiorespiratory monitoring, supplemental oxygen, frequent nasal suctioning and chest percussion therapy and, if they show benefit, albuterol nebulizer treatments. Continuous cardiorespiratory monitoring is

warranted especially for very young infants with respiratory syncytial virus bronchiolitis because frequently their presentation involves apnea and, in fact, they may have very few wheezes on physical exam and have apnea as their sole presentation of RSV. Ribavarin is indicated for those with respiratory failure, immunosppression or severe coexisting medical condition.

**Primary diagnosis:**
Bronchiolitis

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**Location:** Office

**Vitals:** Temperature 39.1C, Blood pressure 118/80 mm Hg, Heart rate 98/min, regular, and Respiratory rate is 20/minute.

**C.C:** Knee pain with swelling, and fever

**HPI:** A 40-year-old white male with no significant past medical problems presents to your office with two-day history of fever, chills, and pain in his left knee associated with swelling. The patient reports that the fever and chills started two days ago. Last night he noticed moderate to severe pain and swelling in his left knee. The patient is unable to ambulate well due to the severity of the pain. There is no history of trauma to the joint. He denies any previous episodes of these symptoms. He also denies IV drugs use or insect bites. The patient's mom has a history of rheumatoid arthritis. ROS are unremarkable. He has no allergies. He is not taking any medications. PMH: No past medical history, no history of hospital admissions. SH: He is sexually active with his wife and denies having multiple sex partners. He does not smoke or drink alcohol.

**How would you evaluate this patient?**
First list the patient problems:
40-year-old healthy male presented with two-day history of fever, chills, and sudden onset of pain and swelling in the knee, without a history of trauma or any prior joint disease.

The differential diagnosis of bacterial arthritis includes gout, pseudogout, Reiter's syndrome, RA, and Lyme disease, each of which can present with acute involvement of one or a few joints.

Always obtain a detailed history and physical examination. In this patient, examine the skin, joints and extremities, abdomen, heart, and lungs. This patient may have infective endocarditis, anemia, or murmurs as part of a diffuse septic process.

**Order:**
General
HEENT /Neck
Heart
Lungs
Abdomen
Extremities
Skin

**Here are the results of the physical examination:**
GENERAL EXAMINATION: The patient appears ill and is in obvious pain. He is awake, alert, oriented to time, place and person. The skin is without rash or any pustular lesions. The lungs are without crackles, wheeze, or rhonchi. The heart is within normal limits. There are no audible murmurs, rubs, or gallops. His abdomen is soft and non tender. Bowel sounds are present in all quadrants. His left knee is erythematous, tender, swollen, and has limited range of motion (ROM). The rest of his exam is unremarkable.

**Order:**
Admit in floor/ward
Vitals Q 4 hours
Plenty of oral fluids
Blood cultures, stat
CBC with diff, stat

Basic metabolic panel, stat
ESR (Optional, non specific)
PT/INR, stat
PTT, stat
X-ray left knee, stat (2 views)
Lidocaine (anesthesia)
Aseptic precautions
Analgesia, stat
Joint aspiration
Synovial fluid Gram stain, culture & sensitivity, cell count and differential, microscopy
Lyme serology
Acetaminophen, po, 1 gram, Q 6 hours prn

Once you draw the blood and aspirate the joint
Ceftriaxone, IV continuous

**How would you continue?**
This patient is clearly ill and in severe pain. He needs to be hospitalized to confirm the diagnosis, rule out endocarditis, start treatment including joint aspiration and to monitor the clinical response. Admit the patient to the general medicine floor. The next step should be joint aspiration. The fluid should be sent for gram stain, culture and sensitivity, cell count with the differential and examined for crystal microscopy. Synovial fluid total protein, lactic dehydrogenase, and glucose level are not required because they are nonspecific in making the diagnosis. Obtain blood cultures from at least two sites. Also, order a CBC with a differential, ESR, and serological testing for Lyme disease. Radiographs should be taken but are usually normal early in the disease process. Culture the skin if there are any skin lesions.

Infectious arthritis can be separated into either nongonococcal or gonococcal. Usually, nongonococcal infectious arthritis occurs in adult patients with previous joint damage or in compromised host. Gram-negative bacilli should be considered in a compromised host. For example, those with malignancies, immunosuppression, HIV, or IV drug abusers. Staph aureus is the single most common cause of nongonococcal bacterial arthritis in the adult population. It is also, the most common organism associated with underlying rheumatoid arthritis. Gonococcal arthritis occurs in patients between the age of 15-40 who are otherwise healthy and sexually active. Staphylococcus epidermidis should be considered if the patient has a prosthetic joint infection. Lyme disease should be considered if the patient has a history of rash or insect bites. Gonococcal arthritis commonly presents as a migrating polyarthritis accompanied by tenosynovitis and erythematous pustular skin lesions. Cutaneous lesions and articular findings are believed to be the consequence of immunoreaction to circulating gonococci and immunocomplex deposition in tissues. However, culture is positive in less than half of the cases and gram stain in 25 percent of cases. Leukocyte counts average 10,000 per microliter. In gonococcal septic arthritis, blood cultures are almost always negative and gonococcus is only occasionally evident on gram stain smears. X ray of the involved joint is indicated primarily to rule out osteomyelitis.

Empirically administer broad-spectrum antibiotics while awaiting lab results. The drug of choice is ceftriaxone, given intravenously. It is a broad-spectrum third generation cephalosporin and covers gram-negative diplococci (Neisseria, gonorrhea), gram-negative bacilli, as well as Lyme disease. If the initial gram stain of the synovial fluid shows gram-positive cocci, IV nafcillin or cefazolin are the drugs of choice. Vancomycin is considered for penicillin allergic patients or if it is a hospital or nursing home-acquired infection. If the initial Gram stain shows gram-negative bacilli, treatment should be started with a third generation cephalosporin such as ceftriaxone. If the suspecting organism is a Pseudomonas, such as in patients with H/O IV drug abuse, the treatment should be started with Ceftazidime along with an aminoglycoside, such as gentamicin.

Treatment should be changed according to the culture results. If the patient is on vancomycin and the culture showed methicillin sensitive S. aureus, vancomycin should be discontinued and nafcillin should be started. Patients should be treated with at least 10-14 days of IV antibiotics, followed by an additional 14 days of oral therapy.

Analysis of synovial fluid usually reveals most of the important diagnoses. Normal synovial fluid contains less than 180 cells per microliter with mostly mononuclear cells. Synovial fluid cell count of 25,000 to 50,000 per microliter with more than 90% neutrophils, is most likely due to bacterial infection. Crystal-induced, rheumatoid, and other noninfectious inflammatory arthritis are usually associated with a count of less than 30,000 to 50,000 cells per microliter. The presence of positively birefringent calcium pyrophosphate crystals indicates pseudogout. The presence of negative birefringent monosodium urophosphate crystals indicate gouty arthritis.

**RESULTS:**

WBC count reveals 15,000/dl with 12% bands.
Blood cultures are pending.
Serology for Lyme disease is pending.
Because it is very difficult to isolate gonococcal from synovial fluid and blood cultures, specimens for culture should be obtained from mucosal surfaces, especially urethral discharge, oropharyngeal mucosal surface, and rectal cultures.
X rays of the joint revealed no osteomyelitis, but there is a joint effusion and soft tissue swelling.
Synovial fluid analysis revealed WBC count of 120,000 with 85% polymorphs and gram stain smear showed gram-positive cocci in clusters. Synovial fluid culture is pending. There are no visible crystals on microscopy.

**How do you approach now?**

This patient clearly has an infectious process of the knee joint. The most likely organism is Staphylococcus aureus. IV antibiotics should be started. If the patient is allergic to penicillin or the organism is methicillin resistant then the drug of choice is vancomycin. Repeated joint aspiration may be necessary. When response to antimicrobial therapy has been demonstrated, NSAID's or Cox 2 inhibitors can be used to reduce pain. Splinting can be used but septic joints usually do not require immobilization.

For recurrent gonococcal arthritis, complement deficiencies must be ruled out.

**Order:**

D/C ceftriaxone
Start IV nafcillin, continuous

**Location:** Emergency room

**Vitals:** Blood pressure: 130/80 mm Hg; Heart rate: 82/minute; Temperature: 38.7 C; Respiratory rate: 16/minute.

**C.C:** Chest pain

**HPI:**
A 47-year-old white male who has a past medical history significant for two years of hypertension presented to your office with the chief complaint of chest pain of one day duration. The patient states that he had a flu-like illness with nasal congestion and mild cough one week ago, which resolved with symptomatic treatment without antibiotics. The patient states that the chest pain has been occurring for the past 24 hours, is primarily retrosternal, increases in intensity with inspiration, and is relieved by sitting up and leaning forward. He says that the pain is 4-5/10 in severity and radiates to back and both arms. For the last two days, the patient has been feeling febrile but he denies any nausea, vomiting, or abdominal pain. He denies any history of shortness of breath, orthopnea, or PND. He has been on a low salt diet and hydrochlorothiazide 25 mg PO BID for his hypertension. His past medical history is significant for the flu-like illness three weeks ago and hypertension for the past two years. FH: Father had an MI at 60. SH: He smokes one to two packs of cigarettes per day. He occasionally drinks alcohol, especially on the weekends. All: He has no known allergies.

**Based on this history, how would you approach this patient?**
This is a presentation of acute pericarditis. Severe constant pain that localizes over the anterior chest, radiates to the arm, shoulder, back, epigastrium or neck, is intensified with inspiration, and relieved by sitting up and leaning forward is a classic picture of acute pericarditis. The pain is often difficult to differentiate from myocardial infarction because often the pain is very severe, short, and sometimes a very constricting pain that radiates either to one or both arms. However, pain which is relieved by sitting up and leaning forward and is intensified by inspiration or lying supine is characteristic of acute pericarditis. Acute pericarditis has a very broad differential diagnosis. The causes are primarily infectious, noninfectious or secondary to hypersensitivity or autoimmunity. The most common infectious causes are coxsackie virus A and B, mumps, adeno, hepatitis, and HIV. The other common infectious causes are usually pyogenic for example: Pneumococcus, Streptococcus, Staphylococcus, Listeria, and Legionella. Tuberculosis can also cause pericarditis but it is usually of chronic origin rather than acute. In those patients the pain is less severe or absent. Fungal infections such as histoplasmosis, coccydeal mycosis, candida, and blastomycosis, have been known to cause pericarditis.

The most common noninfectious causes of acute pericarditis are: acute myocardial infarction; renal failure resulting in uremia; neoplastic disorders which infiltrate the pericardium such as breast cancer, lymphomas, and leukemia; endocrine abnormalities (hypothyroidism or myxedema); and radiation. Pericarditis could also be due to autoimmunity or hypersensitivity reactions. This is especially true with rheumatic fever, collagen vascular diseases such as SLE, rheumatoid arthritis, ankylosing spondylitis, or scleroderma. Acute pericarditis may be due to drug toxicity, especially hydralazine, procainamide, and minoxidil. Other common causes of pericarditis are postmyocardial infarction (also called Dressler's syndrome), post pericardiotomy, posttraumatic or cardiovascular surgery.

**Start with a focused physical examination.**
General examination
HEENT
Neck

Heart
Lungs
Abdomen
Extremities
Skin

**Here are the results:**
The general examination shows that the patient is alert, awake, and oriented times three. The patient is in pain but not in any acute distress. His heart examination revealed normal S-1, S-2. There is a pericardial friction rub present, but there are no murmurs.

Lung examination is within normal limits. Abdominal is benign. Extremities are within normal limits.

**How would you approach this patient now?**
Begin by ruling out myocardial infarction.
Pulse oxy, stat
Oxygen, nasal canula
IV access
Give the patient an aspirin if it is not contra-indicated
Complete bed rest
Nothing by mouth (NPO) except medications
Connect the patient to the telemonitor (continuous cardiorespiratory monitoring).
Blood pressure in both arms (continuous BP cuff)
12 lead EKG, stat
Then obtain cardiac enzymes, especially CK-MB and troponin T, stat and two more sets 8 hours apart.
CBC with a differential, stat
ESR
BMP, stat; (elevated BUN or creatinine may reveals the underlying uremia as the cause of acute pericarditis.)
Chest X-ray, PA and lateral, stat
Blood cultures, stat

**Ok here are the results:**
CBC with differential shows mild leukocytosis with a WBC count of 12,000 with normal bands and polymorphs. There is a mild lymphocytosis. ESR is elevated to 40. The BMP reveals normal electrolytes, BUN, and creatinine. The CK is mildly elevated at 300. Troponin T is pending. The CXR shows cardiac enlargement, an indication that fluid has collected.

The classic findings of pericarditis on EKG are:

- Diffuse ST segment elevation with upward concavity at J point.
- No new Q waves
- PR segment elevation in aVR with PR depressions in other leads.

**Now, how would you approach this patient?**
The presence of above clinical, EKG, and other lab findings strongly suggest that this patient has acute pericarditis.

The following approach is recommended to all patients presenting with signs and symptoms of

acute pericarditis in whom there is no apparent cause such as clear URI, uremia, post myocardial infarction, or prior cardiac surgery.

- Order antinuclear antibody titer, tuberculin skin test, and HIV serology. Obtain blood cultures in febrile patients. Routine viral cultures are not indicated as the yield is low and it doesn't affect the management.

- Echocardiography is indicated in the following circumstances:

    1. If tamponade or purulent pericarditis are suspected
    2. CXR shows cardiomegaly
    3. If there is concern about myocarditis

- After the diagnosis is made, treatment is usually symptomatic. The treatment of choice is aspirin or other NSAID. The primary goal of therapy is to provide prompt pain relief. These agents do not alter the course of the disease. Caorticostreoids should not be used unless the patient is clearly refractory to NSAID's and all the possible causes for the pericarditis has been excluded. Tapping is indicated in: 1. Febrile patient with pericardial effusion. 2. Persistent symptomatic pleural effusion. Fluid should be sent for gram stain, culture, sensitivity and cell count. Antibiotics are indicated for suspected bacterial infection.

**Review orders:**
2D-Echo
D/C Oxygen
D/C Telemonitor (Once the EKG and cardiac enzymes are normal)
Continue aspirin
Reassurance
Patient education

**Once the echo is clear (small fluid) i.e. no evidence of tamponade**
D/C to home
Follow up appointment in two weeks

**Primary diagnosis**
Acute pericarditis

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**Location:** Emergency room

**Vitals:** Temperature is 39.5$^0$C, H.R 110/minute and regular, B.P - 110/64 mmHg, Respiratory rate 22/minute.

**C.C:** Pain and swelling in the right lower extremity

**HPI:**
A 62-year-old white male with a past medical history significant for poorly controlled diabetes mellitus type II presents to your office with a three-day history of painful swollen, right lower leg. The patient reports that he has had an ulcer on the anterior aspect of the right lower extremity for two months but did not seek medical attention because it was not painful and had no discharge. There has been no increase in the size of the ulcer, but for the last two to three days the patient has been having a moderate to severe throbbing pain. This morning he noticed fever, chills, rigors, increased redness, and swelling. The patient denies any trauma, nausea or vomiting, bowel or bladder dysfunction. He has no history of peripheral vascular disease. The patient has not been exposed to salt water and has not eaten crustaceans or shellfish. He has no allergies. Family History: Mom had a heart attack. Dad had a stroke. He denies any smoking, alcohol or IV drug abuse. ROS are unremarkable. PMH: Type 2 diabetes mellitus treated with diet modification and oral hypoglycemics. He has no history of hospitalizations. He takes metformin 500 mg twice daily.

**How do you approach this patient?**
First do physical examination
General
HEENT /Neck
Lungs
Heart
Abdomen
Extremities
Skin
Lower extremity motor and sensory exam

**Here are the results of the examination:**
General exam showed patient is alert, awake, and oriented x 3. He looks very ill and is in moderate to severe leg pain.
HEENT, heart, lungs and abdomen are all within normal limits.
Extremities: There is diffuse erythema and swelling of the right lower leg from below the knee down to the metatarsal joints. A small 2-3 cm ulcer with a pustular base is noted on the shin. Bullae are present but there is no demonstrable crepitus or discharge. The area is very tender. Peripheral pulses are intact.

**Review Orders:**
Pulse oxy, stat
IV access
IV NS, continuous
Admit in medicine floor/ward
Vitals Q 4 hours
Bed rest with leg elevation
NPO except medications (as he may require surgery if there is any evidence of gangrene)
CBC with differential, stat
Basic metabolic profile, stat
Plain X-ray of the leg, stat

Blood cultures x 2, stat
HBA1C, routine
Accu checks, 2 – 3 times daily
D/C metformin
Sliding scale insulin (Type 'regular insulin')
Gram stain and culture of the aspirated material and the wound swabs
Analgesia, stat and prn
Acetaminophen, stat and Q 6hours prn 1gram

**Once the blood cultures are obtained, start**:
Clindamycin, IV Q 8 hours
Ciprofloxacin, IV Q 12 hours
Daily CBC with diff and BMP
Check the patient's leg, (Interval history and physical) every 4 hours until you see improvement
D/C NPO if there is no need of surgical intervention
Start diabetic diet

**Here are the results:**
CBC revealed a WBC of 15,000 with 85% polymorphonuclear cells and 10% bands.
Basic metabolic profile is normal except for blood sugar of 346.
Plain X-ray of the leg shows soft tissue swelling. No evidence of gas, abscess, or bone infection is noted.
Blood and wound cultures are pending.

**Order review:**
We usually give at least two days of IV antibiotics.
Switch to Ciprofloxacin PO BID and Clindamycin po TID
D/C IV fluids
D/C to home
Patient education
D/C sliding scale insulin
D/C Accu checks TID
Accu checks BID
Diabetic diet
Regular exercise
Weight reduction (if obese)
Restart metformin
Medication compliance
Diabetic foot care
Follow up appointment in 2 weeks

**Discussion:**
Cellulitis is primarily a clinical diagnosis. In most of the patients blood cultures, wound cultures, and skin biopsy specimens do not provide microbial etiology. So, in general we do not recommend any of the above-mentioned cultures. However, blood cultures are indicated in the following circumstances

1. Patients who appears toxic.
2. Failure to respond to initial antibiotic regimen
3. Patients with recurrent infections

We usually do not recommend/ perform streptococcal serologies.

The patient should be admitted to the general medicine service for treatment of cellulitis and

uncontrolled diabetes mellitus. This patient has bullae without crepitance. Empirically, give a broad-spectrum antibiotic to cover gram-positive and gram-negative as well as anaerobic organisms. The best combination of drugs is ciprofloxacin and clindamycin (based on our clinical experience), or third generation cephalosporins like ceftriaxone. Clindamycin is affective in treating beta-hemolytic streptococci and S. aureus infections. In contrast to beta-lactam antibiotics, clindamycin has a unique property of preventing toxin production. IV nafcillin or cefazolin are the drugs of choice for staphylococcal or beta hemolytic streptococcus infections. Vancomycin can be given in patients with penicillin allergy and isolates of methicillin resistant S. aureus. If the gram stain shows gram-negative rods then the most likely organism is E. coli. The treatment of choice is IV ceftriaxone.

A diabetic patient who has chronic non-healing plantar foot ulcers usually requires broad-spectrum antibiotics to cover gram positives, gram negatives, and anaerobes. Cultures should be obtained in all patients. Ampicillin and sulbactam and imipenem are the drugs of choice.

Usually, within the first ten days of osteomyelitis, a plain X-ray of the bone is negative. However, this does not rule out osteomyelitis. A technetium bone scan is a more sensitive test and it will detect osteomyelitis in the earlier stages. IV antibiotics should be continued for six-eight weeks for cases of osteomyelitis. If the infection is extensive and there are areas of necrotic skin or tissue, surgical debridement may be necessary. In diabetic patients, osteomyelitis can be due to atypical organisms such as gram-negative bacilli like Pseudomonas or E. coli. Therefore, administer antibiotics that cover Pseudomonas (ciprofloxacin, IV ceftazidime, or piperacillin). The patient's extremities should be immobilized for severe pain or for joint instability. Hyperbaric oxygen can be used if an anaerobic infection is suspected or if the blood cultures grow anaerobic organisms.

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**Location:** Emergency room

**Vitals:** B.P 110/70 mm Hg, HR 100/min, regular, R.R is 24/min, and the temperature is 36.7C

**HPI**: A 34 yr old, previously healthy, white female was brought into the ER after she was involved in a high-speed car accident. She never lost consciousness. She complained of pain in her left upper quadrant. She felt nauseated but never vomited. She ate her last meal three hours earlier. She denied any other past medical problems except being in a drug rehabilitation program one time. She had no known allergies. She said she usually drinks alcohol every evening and smokes one PPD.  She denied any drug abuse. Her last menstrual period was four weeks ago. She was reluctant to give any history secondary to severe pain.

**How do you approach this patient?**
When you get a case of trauma 3 things are very important

1. Primary survey with Initial resuscitation (Airway, Breathing, Circulation)

2. Secondary survey

**Order review:**
Cervical spine immobilization (Most likely that paramedics might have done this before)
IV access
IV NS, bolus and continuous
Pulse oxy, stat
Log roll the patient
Oxygen, Continuous

**Now perform the secondary survey**
Physical examination should consists of a complete head-to-toe secondary survey
General
Spine
HEENT
Lungs
Heart
Abdomen
Pelvis
Perineum
Genitourinary
Rectal
Neurological evaluation

**Here are the results:**
Patient is alert, awake, oriented x3, but is in sever abdominal pain
No pain over the spine; no abrasions are noted
HEENT is normal except small nonbleeding abrasions
Lungs and heart are within normal limits
Abdomen: Steering wheel-shaped contusion is noted on the LUQ. There is no flank swelling or bruising. Patient has severe abdominal tenderness over the left upper quadrant. There is no rigidity or guarding. No bruit heard. Crepitation or instability is noted at the left lower rib cage. There is no pelvic instability noted.
Rectal and pelvic exams did not reveal any evidence of bleeding.

No other evidence of fractures noted.

**Now order the following labs:**
IV analgesia (Morphine IV), stat
Blood type and match, stat
Foley catheter, stat
Continuous BP cuff
Continuous cardiorespiratory monitoring
NPO
CBC with diff, stat
BMP, stat
Serum amylase, stat
LFTs, stat
Urine analysis, stat
PT, stat
PTT, stat
ABG, stat
Blood ethanol, stat
Urine toxicology screen
Pregnancy test, stat
X-ray spine, 2 views
X-ray chest, PA and lateral
X-ray abdomen
X-ray pelvis (if any suspicion of pelvic fracture)

The most important question here is, what is the imaging modality of choice to find out the intraabdominal injury?.
If the patient is unstable, a rapid bedside ultrasonogram is the 1st step. If the patient is stable, an abdominal CT is the investigation of choice.

**Order review:**
CT abdomen with IV contrast, stat
Hb and hematocrit Q 6 hours
Surgery consult, stat

**Results review:**
Hb is 12; LFTS are WNL.
CT abdomen showed splenic hematoma and the surgeon decided to treat conservatively.
All the other investigations are normal.

**Order review:**
D/C cervical immobilization
D/C Log roll position
Transfer to ICU (if the patient is unstable), or to floor/ward (if stable)
Repeat the ultrasound or CT

**Discharge:**
Nausea or vomiting, increased abdominal pain/distention, or new bleeding in urine or feces mandates immediate return and further evaluation.
Continue acetaminophen and codeine combination (Percocet for pain)
Follow up visit in one week
Patient education
No smoking
No alcohol

Wear seat belts

**Discussion:**

- Follow serial hemoglobin and hematocrit as initial values may be normal with acute blood loss. An initial hematocrit of < 30 % indicates severe blood loss.
- Platelet transfusions are indicated in patients with thrombocytopenia of <50,000/mL and ongoing hemorrhage.
- LFTs are useful in any patient with blunt abdominal trauma.
- ABG should be obtained in all major trauma patients, as they are more prone to develop metabolic acidosis (lactic acidosis) from shock.
- Elevated serum amylase is not specific in diagnosing pancreatic injury.
- Obtain serum or urine pregnancy test on all females of childbearing age.
- Obtain drug and alcohol screens on all trauma patients who have a H/O drug abuse or evidence of altered mental status.
- Urinalysis is an important screening test for genitourinary trauma. We obtain urinalysis in all patients with blunt abdominal trauma. Gross hematuria indicates a workup with CT contrast.
- Abdominal CT with oral contrast (who are able to protect their airway) is the investigation of choice to detect intraabdominal injury in hemodynamically stable patients who have sustained blunt abdominal trauma.
- Rapid bedside ultrasound is the imaging of choice in hemodynamically unstable patients. This essentially replaced the need for DPL (Diagnostic peritoneal lavage).

**Location:** Office

**Presenting complaint:** A 29-year-old female presents with 7 day H/O dry cough and breathlessness.

**Vitals:** B.P 130/75 mm Hg, Pulse 92/min, regular, Temp 99.9F, R.R 24/min, Height: 70 inches (175 cm), Weight: 65 Kg (143 lbs)

**HPI:**
A 29-year-old white female presents with the complaints of a dry cough and breathlessness for the last one week. Her other complaints are weight loss of 15 lbs over the last few months and low-grade fever for the last few weeks. There is no personal or family history of asthma or other atopic disorder. She is not taking any prescribed or recreational drugs. She has been sexually active with multiple male and female partners for the last several years and does not use any barrier or other method of contraceptive. She has never been tested for HIV. She was once treated for gonorrhea. She has no known allergies. Her vaccinations are up-to-date. FH: Father died at the age of 70 yrs due to MI. Mother is diabetic. SH: She is a widow as of the last five years and has many boyfriends. She is a waitress in a restaurant. She likes parties and traveling. She is a non-smoker but drinks alcohol heavily. ROS: she has no previous history of STD or UTI. Denies chest pain, expectoration, hemoptysis, orthopnea or PND. Rest of the ROS are unremarkable.

**How do you approach this case?**
Her symptoms of dry cough, dyspnea, and low-grade fever indicate lung infection. Her high-risk sexual behavior puts her at an increased risk for HIV. A lung infection might be some opportunistic infection of AIDS. There fore, we will do a complete physical examination of this patient with special attention to the respiratory system. We will also do staining and culture of expectorated or induced sputum and chest radiography for her lung infection. Her high-risk sexual behavior is an indication of HIV testing which is done after getting informed consent from the patient.

**ORDER:**
Any suspected HIV/AIDS patient should have a complete physical exam.
Complete physical examination

**RESULT OF PE:**
Lung examination is significant for scattered rhonchi and crackles. Otherwise, the rest of the physical exam is within normal limits.

**LABS:**
Pulse oxy, stat
ABG is indicated if the patient is having hypoxemia or significant respiratory distress
CBC with differential, routine
Basic metabolic panel, routine
Gram staining and culture of sputum, routine
Methenamine silver staining of induced sputum (Wright-Giemsa stain or direct fluorescent antibody (DFA) for Pneumocystis if PCP is strongly suspected)
Acid-fast staining of sputum
CXR-PA and lateral view, routine
HIV testing by ELISA

**RESULTS OF LABS:**
CBC shows Leukocytosis
BMP is within normal limits
Gram staining and culture of sputum is negative.
Acid-fast staining of sputum is negative
CXR shows diffuse bilateral interstitial infiltrates
Silver staining is positive for PCP
HIV testing is positive

**DISCUSSION:**
**Pulmonary infections in HIV patients has broad differential diagnosis.**

**Suspect bacterial infection if an HIV patient presents with acute onset**, high-grade fever, and pleural effusion. Pneumococcus is the MC organism.
Mycobacterium tuberculosis: Patients presents with chronic cough, fever and weight loss.
Disseminated fungal infection: Miliary pattern or nodular infiltrates on chest X-ray.
Kaposi sarcoma: Present with mild a cough and chest X-ray shows pulmonary nodules.

Pneumocystis carinii pneumonia presents with dry cough and dyspnea; pleural effusion is not a feature. PCP is confirmed by silver staining or direct fluorescent antibody of induced sputum. If sputum induction is nondiagnostic or cannot be performed, then fiberoptic bronchoscopy with bronchoalveolar lavage (BAL) is recommended, with or without a transbronchial biopsy.

Repeatedly positive ELISA should be confirmed with western blot to make the diagnosis of HIV. PCP is often associated with CD4 count of less than 200 cells/mm3 and an elevated lactate dehydrogenase level (LDH). The TMP-SMX remains the initial drug of choice. Mild PCP is treated oral trimethoprim-sulfamethoxazole. Patients with severe pneumonia or those who cannot tolerate the drug orally should receive intravenous therapy. High-dose therapy is associated with hyperkalemia (Trimethoprim acts as a potassium sparing diuretic).

When to use steroids?
Corticosteroids along with TMP-SMX have significantly decreased the mortality associated with PCP, when used in moderate to severe cases of PCP. It is used when a Pa $O_2$ is 70 mmHg or less, and/or an A-a $O_2$ gradient of 35 mmHg or more on room air

When to admit the patient?
Mild-to-moderate disease - Patients are usually have milder symptoms and nontoxic in appearance. They are not hypoxic; CXR may even be a normal. Outpatient TMP-SMX is the treatment of choice.
Moderate-to-severe disease - Patients presents with severe respiratory distress, and hypoxemia. CXR may be markedly abnormal. Inpatient management with IV TMP-SMX should be considered. Admit patient to ward for moderate to severe disease (ICU if patient unstable).

**ORDER REVIEW:**
ABG, stat
LDH, routine
TMP-SMX, PO (use IV if hypoxemia is present)
Western blot testing for HIV

**RESULTS:**
PaO2 is 77mmHg
Positive western blot for HIV

**DISCUSSION:**
Once the diagnosis of HIV infection has been established, CD 4 count and viral load should be measured to assess the severity of the disease and rate of progression.

All HIV patients should get the following investigations:

- CBC with diff, at the time of diagnosis and for every 3-6 month intervals (30-40 % of HIV patients will have anemia, leukopenia, lymphopenia, and thrombocytopenia)
- SMA 12 should be obtained initially as it will be useful as baseline.
- Yearly VDRL or RPR - Because of high association of coinfection
- All patients should be checked for hepatitis serology, which include HBsAg, anti-HBc, and anti-HCV.
- Toxoplasma serology is useful to begin prophylaxis and to differentiate it from other neurological complications.
- The CDC recommends routine testing with PPD initially and annually in high risk patients if the initial test is negative.
- CDC recommends a PAP smear at the time of diagnosis and every 6 months to one year thereafter.
- Influenza and Pneumococcal vaccine should be given to all HIV patients.
- Antiretroviral therapy is started in HIV-infected patients if the CD4 count is less than 500 ( some say less than 350) or viral load by PCR greater than 20,000 copies/ml.

**ORDER REVIEW:**
CD4 count
PCR for HIV RNA
PPD testing
LFTs
VDRL
Anti-HCV
HBsAg
Anti-HBc
Toxoplasma serology, serum
Pap smear
Influenza vaccine
Pneumococcal vaccine
Zidovudine, oral
Didanosine, oral
Indinavir, oral
Counsel about limit alcohol intake and safe sex practices
HIV support group
Report positive result to Department of Health and Human services
Medication compliance
Regular follow up visits

**PRIMARY DIAGNOSIS:**
PCP

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**Location:** Office

**Vitals:** B.P 138/80 mm Hg, Pulse 80/min, regular, R.R 22/min, Temp 98.6 F, Weight: 50 Kg, Height: 160 cm

**Presenting Complaint:**
A 50-year-old man presents with 10-day H/O constipation, extreme weakness.

**HPI:**
A 50-year-old white male presents with 10 day H/o constipation. He has been having abdominal discomfort and feeling nauseated. He says he has been experiencing fatigue for the past few months but from the past few days he is having severe weakness. He feels that he doesn't have the energy to carry out the routine activities. He complaints of weight loss for the last 4 months. His other complaints are increased urinary frequency, persistent right flank discomfort and on & off night sweats for the last 2 months. Recently, he started using over-the-counter vitamin supplements. He hasn't had feelings of anhedonia, guilt, suicidal thoughts, or lack of concentration. Nor has he complained of cold intolerance, diarrhea or polyphagia. He never had jaundice. He was never admitted in the hospital. He has no known allergies. He takes acetaminophen for headaches. FH: Mother died at the age of 56 due to CVA. Father alive and healthy at the age of 65 yrs, he has diabetes and hypertension. SH: The patient has been married for 20 years and has no kids. He has been smoking 20 cigarettes for the last 20 years and drinks alcohol on weekends. He is sexually active in a monogamous relationship with his wife. ROS: There is no blood in the urine, hesitancy, dysuria, or urethral discharge. He has complaints of persistent flank discomfort the last two months. The rest of the ROS are unremarkable.

**How do you approach this patient?**
This 50 yr old, known smoker presents with several months H/O constitutional symptoms, extreme fatigue, constipation, frequency of urination, and persistent right flank discomfort. So, the most important thing to rule out in this patient is malignancy.

**Order physical exam:**
Complete physical examination

**Here are the results:**
The patient is looking ill and pallor. He is in no obvious discomfort. No lymph nodes are palpable. Lungs and heart are clear to auscultation.
Abdomen: Bowel sounds are diminished. No abdominal tenderness. Right flank discomfort is noted with deep palpation. No organomegaly. No masses palpable. No shifting dullness or fluid thrill.
Genitals: No masses, rash or ulcer.
Rectal exam: Sphincter tone normal, No tenderness, and no ulcer. Prostate not enlarged. Stool color brown. No occult blood.

**Order:**
CBC with differential, stat
Basic metabolic panel, stat
LFTs, stat
U/A, stat

**Here are the results:**
CBC showed HB of 9, MCV of 88.
BMP showed calcium of 20 mg/dL, BUN of 60 and creatinine of 2.3.
LFTs are WNL
U/A showed moderate amount of blood.

**Discussion:**

Constipation is the MC GI complaint n patients with hypercalcemia. Differential diagnosis of hypercalcemia is very broad. However, upto 90% of the cases belong to primary hyperparathyroidism and cancer. Primary hyperparathyroidism is the most frequent cause in ambulatory patients. The degree of hypercalcemia provides useful diagnostic clues. Hypercalcemia in primary hyperparathyroidism is mild (often <11 mg/dL) while it is more marked in cases of malignancy (>13 mg/dL).

Careful history taking and examination and a few lab tests are usually sufficient to establish the cause of hypercalcemia. These tests include chest x-ray (for malignancy or sarcoidosis), serum protein electrophoresis (M. Myeloma) and intact serum PTH assay. Because of the higher incidence of associated hyperparathyroidism in patients with malignancy it is reasonable to obtain an intact PTH even in a patient with known malignancy.

**Review orders:**
Admit the patient in ward/floor (2 reasons 1. For the treatment of hypercalcemia with IV NS, 2. Workup for the underlying cause of his hypercalcemia)
IV access
IV NS, bolus (2 liters) (Please do not give diuretics without prior hydration; We have treated a Ca of 24 without giving any diuretics)
IV NS, 150 cc/hr, continuous
Chest - X ray, routine (PA view)
Serum ferritin, routine
TIBC, routine
Serum iron levels, routine
PTH intact, routine
Repeat BMP next morning
USG of the abdomen
SPEP
Serum alkaline phosphatase

**Review orders:**
CT of the abdomen and chest (If the USG showed renal mass suspicious for malignancy). Do not give IV contrast if the renal function is not improved with IV fluids. To give the contrast creatinine should be <1.5.
Bone scan (If the alkaline phosphatase is elevated)
Monitor serum calcium level every day and adjust the IV NS
Consult oncology

**Discussion:**

- Hyperparathyroidism should be suspected in any patient with the following features:
    - Family history of hyperparathyroidism
    - Family or personal H/O MEN (multiple endocrine neoplasia) syndromes
    - H/O pancreatitis
    - Prolonged asymptomatic hypercalcemia
- This patient is most likely having renal cell carcinoma. Bladder cancer is usually associated with irritative voiding symptoms and hematuria.
- Renal cell carcinoma is often associated with paraneoplastic symptoms. Constitutional symptoms include fever, anorexia, weight loss are common and should make the physician think about malignancy. Moderate to severe anemia is common. Iron studies usually

reveal anemia of chronic disease.

- Hepatic dysfunction is commonly seen in patients with renal cell carcinoma even without hepatic metastasis (termed Stauffer's syndrome). Nephrectomy usually relieves the hepatic dysfunction, but persistent or recurrent dysfunction indicates local recurrence or metastatic disease.
- Long-acting bisphosphonates, such as pamidronate or zolendronate, are the drugs of choice for the treatment of hypercalcemia. They have also shown a reduction in bony metastases and an improvement in survival.
- One the diagnosis of renal cell carcinoma id made the next step is to evaluate the presence/extent extra renal disease. Ct of the chest and abdomen is part of the routine staging procedure. Bone scan is indicated if the patient has elevated alkaline phosphatase or complains of bone pain.
- Criteria using the size of the tumors to differentiate between benign and malignant tumors are no longer used. Histological criteria should be used to confirm the diagnosis. Biopsy of the metastatic lesion if the preferred way of obtaining histologic diagnosis. However, if there is an isolated, solid resectable renal mass is present complete or partial nephrectomy is the preferred way of making the diagnosis and treatment. Preoperative needle biopsies are not recommended in a patient with resectable tumors because of the risk of peritoneal seeding.

**Location:** Office

**Vitals:** BP 130/70 mm Hg, HR 76/min, RR 18/min, and Temperature is 36.8C.

**C.C:** Vaginal discharge

**HPI:** A 39-yr old Caucasian female presents to your office with a 1-week history of foul smelling vaginal discharge. She also complains of pruritus of vulva. She denies any abdominal pain, nausea, vomiting, or fever. She also denies any vaginal bleeding. Her only medications are inhaled betamethasone and albuterol for bronchial asthma. She had a similar problem 6 months ago and it went away after applying over-the-counter antifungal cream. She doesn't use any other medications. Her appetite, bowel movements, and bladder functions are not affected. She is not allergic to anything. FH: Mother has diabetes and father has hypertension. SH: She doesn't smoke or drink. She has never used recreational drugs. GYN: She is G2 P2 and her LMP was 25 days ago. She is sexually active with her husband only. He's had a vasectomy. She had her PAP smear one and half years ago.

**How do you approach this case?**
Order physical exam:
Abdomen
Pelvic exam
Extremities

**Here are the results?**
Pelvic examination reveals curdy white discharge with white patches along the vaginal walls. There is a significant erythema noted over the vulva. There is no uterine or adnexal tenderness. No cervical discharge is noted.
The rest of the examination is within normal limits.

**What would be your approach?**
Based on the inflammatory findings this patient has vaginitis. This could be due to Candida (most likely), or Trichomonas (very less likely). Vaginosis (no inflammation) is very unlikely with the signs of inflammation. You have to keep in mind that there may be a coexistent vaginosis, especially in a patient with a recurrent infection. One more thing that we can say at this stage is that the chance of PID is also very unlikely without adnexal or uterine tenderness and cervical discharge.

**Order:**
Vaginal PH
Wet mount preparation (Saline + KOH)
Gram staining of discharge
Pap smear, routine
GC, culture
Chlamydia, culture
CBC with differ
U/A

**Workup:**
All patients presents with vaginal discharge should have vaginal pH measurement. This is the single most important test that differentiates candida form the other 2 common infections. A pH above 4.5 suggests bacterial vaginosis or trichomoniasis, and excludes candida vulvovaginitis.

Wet mount preparation with saline and KOH (destroys cellular elements) should be ordered on all patients. Saline microscopy is helpful in identifying candidal hyphae, motile trichomonads, clue cells (epithelial cells studded with adherent coccobacilli), and PMNs. Culture for candida and trichomonas is usually not indicated unless the microscopy is negative.

**Cervical culture** for Neisseria gonorrhoeae or Chlamydia trachomatis, must always be performed in any women with purulent vaginal discharge.
Patients with high-risk sexual behavior should have screening for syphilis, HIV, hepatitis B, and other STDs.

**Candidiasis:**
Diagnosis:

- White curdy patches with inflammatory signs on exam.
- Mycelia on KOH preparation.
- Presence of inflammatory cells on Gram stain.

Treatment:

- Miconazole / Clotrimazole suppositories or vaginal cream for 2 weeks.
- If no response give a single oral dose of oral fluconazole.

Trichomonas vaginalis:

- Patents usually present with purulent, malodorous, thin greenish frothy vaginal discharge with associated burning, pruritus, dysuria, and dyspareunia. Physical examination reveals inflammatory signs (erythema of the vulva and vaginal mucosa). In 2% of patients punctate hemorrhages may be visible on the vagina and cervix.

Treatment:

- Non pregnant - Metronidazole 500 mg BD for 7 days (or) 2 gm single dose.
- Pregnant - $1^{st}$ TM - Clindamycin cream; $2^{nd}$ - $3^{rd}$ TM - again metronidazole.
- Many physicians are now using metronidazole in 1st TM also, as CDC no longer discourages its use in 1st TM.

Advice:

- Patients should be advised not to drink alcohol (at least 48 hours) because of a disulfiram-like (Antabuse effect) reaction with metronidazole.
- Treatment is required for partner.
- Safe sex.

**Bacterial vaginosis:**

Diagnosis is made by:

- "Fishy smelling" discharge especially after unprotected intercourse.
- Clue cells (epithelial cells studded with bacteria) on saline wet mount.
- Positive whiff-amine test - The presence of a fishy odor when 10 % KOH is added to vaginal discharge samples.
- No inflammatory signs on examination.
- No inflammatory cells on the Gram stain smear.

Treatment:

- The treatment of choice is 500 mg twice daily for 7 days. Topical vaginal therapy with metronidazole gel for 5 days is as effective as oral metronidazole. The use of single-dose therapy with 2 g of metronidazole is controversial, as it has shown a higher rate of relapse is some studies.
- There is no need to treat partner.

**Advise to all the above patients:**
Patient education
Safe sex
No alcohol
No smoking
No recreational drugs
Pap smear annually
Annual mammogram from the age of 50 yrs
Annual FOBT and colonoscopy for every 10 years from the age of 50 yrs
Lipid profile for every 5 yrs from the age of 20 yrs

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**Location:** Office

**C.C:** High blood pressure is noted in a 55 year-old male patient during his routine medical check-up.

**Vitals:** Pulse: 72/min; B.P.160/95 mm Hg; Temp. 98.5$^0$F; R.R: 17/min.

**HPI:**
A 55-year-old white male comes to the doctor's office for his routine medical check-up which shows high blood pressure. He denies any headache, chest pain, shortness of breath, palpitations, leg swelling, dizziness, or syncope. His bowel movements are regular and his bladder function is good. He has no other complaints. He has no known allergies. He is not taking any medication. For the last 25 years he has smoked 10 cigarettes per day. He drinks alcohol occasionally and does not use illegal drugs. He is sexually active with his wife. FH: Father died at the age of 50 due to MI. Mother is 85, alive, and healthy. The rest of his ROS are unremarkable.

**How would you approach this case?**
Diagnosis of HTN is made when high blood pressure is confirmed on three separate occasions. Once the diagnosis has been made, one should determine cardiovascular risk factors, cause of HTN (secondary and curable causes), and target organ damage.

**Physical examination:**
It is done to find out the cause of HTN and to assess the target organ damage. Ophthalmoscopy, palpation of pulses, and abdominal examination for bruits provide useful information.

**Order:**
Complete physical examination (Because the patient is stable and needs an assessment for end-organ damage) .

**Results of your examination:**
Complete physical examination is within normal limits. Therefore, order the following tests and ask the patient to return in one week for reevaluation of his BP. When evidence of end-organ damage is found on examination, start antihypertensive therapy immediately.

**Laboratory testing:**
All patients who are found to have hypertension should have routine hematocrit, urinalysis, lipid profile, 12-lead EKG, serum electrolytes, serum creatinine, and blood glucose. Other tests are indicated only in certain settings. Ambulatory blood pressure monitoring is required when blood pressure readings in the office setting are high and they are normal in ambulatory settings. Limited echocardiography (more cost effective than complete echocardiogram) may be performed to detect left ventricular hypertrophy when blood pressure values are borderline. Plasma renin activity is determined when primary hyperaldosteronism is suspected (unexplained hypokalemia). Workup up for renovascular hypertension is performed when history is suggestive and when corrective measures are being considered. Intra-arterial digital subtraction angiogram or spiral CT can be used for this purpose.

Thus we will perform the following examination and lab testing in this patient.
**LABS:**
CBC, routine (no need of differential)
BMP, routine

Urinalysis, routine
Lipid profile, routine
EKG, 12 lead, routine
Follow up visit in one week

The patient returns one week later with lab results, which are all normal. Repeated blood pressure measurements, both at home and office over a period of two months, shows stage-1 HTN. A diagnosis of essential HTN is made. Essential HTN is not associated with end-organ damage in this case.

**DISCUSSION:**
Non-pharmacologic measures should be advised to all patients for the treatment of HTN. These measures include regular exercise, weight reduction, reduced salt intake, and avoidance of excessive alcohol.

**Definitions:**
Blood pressure and hypertension are classified as follows:
Optimal blood pressure: systolic <120 mmHg and diastolic <80
Normal blood pressure: systolic 120-129 and diastolic 80-84
High-normal blood pressure: systolic 130-139 or diastolic 85-89

Hypertension:

| | | | | | |
|---|---|---|---|---|---|
| Stage 1: | systolic | 140-159 | or | diastolic | 90-99 |
| Stage 2: | systolic | 160-179 | or | diastolic | 100-109 |
| Stage 3: | systolic | >180 | or | diastolic | >110 |

**Recommendations:**
Borderline or high-normal blood pressure:

- They are treated with non-pharmacological measures and their blood pressure tested every year unless they have DM, target organ damage, or CVS disease.

Stage 1:

- Nonpharmacological measures should be tried initially for up to 12 months (if no other risk factors are present) or 6 months (presence of other cardiovascular risk factors except DM). Treatment with antihypertensive drugs is indicated when there is associated end-organ damage, diabetes, or other vascular risk factors.

Stage 2 and 3:

- Patients should be started on pharmacological therapy immediately.

General approach:

- Recommended approach for the pharmacological therapy of HTN is to start with either thiazides or beta-blockers. If low-dose thaizide is not effective, beta-blocker, calcium channel blocker, or ACE inhibitor can be added or substituted.

- ACE inhibitors are the first line antihypertensives for all diabetic hypertensive patients with or without evidence of end organ damage, symptomatic or asymptomatic left ventricular failure with an EF of <40, post myocardial infarction, and nondiabetic proteinuric chronic

renal failure.

- ARBs are indicated when a patient can't tolerate ACE inhibitor due to dry cough. It is also indicated in hypertensive patient with LVH, and in type 2 Diabetic patient with nephropathy.

This patient has stage 1 HTN without any target organ damage and clinical cardiovascular disease but has multiple risk factors including cigarette smoking, obesity, and family history of early CAD. Therefore, advise both pharmacological and non-pharmacological therapy.

**Order review:**
Oral atenolol, continuous
Patient education, smoking cessation
Patient education, regular exercise
Patient education, medication compliance
Limit alcohol intake
Diet, low sodium
Diet, weight loss
Safe sex counseling
Seat belt use
Regular follow-ups

**Primary diagnosis:**
Essential HTN

**Location:** Office

**Vitals:** B.P: 110/76 mm Hg; H.R: 76/min; R.R: 16/min; Temperature: 36.9C.

**C.C:** Short stature, and primary amenorrhea.

**HPI:** Her mother for evaluation of short stature brings a 13 yr old teen to your office. She is concerned about her daughter being shorter than her classmates. Her height is 4 foot 6 inches. She says that she and her husband were of normal height. She also concerned about her menarche. She says that her other (older) daughter had developed secondary sexual characters and menstruation by the age of 14. She denies any other complaints. The patient has shown age appropriate developmental skills and teeth eruption. At school she shows moderate to high performance in studies. Her past medical history is nothing significant except for ear and throat infections during childhood. She has no known allergies. Her family history is nothing significant. The mother denies any use of alcohol, smoking, or drugs while she was pregnant. Remaining ROS are unremarkable.

**So how would you approach this case?**
Basically, this patient is having short statute as a chief complaint. Even though she did not develop menarche or secondary sexual characters it is very premature to say that this patient is having problems. You have to wait at least until 14 to 16 years to assess the amenorrhea, and secondary sexual characters.

Basically the differential diagnosis in this patient is Turner's syndrome, familial short stature, hypopituitarism, hypothyroidism, constitutional growth delay, derivational dwarfism, and some other syndromes like Noonan's syndrome etc.

First, do a complete physical examination except rectal. Also, order vitals that include blood pressure in both upper limbs and lower limbs.

**Here are the results:**
She has low occipital hairline, wide neck, high arched palate, and widened spaced nipples. No abnormalities in the rest of the examination.
Based on these findings the is most likely having Turner's syndrome.

**Discussion:**
First confirm the diagnosis with serum FSH, LH (elevated), and karyotyping. Also order some other important investigations.

Every girl with Turners syndrome must be screened for associated medical problems. At least 2D echo to detect heart defects, ultrasonography of the kidney (to detect renal problems), skeletal survey (to detect skeletal problems), and thyroid function tests. Hearing should be tested clinically regularly to detect hearing loss. Despite the short stature these patients do not have the growth hormone deficiency. So, the routine testing is not indicated. The metabolic syndrome comprises of hypertension, hyperlipidemia, type 2 DM, and obesity is more common among adults with Turner syndrome. So, all patients should have tested for blood glucose, BUN, serum creatinine, and urinalysis initially and once yearly thereafter because of the risks of diabetes mellitus and chronic renal failure.

**Order the following:**
U/A, routine

BUN, routine
Creatinine, routine
Fasting blood sugar, routine
FSH, serum
LH, routine
Karyotype, routine
Skeletal survey (short $4^{th}$ metacarpal)
Pelvic ultrasound, routine (streaked ovaries)
TSH, routine
2D-Echocardiogram - For Coarctation of aorta
β-HCG if suspicion

**Advice:**
Patient education
No smoking
No alcohol
Safe sex
No illicit drugs
Immunization according to the age
Regular exercise
Regular diet
Follow up appointment after one week.

**Treatment:**
Once the diagnosis of Turner's syndrome is confirmed, consider the following :
Growth hormone therapy, subcutaneous, continuous - It should be started as soon as the height falls below the 5th percentile (till epiphysis is closed). Once the girl reaches 9 yrs, combination therapy with growth hormone and an anabolic steroid like oxandrolone is recommended until the age of 12 yrs.
Estrogen, conjugated, oral, continuous - If the patient is of pre-pubertal age group (< 13 years), continue till puberty is achieved. If the patient is >13 years, then start combination of "estrogen and progestin"
Vitamin D, therapy, oral, continuous; to prevent osteoporosis.
Estrogen replacement counseling
Psychiatry consult - (Reason - IQ estimation)
Ob/Gyn consult - (Reason - Gonadal resection (Children with 'Y' chromosome may have to be operated to remove their gonads to prevent cancer from occurring in the gonads), and for in vitro fertilization (if patient wants to have children.)
If there is any evidence of thyroid problem, treat accordingly.

**Make follow-up appointments:**
Echocardiogram for every 2 years
Thyroid function tests for every one year
Annual complete physical examination

**Primary diagnosis:**
Turner's syndrome

**Location:** Emergency Room

**Vitals:** B.P: 110/70 mm Hg; H.R: 95/min; Temp: 99.8C; R.R: 16/min.

**C.C:** A 65-year-old white male presents with fever and severe pain in the left lower abdomen.

**HPI:** A 65-year-old male presents to the ER with fever, and abdominal pain. Pain started four days ago in the left lower abdomen and has progressively increased in severity. It does not radiate anywhere and is associated with nausea, vomiting, and low-grade fever. Pain is of 7-8/10 in severity now and it is a constant type of pain. There is no history of change in bowel habits or bleeding per rectum. He had similar episodes of pain in left lower abdomen in the past, which subsided spontaneously. However, he states that he has been suffering from constipation for the last 10 years. PMH: He had a cholecystectomy at the age of 50. He has non known allergies. FH: Mother died at the age of 60 due to MI. Father died from Alzheimer's disease at the age of 85. SH: He quit smoking 20 years ago. Before that he had been smoking 20 cig/day since teenage years. He does not drink or use any recreational drugs. The remaining ROS are unremarkable.

**How to approach this case?**
This patient has presented with lower abdominal pain and fever. Here we are dealing with the DD of acute abdomen. We will perform abdominal examination and rectal examination, which will narrow the list of our differential diagnosis.

**Order the physical examination:**
General
HEENT/Neck
Heart
Lungs
Abdominal Examination
Rectal examination
FOBT
When a female presents with acute abdomen, you need to perform genital/pelvic examination.

**Results of PE:**
Patient is in moderate to severe pain. There is marked tenderness and a mass is felt in the left lower abdominal quadrant. No rigidity or guarding noted. Bowel sounds are present. Sphincter tone is normal with normal prostate, brown colored stools without any occult blood, no palpable masses. Rest of the exam is unremarkable.

**Discussion:**
This is probably a straightforward case of acute diverticulitis, which is suggested by history of chronic constipation, episodic left lower quadratic pain, and by the presence of mass and tenderness in the left lower quadrant. But still diagnosis of acute diverticulitis needs to be confirmed and other causes of acute abdomen need to be excluded. Therefore, we will perform certain investigations. Treatment of acute diverticulitis depends upon its severity and the presence of complications. Patient with mild symptoms may be treated as outpatient with oral fluids and antibiotic coverage against gram-negative rods and anaerobes. Patients with more severe disease are hospitalized and given conservative therapy. They are maintained on NPO status, given IV fluids, and IV antibiotics covering both gram-negative bacteria and anaerobes. If patients fail to respond to conservative therapy, some sort of surgery needs to be done. Before, that he may require a follow up CT scan. Complications of diverticulitis include

peritonitis, obstruction, fistula formation, and abscess, all of which need to be treated surgically. Abscess formation is an important complication of diverticulitis. It should always be suspected when a patient fails to respond to conservative therapy and CT scan confirms its presence. It is drained under CT guidance through abdominal wall, transgluteally, transvaginally, or transrectally, depending upon its location.

**Orders:**
Complete bed rest
Make the patient NPO
IV access
IV normal saline, continuous
CBC with differential, stat (to establish infectious or inflammatory process)
BMP, stat (to see the impact of disease on renal function, as dehydration due to vomiting and loss of fluid in inflammatory exudate may result in pre-renal azotemia)
Serum amylase, stat (to exclude pancreatitis)
Serum lipase, stat
LFTs (to exclude hepatitis)
Urinalysis, stat (to exclude UTI)
IV Metronidazole and TMP-SMZ continuous
IV analgesia, stat
X-ray abdomen, acute series, stat (to exclude intestinal obstruction or peritonitis)
CT scan of abdomen, stat (to establish the diagnosis of acute diverticulitis and document its severity)
Repeat vitals and abdominal examination every hour.

When a female presents with acute abdomen, we also perform pregnancy test to rule out ectopic pregnancy or abortion.
This patient is most likely suffering from moderated to severe diverticulitis; therefore we do the following, while investigations are underway.

**Results:**
CBC: Shows elevated white blood cell count with left shift. BMP, LFT's, U/A, serum amylase, and lipase are within normal limits.
X-ray abdomen, acute series: No evidence of obstruction or free fluid.
CT scan of abdomen consistent with the diagnosis of acute uncomplicated diverticulitis.

FOBT is negative.

**Review order:**
Shift the patient to ward
Repeat CBC with diff following day
Input and output chart
IV analgesia, continuous
Continue IV antibiotics
Continue IV ND with 5 %dextrose

**Result of repeat vitals, history, examination, and CBC at 24 hours:**
Pulse 80/min
B.P 110/70
Temp 99 F
R.R 16/min

CBC with differential is WNL

He is having no pain and his abdominal examination elicits no tenderness.

**Review order:**
D/C IV antibiotics
Start oral TMP-SMZ and Metronidazole
D/C IV fluids, IV analgesia
Send him home and schedule next visit after 4 weeks
Sigmoidoscopy and Barium enema after 4 weeks (this is done in every patient with acute diverticulitis after the acute episode is over. This is to determine the extent of the disease, to detect the presence of any co-existent pathology, or to detect stricture, which may be a sequel of acute diverticulitis)
High fiber diet
Docusate, oral daily
Medication compliance
Regular exercise
Patient education

**Primary Diagnosis:**
Acute diverticulitis

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**Location:** Emergency room

**Vitals:** Pulse: 80/min; B.P: 130/80 mm Hg; Temp :98.7$^0$F; R.R: 14/min; Height: 30 inches (75 cm); Weight: 9.5 Kg (21 lbs).

**C.C:** A 16-month-old boy is brought with burns on his buttocks

**HPI:**
A 16-month-old male infant is brought to the ER by his stepmother. She states that the child fell on the iron, which was on the floor at that time. Hot iron caused blisters on his buttocks. On further questioning, she states that the child has the history of frequent falls and has multiple bruises on his shoulders and back. She further states that he feeds poorly and is usually very irritable. He is the only child in the family. His real mother died a year ago. He has been living with his stepmother since then. His father is a drug addict and is hospitalized these days for heroin abuse. ROS are unremarkable.

**How to approach this case:**
This is most likely a case of child abuse. In every case of child abuse we are required to perform complete physical examination regardless of the presentation.

**Order:**
Complete physical examination

**Results:**
The child seems to be malnourished and shows poor grooming. There is a large blister on his buttocks. Bruises of various stages are also noted on his shoulders and back. Rest of the examination is unremarkable.

**Discussion:**
Child abuse must be suspected whenever there is inconsistent or discrepant history that fails to explain the pattern of injury. It is also suspected when there is a delay in seeking medical care, history of previous suspicious events, substance abuse in parents, and failure to thrive in the child. Certain injury patterns are also suggestive of child abuse. They include bruises in multiple stages of healing, retinal hemorrhages, bruise or burns in protected areas like chest, abdomen, back or buttocks. Vaginal bleeding, injury to external genitalia and injury involving the anal region are other important clues to the child abuse. Shaken baby syndrome presents with fractures, CNS manifestations like seizure and retinal hemorrhages. Important differential diagnoses of child abuse are osteogenesis imperfecta, scurvy and syphilis. Bony changes in cases of syphilis and scurvy are symmetric which are highly unlikely in cases of child abuse. Children with osteogenesis imperfecta have blue sclera in many cases and they don't have bruises.

Complete physical examination must be done in every case of child abuse. Coagulation profile including PT, PTT and platelet count is done in all children with bruises. In cases of suspected physical abuse in children younger than 2 years, skeletal survey is essential. Bone scans are useful in detecting new fractures. In children older than 2, skeletal survey is indicated in selected cases. For children aged 2-4, skeletal survey is not needed when the child can communicate effectively and when his injuries are mild. For children older than 4, skeletal survey is indicated only when there is bony tenderness or limited range of motion. CT scan is indicated in cases where infant is severely injured. LFTs and pancreatic enzymes are ordered when there is suspicion of injury to these organs. CT abdomen may also be needed in such

cases. In cases of suspected abdominal trauma, urine and stools are screened for blood. CT scan of head is indicated all severely injured patients, and patients with CNS symptoms. Hospitalization is needed in many cases especially when diagnosis is in doubt, when the child's condition requires inpatient management, and when no safe place is immediately available for the child. The child is treated promptly with appropriate therapy and child protection services are reported immediately in every case of suspected child abuse or neglect. Complete evaluation of family dynamics is needed in all cases and consultation with a psychiatrist may be required.

**ORDERS**:
Silver sulphadiazine cream, continuous
Dressing of the wound
Admit the patient in ward
High calorie diet
Skeletal survey, stat
Bone scan, stat
PT, stat
PTT, stat
CBC, with differential
Consult child protection service
Consult psychiatrist
Ophthalmology consult for retinal hemorrhages
Family counseling

**Primary Diagnosis:**
Child abuse

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**Location:** Emergency room

**Vitals:** B.P: 92/60 mm Hg; HR: 130/min; Temp: $100.5^0$ F; R.R: 24/min;

**C.C:** Sudden onset of abdominal pain.

**HPI:**
A 45-year-old White male is brought to the ER with sudden onset of severe epigastric pain. The pain started 2 hours ago after he took his supper at a local fast food center. He states that the pain was initially mild and vague which later on became more intense. Now his pain is 9-10/10 in severity, burning in nature, and non radiating. Pain gets aggravated by deep breaths and movement. The patient feels somewhat better when he is lying still. He has never had such episodes before. He is feeling nauseated and vomited non bloody contents twice. He takes ibuprofen occasionally for the tension headaches. There is no history of steroid intake, fever, diarrhea, and constipation. Patient has a several year history of on and off epigastric discomfort partially responsive to antacids. He has no other medical problems except tension headaches of 1-year duration. There is no history of penetrating or blunt trauma. There is no history of alcohol abuse. He is a smoker with 20 pack years smoking history. He has no known drug allergies. Family history is not significant. Rest of the ROS are unremarkable.

**How would you approach this patient?**

- This patient has acute upper abdominal pain. Important causes of upper abdominal pain include perforated duodenal ulcer, severe gastritis, acute pancreatitis, biliary disease, lower lobe pneumonia, splenic abscess and infarct, myocardial infarction, and ruptured aortic aneurysm.

- Acute cholecystitis presents with RUQ pain radiating to the right shoulder or back. It is steady and severe. Associated symptoms are nausea and vomiting. Another important feature is fatty food indigestion. Acute cholangitis is characterized by jaundice, fever, and right upper quadrant pain. Pain in cases of acute pancreatitis is in the epigastrium, RUQ or diffuse. Its onset is rapid and it lasts for days. One important feature is band like radiation to the back. Pain is often associated with nausea and vomiting. Other important features are restlessness and feeling of relief on bending forward. Sometimes, lower lobe pneumonia presents with acute abdominal pain. MI may present with upper abdominal pain, therefore EKG must be done in such cases if cardiac risk factors are present. Splenic abscess presents with left upper quadrant pain and fever. In cases of splenic infarct, an evidence of some source of embolus is usually found. After reviewing all the causes. This patient is most likely has perforated peptic ulcer. We should proceed to the physical examination.

**Order:**
Make NPO
IV access
Nasal oxygen, continuous
Continuous pulse oxy
Continuous BP cuff
EKG, 12 lead, stat

**Here are the results:**
Oxygen saturations are 95% on 2-lit O2

EKG is within normal limits without any evidence of ischemia or infarction

**Now, order the physical examination:**
General appearance
HEENT/Neck
Examination of CVS
Examination of lungs
Examination of Abdomen
Examination of Rectum
FOBT
Extremities
Skin
CNS

**Here are the results of your examination:**
General Appearance: Patient is a well-nourished male. He is pale, ill looking, and sweaty; lying quietly on the bed with acute pain.
Abdomen: Abdomen is rigid, very tender, and bowel sounds are absent. There is a rebound tenderness elicited all over the abdomen. No skin ecchymoses.
Rectum: Sphincter tone is normal. Prostate is normal. No tenderness is elicited. Stools are brown. Occult blood is negative.
Rest of the examination is within normal limits.

**Discussion:**
This is most likely a case of localized peritonitis due to perforated duodenal ulcer. If a patient with prior history of peptic ulcer symptoms develops sudden and severe abdominal pain, ulcer perforation should be suspected. Perforated duodenal ulcer is largely a clinical diagnosis; therefore history and physical examination are of utmost importance. Unnecessary delay in establishing the diagnosis worsens the prognosis significantly. X-ray studies will show free air under the diaphragm. CT scan and gastrografin studies will confirm the diagnosis but are usually not required.

**Review order:**
Continue NPO
Pass NG tube, suction
IV Normal Saline, Continuous
Serum amylase, stat
Serum lipase, stat
LFTs, stat
Erect abdominal X-ray, portable
CBC with differential, stat
BMP, stat

**Results:**
Erect X-ray abdomen reveals free air under the diaphragm.
CBC with differential reveals slight leukocytosis with left shift, Hb of 13, and platelets of 200,000/mm3.

**Review order:**
Start with Ranitidine or proton pump inhibitors infusion IV
Start IV ampicillin + gentamicin + metronidazole
Surgical consultation, stat
Preoperative evaluation with
PT/aPTT

Chest X-ray

- **Treatment of perforated duodenal ulcer:**
  Non-surgical management may prove to be successful in some patients. It includes IV fluids, NPO status, nasogastric suction, IV antibiotics, and drugs that decrease or inhibit gastric secretion. All except patients older than 70 are first given a trial of nonoperative treatment.

- For patients with perforated duodenal ulcers, simple patch closure or truncal vagotomy with pyloroplasty are the recommended surgical procedures. Perforated gastric ulcers have much worse prognosis and the surgical procedure of choice is distal gastrectomy.

- H. pylori and NSAIDS may be the cause of peptic ulcer disease and their presence should be ruled out. If H. pylori is present, antibiotics must be given to eradicate its infection.

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**Location:** office

**Presenting complaint:** A 22-year-old woman presents with hirsutism.

**Vitals:** Pulse: 80/min; BP: 122/82 mm Hg; Temp: 98.7 F, R.R: 16/min; Height: 162.5cm; Weight: 90 kg (198lbs) .

**HPI:**
A 20-year-old obese white female comes to the physician office with the complaint of male pattern body hair. She states that besides facial hair, hair is also present on her chest and on the lower abdomen. Her other complaints are amenorrhea for the last 4 months and obesity. She states that her menses have always been irregular since her first menses at the age of 14 years. She neither smokes nor drinks alcohol. She is not using any prescribed or recreational drugs. She has never been sexually active. She denies any other complaints. She is allergic to penicillin. FH: Father is healthy. Mother has a H/O DM. She does not use any recreational drugs. She is un-married. ROS are unremarkable.

**How to approach this case?**
Important points to note in this young female are hirsutism, secondary amenorrhea, and obesity. These findings point towards the diagnosis of polycystic ovarian disease (PCOD). Other possible causes are hyperprolactinemia, late onset congenital adrenal hyperplasia, and androgen secreting tumors. Diseases like Cushing's syndrome and hypothyroidism also need to be ruled out as a cause of obesity.

This patient is very stable and is coming for evaluation first time with you. So, she needs complete physical examination. We also need to examine her skin for pattern of hair distribution, and genitalia for any evidence of virilization.

**Ok first order the examination part:**
Complete physical examination (or)
General, HEENT/Neck, Lymphadenopathy, Lungs, Heart, Abdomen, Pelvic exam, Extremities, Skin, and Neuropsychiatric .

**Here are the results of your examination:**
Young obese female, not in acute distress. Hair are noted on the upper lip, chin, around nipples, and on linea alba.
Rest of the examination is normal.

**Discussion:**
The most widely used criteria for the diagnosis of PCOS is:
1. Clinical or biochemical evidence of hyperandrogenism
2. Menstrual dysfunction (Fewer than 6-9 cycles per year)
3. Exclusion of other common causes of hyperandrogenism

Many biochemical abnormalities are encountered in cases of PCOS. These include high serum androgens, high serum estrone with normal serum estradiol, high serum LH with normal serum FSH, and impaired glucose tolerance. Both total and free serum testosterone concentration is elevated. Finding of polycystic ovaries on USG is nonspecific for the diagnosis of PCOS.

**Differential diagnosis:**
PCOS is a diagnosis of exclusion. PCOS and idiopathic hirsutism account for more than 95

percent cases of hyperandrogenism in females. Other causes are late-onset congenital adrenal hyperplasia, ovarian and adrenal tumors, drugs and hyperprolactinemia. In cases of hyperprolactinemia, menstrual dysfunction is prominent without any evidence of hyperandrogenism and serum prolactin levels are elevated. 24 hour urine cortisol, and 17-ketosteroids are indicated for suspected Cushing's syndrome. Late onset congenital adrenal hyperplasia is a rare disorder and can be ruled out by post-ACTH serum 17-hydroxyprogesterone levels.
In cases of androgen-secreting tumors, there are signs of virilization and serum LH concentration is low. Serum testosterone (>150 ng/dl) and serum dehydroepiandrosterone (>800ug/dl) levels are high in ovarian and adrenal tumors respectively.

**Order routine labs:**
Urine testing for beta-HCG (as she has history of amenorrhea)
Serum testosterone total and free
Serum DHEAS
Serum prolactin
24-hour urine cortisol
24-hour urine 17-ketosteroids
Serum TSH
Serum LH
Serum FSH
Pelvic ultrasound, routine
Follow up visit when results are available.

**Results of labs:**
Urine testing for beta-HCG: negative
Serum testosterone total and free: total is 100ng/dl and free is 5ng/dl
Serum DHEAS: normal
Serum prolactin: 10ng/ml
Serum cortisol: normal
Serum TSH: 1microU/L
Serum LH: 60 IU/L
Serum FSH: 15 IU/L
Pelvic ultrasound: Ovaries shows peripheral "strings of pearls" sign.

**TREATMENT:**
All women with the diagnosis of PCOS should be initially evaluated for metabolic risk factors. The most common metabolic abnormality associated with PCOD is type 2 DM and impaired glucose tolerance. Measurement of weight, blood pressure, and fasting lipids are recommended in all patients. 2-hour glucose tolerance test with 75 g of oral glucose load is indicated in obese women with PCOD. Routine measurement of serum insulin levels is not indicated for various reasons.

Weight reduction in obese females and use of drugs that decrease insulin resistance in both obese and non-obese reverse many abnormalities of PCOS. The drugs used for this purpose are metformin, troglitazone, and D-chiro-inositol. Unopposed estrogen action may result in endometrial hyperplasia and endometrial Ca. To decrease this risk, OCPs are given and progestin present in them antagonizes the effect of estrogen. Another benefit of this therapy is inhibition of androgen production and increase in sex-hormone binding globulin levels. OCPs are therefore the treatment of choice for women who don’t want to conceive. Patients with PCOS who have evidence of DM should be treated with metformin. Metformin is preferable over thiazolidinediones for possible teratogenicty. OCPs are indicated in conjunction with metformin if they do not want to become pregnant. For hirsutism, hair is removed by shaving, electrolysis, laser treatment, and depilatories. Hair growth is slowed by an OCP alone or an OCP combined

with antiandrogen. In cases of infertility, other possible causes of infertility are first ruled out by appropriate testing and only then ovulation induction is attempted. Clomiphene citrate is usually used for this purpose. Other agents include GnRH and exogenous gonadotrophins. Patient's with LDL of more than 160 without risk factors, or >130 with risk factors, >100 with known CAD should be treated with HMG-CoA inhibitor.

**ORDER REVIEW:**
Fasting lipid profile
Glucose tolerance test
Counsel the patient /Patient education
Weight reduction
Low fat, low caloric diet
Regular exercise
OCPs
Pap smear
Follow up in 1 week with the results

**Primary Diagnosis:**
PCOD

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**Location:** Office

**Vitals:** B.P: 140/88 mm Hg; P.R: 80/min; R.R: 17/min; Temp: 36.8C; Height: 150 cm; Weight: 80 kg.

**C.C:** A 52-year-old woman comes to you with the complaint of sleeplessness.

**HPI:**
A 52-year-old African American woman comes to you with the complaint of sleeplessness for the past few weeks. She believes that her inability to sleep is due to episodes of excessive warmth, diaphoresis, and palpitations occurring while she's trying to sleep. The episodes appear to be unrelated to any specific triggers, and last 3-5 minutes. These episodes occur during the daytime as well. She gets comfort in cool environment during these episodes. She had similar symptoms three months ago, which ended spontaneously. She states that she has gained weight in the last couple of months. She has been having occasional episodes of urine incontinence associated with laughing for the last couple of months. She denies diarrhea, abdominal pain, cold intolerance, and feelings of guilt. However, she is irritable about these episodes. She hasn't had a menstrual period for the last 12 months, which was preceded by a couple of months of irregular menstrual cycles. Menarche was at the age of 13. She had two episodes of gonorrheal cervicitis, which were adequately treated. She has been sexually active, with multiple partners, throughout her life. She felt pain during her last sexual intercourse. She has been feeling vaginal dryness for the last few months. She has never been tested for HIV. Her last pap smear one year ago was within normal limits. She has hypertension for which she takes hydrochlorothiazide. She has no known allergies. Her current medications include over the counter vitamins, and hydrochlorothiazide. There is no significant family history. She has been smoking 10 to 15 cigarettes/day for the last 16 years. She occasionally drinks alcohol on the weekends. She has not been sexually active for the last two years. She has never been married. Review of systems is unremarkable.

**How do you approach this case?**
This woman is most likely going through menopause. Her sleep difficulties are simply due to hot flashes. The diagnosis of menopause is established when amenorrhea is present for six months or more and symptoms like hot flashes, or vaginal dryness are exhibited. When there is some doubt, high FSH level confirms the diagnosis. LH levels are less helpful.

This patient has hot flushes, vaginal dryness, insomnia, urine incontinence, and 12 months of amenorrhea. You don't need to order FSH, LH in the presence of symptoms such as amenorrhea, hot flushes, and vaginal dryness. In patients who have had a hysterectomy, elevated FSH is of diagnostic value.

When women develop symptoms of estrogen deficiency, estrogen replacement therapy should be started. Estrogen replacement therapy puts them at an increased risk for endometrial hyperplasia, and endometrial cancer. Therefore, endometrial thickness should be measured yearly by vaginal ultrasonography in those with endometrial thickness greater than 0.4 mm.

Short-term effects of estrogen deficiency:
The most frequent short-term effects of estrogen deficiency are hot flashes. Estrogen is the most effective therapy. Hot flashes may cause inability to sleep that may result in irritability, depression, and other emotional, and psychological complaints. Urinary incontinence and UTI are associated with menopause. Urinary incontinence occurs due to the atrophy of urothelium resulting from estrogen deficiency. Systemic or topical estrogen may prove effective. Estrogen

deficiency results in decreased vaginal lubrication, vaginal atrophy, vaginal dryness, and dyspareunia. Estrogen is used to treat dyspareunia.

Long-term effects of estrogen deficiency:
Osteoporosis is a very important long-term effect of estrogen deficiency. Bone mineral density should be measured in women who are at risk for osteoporosis. Onset of dementia may be delayed by estrogen replacement therapy. All postmenopausal women should be examined annually and risk factors for heart disease, osteoporosis, and breast cancers need to be determined.

This patient is stable. Order complete physical and rectal examination.
**Order:**
Complete physical examination.

**Results of the examination:**
Completely normal physical exam

**Discussion**
The patient is going through menopause. However, she needs a couple of tests to ascertain her risk for colon cancer, breast cancer, cervical cancer, osteoporosis, and heart disease. She needs a sigmoidoscopy along with the fecal occult blood test to check the risk for colon cancer, as she is over 50 years old.

**Order:**
Pap smear
Mammogram, bilateral, screening
Fasting lipid Profile
DEXA Scan
Fecal Occult Blood Test (FOBT)
Flexible Sigmoidoscopy

**Results:**
Mammogram: Normal
Fecal Occult Blood Test: Negative
Flexible Sigmoidoscopy: Negative

Lipid Profile:

| | | |
|---|---|---|
| Serum Cholesterol | 190 mg/dl | (150-240) |
| Serum Triglycerides | 98 mg /dl | (35-160) |
| VLDL | 26 mg/dl | (<40) |
| LDL | 110 mg/dl | (<160) |
| HDL | 40 mg/dl | (30-70) |

Deal Energy X-ray Absorptiometry (DEXA Scan):
The scan detected bone density over the hip, spine, and radius. The bone density was found to be 1.25 standard deviation less than expected for her age.
Impression: Osteopenia

**Review of orders:**
Hormone replacement therapy; combined estrogen and progestins PO
Calcium Carbonate (Oral), continuous
Vitamin D (Oral), continuous
Advise for

HIV testing by ELISA after appropriate counseling (Because she has a H/O STD)
Consider counseling about the following
Smoking cessation
Limit alcohol
Exercise program
Use of seat belt
Medication compliance
Low salt diet (She has HTN)

**Discussion:**
If there are less than two risk factors (HTN, smoking, hyperlipidemia, DM, family history) in a woman, her LDL should be less than 160 mg/dl. If the risk factors are more than two, then her LDL should be less than 130 mg/dl.
Estrogen is helpful for hot flashes and prevention of osteoporosis. In women who still have their uterus, estrogen must be combined with progestins. Calcium, vitamin D, and a good exercise program are all helpful in preventing osteoporosis.

**Location**: Emergency Room

**C.C**: A 42-year-old alcoholic male presents in a state of confusion.

**Vitals**: Pulse: 102/min ; B.P: 160/88 mm Hg; Temp: 99.9$^0$F; R.R: 26/min .

**HPI**:
A 42-year-old male, who chronically abused alcohol for the last 10 years, is brought to the ER in a state of confusion. His family reports that he has been having auditory hallucinations, tremors, nausea, fever, tachypnea, 2 episodes of non bloody vomiting, and insomnia for one day. He was seen on two previous occasions in the ER for alcohol intoxication. Further questioning reveals that he drank excessively three nights ago prior to the development of these symptoms. There is no complaint of headache or neck stiffness. He denies use of prescribed or recreational drugs. There is no history of fall or trauma. He has no known allergies. He is not taking any medication. SH: He is un-married and has no children. He lives with his parents. He has been drinking alcohol for twenty years. He used cocaine for some time 5 years ago, but quit. He smokes occasionally. ROS is unremarkable.

**How to approach this case?**
Here we are dealing with an alcoholic patient who is most likely suffering from withdrawal/delirium tremens. Delirium tremens is a serous form of alcohol withdrawal, which is characterized by disorientation, hallucinations, tachycardia, high BP, fever, and diaphoresis. It typically occurs between 2 to 3 days after last drink. However, it may occur up to 7 days. Examination is performed to find out signs of alcohol related diseases like liver disease and pancreatitis as well as to rule out other causes of altered mental status (infection, trauma).
We will perform relevant examination, draw samples for labs and immediately start treatment in the emergency department.

**Order the physical examination:**
General
Heart and Lungs
Neuropsychiatric
HEENT/Neck
Abdominal
Extremities

**Results of the examination:**
Significant findings on examination are tachycardia, tachypnea, hyperthermia, diaphoresis, tremor, ataxia, disorientation, and hallucination. His mucus membranes are dry. No neck stiffness or other meningeal signs present.
Mild hepatomegaly is present.
Patient is confused, disoriented, combative and abusive.
Heart and lungs are clear.
Pupils are equal and reacting to light. No papilledema.
No peripheral edema

**Emergency care:**
Pulse oxy, stat and continuous
Supplemental oxygen, inhalation, continuous
Cardiorespiratory monitoring, continuous
IV access

IV normal saline bolus then continuous
Blood glucose, stat (chronic use of alcohol may result in hypoglycemia due to decreased glycogen stores)
NPO except meds
EKG, 12 lead, stat
IM thiamine, continuous
PO folic acid 1 mg daily
IV Lorazepam, continuous for moderate sedation
Soft restraints
Aspiration precautions

Tests can be ordered once emergency measures are taken.
**Labs:**
CBC, stat (as alcoholism cause hematological abnormalities like thrombocytopenia and macrocytosis, and also to look for evidence of associated infection which will cause elevation in WBC counts)
BMP, stat
LFTs, stat (for alcoholic liver disease)
PT/INR, stat (associated live disease and its coagulopathy)
PTT, stat (associated live disease and its coagulopathy)
Serum magnesium, stat (hypomagnesemia may be associated with alcoholism)
Serum phosphate, stat (hypophosphatemia may be associated with alcoholism)
Draw blood for culture, stat (infection may be associated with DT)
ABGs, stat (to exclude alcoholic ketoacidosis)
Urine toxicology screen, stat
Blood alcohol levels, stat
Chest X-ray, PA view (to rule out frequently associated chest infection and possibility of aspiration in a patient who has altered mental status) CT scan of head, stat (to rule out associated head injury)
(Lumber puncture, stat (to exclude meningitis because you should not miss meningitis) – If you don't suspect meningitis like in this cases, you don't need to perform this. )

**Results:**
Labs are significant for macrocytosis (MCV of 110fL), and mild degree of hyponatremia (Na of 134 meq/L). Mg is low. Phosphate is low. Blood glucose is 50. LFTs are nearly normal except mild hypoalbuminemia. CT scan of the head is WNL. CXR- shows no abnormalities. Blood alcohol levels are WNL. Urine toxicology is negative. Very mild elevation of PT is noted. ABG showed elevated pH and low $PCO_2$ .

**Review orders:**
IV 50% glucose (after administration of thiamine)

**Discussion:**

- Alcohol is a CNS depressant and sudden withdrawal from it causes hyperactivity of some parts of CNS especially of sympathetic nervous system. Minor withdrawal symptoms include tremors, insomnia, anxiety, headache, and diaphoresis. They usually occur within six hours of withdrawal and resolve within one to two days. Sometimes generalized tonic clonic seizures occur within 48 hours of withdrawal. Withdrawal may result in dehydration, hypokalemia, hypomagnesemia, and hypophosphatemia. Dehydration is due to diaphoresis, hypothermia, and tachypnea. Hypomagnesemia is most frequent with delirium tremens and may be a predisposing factor for alcohol withdrawal seizures. Hypophosphatemia results from malnutrition and may cause heart failure, and rhabdomyolysis.

- Alcoholic hallucinosis is characterized by hallucinations occurring within 12 to 24 hours of alcohol withdrawal. These hallucinations are mostly visual. Sensorium remains intact in cases of alcoholic hallucinosis.

**Treatment of alcohol withdrawal syndromes:**
The patient must be reevaluated frequently and other similar conditions like trauma, infection, liver failure, metabolic abnormalities or drug overdose must be ruled out. CT scan and lumbar puncture are very important when patient presents with altered mental status, and fever. After excluding co-morbid diseases, symptomatic treatment is begun. Patient is placed in a quiet environment. His volume deficit is calculated and replaced. Patients with DT are kept under mechanical restraint. Multivitamins containing folate are given to all patients. Thiamine needs to be given before glucose to decrease the risk of precipitating Wernicke's encephalopathy and Korsakoff's syndrome. Deficiencies of electrolytes should be corrected. Patients at high risk need to be shifted to ICU.
The standard vitamin therapy:

Thiamine 100 mg IM X 1 on admission, then Thiamine 50 mg orally once daily for 3-5 days
Multivitamin one tablet once daily
Folate 1 mg orally once daily

DT is treated initially with lorazepam IV ( 2 - 4 mg IV q 1 hour prn, and then taper to q 2, 3, and 4 hours). Once the patient vitals are stable and can take oral medications chlordiazepoxide (Librium) protocal can be followed.
The standard Librium protocol:

Day 1 Librium 50 mg po q 4 hours X 6
Day 2 Librium 50 mg po q 6 hours X 4
Day 3 Librium 25 mg po q 4 hours X 6
Day 4 Librium 25 mg po q 6 hours X 4

Oral chlordiazepoxide is given to patients with history of delirium tremens, seizures, or prolonged and excessive alcohol intake.

**When do you give antipsychotics?**
Phenothiazines should not be used as they lower the seizure threshold. However, haloperidol is associated with low risk and may be used in combination with benzodiazepine for agitated patients.

After acute treatment, all patients should be screened for alcohol dependence, and should be considered at risk for recurrent episodes of withdrawal. In-hospital evaluation is recommended, and long-term follow-up is crucial.

**Order review:**
Place the patient in the ICU
Continue IV lorazepam,
Start chlordiazepoxide, PO continuous
Haloperidol, IV, PRN (Only if the patient is agitated)
Input/ output charts
IV normal saline, continuous
IV Multivitamins containing folic acid
Replace phosphate
Replace magnesium

Vitamin K, IV one dose daily for 3 days if the PT and INR are elevated
Brief history and physical for every 1 to 2hours until you see good improvement

Once the patient has recovered fully, we do the following

**Order Review:**
Rehabilitation
Alcoholics anonymous
Counsel about safe sex practices, limit alcohol intake, smoking cessation, drive with seat belt, and safety plan.

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**Location:** Office

**C.C:** A 55-year-old white male presents with fatigue.

**Vitals:** Pulse :75/min ; B.P: 110/75 mm Hg ; Temp: 98.6 F; R.R: 16/min .

**HPI:** A 55-year-old white male presents to the outpatient clinic with the compliant of fatigue for the last one month. He says that he feels exhausted after doing his routine daily activities. His ROS is positive for constipation. He denies diarrhea, abdominal pain, melena or blood in the stools. He has no SOB, chest pain, palpitations, nausea, vomiting, fever, chills, or night sweats. He has had no change in his sleeping pattern, however he has decreased appetite and has lost 5 kg (11 lbs) over the last few months. He denies any hematuria. He is happily married and has two sons. He denies any recent traumatic event. He has no known allergies. He has no symptoms of depression. He denies any IV drug abuse. He is not on any medication except multivitamin once daily. Mother has a H/O colon cancer. He has been smoking 10 cig/day for the last 25 years and drinks alcohol only on weekends. He is sexually active with his wife. He denies any stressors at home and work. He has never been tested for HIV. He does not have any history of STD. ROS is unremarkable.

**How do you approach this case?**
This patient has presented with fatigue for the last one month. Physical examination in such cases is very important to exclude some specific causes. Complete physical examination should be performed in all patients presented with fatigue.

**Order :**
General examination: To look for possible features of a psychiatric disorder like poor grooming, agitation as well as for evidence of pallor.
HEENT/Neck: Examination of neck for goiter is very important as hypothyroidism or hyperthyroidism may be the cause of his fatigue.
Lymph node examination: Lymphadenopathy may be a feature of chronic infection or malignancy.
Chest/lung examination: Chronic lung disease may cause fatigue.
Heart/CVS examination: Congestive heart failure may be a cause of fatigue.
Abdominal examination: This patient has abdominal complaints like constipation.
Rectal examination: In the presence of abdominal complaints, rectal examination should be performed.
Neurological examination: Neuromuscular causes may be responsible for fatigue.
Neuropsychiatric examination: Psychiatric causes may be responsible for fatigue.

**Results of PE :**
General: Pallor is noted on palms, and sclera. HEENT: thyroid gland is normal, no other abnormality found. Abdominal examination: completely normal. Rectal examination: Sphincter tone is normal with normal prostate, brown colored stools, and no palpable masses. No lymphadenopathy noted. Patient is alert and no neurological abnormality found. Rest of the examination is within normal limits.

**Discussion:**

- Fatigue has very broad differential diagnosis. Medical and psychiatric illness accounts for up to two thirds of the causes of fatigue. The common causes include psychiatric (depression, anxiety), medications (Antidepressants, hypnotics etc.), endocrine and

metabolic disorders (diabetes, hypo or hyperthyroidism, adrenal insufficiency, chronic renal failure, hepatic failure, etc.), neoplastic (Occult malignancy, severe anemia), cardiorespiratory (CHF, COPD, sleep apnea etc.), infections (EBV, HIV, TB etc.), rheumatologic diseases, and finally chronic or idiopathic fatigue syndrome.

- The general approach to a patient with chronic fatigue includes routine CBC with diff, ESR, basic metabolic panel, LFTs, serum CK, ESR, and TSH. Testing for PPD and HIV is considered in high-risk patients. The workup should also include the routine age appropriate screening (eg, FOBT, sigmoidoscopy, or mammography).

His exam is significant only for pallor. This is most likely a result of anemia.
**Order review:**
CBC, with differential, routine
Basic metabolic panel, routine
TSH, routine
LFTs, routine
FOBT, routine
Return to clinic with the results

**Result of Labs:**
**CBC:**
Hemoglobin: 8g/dl
Microcytic hypochromic cells
Leukocytes and platelets normal in number and morphology

BMP, TSH, and LFTs are within normal limits.
FOBT is positive.

**Order:**
Colonoscopy, routine
Consult, GI procedures (Reason: colonoscopy)

**Results:**
Colonoscopy with biopsy confirms the presence of adenocarcinoma in the descending colon.

**Discussion:**
Once the diagnosis of colorectal cancer is diagnosed, staging should be performed. The role of preoperative CT of the abdomen and pelvis is controversial. MRI and PET scanning are not routinely recommended for preoperative staging. However, PET scanning is especially useful to detect occult metastasis in patient's with symptoms and raising CEA levels. CEA should not be used for screening purposes. However, it should be obtained in all patients before undergoing the surgery. Elevated CEA level after the surgery indicates residual or metastatic disease. Elevated CEA levels also has prognostic significance. Higher levels (>5ng/ml) are associated with worse prognosis.

**Order review:**
Oral iron sulphate, continuous
CT scan of abdomen and pelvis with contrast, routine
CEA level
Refer the patient for colorectal surgery

**Primary Diagnosis:**
Colon cancer

**Location:** A nursery in a community hospital.

**CC:** Infant with jaundice.

**HPI:**
You are called evaluate a 39-week white male infant who appears to be jaundiced. The patient was born approximately 12 hours prior by vaginal delivery with vacuum assistance. Labor was slightly prolonged at 18 hours. The patient's Apgar scores were 8 and 10 at 1 and 5 minutes. Points were removed for acrocyanosis and irritability. The patient took to the breast within about three hours after delivery, had good suck reflex and transitioned well to room temperature environment after being in the warmer for about four hours. Initial evaluation of the patient by the on-call resident was unremarkable other than a cephalohematoma over the posterior parietal and occipital areas from the vacuum-assisted delivery.

Maternal history: Mother is a 28-year-old Group B Streptococci (GBS) positive G2, P2, now L2 white female of Mediterranean descent who received regular prenatal care and had intrapartum antibiotic prophylaxis for her GBS positive status. She has no previous history of sexually transmitted diseases, had no infections during her pregnancy and had laboratory work revealing that she was Rh positive, blood group O. Mother's other prenatal laboratories showed that she had positive rubella titers and positive IgG to toxoplasmosis. There is no history of smoking, IV drug use. Mother is not on any medications other than prenatal vitamins. FH: The patient has an 18-month-old sibling who had jaundice as an infant. Mother cannot recall how high her other child's bilirubin level reached; however, she does note that her first child required phototherapy for two days prior to discharge.

**How to approach this case:**
Jaundice in an infant less than 24 hours old should always be presumed to be pathological. Therefore, you should look carefully for the etiology, including sepsis, hemolysis, polycythemia, and hemorrhages. You need to look at the infant to decide which etiology is highest on your differential and, in particular, to decide whether the child needs immediate antibiotics. You need to attend to details of the mother's medical history (Group B strep status, TORCH exposure) and the delivery (prolonged, traumatic, vaginal vs. c-section, fetal distress intrapartum).

**Therefore, perform physical exam, including**
Review of vital signs (check for temperature instability; voiding)
General appearance (lethargic? Arousable?)
HEENT (cephalohematomas, caput succedaneum, corneal opacity?)
Heart exam
Lung exam
Abdomen (hepatosplenomegaly?)
Genitourinary (patent rectum)
Neurological exam (tone, irritability, reflexes)
Skin (ecchymoses)
Check inputs/outputs

**Results**:
Vital signs are stable. Well-developed white male infant in no acute distress.
HEENT: There is mild scleral icterus and jaundice of the face. There is a 4 cm cephalohematoma over the posterior parietal occipital areas of the infant's head that is soft and slightly ecchymotic. Mucous membranes are moist. Pupils have bilateral red reflex. Oropharynx is clear. The patient has a good suck reflex. Neck is supple without any signs of meningismus. Anterior fontanel is open, flat and soft.

Cardiovascular and Lungs: normal.
Abdomen: soft, nondistended, nontender, no hepatosplenomegaly can be appreciated, no abdominal masses. Umbilicus: normal.
Extremities: normal. There is no acrocyanosis appreciated. Capillary refill is less than two seconds.
Neurologic: Good suck reflex. Moro reflex symmetric. Good tone. Appropriate level of irritability and able to be consoled.
GU: normal. The anus is patent and appropriately positioned.
Review of nurse's notes reveals that the patient has passed several meconium stools and voided one wet diaper.

So far, this infant's physical exam is reassuring. Your initial physical exam did not reveal any signs of sepsis: the patient had no temperature instability, had been eating well, had passed a stool and urine of normal color, and did not appear to be lethargic. Therefore, you can do some work up before initiating antibiotics.

**Order**:
Blood typing of infant and mother (mother's is usually done already & on chart)
Direct Coomb's test, stat
CRP stat and q 12 hr
CBC with differential, stat
Total and indirect bilirubin
Inputs/outputs
Vital signs q 4 hrs

**Discussion:**
This is a full-term infant who presents with jaundice in the first day of life. Because of the early onset of jaundice, hemolysis and sepsis must be ruled out. Other items in the differential include polycythemia and hemorrhages. Workup of this patient should be the initial physical exam to observe for signs of sepsis including in an infant signs of lethargy, vomiting, poor feeding, fever or temperature lability with a low temperature, lack of stooling, or abnormal-colored urine. History taking should focus on any possible maternal infections which might be transmitted to the infant, particularly TORCH infections including CMV, toxoplasmosis and rubella infection, and maternal GBS (Group B streptococcal infection) status. Eliciting any family history of hyperbilirubinemia is also helpful because there is some familial tendency for neonatal jaundice. Laboratory workup should begin by blood typing and direct Coombs' testing on the infant. All infants who are born to mother's with Type O blood group should routinely have direct Coombs' testing to check for maternal fetal incompatibility and these children should be followed closely for evidence of jaundice from hemolysis. Laboratory work should also include C reactive protein for early assessment of infection, CBC, and initially a direct and total bilirubin.

**Results**:
Mother is group O blood group. The patient is Group B. The direct Coombs' test was weakly positive. Initial CBC with differential is normal for age. CRP was normal. Total bilirubin was 5.6, direct bilirubin 0.3, indirect 5.2.

At this point the patient appears to have mild hemolysis secondary to ABO incompatibility with maternal blood with a weakly positive Coombs' test. The patient needs to have his hemoglobin and hematocrit followed as well as his total bilirubin to observe for evidence of a continued climb in the bilirubin level or a significant drop in his hemoglobin and hematocrit.

**Therefore, Order:**
Hemoglobin and hematocrit q 8 hr
Total bilirubin q 8 hr

Continue po feeding, breast milk
May supplement with formula
Vital signs q4 to watch for change in clinical status

**Results**:
$2^{nd}$ CRP is normal.
Hemoglobin and hematocrit remain stable.
Total bilirubin increases to 8.4 and then to 13.4mg/dl

**Order**:
Transfer to NICU (Neonatal ICU)
Phototherapy
Erythromycin ointment for eyes while receiving phototherapy
Start IV fluids at rate to ensure patient's total fluid intake (oral and IV) is 1 ½ maintenance rate. D5 1/4NS

**Results**:
Total bilirubin levels fall with phototherapy

**Order review**:
Phototherapy discontinued
D/C IV fluids
Follow up total bilirubin q daily until stable.

**Discussion:**
At 12 hours of age, the patient's total bilirubin is 5.6 which roughly corresponds to the rule of thumb for assessing clinical jaundice which corresponds to jaundice of the face with a bilirubin of approximately 5, jaundice of the midabdomen indicating a level of approximately 15 mg/dl and jaundice extending to the feet indicating a level of roughly 20 mg/dl. At this point, the patient does not meet criteria for phototherapy. One should consider phototherapy at levels of greater than 12 mg/dl for an infant 25-48 hours old. Definitely do phototherapy if the level is greater than or equal to 15 mg/dl and, if the patient has a level greater than 25 mg/dl, then exchange transfusion and intensive phototherapy is probably warranted. Q8H measurements of hemoglobin, hematocrit and total bilirubin would be appropriate. In addition, a second CRP level would be appropriate to monitor for signs of infection. Titers can be sent for CMV, toxoplasmosis and rubella as well, although usually this data is not available to the clinician in the first 24-48 hours of evaluation. If the patient's clinical status should change and he should become lethargic or have difficulty feeding and you suspect sepsis, then empiric antibiotic therapy should be begun but urine cultures and a spinal would be appropriate.

By history, this patient also has an increased risk for hyperbilirubinemia secondary to his positive family history of a sibling who had neonatal jaundice requiring phototherapy. An infant with a sibling who developed a bilirubin level of greater than 12 has approximately a three times greater risk of developing jaundice than an infant with a negative family history.

In addition, this infant obviously has an ABO incompatibility. One would suspect that the bilirubin level would continue to climb over the next 24 hours and this patient might indeed meet criteria for phototherapy. In the meantime, the patient should be continued to be monitored and the mother should be counseled to continue frequent breast-feeding to keep the baby well hydrated and to observe for any signs of infection.

The infant's other risk factor for elevated jaundice includes his cephalohematoma which can be an increased source of bilirubin production as the hemorrhage reabsorbs. The patient did not

meet criteria for polycythemia but this is another cause of early jaundice. For instance with "physiologic jaundice" the bilirubin level does not rise more than 5 mg/dl per 24 hours and it usually peaks on day three with a level no greater than 13 mg/dl. These children usually do not present with jaundice within the first 24-hours of life. Likewise, breast-feeding jaundice which does present within the five days of life usually does not reach clinical levels within the first 24 hours. Breast milk jaundice is usually seen towards the end of the first week of life in an infant who is otherwise thriving. Jaundice which arises greater than one week from birth may indicate both breast milk jaundice but also other pathological mechanisms including liver disorder such as biliary atresia or metabolic disorder such has hypothyroidism, galactosemia or hereditary hemolytic disorder such has spherocytosis or G6PD deficiency which incidentally is an X-linked disease with variable phenotype. Jaundice that persists beyond the third week really should prompt one to investigate biliary causes as well as the metabolic and hereditary hemolytic diseases. Most forms of jaundice should resolve by two to three weeks of age and the vast majority of infants who do have jaundice have a physiologic or breast-feeding associated cause.

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**Location:** Outpatient clinic

**Vitals:** Temperature of 36.3C; H.R: 95/min; R.R: 22/min; Blood pressure is 85/50 lying down and 77/46 mm Hg standing.

**C.C:** Swelling

**HPI:**
The patient is a three-year-old white male who presents with his mother for evaluation of facial and scrotal swelling of ten days duration. Mother reports that the child had been well until one day prior to admission when she noticed the onset of swelling in his face. She also noted that he had scrotal swelling because he is almost potty trained. She notes some decrease in his urine output as well, although no change in color of the urine, other than becoming somewhat more concentrated. He has had no preceding diarrheal illness, sore throat, abdominal complaints, fevers, and rashes. Mother reports that the child has not complained of any pain syndrome. He does seem to be a little bit more tired than usual. Birth history is unremarkable. All of his immunizations are up to date. SH: He lives with his parents; two older siblings who are healthy, and have had no hospitalizations. There are no pets in the home. There are no smokers in the home. Risk for tuberculosis is low. Development has been normal.

**How to approach this case?**
Determine the nature and etiology of the "swelling", including whether it's edema or something like hives. Examine the patient to decide whether he needs inpatient or outpatient management.

**Physical exam**:
General appearance
HEENT/Neck
Heart
Lung
Abdomen
Genitourinary
Extremities
Skin
CNS

**Results**:
General: well-developed, well-nourished white male in no acute distress. HEENT: remarkable for periorbital edema. Mucous membranes are slightly dry. Neck is supple without lymphadenopathy or thyromegaly. Pupils normal. Cardiovascular: Regular rate and rhythm without murmurs, rubs or gallops. Lungs: very faint rales at the bases and otherwise clear. Abdomen is soft, nontender, nondistended. There are normoactive bowel sounds. There is 1+ sacral edema. + fluid wave. GU: There is scrotal edema present. There is no tenderness to palpation and the cremasteric reflex is intact bilaterally. Extremities: Pulses are 2/4 in the radial, femoral, and dorsalis pedis areas. Hands and feet show 2+ pitting edema and are otherwise unremarkable. Neurologic is nonfocal and appropriate.

**Discussion:**
This is a three-year-old patient who is manifesting signs of generalized edema, most prominent in his face hands and scrotum. The leading diagnosis in this age frame for such marked edema is nephrotic syndrome secondary to minimal change disease.

**Order**:
Urinalysis, stat
Basic metabolic panel, stat
CBC with differential, stat
LFTs
Lipid panel
PT/INR, PTT
Complement 3 and 4 levels

**Results**:
Urinalysis shows 4+ protein, no blood, no RBCs, specific gravity is 1.030,
CBC shows a white count of 7, hemoglobin 12.6, hematocrit 36, and platelets 240.
Complete metabolic panel (LFTs + BMP) reveals an albumin of 1.5, normal liver function tests, sodium 130, potassium 4.0, chloride 96, bicarbonate 20, BUN 10, creatinine 0.7, glucose 78, calcium 9.4, cholesterol level is 320 mg/dl. Serum albumin is 1.5 gm/dl. Serum protein is 3.7. PT, PTT are normal. Complement levels within normal. Patient has orthostatic hypotension and mild dehydration.

**Order**:
Admit to floor
Inputs/outputs
Vital signs q4; Continuous cardiorespiratory monitoring
Nephrology consult
Albumin 25% solution IV, 1 gr/kg body weight, infused over 8 hours
Lasix (Furosemide), 1 mg/kg, administered halfway through the albumin infusion
Complete metabolic panel q AM
No salt added, high protein diet.

**Results**:
Patient responds with good diuresis to albumin and lasix therapy over 24 hours.
Vital signs remain stable. Orthostasis resolves.
Electrolytes and renal function remain stable.

**Order**:
Prednisone 2 mg/kg per day, may give in divided dose, po
Vital signs q 12 hours
Repeat albumin and lasix therapy.

**Results**:
Patient tolerates prednisone.
Remains clinically stable.

**Order review**:
Discharge to home.
Prednisone for 4-6 weeks.
Follow up in 3-5 days.

**Discussion:**
The most likely cause of this patient's clinical syndrome is a nephrotic syndrome. The patient is a three year old with generalized edema and screening laboratory tests indicate low protein as well as proteinuria. He therefore meets the diagnostic criteria for nephrotic syndrome which are:

1. Generalized edema.

2. Hypoproteinemia, usually less 2 gm/dl, with a disproportionately low albumin level in relation to the globulin level.

3. Urine protein to urine creatinine ratio in excess of 2 on first morning void or a 24-hour urine protein that exceeds 50 mg/kg of body weight.

4. Hypercholesterolemia greater than 200 mg/dl.

In the vast majority of children in this age range the nephrotic syndrome is due to minimal change disease. This is the cause in approximately 76 percent of children in the one to 12 year age range who present with nephrotic syndrome in childhood. Other etiologies are focal segmental glomerulonephropathy, membranoproliferative glomerulonephropathy, membranous nephropathy and then other causes. For most children, clinical diagnosis is sufficient and renal biopsy is not warranted unless the child is not responsive to steroids as noted below. CLINICAL FINDINGS in nephrotic syndrome include facial edema frequently periorbital, pretibial edema as well as swelling of the scrotum or labia which may be prominent. These children also have reduced perfusion of their splanchnic capillary bed and may have abdominal pain. As a consequence of their low intravascular oncotic pressure, they may have hypotension as well as pleural effusions with tachypnea and chest pain. As noted in the diagnostic criteria, they do have hypercholesterolemia with increases in their VLDL and LDL because of changes in hepatic catabolism and enhanced synthesis, respectively. However, the disturbances in lipid metabolism usually do not cause any other clinical findings. By contrast, changes in the protein levels of their coagulation cascade does put them at increased risk for thrombosis. Their tendency to form thrombus is due to a combination of factors including hyperaggreatable platelets, increased fibrinogen concentrations, loss of antithrombin III, increased blood viscosity and decreased blood flow. Venous thrombosis can occur in the deep veins of the extremities and the cerebrocortial system and renal veins and the pulmonary venous system and it is a source of increased morbidity for these children. As a consequence, one should obtain initial coagulation studies upon admission.

Laboratory analysis also shows reduced immunoglobulins, particularly IgG. This low level of IgG in combination with the steroids which are the primary treatment for nephrotic syndrome puts the children at increased risk for development of infections.

Peritonitis is one of the more serious complications of nephrotic syndrome. The causative organisms in children are streptococcus pneumoniae and Escherichia coli. One should consider peritonitis in any child who presents with significant abdominal complaints and paracentesis should be performed to identify the organism and confirm the diagnosis. For children in whom thrombosis is a serious consideration, one can start heparin therapy at a dose of 50 units/kg intravenously and 100 units/kg every four hours IV for maintenance therapy. Human nephrotic syndrome is supportive and aimed at increasing the intravascular oncotic pressure, decreasing third spaced fluid maintaining fluid balance, monitoring nutrition and treating any concomitant infection. Usually the typical approach is to give the patient intravenous albumin 1 gm/kg of a 25% solution for example and infuse it continuously over 8 to 12 hours under close supervision for the development of heart failure. Loop diuretics like Lasix can then be administered halfway through the albumin infusion or after it at a dose of 1-2 mg/kg IV and this effectively reduces third spaced fluids and pulls interstitial fluid into the vascular space. Prednisone is begun on patients at a dose of 60 mg/M2 or 2 mg/kg and the daily dose is maintained for four to six weeks. It is advisable to obtain a tuberculosis screen test prior to initiating the steroid therapy. Most children will begin to show a decrease in their urine protein excretion after about seven to ten days following the initiation of steroids. If the child is stable with just mild to moderate edema, no pulmonary edema and has good diuretic response, then they do not need to stay in

the hospital until their protein excretion is reduced and instead most of them can be discharged within two to three days. Fluid balance in the hospital setting is important and should be monitored closely during the initial diuresis. Patient should be given a high quality, high protein diet to improve their growth and because they have an increased protein need to regenerate their albumin. They should have a no salt added diet to discourage further edema formation. About 85-90% of children treated in fashion will have a satisfactory response and obtain remission. The mortality in minimal change nephrotic syndrome is approximately 2% with the majority of deaths due to peritonitis or thrombus formation and these complications can occur even under ideal treatment circumstances. The other 98% of children who develop this syndrome are likely to have a good response to steroids and return to a normal state of health. About two-thirds of them experience at least a single relapse and another third go on to have a series of relapses over the course of many years.

For children who remain symptom free for over two years without any medications, their prognosis is the best and they are considered recovered.

**Primary diagnosis:**
NEPHROTIC SYNDROME

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**Location:** Emergency Room.

**Vital signs:** Temperature 38.6C; heart rate 156/min; respirations 62 per minute; blood pressure is 75/43m Hg; Weight 3.0 kg.

**C.C:** Poor feeding, and decreased responsiveness.

**HPI:**
The patient is a six-day-old female, brought to the Emergency Room by her mother because of difficulty arousing the baby for feedings, decreased intake and generally seeming less responsive according to the mother. Mom did not take patient's temperature. She has noticed that there are a decreased number of wet diapers from usual of around eight per day to only four since the same time the day prior to being seen. The baby shows some increased somnolence and when she is awake she seems to be more irritable. Mother notes that during breast-feeding the patient's sucking seems somewhat diminished. The patient has had no episodes of emesis or diarrhea, other than her usual loose yellow stools from breast-feeding. Mother has witnessed no cyanosis, episodes of apnea, gross hematuria, or seizure-like activity.

BIRTH HISTORY: The patient was a 3.210 kg female born at 38-weeks gestation to a G2, P2, now L2, GBS positive, Rh positive 25-year-old nonsmoking mother who was in good health throughout the pregnancy and received regular prenatal care including intrapartum antibiotics. Birth was via spontaneous vaginal delivery with labor lasting approximately 14 hours and delivery occurring without complications. The patient's Apgar scores were 9, one point taken off for color, and 10 at one and five minutes, respectively. The patient was discharged home after 48 hours with the mother. The discharge weight was 3.002 kg. SOCIAL: The patient lives with parents and a three-year-old sibling. Father smokes in the house. There is no previous history for the mother of any elicit or IV drug use. The baby is being breast-fed on demand approximately every two to three hours for the first approximately four days of life. Each breast-feeding sitting lasting about 20 minutes. Mother reports that the baby is now feeding every three to four hours and only staying at the breast for about ten minutes before falling off to sleep. The baby did receive a hepatitis B immunization prior to discharge from the hospital.

**How to approach this case?**
In an infant less than one month old presenting with decreased responsiveness, the suspicion for sepsis should be high, but the differential is broad and includes trauma (e.g., shaken baby), congenital abnormalities, and parental misinterpretation.

**Physical exam**:
Pulse Oximetry, stat
General appearance
HEENT/neck
Heart
Lung
Abdomen
Neuro
Musculoskeletal
Skin

**Results**:
General: Well-developed, well-nourished white infant sleeping in her mother's arms. Pulse oximetry 91% on room air. HEENT: Normocephalic, atraumatic. Anterior fontanel is open, flat

and soft. Mucous membranes are slightly dry. Pupils are equal, round and reactive to light. Red reflex is present bilaterally. Nares show mild flaring and are patent. Tympanic membranes are within normal limits. Oropharynx is clear. Neck flexion and extension are within normal and do not elicit irritability. Cardiovascular: Regular rate and rhythm without murmurs, rubs or gallops, S-1 and S-2 auscultated. Lungs are clear bilaterally. There are mild subcostal and suprasternal retractions. Abdomen is soft, nontender, and nondistended with normoactive bowel sounds. No hepatosplenomegaly appreciated. Umbilicus is without erythema or discharge around the umbilical stump. Extremities: Pulses are 2/4 in the radial, femoral, dorsalis pedis areas. Capillary refill is between 2 and 3 seconds with no evidence of cyanosis, edema or clubbing of the extremities. GU shows normal female genitalia.

At this point in the evaluation, one has a six-day-old infant with a fever of 38.6 and some evidence of respiratory compromise with diminished peripheral O2 saturation and tachypnea with retractions.

**Orders**:
Supplemental oxygen to keep saturations >94%
Place IV
CBC with differential, stat
Basic metabolic panel or chemistry panel, stat
Blood cultures, urine cultures, and, given this patient's age, CSF cultures.
CSF for protein, glucose, cell count, and Gram stain.
Chest X ray should be obtained to evaluate for pneumonia.
CRP is also useful to evaluate acute infectious processes but is nonspecific.

**Results**:
Chest X ray - Diffuse reticular nodular pattern bilaterally with slight hyperinflation, and a very small right pleural effusion.
CBC: White count 16, hemoglobin 13.7, hematocrit 38, platelets 221, the differential shows 68% neutrophils with 5 band neutrophils, 10% lymphocytes.
Chemistry panel shows sodium of 135, potassium 3.9, chloride 99, CO2 20, Bun 7, creatinine 0.3, calcium 10.1, glucose 71,
CRP elevated at 2.7.
Blood cultures were obtained and pending.
Urinalysis - Specific gravity of 1.028, 1-4 white blood cells, 0 red cells, negative nitrate, negative esterase. Urine cultures still pending.
Lumbar puncture was performed. CSF cell count, glucose and protein were within normal limits. Gram stain no organisms, no neutrophils. Culture is still pending.

**Order**:
Admit to floor
Continuous cardiorespiratory monitoring.
Vitals signs q4
Diet no oral if respiratory rate is greater than 60
IVF D5 ¼ NS at maintenance rate
Ampicillin 100 mg/kg/day divided q 8 hr
Cefotaxime 150 mg/kg/day divided q 8 hr
Inputs/outputs
CBC with diff, BMP q daily

**Results**:
Blood culture grows out gram-positive cocci in chains. (The likelihood of Group B strep infection is very high.)

**Order**:
Continue monitoring.
Examine the patient for every 2 to 4 hours until you see some improvement, then every 8 to 12 hours
Change diet to po when respiratory rate is < 60 and no significant respiratory distress.
Wean oxygen for saturations >94%

**Results**:
Patient's oxygenation improves and she's weaned to room air.
Respiratory rate normalizes; work of breathing normalizes.
Patient tolerates po and maintains hydration status.
Blood culture—group B strep. Sensitive to amoxicillin.

**Order**:
Discharge home
Change antibiotic to amoxicillin 50-80 mg/kg/day divided q 8

**Discussion:**
This patient presents with signs and symptoms suggestive of a respiratory process; however, given her age and other nonspecific findings, the possibility of urinary tract or CSF infection or generalized sepsis is still in the differential and therefore one would want to begin empiric antibiotics to cover for the most likely organisms to infect this infant. For a child of this age with respiratory symptoms, the most likely etiologies are E. coli and Group B strep infections. Other causes of respiratory compromise with infectious etiologies include Haemophilus influenza, streptococcus pneumoniae, Group B strep, Listeria, and anaerobes. For many infants, the only indication that their infection is respiratory in nature is tachypnea which may at first be missed. Oftentimes these infants do not have typical rales or sounds of consolidation on auscultation. Depending on how old the infant is, hyaline membrane disease and transient tachypnea of the newborn are differential considerations for the infant in the first 24-48 hours of life who exhibits respiratory symptoms.

Blood cultures obtained on newborns with respiratory illnesses frequently will grow out the offending organism. This patient has a risk factor for Group B strep infection because her mother was Group B strep positive. Despite the fact that the mother received intrapartum antibiotics, it is still possible for this infant to have a Group B strep infection. Likewise, for maternal histories in which the Group B strep screening is negative, it is still possible that the infant has GBS infection since screening is not 100% sensitive.

Empiric antibiotic coverage should be done as soon as possible after culture fluids are obtained. One regimen is ampicillin 100 mg/kg/d divided every 12 hours for infants who are less than 1.2 kg or every eight hours for infants who are greater than 1.2 kg and cefotaxime (Claforan) 100 mg/kg/d divided every 12 hours or 150 mg/kg/d divided every eight hours for infants who are greater than 1.2 kg and greater than seven days old. Gentamicin can be added as well or used as an alternative treatment when there is no evidence for meningitis. Infants should be treated at least ten days and possibly 14-21 days if they have a gram-negative infection.

An infant of this age with respiratory symptoms should be admitted and monitored closely for worsening respiratory compromise with decreased oxygenation and increased work of breathing. In an infant who does not respond to empiric antibiotic therapy but still has respiratory symptoms, then CMV (cytomegalovirus) pneumonia should be considered. If there is a maternal history of herpes simplex virus infection, particularly a primary infection, then that etiology should also strongly be considered and acyclovir begun.

**Primary diagnosis:**
Group B streptococcal pneumonia

**Location:** Emergency Room.

**Vital signs:** B.P: 108/75 mm Hg; HR 88/min; RR: 8/min; Temp. 36.5C.

**CC:** altered mental status, stumbling

**HPI:**
The patient is a seven-year-old boy brought in by his parents after he came home from a playmate's house and his parents found him to be confused and stumbling; he then became less responsive with garbled speech and somnolence. He had been previously well with no recent infections, no sick contacts. He had gone to school that day and come home appearing to be normal at that time. He then went to a schoolmate's house and returned home several hours later with the above symptoms. SOCIAL HISTORY: He attends second grade at a suburban school. He lives with his parents and two other siblings. His development has been normal. His immunizations are up to date. ROS: no headache, fevers, vomiting, diarrhea, photophobia, joint complaints, rashes, urinary complaints, no seizure activity.

**How to approach this case?**
This child has suffered an acute change in mental status. Initial management should focus on the ABCs. He needs a brief focused physical exam to guide the differential.

**Order**:
Pulse oximetry, stat
Supplemental oxygen
Continuous cardiorespiratory monitoring
Finger stick glucose
IV lock
Urine toxicology screen
Narcan (naloxone), IV

**Physical exam**:
General appearance
HEENT/neck
Heart
Lung
Abdomen
Musculoskeletal
Neuro

**Results**:
O2 sat 94% on room air.
General: well-developed, well-nourished seven-year-old boy; he appears diaphoretic and cool. Neuro: He mumbles a response that cannot be understood and will not open his eyes to command; he localizes to painful stimuli. HEENT/Neck: Pupils 3mm bilaterally and responsive. Neck supple, no adenopathy: mucous membranes tacky. He has the odor of alcohol on his breath. Heart: regular without murmurs. Lung: respirations are shallow and slow. Abdomen: normal. Musculoskeletal: There is no evidence of trauma.

There is no change in level of responsiveness after Naloxone.
Finger stick glucose is 48 mg/dl.

**Order**:
D50, 1 ampule, IV
IVF Normal saline bolus 500cc, then at maintenance
Blood alcohol level (BAL)
Serum toxicology panel
Basic metabolic panel, stat
CBC with differential, stat
Accuchecks q 1 hour until stable

**Results**:
BAL is elevated.
Urine toxicology screen positive for ethanol.
Serum toxicology panel positive for ethanol only.
BMP is normal.
CBC with diff is normal.
Accuchecks normalize.

**Order**:
Admit to observation unit/floor.
Continuous cardiorespiratory monitoring.
IVF D5 ½ NS with 20 meq/L KCL at maintenance
NPO until awake
BMP in AM
Repeat blood alcohol level in 12 hours.

**Result**:
Patient becomes more responsive after 4 hours and is fully awake and back to his baseline by the next morning.
Repeat BAL is within normal limits.

**Order**:
Discharge home.
Patient education on drug use/toxicity.
Screen for abuse and domestic violence prior to discharge.

**Discussion:**
This is a school-aged child who presents with altered mental status and hypoglycemia. He had a depressed mental status with shallow and slow respiratory rate and hypoglycemia. This presentation along with helpful information obtained during the physical exam, such as the smell of alcohol, can direct the clinician to look for ethanol intoxication as the cause of this patient's syndrome. Typically children get hypoglycemia and it is not necessarily related to the dose or blood level of the ethanol. They have a depressed CNS secondary to ethanol as a CNS depressant. EVALUATION involves ruling out trauma, infectious processes (particularly CSF infections), sepsis, or other drug intoxication, and then beginning supportive care with detection and maintenance of the airway. IV fluids are given for fluid balance, correction of any electrolyte imbalances and correction of hypoglycemia. Most children respond well to supportive therapy and their prognosis for a full recovery is excellent in the absence of prolonged hypoglycemia and respiratory arrest.

**Location:** Emergency room

**Vitals:** B.P: 100/60 mm of Hg; P.R: 112/min, regular; Temperature is $98.6^0$C; R.R: 34/min.

**C.C**: Shortness of breath and chest pain.

**HPI:**
A 65-year-old white female, with a past medical history of ovarian carcinoma treated with chemotherapy, presents to the emergency room with the sudden onset of severe shortness of breath associated with right-sided chest pain. The patient reports that while watching the baseball game she suddenly noticed severe shortness of breath. The pain is constant, 7-8/10 in severity, increases with deep breaths, and non-radiating. She is nauseated but denies any vomiting. She denies any fever, chills, cough, and hemoptysis. She denies orthopnea, PND, exertional chest pain, or shortness of breath. There is no H/O leg swelling, or claudication symptoms. PMH is significant for ovarian cancer treated with TAH + BSO, followed by chemotherapy. She is disease free for the past 3 years. SH: She smoked 1 PPD for 30 years. Drinks alcohol occasionally. She is allergic to penicillin. FH: Father died from acute MI at the age of 60. Mother died from breast cancer at the age of 65. ROS: Her ROS is unremarkable.

**How would you approach this case?**
Based on history the most probable diagnostic possibilities are – MI, pulmonary embolism, aortic dissection, tension pneumothorax, acute heart failure, and acute pericarditis. All of these are associated with very high mortality. Always stabilize the patient first. Once the patient is stable you have to do really focus examination and the most important investigations.

**Order:**
Airway, breathing, and circulation is maintained in this patient.
Pulse oxymetry, stat and continuous
Oxygen, nasal canula, continuous
Elevate the patient head
IV access, stat
Continuous cardiorespiratory monitoring
Aspirin 325 mg, sublingual, one dose
Sublingual nitroglycerine is not indicated in this patient, as his B.P is borderline.

**Order focused physical exam:**
Lungs
Heart

**Results:**
Pulse oximetry showed oxygen saturations of 85% on room air and 87% on four liters.
Lungs are clear to auscultation (excludes tension pneumothorax). Heart exam is remarkable for loud pulmonic component of $S_2$.
Patient is still having shortness of breath.

**Review orders:**
Check the blood pressure on both arms (we excluded heart failure by physical exam)
12 lead EKG, stat
Portable chest X-ray, PA view, stat
CK-MB, stat
Troponin T or I, stat

ABG, stat
IV NS, 250 cc bolus, stat
IV NS, 100 cc/hr, continuous

**Results:**
EKG showed sinus tachycardia, RVH, and new onset right bundle branch black.
Chest X-ray is within normal limits.
Blood pressure is equal in both arms.
ABG, showed PAO2 of 60, PACO2 of 37, and PH of 7.5
CK - MB, and Troponin I or T are within normal limits.

**Review orders:**
V/Q scan, stat
D-dimer, stat

**Results:**
V/Q scan: Intermediate to high probability for PE
D-dimer is elevated.

**Review orders:**
Stat aPTT, one time
Stat PT/INR, one time
CBC with diff, stat
Basic metabolic panel, stat
FOBT (Fecal Occult Blood Testing), stat
Start IV heparin, bolus
IV heparin, continuous
aPTT, after 6 hours

**Review orders:**
aPTT is 35
PT is 14 and the INR is 0.9
CBC with differential: Mild leukocytosis but no bandemia, Hb is 14, Platelets count: 250,000
BMP is completely normal.

**Review orders:**
Perform detailed physical exam and interval history

**Results:**
Patient is slightly better on oxygen

**Review orders:**
Admit the patient to floor
Continue cardiorespiratory monitoring (telemetry)
Maintain oxygen saturations >90-92% with high flow oxygen (100% Non-rebreather mask)
NPO except medications
Vitals: Q 2 hours
Complete bed rest
Strict inputs and outputs
Continue IV fluids
Daily CBC with diff
aPTT for every 6 hours (adjust the heparin drip to a goal aPTT of 55-70)
Perform brief history and physical exam for every 2 to 4 hours until you see clinically significant

improvement.

**Next day, review order:**
Consider weaning oxygen
Stop IV fluids if the BP is stable
Start regular diet
Change vitals to Q 8 hours
D/C continuous cardiorespiratory monitoring
Start Coumadin (warfarin), once daily (for a female of reproductive age always rule out pregnancy before you give warfarin i.e. order a pregnancy test).
Daily aPTT/PT/INR
Check the platelet count and Hb (CBC with diff), as heparin is associated with thrombocytopenia and bleeding.

**Discharge the patient:**
Once the INR is above 2, plan discharge (goal is 2-3)
D/C heparin on 4th or 5th day
Anticoagulation teaching
Patient education
Follow-up in 2 days for PT/INR checked.
Continue warfarin for 12 months, monitor INR twice weekly. During follow up look for any sites of bleeding. (In general, menstruation is not a contraindication of warfarin. If patient wants to become pregnant D/C warfarin and start heparin.)
No smoking

**Discussion:**
Pulmonary embolism should be suspected in any patient presents with sudden onset of SOB, and chest pain.
Findings suggestive of PE:

- D-dimer is positive. D-dimer is a very sensitive assay for ruling out PE. Normal D-dimer essentially excludes PE. But the positive D-dimer may be a false positive.

- ABG: Increased A - a gradient, ωολ $PO_2$, low $PCO_2$, and respiratory alkalosis. A-a gradient is more sensitive than $PO_2$ alone.

- EKG: Right ventricular hypertrophy & new onset RBBB.

- Chest –X-ray may be normal. Some times a wedge shaped consolidation may be seen in the middle and lower lobes (Hampton's hump).

This patient clearly has risk factors for a hypercoagulable state (ovarian carcinoma). Based on history and physical examination and the results of the V/Q scan this is a pulmonary embolism. V/Q scans of low to intermediate probability warrant further investigations and deep vein thrombosis should be ruled out with a duplex of the lower extremities. Otherwise venous ultrasound of the legs is indicted in patients with suspected PE and leg symptoms. If the Doppler is negative, continue the investigation with a either CT angio or pulmonary angiogram, the gold standard diagnostic test for pulmonary thromboembolism. A negative result by pulmonary angiogram essentially excludes pulmonary thromboembolism as the diagnosis. If the V/Q is highly probable for pulmonary embolism treatment should be started without further investigations. The treatment of choice is low molecular weight heparin. Low molecular weight heparin is associated with a lower risk of thrombocytopenia and hemorrhage and it appears to be as effective as unfractionated heparin in the treatment of venous thromboembolism. Failure

to achieve therapeutic heparin levels within 24 hours is associated with a five-fold increase risk of clot propagation and increase in mortality. However, FDA has not approved LMWH for he treatment of PE. So, we usually continue with unfractionated heparin. All patients should be followed with regular platelet counts. Thrombolytic therapy with streptokinase or t-PA may accelerate resolution of emboli compared with standard heparin therapy. However, at one week and one month after diagnosis, there is no difference in outcome compared with heparin and warfarin. The major disadvantage of the thrombolytic therapy compared with heparin is its greater cost and a significant increase in major hemorrhagic complications like stroke. Current evidence supports the use of thrombolytic therapy for patients at high risk despite heparin therapy or for those in whom thromboembolism may be life saving. Thrombolytic therapy is absolutely contraindicated in any patient with active intimal bleeding or stroke within the past two months, or patients who have had major surgical procedures or trauma within six weeks. Placing an IVC filter is routinely used for patients who have contraindications for anticoagulation or in patients with recurrent pulmonary thromboembolism from the pelvis or lower extremities despite adequate medical therapy. However, placement of IVC filter does not guarantee prevention of emboli as clots may form above the filter. IVC filters are also associated with a two-fold increased recurrence of venous thrombosis in the first two years following the placement.

**How long do you treat with warfarin?**

- Occurrence of PE in the setting of reversible risk factors such as use oral contraceptive pills, immobilization, or surgery should be treated with 3 to 6 months of warfarin therapy. If the first episode of thromboembolism occurs in the setting of underlying malignancy, anticardiolipin antibody, and antithrombin deficiency patient should be treated with at least 12 months of warfarin therapy.

- Patient's with first episode of idiopathic thromboembolism should be treated for at least 6 months with warfarin. 3 months of therapy is inadequate in this patient group.

- Patients with recurrent thromboembolism or a continuing risk factor should be treated indefinitely.

**Location:** Office

**Vitals:** Temp: 38.1C; P.R: 82/minute; B.P: 128/80; R.R: 16/min.

**C.C:** Pain and swelling of the first metatarsophalangeal joint.

**HPI:**
A 43-year-old, previously healthy, white male presented to your office with a two-day history of excruciating pain in the right metatarsophalangeal joint. The pain was sudden in onset, stated overnight, 8-9/10 in severity, and was aggravated by moving the joint. Today he noticed some swelling and pain in the right knee. The patient denies any trauma. The patient also has a mild fever, and body aches. He denies any history of morning stiffness, tick bites, or rashes. The patient has had similar pain two months ago for which he took over-the-counter ibuprofen and it relieved the pain. Past medical history: Nothing significant. SH: He smokes one to two packs of cigarettes a day and drinks alcohol on the weekends. The patient is sexually active with his wife and does not use any type of contraception. He denies any prior H/O STDs, or urethral discharge. FH: Significant for osteoarthritis in his mother.

**How would you evaluate this patient?**
This is a 33-yr old, previously healthy, male presented with acute onset of severe pain in the right metatarsophalangeal joint as well as some knee pain, with a similar episode around 2 months ago.
Discuss the differential diagnosis:
Gout – Involvement of the metatarsophalangeal joint is very classic for gout.
Pseudogout can be present with pain in the metatarsophalangeal joint.
Septic arthritis - When any patient presents with swelling, redness, pain in the joint, accompanied by fever and chills, always consider septic arthritis. Sometimes rheumatoid arthritis is a part of the differential diagnosis because monoarticular rheumatoid arthritis can present with pain and swelling in any joint.

**Order examination:**
Focus the physical examination on the:
General
HEENT/Neck
Lymphnode exam
Heart
Lungs
Abdomen
Extremities
Genitourinary
Skin
Neurological

**Results:**
The extremities reveal a warm, tender, erythematous joint with extensive soft tissue swelling; erythema extending to the knee and below the first metatarsophalangeal joint. Skin examination is within normal limits and did not reveal any rash. Rest of the exam is within normal limits.

**Now, how would you approach this patient?**
Here you have a patient with painful, swollen, tender, erythematous right metatarsophalangeal joint. If you get any patient like this, always the first step is to get aspiration of the fluid from

the joint space. The fluid should be tested for viscosity, WBC count with a differential, gram stain, culture & sensitivity, and microscopy, which may reveal crystals. Also, obtain an urinalysis that may show some uric acid crystals. Do routine labs for a complete blood count with a differential as well as a basic metabolic profile. At the same time, obtain serum uric acid levels. Get an X ray of the joint. While waiting on the aspiration and lab results, start the treatment. The treatment of choice is nonsteroidal anti-inflammatory drugs. Typically, indomethacin is the best drug.

**Order:**
CBC with, diff, stat
BUN, stat
Creatinine, stat
PT, stat
PTT, stat
Serum uric acid
X-ray of the joint
Indomethacin, oral, continuous
If you have a patient with a history of gastrointestinal bleeding, acid peptic disease, or peptic ulcer disease, you can start Cox 2 inhibitors like celecoxib or rofecoxib instead of nonsteroidal anti-inflammatory drugs like indomethacin.

**Results:**
Normal PT/PTT. CBC with diff showed a WBC count of 12,000/ml with 80% polymorphs; no bands are noted. BMP is within normal limits. Serum uric acid level is 20

**Order review:**
Aspiration of the joint, stat
Fluid should be sent for gram stain, microscopy, and cell count.

**Results:**
Synovial fluid analysis did not reveal any organisms. The WBC count is 10,000 per micro liter and most of the cells are polymorphs. Microscopy reveals negative birefringent monosodium urate crystals.

The presence of negatively birefringent monosodium urate crystals is pathognomonic of acute gouty arthritis. Based on these investigations, the most probable diagnosis of this patient is acute gouty arthritis.

**Treatment:**
Usually NSAIDs, that is indomethacin, is the drug of choice for acute gouty arthritis. Often, the clinical response will be seen within 12-24 hours. If NSAIDs or Cox 2 inhibitors are contraindicated, colchicine is the drug of choice. Colchicine is very effective in treating acute gouty arthritis but the incidence of side effects like diarrhea, abdominal cramps, nausea, and vomiting often limit its usefulness. Glucocorticoids are usually reserved for patient's who have contraindications for both NSAIDs as well as colchicine for example in patients with renal failure. If the patient does not respond to NSAIDs and colchicine and the patient is having monoarticular arthritis, then intra-articular triamcinolone can be used to treat a single inflamed joint. Allopurinol should not be prescribed in acute gouty arthritis. It is primarily used for the prevention of acute gouty arthritis. The patient should be advised not to take aspirin, diuretics, excessive amounts of alcohol, and foods rich in purines. The serum uric acid level should be lowered if arthritic attacks are frequently occurring or if there is any renal damage or if there is persistent elevation of serum or urine uric acid levels. Allopurinol is highly effective for hyperuricemia. If the patient is having a history of tophi, concomitant use of a glycosuric agent like probenecid or sulfapyrazone should be used. If an acute attack occurs during the treatment

with allopurinol it should be continued at the same dosage while other agents are used to treat the acute attack. The use of glycosuric drugs is limited to patients who have low uric acid levels. A 24-hour measurement of creatinine clearance as well as urine uric acid levels should be obtained before you start glycosuric drugs. Glycosuric drugs are ineffective when the GFR is less than 50 ml/minute. They are not recommended for patients who already have high levels of urine uric acid i.e. about 800 mg for a period of 24 hours because of the risk of urate stone formation. Patients should also be advised to take high fluid intake and urine should be alkalinized with sodium bicarbonate.

Pseudogout: If you find a calcium pyrophosphate crystals deposited in the bone, or positively birefringent crystals in the fluid aspiration, the most likely diagnosis is pseudogout. As in acute gouty arthritis, the treatment of choice for most patients is a brief course of high dose nonsteroidal anti-inflammatory drugs. The maintenance therapy of choice is colchicine rather than allopurinol or glycosuric agents, which have no role in treating pseudogout. Patients who have contraindications for nonsteroidal anti-inflammatory drugs, use oral corticosteroids as the treatment of choice.

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