STATION 1

Acute epiglottitis scenario

Definition: Life-threatening inflammation of the epiglottis, usually due to infection.

Etiology: Haemophilus influenzae type B (HiB) (most common in unvaccinated individuals), Streptococcus and Staphylococcus species.

Epidemiology: More common in children (2–7 years) but can occur in adults.

Clinical Features:

Rapid onset of high fever

Severe sore throat (disproportionate to oropharyngeal findings)

Dysphagia, drooling, and distress (3D's)

Muffled "hot potato" voice

Inspiratory stridor, tripod position

No cough (unlike croup)

Diagnosis:

Clinical suspicion (do not delay management for tests)

Lateral neck X-ray: Thumb sign

Flexible laryngoscopy (in stable patients)

Management:

Airway protection is the priority (Intubation in severe cases)

IV antibiotics: Ceftriaxone or Cefotaxime + Vancomycin if MRSA suspected

IV corticosteroids (e.g., dexamethasone) to reduce swelling

Supportive care: Humidified oxygen, fluids

Prevention: HiB vaccination

STATION 2

Pulmonary fibrosis

Definition: Progressive scarring of lung tissue leading to restrictive lung disease.

Etiology:

Idiopathic: Idiopathic Pulmonary Fibrosis (IPF – most common).

Secondary Causes:

Autoimmune diseases (RA, SLE, scleroderma).

Environmental exposure (silica, asbestos, coal dust).

Medications (amiodarone, methotrexate, bleomycin).

Radiation therapy.

Clinical Features:

Progressive dyspnea on exertion.

Chronic dry cough.

Clubbing of fingers (advanced cases).

Velcro-like inspiratory crackles on auscultation.

Diagnosis:

High-resolution CT (HRCT): Honeycombing pattern.

Pulmonary function tests (PFTs): Restrictive pattern (↓ TLC, ↓ FVC, normal or ↑ FEV1/FVC).

Lung biopsy (if needed for confirmation).

Management:

No cure, but treatment slows progression.

Antifibrotic drugs: Pirfenidone, Nintedanib (for IPF).

Oxygen therapy for hypoxemia.

Pulmonary rehabilitation.

Lung transplant (severe cases).

Prognosis: Poor; median survival in IPF is 3–5 years.

STATION 3

Infective endocarditis scenario static station

Infection of the endocardial surface of the heart, commonly

involving heart valves.

Etiology:

Native Valve Endocarditis (NVE):

- Staphylococcus aureus (most common, acute)

- Viridans streptococci (subacute, post-dental procedures)

- Enterococcus (elderly, genitourinary procedures)

- *Prosthetic Valve Endocarditis (PVE):*

- Early (<1 year post-surgery): Staphylococcus epidermidis

- Late (>1 year post-surgery): Similar to NVE pathogens

- *IV Drug Users:* Staphylococcus aureus (affects *tricuspid valve* commonly)

Risk Factors:

Congenital or rheumatic heart disease

- Prosthetic heart valves

- IV drug use

- Recent dental, GI, or cardiac procedures

- Immunosuppression

Clinical Features:

Fever + New murmur (most common findings)

- *Janeway lesions* – painless palm/sole macules

- *Osler nodes* – painful fingertip nodules

- *Roth spots* – retinal hemorrhages

Splinter hemorrhages – under nails

Septic emboli – stroke, infarcts, abscesses

Diagnosis (Modified Duke Criteria):

Major Criteria:

1. Positive blood cultures (typical organisms from 2 culture,, persistent positive bacteremia taken greater than 12 hr apart,>3 positive culture taken over 1 hr apart)

2. Evidence of endocardial involvement (Echo: vegetations, abscess or new valve regurgitation)

- *Minor Criteria:*

- Fever ⩾38°C

- Predisposing condition (IV drug use, heart disease)

- Vascular or immunologic phenomena

- Microbiologic evidence not meeting major criteria

Investigations:

Blood cultures x3 before antibiotics

- *Echocardiography:*

- *Transthoracic (TTE)* – initial test

- *Transesophageal (TEE)* – more sensitive for vegetations

Management:

Empirical IV antibiotics (before cultures return):

- *Native valve(staph)*: Vancomycin + gentamicin

- *Prosthetic valve*: Vancomycin + Gentamicin + Rifampin OR

vancomycin +gentamicin+cefeipime

subacute IE.ceftrioxone +gentamicin

Gentamicin +benzyl penicillin

amipicillim +gentamicin

- *Definitive therapy*: Tailor antibiotics based on cultures (usually 4–6 weeks).

- *Surgery indications:*

- Heart failure due to valve destruction

- Persistent infection despite treatment

- Large vegetations (>10 mm, embolic risk)

- Prosthetic valve involvement

Prevention:

Antibiotic prophylaxis for high-risk patients before dental/GI/GU procedures (e.g., amoxicillin).in case of allergy clindamycin

STATION 4

Afib

Irregular, rapid atrial rhythm causing ineffective atrial contraction.

Types:

Paroxysmal: Self-terminating within 7 days.

Persistent: Lasts >7 days, requires intervention.

Long-standing persistent: >12 months.

Permanent: Refractory to treatment or accepted by patient/physician.

Causes (PIRATES Mnemonic):

Pulmonary disease (COPD, PE)

Ischemic heart disease

Rheumatic heart disease (mitral stenosis), valve disease

Alcohol, anemia, age

Thyrotoxicosis

Electrolyte imbalance (K+, Mg2+), Endocarditis

Sepsis, Stress (surgery)

Clinical Features:

Palpitations, irregular pulse

Dyspnea, dizziness, fatigue

Stroke (due to thromboembolism)

ECG Findings:

Irregularly irregular rhythm

No distinct P waves

Narrow QRS

Management:

1. Rate Control (preferred in stable patients):

Beta-blockers (e.g., metoprolol)

Non-DHP CCBs (e.g., diltiazem, verapamil)

Digoxin (if heart failure present)

2. Rhythm Control (if symptomatic or young patients):

Electrical cardioversion (if unstable)

Antiarrhythmics: Amiodarone, Flecainide

3. Anticoagulation (to prevent stroke, based on CHA_2DS_2-VASc

score):

NOACs (apixaban, rivaroxaban)

Warfarin (if mechanical valve or severe mitral stenosis)

Complications:

Stroke (most feared, due to thromboembolism)

Heart failure (due to tachycardia-induced cardiomyopathy)

STATION 5

Tof

Most common cyanotic congenital heart disease (R → L shunt).

Pathophysiology (PROVe Mnemonic):

1. Pulmonary stenosis (subvalvular RV outflow obstruction)

2. Right ventricular hypertrophy (RVH due to high pressure)

3. Overriding aorta (displacement over VSD)

4. Ventricular septal defect (VSD)

Clinical Features:

Cyanosis (worsens with exertion)not at birth ,with in weeks or months

.Tet spells (hypercyanotic episodes, relieved by squatting)

.Clubbing (chronic hypoxia)

Harsh systolic ejection murmur (due to pulmonary stenosis)

growth retarded

loud P2

Diagnosis:

CXR: Boot-shaped heart,decreased pulmonary vascular marking

ECG: Right axis deviation, RVH

Echocardiography: Confirms defects

Management:

Acute Tet Spells:

Knee-chest position

Oxygen, IV fluids

morphine

Beta-blockers (e.g., propranolol)

bicorbonate

Definitive Treatment:

Surgical repair (within 3month___2year of life)

Palliative shunt (Blalock-Taussig shunt) if early surgery not possible

Complications:

Polycythemia (due to chronic hypoxia)

Stroke (due to paradoxical embolism)

Arrhythmias (post-surgery risk)

failure to thrive

STATION 6

COPD

Chronic, progressive airflow limitation due to emphysema and/or chronic bronchitis.

Risk Factors:

Smoking (most common)

Air pollution, occupational exposure (dust, chemicals)

Alpha-1 antitrypsin deficiency (genetic cause)

Pathophysiology:

Emphysema → Alveolar destruction, loss of elasticity → Air trapping

Chronic bronchitis → Excess mucus, inflammation → Airway

narrowing

Clinical Features:

Chronic cough with sputum (bronchitis dominant)

Progressive dyspnea

Wheezing, prolonged expiration

Barrel chest (hyperinflation in emphysema)

Cyanosis (blue bloaters – chronic bronchitis) vs. Pursed-lip breathing (pink puffers – emphysema)

Diagnosis:

Spirometry:

FEV1/FVC < 70% (irreversible obstruction)

↓ FEV1, ↑ RV (air trapping)

CXR: Hyperinflation, flattened diaphragm

ABG: Hypoxemia, hypercapnia in advanced disease

Management:

1. Smoking cessation (most important intervention!)

2. Bronchodilators:

SABA/SAMA (e.g., albuterol, ipratropium) – for symptom relief

LABA/LAMA (e.g., salmeterol, tiotropium) – for maintenance

3. Inhaled corticosteroids (ICS) (if frequent exacerbations)

4. Oxygen therapy (if severe hypoxemia: SpO_2 < 88%)

5. Pulmonary rehabilitation

Exacerbation Management:

Short-acting bronchodilators (SABA + SAMA)

Systemic steroids (prednisone 40 mg for 5 days)

Antibiotics (if purulent sputum or pneumonia)

Oxygen (target SpO_2 88–92%)

Complications:

Cor pulmonale (right heart failure)

Respiratory failure

Frequent infections (pneumonia, bronchitis)

STATION 7

Lung CA

Types: Non-Small Cell Lung Cancer (NSCLC) (85% – adenocarcinoma, squamous cell, large cell) | Small Cell Lung Cancer (SCLC) (15%, aggressive, early metastasis)

Risk Factors: Smoking (strongest), radiation, asbestos, radon, genetics

Symptoms: Chronic cough, hemoptysis, weight loss, dyspnea,

chest pain

Paraneoplastic Syndromes: SIADH, Cushing's (SCLC); Hypercalcemia (Squamous cell)

Diagnosis: CXR → CT → Biopsy (bronchoscopy, FNA, VATS)

Staging: NSCLC (TNM system); SCLC (Limited vs. Extensive)

Treatment: NSCLC (Surgery ± chemo/radiation, targeted therapy); SCLC (Chemo + Radiation, no surgery in most cases)

Complications: Pancoast tumor (Horner's syndrome), SVC syndrome, metastasis (brain, liver, bone, adrenal)

STATION 8

Pneumonia

Definition: Infection of the lung parenchyma causing inflammation and alveolar consolidation.

Types: Community-acquired (CAP), Hospital-acquired (HAP), Ventilator-associated (VAP), Aspiration pneumonia

Common Pathogens:

CAP: Streptococcus pneumoniae (most common), Haemophilus influenzae, Mycoplasma pneumoniae (atypical)

HAP/VAP: Pseudomonas, MRSA, Klebsiella

Aspiration: Anaerobes (Bacteroides, Fusobacterium)

Symptoms: Fever, productive cough, dyspnea, pleuritic chest pain

Signs: Crackles, bronchial breath sounds, dullness to percussion, ↑ tactile fremitus

Diagnosis: CXR (lobar vs. interstitial infiltrates), CBC, sputum & blood cultures

Severity Score: CURB-65 (Confusion, Urea >7, RR ≥30, BP <90/60, Age ≥65)

Treatment:

Outpatient CAP: Amoxicillin or Doxycycline (or Macrolide if atypical)

Inpatient CAP: Ceftriaxone + Azithromycin (or Levofloxacin alone)

HAP/VAP: Pip-Tazo + Vancomycin (cover MRSA & Pseudomonas)

Aspiration: Clindamycin or Metronidazole + Amoxicillin

Complications: Pleural effusion, abscess, ARDS, sepsis

Prevention: Pneumococcal & Influenza vaccines

STATION 9

Tb

Cause: Mycobacterium tuberculosis (acid-fast bacillus)

Transmission: Airborne droplets (cough, sneeze, talk)

Risk Factors: HIV, immunosuppression, malnutrition, overcrowding

Types: Primary TB (initial infection, often asymptomatic), Latent TB (dormant, non-contagious), Reactivation TB (symptomatic, contagious), Miliary TB (disseminated, severe)

Symptoms: Chronic cough, hemoptysis, fever, night sweats, weight loss

Diagnosis: Mantoux (PPD) or IGRA (Quantiferon), CXR (upper lobe cavitations), Sputum AFB stain & culture, NAAT (GeneXpert)

Treatment (RIPE for Active TB): Rifampin, Isoniazid, Pyrazinamide, Ethambutol (6 months total: RIPE for 2 months, RI for 4 months)

Latent TB Treatment: Isoniazid + Rifapentine (3 months) or Rifampin (4 months) or Isoniazid (6-9 months)

Side Effects: Rifampin (red-orange urine), Isoniazid (neuropathy, hepatotoxicity), Pyrazinamide (hyperuricemia, gout), Ethambutol (optic neuritis)

Prevention: BCG vaccine (not in the U.S.), screening high-risk groups

Complications: Cavitary lung disease, hemoptysis, Pott's disease (TB spine), TB meningitis

STATION 10

BAL uses

Infections: PJP, TB, bacterial, viral, fungal pneumonias

Interstitial Lung Disease (ILD): IPF, sarcoidosis, hypersensitivity pneumonitis

Malignancy: Lung cancer diagnosis, lymphangitic carcinomatosis

Occupational Lung Disease: Silicosis, asbestosis, berylliosis

Hematologic Disorders: Pulmonary hemorrhage syndromes (Goodpasture, vasculitis)

Transplant Monitoring: Lung transplant rejection, opportunistic infections

STATION 11

Congestive heart failure stages mortality drugs

Mitral

New York Heart Association (NYHA) Classification	
Class I	No limitation during ordinary activity
Class II	Slight limitation during ordinary activity
Class III	Marked limitation of normal activities without symptoms at rest.
Class IV	Dyspnea at rest; all activities cause dyspnea.

* Chronic Heart Failure *

American College of Cardiology (American Heart Association) Heart Failure Staging	
Stage A	No structural heart disease or symptoms of heart failure
Stage B	Structural heart disease but no symptoms of heart failure
Stage C	Structural heart disease and symptoms of heart failure
Stage D	Refractory heart failure requiring specialized interventions

ACC

Tx
Risk Factor reduction
Tx HTN, dyslipidemia, ACE-I, ARAs

Tx → ACEI or ARBs, B-Blocker in selected

Tx → ACEI + B-Block in all patients

Tx → Ionotropes, VAD, Transplantation

Hospice (peace death)

Dietary, diuresis & digoxin

cardiac resynchronization

revascularization

mitral surgery, consider

multidisciplinary team!

Aldosterone antagonist - mesirtido

Clinical Pearl:

Dyspnea of Cardiac Origin:

- Dyspnea on exertion is the most common symptom of congestive heart failure.
- The features that differentiate cardiac dyspnea from dyspnea of other origins are:
  1. Orthopnea
  2. Paroxysmal nocturnal dyspnea (PND)
  3. S3 heart sound

STATION 12

Pulmonary Embolism (PE)

- Cause: Thrombus (DVT) travels to pulmonary arteries
- Risk Factors: Immobility, surgery, pregnancy, malignancy, thrombophilia
- Symptoms: Sudden dyspnea, chest pain, hemoptysis, tachycardia, hypotension
- Diagnosis: D-dimer, CTPA (gold standard), ECG (S1Q3T3 pattern), ABG (hypoxia)
- Treatment: Anticoagulation (heparin, LMWH), thrombolysis (severe cases), IVC filter (if anticoagulation contraindicated)

Amniotic Fluid Embolism (AFE)

- Cause: Amniotic fluid enters maternal circulation triggering anaphylactoid reaction
- Risk Factors: Multiparity, C-section, placenta previa/accreta, uterine rupture
- Symptoms: Sudden hypotension, respiratory distress, coagulopathy (DIC), altered mental status
- Diagnosis: Clinical, exclusion of other causes, lab findings

(DIC, hypoxia)

- Treatment: Supportive (oxygen, fluids, vasopressors), blood products (for DIC), ECMO in severe cases

STATION 13

Myocarditis

Myocarditis

- Cause: Viral (Coxsackie, adenovirus), bacterial, autoimmune, toxins, drugs
- Symptoms: Chest pain, dyspnea, palpitations, fatigue, syncope, fever
- Diagnosis: ECG (ST changes, arrhythmias), cardiac enzymes (↑troponin), echocardiogram, cardiac MRI (gold standard), endomyocardial biopsy (definitive but rarely needed)
- Treatment: Supportive (oxygen, fluids, pain management), heart failure treatment (ACEi, β-blockers, diuretics), immunosuppression (if autoimmune), antivirals (if indicated), avoid NSAIDs (may worsen inflammation)

STATION 14

Bronchiolitis

Definition: Acute viral infection of the small airways (bronchioles), common in infants.

Cause: Respiratory syncytial virus (RSV) most common, also rhinovirus, adenovirus.

Risk Factors: Prematurity, congenital heart/lung disease, immunodeficiency, smoke exposure.

Symptoms: Cough, wheezing, tachypnea, nasal congestion, respiratory distress (grunting, retractions).

Diagnosis: Clinical (no routine CXR or labs), RSV PCR if needed.

Treatment: Supportive (hydration, nasal suctioning, oxygen if needed); NO antibiotics or steroids.

Severe Cases: Hospitalization, high-flow oxygen, mechanical ventilation if respiratory failure.

Prevention: Palivizumab (high-risk infants), hand hygiene, avoid sick contacts.

STATION 15

Asthma

- Cause: Chronic airway inflammation, hyperresponsiveness, triggers (allergens, infections, exercise, cold air)

- Symptoms: Wheezing, dyspnea, cough (worse at night), chest tightness
- Diagnosis: Spirometry (↓ FEV1/FVC, reversibility with bronchodilator), peak flow monitoring, methacholine challenge (if unclear)
- Treatment: SABA (rescue, e.g., albuterol), ICS (controller, e.g., budesonide), LABA (e.g., salmeterol, always with ICS), LTRA (e.g., montelukast), biologics (severe cases)
- Exacerbation: Nebulized SABA, systemic steroids, oxygen, $MgSO_4$ (severe), mechanical ventilation (if respiratory failure)

STATION 16

Right & left point of maximal impulse-PMI- displacement causes

Rightward PMI Displacement

- RV hypertrophy (pulmonary hypertension, COPD)
- Dextrocardia
- Tension pneumothorax (left-sided)
- Pleural effusion (left-sided)
- Lung collapse (left-sided)

Leftward PMI Displacement

- LV hypertrophy (hypertension, aortic stenosis)
- Cardiomegaly (heart failure, dilated cardiomyopathy)
- Tension pneumothorax (right-sided)
- Pleural effusion (right-sided)
- Lung collapse (right-sided)

STATION 17

VSD treatment

VSD Treatment

- Small: Spontaneous closure (monitor)
- Moderate/Large: Diuretics (furosemide), ACEi (afterload reduction), high-calorie feeds
- Surgery: Indications (CHF, growth failure, pulmonary HTN, large defect)
- Catheter Closure: Select cases (muscular VSD)
- Endocarditis Prophylaxis: Only if prior infective endocarditis or prosthetic repair

STATION 18

Typhoid FEVER

Cause: Salmonella typhi (gram-negative bacillus)

Transmission: Fecal-oral route (contaminated food/water)

Incubation Period: 1–2 weeks

Symptoms:

Prolonged fever (stepwise rise)

Abdominal pain, diarrhea/constipation

Rose spots (faint salmon-colored macules on trunk)

Hepatosplenomegaly

Relative bradycardia

Diagnosis:

Blood cultures (1st week most sensitive)

Widal test (serology, less reliable)

Stool/urine culture (late stages)

Treatment:

Ceftriaxone or Azithromycin (uncomplicated cases)

Fluoroquinolones (e.g., Ciprofloxacin) if sensitive

Supportive care (hydration, antipyretics)

Complications: Intestinal perforation, GI bleeding, encephalopathy

Prevention: Typhoid vaccine, improved sanitation, hand

hygiene