Current Clinical Strategies

History and Physical Examination

Tenth Edition

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Current Clinical Strategies Publishing
www.ccspublishing.com/ccs

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Current Clinical Strategies Publishing
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Phone: 800-331-8227
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E-mail: info@ccspublishing.com
Internet: www.ccspublishing.com/ccs

Printed in USA ISBN 1-929622-28-7

Medical Documentation

History and Physical Examination

Identifying Data: Patient's name; age, race, sex. List the patient's significant medical problems. Name of informant (patient, relative).

Chief Compliant: Reason given by patient for seeking medical care and the duration of the symptom. List all of the patients medical problems.

History of Present Illness (HPI): Describe the course of the patient's illness, including when it began, character of the symptoms, location where the symptoms began; aggravating or alleviating factors; pertinent positives and negatives. Describe past illnesses or surgeries, and past diagnostic testing.

Past Medical History (PMH): Past diseases, surgeries, hospitalizations; medical problems; history of diabetes, hypertension, peptic ulcer disease, asthma, myocardial infarction, cancer. In children include birth history, prenatal history, immunizations, and type of feedings.

Medications:

Allergies: Penicillin, codeine?

Family History: Medical problems in family, including the patient's disorder. Asthma, coronary artery disease, heart failure, cancer, tuberculosis.

Social History: Alcohol, smoking, drug usage. Marital status, employment situation. Level of education.

Review of Systems (ROS):

General: Weight gain or loss, loss of appetite, fever, chills, fatigue, night sweats.

Skin: Rashes, skin discolorations.

Head: Headaches, dizziness, masses, seizures.

Eyes: Visual changes, eye pain.

Ears: Tinnitus, vertigo, hearing loss.

Nose: Nose bleeds, discharge, sinus diseases.

Mouth and Throat: Dental disease, hoarseness, throat pain.

Respiratory: Cough, shortness of breath, sputum (color).

Cardiovascular: Chest pain, orthopnea, paroxysmal nocturnal dyspnea; dyspnea on exertion, claudication, edema, valvular disease.

Gastrointestinal: Dysphagia, abdominal pain, nausea, vomiting, hematemesis, diarrhea, constipation, melena (black tarry stools), hematochezia (bright red blood per rectum).

Genitourinary: Dysuria, frequency, hesitancy, hematuria, discharge.

Gynecological: Gravida/para, abortions, last menstrual period (frequency, duration), age of menarche, menopause; dysmenorrhea, contraception, vaginal bleeding, breast masses.

Endocrine: Polyuria, polydipsia, skin or hair changes, heat intolerance.

Musculoskeletal: Joint pain or swelling, arthritis, myalgias.
Skin and Lymphatics: Easy bruising, lymphadenopathy.
Neuropsychiatric: Weakness, seizures, memory changes, depression.

Physical Examination

General appearance: Note whether the patient appears ill, well, or malnourished.

Vital Signs: Temperature, heart rate, respirations, blood pressure.

Skin: Rashes, scars, moles, capillary refill (in seconds).

Lymph Nodes: Cervical, supraclavicular, axillary, inguinal nodes; size, tenderness.

Head: Bruising, masses. Check fontanels in pediatric patients.

Eyes: Pupils equal round and react to light and accommodation (PERRLA); extra ocular movements intact (EOMI), and visual fields. Funduscopy (papilledema, arteriovenous nicking, hemorrhages, exudates); scleral icterus, ptosis.

Ears: Acuity, tympanic membranes (dull, shiny, intact, injected, bulging).

Mouth and Throat: Mucus membrane color and moisture; oral lesions, dentition, pharynx, tonsils.

Neck: Jugulovenous distention (JVD) at a 45 degree incline, thyromegaly, lymphadenopathy, masses, bruits, abdominojugular reflux.

Chest: Equal expansion, tactile fremitus, percussion, auscultation, rhonchi, crackles, rubs, breath sounds, egophony, whispered pectoriloquy.

Heart: Point of maximal impulse (PMI), thrills (palpable turbulence); regular rate and rhythm (RRR), first and second heart sounds (S1, S2); gallops (S3, S4), murmurs (grade 1-6), pulses (graded 0-2+).

Breast: Dimpling, tenderness, masses, nipple discharge; axillary masses.

Abdomen: Contour (flat, scaphoid, obese, distended); scars, bowel sounds, bruits, tenderness, masses, liver span by percussion; hepatomegaly, splenomegaly; guarding, rebound, percussion note (tympanic), costovertebral angle tenderness (CVAT), suprapubic tenderness.

Genitourinary: Inguinal masses, hernias, scrotum, testicles, varicoceles.

Pelvic Examination: Vaginal mucosa, cervical discharge, uterine size, masses, adnexal masses, ovaries.

Extremities: Joint swelling, range of motion, edema (grade 1-4+); cyanosis, clubbing, edema (CCE); pulses (radial, ulnar, femoral, popliteal, posterior tibial, dorsalis pedis; simultaneous palpation of radial and femoral pulses).

Rectal Examination: Sphincter tone, masses, fissures; test for occult blood, prostate (nodules, tenderness, size).

Neurological: Mental status and affect; gait, strength (graded 0-5); touch sensation, pressure, pain, position and vibration; deep tendon reflexes (biceps, triceps, patellar, ankle; graded 0-4+); Romberg test (ability to stand erect with arms outstretched and eyes closed).

Cranial Nerve Examination:

I: Smell

II: Vision and visual fields

III, IV, VI: Pupil responses to light, extraocular eye movements, ptosis

V: Facial sensation, ability to open jaw against resistance, corneal reflex.

VII: Close eyes tightly, smile, show teeth

VIII: Hears watch tic; Weber test (lateralization of sound when tuning fork is placed on top of head); Rinne test (air conduction last longer than bone conduction when tuning fork is placed on mastoid process)

IX, X: Palette moves in midline when patient says "ah," speech

XI: Shoulder shrug and turns head against resistance

XII: Stick out tongue in midline

Labs: Electrolytes (sodium, potassium, bicarbonate, chloride, BUN, creatinine), CBC (hemoglobin, hematocrit, WBC count, platelets, differential); X-rays, ECG, urine analysis (UA), liver function tests (LFTs).

Assessment (Impression): Assign a number to each problem and discuss separately. Discuss differential diagnosis and give reasons that support the working diagnosis; give reasons for excluding other diagnoses.

Plan: Describe therapeutic plan for each numbered problem, including testing, laboratory studies, medications, and antibiotics.

Progress Notes

Daily progress notes should summarize developments in a patient's hospital course, problems that remain active, plans to treat those problems, and arrangements for discharge. Progress notes should address every element of the problem list.

Progress Note

Date/time:
Subjective: Any problems and symptoms of the patient should be charted. Appetite, pain, headaches or insomnia may be included.
Objective:
General appearance.
Vitals, including highest temperature over past 24 hours. Fluid I/O (inputs and outputs), including oral, parenteral, urine, and stool volumes.
Physical exam, including chest and abdomen, with particular attention to active problems. Emphasize changes from previous physical exams.
Labs: Include new test results and circle abnormal values.
Current medications: List all medications and dosages.
Assessment and Plan: This section should be organized by problem. A separate assessment and plan should be written for each problem.

Procedure Note

A procedure note should be written in the chart when a procedure is performed. Procedure notes are brief operative notes.

Procedure Note
Date and time: **Procedure:** **Indications:** **Patient Consent:** Document that the indications, risks and alternatives to the procedure were explained to the patient. Note that the patient was given the opportunity to ask questions and that the patient consented to the procedure in writing. **Lab tests:** Electrolytes, INR, CBC **Anesthesia:** Local with 2% lidocaine **Description of Procedure:** Briefly describe the procedure, including sterile prep, anesthesia method, patient position, devices used, anatomic location of procedure, and outcome. **Complications and Estimated Blood Loss (EBL):** **Disposition:** Describe how the patient tolerated the procedure. **Specimens:** Describe any specimens obtained and laboratory tests which were ordered.

Discharge Note

The discharge note should be written in the patient's chart prior to discharge.

Discharge Note
Date/time: **Diagnoses:** **Treatment:** Briefly describe treatment provided during hospitalization, including surgical procedures and antibiotic therapy. **Studies Performed:** Electrocardiograms, CT scans. **Discharge Medications:** **Follow-up Arrangements:**

Prescription Writing

- Patient's name:
- Date:
- Drug name, dosage form, dose, route, frequency (include concentration for oral liquids or mg strength for oral solids): Amoxicillin 125mg/5mL 5 mL PO tid
- Quantity to dispense: mL for oral liquids, # of oral solids
- Refills: If appropriate
- Signature

Discharge Summary

Patient's Name and Medical Record Number:
Date of Admission:
Date of Discharge:
Admitting Diagnosis:
Discharge Diagnosis:
Attending or Ward Team Responsible for Patient:
Surgical Procedures, Diagnostic Tests, Invasive Procedures:
Brief History, Pertinent Physical Examination, and Laboratory Data: Describe the course of the patient's disease up until the time that the patient came to the hospital, including physical exam and laboratory data.
Hospital Course: Describe the course of the patient's illness while in the hospital, including evaluation, treatment, medications, and outcome of treatment.
Discharged Condition: Describe improvement or deterioration in the patient's condition, and describe present status of the patient.
Disposition: Describe the situation to which the patient will be discharged (home, nursing home), and indicate who will take care of patient.
Discharged Medications: List medications and instructions for patient on taking the medications.
Discharged Instructions and Follow-up Care: Date of return for follow-up care at clinic; diet, exercise.
Problem List: List all active and past problems.
Copies: Send copies to attending, clinic, consultants.

Cardiovascular Disorders

Chest Pain and Myocardial Infarction

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of chest pain for 4 hours.

History of the Present Illness: Duration of chest pain. Location, radiation (to arm, jaw, back), character (squeezing, sharp, dull), intensity, rate of onset (gradual or sudden); relationship of pain to activity (at rest, during sleep, during exercise); relief by nitroglycerine; increase in frequency or severity of baseline anginal pattern. Improvement or worsening of pain. Past episodes of chest pain. Age of onset of angina.

Associated Symptoms: Diaphoresis, nausea, vomiting, dyspnea, orthopnea, edema, palpitations, syncope, dysphagia, cough, sputum, paresthesias.

Aggravating and Relieving Factors: Effect of inspiration on pain; effect of eating, NSAIDS, alcohol, stress.

Cardiac Testing: Past stress testing, stress echocardiogram, angiogram, nuclear scans, ECGs.

Cardiac Risk factors: Hypertension, hyperlipidemia, diabetes, smoking, and a strong family history (coronary artery disease in early or mid-adulthood in a first-degree relative).

PMH: History of diabetes, claudication, stroke. Exercise tolerance; history of peptic ulcer disease. Prior history of myocardial infarction, coronary bypass grafting or angioplasty.

Social History: Smoking, alcohol, cocaine usage, illicit drugs.

Medications: Aspirin, beta-blockers, estrogen.

Physical Examination

General: Visible pain, apprehension, distress, pallor. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Pulse (tachycardia or bradycardia), BP (hypertension or hypotension), respirations (tachypnea), temperature.

Skin: Cold extremities (peripheral vascular disease), xanthomas (hypercholesterolemia).

HEENT: Fundi, "silver wire" arteries, arteriolar narrowing, A-V nicking, hypertensive retinopathy; carotid bruits, jugulovenous distention.

Chest: Inspiratory crackles (heart failure), percussion note.

Heart: Decreased intensity of first heart sound (S1) (LV dysfunction); third heart sound (S3 gallop) (heart failure, dilation), S4 gallop (more audible in the left lateral position; decreased LV compliance due to ischemia); systolic mitral insufficiency murmur (papillary muscle dysfunction), cardiac rub (pericarditis).

Abdomen: Hepatojugular reflux, epigastric tenderness, hepatomegaly, pulsatile

mass (aortic aneurysm).

Rectal: Occult blood.

Extremities: Edema (heart failure), femoral bruits, unequal or diminished pulses (aortic dissection); calf pain, swelling (thrombosis).

Neurologic: Altered mental status.

Labs:

Electrocardiographic Findings in Acute Myocardial Infarction: ST segment elevations in two contiguous leads with ST depressions in reciprocal leads, hyperacute T waves.

Chest X-ray: Cardiomegaly, pulmonary edema (CHF).

Electrolytes, LDH, magnesium, CBC. CPK with isoenzymes, troponin I or troponin T, myoglobin, and LDH. Echocardiography.

Common Markers for Acute Myocardial Infarction

Marker	Initial Elevation After MI	Mean Time to Peak Elevations	Time to Return to Baseline
Myoglobin	1-4 h	6-7 h	18-24 h
CTnI	3-12 h	10-24 h	3-10 d
CTnT	3-12 h	12-48 h	5-14 d
CKMB	4-12 h	10-24 h	48-72 h
CKMBiso	2-6 h	12 h	38 h

CTnI, CTnT = troponins of cardiac myofibrils; CPK-MB, MM = tissue

Differential Diagnosis of Chest Pain

A. **Acute Pericarditis.** Characterized by pleuritic-type chest pain and diffuse ST segment elevation.
B. **Aortic Dissection.** "Tearing" chest pain with uncontrolled hypertension, widened mediastinum and increased aortic prominence on chest X-ray.
C. **Esophageal Rupture**. Occurs after vomiting; X-ray may reveal air in mediastinum or a left side hydrothorax.
D. **Acute Cholecystitis**. Characterized by right subcostal abdominal pain with anorexia, nausea, vomiting, and fever.
E. **Acute Peptic Ulcer Disease.** Epigastric pain with melena or hematemesis, and anemia.

Dyspnea

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of shortness of breath for 4 hours.

History of the Present Illness: Rate of onset of shortness of breath (gradual, sudden), orthopnea (dyspnea when supine), paroxysmal nocturnal dyspnea (PND), chest pain, palpitations. Dyspnea with physical exertion; history of myocardial infarction, syncope. Past episodes; aggravating or relieving factors (noncompliance with medications, salt overindulgence). Edema, weight gain, cough, sputum, fever, anxiety; hemoptysis, leg pain (DVT).

Past Medical History: Emphysema, heart failure, hypertension, coronary artery disease, asthma, occupational exposures, HIV risk factors.

Medications: Bronchodilators, cardiac medications (noncompliance), drug allergies.

Past Treatment or Testing: Cardiac testing, chest X-rays, ECG's, spirometry.

Physical Examination

General Appearance: Respiratory distress, dyspnea, pallor, diaphoresis. Note whether the patient appears ill, well, or in distress. Fluid input and output balance.

Vital Signs: BP (supine and upright), pulse (tachycardia), temperature, respiratory rate (tachypnea).

HEENT: Jugulovenous distention at 45 degrees, tracheal deviation (pneumothorax).

Chest: Stridor (foreign body), retractions, breath sounds, wheezing, crackles (rales), rhonchi; dullness to percussion (pleural effusion), barrel chest (COPD); unilateral hyperresonance (pneumothorax).

Heart: Lateral displacement of point of maximal impulse; irregular rate, irregular rhythm (atrial fibrillation); S3 gallop (LV dilation), S4 (myocardial infarction), holosystolic apex murmur (mitral regurgitation); faint heart sounds (pericardial effusion).

Abdomen: Abdominojugular reflux (pressing on abdomen increases jugular vein distention), hepatomegaly, liver tenderness.

Extremities: Edema, pulses, cyanosis, clubbing. Calf tenderness or swelling (DVT).

Neurologic: Altered mental status.

Labs: ABG, cardiac enzymes; chest X-ray (cardiomegaly, hyperinflation with flattened diaphragms, infiltrates, effusions, pulmonary edema), ventilation/perfusion scan.

Electrocardiogram

A. ST segment depression or elevation, new left bundle-branch block.
B. ST elevations in two contiguous leads, with ST depressions in reciprocal leads (MI).

Differential Diagnosis: Heart failure, myocardial infarction, upper airway

obstruction, pneumonia, pulmonary embolism, chronic obstructive pulmonary disease, asthma, pneumothorax, foreign body aspiration, hyperventilation, malignancy, anemia.

Edema

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of ankle swelling for 1 day.

History of the Present Illness: Duration of edema; localized or generalized; let pain, redness. History of heart failure, liver, or renal disease; weight gain, shortness of breath, malnutrition, chronic diarrhea (protein losing enteropathy), allergies, alcoholism. Exacerbation by upright position. Recent fluid input and output balance.

Past Medical History: Cardiac testing, chest X-rays. History of deep vein thrombosis, venous insufficiency.

Medications: Cardiac drugs, diuretics, calcium channel blockers.

Physical Examination

General Appearance: Respiratory distress, dyspnea, pallor, diaphoresis. Note whether the patient appears ill, well, or malnourished.

Vitals: BP (hypotension), pulse, temperature, respiratory rate.

HEENT: Jugulovenous distention at 45°; carotid pulse amplitude.

Chest: Breath sounds, crackles, wheeze, dullness to percussion.

Heart: Displacement of point of maximal impulse, atrial fibrillation (irregular rhythm); S3 gallop (LV dilation), friction rubs.

Abdomen: Abdominojugular reflux, ascites, hepatomegaly, splenomegaly, distention, fluid wave, shifting dullness, generalized tenderness.

Extremities: Pitting or non-pitting edema (graded 1 to 4+), redness, warmth; mottled brown discoloration of ankle skin (venous insufficiency); leg circumference, calf tenderness, Homan's sign (dorsiflexion elicits pain; thrombosis); pulses, cyanosis, clubbing.

Neurologic: Altered mental status.

Labs: Electrolytes, liver function tests, CBC, chest X-ray, ECG, cardiac enzymes, Doppler studies of lower extremities.

Differential Diagnosis of Edema

Unilateral Edema: Deep venous thrombosis; lymphatic obstruction by tumor.

Generalized Edema: Heart failure, cirrhosis, acute glomerulonephritis, nephrotic syndrome, renal failure, obstruction of hepatic venous outflow, obstruction of inferior or superior vena cava.

Endocrine: Mineralocorticoid excess, hypoalbuminemia.

Miscellaneous: Anemia, angioedema, iatrogenic edema.

Congestive Heart Failure

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of shortness of breath for 1 day.

History of the Present Illness: Duration of dyspnea; rate of onset (gradual, sudden); paroxysmal nocturnal dyspnea (PND), orthopnea; number of pillows needed under back when supine to prevent dyspnea; dyspnea on exertion (DOE); edema of lower extremities. Exercise tolerance (past and present), weight gain. Severity of dyspnea compared with past episodes.

Associated Symptoms: Fatigue, chest pain, pleuritic pain, cough, fever, sputum, diaphoresis, palpitations, syncope, viral illness.

Past Medical History: Past episodes of heart failure; hypertension, excess salt or fluid intake; noncompliance with diuretics, digoxin, antihypertensives; alcoholism, drug use, diabetes, coronary artery disease, myocardial infarction, heart murmur, arrhythmias. Thyroid disease, anemia, pulmonary disease.

Past Testing: Echocardiograms for ejection fraction, cardiac testing, angiograms, ECGs.

Cardiac Risk Factors: Smoking, diabetes, family history of coronary artery disease or heart failure, hypercholesterolemia, hypertension.

Precipitating Factors: Infections, noncompliance with low salt diet; excessive fluid intake; anemia, hyperthyroidism, pulmonary embolism, nonsteroidal anti-inflammatory drugs, renal insufficiency; beta blockers, calcium blockers, antiarrhythmics.

Treatment in Emergency Room: IV Lasix given, volume diuresed. Recent fluid input and output balance.

Physical Examination

General Appearance: Respiratory distress, anxiety, diaphoresis. Dyspnea, pallor. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypotension or hypertension), pulse (tachycardia), temperature, respiratory rate (tachypnea).

HEENT: Jugulovenous distention at a 45 degree incline (vertical distance from the sternal angle to top of column of blood); hepatojugular reflux (pressing on abdomen causes jugulovenous distention); carotid pulse, amplitude, duration, bruits.

Chest: Breath sounds, crackles, rhonchi; dullness to percussion (pleural effusion).

Heart: Lateral displacement of point of maximal impulse; irregular rhythm (atrial fibrillation); S3 gallop (LV dilation).

Abdomen: Ascites, hepatomegaly, liver tenderness.

Extremities: Edema (graded 1 to 4+), pulses, jaundice, muscle wasting.

Neurologic: Altered mental status.

Labs: Chest X-ray: cardiomegaly, perihilar congestion; vascular cephalization (increased density of upper lobe vasculature); Kerley B lines (horizontal

streaks in lower lobes), pleural effusions.

ECG: Left ventricular hypertrophy, ectopic beats, atrial fibrillation.

Electrolytes, BUN, creatinine, sodium; CBC; serial cardiac enzymes, CPK, MB, troponins, LDH. Echocardiogram.

Conditions That Mimic or Provoke Heart Failure:

- **A.** Coronary artery disease and myocardial infarction
- **B.** Hypertension
- **C.** Aortic or mitral valve disease
- **D.** Cardiomyopathies: Hypertrophic, idiopathic dilated, postpartum, genetic, toxic, nutritional, metabolic
- **E.** Myocarditis: Infectious, toxic, immune
- **F.** Pericardial constriction
- **G.** Tachyarrhythmias or bradyarrhythmias
- **H.** Pulmonary embolism
- **I.** Pulmonary disease
- **J.** High output states: Anemia, hyperthyroidism, arteriovenous fistulas, Paget's disease, fibrous dysplasia, multiple myeloma
- **K.** Renal failure, nephrotic syndrome

Factors Associated with Heart Failure

- **A.** Increase Demand: Anemia, fever, infection, excess dietary salt, renal failure, liver failure, thyrotoxicosis, arteriovenous fistula. Arrhythmias, cardiac ischemia/infarction, pulmonary emboli, alcohol abuse, hypertension.
- **B.** Medications: Antiarrhythmics (disopyramide), beta-blockers, calcium blockers, NSAID's, noncompliance with diuretics, excessive intravenous fluids

New York Heart Association Classification of Heart Failure

Class I: Symptomatic only with strenuous activity.

Class II: Symptomatic with usual level of activity.

Class III: Symptomatic with minimal activity, but asymptomatic at rest.

Class IV: Symptomatic at rest.

Palpitations and Atrial Fibrillation

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of palpitations for 8 hours.

History of the Present Illness: Palpitations (rapid or irregular heart beat), fatigue, dizziness, nausea, dyspnea, edema; duration of palpitations. Results of previous ECGs.

Associated Symptoms: Chest pain, pleuritic pain, syncope, fatigue, exercise intolerance, diaphoresis, symptoms of hyperthyroidism (tremor, anxiety).

Cardiac History: Hypertension, coronary disease, rheumatic heart disease, arrhythmias.

Past Medical History: Diabetes, pneumonia, noncompliance with cardiac medications, pericarditis, hyperthyroidism, electrolyte abnormalities, COPD, mitral valve stenosis; diet pills, decongestants, alcohol, caffeine, cocaine.

Physical Examination

General Appearance: Respiratory distress, anxiety, diaphoresis. Dyspnea, pallor. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypotension), pulse (irregular tachycardia), respiratory rate, temperature.

HEENT: Retinal hemorrhages (emboli), jugulovenous distention, carotid bruits; thyromegaly (hyperthyroidism).

Chest: Crackles (rales).

Heart: Irregular rhythm (atrial fibrillation); dyskinetic apical pulse, displaced point of maximal impulse (cardiomegaly), S4, mitral regurgitation murmur (rheumatic fever); pericardial rub (pericarditis).

Rectal: Occult blood.

Extremities: Peripheral pulses with irregular timing and amplitude. Edema, cyanosis, petechia (emboli). Femoral artery bruits (atherosclerosis).

Neuro: Altered mental status, motor weakness (embolic stroke), CN 2-12, sensory; dysphasia, dysarthria (stroke); tremor (hyperthyroidism).

Labs: Sodium, potassium, BUN, creatinine; magnesium; drug levels; CBC; serial cardiac enzymes; CPK, LDH, TSH, free T4. Chest X-ray.

ECG: Irregular R-R intervals with no P waves (atrial fibrillation). Irregular baseline with rapid fibrillary waves (320 per minute). The ventricular response rate is 130-180 per minute.

Echocardiogram for atrial chamber size.

Differential Diagnosis of Atrial Fibrillation

Lone Atrial Fibrillation: No underlying disease state.

Cardiac Causes: Hypertensive heart disease with left ventricular hypertrophy, heart failure, mitral valve stenosis or regurgitation, pericarditis, hypertrophic cardiomyopathy, coronary artery disease, myocardial infarction, aortic stenosis, amyloidosis.

Noncardiac Causes: Hypoglycemia, theophylline intoxication, pneumonia,

asthma, chronic obstructive pulmonary disease, pulmonary embolism, heavy alcohol intake or alcohol withdrawal, hyperthyroidism, systemic illness, electrolyte abnormalities. Stimulant abuse, excessive caffeine, over-the-counter cold remedies, illicit drugs.

Hypertension

Chief Compliant: The patient is a 50 year old white male with coronary heart disease who presents with a blood pressure of 190/120 mmHg for 1 day.

History of the Present Illness: Degree of blood pressure elevation; patient's baseline BP from records; baseline BUN and creatinine. Age of onset of hypertension.

Associated Symptoms: Chest or back pain (aortic dissection), dyspnea, orthopnea, dizziness, blurred vision (hypertensive retinopathy); nausea, vomiting, headache (pheochromocytoma); lethargy, confusion (encephalopathy).

Paroxysms of tremor, palpitations, diaphoresis; edema, thyroid disease, angina; flank pain, dysuria, pyelonephritis. Alcohol withdrawal, noncompliance with antihypertensives (clonidine or beta-blocker withdrawal), excessive salt, alcohol.

Medications: Over-the-counter cold remedies, beta agonists, diet pills, eye medications (sympathomimetics), bronchodilators, cocaine, amphetamines, nonsteroidal anti-inflammatory agents, oral contraceptives, corticosteroids.

Past Medical History: Cardiac Risk Factors: Family history of coronary artery disease before age 55, diabetes, hypertension, smoking, hypercholesterolemia.

Past Testing: Urinalysis, ECG, creatinine.

Physical Examination

General Appearance: Delirium, confusion (hypertensive encephalopathy).

Vital Signs: Supine and upright blood pressure; BP in all extremities; pulse, temperature, respirations.

HEENT: Hypertensive retinopathy, hemorrhages, exudates, "cotton wool" spots, A-V nicking; papilledema; thyromegaly (hyperthyroidism). Jugulovenous distention, carotid bruits.

Chest: Crackles (rales, pulmonary edema), wheeze, intercostal bruits (aortic coarctation).

Heart: Rhythm; laterally displaced apical impulse with patient in left lateral position (ventricular hypertrophy); narrowly split S2 with increased aortic component; systolic ejection murmurs.

Abdomen: Renal bruits (bruit just below costal margin, renal artery stenosis); abdominal aortic enlargement (aortic aneurysm), renal masses, enlarged kidney (polycystic kidney disease); costovertebral angle tenderness. Truncal

obesity (Cushing's syndrome).

Skin: Striae (Cushing's syndrome), uremic frost (chronic renal failure), hirsutism (adrenal hyperplasia), plethora (pheochromocytoma).

Extremities: Asymmetric femoral to radial pulses (coarctation of aortic); femoral bruits, edema; tremor (pheochromocytoma, hyperthyroidism).

Neuro: Altered mental status, rapid return phase of deep tendon reflexes (hyperthyroidism), localized weakness (stroke), visual acuity.

Labs: Potassium, BUN, creatinine, glucose, uric acid, CBC. UA with microscopic (RBC casts, hematuria, proteinuria). 24 hour urine for metanephrine, plasma catecholamines (pheochromocytoma), plasma renin activity.

12 Lead Electrocardiography: Evidence of ischemic heart disease, rhythm and conduction disturbances, or left ventricular hypertrophy.

Chest X-ray: Cardiomegaly, indentation of aorta (coarctation), rib notching.

Findings Suggesting Secondary Hypertension:

A. **Primary Aldosteronism:** Serum potassium <3.5 mEq/L while not taking medication.
B. **Aortic Coarctation:** Femoral pulse delayed later than radial pulse; posterior systolic bruits below ribs.
C. **Pheochromocytoma:** Tachycardia, tremor, pallor.
D. **Renovascular Stenosis:** Paraumbilical abdominal bruits.
E. **Polycystic Kidneys:** Flank or abdominal mass.
F. **Pyelonephritis:** Urinary tract infections, costovertebral angle tenderness.
G. **Renal Parenchymal Disease:** Increased serum creatinine ≥ 1.5 mg/dL, proteinuria.

Screening Tests for Secondary Hypertension

Hypertensive Disorder	Screening Test
Renovascular Hypertension	Captopril Test: Plasma renin level before and 1 hr after captopril 25 mg PO. A greater than 150% increase in renin is positive Captopril Renography: Renal scan before and after captopril 25 mg PO Intravenous pyelography MRI angiography Digital subtraction angiography
Hyperaldosteronism	Serum Potassium 24 hr urine potassium Plasma renin activity CT scan of adrenals

Hypertensive Disorder	Screening Test
Pheochromocytoma	24 hr urine metanephrine Plasma catecholamine level CT scan Nuclear MIBG scan
Cushing's Syndrome	Plasma ACTH Dexamethasone suppression test
Hyperparathyroidism	Serum calcium Serum parathyroid hormone

Differential Diagnosis of Hypertension

A. **Primary (essential) Hypertension (90%)**

B. **Secondary Hypertension:** Renovascular hypertension, pheochromocytoma, cocaine use; withdrawal from alpha$_2$ stimulants, clonidine or beta blockers, alcohol withdrawal; noncompliance with antihypertensive medications.

Pericarditis

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of chest pain for 6 hours.

History of the Present Illness: Sharp pleuritic chest pain; onset, intensity, radiation, duration. Exacerbated by supine position, coughing or deep inspiration; relieved by leaning forward; pain referred to the back; fever, chills, palpitations, dyspnea.

Associated Findings: History of recent upper respiratory infection, autoimmune disease; prior episodes of pain; tuberculosis exposure; myalgias, arthralgias, rashes, fatigue, anorexia, weight loss, kidney disease.

Medications: Hydralazine, procainamide, isoniazid, penicillin.

Physical Examination

General Appearance: Respiratory distress, anxiety, diaphoresis. Dyspnea, pallor, leaning forward position.

Vital Signs: BP, pulse (tachycardia); pulsus paradoxus (drop in systolic BP >10 mmHg with inspiration).

HEENT: Cornea, sclera, iris lesions, oral ulcers (lupus); jugulovenous distention (cardiac tamponade).

Skin: Malar rash (butterfly rash), discoid rash (lupus).

Chest: Crackles (rales), rhonchi.

Heart: Rhythm; friction rub on end-expiration while sitting forward; cardiac rub with 1-3 components at left lower sternal border; distant heart sounds (pericardial effusion).

Rectal: Occult blood.

Extremities: Arthralgias, joint tenderness.

Labs: ECG: diffuse, downwardly, concave, ST segment elevation in limb leads and precordial leads; upright T waves, PR segment depression, low QRS voltage.

Chest X-ray: large cardiac silhouette; "water bottle sign," pericardial calcifications.

Echocardiogram.

Increased WBC; UA, urine protein, urine RBCs; CPK, MB, LDH, blood culture, increased ESR.

Differential Diagnosis: Idiopathic pericarditis, infectious pericarditis (viral, bacterial, mycoplasmal, mycobacterial), Lyme disease, uremia, neoplasm, connective tissue disease, lupus, rheumatic fever, polymyositis, myxedema, sarcoidosis, post myocardial infarction pericarditis (Dressler's syndrome), drugs (penicillin, isoniazid, procainamide, hydralazine).

Syncope

Chief Compliant: The patient is a 50 year old white male with hypertension who presents with loss of consciousness for 1 minute, 1 hour before admission.

History of the Present Illness: Time of occurrence and description of the episode. Duration of unconsciousness, rate of onset; activity before and after event. Body position, arm position (reaching), neck position (turning to side), mental status before and after event. Precipitants (fear, tension, hunger, pain, cough, micturition, defecation, exertion, Valsalva, hyperventilation, tight shirt collar).

Seizure activity (tonic/clonic). Chest pain, palpitations, dyspnea, weakness.

Post-syncopal disorientation, confusion, vertigo, flushing; urinary of fecal incontinence, tongue biting. Rate of return to alertness (delayed or spontaneous).

Prodromal Symptoms: Nausea, diaphoresis, pallor, lightheadedness, dimming vision (vasovagal syncope).

Past Medical History: Past episodes of syncope, stroke, transient ischemic attacks, seizures, cardiac disease, arrhythmias, diabetes, anxiety attacks.

Past Testing: 24 hour Holter, exercise testing, cardiac testing, ECG, EEG.

Medications Associated with Syncope	
Antihypertensives or anti-angina agents Adrenergic antagonists Calcium channel blockers Diuretics Nitrates Vasodilators Antidepressants Tricyclic antidepressants Phenothiazines	Antiarrhythmics Digoxin Quinidine Insulin Drugs of abuse Alcohol Cocaine Marijuana

Physical Examination

General Appearance: Level of alertness, respiratory distress, anxiety, diaphoresis. Dyspnea, pallor. Note whether the patient appears ill or well.

Vital Signs: Temperature, respiratory rate, postural vitals (supine and after standing 2 minutes), pulse. Blood pressure in all extremities; asymmetric radial to femoral artery pulsations (aortic dissection).

HEENT: Cranial bruising (trauma). Pupil size and reactivity, extraocular movements; tongue or buccal lacerations (seizure); flat jugular veins (volume depletion); carotid or vertebral bruits.

Skin: Pallor, turgor, capillary refill.

Chest: Crackles, rhonchi (aspiration).

Heart: Irregular rhythm (atrial fibrillation); systolic murmurs (aortic stenosis), friction rub.

Abdomen: Bruits, tenderness, pulsatile mass.

Genitourinary/Rectal: Occult blood, urinary or fecal incontinence (seizure).

Extremities: Needle marks, injection site fat atrophy (diabetes), extremity palpation for trauma.

Neuro: Cranial nerves 2-12, strength, gait, sensory, altered mental status; nystagmus. Turn patient's head side to side, up and down; have patient reach above head, and pick up object.

Labs: ECG: Arrhythmias, conduction blocks. Chest X-ray, electrolytes, glucose, Mg, BUN, creatinine, CBC; 24-hour Holter monitor.

Differential Diagnosis of Syncope	
Non-cardiovascular	**Cardiovascular**
Metabolic Hyperventilation Hypoglycemia Hypoxia Neurologic Cerebrovascular insufficiency	Reflex (heart structurally normal) Vasovagal Situational Cough Defecation Micturition

Non-cardiovascular	Cardiovascular
Normal pressure hydrocephalus Seizure Subclavian steal syndrome Increased intracranial pressure Psychiatric Hysteria Major depression	Postprandial Sneeze Swallow Carotid sinus syncope Orthostatic hypotension Drug-induced Cardiac Obstructive Aortic dissection Aortic stenosis Cardiac tamponade Hypertrophic cardiomyopathy Left ventricular dysfunction Myocardial infarction Myxoma Pulmonary embolism Pulmonary hypertension Pulmonary stenosis Arrhythmias Bradyarrhythmias Sick sinus syndrome Pacemaker failure Supraventricular and ventricular tachyarrhythmias

24 Syncope

Pulmonary Disorders

Hemoptysis

Chief Compliant: The patient is a 50 year old white male with hypertension who has been coughing up blood for one day.

History of the Present Illness: Quantify the amount of blood, acuteness of onset, color (bright red, dark), character (coffee grounds, clots); dyspnea, chest pain (left or right), fever, chills; past bronchoscopies, exposure to tuberculosis; hematuria, weight loss, anorexia, hoarseness.

Farm exposure, homelessness, residence in a nursing home, immigration from a foreign country. Smoking, leg pain or swelling (pulmonary embolism), bronchitis, aspiration of food or foreign body.

Past Medical History: COPD, heart failure, HIV risk factors (pulmonary Kaposi's sarcoma). Prior chest X-rays, CT scans, tuberculin testing (PPD).

Medications: Anticoagulants, aspirin, NSAIDs**.**

Family history: Bleeding disorders.

Physical Examination

General Appearance: Dyspnea, respiratory distress. Anxiety, diaphoresis, pallor. Note whether the patient appears ill or well.

Vital Signs: Temperature, respiratory rate (tachypnea), pulse (tachycardia), BP (hypotension); assess hemodynamic status.

Skin: Petechiae, ecchymoses (coagulopathy); cyanosis, purple plaques (Kaposi's sarcoma); rashes (paraneoplastic syndromes).

HEENT: Nasal or oropharyngeal lesions, tongue lacerations; telangiectasias on buccal mucosa (Rendu-Osler-Weber disease); ulcerations of nasal septum (Wegener's granulomatosus), jugulovenous distention, gingival disease (aspiration).

Lymph Nodes: Cervical, scalene or supraclavicular adenopathy (Virchow's nodes, intrathoracic malignancy).

Chest: Stridor, tenderness of chest wall; rhonchi, apical crackles (tuberculosis); localized wheezing (foreign body, malignancy), basilar crackles (pulmonary edema), pleural friction rub, breast masses (metastasis).

Heart: Mitral stenosis murmur (diastolic rumble), right ventricular gallop; accentuated second heart sound (pulmonary embolism).

Abdomen: Masses, liver nodules (metastases), tenderness.

Extremities: Calf tenderness, calf swelling (pulmonary embolism); clubbing (pulmonary disease), edema, bone pain (metastasis).

Rectal: Occult blood.

Labs: Sputum Gram stain, cytology, acid fast bacteria stain; CBC, platelets, ABG; pH of expectorated blood (alkaline=pulmonary; acidic=GI); UA

(hematuria); INR/PTT, bleeding time; creatinine, sputum fungal culture; anti-glomerular basement membrane antibody, antinuclear antibody; PPD, cryptococcus antigen.

ECG, chest X-ray, CT scan, bronchoscopy, ventilation/perfusion scan.

Differential Diagnosis

Infection: Bronchitis, pneumonia, lung abscess, tuberculosis, fungal infection, bronchiectasis, broncholithiasis.

Neoplasms: Bronchogenic carcinoma, metastatic cancer, Kaposi's sarcoma.

Vascular: Pulmonary embolism, mitral stenosis, pulmonary edema.

Miscellaneous: Trauma, foreign body, aspiration, coagulopathy, epistaxis, oropharyngeal bleeding, vasculitis, Goodpasture's syndrome, lupus, hemosiderosis, Wegener's granulomatosus.

Wheezing and Asthma

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of wheezing for one day.

History of the Present Illness: Onset, duration, and progression of wheezing; severity of attack compared to previous episodes; cough, fever, chills, purulent sputum; current and baseline peak flow rate. Frequency of bronchodilator use, relief of symptoms by bronchodilators. Frequency of exacerbations and hospitalizations or emergency department visits; duration of past exacerbations, steroid dependency, history of intubation, home oxygen or nebulizer use.

Precipitating factors, exposure to allergens (foods, pollen, animals, drugs); seasons that provoke symptoms; exacerbation by exercise, aspirin, beta-blockers, recent upper respiratory infection; chest pain, foreign body aspiration. Worsening at night or with infection.

Treatment given in emergency room and response.

Past Medical History: Previous episodes of asthma, COPD, pneumonia. Baseline arterial blood gas results; past pulmonary function testing.

Family History: Family history of asthma, allergies, hay-fever, atopic dermatitis.

Social History: Smoking, alcohol.

Physical Examination

General Appearance: Dyspnea, respiratory distress, diaphoresis, somnolence. Anxiety, diaphoresis, pallor. Note whether the patient appears cachectic, well, or in distress.

Vital Signs: Temperature, respiratory rate (tachypnea >28 breaths/min), pulse (tachycardia), BP (widened pulse pressure, hypotension), pulsus paradoxus (inspiratory drop in systolic blood pressure >10 mmHg = severe attack).

HEENT: Nasal flaring, pharyngeal erythema, cyanosis, jugulovenous distention, grunting.

Chest: Expiratory wheeze, rhonchi, decreased intensity of breath sounds (emphysema); sternocleidomastoid muscle contractions, barrel chest, increased anteroposterior diameter (hyperinflation); intracostal and supraclavicular retractions.

Heart: Decreased cardiac dullness to percussion (hyperinflation); distant heart sounds, third heart sound gallop (S3, cor pulmonale); increased intensity of pulmonic component of second heart sound (pulmonary hypertension).

Abdomen: Retractions, tenderness.

Extremities: Cyanosis, clubbing, edema.

Skin: Rash, urticaria.

Neuro: Decreased mental status, confusion.

Labs: Chest X-ray: hyperinflation, bullae, flattening of diaphragms; small, elongated heart.

ABG: Respiratory alkalosis, hypoxia.

Sputum gram stain; CBC, electrolytes, theophylline level.

ECG: Sinus tachycardia, right axis deviation, right ventricular hypertrophy. Pulmonary function tests, peak flow rate.

Differential Diagnosis: Asthma, bronchitis, COPD, pneumonia, congestive heart failure, anaphylaxis, upper airway obstruction, endobronchial tumors, carcinoid.

Chronic Obstructive Pulmonary Disease

Chief Compliant: The patient is a 50 year old white male with chronic obstructive pulmonary disease who complains of wheezing for one day.

History of the Present Illness: Duration of wheezing, dyspnea, cough, fever, chills; increased sputum production; sputum quantity, consistency, color; smoking (pack-years); severity of attack compared to previous episodes; chest pain, pleurisy.

Current and baseline peak flow rate. Frequency of bronchodilator use, relief of symptoms by bronchodilators. Frequency of exacerbations and hospitalizations or emergency department visits; duration of past exacerbations, steroid dependency, history of intubation, home oxygen or nebulizer use. Chest trauma, noncompliance with medications.

Baseline blood gases.

Treatment given in emergency room and response.

Precipitating factors, exposure to allergens (foods, pollen, animals, drugs); seasons that provoke symptoms; exacerbation by exercise, aspirin, beta-blockers, recent upper respiratory infection. Worsening at night or with infection.

Past Medical History: Frequency of exacerbations, home oxygen use, steroid dependency, history of intubation, nebulizer use; pneumonia, past pulmonary function tests. Diabetes, heart failure.

Medications: Bronchodilators, prednisone, ipratropium.
Family History: Emphysema.
Social History: smoking, alcohol abuse.

Physical Examination
General Appearance: Diaphoresis, respiratory distress; speech interrupted by breaths. Anxiety, dyspnea, pallor. Note whether the patient appears "cachectic," in severe distress, or well.
Vital Signs: Temperature, respiratory rate (tachypnea, >28 breaths/min), pulse (tachycardia), BP.
HEENT: Pursed-lip breathing, jugulovenous distention. Mucous membrane cyanosis, perioral cyanosis.
Chest: Barrel chest, retractions, sternocleidomastoid muscle contractions, supraclavicular retractions, intercostal retractions, expiratory wheezing, rhonchi. Decreased air movement, hyperinflation.
Heart: Right ventricular heave, distant heart sounds, S3 gallop (cor pulmonale).
Extremities: Cyanosis, clubbing, edema.
Neuro: Decreased mental status, somnolence, confusion.
Labs: Chest X-ray: Diaphragmatic flattening, bullae, hyperaeration.
ABG: Respiratory alkalosis (early), acidosis (late), hypoxia. Sputum gram stain, culture, CBC, electrolytes.
ECG: Sinus tachycardia, right axis deviation, right ventricular hypertrophy, PVCs.
Differential Diagnosis: COPD, chronic bronchitis, asthma, pneumonia, heart failure, alpha-1-antitrypsin deficiency, cystic fibrosis.

Pulmonary Embolism

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of shortness of breath for 4 hours.
History of the Present Illness: Sudden onset of pleuritic chest pain and dyspnea. Unilateral leg pain, swelling; fever, cough, hemoptysis, diaphoresis, syncope. History of deep venous thrombosis.
Virchow's Triad: Immobility, trauma, hypercoagulability; malignancy (pancreas, lung, genitourinary, stomach, breast, pelvic, bone); estrogens (oral contraceptives), history of heart failure, surgery, pregnancy.

Physical Examination
General Appearance: Dyspnea, apprehension, diaphoresis. Note whether the patient appears in respiratory distress, well, or malnourished.
Vitals: Temperature (fever), respiratory rate (tachypnea, >28 breaths/min), pulse (tachycardia >100/min), BP (hypotension).
HEENT: Jugulovenous distention, prominent jugular A-waves.

Chest: Crackles; tenderness or splinting of chest wall, pleural friction rub; breast mass (malignancy).

Heart: Right ventricular gallop; accentuated, loud, pulmonic component of second heart sound (S2); S3 or S4 gallop; murmurs.

Extremities: Cyanosis, edema, calf redness or tenderness; Homan's sign (pain with dorsiflexion of foot); calf swelling, increased calf circumference (>2 cm difference), dilated superficial veins.

Rectal: Occult blood.

Genitourinary: Testicular or pelvic masses.

Neuro: Altered mental status.

Frequency of Symptoms and Signs in Pulmonary Embolism

Symptoms	%	Signs	%
Dyspnea	84	Tachypnea (>16/min)	92
Pleuritic chest pain	74	Rales	58
Apprehension	59	Accentuated S2	53
Cough	53	Tachycardia	44
Hemoptysis	30	Fever (>37.8°C)	43
Sweating	27	Diaphoresis	36
Non-pleuritic chest pain	14	S3 or S4 gallop	34
Syncope	13	Thrombophlebitis	32

Labs: ABG: Hypoxemia, hypocapnia, respiratory alkalosis.

Lung Scan: Ventilation/perfusion mismatch. Duplex ultrasound of lower extremities.

Pulmonary Angiogram: Arterial filling defects.

Chest X-ray: Elevated hemidiaphragm, wedge shaped infiltrate; localized oligemia; effusion, segmental atelectasis.

ECG: Sinus tachycardia, nonspecific ST-T wave changes, QRS changes (acute right shift, S_1Q_3 pattern); right heart strain pattern (P-pulmonale, right bundle branch block, right axis deviation).

Differential Diagnosis: Heart failure, myocardial infarction, pneumonia, pulmonary edema, chronic obstructive pulmonary disease, asthma, aspiration of foreign body or gastric contents, pleuritis.

30 Pulmonary Embolism

Infectious Diseases

Fever

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of fever for one week.

History of the Present Illness: Degree of fever, time of onset, pattern of fever; shaking chills (rigors), cough, sputum, sore throat, headache, neck stiffness, dysuria, urinary frequency, back pain; night sweats; vaginal discharge, myalgias, nausea, vomiting, diarrhea, anorexia.

Chest or abdominal pain; ear, bone or joint pain; recent acetaminophen use.

Exposure to tuberculosis or hepatitis; travel history, animal exposure; recent dental GI procedures. Ill contacts; Foley catheter; antibiotic use, alcohol, allergies.

Past Medical History: Cirrhosis, diabetes, heart murmur, recent surgery; AIDS risk factors.

Medications: Antibiotics, acetaminophen.

Social History: Alcoholism.

Physical Examination

General Appearance: Toxic appearance, altered level of consciousness. Dyspnea, diaphoresis. Note whether the patient appears, septic, ill, or well.

Vital Signs: Temperature (fever curve), respiratory rate (tachypnea), pulse (tachycardia), BP.

Skin: Pallor, delayed capillary refill; rash, purpura, petechia (septic emboli, meningococcemia). Pustules, cellulitis, abscesses.

HEENT: Papilledema, periodontitis, tympanic membrane inflammation, sinus tenderness; pharyngeal erythema, lymphadenopathy, neck rigidity.

Breast: Tenderness, masses.

Chest: Rhonchi, crackles, dullness to percussion (pneumonia).

Heart: Murmurs (endocarditis), friction rub (pericarditis).

Abdomen: Masses, tenderness, hepatomegaly, splenomegaly; Murphy's sign (right upper quadrant tenderness and arrest of inspiration, cholecystitis); shifting dullness, ascites. Costovertebral angle tenderness, suprapubic tenderness.

Extremities: Cellulitis, infected decubitus ulcers or wounds; IV catheter tenderness (phlebitis), calf tenderness, Homan's sign; joint or bone tenderness (septic arthritis). Osler's nodes, Janeway's lesions (peripheral lesions of endocarditis).

Rectal: Prostate tenderness; rectal flocculence, fissures, and anal ulcers.

Pelvic/Genitourinary: Cervical discharge, cervical motion tenderness; adnexal or uterine tenderness, adnexal masses; genital herpes lesions.

Neurologic: Altered mental status.

Labs: CBC, blood C&S x 2, glucose, BUN, creatinine, UA, urine Gram stain, C&S; lumbar puncture; skin lesion cultures, bilirubin, transaminases; tuberculin skin test, Gram Strain of buffy coat

Chest X-ray; abdominal X-rays; gallium, indium scans.

Differential Diagnosis

Infectious Causes of Fever: Abscesses, mycobacterial infections (tuberculosis), cystitis, pyelonephritis, endocarditis, wound infection, diverticulitis, cholangitis, osteomyelitis, IV catheter phlebitis, sinusitis, otitis media, upper respiratory infection, pharyngitis, pelvic infection, cellulitis, hepatitis, infected decubitus ulcer, peritonitis, abdominal abscess, perirectal abscess, mastitis; viral infections, parasitic infections.

Malignancies: Lymphomas, leukemia, solid tumors, carcinomas.

Connective Tissue Diseases: Lupus, rheumatic fever, rheumatoid arthritis, temporal arteritis, sarcoidosis, polymyalgia rheumatica.

Other Causes of Fever: Atelectasis, drug fever, pulmonary emboli, pericarditis, pancreatitis, factitious fever, alcohol withdrawal. Deep vein thrombosis, myocardial infarction, gout, porphyria, thyroid storm.

Medications Associated with Fever: Barbiturates, isoniazid, nitrofurantoin, penicillins, phenytoin, procainamide, sulfonamides.

Sepsis

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of high fever and chills for one day.

History of the Present Illness: Degree of fever, time of onset, pattern of fever; shaking chills (rigors), cough, sputum, sore throat, headache, neck stiffness, dysuria, urinary frequency, back pain; night sweats; vaginal discharge, myalgias, nausea, vomiting, diarrhea, malaise, anorexia.

Chest or abdominal pain; ear, bone or joint pain.

Exposure to tuberculosis or hepatitis; travel history, animal exposure; recent dental GI procedures. IV catheter, Foley catheter; antibiotic use, alcohol, allergies.

Past Medical History: Cirrhosis, diabetes, heart murmur, recent surgery; AIDS risk factors.

Medications: Antibiotics, acetaminophen.

Social History: Alcoholism.

Physical Examination

General Appearance: Toxic appearance, altered level of consciousness. Dyspnea, apprehension, diaphoresis. Note whether the patient appears, septic, ill, or well.

Vital Signs: Temperature (fever curve), respiratory rate (tachypnea or hypoventilation), pulse (tachycardia), BP (hypotension).

Skin: Pallor, mottling, cool extremities, delayed capillary refill; rash, purpura, petechia (septic emboli, meningococcemia), ecthyma gangrenosum (purpuric necrotic plaque of Pseudomonas infection). Pustules, cellulitis, abscesses.

HEENT: Papilledema, periodontitis, tympanic membrane inflammation, sinus tenderness; pharyngeal erythema, lymphadenopathy, neck rigidity.

Breast: Tenderness, masses.

Chest: Rhonchi, crackles, dullness to percussion (pneumonia).

Heart: Murmurs (endocarditis), friction rub (pericarditis).

Abdomen: Masses, tenderness, hepatomegaly, splenomegaly; Murphy's sign (right upper quadrant tenderness and arrest of inspiration, cholecystitis); shifting dullness, ascites. Costovertebral angle tenderness, suprapubic tenderness.

Extremities: Cellulitis, infected decubitus ulcers or wounds; IV catheter tenderness (phlebitis), calf tenderness, Homan's sign; joint or bone tenderness (septic arthritis). Osler's nodes, Janeway's lesions (peripheral lesions of endocarditis).

Rectal: Prostate tenderness; rectal flocculence, fissures, and anal ulcers.

Pelvic/Genitourinary: Cervical discharge, cervical motion tenderness; adnexal or uterine tenderness, adnexal masses; genital herpes lesions.

Neurologic: Altered mental status.

Labs: CBC, blood C&S x 2, glucose, BUN, creatinine, UA, urine Gram stain, C&S; lumbar puncture; skin lesion cultures, bilirubin, transaminases; tuberculin skin test, Gram Strain of buffy coat

Chest X-ray; abdominal X-rays; gallium, indium scans.

Laboratory Tests for Serious Infections

Complete blood count, leukocyte differential and platelet count	Serum lactic acid
Electrolytes	Cultures with antibiotic sensitivities Blood, urine, wound, sputum, drains
Arterial blood gases	Chest X-ray
Blood urea nitrogen and creatinine	Adjunctive imaging studies (eg, computed tomography, magnetic resonance imaging, abdominal X-rays)
Urinalysis	
INR, partial thromboplastin time, fibrinogen	

Differential Diagnosis

Infectious Causes of Sepsis: Abscesses, mycobacterial infections (tuberculosis), pyelonephritis, endocarditis, wound infection, diverticulitis, cholangitis, osteomyelitis, IV catheter phlebitis, pelvic infection, cellulitis, infected decubitus ulcer, peritonitis, abdominal abscess, perirectal abscess, parasitic infections.

Defining sepsis and related disorders	
Term	**Definition**
Systemic inflammatory response syndrome (SIRS)	The systemic inflammatory response to a severe clinical insult manifested by ≥2 of the following conditions: Temperature >38°C or <36°C, heart rate >90 beats/min, respiratory rate >20 breaths/min or $PaCO_2$ <32 mm Hg, white blood cell count >12,000 cells/mm^3 , <4000 cells/mm^3 , or >10% band cells
Sepsis	The presence of SIRS caused by an infectious process; sepsis is considered severe if hypotension or systemic manifestations of hypoperfusion (lactic acidosis, oliguria, change in mental status) is present.
Septic shock	Sepsis-induced hypotension despite adequate fluid resuscitation, along with the presence of perfusion abnormalities that may induce lactic acidosis, oliguria, or an alteration in mental status.
Multiple organ dysfunction syndrome (MODS)	The presence of altered organ function in an acutely ill patient such that homeostasis cannot be maintained without intervention

Cough and Pneumonia

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of cough for 12 hours.

History of the Present Illness: Duration of cough, chills, rigors, fever; rate of onset of symptoms. Sputum color, quantity, consistency, blood; living situation (nursing home, homelessness). Recent antibiotic use.

Associated Symptoms: Pleuritic chest pain, dyspnea, sore throat, rhinorrhea, headache, stiff neck, ear pain; nausea, vomiting, diarrhea, myalgias, arthralgias.

Past Medical History: Previous pneumonia, intravenous drug abuse, AIDS risk factors. Diabetes, heart failure, COPD, asthma, immunosuppression, alcoholism, steroids; ill contacts, aspiration, smoking, travel history, exposure to tuberculosis, tuberculin testing. Pneumococcal vaccination.

Physical Examination

General Appearance: Respiratory distress, dehydration. Note whether the patient appears septic, ill, well, or malnourished.

Vital Signs: Temperature (fever), respiratory rate (tachypnea), pulse (tachycardia), BP (hypotension).

HEENT: Tympanic membranes, pharyngeal erythema, lymphadenopathy, neck

rigidity.

Chest: Dullness to percussion, tactile fremitus (increased sound conduction); rhonchi; end-inspiratory crackles; bronchial breath sounds with decreased intensity; whispered pectoriloquy (increased transmission of sound), egophony (E to A changes).

Extremities: Cyanosis, clubbing.

Neuro: Gag reflex, mental status, cranial nerves 2-12.

Labs: CBC, electrolytes, BUN, creatinine, glucose; UA, ECG, ABG.

Chest X-ray: Segmental consolidation, air bronchograms, atelectasis, effusion.

Sputum Gram Stain: >25 WBC per low-power field, bacteria.

Differential Diagnosis: Pneumonia, heart failure, asthma, bronchitis, viral infection, pulmonary embolism, malignancy.

Etiologic Agents of Community Acquired Pneumonia

Age 5-40 (without underlying lung disease): Viral, mycoplasma pneumoniae, Chlamydia pneumoniae, Streptococcus pneumoniae, legionella.

>40 (no underlying lung disease): Streptococcus pneumonia, group A streptococcus, H. influenza.

>40 (with underlying disease): Klebsiella pneumonia, Enterobacteriaceae, Legionella, Staphylococcus aureus, Chlamydia pneumoniae.

Aspiration Pneumonia: Streptococcus pneumoniae, Bacteroides sp, anaerobes, Klebsiella, Enterobacter.

Pneumocystis Carinii Pneumonia and AIDS

Chief Compliant: The patient is a 32 year old white male with AIDS who complains of cough for 1 day.

History of the Present Illness: Progressive exertional dyspnea and fatigue with exertion (climbing stairs). Fever, chills, insidious onset; CD4 lymphocyte count and HIV-RNA titer (viral load); duration of HIV positivity; prior episodes of PCP or opportunistic infection.

Dry nonproductive cough, night sweats. Prophylactic trimethoprim/sulfamethoxazole treatment; antiviral therapy. Baseline and admission arterial blood gas.

Associated Symptoms: Headache, stiff neck, lethargy, fatigue, weakness, malaise, weight loss, diarrhea, visual changes. Oral lesions, odynophagia (pain with swallowing), skin lesions.

Past Medical History: History of herpes simplex, toxoplasmosis, tuberculosis, hepatitis, mycobacterium avium complex, syphilis. Prior pneumococcal immunization. Mode of acquisition of HIV infection; sexual, substance use history (intravenous drugs), blood transfusion.

Medications: Antivirals, antibiotics, alternative medications.

Physical Examination

General Appearance: Cachexia, respiratory distress, cyanosis. Note whether the patient appears septic, ill, well, or malnourished.

Vital Signs: Temperature (fever), respiratory rate (tachypnea), pulse (tachycardia), BP (hypotension).

HEENT: Herpetic lesions, oropharyngeal thrush, hairy leukoplakia; oral Kaposi's sarcoma (purple-brown macules); retinitis, hemorrhages, perivascular white spots, cotton wool spots (CMV retinitis); visual field deficits (toxoplasmosis). Neck rigidity, lymphadenopathy.

Chest: Dullness, decreased breath sounds at bases, crackles, rhonchi.

Heart: Murmurs (IV drug users).

Abdomen: Right upper quadrant tenderness, hepatosplenomegaly.

Pelvic/Rectal: Candidiasis, perianal herpetic lesions, ulcers, condyloma.

Dermatologic Signs of AIDS: Rashes, Kaposi's sarcoma (multiple purple nodules or plaques), seborrheic dermatitis, zoster, herpes, molluscum contagiosum, oral thrush.

Lymph Node Examination: Lymphadenopathy.

Neuro: Confusion, disorientation (AIDS dementia complex, meningitis), motor deficits, sensory deficits, cranial nerves.

Labs: Chest X-ray: Diffuse, interstitial infiltrates.

ABG: hypoxia, increased Aa gradient. CBC, sputum gram stain, Pneumocystis immunofluorescent stain; CD4 count, HIV RNA PCR or bDNA, hepatitis surface antigen, hepatitis antibody, electrolytes. Bronchoalveolar lavage, high-resolution CT scan.

Differential Diagnosis: Pneumocystis carinii pneumonia, bacterial pneumonia, tuberculosis, Kaposi's sarcoma.

Meningitis

Chief Compliant: The patient is a 80 year old female with diabetes who complains of fever for 8 hours.

History of the Present Illness: Duration and degree of fever, chills; headache, neck stiffness; cough, sputum; lethargy, irritability (high pitched cry), altered consciousness, nausea, vomiting. Skin rashes, ill contacts, travel history.

History of pneumonia, bronchitis, otitis media, sinusitis, endocarditis.

Past Medical History: Diabetes, alcoholism, sickle cell disease, splenectomy malignancy, immunosuppression, AIDS, intravenous drug use, tuberculosis; recent upper respiratory infections.

Medications: Antibiotics, acetaminophen.

Physical Examination

General Appearance: Level of consciousness, obtundation, labored respirations. Note whether the patient appears ill, well, or septic.

Vital Signs: Temperature (fever), pulse (tachycardia), respiratory rate (tachypnea), BP (hypotension).

HEENT: Pupil reactivity, extraocular movements, papilledema. Full fontanelle in infants. Brudzinski's sign (neck flexion causes hip flexion); Kernig's sign (flexing hip and extending knee elicits resistance).

Chest: Rhonchi, crackles.

Heart: Murmurs, friction rubs, S3, S4.

Skin: Capillary refill, rashes, splinter hemorrhages of nails, Janeway's lesions (endocarditis), petechia, purpura (meningococcemia).

Neuro: Altered mental status, cranial nerve palsies, weakness, sensory deficits, Babinski's sign.

CT Scan: Increased intracranial pressure.

Labs:

CSF Tube 1 - Gram stain, culture and sensitivity, bacterial antigen screen (1-2 mL).

CSF Tube 2 - Glucose, protein (1-2 mL).

CSF Tube 3 - Cell count and differential (1-2 mL).

CBC, electrolytes, BUN, creatinine.

Differential Diagnosis: Meningitis, encephalitis, brain abscess, viral infection, tuberculosis, osteomyelitis, subarachnoid hemorrhage.

Etiology of Bacterial Meningitis

15-50 years: Streptococcus pneumoniae, Neisseria meningitis, Listeria.

>50 years or debilitated: Streptococcus pneumoniae, Neisseria meningitis, Listeria, Haemophilus influenza, Pseudomonas, streptococci.

AIDS: Cryptococcus neoformans, Toxoplasma gondii, herpes encephalitis, coccidioides.

Cerebral Spinal Fluid Analysis				
Disease	**Color**	**Protein**	**Cells**	**Glucose**
Normal CSF Fluid	Clear	<50 mg/100 mL	<5 lymphs/mm^3	>40 mg/100 mL, ½-2/3 of blood glucose level drawn at same time
Bacterial meningitis or tuberculous meningitis	Yellow opalescent	Elevated 50-1500	25-10000 WBC with predominate polys	low
Tuberculous, fungal, partially treated bacterial, syphilitic meningitis, meningeal metastases	Clear opalescent	Elevated usually <500	10-500 WBC with predominant lymphs	20-40, low
Viral meningitis, partially treated bacterial meningitis, encephalitis, toxoplasmosis	Clear opalescent	Slightly elevated or normal	10-500 WBC with predominant lymphs	Normal to low

Pyelonephritis and Urinary Tract Infection

Chief Compliant: The patient is a 50 year old female with diabetes who complains of flank pain for 8 hours.

History of the Present Illness: Dysuria, frequency (repeated voiding of small amounts), urgency; suprapubic discomfort or pain, hematuria, fever, chills, (pyelonephritis); back pain, nausea, vomiting.

History of urinary infections, renal stones or colicky pain. Recent antibiotic use, prostate enlargement. Diaphragm use.

Risk factors: Diaphragm or spermicide use, sexual intercourse, elderly, anatomic abnormality, calculi, prostatic obstruction, urinary tract instrumentation, urinary tract obstruction, catheterization.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Temperature (fever), respiratory rate, pulse, BP.

Abdomen: Suprapubic tenderness, costovertebral angle tenderness, masses.

Pelvic/Genitourinary: Urethral or vaginal discharge, cystocele.

Rectal: Prostatic hypertrophy or tenderness (prostatitis).

Labs: UA with micro. Urine Gram stain, urine C&S. CBC with differential, creatinine, electrolytes.

Pathogens: E coli, Klebsiella, Proteus, Pseudomonas, Enterobacter, Staphylococcus saprophyticus, enterococcus, group B streptococcus, Chlamydia trachomatis.

Differential Diagnosis: Acute cystitis, pyelonephritis, vulvovaginitis, gonococcal or chlamydia urethritis, herpes, cervicitis, papillary necrosis, renal calculus, appendicitis, cholecystitis, pelvic inflammatory disease.

Endocarditis

Chief Compliant: The patient is a 50 year old white male with mitral valve prolapse who complains of fever for 4 hours.

History of the Present Illness: Fever, chills, night sweats, fatigue, malaise, weight loss; pain in fingers or toes (emboli); pleuritic chest pain; skin lesions. History of heart murmur, rheumatic heart disease, heart failure, prosthetic valve.

Past Medical History: Recent dental or gastrointestinal procedure; intravenous drug use, recent intravenous catheterization; urinary tract infection; colonic disease, decubitus ulcers, wound infection. History of stroke.

Physical Examination

General Appearance: Septic appearance. Note whether the patient appears ill, well, or malnourished.

Vitals: Temperature (fever), pulse (tachycardia), BP (hypotension).

HEENT: Oral mucosal and conjunctival petechiae; Roth's spots (retinal hemorrhages with pale center, emboli).

Heart: New or worsening heart murmur.

Abdomen: Liver tenderness (abscess); splenomegaly, spinal tenderness (vertebral abscess).

Neuro: Focal neurological deficits (septic emboli), cranial nerves.

Extremities: Splinter hemorrhages under nails; Osler's nodes (tender, erythematous nodules on pads of toes or fingers); Janeway lesions (erythematous, nontender lesions on palms and soles, septic emboli), joint pain (septic arthritis).

Labs: WBC, UA (hematuria); blood cultures x 3, urine culture.

Echocardiogram: Vegetations, valvular insufficiency.

Chest X-ray: Cardiomegaly, valvular calcifications, multiple focal infiltrates.

Native Valve Pathogens: Streptococcus viridans, streptococcus bovis, enterococci, staphylococcus aureus, streptococcus pneumonia, pseudomonas, group D streptococcus.

Prosthetic Valve Pathogens: Staphylococcus aureus, Enterobacter sp., staphylococcus epidermidis.

Gastrointestinal Disorders

Abdominal Pain and the Acute Abdomen

Chief Compliant: The patient is a 50 year old white male with diabetes who complains of right lower quadrant abdominal pain for 4 hours.

History of the Present Illness: Duration of pain, pattern of progression; exact location at onset and at present; diffuse or localized; location and character at onset and at present (burning, crampy, sharp, dull); constant or intermittent ("colicky"); radiation of pain (to shoulder, back, groin); sudden or gradual onset.

Effect of eating, vomiting, defecation, flatus, urination, inspiration, movement, position on the pain. Timing and characteristics of last bowel movement. Similar episodes in past; relation to last menstrual period.

Associated Symptoms: Fever, chills, nausea, vomiting (bilious, feculent, blood, coffee ground-colored material); vomiting before or after onset of pain; jaundice, constipation, change in bowel habits or stool caliber, obstipation (inability to pass gas); chest pain, diarrhea, hematochezia (rectal bleeding), melena (black, tarry stools); dysuria, hematuria, anorexia, weight loss, dysphagia, odynophagia (painful swallowing); early satiety, trauma.

Aggravating or Relieving Factors: Fatty food intolerance, medications, aspirin, NSAID's, narcotics, anticholinergics, laxatives, antacids.

Past Medical History: History of abdominal surgery (appendectomy, cholecystectomy), hernias, gallstones; coronary disease, kidney stones; alcoholism, cirrhosis, peptic ulcer, dyspepsia. Endoscopies, X-rays, upper GI series.

Physical Examination

General Appearance: Degree of distress, body positioning to relieve pain, nutritional status. Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vitals: Temperature (fever), pulse (tachycardia), BP (hypotension), respiratory rate (tachypnea).

HEENT: Pale conjunctiva, scleral icterus, atherosclerotic retinopathy, "silver wire" arteries (ischemic colitis); flat neck veins (hypovolemia). Lymphadenopathy, Virchow node (supraclavicular mass).

Abdomen

Inspection: Scars, ecchymosis, visible peristalsis (small bowel obstruction), distension. Scaphoid, flat.

Auscultation: Absent bowel sounds (paralytic ileus or late obstruction), high-pitched rushes (obstruction), bruits (ischemic colitis).

Palpation: Begin palpation in quadrant diagonally opposite to point of maximal pain with patient's legs flexed and relaxed. Bimanual palpation

of flank (renal disease). Rebound tenderness; hepatomegaly, splenomegaly, masses; hernias (incisional, inguinal, femoral). Pulsating masses; costovertebral angle tenderness. Bulging flanks, shifting dullness, fluid wave (ascites).

Specific Signs on Palpation

Murphy's sign: Inspiratory arrest with right upper quadrant palpation, cholecystitis.

Charcot's sign: Right upper quadrant pain, jaundice, fever; gallstones.

Courvoisier's sign: Palpable, nontender gallbladder with jaundice; pancreatic malignancy.

McBurney's point tenderness: Located two thirds of the way between umbilicus and anterior superior iliac spine; appendicitis.

Iliopsoas sign: Elevation of legs against examiner's hand causes pain, retrocecal appendicitis. Obturator sign: Flexion of right thigh and external rotation of thigh causes pain in pelvic appendicitis.

Rovsing's sign: Manual pressure and release at left lower quadrant colon causes referred pain at McBurney's point; appendicitis.

Cullen's sign: Bluish periumbilical discoloration; peritoneal hemorrhage.

Grey Turner's sign: Flank ecchymoses; retroperitoneal hemorrhage.

Percussion: Loss of liver dullness (perforated viscus, free air in peritoneum); liver and spleen span by percussion.

Rectal Examination: Masses, tenderness, impacted stool; gross or occult blood.

Genital/Pelvic Examination: Cervical discharge, adnexal tenderness, uterine size, masses, cervical motion tenderness.

Extremities: Femoral pulses, popliteal pulses (absent pulses indicate ischemic colitis), edema.

Skin: Jaundice, dependent purpura (mesenteric infarction), petechia (gonococcemia).

Stigmata of Liver Disease: Spider angiomata, periumbilical collateral veins (Caput medusae), gynecomastia, ascites, hepatosplenomegaly, testicular atrophy.

Labs: CBC, electrolytes, liver function tests, amylase, lipase, UA, pregnancy test. ECG.

Chest X-ray: Free air under diaphragm, infiltrates, effusion (pancreatitis).

X-rays of abdomen (acute abdomen series): Flank stripe, subdiaphragmatic free air, distended loops of bowel, sentinel loop, air fluid levels, thumbprinting, mass effects, calcifications, fecaliths, portal vein gas, pneumatobilia.

Differential Diagnosis

Generalized Pain: Intestinal infarction, peritonitis, obstruction, diabetic ketoacidosis, sickle crisis, acute porphyria, penetrating posterior duodenal ulcer, psychogenic pain.

Right Upper Quadrant: Cholecystitis, cholangitis, hepatitis, gastritis, pancrea-

titis, hepatic metastases, gonococcal perihepatitis (Fitz-Hugh-Curtis syndrome), retrocecal appendicitis, pneumonia, peptic ulcer.

Epigastrium: Gastritis, peptic ulcer, gastroesophageal reflux disease, esophagitis, gastroenteritis, pancreatitis, perforated viscus, intestinal obstruction, ileus, myocardial infarction, aortic aneurysm.

Left Upper Quadrant: Peptic ulcer, gastritis, esophagitis, gastroesophageal reflux, pancreatitis, myocardial ischemia, pneumonia, splenic infarction, pulmonary embolus.

Left Lower Quadrant: Diverticulitis, intestinal obstruction, colitis, strangulated hernia, inflammatory bowel disease, gastroenteritis, pyelonephritis, nephrolithiasis, mesenteric lymphadenitis, mesenteric thrombosis, aortic aneurysm, volvulus, intussusception, sickle crisis, salpingitis, ovarian cyst, ectopic pregnancy, endometriosis, testicular torsion, psychogenic pain.

Right Lower Quadrant: Appendicitis, diverticulitis (redundant sigmoid) salpingitis, endometritis, endometriosis, intussusception, ectopic pregnancy, hemorrhage or rupture of ovarian cyst, renal calculus.

Hypogastric/Pelvic: Cystitis, salpingitis, ectopic pregnancy, diverticulitis, strangulated hernia, endometriosis, appendicitis, ovarian cyst torsion; bladder distension, nephrolithiasis, prostatitis, malignancy.

Nausea and Vomiting

Chief Compliant: The patient is a 50 year old white male with diabetes who complains of vomiting for 4 hours.

History of the Present Illness: Character of emesis (color, food, bilious, feculent, hematemesis, coffee ground material, projectile); abdominal pain, effect of vomiting on pain; early satiety, fever, melena, vertigo, tinnitus (labyrinthitis).

Clay colored stools, dark urine, jaundice (biliary obstruction); recent change in medications. Ingestion of spoiled food; exposure to ill contacts; dysphagia, odynophagia.

Possibility of pregnancy (last menstrual period, contraception, sexual history).

Past Medical History: Diabetes, cardiac disease, peptic ulcer, liver disease, CNS disease, headache. X-rays, upper GI series, endoscopy.

Medications Associated with Nausea: Digoxin, colchicine, theophylline, chemotherapy, anticholinergics, morphine, meperidine (Demerol), oral contraceptives, progesterone, antiarrhythmics, erythromycin, antibiotics, antidepressants.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (orthostatic hypotension), pulse (tachycardia), respiratory rate,

temperature (fever).

Skin: Pallor, jaundice, spider angiomas.

HEENT: Nystagmus, papilledema; ketone odor on breath (apple odor, diabetic ketoacidosis); jugulovenous distention or flat neck veins.

Abdomen: Scars, bowel sounds, bruits, tenderness, rebound, rigidity, distention, hepatomegaly, ascites.

Extremities: Edema, cyanosis.

Rectal: Masses, occult blood.

Labs: CBC, electrolytes, UA, amylase, lipase, LFTs, pregnancy test, four views of the abdomen series.

Differential Diagnosis: Gastroenteritis, systemic infections, medications (contraceptives, antiarrhythmics, chemotherapy, antibiotics), pregnancy, appendicitis, peptic ulcer, cholecystitis, hepatitis, intestinal obstruction, gastroesophageal reflux, gastroparesis, ileus, pancreatitis, myocardial ischemia, tumors (esophageal, gastric), increased intracranial pressure, labyrinthitis, diabetic ketoacidosis, renal failure, toxins, bulimia, psychogenic vomiting.

Anorexia and Weight Loss

Chief Compliant: The patient is a 50 year old white male with diabetes who complains of loss of appetite and weight loss for one week.

History of the Present Illness: Time of onset, amount and rate of weight loss (sudden, gradual); change in appetite, nausea, vomiting, dysphagia, abdominal pain; exacerbation of pain with eating (intestinal angina); diarrhea, fever, chills, night sweats; dental problems; restricted access to food.

Polyuria, polydipsia; skin or hair changes; 24-hour diet recall; dyspepsia, jaundice, dysuria; cough, change in bowel habits; chronic illness.

Dietary restrictions (low salt, low fat); diminished taste, malignancy, AIDS risks factors; psychiatric disease, renal disease, alcoholism, drug abuse (cocaine, amphetamines).

Physical Examination

General Appearance: Muscle wasting, cachexia. Signs of dehydration. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Pulse (bradycardia), BP, respiratory rate, temperature (hypothermia).

Skin: Pallor, jaundice, hair changes, skin laxity, cheilosis, dermatitis (Pellagra).

HEENT: Dental erosions from vomiting, oropharyngeal lesions, thyromegaly, glossitis, temporal wasting, supraclavicular adenopathy (Virchow's node).

Chest: Rhonchi, barrel shaped chest.

Heart: Murmurs, displaced PMI.

Abdomen: Scars, decreased bowel sounds, tenderness, hepatomegaly

splenomegaly. Periumbilical adenopathy, palpable masses.

Extremities: Edema, muscle wasting, lymphadenopathy, skin abrasions on fingers.

Neurologic: Decreased sensation, poor proprioception.

Rectal: Occult blood, masses.

Labs: CBC, electrolytes, protein, albumin, pre-albumin, transferrin, thyroid studies, LFTs, toxicology screen.

Differential Diagnosis: Inadequate caloric intake, peptic ulcer, depression, anorexia nervosa, dementia, hyper/hypothyroidism, cardiopulmonary disease, narcotics, diminished taste, diminished olfaction, poor dental hygiene (loose dentures), cholelithiasis, malignancy (gastric carcinoma), gastritis, hepatic or renal failure, infection, alcohol abuse, AIDS.

Diarrhea

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of diarrhea for two days.

History of the Present Illness: Rate of onset, duration, frequency. Volume of stool output (number of stools per day), watery stools; fever. Abdominal cramps, bloating, flatulence, tenesmus (painful urge to defecate), anorexia, nausea, vomiting, bloating; myalgias, arthralgias, weight loss.

Stool Appearance: Buoyancy, blood or mucus, oily, foul odor.

Recent ingestion of spoiled poultry (salmonella), milk, seafood (shrimp, shellfish; Vibrio parahaemolyticus); common sources (restaurants), travel history, laxative abuse.

Ill contacts with diarrhea, inflammatory bowel disease; family history of celiac disease.

Past Medical History: Sexual exposures, immunosuppressive agents, AIDS risk factors, coronary artery disease, peripheral vascular disease (ischemic colitis). Exacerbation by stress.

Medications Associated with Diarrhea: Laxatives, magnesium-containing antacids, sulfa drugs, antibiotics (erythromycin, clindamycin), cholinergic agents, colchicine, milk (lactase deficiency), gum (sorbitol).

Physical Examination

General Appearance: Signs of dehydration or malnutrition. Septic appearance. Note whether the patient appears ill or well.

Vital Signs: BP (orthostatic hypotension), pulse (tachycardia), respiratory rate, temperature (fever).

Skin: Decreased skin turgor, skin mottling, delayed capillary refill, jaundice.

HEENT: Oral ulcers (inflammatory bowel or celiac disease), dry mucous membranes, cheilosis (cracked lips, riboflavin deficiency); glossitis (B12, folate deficiency). Oropharyngeal candidiasis (AIDS).

Abdomen: Hyperactive bowel sounds, tenderness, rebound, guarding, rigidity (peritoneal signs), distention, hepatomegaly, bruits (ischemic colitis).

Extremities: Arthritis (ulcerative colitis). Absent peripheral pulses, bruits (ischemic colitis).

Rectal: Perianal ulcers, sphincter tone, tenderness, masses, occult blood.

Neuro: Mental status changes. Peripheral neuropathy (B6, B12 deficiency), decreased perianal sensation, sphincter reflex.

Labs: Electrolytes, Wright's stain for fecal leucocytes; cultures for enteric pathogens, ova and parasites x 3; clostridium difficile toxin. CBC with differential, calcium, albumin, flexible sigmoidoscopy.

Abdominal X-ray: Air fluid levels, dilation, pancreatic calcifications.

Differential Diagnosis

Acute Infectious Diarrhea: Infectious diarrhea (salmonella, shigella, E coli, Campylobacter, Bacillus cereus), enteric viruses (rotavirus, Norwalk virus), traveler's diarrhea, antibiotic-related diarrhea

Chronic Diarrhea:

Osmotic Diarrhea: Laxatives, lactulose, lactase deficiency (gastroenteritis, sprue), other disaccharidase deficiencies, ingestion of mannitol, sorbitol, enteral feeding.

Secretory Diarrhea: Bacterial enterotoxins, viral infection; AIDS-associated disorders (mycobacterial, HIV enteropathy), Zollinger-Ellison syndrome, vasoactive intestinal peptide tumor, carcinoid tumors, medullary thyroid cancer, colonic villus adenoma.

Exudative Diarrhea: Bacterial infection, Clostridium difficile, parasites, Crohn's disease, ulcerative colitis, diverticulitis, intestinal ischemia, diverticulitis.

Diarrhea Secondary to Altered Intestinal Motility: Diabetic gastroparesis, hyperthyroidism, laxatives, cholinergics, irritable bowel syndrome, bacterial overgrowth, constipation-related diarrhea.

Hematemesis and Upper Gastrointestinal Bleeding

Chief Compliant: The patient is a 50 year old white male with peptic ulcer disease who complains of emesis of blood for 4 hours.

History of the Present Illness: Duration and frequency of hematemesis (bright red blood, coffee ground material), volume of blood, hematocrit. Forceful retching prior to hematemesis (Mallory-Weiss tear).

Abdominal pain, melena, hematochezia (bright red blood per rectum); history of peptic ulcer, esophagitis, prior bleeding episodes. Nose bleeds, syncope, lightheadedness, nausea.

Ingestion of alcohol. Weight loss, malaise, fatigue, anorexia, early satiety, jaundice.

Nasogastric aspirate quantity and character; transfusions given previously.

Past Medical History: Liver or renal disease, hepatic encephalopathy, esophageal varices, aortic surgery. **Past Testing:** X-ray studies, endoscopy. **Past Treatment:** Endoscopic sclerotherapy, shunt surgery.

Medications: Aspirin, nonsteroidal anti-inflammatory drugs, steroids, anticoagulants.

Family History: Liver disease or bleeding disorders.

Physical Examination

General Appearance: Pallor, diaphoresis, cold extremities, confusion. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Supine and upright pulse and blood pressure (orthostatic hypotension; resting tachycardia indicates a 10% blood volume loss; postural hypotension indicates a 20-30% blood loss); oliguria (<20 mL of urine per hour), temperature.

Skin: Delayed capillary refill, pallor, petechiae. Stigmata of liver disease (jaundice, umbilical venous collaterals [caput medusae], spider angiomas, parotid gland hypertrophy). Hemorrhagic telangiectasia (Osler-Weber-Rendu syndrome), abnormal pigmentation (Peutz-Jeghers syndrome); purple-brown nodules (Kaposi's sarcoma).

HEENT: Scleral pallor, oral telangiectasia, flat neck veins.

Chest: Gynecomastia (cirrhosis), breast masses (metastatic disease).

Heart: Systolic ejection murmur.

Abdomen: Scars, tenderness, rebound, masses, splenomegaly, hepatic atrophy (cirrhosis), liver nodules. Ascites, dilated abdominal veins.

Extremities: Dupuytren's contracture (palmar contractures, cirrhosis), edema.

Neuro: Decreased mental status, confusion, poor memory, asterixis (flapping wrists, hepatic encephalopathy).

Genitourinary/Rectal: Gross or occult blood, masses, testicular atrophy.

Labs: CBC, platelets, electrolytes, BUN (elevation suggests upper GI bleed), glucose, INR/PTT, ECG. Endoscopy, nuclear scan, angiography.

Differential Diagnosis of Upper GI Bleeding: Gastric or duodenal ulcer, esophageal varices, Mallory Weiss tear (gastroesophageal junction tear due to vomiting or retching), gastritis, esophagitis, swallowed blood (nose bleed, oral lesion), duodenitis, gastric cancer, vascular ectasias, coagulopathy, hypertrophic gastropathy (Menetrier's disease), aorto-enteric fistula.

Melena and Lower Gastrointestinal Bleeding

Chief Compliant: The patient is a 50 year old white male with diverticulosis who complains of rectal bleeding for 8 hours.

History of the Present Illness: Duration, quantity, color of bleeding (gross blood, streaks on stool, melena), recent hematocrit. Change in bowel habits or stool caliber, abdominal pain, fever. Constipation, diarrhea, anorectal pain. Epistaxis, anorexia, weight loss, malaise, vomiting. Color of nasogastric aspirate.

Fecal mucus, tenesmus (straining during defecation), lightheadedness.

Past Medical History: Diverticulosis, hemorrhoids, colitis, peptic ulcer, hematemesis, bleeding disease, coronary or renal disease, cirrhosis, alcoholism, easy bruising.

Medications: Anticoagulants, aspirin, NSAIDS.

Past Testing: Barium enema, colonoscopy, sigmoidoscopy, upper GI series.

Physical Examination

General Appearance: Signs of dehydration, pallor. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP, pulse (orthostatic hypotension), respiratory rate, temperature (tachycardia), oliguria.

Skin: Cold, clammy skin; delayed capillary refill, pallor, jaundice. Stigmata of liver disease: Umbilical venous collaterals (Caput medusae), jaundice, spider angiomata, parotid gland hypertrophy, gynecomastia. Rashes, purpura, buccal mucosa discolorations or pigmentation (Henoch-Schönlein purpura or Peutz-Jeghers polyposis syndrome).

HEENT: Atherosclerotic retinal disease, “silver wire” arteries (ischemic colitis).

Heart: Systolic ejection murmurs, atrial fibrillation (mesenteric emboli).

Abdomen: Scars, bruits, masses, distention, rebound tenderness, hernias, liver atrophy (cirrhosis), splenomegaly. Ascites, pulsatile masses (aortic aneurysm).

Genitourinary: Testicular atrophy.

Extremities: Cold, pale extremities.

Neuro: Decreased mental status, confusion, asterixis (flapping hand tremor; hepatic encephalopathy).

Rectal: Gross or occult blood, masses, hemorrhoids; fissures, polyps, ulcers.

Labs: CBC (anemia), liver function tests, ammonia level. Abdominal X-ray series (thumbprinting, air fluid levels).

Differential Diagnosis of Lower Gastrointestinal Bleeding: Hemorrhoids, fissures, diverticulosis, upper GI bleeding, rectal trauma, inflammatory bowel disease, infectious colitis, ischemic colitis, bleeding polyps, carcinoma, angiodysplasias, intussusception, coagulopathies, Meckel's diverticulitis, epistaxis, endometriosis, aortoenteric fistula.

Cholecystitis

Chief Compliant: The patient is a 50 year old white male with obesity who complains of right upper quadrant pain for 6 hours.

History of the Present Illness: Biliary colic (constant right upper quadrant pain, 30-90 minutes after meals, lasting several hours). Radiation to epigastrium, scapula or back; nausea, vomiting, anorexia, low-grade fever; fatty food intolerance, dark urine, clay colored stools; bloating, jaundice, early satiety, flatulence, obesity.

Previous epigastric pain, gallstones, alcohol.

Past Medical History: Fasting, weight loss, hyperalimentation, estrogen, pregnancy, diabetes, sickle cell anemia, hereditary spherocytosis. **Prior Testing:** Ultrasounds, HIDA scans, endoscopies.

Causes of Cholesterol Stones: Hereditary, pregnancy, exogenous steroids, diabetes, Crohn's disease; rapid weight loss, hyperalimentation.

Causes of Pigment Stones: Asians with biliary parasites, sickle cell anemia, hereditary spherocytosis, cirrhosis.

Physical Examination

General Appearance: Obese, restless patient unable to find a comfortable position. Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Pulse (mild tachycardia), temperature (low-grade fever), respiratory rate (shallow respirations), BP.

Skin: Jaundice, capillary refill.

HEENT: Scleral icterus, sublingual jaundice.

Abdomen: Epigastric or right upper quadrant tenderness, Murphy's sign (tenderness and inspiratory arrest during palpation of RUQ); firm tender, sausage-like mass in RUQ (enlarged gallbladder); guarding, rigidity, rebound (peritoneal signs); Charcot's sign (intermittent right upper quadrant abdominal pain, jaundice, fever).

Labs: Ultrasound, HIDA (radionuclide) scan, WBC, hyperbilirubinemia, alkaline phosphatase, AST, amylase.

Plain Abdominal X-ray: Increased gallbladder shadow, gallbladder calcifications; air in gallbladder wall (emphysematous cholecystitis), small bowel obstruction (gallstone ileus).

Differential Diagnosis: Calculus cholecystitis, cholangitis, peptic ulcer, pancreatitis, appendicitis, gastroesophageal reflux disease, hepatitis, nephrolithiasis, pyelonephritis, hepatic metastases, gonococcal perihepatitis (Fitz-Hugh-Curtis syndrome), pleurisy, pneumonia, angina, herpes zoster.

Jaundice and Hepatitis

Chief Compliant: The patient is a 50 year old white male with alcoholism who complains of jaundice for 3 days.

History of the Present Illness: Dull right upper quadrant pain, anorexia, jaundice, nausea, vomiting, fever, dark urine, increased abdominal girth (ascites), pruritus, arthralgias, urticarial rash; somnolence (hepatic encephalopathy). Weight loss, melena, hematochezia, hematemesis.

IV drug abuse, alcoholism, exposure to hepatitis or jaundiced persons, blood transfusion, day care centers, foreign travel; prior hepatitis immunization.

Past Medical History: Heart failure, sepsis. **Prior Testing:** Hepatitis serologies, liver function tests, liver biopsy.

Medications: Hepatotoxins: Acetaminophen, isoniazid, nitrofurantoin, methotrexate, sulfonamides, NSAIDS, phenytoin.

Family History: Jaundice, liver disease.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Pulse, BP, respiratory rate, temperature (fever).

Skin: Jaundice, needle tracks, sclerotic veins from intravenous injections, urticaria, spider angiomas, bronze skin discoloration (hemochromatosis).

HEENT: Scleral icterus, sublingual jaundice, lymphadenopathy, Kayser-Fleischer rings (bronze corneal pigmentation, Wilson's disease).

Chest: Gynecomastia, Murphy's sign (inspiratory arrest with palpation of the right upper quadrant).

Abdomen: Scars, bowel sounds, right upper quadrant tenderness; liver span, hepatomegaly; liver margin texture (blunt, irregular, firm), splenomegaly (hepatitis) or hepatic atrophy (cirrhosis), ascites. Umbilical venous collaterals (Caput medusae). Courvoisier's sign (palpable nontender gallbladder with jaundice; pancreatic or biliary malignancy).

Genitourinary: Testicular atrophy.

Extremities: Joint tenderness, palmar erythema, Dupuytren's contracture (fibrotic palmar ridge).

Neuro: Disorientation, confusion, asterixis (flapping tremor when wrists are hyperextended, encephalopathy).

Rectal: Occult blood, hemorrhoids.

Labs: CBC with differential, LFTs, amylase, lipase, hepatitis serologies (hepatitis B surface antibody, hepatitis B surface antigen, hepatitis A IgM, hepatitis C antibody), antimitochondrial antibody (primary biliary cirrhosis), ANA, ceruloplasmin, urine copper (Wilson's disease), alpha-1-antitrypsin deficiency, drug screen, serum iron, TIBC, ferritin (hemochromatosis), liver biopsy.

Differential Diagnosis of Jaundice

Extrahepatic Causes of Jaundice: Biliary tract disease (gallstone, stricture, cancer), infections (parasites, HIV, CMV, microsporidia); pancreatitis, pancreatic cancer.

Intrahepatic Causes of Jaundice: Viral hepatitis, medication-related hepatitis, acute fatty liver of pregnancy, alcoholic hepatitis, cirrhosis, primary biliary cirrhosis, autoimmune hepatitis, Wilson's disease, right heart failure, total parenteral nutrition; Dubin Johnson syndrome, Rotor's syndrome (direct hyperbilirubinemia); Gilbert's syndrome, Crigler-Niger syndrome (indirect); sclerosing cholangitis, sarcoidosis, amyloidosis, tumor.

Cirrhosis

Chief Compliant: The patient is a 50 year old white male with alcoholism who complains of jaundice for one week.

History of the Present Illness: Jaundice, anorexia, nausea; abdominal distension, abdominal pain, increased abdominal girth (ascites); vomiting, diarrhea, fatigue. Somnolence, confusion (encephalopathy). Alcohol use, viral hepatitis, blood transfusion, IV drug use.

Precipitating Factors of Encephalopathy: Gastrointestinal bleeding, high protein intake, constipation, azotemia, CNS depressants.

Medications Associated with Hepatotoxicity: Acetaminophen, isoniazid, nitrofurantoin, methotrexate, sulfonamides, NSAIDS, phenytoin.

Physical Examination

General Appearance: Muscle wasting, fetor hepaticas (malodorous breath). Note whether the patient appears ill, well, or malnourished.

Vital Signs: Pulse, BP, temperature (fever), respiratory rate.

Skin: Jaundice, spider angiomas (stellate, erythematous arterioles), palmar erythema; bronze skin discoloration (hemochromatosis), purpura, loss of body hair.

HEENT: Kayser-Fleischer rings (bronze corneal pigmentation, Wilson's disease), jugulovenous distention (fluid overload). Parotid enlargement, scleral icterus, gingival hemorrhage (thrombocytopenia).

Chest: Bibasilar crackles, gynecomastia.

Abdomen: Bulging flanks, tenderness, rebound (peritonitis); fluid wave, shifting dullness, "puddle sign" (flick over lower abdomen while auscultating for dullness). Courvoisier's sign (palpable nontender gallbladder with jaundice; pancreatic malignancy); atrophic liver; liver texture (blunt, irregular, firm), splenomegaly. Umbilical or groin hernias (ascites).

Genitourinary: Scrotal edema, testicular atrophy.

Extremities: Lower extremity edema.

Neuro: Confusion, asterixis (jerking movement of hand with wrist hyperexten-

sion; hepatic encephalopathy).

Rectal: Occult blood, hemorrhoids.

Stigmata of Liver Disease: Spider angiomas (stellate, red arterioles), jaundice, bronze discoloration (hemochromatosis), dilated periumbilical collateral veins (Caput medusae), ecchymoses, umbilical eversion, venous hum and thrill at umbilicus (Cruveilhier-Baumgarten syndrome); palmar erythema, Dupuytren's contracture (fibrotic palmar ridge to ring finger). Lacrimal and parotid gland enlargement, testicular atrophy, gynecomastia, ascites, encephalopathy, edema.

Labs: CBC, electrolytes, LFTs, albumin, INR/PTT, liver function tests, bilirubin, UA. Hepatitis serologies, antimitochondrial, antibody (primary biliary cirrhosis), ANA, anti-Smith antibody, ceruloplasmin, urine copper (Wilson's disease), alpha-1-antitrypsin, serum iron, TIBC, ferritin (hemochromatosis).

Abdominal X-ray: Hepatic angle sign (loss of lower margin of right lateral liver angle), separation or centralization of bowel loops, generalized abdominal haziness (ascites). Ultrasound, paracentesis.

Differential Diagnosis of Cirrhosis: Alcoholic liver disease, viral hepatitis (B, C, D), hemochromatosis, primary biliary cirrhosis, autoimmune hepatitis, inborn error of metabolism (Crigler Najjar syndrome; Wilson's disease, alpha-1-antitrypsin deficiency), heart failure, venous outflow obstruction (Budd-Chiari, portal vein thrombus).

Evaluation of Ascites Fluid						
Etiology	**Appearance**	**Protein**	**Serum/fluid albumen ratio**	**RBC**	**WBC**	**Other**
Cirrhosis	Straw	<3 g/dL	>1.1	low	<250 cells/mm^3	
Spontaneous Bacterial Peritonitis	Cloudy	<3	>1.1	low	>250 polys	Bacteria on gram stain and culture
Secondary Bacterial Peritonitis	Purulent	>3	<1.1	low	>10000	Bacteria on gram stain and culture
Neoplasm	Straw/bloody	>3	varies	high	>1000 lymphs	Malignant cells on cytology; triglycerides
Tuberculosis	Clear	>3	<1.1	low-high	>1000 lymphs	Acid fast bacilli
Heart Failure	Straw	>3	>1.1	low	<1000	
Pancreatitis	Turbid	>3	<1.1	varies	varies	Elevated amylase, lipase

Pancreatitis

Chief Compliant: The patient is a 50 year old white male with alcoholism who complains of abdominal pain for 4 hours.

History of the Present Illness: Constant, dull, boring, mid-epigastric or left upper quadrant pain; radiation to the mid-back; exacerbated by supine position, relieved by sitting with knees drawn up; nausea, vomiting, low-grade fever, rigors, jaundice, anorexia, dyspnea; elevated amylase.

Precipitating Factors: Alcohol, gallstones, trauma, postoperative pancreatitis, retrograde cholangiopancreatography, hypertriglyceridemia, hypercalcemia, renal failure, Coxsackie virus or mumps infection, mycoplasma infection. Lupus, vasculitis, penetration of peptic ulcer, scorpion stings, tumor.

Medications Associated with Pancreatitis: Sulfonamides, thiazides, dideoxyinosine (DDI), furosemide, tetracycline, estrogen, azathioprine, valproate, pentamidine.

Physical Examination

General Appearance: Signs of volume depletion, tachypnea. Septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Temperature (low-grade fever), pulse (tachycardia), BP (hypotension), respirations (tachypnea).

Chest: Crackles, left lower lobe dullness (pleural effusion).

HEENT: Scleral icterus, Chvostek's sign (taping cheek results in facial spasm, hypocalcemia).

Skin: Jaundice, subcutaneous fat necrosis (erythematous skin nodules on legs and ankles); palpable purpura (polyarteritis nodosum).

Abdomen: Epigastric tenderness, distension; rigidity, rebound, guarding, hypoactive bowel sounds; upper abdominal mass; Cullen's sign (periumbilical bluish discoloration from hemoperitoneum), Grey-Turner's sign (bluish flank discoloration from retroperitoneal hemorrhage).

Extremities: Peripheral edema, anasarca.

Labs: Amylase, lipase, calcium, WBC, triglycerides, glucose, AST, LDL, UA.

Abdomen X-Rays: Ileus, pancreatic calcifications, obscure psoas margins, displaced or atonic stomach. Colon cutoff sign (spasm of splenic flexure with no distal colonic gas), diffuse ground-glass appearance (ascites).

Chest X-ray: Left plural effusion.

Ultrasound: Gallstones, pancreatic edema or enlargement.

CT Scan with Oral Contrast: Pancreatic phlegmon, pseudocyst, abscess.

Ranson's Criteria of Pancreatitis Severity:

Early criteria: Age >55; WBC >16,000; glucose >200; LDH >350 IU/L; AST >250.

During initial 48 hours: Hematocrit decrease >10%; BUN increase >5; arterial pO_2 <60 mmHg; base deficit >4 mEq/L; calcium <8; estimated fluid sequestration >6 L.

Differential Diagnosis of Midepigastric Pain: Pancreatitis, peptic ulcer, cholecystitis, hepatitis, bowel obstruction, mesenteric ischemia, renal colic, aortic dissection, pneumonia, myocardial ischemia.

Disorders Associated with Pancreatitis: Alcoholic pancreatitis, gallstone pancreatitis, penetrating peptic ulcer, trauma, medications, hyperlipidemia, hypercalcemia, viral infections, pancreatic divisum, familial pancreatitis, pancreatic malignancy, methyl alcohol, scorpion stings, endoscopic retrograde cholangiopancreatography, vasculitis.

Gastritis and Peptic Ulcer Disease

Chief Compliant: The patient is a 50 year old white male with arthritis who complains of abdominal pain for two days.

History of the Present Illness: Recurrent, dull, burning, epigastric pain; 1-3 hours after meals; relieved by or worsen by food; worse when supine or reclining; relieved by antacids; awakens patient at night or in early morning. Pain may radiate to back; nausea, vomiting, weight loss, coffee ground hematemesis; melena. Alcohol, salicylates, nonsteroidal anti-inflammatory drugs.

Past Medical History: Endoscopy, upper GI series; history of previous ulcer disease and Helicobacter pylori (HP) therapy, surgery.

Physical Examination

General Appearance: Mild distress. Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: Pulse (tachycardia), BP (orthostatic hypotension), respiratory rate, temperature.

Skin: Pallor, delayed capillary refill.

Abdomen: Scars, mild to moderate epigastric tenderness; rebound, rigidity, guarding (perforated ulcer), bowel sounds.

Rectal: Occult blood.

Labs: CBC, electrolytes, BUN, amylase, lipase. Abdominal X-ray series, endoscopy.

Differential Diagnosis: Pancreatitis, gastritis, gastroenteritis, perforating ulcer, intestinal obstruction, mesenteric thrombosis, aortic aneurysm, gastroesophageal reflux disease, non-ulcer dyspepsia, hepatitis, cholecystitis.

Mesenteric Ischemia and Infarction

Chief Compliant: The patient is a 50 year old white male with coronary heart disease who complains of abdominal pain for 6 hours.

History of the Present Illness: Sudden onset of severe, poorly localized, periumbilical pain; pain is postprandial and may be relieved by nitroglycerine; episodes of bloody diarrhea, nausea, vomiting, food aversion, weight loss.

Pain out of proportion to the physical findings may be the only presenting symptom.

Past Medical History: Peripheral arterial occlusive disease, claudication, chest pain, angina, myocardial infarction, atrial fibrillation, hypertension, hypercholesterolemia, diabetes, heart failure.

Medications: Nitroglycerine, beta-blockers, aspirin.

Physical Examination

General Appearance: Lethargy, mild to moderate distress. Signs of dehydration, septic appearance. Note whether the patient appears "cachectic," ill, well, or malnourished.

Vitals: Pulse, BP (orthostatic hypotension), pulse (tachycardia), respiratory rate, temperature.

HEENT: Atherosclerotic retinopathy, "silver wire" arteries; carotid bruits (mesenteric ischemia).

Skin: Cold, clammy skin, pallor, delayed capillary refill.

Abdomen: Initially hyperactive bowel sounds, then absent bowel sounds; rebound tenderness, distention, guarding, rigidity (peritoneal signs), pulsatile masses (aortic aneurysm), abdominal bruit.

Extremities: Weak peripheral pulses, femoral bruits; asymmetric pulses (atherosclerotic disease).

Rectal: Occult or gross blood.

Labs: CBC, electrolytes, leukocytosis, hyperamylasemia. Hemoconcentration, prerenal azotemia, metabolic acidosis.

Chest X-ray: Free air under diaphragm (perforated viscus). Abdominal X-ray: "thumb-printing" (edema of intestinal wall), portal vein gas. Bowel wall gas (colonic ischemia, nonocclusive); angiogram.

Differential Diagnosis: Mesenteric ischemia, mesenteric infarction, appendicitis, peritonitis,, acute cholecystitis, perforated viscus, peptic ulcer, gastroenteritis, pancreatitis, bowel obstruction, carcinoma, ruptured aortic aneurysm.

Intestinal Obstruction

Chief Compliant: The patient is a 50 year old white male with colon cancer who complains of abdominal pain for 6 hours.

History of the Present Illness: Vomiting (bilious, feculent, bloody), nausea, obstipation, distention, crampy abdominal pain. Initially crampy or colicky pain with exacerbations every 5-10 minutes. Pain becomes diffuse with fever. Hernias, previous abdominal surgery, use of opiates, anticholinergics, antipsychotics, gallstones; colon cancer; history of constipation, recent weight loss.

Pain localizes to periumbilical region in small bowel obstruction and localizes to lower abdomen in large bowel obstruction.

Physical Examination

General Appearance: Severe distress, signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypotension), pulse (tachycardia), respiratory rate, temperature (fever).

Skin: Cold, clammy skin, pallor.

Abdomen: Hernias (incisional, inguinal, femoral, umbilical), scars (intraabdominal adhesions). Tenderness, rebound, rigidity, tender mass, distention, bruits.

Bowel Sounds: High pitch rushes and tinkles coinciding with cramping (early) or absent bowel sounds (late).

Rectal: Gross blood, masses.

Labs: Leucocytosis, elevated BUN and creatinine, electrolytes; hypokalemic metabolic alkalosis due to vomiting, hyperamylasemia.

Abdominal X-rays: Dilated loops of small or large bowel, air-fluid levels, ladder pattern of dilated loops of bowel in the mid-abdomen. Colonic distention with haustral markings.

Causes of Small Bowel Obstruction: Adhesions (previous surgery), hernias, strictures from inflammatory processes; superior mesenteric artery syndrome, gallstone ileus. Ischemia, small bowel tumors, metastatic cancer.

Causes of Large Bowel Obstruction: Colon cancer, volvulus, diverticulitis, adynamic ileus, mesenteric ischemia, Ogilvie's syndrome (chronic pseudo-obstruction); narcotic ileus.

Differential Diagnosis: Cholecystitis, peptic ulcer, gastritis, gastroenteritis, peritonitis, sickle crisis, cancer, pancreatitis, renal colic, myocardial infarction.

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Gynecologic Disorders

Amenorrhea

Chief Compliant: The patient is a 24 year old female with anorexia nervosa who complains of amenorrhea for 3 months.

History of the Present Illness: Primary amenorrhea (absence of menses by age 16) or secondary amenorrhea (cessation of menses after previously normal menstruation). Age of menarche, last menstrual period. Menstrual pattern, timing of breast and pubic hair development, sexual activity, possibility of pregnancy, pregnancy testing.

Life style changes, dieting and excessive exercise, medications (contraceptives) or drugs (marijuana), psychologic stress.

Hot flushes and night sweats (hypoestrogenism), galactorrhea (prolactinoma).

History of dilation and curettage, postpartum infection (Asherman's syndrome), history of severe hemorrhage (Sheehan's syndrome), obesity, weight gain or loss, headaches, visual disturbances, thyroid symptoms; symptoms of pregnancy (nausea, breast tenderness).

Past Medical History: Pregnancy complications, radiation therapy, chemotherapy.

Medications: phenothiazines, antidepressants.

Physical Examination

General Appearance: Secondary sexual characteristics, body habitus, obesity, signs of hyperthyroidism (tremor) or hypothyroidism (bradycardia, cool dry skin, hypothermia, brittle hair). Note whether the patient appears ill, well, or malnourished.

HEENT: Acne, hirsutism, temporal balding, deepening of the voice (hyperandrogenism), thyroid enlargement or nodules.

Chest: Galactorrhea, Tanner stage of breast development, breast atrophy.

Abdomen: Abdominal striae (Cushing's syndrome).

Gyn: Pubic hair distribution; inguinal or labial masses, clitoromegaly, imperforate hymen, vaginal septum, vaginal atrophy, uterine enlargement, ovarian cysts or tumors.

Neuro: Visual field defects, cranial nerve palsies, focal motor deficits, .

Labs: Pregnancy test, prolactin, TSH, FSH, LH. Progesterone-estrogen challenge test.

Differential Diagnosis of Amenorrhea	
Pregnancy	**Outflow tract-related**
Hormonal contraception	Imperforate hymen
Hypothalamic-related	Transverse vaginal septum
Chronic or systemic illness	Agenesis of the vagina, cervix, uterus
Stress	Uterine synechiae
Athletics	**Androgen excess**
Eating disorder	Polycystic ovarian syndrome
Obesity	Adrenal tumor
Drugs	Adrenal hyperplasia (classic and nonclassic)
Tumor	Ovarian tumor
Pituitary-related	**Other endocrine causes**
Hypopituitarism	Thyroid disease
Tumor	Cushing syndrome
Infiltration	
Infarction	
Ovarian-related	
Dysgenesis	
Agenesis	
Ovarian failure	

Abnormal Uterine Bleeding

Chief Compliant: The patient is a 24 year old female who complains of abnormal vaginal bleeding for two weeks.

History of the Present Illness: Last menstrual period, age of menarche; regularity, duration and frequency of menses; amount of bleeding, number of pads per day; passage of clots; postcoital bleeding, intermenstrual bleeding; abdominal pain, fever, lightheadedness, sexually active, possibility of pregnancy, birth control method, hormonal contraception.

Psychologic stress, weight changes, exercise. Changes in hair or skin texture or distribution

Molimina symptoms of pregnancy (premenstrual breast tenderness, bloating, dysmenorrhea).

Past Medical History: Obstetrical history. Thyroid, renal, or hepatic diseases, coagulopathies. Adenomyosis, endometriosis, fibroids. Dental bleeding, endometrial biopsies.

Family History: Coagulopathies, endocrine disorders.

Physical Examination

General Appearance: Assess rate of bleeding. Note whether the patient appears ill or well; obesity.

Vital Signs: Assess hemodynamic stability, tachycardia, hypotension, orthostatic vitals; signs of shock.

Skin: Pallor, hirsutism, petechiae, skin and hair changes; fine thinning hair (hypothyroidism),

HEENT: Thyroid enlargement

Chest: Breast development by Tanner staging, galactorrhea..

Gyn: Pubic hair distribution. Cervical motion tenderness, adnexal tenderness, uterine size, cervical lesions. Cervical lesions should be biopsied.

Labs: CBC, platelets; serum pregnancy test; gonococcal culture, Chlamydia test, endometrial sampling. INR/PTT, bleeding time, type and screen.

Differential Diagnosis

Pregnancy-related. Ectopic pregnancy, abortion

Hormonal contraception. Oral contraceptive pills

Hypothalamic-related. Dieting, chronic illness, stress, excessive exercise, eating disorders, obesity, drugs

Pituitary-related. Prolactinoma

Outflow tract-related. Trauma, foreign body, vaginal tumor, cervical carcinoma, endometrial polyp, uterine myoma, uterine carcinoma, intrauterine device

Androgen excess. Polycystic ovarian syndrome, adrenal tumor, ovarian tumor, adrenal hyperplasia

Other endocrine causes. Thyroid disease, adrenal disease

Hematologic-related. Thrombocytopenia, clotting factor deficiencies, thrombocytopenia, anticoagulant medications

Infectious causes. Pelvic inflammatory disease, cervicitis

Pelvic Pain and Ectopic Pregnancy

Chief Compliant: The patient is a 50 year old female with hypertension who complains of chest pain for 4 hours.

History of the Present Illness: Positive pregnancy test, missed menstrual period, pelvic or abdominal pain (bilateral or unilateral), symptoms of pregnancy (nausea, breast tenderness); abnormal vaginal bleeding (quantify). Last menstrual period, menstrual interval, duration, age of menarche, obstetrical history.

Characteristics of pelvic pain; onset, duration; shoulder pain. Rupture of ectopic pregnancy usually occurs 6-12 weeks after last menstrual period. Current sexual activity and practices.

Associated Symptoms: Fever, vaginal discharge, dysuria, gastrointestinal symptoms, fever.

Risk Factors for Ectopic Pregnancy: Multiparity, pelvic inflammatory disease, tubal surgery, previous pelvic surgery, previous ectopic, and intrauterine device (IUD) use

Past Medical History: Surgical history, gynecologic history, sexually transmit-

ted diseases, Chlamydia, gonorrhea, infertility.

Medications: Method of Contraception: Oral contraceptives or barrier method, intrauterine device (IUD).

Physical Examination

General Appearance: Moderate to severe distress. Septic appearance. Note whether the patient appears ill, well, or distressed.

Vital Signs: BP (hypotension), pulse (tachycardia), respiratory rate, temperature (low fever).

Skin: Cold clammy skin, pallor, delayed capillary refill.

Abdomen: Cullen's sign (periumbilical darkening, intraabdominal bleeding), local then generalized tenderness, rebound (peritoneal signs).

Pelvic: Cervical discharge, cervical motion tenderness; Chadwick's sign (cervical cyanosis; pregnancy); Hegar's sign (softening of uterine isthmus; pregnancy); enlarged uterus; tender adnexal mass or cul-de-sac fullness.

Labs: Quantitative beta-HCG, transvaginal ultrasound. Type and hold, Rh, CBC, UA with micro; GC, chlamydia culture.

Differential Diagnosis of Pelvic Pain

Pregnancy-Related Causes. Ectopic pregnancy, abortion (spontaneous, threatened, or incomplete), intrauterine pregnancy with corpus luteum bleeding.

Gynecologic Disorders. Pelvic inflammatory disease, endometriosis, ovarian cyst hemorrhage or rupture, adnexal torsion, Mittelschmerz, uterine leiomyoma torsion, primary dysmenorrhea, tumor.

Non-reproductive Tract Causes

Gastrointestinal. Appendicitis, inflammatory bowel disease, mesenteric adenitis, irritable bowel syndrome, diverticulitis.

Urinary Tract. Urinary tract infection, renal calculus.

Neurologic Disorders

Headache

Chief Compliant: The patient is a 50 year old female with hypertension who complains of chest pain for 4 hours.

History of the Present Illness: Quality of pain (dull, band-like, sharp, throbbing), location (retro-orbital, temporal, suboccipital, bilateral or unilateral), time course of typical headache episode; onset (gradual or sudden); exacerbating or relieving factors; time of day, effect of supine position.

Age at onset of headaches; change in severity, frequency; awakening from sleep; analgesic or codeine use; family history of migraine. "The worst headache ever" (subarachnoid hemorrhage).

Aura or Prodrome: Visual scotomata, blurred vision; nausea, vomiting, sensory disturbances.

Associated Symptoms: Weakness, diplopia, photophobia, fever, nasal discharge (sinusitis); neck stiffness (meningitis); eye pain or redness (glaucoma); ataxia, dysarthria, transient blindness. Lacrimation, flushing, intermittent headaches (cluster headaches), depression.

Aggravating or Relieving Factors: Relief by analgesics or sleep. Exacerbation by foods (chocolate, alcohol, wine, cheese, monosodium glutamate), emotional upset, menses; hypertension, trauma; lack of sleep; exacerbation by fatigue, exertion.

Drugs: ACE inhibitors and antagonists, alpha-adrenergic blockers, metronidazole (Flagyl), calcium channel blockers, e.g., nifedipine (Adalat), H2 blockers, oral contraceptives, nitrates, NSAIDs, selective-serotonin reuptake inhibitors.

Physical Examination

General Appearance: Note whether the patient appears ill or well.

Vital Signs: BP (hypertension), pulse, temperature (fever), respiratory rate.

HEENT: Cranial or temporal tenderness (temporal arteritis), asymmetric pupil reactivity; papilledema, extraocular movements, visual field deficits. Conjunctival injection, lacrimation, rhinorrhea (cluster headache).

Temporomandibular joint tenderness (TMJ syndrome); temporal or ocular bruits (arteriovenous malformation); sinus tenderness (sinusitis).

Dental infection, tooth tenderness to percussion (abscess).

Neck: Neck rigidity ; paraspinal muscle tenderness.

Skin: Café au lait spots (neurofibromatosis), facial angiofibromas (adenoma sebaceum).

Neuro: Cranial nerve palsies (intracranial tumor); auditory acuity, focal weakness (intracranial tumor), sensory deficits, deep tendon reflexes, ataxia.

Labs: Electrolytes, ESR, MRI scan, lumbar puncture. CBC with differential.

Indications for MRI scan: Focal neurologic signs, papilledema, decreased visual acuity, increased frequency or severity of headache, excruciating or paroxysmal headache, awakening from sleep, persistent vomiting, head trauma with focal neurologic signs or lethargy.

Differential Diagnosis: Migraine, tension headache; systemic infection, subarachnoid hemorrhage, sinusitis, arteriovenous malformation, hypertensive encephalopathy, temporal arteritis, meningitis, encephalitis, post concussion syndrome, intracranial tumor, venous sinus thrombosis, benign intracranial hypertension (pseudotumor cerebri), subdural hematoma, trigeminal neuralgia, glaucoma, analgesic overuse.

Characteristics of Migraine: Childhood to early adult onset; family history of headache; aura of scotomas or scintillations, unilateral pulsating or throbbing pain; nausea, vomiting. Lasts 2-6 hours; relief with sleep.

Characteristics of Tension Headache: Bilateral, generalized, bitemporal or suboccipital. Band-like pressure; throbbing pain, occurs late in day; related to stress. Onset in adolescence or young adult. Lasts hours and is usually relieved by simple analgesics.

Characteristics of Cluster Headache: Unilateral, retro-orbital searing pain, lacrimation, nasal and conjunctival congestion. Young males; lasts 20-60 min. Occurs several times each day over several weeks, followed by pain-free periods.

Dizziness and Vertigo

Chief Compliant: The patient is a 50 year old female with hypertension who complains of chest pain for 4 hours.

History of the Present Illness: Sensation of spinning or movement of surroundings, light headedness, nausea, vomiting, tinnitus. Rate of onset of vertigo. Aggravation by change in position, turning head, changing from supine to standing, coughing.

Hyperventilation, recent change in eyeglasses. Headache, hearing loss, head trauma, diplopia.

Past Medical History: Recent upper respiratory infection, paresthesias, syncope; hypertension, diabetes, history of stroke, transient ischemic attack, anemia, cardiovascular disease.

Medications Associated with Vertigo: Antihypertensives, aspirin, alcohol, sedatives, diuretics, phenytoin, gentamicin, furosemide.

Physical Examination

General Appearance: Effect of hyperventilation on symptoms. Effect of Valsalva maneuver on symptoms. Note whether the patient appears ill or well.

Vital Signs: Pulse, BP (supine and upright, postural hypotension), respiratory

rate, temperature.

HEENT: Nystagmus, visual acuity, visual field deficits, papilledema; facial weakness. Tympanic membrane inflammation (otitis media), cerumen. Effect of head turning or of placing the patient recumbent with head extended over edge of bed; Rinne's test (air/bone conduction); Weber test (lateralization of sound).

Heart: Rhythm, murmurs.

Neuro: Cranial nerves 2-12, sensory deficits, ataxia, weakness. Romberg test, finger to nose test (coordination), tandem gait.

Rectal: Occult blood.

Labs: CBC, electrolytes, MRI scan.

Differential Diagnosis

Drugs Associated with Vertigo: Aminoglycosides, loop diuretics, aspirin, caffeine, alcohol, phenytoin, psychotropics (lithium, haloperidol), benzodiazepines.

Peripheral Causes of Vertigo: Acute labyrinthitis/neuronitis, benign positional vertigo, Meniere's disease (vertigo, tinnitus, deafness), otitis media, acoustic neuroma, cerebellopontine angle tumor, cholesteatoma (chronic middle ear effusion), impacted cerumen.

Central Causes of Vertigo: Vertebrobasilar insufficiency, brain stem or cerebellar infarctions, tumors, encephalitis, meningitis, brain stem or cerebellar contusion, Parkinson's disease, multiple sclerosis.

Other Disorders Associated with Vertigo: Motion sickness, presyncope, syndrome of multiple sensory deficits (peripheral neuropathies, visual impairment, orthopedic problems), new eyeglasses, orthostatic hypotension.

Delirium, Coma and Confusion

Chief Compliant: The patient is a 50 year old male with coronary heart disease who presents with confusion for 6 hours.

History of the Present Illness: Level of consciousness, obtundation (awake but not alert), stupor (unconscious but awakable with vigorous stimulation), coma (cannot be awakened). Confusion, hallucination, formification (sensation that insects are crawling under skin); poor concentration, agitation. Activity and symptoms prior to onset. Fever, headache, epilepsy (post-ictal state).

Past Medical History: Trauma, suicide attempts or depression, dementia, stroke, transient ischemic attacks, hypertension; renal, liver or cardiac disease.

Medications: Insulin, oral hypoglycemics, narcotics, alcohol, drugs, antipsychotics, anticholinergics, anticoagulants.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypertensive encephalopathy), pulse, temperature (fever), respiratory rate.

HEENT: Skull palpation for tenderness, lacerations. Pupil size and reactivity; extraocular movements. Papilledema, hemorrhages, flame lesions; facial asymmetry, ptosis, weakness. Battle's sign (ecchymosis over mastoid process), raccoon sign (periorbital ecchymosis, skull fracture), hemotympanum (basal skull fracture). Tongue or cheek lacerations (post-ictal state). Atrophic tongue (B12 deficiency).

Neck: Neck rigidity, carotid bruits.

Chest: Breathing pattern (Cheyne-Stokes hyperventilation); crackles, wheezes.

Heart: Rhythm, murmurs.

Abdomen: Hepatomegaly, splenomegaly, masses, ascites, tenderness, distention, dilated superficial veins (liver failure).

Extremities: Needle track marks (drug overdose), tattoos.

Skin: Cyanosis, jaundice, spider angiomata, palmar erythema (hepatic encephalopathy); capillary refill, petechia, splinter hemorrhages. Injection site fat atrophy (diabetes).

Neuro: Concentration (subtraction of serial 7s, delirium), strength, cranial nerves 2-12, mini-mental status exam; orientation to person, place, time, recent events; Babinski's sign, primitive reflexes (snout, suck, glabella, palmomental grasp). Tremor (Parkinson's disease, delirium tremens), incoherent speech, lethargy, somnolence.

Glasgow Coma Scale

Best Verbal Response: None - 1; incomprehensible sounds or cries - 2; appropriate words or vocal sounds - 3; confused speech or words - 4; oriented speech - 5.

Best Eye Opening Response: No eye opening - 1; eyes open to pain - 2; eyes open to speech - 3; eyes open spontaneously - 4.

Best Motor Response: None - 1; abnormal extension to pain - 2; abnormal flexion to pain - 3; withdraws to pain - 4; localizes to pain - 5; obeys commands - 6.

Total Score: 3-15

Special Neurologic Signs

Decortication: Painful stimuli causes flexion of arms, wrist and fingers with leg extension; indicates damage to contralateral hemisphere above midbrain.

Decerebration: Painful stimuli causes extension of legs and arms; wrists and fingers flex; indicates midbrain and pons functioning.

Oculocephalic Reflex (Doll's eyes maneuver): Eye movements in response to lateral rotation of head; no eye movements or loose movements occur with bihemispheric lesions.

Oculovestibular Reflex (Cold caloric maneuver): Irrigation of ear with cold

water causes tonic deviation of eyes to irrigated ear if intact brain stem; if the patient is conscious, nystagmus and vertigo will occur.

Labs: Glucose, electrolytes, calcium, BUN, creatinine, ABG. CT/MRI, ammonia, alcohol, liver function tests, urine toxicology screen, B-12, folate levels. LP if no signs of elevated intracranial pressure and suspicion of meningitis.

Differential Diagnosis of Delirium: Electrolyte imbalance, hyperglycemia, hypoglycemia (insulin overdose), alcohol or drug withdraw or intoxication, hypoxia, meningitis, encephalitis, systemic infection, stroke, intracranial hemorrhage, postictal state, exacerbation of dementia; narcotic or anticholinergic overdose; steroid withdrawal, hepatic encephalopathy; psychotic states, dehydration, hypertensive encephalopathy, head trauma, subdural hematoma, uremia, vitamin B12 or folate deficiency, hypothyroidism, ketoacidosis, factitious coma.

Weakness and Ischemic Stroke

Chief Compliant: The patient is a 50 year old white male with claudication who presents with right arm weakness for 3 hours.

History of the Present Illness: Rate and pattern of onset of weakness (gradual, sudden); time of onset and time course to maximum deficit; anatomic location of deficit; activity prior to onset (Valsalva, exertion, neck movement, sleeping); improvement or progression of weakness; headache prior to event, nausea, vomiting, loss of consciousness; visual aura, vertigo, seizure.

Confusion, dysarthria, incontinence of stool or urine, dysphagia, palpitations; prior transient ischemic attacks (neurologic deficit lasting less than 24 hours), prior strokes; past transient monocular blindness (Amaurosis fugax), tongue biting, tonic-clonic movements, head trauma , claudication.

Past Medical History: Hypertension, diabetes, coronary disease, endocarditis, hyperlipidemia, IV drug abuse, cocaine use, heart failure, valvular disease, arrhythmias (atrial fibrillation). **Past testing:** CT scans, carotid Doppler studies, echocardiograms.

Medications: Anticoagulants, alcohol, antihypertensives, cigarette smoking.

Family history: Stroke, hyperlipidemia, cardiac disease.

Physical Examination

General Appearance: Level of consciousness, lethargy. Note whether the patient appears ill or well.

Vital Signs: BP, pulse (bradycardia), temperature, respiratory rate. Cushing's response (bradycardia, hypertension, abnormal respirations).

HEENT: Signs of head trauma, pupil size and reactivity, extraocular movements. Fundi: hypertensive retinopathy, Roth spots (flame-shaped lesions, endocarditis), retinal hemorrhages (subarachnoid hemorrhage), papilledema;

facial asymmetry or weakness. Tongue or buccal lacerations.

Neck: Neck rigidity, carotid bruits.

Chest: Breathing pattern, Cheyne Stokes respiration (periodic breathing with periods of apnea, elevated intracranial pressure).

Heart: Irregular rhythm (atrial fibrillation), S3 (heart failure), murmurs (mitral stenosis, cardiogenic emboli).

Abdomen: Aortic pulsations, renal bruits (atherosclerotic disease).

Extremities: Unequal peripheral pulses, ecchymoses, trauma.

Skin: Petechia, splinter hemorrhages.

Neuro: Focal motor deficits, cranial nerves 2-12, gaze, ptosis, Babinski's sign (stroke sole of foot, and toes dorsiflex if pyramidal tract lesion). Clonus, primitive reflexes (snout, glabella, palmomental, grasp). Mini-mental status exam, memory, concentration.

Signs of Increased Intracranial Pressure: Lethargy, headache, vomiting, meningismus, papilledema, focal neurologic deficits.

Signs of Cerebral Herniation: Obtundation, dilation of ipsilateral pupil, decerebrate posturing (extension of arms and legs in response to painful stimuli), ascending weakness. Cushing's response - bradycardia, hypertension, abnormal respirations.

Labs: CT scan: Bleeding, infarction, mass effect, midline shift. ECG, CBC.

Differential Diagnosis of Stroke: Abscess, meningitis, encephalitis, subdural hematoma, brain tumor, hypoglycemia, hypocalcemia, postictal paralysis (Todd's paralysis), delirium, conversion reaction; atypical migraine, basilar artery stenosis, transient ischemic attack.

Seizure

Chief Compliant: The patient is a 50 year old white male with epilepsy who presents with a seizure 4 hours prior to admission.

History of the Present Illness: Time of onset of seizure, duration of seizure, tonic-clonic movements, description of seizure. Past seizures, noncompliance with anticonvulsant medication (recent blood level). Aura (irritability, behavioral change, lethargy), pallor, incontinence of urine or feces, vomiting, post-ictal weakness or paralysis. Biting of tongue, past episodes of incontinence of urine during sleep.

Prodrome (visual changes, paresthesias), stroke, migraine headaches, fever, chills. Diabetes (hypoglycemia), family history of epilepsy.

Factors that May Precipitate Seizures: Fatigue, sleep deprivation, infection, hyperventilation, head trauma, alcohol or drug withdrawal, cocaine; meningitis, high fever, uremia, hypoglycemia, theophylline toxicity, stroke.

Past testing: EEG's, MRI scans.

Physical Examination

General Appearance: Post-ictal lethargy. Note whether the patient appears ill or well.

Vital Signs: BP (hypertension), pulse, respiratory rate, temperature (hyperpyrexia).

HEENT: Head trauma; pupil reactivity and equality, extraocular movements; papilledema, gum hyperplasia (phenytoin); tongue or buccal lacerations; carotid bruits, neck rigidity.

Chest: Rhonchi, wheeze (aspiration).

Heart: Rhythm, murmurs.

Extremities: Cyanosis, fractures, trauma.

Genitourinary/Rectal: Incontinence of urine or feces.

Skin: Café-au-lait spots, neurofibromas (Von Recklinghausen's disease), splinter hemorrhages (endocarditis). Unilateral port-wine facial nevus (Sturge-Weber syndrome); facial angiofibromas (adenoma sebaceum), hypopigmented ash leaf spots (tuberous sclerosis). Spider angiomas (hepatic encephalopathy), hirsutism (phenytoin).

Neuro: Dysarthria, sensory deficits, visual field deficits, focal weakness (Todd's paralysis), cranial nerves, Babinski's sign.

Labs: Glucose, electrolytes, calcium, liver function tests, CBC, urine toxicology, anticonvulsant levels, RPR/VDRL. EEG, MRI, lumbar puncture.

Differential Diagnosis: Epilepsy (complex partial seizure, generalized seizure), noncompliance with anticonvulsant medications, hypoglycemia, hyponatremia, hypocalcemia, hypomagnesemia, hypertensive encephalopathy, alcohol withdrawal, meningitis, encephalitis, brain tumor, stroke, vasculitis, pseudo-seizure.

70 Seizure

Renal Disorders

Oliguria and Acute Renal Failure

Chief Compliant: The patient is a 50 year old white male with diabetes who presents with decreased urine output for 8 hours.

History of the Present Illness: Oliguria (<20 mL/h, 400-500 mL urine/day); anuria (<100 mL urine/day); hemorrhage, heart failure, sepsis, vomiting, nasogastric suction; diarrhea, fever, chills; measured fluid input and output by Foley catheter; prostate enlargement, kidney stones

Dysuria, flank pain. Abdominal pain, hematuria, passing of tissue fragments, foamy urine (proteinuria).

Past Medical History: Recent upper respiratory infection (post streptococcal glomerulonephritis), recent chemotherapy (tumor lysis syndrome).

Medications: Anticholinergics, nephrotoxic drugs (aminoglycosides, amphotericin, NSAID's)renally excreted medications.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient appears ill or well.

Vital Signs: BP (orthostatic vitals; an increase in heart rate by >15 mmHg and a fall in systolic pressure >15 mmHg, indicates significant volume depletion); pulse (tachycardia); temperature (fever), respiratory rate (tachypnea).

Skin: Decreased skin turgor over sternum (hypovolemia); skin temperature and color; delayed capillary refill; jaundice (hepatorenal syndrome).

HEENT: Oral mucosa moisture, ocular moisture, flat neck veins (volume depletion), venous distention (heart failure).

Chest: Crackles (heart failure).

Heart: Irregular rhythm, murmurs, S3 (volume overload).

Abdomen: Hepatomegaly, abdominojugular reflex (heart failure); costovertebral angle tenderness; distended bladder, nephromegaly (obstruction).

Pelvic: Pelvic masses, cystocele, urethrocele.

Rectal: Prostate hypertrophy; absent sphincter reflex, decreased sensation (atonic bladder due to vertebral disk herniation).

Extremities: Peripheral edema (heart failure).

Labs: Sodium, potassium, BUN, creatinine, uric acid. Urine and serum osmolality, UA, urine creatinine. Ultrasound of bladder and kidneys.

$$\text{Fractional excretion of sodium (FE Na)} = \frac{\text{UNa(mMol/L)} \times \text{Scr(mmol/L)}}{\text{SNa(mMol/L)}\ \ \text{UCr(mMol/L)}} \times 100$$

$$\text{Renal Failure Index} = \frac{\text{UNa} \times 100}{\text{U/PCr}}$$

Clinical Findings in Pre-renal, Renal, Post-renal Failure			
	Prerenal	**ARF**	**Postrenal**
BUN/Creatinine ratio	>15:1	<15:1	varies
Urine sodium	<20 mMol/L	>20	varies
Urine osmolality	>500 mOsm/kg	<350	varies
Renal failure Index	<1	>1	varies
FE Na	<1%	>1%	varies
Urine/plasma creatinine	>40	>20	varies
Urine analyses	normal	cellular casts	RBCs, WBCs, bacteria

Differential Diagnosis of Acute Renal Failure

Prerenal Insult

A. Prerenal insult is the most common cause of acute renal failure, accounting for 70%. It is usually caused by reduced renal perfusion pressure secondary to extracellular fluid volume loss (diarrhea, diuresis, GI hemorrhage), or secondary to extracellular fluid sequestration (pancreatitis, sepsis), inadequate cardiac output, renal vasoconstriction (sepsis, liver disease), or inadequate fluid intake or replacement.

Intrarenal Insult

A. Insult to the renal parenchyma (tubular necrosis) causes 20% of acute renal failure.

B. Prolonged hypoperfusion is the most common cause of tubular necrosis. Nephrotoxins (radiographic contrast, aminoglycosides) are the second most common cause of tubular necrosis.

C. Pigmenturia induced renal injury can be caused by intravascular hemolysis or rhabdomyolysis.

D. Acute glomerulonephritis or acute interstitial nephritis (usually from allergic reactions to beta-lactam antibiotics, sulfonamides, rifampin, NSAIDs, cimetidine, phenytoin, allopurinol, thiazides, furosemide, analgesics) are occasional causes of intrarenal kidney failure.

Postrenal Insult

A. Postrenal damage results from obstruction of urine flow, and it is the least common cause of acute renal failure, accounting for 10%.

B. Postrenal insult may be caused by prostate cancer, benign prostatic hypertrophy, renal calculi obstruction or amyloidosis, uric acid crystals, multiple myeloma, or acyclovir.

Chronic Renal Failure

Chief Compliant: The patient is a 50 year old white male with diabetes who presents with an elevated creatinine for 2 weeks.

History of the Present Illness: Oliguria, current and baseline creatinine and BUN. Diabetes, hypertension; history of pyelonephritis, sepsis, heart failure, liver disease; peripheral edema, dark colored urine, rashes or purpura. Hypovolemia secondary to diarrhea, hemorrhage, over-diuresis; glomerulonephritis, interstitial nephritis. Excessive bleeding, flank pain, anorexia, insomnia, fatigue, malaise, weight loss, paresthesias, anemia.

Past Medical History: Past ultrasounds, kidney stones, prostate disease, urethral obstruction.

Medications: Nonsteroidal anti-inflammatory drugs, aminoglycosides, contrast dyes.

Family History: Polycystic kidney disease, hereditary glomerulonephritis.

Physical Examination

General Appearance: Evaluate intravascular volume status. Signs of fluid overload. Note whether the patient appears ill, well, or lethargic.

Vital Signs: Postural blood pressure and pulse (tachycardia, hypertension), temperature (fever), respiratory rate.

Skin: Skin turgor, sallow yellow skin (urochromes), fine white powder (uremic frost), purpura, petechiae (coagulopathy). Jaundice, spider angiomas (hepatorenal syndrome).

HEENT: Neck vein distention (volume overload).

Chest: Crackles (rales).

Heart: S3 gallop (volume overload), cardiac friction rub (pericarditis), displacement of heart border, muffled heart sounds (effusion), irregular rhythm (electrolyte imbalances).

Abdomen: Distended bladder, costovertebral angle tenderness, suprapubic tenderness, pelvic masses, ascites.

Rectal: Occult blood, prostate enlargement.

Neuro: Asterixis, myoclonus, sensory deficits, motor deficits.

Labs: BUN, creatinine, potassium (hyperkalemia), albumin, calcium, phosphorus, proteinuria.

Differential Diagnosis of Chronic Renal Failure: Hypertensive nephrosclero-

sis, diabetic nephrosclerosis, glomerulonephritis, polycystic kidney disease, tubulointerstitial renal disease, reflux nephropathy, analgesic nephropathy, chronic obstructive uropathy, amyloidosis, Lupus nephropathy.

Hematuria

Chief Compliant: The patient is a 50 year old white male with hypertension who complains of bloody urine for 4 days.

History of the Present Illness: Quantity of RBCs found on urinalysis. Repeat testing. Color, timing, pattern of hematuria: Initial hematuria (anterior urethral lesion); terminal hematuria (bladder neck or prostate lesion); hematuria throughout voiding (bladder or upper urinary tract). Frequency, dysuria, suprapubic pain, flank pain (renal colic), perineal pain; fever. Recent exercise, menstruation; bleeding between voidings.

Foley catheterization, prior stone passage, tissue passage in urine, joint pain.

Recent sore throat, streptococcal skin infection (glomerulonephritis), joint pain.

Past Medical History: Prior pyelonephritis; occupational exposure to toxins.

Medications Associated with Hematuria: Warfarin, aspirin, ibuprofen, naproxen, phenobarbital, allopurinol, phenytoin, cyclophosphamide. **Causes of Red Urine:** Pyridium, phenytoin, ibuprofen, cascara laxatives, levodopa, methyldopa, quinine, rifampin, berries, flava beans, food coloring, rhubarb, beets, hemoglobinuria, myoglobinuria.

Family History: Hematuria, renal disease, sickle cell, bleeding diathesis, deafness (Alport's syndrome), hypertension.

Physical Examination

General Appearance: Signs of dehydration. Note whether the patient appears ill, well, or lethargic.

Vital Signs: BP (hypertension), pulse (tachycardia), respiratory rate, temperature (fever).

Skin: Rashes.

HEENT: Pharyngitis, carotid bruits.

Heart: Heart murmur; irregular rhythm (atrial fibrillation, renal emboli).

Abdomen: Tenderness, masses, costovertebral angle tenderness (renal calculus or pyelonephritis), abdominal bruits, nephromegaly, suprapubic tenderness.

Genitourinary: Urethral lesions, discharge, condyloma, foreign body, cervical malignancy; prostate tenderness, nodules, or enlargement (prostatitis, prostate cancer).

Extremities: Peripheral edema (nephrotic syndrome), arthritis, ecchymoses, petechiae, unequal peripheral pulses (aortic dissection).

Labs: UA with microscopic exam of urine, CBC, KUB, intravenous pyelogram, ultrasound. Streptozyme panel, ANA, INR/PTT.

Indicators of Significant Hematuria: (1) >3 RBC's per high-power field on 2 of 3 specimens; (2) >100 RBC's per HPF in 1 specimen; (3) gross hematuria

The patient should abstain from exercise for 48 hours prior to urine collection, and urine should not be collected during menses.

Differential Diagnosis

A. **Medical Hematuria** is caused by a glomerular lesion; plasma proteins filter into urine out of proportion to the amount of hematuria. It is characterized by glomerular RBCs that are distorted with crenated membranes and an uneven hemoglobin distribution and casts. Microscopic hematuria and a urine dipstick test of 2+ protein is more likely to have a medical cause.

B. **Urologic Hematuria** is caused by a urologic lesion, such as a urinary stone or carcinoma; it is characterized by minimal proteinuria, and protein appears in urine proportional to the amount of whole blood present. RBCs are disk shaped with an even hemoglobin distribution; there is an absence of casts.

Nephrolithiasis

Chief Compliant: The patient is a 40 year old white female who complains of flank pain for 8 hours.

History of the Present Illness: Severe, colicky, intermittent,, lower abdominal pain; flank pain, hematuria, fever, dysuria; prior history of renal stones. Abdominal pain may radiate laterally around abdomen to groin, testicles or labia. History of low fluid intake, urinary tract infection, parenteral nutrition. Excessive calcium administration, immobilization, furosemide.

Past Medical History: Chemotherapy, inflammatory bowel disease, ileal resection. Diet high in oxalate: Spinach, rhubarb, nuts, tea, cocoa.

Medications: Excess vitamin C, hydrochlorothiazide, indinavir, unusual dietary habits.

Family History: Kidney stones.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient appears ill, well, or lethargic.

Abdomen: Costovertebral angle tenderness, suprapubic tenderness; enlarged kidney.

Gyn: Cervical motion tenderness, adnexal tenderness, cysts.

Labs: Serum electrolytes, calcium, phosphorus, creatinine, uric acid. Urine cystine, UA microscopic (hematuria), urine culture, KUB, intravenous pyelogram. PTH levels (if hypercalcemia), 24-hour urine calcium, phosphate, urate, oxalate, citrate, Cr, sodium, urea nitrogen, and cystine.

Differential Diagnosis: Nephrolithiasis, appendicitis, cystitis, pyelonephritis,

diverticulitis, salpingitis, torsion of hernia, ovarian torsion, ovarian cyst rupture or hemorrhage, bladder obstruction, prostatitis, prostate cancer, endometriosis, ectopic pregnancy, colonic obstruction, carcinoma (colon, prostrate, cervix, bladder).

Causes of Nephrolithiasis: Hypercalcemia, hyperuricosuria, hyperoxaluria, cystinuria, renal tubular acidosis, Proteus mirabilis urinary tract infection (staghorn calculi).

Hyperkalemia

Chief Compliant: The patient is a 50 year old white male with hypertension who presents with an elevated serum potassium on routine screening.

History of the Present Illness: Serum potassium >5.5 mMol/L (repeat test to exclude lab error); muscle weakness, syncope, lightheadedness, palpitations, oliguria; oral or intravenous potassium, salt substitutes, potassium sparing diuretics, angiotensin converting enzyme inhibitors; nonsteroidal anti-inflammatory drugs, beta-blockers, heparin, digoxin, cyclosporine, succinylcholine; muscle trauma, chemotherapy (tumor lysis syndrome). Plasma renin activity, urine potassium.

Past Medical History: Renal disease, diabetes, adrenal insufficiency (Addison's syndrome). History of episodic paralysis precipitated by exercise (familial hyperkalemic periodic paralysis).

Medications: Potassium sparing diuretics, angiotensin converting enzyme inhibitors; nonsteroidal anti-inflammatory drugs.

Physical Examination

General Appearance: Dehydration. Note whether the patient appears ill, well, or malnourished.

Skin: Hyperpigmentation (Addison's disease), hematomas.

HEENT: Extraocular movements, pupils equally reactive.

Abdomen: Suprapubic tenderness.

Neuro: Muscle weakness, diminished deep tendon reflexes, cranial nerves 2-12.

Labs: Potassium, platelets, bicarbonate, chloride, anion gap, LDH, 24 hour urine K, pH. Serum aldosterone, plasma renin activity.

ECG: Tall peaked, precordial T waves; diminished QT interval; widened QRS complex, prolonged PR interval, P wave flattening, AV block, ventricular arrhythmias, sine wave, asystole.

Differential Diagnosis

Inadequate Excretion: Renal failure, adrenal insufficiency (Addison's syndrome), potassium sparing diuretics (spironolactone), urinary tract obstruction, lupus, hypoaldosteronism, ACE inhibitors, NSAIDs, heparin.

Increased Potassium Production: Hemolysis, rhabdomyolysis, muscle crush injury, internal hemorrhage, drugs (succinylcholine, digoxin overdose, beta blockers), acidosis, hyperkalemic periodic paralysis, hyperosmolality.

Excess Intake of Potassium: Oral or IV potassium supplements, salt substitutes.

Pseudo-hyperkalemia: Hemolysis after collection of blood, use of excessively small needle, excessive shaking of sample, delayed transport of blood to lab, thrombocytosis, leukocytosis, prolonged tourniquet use.

Hypokalemia

Chief Compliant: The patient is a 50 year old white male with hypertension who presents with a low serum potassium on routine screening.

History of the Present Illness: Potassium <3.5 mMol/L (repeat test to exclude lab error), hyperglycemia, diuretics, diarrhea, vomiting, laxative abuse; poor intake of potassium containing foods (fruits, vegetables, meats); . Conn's syndrome (hyperaldosteronism). Urine potassium.

Associated Symptoms: Muscle weakness, cramping pain, nausea, vomiting, constipation, palpitations, paresthesias, polyuria.

Past Medical History: Renal disease, stress (catecholamine release); biliary drainage, enteric fistula, dialysis.

Medications: Corticosteroids, nephrotoxins, bicarbonate, beta-agonists, vitamin B12, Kayexalate ingestion, excessive licorice ingestion, chewing tobacco, clay ingestion.

Physical Examination

General Appearance: Signs of dehydration. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypotension), pulse, temperature, respiratory rate.

Heart: Irregular rhythm.

Abdomen: Hypoactive bowel sounds (ileus), abdominal tenderness.

Neuro: Weakness, hypoactive deep tendon reflexes.

Labs: Serum potassium. 24 hour urine potassium >20 mEq/day indicates excessive urinary K loss. If <20 mEq/d, low K intake or nonurinary K loss is the cause. Electrolytes, BUN, creatinine, glucose, magnesium, CBC, plasma renin activity, aldosterone. Urine specific gravity.

ECG: Flattening and inversion of T-waves (II, V3), ST segment depression, U waves (II, V1, V2, V3); first or second degree block, QT interval prolongation, premature atrial or ventricular contractions, supraventricular tachycardia, ventricular tachycardia or fibrillation.

Differential Diagnosis of Hypokalemia

Cellular Redistribution of Potassium: Intracellular shift of potassium by

insulin (exogenous or glucose load), beta2 agonist; thyrotoxic periodic paralysis; alkalosis; familial periodic paralysis, vitamin B12 treatment, hypothermia; acute myeloid leukemia.

Nonrenal Potassium Loss:

Gastrointestinal Loss. Diarrhea, laxative abuse, villous adenoma, biliary drainage, enteric fistula, potassium binding resin ingestion

Non-gastrointestinal Loss. Sweating, low potassium ingestion, dialysis

Renal Potassium Loss:

Hypertensive High Renin States. Malignant hypertension, renal artery stenosis, renin-producing tumor.

Hypertensive Low Renin, High Aldosterone States. Primary hyperaldosteronism (adenoma or hyperplasia).

Hypertensive Low Renin, Low Aldosterone States. Congenital adrenal hyperplasia, Cushing's syndrome, exogenous mineralocorticoids (Florinef, licorice, chewing tobacco), Liddle's syndrome

Normotensive. Renal tubular acidosis (type I or II), metabolic alkalosis with a urine chloride <10 mEq/day is caused by vomiting; metabolic alkalosis with a urine chloride >10 mEq/day is caused by Bartter's syndrome, diuretics, magnesium depletion, normotensive hyperaldosteronism.

Hyponatremia

Chief Compliant: The patient is a 50 year old white male with hypertension who presents with a low serum sodium on routine screening.

History of the Present Illness: Serum sodium <135 mMol/L (repeat test to exclude lab error); confusion, agitation, irritability, lethargy, anorexia, nausea, vomiting, headache, muscle weakness or tremor, cramps, seizures; decreased output of dark urine (dehydration); polydipsia (water intoxication); diarrhea.

Past Medical History: Renal, CNS, or pulmonary disease (syndrome of inappropriate antidiuretic hormone); heart failure, cirrhosis, hypothyroidism, hyperlipidemia (pseudo-hyponatremia).

Medications: Steroid withdrawal hypotonic IV fluids, psychotropic medications, chemotherapeutic agents.

Physical Examination

General Appearance: Signs of dehydration. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypotension), pulse (tachycardia), temperature, respiratory rate.

Skin: Decreased skin turgor, delayed capillary refill; hyperpigmentation (Addison's disease), moon-face, truncal obesity (hypocortisolism with steroid withdrawal).

HEENT: Decreased ocular and oral moisture.
Chest: Cheyne-Stokes respirations, crackles.
Heart: Irregular rhythm. Premature ventricular contractions.
Abdomen: Ascites, tenderness.
Extremities: Edema.
Neuro: Confusion, irritability, motor weakness, ataxia, positive Babinski's sign, muscle twitches; hypoactive deep tendon reflexes, cranial nerve palsies.
Labs: Electrolytes, BUN, creatinine, cholesterol, triglycerides, glucose, protein, serum osmolality, albumin; urine sodium, urine osmolality, chest X-ray, ECG.

Differential Diagnosis of Hyponatremia Based on Urine Osmolality

A. **Low Urine Osmolality (50-180 mOsm/L).** Primary excessive water intake (psychogenic water drinking).
B. **High Urine Osmolality (urine osmolality >serum osmolality)**
   1. **High Urine Sodium (>40 mEq/L) and Volume Contracted.** Renal fluid loss caused by excessive diuretic use, salt-wasting nephropathy, Addison's disease, or osmotic diuresis.
   2. **High Urine Sodium (>40 mEq/L) and Normal Volume.** Water retention caused by carbamazepine or cyclophosphamide, hypothyroidism, syndrome of inappropriate antidiuretic hormone secretion.
   3. **Low Urine Sodium (<20 mEq/L) and Volume Contraction.** Extrarenal source of fluid loss (vomiting, burns).
   4. **Low Urine Sodium (<20 mEq/L) and Volume-expanded, Edematous.** Heart failure, cirrhosis with ascites, nephrotic syndrome.

Hypernatremia

Chief Compliant: The patient is a 50 year old white male with hypertension who presents with an elevated serum sodium on routine screening.
History of the Present Illness: Serum sodium >145 mEq/L (repeat test to exclude lab error). History of dehydration due to fever, vomiting, burns, heat exposure, diarrhea, elevated glucose, salt ingestion, administration of hypertonic fluids (sodium bicarbonate, sodium chloride), sweating, impaired access to water (elderly), adipsia (lack of thirst); head injury.
Altered mental status, lethargy, agitation, polyuria, anorexia, muscle twitching, renal disease. Recent fluid intake.
Past Medical History: Pancreatitis, diarrhea, diabetes, renal failure.
Medications Associated with Hypernatremia: Amphotericin, phenytoin, lithium, aminoglycosides.

Physical Examination

General Appearance: Lethargy, obtundation, stupor. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (orthostatic hypotension), pulse (tachycardia), temperature (fever), respiratory rate; decreased urine output.

Skin: Decreased skin turgor ("doughy" consistency), delayed capillary refill, hyperpigmentation (Conn's syndrome), moon-face, truncal obesity, stria (hypoadrenal crisis, steroid withdrawal).

HEENT: Decreased eye moisture, decreased eye turgor, dry oral mucosa, flat neck veins,.

Neuro: Decreased muscle tone, tremor, hyperreflexia; extensor plantar reflex (Babinski's sign), spasticity, ataxia.

Labs: Increased hematocrit; sodium, BUN, creatinine, urine and serum, osmolality. Spot urine sodium, creatinine.

Differential Diagnosis:

Hypernatremia with Hypovolemia

A. **Extrarenal Loss of Water (urine sodium >20 mMol/L).** Vomiting, diarrhea, sweating, pancreatitis, respiratory water loss.
B. **Renal loss of water (urine sodium <10 mMol/L).** Diuretics, hyperglycemia, renal failure.

Euvolemic Hypernatremia with Renal Water Losses. Diabetes insipidus (central or nephrogenic secretion of excessive antidiuretic hormone).

Hypernatremia with Hypervolemia (urine sodium >20 mMol/L): Hypertonic solutions of sodium chloride or sodium bicarbonate, hyperaldosteronism, Cushing's, syndrome, congenital adrenal hyperplasia.

Endocrinologic Disorders

Diabetic Ketoacidosis

Chief Compliant: The patient is a 12 year old male with diabetes who presents with an elevated serum glucose and ketoacidosis.

History of the Present Illness: Initial glucose level, ketones, anion gap. Polyuria, polyphagia, polydipsia, fatigue, lethargy, nausea, vomiting, weight loss; noncompliance with insulin, hypoglycemic agents; blurred vision, infection, dehydration, abdominal pain (appendicitis), dyspnea.

Cough, fever, chills, ear pain (otitis media), dysuria, frequency (urinary tract infection); back pain (pyelonephritis), chest pain; frequent Candida or bacterial infections.

Factors that May Precipitate Diabetic Ketoacidosis. New onset of diabetes, noncompliance with insulin, infection, pancreatitis, myocardial infarction, stress, trauma, stroke, pregnancy.

Past Medical History: Renal disease, prior ketoacidosis, sensory deficits in extremities (diabetic neuropathy), retinopathy, hypertension.

Medications: Insulin, oral hypoglycemics.

Physical Examination

General Appearance: Somnolence, Kussmaul respirations (deep sighing breathing). Signs of dehydration, toxic appearance. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP (hypotension), pulse (tachycardia), temperature (fever or hypothermia), respiratory rate (tachypnea).

Skin: Decreased skin turgor, delayed capillary refill; hyperpigmented atrophic macules on legs (shin spots); intertriginous candidiasis, erythrasma, localized fat atrophy (insulin injections).

HEENT: Diabetic retinopathy (neovascularization, hemorrhages, exudates); acetone breath odor (musty, apple odor), decreased visual acuity, low oral moisture (dehydration), tympanic membrane inflammation (otitis media); flat neck veins, neck rigidity.

Chest: Rales, rhonchi.

Abdomen: Hypoactive bowel sounds (ileus), abdominal tenderness, costovertebral angle tenderness (pyelonephritis), suprapubic tenderness (urinary tract infection).

Extremities: Decreased pulses (atherosclerotic disease), foot ulcers, cellulitis.

Neuro: Delirium, confusion, peripheral neuropathy (decreased proprioception and sensory deficits in feet), hypotonia, hyporeflexia.

Labs: Glucose, sodium, potassium, bicarbonate, chloride, BUN, creatinine, anion gap; triglycerides, phosphate, CBC, serum ketones; UA (proteinuria, ketones). Chest X-ray, ECG.

Differential Diagnosis

Ketosis-Causing Conditions. Alcoholic ketoacidosis or starvation.

Acidosis-Causing Conditions

Increased Anion Gap Acidoses. DKA, uremia, and salicylate or methanol poisoning.

Non-Anion Gap Acidoses. Renal or gastrointestinal bicarbonate losses due to diarrhea or renal tubular acidosis.

Hyperglycemia-Causing Conditions. Hyperosmolar nonketotic coma.

Diagnostic Criteria for DKA. Glucose ≥250, pH <7.3, bicarbonate <15, ketone positive >1:2 dilutions.

Hypothyroidism and Myxedema Coma

Chief Compliant: The patient is a 50 year old white female with hypothyroidism who presents with weakness for 5 days.

History of the Present Illness: Fatigue, cold intolerance, constipation, weight gain or inability to lose weight, muscle weakness; thyroid swelling or mass; dyspnea on exertion; mental slowing, dry hair and skin, deepening of voice; carpal tunnel syndrome, amenorrhea. Somnolence, apathy, depression, paresthesias.

Myxedema madness: Agitation, disorientation, delusions, hallucinations, paranoia, restlessness, lethargy.

Factors Predisposing to Myxedema Coma. Cold exposure, infection, trauma, surgery, anesthesia, narcotics, phenothiazines, phenytoin, sedatives, propranolol, alcohol.

Past Medical History: Hyperthyroidism, thyroid testing, thyroid surgery.

Medications: Radioactive iodine treatment, antithyroid medication, lithium.

Physical Examination

General Appearance: Hypoactivity, confusion, somnolence, coarse, deep voice; dull, expressionless face. Signs of dehydration.

Vital Signs: Bradycardia, hypotension, hypothermia.

Skin: Cool, dry, pale, rough, doughy skin; thin, brittle dry nails with longitudinal ridges; yellowish skin without scleral icterus (carotenemia). Hyperkeratosis of elbows and knees.

HEENT: Thin, dry, brittle hair, alopecia; macroglossia (enlarged tongue), puffy face and eyelids; loss of lateral third of eyebrows, papilledema, thyroid surgery scar. Jugulovenous distention (pericardial effusion).

Chest: Dullness to percussion (pleural effusion).

Heart: Muffled heart sounds (pericardial effusion); displacement of lateral heart border, bradycardia.

Abdomen: Hypoactive bowel sounds (ileus), myxedematous ascites.

Extremities: Diminished muscle strength and power. Myxedema: transient local

swelling after tapping a muscle.

Neuro: Visual field deficits, cranial nerve palsies (pituitary tumor), hypoactive tendon reflexes with delayed return phase. Decreased mental status, stupor, ataxia; weakness, sensory impairment.

Labs: Thyroid stimulating hormone, CBC, electrolytes, hypercholesterolemia, hypertriglyceridemia, creatinine phosphokinase, LDH.

ECG: Bradycardia, low voltage QRS complexes; flattened or inverted T waves, prolonged Q-T interval.

Differential Diagnosis of Hypothyroidism	
Cause	**Clues to Diagnosis**
Autoimmune thyroiditis (Hashimoto's disease)	Family or personal history of autoimmune thyroiditis or goiter
Iatrogenic: Ablation, medication, surgery	History of thyroidectomy, irradiation with iodine 131, or thioamide drug therapy
Diet (high levels of iodine)	Kelp consumption
Subacute thyroiditis (viral)	History of painful thyroid gland or neck pain
Postpartum thyroiditis	Symptoms of hyperthyroidism followed by hypothyroidism 6 months postpartum

Hyperthyroidism and Thyrotoxicosis

Chief Compliant: The patient is a 50 year old white male who presents with tremor and restlessness for 4 days.

History of the Present Illness: Tremor, nervousness, hyperkinesis (restlessness), fever, heat intolerance, palpitations, diaphoresis, irritability, insomnia; thyroid enlargement, masses, thyroid pain, amenorrhea.

Weight loss with increased appetite; dyspnea and fatigue after slight exertion; softening of the skin; fine, silky hair texture; proximal muscle weakness (especially thighs when climbing stairs), hyperdefecation.

Atrial fibrillation; diplopia, reduced visual acuity, eye discomfort or pain, lacrimation; recent upper respiratory infection. Previous thyroid function testing.

Past Medical History: Factors Precipitating Thyroid Storm: Infection, surgery, diabetic ketoacidosis, pulmonary embolus, excess hormone medication, cerebral vascular accident, myocardial infarction, labor and delivery, iodine-131 or iodine therapy.

Family History: Thyroid disease.

Physical Examination

General Appearance: Restless, anxious, hyperactive; delirium. Signs of dehydration.

Vital Signs: Widened pulse pressure (difference between systolic and diastolic pressure), hyperpyrexia (>104°F), tachycardia, hypertension.

Skin: Moist, warm, velvety skin, diaphoresis; palmar erythema, fine silky hair. Plummer's nails (distal onycholysis, separation of fingernail from nail bed), clubbing of fingers and toes (acropachy). Loss of subcutaneous fat and muscle mass.

HEENT: Exophthalmos (forward displacement of the eyeballs), proptosis (lid elevation), widened palpebral fissures; lid lag, infrequent blinking.

Ophthalmoplegia (restricted extraocular movements), chemosis (edema of conjunctiva), conjunctival injection, corneal ulcers; periorbital edema or ecchymoses; optic nerve atrophy, impaired visual acuity, difficulty with convergence. Painless, diffusely enlarged thyroid without masses; thyroid thrill and bruit.

Heart: Irregular rhythm (atrial fibrillation), systolic murmur (mitral or tricuspid regurgitation, flow murmur), displacement of apical impulse. Accentuated first heart sound.

Extremities: Fine tremor; non-pitting pre-tibial edema (Grave's disease).

Neuro: Proximal muscle weakness, hyperreflexia (rapid return phase of deep tendon reflexes); rapid, pressured speech, anxiety.

Labs: Free T4, TSH, beta-HCG pregnancy test.

ECG: Sinus tachycardia, atrial fibrillation.

Differential Diagnosis: Grave's disease, toxic multinodular goiter, acute thyroiditis, thyrotoxicosis factitia (ingestion of thyroid hormone), trophoblastic tumor (molar pregnancy), TSH-producing pituitary adenoma, postpartum thyroiditis, struma ovarii, functional follicular carcinoma, thyroid adenoma or carcinoma.

Hematologic and Rheumatologic Disorders

Deep Venous Thrombosis

Chief Compliant: The patient is a 50 year old white male with an paraplegia who complains of left calf pain for 6 hours.

History of the Present Illness: Sudden onset of unilateral calf pain, swelling, and redness; exacerbation of pain by walking and flexing of foot, dyspnea.

Risk Factors for Deep Venous Thrombosis

A. **Venous stasis** risk factors include prolonged immobilization, stroke, myocardial infarction, heart failure, obesity, anesthesia, age >65 years old.
B. **Endothelial injury** risk factors include surgery, trauma, central venous access catheters, pacemaker wires, previous thromboembolic event.
C. **Hypercoagulable state** risk factors include malignant disease, high estrogen level (pregnancy, oral contraceptives).
D. **Hematologic Disorders.** Polycythemia, leukocytosis, thrombocytosis, antithrombin III deficiency, protein C deficiency, protein S deficiency, antiphospholipid syndrome.

Past Medical History: Peptic ulcer, melena, surgery.

Physical Examination

General Appearance: Dyspnea, respiratory distress. Note whether the patient appears ill, well, or malnourished.

Vital Signs: BP, pulse, respiratory rate (tachypnea if pulmonary embolus), temperature (low-grade fever).

Chest: Breast masses.

Abdomen: Distention, tenderness, masses.

Genitourinary: Testicular or pelvic masses, inguinal lymphadenopathy.

Rectal: Occult fecal blood, prostate masses.

Extremities: >2 cm difference in calf circumference, redness, cyanosis; mottling, tenderness; Homan's sign (tenderness with dorsiflexion of foot); warmth, dilated varicose veins.

Labs: Doppler studies, venogram; INR/PTT, CBC, electrolytes, BUN, creatinine; ECG, UA, chest X-ray.

Differential Diagnosis: Thrombophlebitis, ruptured Baker's cyst, lymphatic obstruction, cellulitis, muscle injury, hematoma, plantaris tendon rupture.

Low Back Pain and Sciatica

Chief Compliant: The patient is a 50 year old female who presents with low back pain for 1 week.

History of the Present Illness: Onset of pain (eg, time of day, activity); location of pain (eg, site, radiation of pain to thigh or calf); type and character of pain (sharp, dull), duration of pain. Aggravating and relieving factors. Psychosocial stressors at home or work.

"Red flags": Age greater than 50 years, fever, weight loss.

Hip pain, joint pain, weakness, numbness, tingling; morning stiffness, night pain, bone pain, abdominal pain, leg pain. Difficult urination, incontinence of bladder or bowel, impotence, constipation.

Past Medical History: Previous injuries, trauma, severe falls, occupational injuries, cancer. Previous therapy and efficacy.

Social History: Drug or alcohol abuse; functional impact of the pain on the patient's work and activities.

Medications: NSAIDs, acetaminophen, corticosteroids.

Physical Examination

General Appearance: Note whether the patient appears ill or well. Informal observation (eg, patient's posture, expressions, pain behavior). Painful grimacing with movements.

Vital Signs: BP, pulse, respirations, temperature

Skin: Discoid lesions (erythematous plaques), redness.

HEENT: Malar rash (erythematous rash in “butterfly” pattern on the face).

Chest: Pleural friction rub (pleuritis).

Heart: Cardiac friction rubs.

Abdomen: Abdominal tenderness.

Back: Palpation of spinous processes and interspinous ligaments for tenderness. Range of motion, mobility (patient sits, lies down and stands up).

Extremities: Joint tenderness, muscle weakness.

Rectal: Decreased anal sphincter tone, anal reflex, perianal sensation

Neuro: Posture, gait, deep tendon reflexes. Pinprick sensation in lower extremities.

Muscle strength is graded from zero (no evidence of contractility) to 5 (complete range of motion against gravity, with full resistance). Straight leg raise test. Resistance to hip flexion, quadriceps strength, heel walking. Great toe dorsiflexion strength.

Trendelenburg test: The patient to stands on one leg. A pelvis drop is a positive test.

Labs: ESR, CBC, rheumatoid factor. X-Rays, MRI. Electromyography, nerve conduction studies.

Differential Diagnosis: Back strain, acute disc herniation, osteoarthritis or

spinal stenosis, spondylolisthesis, ankylosing spondylitis, infection, malignancy.

Connective Tissue Diseases

Chief Compliant: The patient is a 50 year old female who presents with joint pain and rash for 2 weeks.

History of the Present Illness: Joint pain, fatigue, malaise, weight loss, fever, skin rashes; swelling of upper and lower extremities, morning joint stiffness, photosensitivity, muscle aches, weakness.

Hip and back pain, oral ulcers, renal disease; anemia, psychiatric illness, dysphagia, pleurisy, positional chest pain (pericarditis), Raynaud's syndrome (cyanosis of hands when exposed to cold)

Past Medical History: Migraine headaches, stroke, seizures, depression, hypertension.

Medications Associated with Lupus: Procainamide, isoniazid, hydralazine, methyldopa (Aldomet).

Physical Examination

General Appearance: Note whether the patient appears ill, well, or malnourished.

Vital Signs: Hypertension, pulse, respiratory rate, temperature.

Skin: Skin fibrosis (thickening, scleroderma), telangiectasias, discoid lesions (erythematous plaques), purpura, skin ulcers, rheumatoid nodules, livedo reticularis.

HEENT: Keratoconjunctivitis sicca (dry inflammation of conjunctiva), malar rash ("butterfly" rash on the face), oral ulcers. Episcleritis or scleritis, xerophthalmia (dry eyes), parotid enlargement.

Chest: Pleural friction rub (pleuritis), fine rales (interstitial fibrosis).

Heart: Cardiac friction rubs (pericarditis).

Abdomen: Hepatosplenomegaly, abdominal tenderness.

Extremities: Joint tenderness, lymphadenopathy sclerodactyly (thickening of digital subcutaneous tissue), nodules.

Neuro: Mental status, extraocular movements, cranial nerves, muscle weakness, sensory deficits.

Labs: Electrolytes, creatinine, ANA, anti-Smith antibody, anti-DNA antibody, antineutrophilic cytoplasmic antibody, LE cell prep, rheumatoid factor, RPR, ESR, CBC, UA, ECG, complement. UA (proteinuria, casts).

Diagnostic Criteria for Rheumatoid Arthritis: Four or more of the following.

1. Morning stiffness (>6 weeks)
2. Arthritis in 3 or more joints (>6 weeks)
3. Arthritis of hand joints (>6 weeks)

4. Symmetric arthritis (>6 weeks)
5. Rheumatoid nodules
6. Positive rheumatoid factor
7. X-ray abnormalities: Erosions, bony decalcification (especially in hands/wrist).

Diagnostic Criteria for Systemic Lupus Erythematosus: Four or more of the following.

1. Malar rash
2. Discoid rash
3. Photosensitivity
4. Oral or nasopharyngeal ulcers
5. Nonerosive arthritis
6. Pleuritis or pericarditis
7. Persistent proteinuria
8. Seizures or psychosis
9. Hemolytic anemia
10. Positive lupus erythematosus cell, positive anti-DNA antibody, Smith antibody, false positive VDRL.
11. Positive ANA

Psychiatric Disorders

Clinical Evaluation of the Psychiatric Patient

I. Psychiatric history

A. Identifying information. Age, sex, marital status, race, referral source.

B. Chief complaint (CC). Reason for consultation; the reason is often a direct quote from the patient.

C. History of present illness (HPI)

1. Current symptoms: date of onset, duration and course of symptoms.

2. Previous psychiatric symptoms and treatment.

3. Recent psychosocial stressors: stressful life events which may have contributed to the patient's current presentation.

4. Reason the patient is presenting now.

5. This section provides evidence that supports or rules out relevant diagnoses. Therefore documenting the absence of pertinent symptoms is also important.

6. Historical evidence in this section should be relevant to the current presentation.

D. Past psychiatric history

1. Previous and current psychiatric diagnoses.

2. History of psychiatric treatment, including outpatient and inpatient treatment.

3. History of psychotropic medication use.

4. History of suicide attempts and potential lethality.

E. Past medical history

1. Current and/or previous medical problems.

2. Type of treatment, including prescription, over-the-counter medications, home remedies.

F. Family history. Relatives with history of psychiatric disorders, suicide or suicide attempts, alcohol or substance abuse.

G. Social history

1. Source of income.

2. Level of education, relationship history (including marriages, sexual orientation, number of children); individuals that currently live with patient.

3. Support network.

4. Current alcohol or illicit drug usage.

5. Occupational history.

H. Developmental history. Family structure during childhood, relationships with parental figures and siblings; developmental milestones, peer relationships, school performance.

II. **Mental status exam**. The mental status exam is an assessment of the patient at the present time. Historical information should not be included in this section.

A. General appearance and behavior

1. Grooming, level of hygiene, characteristics of clothing.
2. Unusual physical characteristics or movements.
3. **Attitude.** Ability to interact with the interviewer.
4. **Psychomotor activity.** Agitation or retardation.
5. Degree of eye contact.

B. Affect

1. **Definition.** External range of expression, described in terms of quality, range and appropriateness.
2. **Types of affect**
   a. **Flat.** Absence of all or most affect.
   b. **Blunted or restricted.** Moderately reduced range of affect.
   c. **Labile.** Multiple abrupt changes in affect.
   d. **Full or wide range of affect.** Generally appropriate.

C. Mood. Internal emotional tone of the patient (ie, dysphoric, euphoric, angry, euthymic, anxious).

D. Thought processes

1. **Use of language.** Quality and quantity of speech. The tone, associations and fluency of speech should be noted.

E. Thought content

1. **Definition.** Hallucinations, delusions and other perceptual disturbances.

F. Cognitive evaluation

1. **Level of consciousness.**
2. **Orientation:** Person, place and date.
3. **Attention and concentration:** Repeat 5 digits forwards and backwards or spell a five-letter word ("world") forwards and backwards.
4. **Short-term memory:** Ability to recall 3 objects after 5 minutes.
5. **Fund of knowledge:** Ability to name past five presidents, five large cities, or historical dates.
6. **Calculations.** Subtraction of serial 7s, simple math problems.
7. **Abstraction.** Proverb interpretation and similarities.

G. Insight. Ability of the patient to display an understanding of his current problems, and the ability to understand the implication of these problems.

H. Judgment. Ability to make sound decisions regarding everyday activities. Judgement is best evaluated by assessing a patient's history of decision making, rather than by asking hypothetical questions.

III. **DSM-IV multiaxial assessment diagnosis**
Axis I: Clinical disorders
Other conditions that may be a focus of clinical attention.
Axis II: Personality disorders
Mental retardation
Axis III: General medical conditions
Axis IV: Psychosocial and environmental problems
Axis V: Global assessment of functioning
IV. **Treatment plan.** This section should discuss pharmacologic treatment and other psychiatric therapy, including hospitalization.

Mini-mental Status Examination

Orientation: What is the year, season, day of week, date, month? - 5 points
What is the state, county, city, hospital, floor ? - 5 points
Registration: Repeat: 3 objects: apple, book, coat. - 3 points
Attention/Calculation: Spell "WORLD" backwards - 5 points
Memory: Recall the names of the previous 3 objects: - 3 points
Language: Name a pencil and a watch - 2 points
Repeat, "No ifs, and's or buts" - 1 point
Three stage command: "Take this paper in your right hand, fold it in half, and put it on the floor." - 3 points
Written command: "Close your eyes." - 1 point
Write a sentence. - 1 point
Visual Spacial: Copy two overlapping pentagons - 1 point
Total Score
Normal: 25-30
Mild intellectual impairment: 20-25
Moderate intellectual impairment: 10-20
Severe intellectual impairment: 0-10

Attempted Suicide and Drug Overdose

Chief Compliant: The patient is a 50 year old white male with depression who presents after overdosing on antidepressants 3 hours prior to admission.
History of the Present Illness: Time suicide was attempted and method. Quantity of pills; motive for attempt. Alcohol intake, other medications; place where medication was obtained; last menstrual period.
Symptoms of Tricyclic Antidepressant Overdose: Dry mouth, hallucinations, seizures, agitation, visual changes.
Psychiatric History: Previous suicide attempts or threats, family support,

marital conflict, family conflict, alcohol or drug abuse, job stress, school stress. Availability of other dangerous medications or weapons.

Precipitating factor for suicide attempt (death, divorce, humiliating event, unemployment, medical illness); further desire to commit suicide; is there a definite plan? Was action impulsive or planned?

Detailed account of events 48-hours prior to suicide attempt and after. Feelings of sadness, guilt, hopelessness, helplessness. Reasons that a patient has to wish to go on living. Did the patient believe that he would succeed in suicide? Is the patient upset that he is still alive?

Past Medical History: Prior suicide attempts, emotional, physical, or sexual abuse.

Family History: Depression, suicide, psychiatric disease, emotional, physical, or sexual abuse. .

Physical Examination

General Appearance: Demeanor, affect, level of consciousness, confusion, delirium; presence of potentially dangerous objects or substances (belts, shoe laces).

Vital Signs: BP (hypotension), pulse (bradycardia), temperature (hyperpyrexia), respiratory rate.

HEENT: Signs of trauma; pupil size and reactivity, mydriasis, nystagmus.

Chest: Abnormal respiratory patterns, rhonchi (aspiration).

Heart: Irregular rhythm.

Abdomen: Wounds, decreased bowel sounds, tenderness.

Extremities: Needle marks, wounds, ecchymoses.

Neuro: Mental status exam, mood, affect, depressed mood, rapid-pressured speech; tremor, clonus, hyperactive reflexes.

ECG Signs of Antidepressant Overdose: QRS widening, PR or QT prolongation, AV block, ventricular tachycardia, Torsades de pointes ventricular arrhythmia.

Labs: Electrolytes, BUN, creatinine, glucose; ABG. Alcohol, acetaminophen levels; chest X-ray, urine toxicology screen.

Alcohol Withdrawal

Chief Compliant: The patient is a 50 year old white male with alcoholism who presents with tremor and agitation after discontinuing alcohol 12 hours prior to admission.

History of the Present Illness: Determine the amount and frequency of alcohol use and other drug use in the past month, week, and day. Time of last alcohol consumption; tremors, anxiety, nausea, vomiting; diaphoresis, agitation, fever, abdominal pain, headaches; hematemesis, melena, past withdrawal reactions; history of delirium tremens, hallucinations, chest pain. Age of onset

of heavy drinking.

Determine whether the patient ever consumes five or more drinks at a time (binge drinking). Drug abuse.

Effects of the alcohol or drug use on the patient's life, including problems with health, family, job or financial status or the legal system.

History of blackouts or motor vehicle crashes.

Past Medical History: Gastritis, ulcers, GI bleeding; hepatitis, cirrhosis, pancreatitis, drug abuse.

Family History: Alcoholism.

Physical Examination

General Appearance: Poor nutritional status, slurred speech, disorientation, diaphoresis.

Vital Signs: BP (hypertension), pulse (tachycardia), respiratory rate, temperature (hyperthermia).

HEENT: Signs of head trauma, ecchymoses. Conjunctival injection, icterus, nystagmus, extraocular movements, pupil reactivity.

Chest: Rhonchi, crackles (aspiration), gynecomastia (cirrhosis).

Heart: Irregular rhythm, murmurs.

Abdomen: Liver tenderness, hepatomegaly or liver atrophy, liver span, splenomegaly, ascites.

Genitourinary: Testicular atrophy, hernias.

Rectal: Occult blood.

Skin: Jaundice, spider angiomas (stellate arterioles with branching capillaries), palmar erythema, muscle atrophy (stigmata of liver disease); needle tracks.

Extremities: Dupuytren's contracture (fibrotic palmar ridge to ring finger).

Neuro: Mood, affect, speech patterns, depressed mood. Cranial nerves 2-12, reflexes, ataxia. Asterixis, decreased vibratory sense (peripheral neuropathy).

Wernicke's Encephalopathy: Ophthalmoplegia, ataxia, confusion (thiamine deficiency).

Korsakoff's Syndrome: Retrograde or antegrade amnesia, confabulation.

Labs: Electrolytes, magnesium, glucose, liver function tests, CBC, mean corpuscular volume, gamma-glutamyltransferase, aspartate aminotransferase (AST), alanine aminotransferase (ALT), carbohydrate-deficient transferrin (CDT). UA; chest X-ray; ECG.

Differential Diagnosis of Altered Mental Status: Alcohol intoxication, hypoglycemia, narcotic overdose, meningitis, drug overdose, head trauma, alcoholic ketoacidosis, anticholinergic poisoning, sedative-hypnotic withdrawal, intracranial hemorrhage.

Commonly Used Formulas

A-a gradient = $[(P_B - PH_2O)\ FiO_2 - PCO_2/R] - PO_2$ arterial

$= (713 \times FiO_2 - pCO_2/0.8) - pO_2$ arterial

P_B = 760 mmHg; PH_2O = 47 mmHg ; $R \approx 0.8$
normal Aa gradient <10-15 mmHg (room air)

Arterial oxygen capacity =(Hgb(gm)/100 mL) x 1.36 mL O_2/gm Hgb

Arterial O_2 content = $1.36(Hgb)(SaO_2)+0.003(PaO_2)$= NL 20 vol%

O_2 delivery = CO x arterial O_2 content = NL 640-1000 mL O_2/min

Cardiac output = HR x stroke volume

$$\text{CO L/min} = \frac{125 \text{ mL } O_2/\text{min}/M^2}{8.5\ \{(1.36)(Hgb)(SaO_2) - (1.36)(Hgb)(SvO_2)\}} \times 100$$

Normal CO = 4-6 L/min

$$\text{SVR} = \frac{\text{MAP - CVP x 80}}{CO_{L/min}} = \text{NL 800-1200 dyne/sec/cm}^2$$

$$\text{PVR} = \frac{\text{PA - PCWP x 80}}{CO_{L/min}} = \text{NL 45-120 dyne/sec/cm}^2$$

$$\text{GFR mL/min} = \frac{(140 - \text{age}) \times \text{wt in Kg}}{72 \text{ (males)} \times \text{serum Cr (mg/dL)}}$$
$$85 \text{ (females)} \times \text{serum Cr (mg/dL)}$$

$$\text{Creatinine clearance} = \frac{\text{U Cr (mg/100 mL)} \times \text{U vol (mL)}}{\text{P Cr (mg/100 mL)} \times \text{time (1440 min for 24h)}}$$

Normal creatinine clearance = 100-125 mL/min(males), 85-105(females)

$$\text{Body water deficit (L)} = \frac{0.6(\text{weight kg})([\text{measured serum Na}]-140)}{140}$$

$$\text{Osmolality mOsm/kg} = 2[Na+ K] + \frac{BUN}{2.8} + \frac{glucose}{18} = \text{NL 270-290 } \frac{mOsm}{kg}$$

$$\text{Fractional excreted Na} = \frac{\text{U Na/ Serum Na x 100}}{\text{U Cr/ Serum Cr}} = \text{NL<1\%}$$

Anion Gap = Na - (Cl + HCO3)

For each 100 mg/dL increase in glucose, Na+ decrease by 1.6 mEq/L.

Corrected serum Ca^+ (mg/dL) = measured Ca mg/dL + 0.8 x (4 - albumin g/dL)

Ideal body weight males = 50 kg for first 5 feet of height + 2.3 kg for each additional inch.

Ideal body weight females = 45.5 kg for first 5 feet + 2.3 kg for each additional inch.

Basal energy expenditure (BEE):
Males=66 + (13.7 x actual weight Kg) + (5 x height cm)-(6.8 x age)
Females= 655+(9.6 x actual weight Kg)+(1.7 x height cm)-(4.7 x age)

Nitrogen Balance = Gm protein intake/6.25 - urine urea nitrogen - (3-4 gm/d insensible loss)

Predicted Maximal Heart Rate = 220 - age

Normal ECG Intervals (sec)

PR	0.12-0.20
QRS	0.06-0.08
Heart rate/min	**Q-T**
60	0.33-0.43
70	0.31-0.41
80	0.29-0.38
90	0.28-0.36
100	0.27-0.35

Commonly Used Drug Levels	
Drug	**Therapeutic Range**
Amikacin	Peak 25-30; trough <10 mcg/mL
Amiodarone	1.0-3.0 mcg/mL
Amitriptyline	100-250 ng/mL
Carbamazepine	4-10 mcg/mL
Desipramine	150-300 ng/mL
Digoxin	0.8-2.0 ng/mL
Disopyramide	2-5 mcg/mL
Doxepin	75-200 ng/mL
Flecainide	0.2-1.0 mcg/mL
Gentamicin	Peak 6.0-8.0; trough <2.0 mcg/mL
Imipramine	150-300 ng/mL
Lidocaine	2-5 mcg/mL
Lithium	0.5-1.4 mEq/L
Mexiletine	1.0-2.0 mcg/mL
Nortriptyline	50-150 ng/mL
Phenobarbital	10-30 mEq/mL
Phenytoin	8-20 mcg/mL
Procainamide	4.0-8.0 mcg/mL
Quinidine	2.5-5.0 mcg/mL
Salicylate	15-25 mg/dL
Streptomycin	Peak 10-20; trough <5 mcg/mL
Theophylline	8-20 mcg/mL
Tocainide	4-10 mcg/mL
Valproic acid	50-100 mcg/mL
Vancomycin	Peak 30-40; trough <10 mcg/mL

Commonly Used Abbreviations

½ NS	0.45% saline solution
ac	ante cibum (before meals)
ABG	arterial blood gas
ac	before meals
ACTH	adrenocorticotropic hormone
ad lib	ad libitum (desired)
ADH	antidiuretic hormone
AFB	acid-fast bacillus
alk phos	alkaline phosphatase
ALT	alanine aminotransferase
am	morning
AMA	against medical advice
amp	ampule
AMV	assisted mandatory ventilation; assist mode ventilation
ANA	antinuclear antibody
ante	before
AP	anteroposterior
ARDS	adult respiratory distress syndrome
ASA	acetylsalicylic acid
AST	aspartate aminotransferase
bid	bis in die (twice a day)
B-12	vitamin B-12 (cyanocobalamin)
BM	bowel movement
BP	blood pressure
BUN	blood urea nitrogen
c/o	complaint of
c	cum (with)
C and S	culture and sensitivity
C	centigrade
Ca	calcium
cap	capsule
CBC	complete blood count; includes hemoglobin, hematocrit, red blood cell indices, white blood cell count, and platelets
cc	cubic centimeter
CCU	coronary care unit
cm	centimeter
CMF	cyclophosphamide, methotrexate, fluorouracil
CNS	central nervous system
CO_2	carbon dioxide
COPD	chronic obstructive pulmonary disease
CPK-MB	myocardial-specific CPK isoenzyme
CPR	cardiopulmonary resuscitation
CSF	cerebrospinal fluid
CT	computerized tomography
CVP	central venous pressure
CXR	Chest X-ray
d/c	discharge; discontinue
D5W	5% dextrose water solution; also D10W, D50W
DIC	disseminated intravascular coagulation
diff	differential count
DKA	diabetic ketoacidosis
dL	deciliter
DOSS	docusate sodium sulfosuccinate
DTs	delirium tremens
ECG	electrocardiogram
ER	emergency room
ERCP	endoscopic retrograde cholangiopancreatography
ESR	erythrocyte sedimentation rate
ET	endotracheal tube
ETOH	alcohol
FEV_1	forced expiratory volume (in one second)
FiO_2	fractional inspired oxygen
g	gram(s)
GC	gonococcal; gonococcus
GFR	glomerular filtration rate
GI	gastrointestinal
gm	gram
gt	drop
gtt	drops
h	hour
H_20	water
HBsAG	hepatitis B surface antigen
HCO_3	bicarbonate
Hct	hematocrit
HDL	high-density lipoprotein
Hg	mercury
Hgb	hemoglobin concentration
HIV	human immunodeficiency virus
hr	hour
hs	hora somni (bedtime, hour of sleep)

IM	intramuscular
I and O	intake and output--measurement of the patient's intake and output
IU	international units
ICU	intensive care unit
IgM	immunoglobulin M
IMV	intermittent mandatory ventilation
INH	isoniazid
INR	International normalized ratio
IPPB	intermittent positive-pressure breathing
IV	intravenous or intravenously
IVP	intravenous pyelogram; intravenous piggyback
K^+	potassium
kcal	kilocalorie
KCL	potassium chloride
KPO_4	potassium phosphate
KUB	X-ray of abdomen (kidneys, ureters, bowels)
L	liter
LDH	lactate dehydrogenase
LDL	low-density lipoprotein
liq	liquid
LLQ	left lower quadrant
LP	lumbar puncture, low potency
LR	lactated Ringer's (solution)
MB	myocardial band
MBC	minimal bacterial concentration
mcg	microgram
mEq	milliequivalent
mg	milligram
Mg	magnesium
$MgSO_4$	Magnesium Sulfate
MI	myocardial infarction
MIC	minimum inhibitory concentration
mL	milliliter
mm	millimeter
MOM	Milk of Magnesia
MRI	magnetic resonance imaging
Na	sodium
$NaHCO_3$	sodium bicarbonate
Neuro	neurologic
NG	nasogastric
NKA	no known allergies
NPH	neutral protamine Hagedorn (insulin)
NPO	nulla per os (nothing by mouth)
NS	normal saline solution (0.9%)
NSAID	nonsteroidal anti-inflammatory drug
O_2	oxygen
OD	right eye
oint	ointment
OS	left eye
Osm	osmolality
OT	occupational therapy
OTC	over the counter
OU	each eye
oz	ounce
p, post	after
pc	post cibum (after meals)
PA	posteroanterior; pulmonary artery
PaO_2	arterial oxygen pressure
pAO_2	partial pressure of oxygen in alveolar gas
PB	phenobarbital
pc	after meals
pCO_2	partial pressure of carbon dioxide
PEEP	positive end-expiratory pressure
per	by
pH	hydrogen ion concentration (H+)
PID	pelvic inflammatory disease
pm	afternoon
PO	orally, per os
pO_2	partial pressure of oxygen
polys	polymorphonuclear leukocytes
PPD	purified protein derivative
PR	per rectum
prn	pro re nata (as needed)
PT	physical therapy; prothrombin time
PTCA	percutaneous transluminal coronary angioplasty
PTT	partial thromboplastin time
PVC	premature ventricular contraction
q	quaque (every) q6h, q2h every 6 hours; every 2 hours
qid	quarter in die (four times a day)
qAM	every morning
qd	quaque die (every day)
qh	every hour
qhs	every night before bedtime
qid	4 times a day

qOD	every other day
qs	quantity sufficient
R/O	rule out
RA	rheumatoid arthritis; room air; right atrial
Resp	respiratory rate
RL	Ringer's lactated solution (also LR)
ROM	range of motion
rt	right
s	sine (without)
s/p	status post
sat	saturated
SBP	systolic blood pressure
SC	subcutaneously
SIADH	syndrome of inappropriate antidiuretic hormone
SL	sublingually under tongue
SLE	systemic lupus erythematosus
SMA-12	sequential multiple analysis; a panel of 12 chemistry tests. Tests include Na^+, K^+, $HCO3^-$, chloride, BUN, glucose, creatinine, bilirubin, calcium, total protein, albumin, alkaline phosphatase.
SMX	sulfamethoxazole
sob	shortness of breath
sol	solution
SQ	under the skin
ss	one-half
STAT	statim (immediately)
susp	suspension
tid	ter in die (three times a day)
T4	Thyroxine level (T4)
tab	tablet
TB	tuberculosis
Tbsp	tablespoon
Temp	temperature
TIA	transient ischemic attack
tid	three times a day
TKO	to keep open, an infusion rate (500 mL/24h)
TMP-SMX	trimethoprim-sulfamethoxazole combination
TPA	tissue plasminogen activator
TSH	thyroid-stimulating hormone
tsp	teaspoon
U	units
UA	urinalysis
URI	upper respiratory infection
Ut Dict	as directed
UTI	urinary tract infection
VAC	vincristine, adriamycin, and cyclophosphamide
vag	vaginal
VC	vital capacity
VDRL	Venereal Disease Research Laboratory
VF	ventricular function
V fib	ventricular fibrillation
VLDL	very low-density lipoprotein
Vol	volume
VS	vital signs
VT	ventricular tachycardia
W	water
WBC	white blood count
x	times

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