Common Medical Diseases and Their Diagnosis: A Comprehensive Overview

Disclaimer

This document provides general information about common medical diseases and their diagnosis. It is intended for educational purposes only and should not be substituted for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read in this document.

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1. Introduction

Understanding common medical diseases is crucial for promoting public health awareness and facilitating early detection. Diseases vary widely in their causes, manifestations, and impact on individuals. Early and accurate diagnosis is often the cornerstone of effective treatment and management, leading to better patient outcomes and improved quality of life.

This document provides an overview of several common medical conditions, outlining their general characteristics, typical symptoms, and the common diagnostic approaches used by healthcare professionals. The diagnostic process is often multifaceted, involving a combination of patient history, physical examination, laboratory tests, and imaging studies. It is a critical step in formulating a targeted and effective treatment plan.

The information presented here aims to provide a foundational understanding and should not replace consultation with healthcare providers. Medical science is continually evolving, and diagnostic and treatment protocols may change.

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2. Cardiovascular Diseases

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. They are a leading cause of morbidity and mortality globally. Early diagnosis and management are key to preventing severe complications.

2.1 Hypertension (High Blood Pressure)

Overview: Hypertension, commonly known as high blood pressure, is a chronic medical condition in which the force of the blood against the artery walls is consistently too high. If left untreated, it can lead to severe health complications, including heart disease, stroke, kidney failure, and vision loss. Blood pressure is recorded as two numbers: systolic pressure (the pressure when the heart beats) over diastolic pressure (the pressure when the heart rests between beats). A reading consistently at or above 130/80 mmHg is generally considered hypertensive, though guidelines may vary. Many people with hypertension have no symptoms, which is why it's often called the "silent killer."

Common Symptoms: Often, hypertension has no warning signs or symptoms. Some individuals may experience:

- Severe headaches

- Nosebleeds
- Fatigue or confusion
- Vision problems
- Chest pain
- Difficulty breathing
- Irregular heartbeat
- Blood in the urine (These symptoms typically occur when blood pressure reaches a dangerously high, life-threatening level).

Diagnosis: Diagnosis of hypertension is straightforward but requires accurate measurement.

- **Blood Pressure Measurement:** The primary method is using a sphygmomanometer. Readings are usually taken on multiple occasions, under calm conditions, to confirm a sustained high level. Ambulatory blood pressure monitoring (ABPM), where a device takes readings over 24 hours, or home blood pressure monitoring may be used for more comprehensive assessment.
- **Medical History and Physical Examination:** A doctor will ask about family history of hypertension, lifestyle factors (diet, exercise, smoking, alcohol intake), and other medical conditions. A physical exam helps assess overall health and look for signs of organ damage.
- **Laboratory Tests:**
  - **Urinalysis:** To check for kidney damage (e.g., protein in urine).
  - **Blood tests:** To check kidney function (creatinine, BUN), electrolytes (sodium, potassium), blood glucose (for diabetes), and cholesterol levels.
  - **Electrocardiogram (ECG or EKG):** To assess heart rhythm and detect signs of heart damage or strain (e.g., left ventricular hypertrophy).
- **Further Investigations (if indicated):** Echocardiogram (to visualize heart structure and function), renal ultrasound (to examine kidneys and their blood supply).

2.2 Coronary Artery Disease (CAD)

Overview: Coronary Artery Disease is the most common type of heart disease. It occurs when the coronary arteries, which supply blood, oxygen, and nutrients to the heart muscle, become damaged or diseased. Cholesterol-containing deposits (plaque) in these arteries and inflammation are usually the main causes (atherosclerosis). Over time, CAD can lead to chest pain (angina), shortness of breath, or even a heart attack (myocardial infarction).

Common Symptoms: Symptoms may not be apparent initially, or may only occur during exertion. As plaque buildup progresses:

- **Chest pain (angina):** Often described as pressure, tightness, squeezing, or heaviness in the chest. It can radiate to the shoulder, arm, neck, jaw, or back. Usually triggered by physical or emotional stress.
- **Shortness of breath:** Especially during exertion.
- **Fatigue:** Feeling unusually tired.
- **Heart attack symptoms:** Crushing chest pain, pain radiating to the jaw or left arm, sweating, nausea, extreme shortness of breath. (A heart attack is a medical emergency).

Diagnosis:

- **Medical History and Risk Factor Assessment:** Includes family history, smoking, diabetes, high blood pressure, high cholesterol, obesity, and physical inactivity.
- **Physical Examination:** Checking blood pressure, listening to the heart.
- **Electrocardiogram (ECG or EKG):** Records the electrical activity of the heart. Can show evidence of a previous heart attack or ischemia (reduced blood flow) during an episode of chest pain.
- **Stress Test:** Monitors heart activity (ECG, heart rate, blood pressure) while the patient walks on a treadmill or rides a stationary bike. It helps show how the heart performs during exertion. Pharmacological stress tests (using medication to stress the heart) are an option for those unable to exercise.
- **Echocardiogram:** Uses sound waves to create images of the heart, showing its size, shape, and how well its chambers and valves are working. A stress echocardiogram can assess heart function before and after exercise.
- **Blood Tests:** To check cholesterol levels (lipid profile), cardiac enzymes (like troponin, which are released during a heart attack), and other markers of heart disease.
- **Coronary Angiography (Cardiac Catheterization):** This is an invasive procedure considered the gold standard for diagnosing CAD. A thin, flexible tube (catheter) is guided through a blood vessel to the coronary arteries. A contrast dye is injected, and X-rays (angiograms) are taken to visualize blockages or narrowing.
- **Computed Tomography (CT) Coronary Angiogram:** A non-invasive imaging test that uses CT scanning to visualize the coronary arteries. It can detect plaque buildup and narrowing.

2.3 Stroke

Overview: A stroke, sometimes called a "brain attack," occurs when the blood supply to part of the brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. Brain cells begin to die in minutes. There are two main types of stroke:

- **Ischemic stroke:** Caused by a blockage in an artery (e.g., a blood clot). This is the most common type.
- **Hemorrhagic stroke:** Caused by a leaking or bursting blood vessel in the brain. A transient ischemic attack (TIA), or "mini-stroke," is a temporary interruption of blood flow to the brain, which doesn't cause permanent damage but is a serious warning sign for a future stroke.

Common Symptoms: Stroke symptoms appear suddenly. The acronym **FAST** is used to remember key signs:

- **F - Face drooping:** One side of the face may droop or feel numb. Ask the person to smile.
- **A - Arm weakness:** One arm may be weak or numb. Ask the person to raise both arms. Does one arm drift downward?
- **S - Speech difficulty:** Speech may be slurred, or the person may be unable to speak or hard to understand. Ask the person to repeat a simple sentence.
- **T - Time to call emergency services:** If any of these symptoms are present, even if they go away, call for emergency medical help immediately.

Other symptoms can include:

- Sudden numbness or weakness of the leg, arm, or face, especially on one side of the body.
- Sudden confusion, trouble understanding speech.
- Sudden trouble seeing in one or both eyes.
- Sudden trouble walking, dizziness, loss of balance or coordination.
- Sudden severe headache with no known cause.

Diagnosis: Rapid diagnosis is crucial for stroke treatment.

- **Physical Examination and Neurological Assessment:** Doctors will check for the signs mentioned above, assess level of consciousness, coordination, sensation, reflexes, and speech. They will also ask about when symptoms started.
- **Brain Imaging Tests:** These are critical to determine the type of stroke (ischemic or hemorrhagic), its location, and extent.
  - **Computed Tomography (CT) scan:** Often the first imaging test done. It can quickly show bleeding in the brain (hemorrhagic stroke) or damage from an ischemic stroke (though early ischemic changes may not always be visible). A CT angiogram (CTA) can visualize blood vessels.
  - **Magnetic Resonance Imaging (MRI):** More sensitive in detecting early ischemic stroke damage and providing detailed images of brain tissue. An MR angiogram (MRA) can also visualize blood vessels.

- **Blood Tests:** Including blood sugar levels, clotting factors, platelet count, and electrolytes.
- **Carotid Ultrasound:** Uses sound waves to create images of the carotid arteries in the neck, checking for plaque buildup (atherosclerosis) which can be a source of clots.
- **Echocardiogram:** To check for sources of clots in the heart that could travel to the brain (e.g., atrial fibrillation, valve problems).
- **Cerebral Angiography:** An invasive procedure similar to coronary angiography, used in specific cases to get detailed images of the brain's blood vessels.

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3. Respiratory Diseases

Respiratory diseases affect the airways and lungs, ranging from acute infections to chronic conditions.

3.1 Asthma

Overview: Asthma is a chronic inflammatory disease of the airways that causes them to narrow and swell and produce extra mucus. This can make breathing difficult and trigger coughing, wheezing (a whistling sound when you breathe out), and shortness of breath. For some people, asthma is a minor nuisance. For others, it can be a major problem that interferes with daily activities and may lead to a life-threatening asthma attack. Asthma severity varies from person to person.

Common Symptoms: Symptoms vary in frequency and intensity. Common symptoms include:

- **Wheezing:** A whistling or squeaky sound when breathing, especially exhaling.
- **Shortness of breath (dyspnea):** Feeling like you can't get enough air.
- **Chest tightness or pain.**
- **Coughing:** Often worse at night or early in the morning, or during/after exercise.
- Trouble sleeping caused by shortness of breath, coughing, or wheezing.
- Symptoms that are triggered or worsened by viral infections (like a cold), exercise, allergens (pollen, dust mites, pet dander), irritants (smoke, strong odors), cold air, or certain medications.

Diagnosis:

- **Medical History and Symptom Review:** The doctor will ask about symptoms, their pattern, triggers, family history of asthma or allergies, and other related health conditions.
- **Physical Examination:** The doctor will listen to the lungs for wheezing or other abnormal sounds. They may also check for signs of allergies (e.g., swollen nasal passages, skin conditions like eczema).
- **Lung Function Tests (Pulmonary Function Tests - PFTs):** These are key for diagnosing asthma.
    - **Spirometry:** Measures how much air you can inhale and exhale, and how quickly you can exhale. The patient breathes into a device called a spirometer. Measurements are often taken before and after inhaling a bronchodilator medicine (which opens airways). A significant improvement in airflow after the bronchodilator suggests asthma. Key measurements include FEV1 (forced expiratory volume in one second) and FVC (forced vital capacity).
    - **Peak Expiratory Flow (PEF):** Measures how fast you can blow air out of your lungs. A peak flow meter can be used at home to monitor asthma.
- **Bronchoprovocation Test (Challenge Test):** If spirometry is normal but asthma is still suspected, this test may be done. The patient inhales a substance (e.g., methacholine or histamine) that can trigger airway narrowing in people with asthma. Spirometry is repeated.
- **Allergy Testing:** Skin tests or blood tests (e.g., IgE tests) may be done to identify allergens that could be triggering asthma symptoms.
- **Exhaled Nitric Oxide Test (FeNO):** Measures the level of nitric oxide in the breath. Higher levels can indicate airway inflammation, a feature of some types of asthma.
- **Chest X-ray:** May be done to rule out other conditions like pneumonia or heart failure, especially if symptoms are atypical. It's usually normal in people with asthma.

3.2 Pneumonia

Overview: Pneumonia is an infection that inflames the air sacs (alveoli) in one or both lungs. The air sacs may fill with fluid or pus (purulent material), causing cough with phlegm or pus, fever, chills, and difficulty breathing. A variety of organisms, including bacteria, viruses, and fungi, can cause pneumonia. It can range in seriousness from mild to life-threatening. It is most serious for infants and young children, people older than age 65, and people with underlying health problems or weakened immune systems.

Common Symptoms: Symptoms can vary depending on the cause (bacterial, viral, etc.), age, and overall health.

- **Cough:** May produce greenish, yellow, or even bloody mucus (phlegm).
- **Fever, sweating, and shaking chills.**
- **Shortness of breath:** May only occur when climbing stairs or exerting oneself.
- **Chest pain:** Sharp or stabbing pain, often worse when breathing deeply or coughing.
- **Fatigue and muscle aches.**
- **Nausea, vomiting, or diarrhea** (more common in children or with certain types of pneumonia).
- **Confusion or changes in mental awareness** (especially in older adults).
- **Lower than normal body temperature** (in older adults or those with weak immune systems).

Diagnosis:

- **Medical History and Physical Examination:** The doctor will ask about symptoms, recent illnesses, travel, and exposure to others who are sick. During the physical exam, the doctor will listen to the lungs with a stethoscope. Crackling, bubbling, or rumbling sounds (rales or rhonchi) when inhaling can indicate pneumonia.
- **Chest X-ray:** This is the most common test used to confirm pneumonia. It can show the location and extent of inflammation in the lungs.
- **Blood Tests:**
    - **Complete Blood Count (CBC):** To check for signs of infection, such as an elevated white blood cell count.
    - **Blood cultures:** To identify if the infection has spread to the bloodstream (sepsis) and to help identify the specific bacteria causing the infection.
- **Sputum Test:** A sample of mucus coughed up from the lungs (sputum) can be analyzed to help identify the microorganism causing the infection.
- **Pulse Oximetry:** A small sensor placed on a fingertip measures the oxygen saturation in the blood. Pneumonia can prevent the lungs from adequately oxygenating the blood.
- **CT Scan of the Chest:** May be ordered if the pneumonia is not responding to treatment or if complications are suspected. It provides more detailed images than an X-ray.
- **Pleural Fluid Culture:** If there is fluid buildup in the space between the lungs and the chest wall (pleural effusion), a sample of this fluid may be taken with a needle (thoracentesis) and analyzed for infection.
- **Bronchoscopy:** In severe or unclear cases, a thin, flexible tube with a camera (bronchoscope) may be passed down the throat into the lungs to view the airways and collect samples.

3.3 Chronic Obstructive Pulmonary Disease (COPD)

Overview: Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease characterized by persistent airflow limitation that makes it difficult to breathe. It's an umbrella term primarily referring to two conditions:

- **Chronic bronchitis:** Long-term inflammation of the bronchi (airways), leading to a persistent cough with mucus.
- **Emphysema:** Damage to the air sacs (alveoli) in the lungs, which weakens and eventually ruptures them, reducing the surface area for gas exchange. The most common cause of COPD is long-term exposure to irritants that damage the lungs and airways, usually cigarette smoke. Air pollution, chemical fumes, and dust can also contribute.

Common Symptoms: COPD symptoms often don't appear until significant lung damage has occurred, and they usually worsen over time.

- **Chronic cough:** Often the first symptom, may produce clear, white, yellow, or greenish mucus (sputum).
- **Shortness of breath (dyspnea):** Especially during physical activities, becoming more persistent as the disease progresses.
- **Wheezing.**
- **Chest tightness.**
- **Frequent respiratory infections** (like colds or flu).
- **Fatigue or lack of energy.**
- **Unintended weight loss** (in later stages).
- **Swelling in ankles, feet, or legs** (due to associated heart problems).
- **Cyanosis:** Blueness of the lips or fingernail beds due to low oxygen levels.

Diagnosis:

- **Medical History and Symptom Review:** Detailed questions about smoking history, exposure to lung irritants, family history of COPD, and the nature of symptoms.
- **Physical Examination:** Listening to the lungs for wheezing or diminished breath sounds. Checking for barrel chest (a sign of emphysema).
- **Lung Function Tests (Pulmonary Function Tests - PFTs):**
    - **Spirometry:** This is the most important test for diagnosing COPD. It measures how much air a person can breathe in and out, and how fast air can be exhaled. A key indicator for COPD is a reduced FEV1/FVC ratio (the proportion of lung volume that can be exhaled in the first second relative to the total amount that can be exhaled), especially if it doesn't significantly improve with a bronchodilator.
- **Chest X-ray:** Can show signs of emphysema (e.g., hyperinflated lungs) or rule out other lung problems like pneumonia or lung cancer. However, a chest X-ray may look normal in early COPD.
- **CT Scan of the Lungs:** Can provide more detailed images and help identify emphysema and assess its severity. It's not routinely needed for diagnosis but can be useful in certain situations (e.g., planning surgery).
- **Arterial Blood Gas (ABG) Analysis:** A blood sample, usually taken from an artery in the wrist, is analyzed to measure the levels of oxygen and carbon dioxide in the blood. This helps assess lung function and the severity of COPD.
- **Alpha-1 Antitrypsin Deficiency Testing:** Alpha-1 antitrypsin is a protein that protects the lungs. A deficiency in this protein is a rare genetic cause of COPD, especially in younger individuals or those without a significant smoking history. A blood test can check for this deficiency.
- **Six-Minute Walk Test:** Measures how far a person can walk in six minutes to assess exercise tolerance and oxygen needs. Pulse oximetry may be used during this test.

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4. Metabolic & Endocrine Diseases

These diseases involve disturbances in the body's metabolism or endocrine system, which regulates hormones.

4.1 Type 2 Diabetes Mellitus

Overview: Type 2 Diabetes Mellitus is a chronic metabolic disorder characterized by high levels of blood glucose (hyperglycemia). It occurs when the body either becomes resistant to the effects of insulin (a hormone produced by the pancreas that regulates blood sugar) or doesn't produce enough insulin to maintain normal glucose levels. Over time, high blood sugar can damage nerves, eyes, kidneys, and blood vessels, leading to serious complications. It is often linked to obesity, physical inactivity, and genetics.

Common Symptoms: Symptoms of Type 2 diabetes often develop slowly over several years and can be so mild that they go unnoticed. Some people have no symptoms.

- **Increased thirst (polydipsia).**
- **Frequent urination (polyuria),** especially at night.
- **Increased hunger (polyphagia).**
- **Unexplained weight loss.**
- **Fatigue.**
- **Blurred vision.**
- **Slow-healing sores or frequent infections.**
- **Numbness or tingling in the hands or feet (neuropathy).**
- **Areas of darkened skin (acanthosis nigricans),** usually in the armpits and neck.

Diagnosis: Several blood tests are used to diagnose prediabetes and Type 2 diabetes:

- **Fasting Plasma Glucose (FPG) Test:** Measures blood glucose after an overnight fast (not eating for at least 8 hours).
    - Normal: below 100 mg/dL
    - Prediabetes: 100 to 125 mg/dL
    - Diabetes: 126 mg/dL or higher on two separate occasions.
- **Glycated Hemoglobin (A1C or HbA1c) Test:** This test reflects average blood glucose levels over the past 2-3 months. It measures the percentage of blood sugar attached to hemoglobin.
    - Normal: below 5.7%
    - Prediabetes: 5.7% to 6.4%
    - Diabetes: 6.5% or higher on two separate occasions.
- **Oral Glucose Tolerance Test (OGTT):** Measures blood glucose after an overnight fast, and then again 2 hours after drinking a sugary liquid provided by the lab.
    - After 2 hours:
        - Normal: below 140 mg/dL
        - Prediabetes: 140 to 199 mg/dL
        - Diabetes: 200 mg/dL or higher.
- **Random Plasma Glucose (RPG) Test:** Measures blood glucose at any time of day without regard to when you last ate. A blood glucose level of 200 mg/dL or

higher, along with symptoms of diabetes, suggests diabetes. This test is typically used for people with severe symptoms.

If results are borderline or if one test is positive, repeat testing or a different test is often recommended to confirm the diagnosis. Screening for Type 2 diabetes is recommended for adults with risk factors (overweight/obesity, family history, history of gestational diabetes, etc.) or starting at a certain age (e.g., 35 or 45).

4.2 Hypothyroidism

Overview: Hypothyroidism, also known as underactive thyroid, is a condition in which the thyroid gland doesn't produce enough of certain crucial hormones (primarily thyroxine/T4 and triiodothyronine/T3). The thyroid gland is a small, butterfly-shaped gland located at the front of the neck. These hormones regulate metabolism, energy use, body temperature, and affect the function of many organs, including the heart, brain, liver, kidneys, and skin. Hypothyroidism can develop gradually and its symptoms can be vague. Hashimoto's disease, an autoimmune disorder, is the most common cause in iodine-sufficient areas.

Common Symptoms: Symptoms vary depending on the severity of the hormone deficiency and often develop slowly over years.

- **Fatigue and sluggishness.**
- **Increased sensitivity to cold.**
- **Constipation.**
- **Dry skin.**
- **Weight gain (often modest, primarily fluid retention).**
- **Puffy face.**
- **Hoarseness.**
- **Muscle weakness, aches, tenderness, and stiffness.**
- **Joint pain, stiffness, or swelling.**
- **Heavier than normal or irregular menstrual periods.**
- **Thinning hair or hair loss.**
- **Slowed heart rate (bradycardia).**
- **Depression.**
- **Impaired memory or difficulty concentrating ("brain fog").**
- **Goiter (enlarged thyroid gland),** though this can also occur with hyperthyroidism.

Diagnosis:

- **Medical History and Physical Examination:** The doctor will ask about symptoms, family history of thyroid disease, and medications. The physical exam includes checking the thyroid gland for enlargement or nodules, and looking for signs like dry skin, slow reflexes, or swelling.
- **Blood Tests:** These are the primary tools for diagnosing hypothyroidism.
    - **Thyroid-Stimulating Hormone (TSH) Test:** TSH is produced by the pituitary gland in the brain and tells the thyroid to make thyroid hormones.
        - If the thyroid is underactive, TSH levels are typically **high** as the pituitary tries to stimulate the thyroid more. This is often the first test done.
    - **Thyroxine (T4) Test:** Measures the level of T4 (free T4 or total T4) in the blood.
        - In hypothyroidism, T4 levels are usually **low**.
    - A diagnosis of primary hypothyroidism (the most common type, where the problem is with the thyroid gland itself) is generally confirmed by a high TSH level and a low free T4 level. Subclinical hypothyroidism may show a high TSH with a normal free T4.
- **Thyroid Antibody Tests:** If an autoimmune cause like Hashimoto's disease is suspected, tests for thyroid antibodies (e.g., anti-thyroid peroxidase antibodies or TPOAb, anti-thyroglobulin antibodies or TgAb) may be ordered. Elevated levels suggest an autoimmune process attacking the thyroid.

4.3 Iron Deficiency Anemia

Overview: Iron deficiency anemia is a common type of anemia — a condition in which blood lacks adequate healthy red blood cells (RBCs). Red blood cells carry oxygen to the body's tissues. As the name implies, iron deficiency anemia is due to insufficient iron. Without enough iron, your body can't produce enough hemoglobin, a substance in red blood cells that enables them to carry oxygen. As a result, iron deficiency anemia may leave you tired and short of breath. It can be caused by blood loss (e.g., heavy menstrual periods, internal bleeding), inadequate dietary iron intake, or poor absorption of iron.

Common Symptoms: Initially, iron deficiency anemia can be so mild that it goes unnoticed. As the body becomes more deficient in iron and anemia worsens, signs and symptoms intensify.

- **Fatigue and weakness (most common).**
- **Pale skin (pallor).**
- **Shortness of breath, especially with exertion.**
- **Headache or dizziness/lightheadedness.**
- **Cold hands and feet.**
- **Inflammation or soreness of the tongue (glossitis).**
- **Brittle nails or spoon-shaped nails (koilonychia).**
- **Poor appetite, especially in infants and children.**
- **Unusual cravings for non-nutritive substances, such as ice, dirt, or starch (pica).**
- **Chest pain or fast heartbeat (tachycardia) in severe cases.**
- **Poor concentration.**

Diagnosis:

- **Medical History and Physical Examination:** The doctor will ask about diet, medications, history of blood loss (e.g., menstruation, gastrointestinal issues), and symptoms. The physical exam will look for signs like pallor, rapid heartbeat, or signs of underlying causes of blood loss.
- **Blood Tests:**
    - **Complete Blood Count (CBC):** This test measures various components of blood. In iron deficiency anemia:
        - **Hemoglobin (Hb) and Hematocrit (Hct):** Levels are usually low.
        - **Mean Corpuscular Volume (MCV):** Indicates the average size of red blood cells. In iron deficiency, RBCs are often smaller than normal (microcytic).
        - **Mean Corpuscular Hemoglobin (MCH) and Mean Corpuscular Hemoglobin Concentration (MCHC):** Indicate the amount and concentration of hemoglobin in red blood cells, which are typically low (hypochromic).
        - **Red Blood Cell Distribution Width (RDW):** May be increased, indicating variation in RBC size.
    - **Iron Studies:** These tests measure different aspects of iron in the body and are crucial for confirming iron deficiency as the cause of anemia.
        - **Serum Iron:** Measures the amount of iron in the liquid portion of the blood. Usually low.
        - **Serum Ferritin:** Measures the amount of stored iron in the body. This is often the most sensitive test for iron deficiency; low ferritin levels are a strong indicator.
        - **Total Iron-Binding Capacity (TIBC) or Transferrin:** Measures the blood's capacity to bind iron with transferrin (a protein that transports iron). TIBC is usually high in iron deficiency.
        - **Transferrin Saturation:** The percentage of transferrin that is saturated with iron. This is typically low.
- **Tests to Determine Underlying Cause (if not obvious):**
    - **Endoscopy/Colonoscopy:** To look for sources of bleeding in the gastrointestinal tract (e.g., ulcers, polyps, cancer).

- **Fecal Occult Blood Test (FOBT):** To check for hidden blood in the stool.
- **Pelvic Ultrasound or Gynecological Evaluation:** To investigate heavy menstrual bleeding.

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5. Infectious Diseases

Infectious diseases are disorders caused by organisms — such as bacteria, viruses, fungi, or parasites.

5.1 Influenza (Flu)

Overview: Influenza, commonly known as the flu, is a contagious respiratory illness caused by influenza viruses. It can cause mild to severe illness, and at times can lead to serious complications such as pneumonia, bronchitis, sinus infections, ear infections, and worsening of chronic medical conditions like asthma or heart failure. Influenza viruses infect the nose, throat, and sometimes the lungs. It spreads mainly by droplets made when people with flu cough, sneeze, or talk.

Common Symptoms: Flu symptoms usually come on suddenly and can include:

- **Fever or feeling feverish/chills (not everyone with flu will have a fever).**
- **Cough (usually dry).**
- **Sore throat.**
- **Runny or stuffy nose.**
- **Muscle or body aches.**
- **Headache.**
- **Fatigue (tiredness) – often severe.**
- Some people may have vomiting and diarrhea, though this is more common in children than adults.

Diagnosis:

- **Clinical Diagnosis:** In many cases, especially during flu season, doctors can diagnose influenza based on characteristic symptoms. If flu is prevalent in the community, a person with typical flu symptoms is often presumed to have the flu without specific testing.
- **Rapid Influenza Diagnostic Tests (RIDTs):** These tests can detect influenza antigens (parts of the virus) in respiratory specimens (e.g., a throat or nasal swab). Results are usually available within 15-30 minutes. However, RIDTs have variable sensitivity and may produce false negatives, especially when flu activity is low.
- **Rapid Molecular Assays:** These are more accurate than RIDTs and can detect the genetic material (RNA) of the virus. Results can be available in 15-30 minutes to a few hours.
- **Reverse Transcription Polymerase Chain Reaction (RT-PCR) and other molecular assays:** These are the most accurate tests for influenza. They detect viral RNA and can sometimes identify the specific type and subtype of influenza virus. Results usually take several hours to a day or more, depending on the lab. These tests are often used in hospitals or for public health surveillance.
- **Viral Culture:** Involves growing the virus from a respiratory specimen. It takes several days for results and is typically used for public health purposes (e.g., monitoring antiviral resistance, developing vaccines) rather than for individual patient diagnosis.
- **Chest X-ray:** May be done if complications like pneumonia are suspected.

The decision to test for flu depends on factors like the severity of illness, whether the patient is at high risk for complications, and whether a definitive diagnosis will change treatment decisions (e.g., use of antiviral medications).

5.2 Tuberculosis (TB)

Overview: Tuberculosis (TB) is a potentially serious infectious disease that mainly affects the lungs (pulmonary TB) but can also affect other parts of the body, such as the kidneys, spine, or brain (extrapulmonary TB). It is caused by a bacterium called *Mycobacterium tuberculosis*. TB is spread from person to person through the air when people with active pulmonary TB cough, sneeze, speak, or sing, expelling TB bacteria into the air. Not everyone infected with TB bacteria becomes sick. There are two TB-related conditions:

- **Latent TB Infection (LTBI):** People with LTBI have TB bacteria in their bodies, but they are not ill and cannot spread the bacteria to others. However, they are at risk of developing active TB disease later.
- **Active TB Disease:** People with active TB disease are sick from the TB bacteria and can spread it to others.

Common Symptoms (Active Pulmonary TB): Symptoms of active TB disease can be mild for many months, leading to delays in seeking care and transmission to others.

- **Persistent cough lasting three weeks or longer, often with sputum.**
- **Coughing up blood or bloody sputum (hemoptysis).**
- **Chest pain, or pain with breathing or coughing.**
- **Unintentional weight loss.**
- **Fatigue.**
- **Fever (often low-grade and in the evenings).**
- **Night sweats.**
- **Chills.**
- **Loss of appetite.**

Diagnosis: Diagnosing TB involves several steps:

- **Screening for Latent TB Infection (LTBI):**
  - **Tuberculin Skin Test (TST) or Mantoux test:** A small amount of tuberculin fluid is injected under the skin of the forearm. The person returns after 48 to 72 hours to have a healthcare worker look for a reaction (a raised, hard bump or swelling) at the injection site. The size of the reaction determines if it's positive.
  - **Interferon-Gamma Release Assays (IGRAs):** These are blood tests that measure the immune response to TB bacteria. Examples include QuantiFERON-TB Gold Plus and T-SPOT.TB test. IGRAs are often preferred in certain populations. A positive TST or IGRA indicates TB infection but does not distinguish between latent infection and active disease.
- **Diagnosing Active TB Disease:**
  - **Medical History and Physical Examination:** Includes asking about symptoms, exposure to TB, risk factors (e.g., HIV infection, weakened immune system, living in crowded conditions). Physical exam includes listening to the lungs.
  - **Chest X-ray or CT Scan:** Often the first step if active pulmonary TB is suspected. Abnormalities such as infiltrates, cavities, or opacities in the upper lobes of thelungs are suggestive of TB. However, TB can appear differently, and some people (e.g., with HIV) may have normal chest X-rays.
  - **Microbiological Tests (Sputum Smear and Culture):** These are crucial for confirming active pulmonary TB.
    - **Sputum Smear Microscopy (Acid-Fast Bacilli - AFB Smear):** Sputum samples (usually 2-3 collected on different occasions) are examined under

a microscope for acid-fast bacilli. This test is rapid but may miss cases with low bacterial counts.
        - **Nucleic Acid Amplification Tests (NAATs), such as Xpert MTB/RIF assay:** These are rapid molecular tests performed on sputum that can detect *Mycobacterium tuberculosis* DNA and also test for resistance to rifampicin (a key TB drug). Highly recommended by WHO as an initial diagnostic test.
        - **Mycobacterial Culture:** This is the gold standard for TB diagnosis. Sputum or other body fluid/tissue samples are cultured to grow *M. tuberculosis*. It can take several weeks for results but is more sensitive than smear microscopy and allows for drug susceptibility testing (DST) to determine which drugs will be effective.
    - **For Extrapulmonary TB:** Diagnosis may involve imaging tests of the affected body part (e.g., MRI of the spine, CT of the abdomen) and biopsies or fluid samples from the affected site for microscopy, culture, and NAAT.

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6. Gastrointestinal Diseases

These disorders affect the digestive system, which includes the esophagus, stomach, small intestine, large intestine, rectum, liver, gallbladder, and pancreas.

6.1 Gastritis

Overview: Gastritis is a general term for a group of conditions with one thing in common: inflammation of the lining of the stomach (the gastric mucosa). This inflammation can be caused by various factors, including infection with *Helicobacter pylori* bacteria, regular use of certain pain relievers (NSAIDs like ibuprofen or naproxen), excessive alcohol consumption, stress, or autoimmune reactions. Gastritis can occur suddenly (acute gastritis) or appear slowly over time (chronic gastritis). In some cases, gastritis can lead to ulcers and an increased risk of stomach cancer.

Common Symptoms: Symptoms can vary and some people with gastritis have no symptoms at all.

- **Gnawing or burning ache or pain (indigestion) in the upper abdomen (epigastric pain) that may become either worse or better with eating.**
- **Nausea.**
- **Vomiting (sometimes with blood or coffee ground-like material if bleeding is present).**
- **Feeling of fullness in the upper abdomen after eating.**
- **Loss of appetite.**
- **Bloating.**
- **Belching.**
- **Black, tarry stools (melena)** if there is bleeding from the stomach lining.

Diagnosis:

- **Medical History and Physical Examination:** The doctor will ask about symptoms, diet, medication use (especially NSAIDs), alcohol consumption, and family history. A physical exam may include checking for abdominal tenderness.
- **Tests for *Helicobacter pylori* Infection:** Since *H. pylori* is a common cause, tests are often performed:
    - **Urea Breath Test:** The patient swallows a special substance containing urea. If *H. pylori* is present, it breaks down the urea, releasing carbon dioxide that can be detected in the breath.
    - **Stool Antigen Test:** Detects *H. pylori* antigens (proteins) in a stool sample.
    - **Blood Test:** Can detect antibodies to *H. pylori*, indicating current or past infection. Less accurate for confirming active infection that needs treatment.
- **Upper Endoscopy (Esophagogastroduodenoscopy - EGD):** This is often the most definitive test. A thin, flexible tube with a light and camera (endoscope) is passed down the throat into the esophagus, stomach, and duodenum. This allows the doctor to visually inspect the stomach lining for inflammation, erosions, ulcers, or other abnormalities.
- **Biopsy during Endoscopy:** Small tissue samples can be taken from the stomach lining during endoscopy and examined under a microscope (histopathology) to confirm gastritis, identify its type, check for *H. pylori*, and rule out other conditions like cancer.
- **Blood Tests:** A complete blood count (CBC) may be done to check for anemia, which can occur if gastritis causes chronic bleeding.
- **Upper GI Series (Barium Swallow):** Less commonly used now due to the availability of endoscopy. The patient drinks a barium solution that coats the digestive tract, and X-rays are taken to visualize the esophagus, stomach, and duodenum.

6.2 Gastroesophageal Reflux Disease (GERD)

Overview: Gastroesophageal Reflux Disease (GERD) is a chronic digestive condition where stomach acid or, occasionally, stomach content, frequently flows back up into the esophagus (the tube connecting the mouth and stomach). This backwash (acid reflux) can irritate the lining of your esophagus. Many people experience acid reflux from time to time. However, when acid reflux occurs repeatedly over time, it can cause GERD. The main cause is often a weakened or improperly functioning lower esophageal sphincter (LES), a ring of muscle at the bottom of the esophagus that normally acts as a one-way valve.

Common Symptoms:

- **Heartburn (pyrosis):** A burning sensation in the chest, often after eating, which might be worse at night or when lying down.
- **Regurgitation:** A sour or bitter-tasting acid backing up into the throat or mouth.
- **Chest pain:** Non-cardiac chest pain, sometimes mistaken for heart attack pain.
- **Dysphagia:** Difficulty swallowing or the sensation of food being stuck in the throat.
- **Chronic cough,** especially at night.
- **Laryngitis or hoarseness.**
- **New or worsening asthma.**
- **Globus sensation:** Feeling of a lump in the throat.
- **Nausea.**
- **Bad breath.**
- **Dental erosion.**

Diagnosis: Diagnosis is often based on symptoms and response to lifestyle changes and medication.

- **Clinical Diagnosis based on Symptoms:** If typical GERD symptoms like heartburn and regurgitation are present, a doctor may diagnose GERD and start treatment without further testing.
- **Empirical Trial of Proton Pump Inhibitors (PPIs):** If symptoms improve significantly with a course of PPI medication (which reduces stomach acid production), it supports a GERD diagnosis.
- **Upper Endoscopy (EGD):** Recommended if symptoms are severe, persistent despite treatment, or if there are alarm symptoms (e.g., dysphagia, weight loss, bleeding). Endoscopy allows visualization of the esophageal lining for inflammation (esophagitis), ulcers, narrowing (strictures), or Barrett's esophagus (a precancerous condition). Biopsies can be taken.
- **Ambulatory Esophageal pH Monitoring (or pH-impedance monitoring):** This is considered the gold standard for diagnosing GERD, especially if endoscopy is normal or diagnosis is uncertain. A thin tube with a sensor is passed through the nose into the esophagus, or a wireless capsule is attached to the esophageal lining during endoscopy. It measures the amount of acid refluxing into the esophagus over a 24-48 hour period. Impedance monitoring can detect non-acid

reflux as well.
- **Esophageal Manometry:** This test measures the rhythmic muscle contractions (peristalsis) in the esophagus when swallowing and the coordination and force exerted by the esophageal muscles, including the LES. It's often done before considering anti-reflux surgery or if there are swallowing difficulties.
- **Barium Swallow (Esophagram):** The patient drinks a barium solution, and X-rays are taken to visualize the esophagus. It can help identify strictures, hiatal hernia, or motility problems, but is less sensitive for diagnosing GERD itself compared to pH monitoring.

6.3 Irritable Bowel Syndrome (IBS)

Overview: Irritable Bowel Syndrome (IBS) is a common chronic functional gastrointestinal disorder that affects the large intestine (colon). It is characterized by a group of symptoms that occur together, including recurrent abdominal pain or discomfort, and changes in bowel habits (diarrhea, constipation, or both). IBS does not cause inflammation, structural changes, or permanent damage to the bowel, nor does it increase the risk of colorectal cancer. The exact cause of IBS is unknown, but factors like gut motility issues, visceral hypersensitivity (increased pain sensitivity in the gut), gut-brain axis dysfunction, post-infectious changes, stress, and alterations in gut microbiota are thought to play a role.

Common Symptoms: Symptoms vary widely among individuals and can fluctuate over time.

- **Abdominal pain or cramping:** Often related to bowel movements (may improve or worsen after a bowel movement).
- **Changes in bowel habits:**
  - **IBS with constipation (IBS-C):** Hard, lumpy stools; straining; infrequent bowel movements.
  - **IBS with diarrhea (IBS-D):** Loose, watery stools; urgency; frequent bowel movements.
  - **IBS with mixed bowel habits (IBS-M):** Alternating constipation and diarrhea.
- **Bloating and abdominal distension.**
- **Excess gas (flatulence).**
- **Mucus in the stool.**
- **Feeling of incomplete bowel movement.**

Diagnosis: There is no specific test to definitively diagnose IBS. Diagnosis is typically based on a careful medical history and ruling out other conditions with similar symptoms.

- **Rome Criteria:** Healthcare providers often use diagnostic criteria, such as the Rome IV criteria, which include recurrent abdominal pain (on average, at least 1 day/week in the last 3 months) associated with two or more of the following:
  - Related to defecation.
  - Associated with a change in frequency of stool.
  - Associated with a change in form (appearance) of stool.
- **Medical History and Symptom Assessment:** Detailed questions about symptoms, their pattern, duration, triggers (e.g., certain foods, stress), bowel habits, and impact on quality of life.
- **Physical Examination:** To assess general health and check for abdominal tenderness or masses.
- **Ruling out Other Conditions:** Tests may be done to exclude other diseases that can cause similar symptoms, such as:
  - **Celiac disease:** Blood tests (e.g., tissue transglutaminase IgA antibody) and possibly endoscopy with biopsy.
  - **Inflammatory Bowel Disease (IBD - Crohn's disease or ulcerative colitis):** Blood tests (e.g., C-reactive protein, fecal calprotectin), stool tests, and endoscopy/colonoscopy with biopsies.
  - **Lactose intolerance:** Breath test or dietary elimination.
  - **Bowel infections:** Stool cultures.
  - **Colorectal cancer:** Colonoscopy (especially in older individuals or those with alarm symptoms like rectal bleeding, unexplained weight loss, or family history of colon cancer).
- **Limited Diagnostic Testing:** For typical IBS symptoms without alarm features, extensive testing is often not needed. However, some baseline tests might be performed:
  - **Complete Blood Count (CBC):** To check for anemia or signs of infection/inflammation.
  - **Inflammatory markers:** Such as C-reactive protein (CRP) or fecal calprotectin to rule out IBD.
  - **Thyroid function tests:** As thyroid disorders can affect bowel habits.

IBS is a diagnosis of exclusion and based on positive symptom criteria once other organic diseases have been ruled out.

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7. Musculoskeletal Diseases

These diseases affect the bones, joints, muscles, ligaments, and tendons.

7.1 Osteoarthritis (OA)

Overview: Osteoarthritis is the most common form of arthritis, affecting millions of people worldwide. It is a degenerative joint disease that occurs when the protective cartilage that cushions the ends of bones wears down over time. While OA can damage any joint, it most commonly affects joints in the hands, knees, hips, and spine. The damage is not reversible, but symptoms can usually be managed. OA is often considered a "wear and tear" disease, but it also involves inflammation and changes in the bone and connective tissues. Risk factors include older age, obesity, previous joint injuries, overuse of joints, genetics, and female gender.

Common Symptoms: Symptoms often develop slowly and worsen over time.

- **Pain:** Affected joints may hurt during or after movement.
- **Stiffness:** Joint stiffness is most noticeable upon waking up or after a period of inactivity. It usually lasts for a short time (e.g., less than 30 minutes).
- **Tenderness:** The joint may feel tender when light pressure is applied to or near it.
- **Loss of flexibility:** Inability to move the joint through its full range of motion.
- **Grating sensation (crepitus):** A popping, cracking, or grating feeling may be heard or felt when using the joint.
- **Bone spurs (osteophytes):** Extra bits of bone, which feel like hard lumps, can form around the affected joint.
- **Swelling:** May be caused by soft tissue inflammation around the joint.

Diagnosis:

- **Medical History and Symptom Review:** The doctor will ask about joint pain, stiffness, impact on daily activities, and risk factors.
- **Physical Examination:** The doctor will examine the affected joint(s) for tenderness, swelling, redness, and range of motion. They will observe how the patient walks or moves.
- **Imaging Tests:**
  - **X-rays:** While cartilage itself doesn't show up on X-rays, they can reveal characteristic features of OA, such as:
    - **Narrowing of the joint space:** Indicating cartilage loss.
    - **Bone spurs (osteophytes):** Bony growths at the edges of joints.

        - **Sclerosis:** Increased bone density beneath the cartilage.
        - **Cysts:** Fluid-filled spaces in the bone. X-rays are often used to confirm the diagnosis and assess the severity of joint damage. However, X-ray findings don't always correlate with the level of pain.
    - **Magnetic Resonance Imaging (MRI):** An MRI is not routinely needed to diagnose OA but may be used if X-rays are inconclusive, if other problems like a torn meniscus or ligament damage are suspected, or to get a more detailed look at cartilage and soft tissues.
- **Laboratory Tests:**
    - **Blood Tests:** There are no specific blood tests to diagnose OA. Blood tests (e.g., erythrocyte sedimentation rate - ESR, C-reactive protein - CRP, rheumatoid factor - RF, anti-CCP antibodies) may be ordered to rule out other types of arthritis, such as rheumatoid arthritis or gout, which can cause similar symptoms.
    - **Joint Fluid Analysis (Arthrocentesis):** If a joint is swollen, the doctor might use a needle to withdraw fluid from the affected joint. Analyzing this fluid can help rule out gout (by checking for urate crystals) or infection, and can help differentiate OA from inflammatory arthritis. OA fluid is typically non-inflammatory.

7.2 Rheumatoid Arthritis (RA)

Overview: Rheumatoid Arthritis is a chronic autoimmune and inflammatory disease where the body's immune system mistakenly attacks its own healthy cells and tissues, primarily targeting the lining of the joints (synovium). This causes inflammation that results in painful swelling, and over time, can lead to bone erosion, joint deformity, and damage to other body systems, including the skin, eyes, lungs, heart, and blood vessels. RA typically affects joints symmetrically (e.g., both hands, both wrists, or both knees). If not treated early and aggressively, RA can lead to significant disability. The exact cause is unknown, but genetic predisposition, environmental factors (like smoking or infections), and hormonal factors are thought to play a role.

Common Symptoms: Symptoms can vary in severity and may come and go (flares and remissions).

- **Tender, warm, swollen joints:** Often affecting smaller joints first (like those in the hands and feet), and usually symmetrically.
- **Joint stiffness:** Typically worse in the mornings and after periods of inactivity, often lasting for more than 30 minutes (can be hours).
- **Fatigue, fever, and loss of appetite.**
- **Rheumatoid nodules:** Firm lumps of tissue that can form under the skin, often near joints like elbows or fingers.
- Symptoms often develop gradually over weeks or months, but can sometimes start abruptly.
- Involvement of multiple joints (polyarthritis).

Diagnosis: Early diagnosis and treatment are crucial to prevent joint damage.

- **Medical History and Symptom Review:** Detailed questions about joint pain, stiffness (especially morning stiffness duration), swelling, symmetry of affected joints, family history of RA or autoimmune diseases, and impact on daily function.
- **Physical Examination:** The doctor will examine joints for swelling, warmth, tenderness, and range of motion. They will also look for rheumatoid nodules and signs of RA in other parts of the body.
- **Blood Tests:**
    - **Rheumatoid Factor (RF):** An antibody found in the blood of many people with RA. However, RF can also be present in people without RA (e.g., older individuals, those with other autoimmune diseases or chronic infections) and absent in some people with RA (seronegative RA).
    - **Anti-Cyclic Citrullinated Peptide (anti-CCP) Antibodies (or ACPA):** These antibodies are more specific for RA than RF and are often present in the early stages of the disease. A positive anti-CCP test is a strong indicator of RA.
    - **Erythrocyte Sedimentation Rate (ESR or sed rate) and C-Reactive Protein (CRP):** These are non-specific markers of inflammation in the body. Elevated levels are common in RA and can be used to monitor disease activity and response to treatment.
    - **Complete Blood Count (CBC):** May show anemia (common in chronic inflammatory conditions like RA) or an elevated white blood cell count.
- **Imaging Tests:**
    - **X-rays:** In early RA, X-rays may be normal. As the disease progresses, X-rays can show joint erosions (damage to the bone), narrowing of the joint space, and soft tissue swelling. They are useful for monitoring disease progression.
    - **Magnetic Resonance Imaging (MRI) and Ultrasound:** These imaging techniques are more sensitive than X-rays in detecting early signs of inflammation (synovitis) and bone erosions. They can be particularly useful when the diagnosis is uncertain or to assess early joint damage.
- **Classification Criteria:** Doctors may use classification criteria (e.g., the 2010 American College of Rheumatology/European League Against Rheumatism - ACR/EULAR criteria) which combine information on joint involvement, serology (RF, anti-CCP), acute-phase reactants (ESR, CRP), and duration of symptoms to help classify a patient as having RA for research and clinical purposes.

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8. Neurological Diseases

Neurological diseases are disorders of the brain, spinal cord, and nerves throughout the body.

8.1 Migraine

Overview: Migraine is a common neurological disorder characterized by recurrent, moderate to severe headaches, often accompanied by other symptoms. It is more than just a bad headache. Migraines can be debilitating and significantly impact quality of life. The exact cause of migraine is not fully understood, but it's thought to involve abnormal brain activity temporarily affecting nerve signals, chemicals, and blood vessels in the brain. Genetics and environmental factors play a role. Many migraines are triggered by specific factors like stress, hormonal changes (in women), certain foods and drinks, changes in sleep patterns, or sensory stimuli.

Common Symptoms: Migraine attacks can progress through several stages, though not everyone experiences all of them: prodrome, aura, attack (headache phase), and postdrome.

- **Headache:**
    - Often throbbing or pulsating.
    - Typically unilateral (affecting one side of the head), but can be bilateral.
    - Moderate to severe intensity.
    - Worsened by routine physical activity.
    - Lasts from 4 to 72 hours if untreated or unsuccessfully treated.
- **Associated Symptoms during the Headache Phase:**
    - **Nausea, with or without vomiting.**
    - **Sensitivity to light (photophobia).**
    - **Sensitivity to sound (phonophobia).**
    - Sensitivity to smells (osmophobia) may also occur.
- **Aura (experienced by about 20-30% of migraine sufferers):** Reversible neurological symptoms that usually precede or accompany the headache, developing gradually over 5-20 minutes and lasting less than 60 minutes.
    - **Visual aura (most common):** Seeing flashing lights, zigzag lines, blind spots, shimmering spots or stars, or temporary vision loss.
    - **Sensory aura:** Tingling, numbness, or a pins-and-needles sensation, often starting in a limb and spreading.

    - **Motor aura:** Weakness, usually on one side of the body (hemiplegic migraine - rare).
    - **Speech or language aura:** Difficulty speaking (aphasia).
- **Prodrome:** Subtle changes that can occur one or two days before a migraine, such as constipation, mood changes (depression or euphoria), food cravings, neck stiffness, increased thirst and urination, or frequent yawning.
- **Postdrome ("migraine hangover"):** After the headache resolves, some people feel drained, tired, or "washed out," while others may feel mildly euphoric. This can last for up to a day.

Diagnosis: Diagnosis of migraine is primarily clinical, based on a detailed medical history and neurological examination. There is no specific blood test or imaging study to confirm a migraine diagnosis itself, but tests may be done to rule out other conditions.

- **Medical History and Headache Diary:** The doctor will ask about the characteristics of the headaches (frequency, duration, severity, location, type of pain), associated symptoms, triggers, family history of migraines, and response to any treatments tried. Keeping a headache diary can be very helpful.
- **Neurological Examination:** To assess reflexes, sensation, coordination, and look for any signs that might suggest a more serious underlying cause for the headaches (e.g., tumor, stroke, infection). This is usually normal in migraine sufferers.
- **Diagnostic Criteria:** The International Headache Society (IHS) has established criteria for diagnosing different types of migraine (e.g., migraine without aura, migraine with aura). These criteria are based on the number of attacks, duration, characteristics of the headache, and associated symptoms.
- **Ruling out Other Conditions:** If headaches are atypical, have an unusual pattern, are accompanied by abnormal neurological signs, or if there are "red flag" symptoms (e.g., sudden severe "thunderclap" headache, headache that worsens with coughing or straining, new headache in someone over 50 or with a history of cancer/HIV, headache with fever and stiff neck), further tests may be ordered to exclude other causes:
    - **Magnetic Resonance Imaging (MRI) or Computed Tomography (CT) scan of the brain:** To look for structural abnormalities like tumors, bleeding, stroke, or infections.
    - **Lumbar Puncture (Spinal Tap):** If meningitis or encephalitis is suspected.
    - **Blood tests:** To rule out underlying conditions like thyroid problems or inflammation.

The vast majority of people with typical migraine symptoms and a normal neurological exam do not require brain imaging.

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9. Mental Health Conditions

Mental health conditions are disorders that affect mood, thinking, and behavior.

9.1 Depression (Major Depressive Disorder - MDD)

Overview: Major Depressive Disorder (MDD), often simply called depression, is a common but serious mood disorder. It causes persistent feelings of sadness, loss of interest or pleasure in activities once enjoyed, and can interfere with daily functioning. Depression is more than just feeling "down" or "blue" for a few days. It is a medical illness that affects how you feel, think, and behave. It can lead to a variety of emotional and physical problems. The exact cause of depression is not fully understood but likely involves a combination of genetic, biological (e.g., neurotransmitter imbalances), environmental, and psychological factors.

Common Symptoms: Symptoms must be present for at least two weeks and represent a change from previous functioning. At least one of the symptoms must be either (1) depressed mood or (2) loss of interest or pleasure.

- **Persistent sad, anxious, or "empty" mood.**
- **Loss of interest or pleasure in hobbies and activities that were once enjoyable (anhedonia).**
- **Significant weight loss when not dieting or weight gain, or decrease or increase in appetite nearly every day.**
- **Insomnia (difficulty sleeping) or hypersomnia (excessive sleeping) nearly every day.**
- **Psychomotor agitation (e.g., restlessness, pacing) or retardation (e.g., slowed movements and speech) observable by others.**
- **Fatigue or loss of energy nearly every day.**
- **Feelings of worthlessness or excessive or inappropriate guilt nearly every day.**
- **Diminished ability to think or concentrate, or indecisiveness, nearly every day.**
- **Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.**
- Physical symptoms such as headaches, digestive problems, or chronic pain that do not respond to treatment may also occur.

Diagnosis:

- **Clinical Interview and Psychiatric Evaluation:** A doctor or mental health professional (psychiatrist, psychologist) will conduct a thorough interview to discuss symptoms, their duration and severity, medical history, family history of mental illness, substance use, and overall functioning. Standardized questionnaires or rating scales (e.g., Patient Health Questionnaire-9 or PHQ-9, Beck Depression Inventory or BDI) may be used to help assess symptoms.
- **Diagnostic Criteria (e.g., DSM-5):** Mental health professionals use criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) or the International Classification of Diseases (ICD) to diagnose MDD. For a diagnosis of MDD, a person typically needs to have experienced five or more of the characteristic symptoms (listed above) during the same 2-week period, with at least one being depressed mood or loss of interest/pleasure, causing clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- **Physical Examination and Laboratory Tests:** A physical exam and sometimes lab tests (e.g., thyroid function tests, complete blood count, vitamin B12 levels) may be done to rule out underlying medical conditions that can cause symptoms similar to depression (e.g., hypothyroidism, anemia, certain vitamin deficiencies, side effects of medications). There is no specific lab test to diagnose depression itself.
- **Ruling out Other Mental Health Conditions:** The evaluation will also aim to distinguish depression from other mental health conditions, such as bipolar disorder (which can involve depressive episodes), anxiety disorders, or adjustment disorder.

It is important to seek professional help if you suspect you or someone you know has depression.

9.2 Generalized Anxiety Disorder (GAD)

Overview: Generalized Anxiety Disorder (GAD) is a mental health condition characterized by excessive, persistent, and unrealistic worry about everyday things, often with no apparent reason. People with GAD tend to expect disaster and can't stop worrying about health, money, family, work, or school, even when there's little or no cause for concern. This worry is often disproportionate to the actual likelihood or impact of the feared event. GAD is different from the normal worry everyone experiences; it's more pervasive, intense, and interferes significantly with daily life and functioning. The causes are likely a combination of genetic, biological, environmental, and life experience factors.

Common Symptoms: To be diagnosed with GAD, the excessive worry and anxiety must occur more days than not for at least six months and be difficult to control. The worry is associated with three or more of the following physical or cognitive symptoms (only one item is required in children):

- **Restlessness or feeling keyed up or on edge.**
- **Being easily fatigued.**
- **Difficulty concentrating or mind going blank.**

- **Irritability.**
- **Muscle tension (e.g., aches, soreness).**
- **Sleep disturbance (difficulty falling or staying asleep, or restless, unsatisfying sleep).**

Other symptoms may include:

- Trembling, twitching.
- Sweating, nausea, or diarrhea.
- Shortness of breath or rapid heartbeat.
- Feeling a lump in the throat.
- Exaggerated startle response.

The focus of the worry can shift from one concern to another.

Diagnosis:

- **Clinical Interview and Psychiatric Evaluation:** A doctor or mental health professional will conduct a comprehensive interview to assess symptoms, the nature and focus of worries, their duration and intensity, and how they impact daily life. Standardized anxiety rating scales (e.g., GAD-7 scale, Hamilton Anxiety Rating Scale) may be used.
- **Diagnostic Criteria (e.g., DSM-5):** Mental health professionals use criteria from the DSM-5 or ICD. Key criteria include:
    - Excessive anxiety and worry occurring more days than not for at least 6 months about a number of events or activities.
    - The individual finds it difficult to control the worry.
    - The anxiety and worry are associated with three (or more) of the six main symptoms listed above.
    - The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
    - The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., hyperthyroidism).
    - The disturbance is not better explained by another mental disorder (e.g., anxiety about having panic attacks in panic disorder, negative evaluation in social anxiety disorder, etc.).
- **Physical Examination and Laboratory Tests:** Similar to depression, a physical exam and lab tests may be done to rule out medical conditions that can mimic anxiety symptoms (e.g., thyroid disorders, heart conditions, substance withdrawal).
- **Ruling out Other Mental Health Conditions:** It's important to differentiate GAD from other anxiety disorders (like panic disorder, social anxiety disorder, obsessive-compulsive disorder), depression (as anxiety and depression often co-occur), or stress-related disorders.

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10. Other Common Conditions

10.1 Chronic Kidney Disease (CKD) - Early Diagnosis

Overview: Chronic Kidney Disease (CKD) means the kidneys are damaged and can't filter blood as well as they should. This damage can cause wastes to build up in the body. CKD is called "chronic" because the damage to kidneys happens slowly over a long period. It can also cause other health problems, such as heart disease. The main risk factors for developing CKD are diabetes and high blood pressure. Other risk factors include heart disease, obesity, family history of kidney failure, older age, and certain ethnic groups. Early detection and treatment can often keep chronic kidney disease from getting worse. When kidney disease progresses, it may eventually lead to kidney failure, which requires dialysis or a kidney transplant to maintain life.

Common Symptoms (Early Stages): CKD often has no symptoms in its early stages, or symptoms may be non-specific. Many people don't realize they have it until the disease is advanced. When symptoms do occur, they might include:

- **Often no symptoms in early stages.**
- **Fatigue, weakness.**
- **Difficulty concentrating.**
- **Poor appetite.**
- **Trouble sleeping.**
- **Muscle cramping at night.**
- **Swollen feet and ankles (edema).**
- **Puffiness around the eyes, especially in the morning.**
- **Dry, itchy skin.**
- **Need to urinate more often, especially at night (nocturia).** (Many of these symptoms are non-specific and can be due to other conditions.)

Diagnosis (Focus on Early Detection): Since early CKD often has no symptoms, diagnosis relies on screening individuals at high risk and through specific tests.

- **Blood Test for Glomerular Filtration Rate (GFR):**
    - **Serum Creatinine:** Creatinine is a waste product from muscle activity that healthy kidneys filter out of the blood. If kidneys aren't working well, creatinine levels in the blood rise.
    - **Estimated GFR (eGFR):** The GFR is the best measure of kidney function. It indicates how well the kidneys are filtering wastes from the blood. It is usually estimated (eGFR) from the serum creatinine level using a formula that includes age, sex, and race.
        - An eGFR below 60 mL/min/1.73m² for three months or more indicates CKD.
        - An eGFR of 60 or higher is generally considered normal, but if there's other evidence of kidney damage (see below), CKD might still be present.
- **Urine Test for Albumin (Albuminuria):**
    - **Albumin-to-Creatinine Ratio (UACR):** Albumin is a type of protein normally found in the blood. Healthy kidneys don't let much albumin pass into the urine. Damaged kidneys may allow albumin to leak into the urine. A UACR test on a spot urine sample measures the amount of albumin compared to the amount of creatinine in the urine.
        - A UACR result of 30 mg/g or higher is a sign of kidney damage (albuminuria) and indicates CKD, even if eGFR is normal.
- **Imaging Tests:**
    - **Ultrasound or CT scan:** These tests can create pictures of the kidneys and urinary tract. They can help identify structural abnormalities, kidney size, obstructions (like kidney stones or tumors), or polycystic kidney disease. They are not typically used for routine screening but may be done if there are symptoms, abnormal blood/urine tests, or to investigate the cause of CKD.
- **Kidney Biopsy:** In some cases, if the cause of kidney disease is unclear or if specific treatment decisions depend on the type of kidney damage, a kidney biopsy may be performed. A small piece of kidney tissue is removed with a needle and examined under a microscope.

Regular screening with eGFR and UACR is recommended for individuals at high risk for CKD, such as those with:

- Diabetes
- High blood pressure (hypertension)
- Family history of kidney failure

- Heart disease
- Older age

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11. Conclusion

The diseases outlined in this document represent some of the most common health challenges faced globally. Understanding their basic characteristics, typical symptoms, and the diagnostic processes involved is a key step towards better health awareness and management.

Early and accurate diagnosis is paramount for effective treatment, slowing disease progression, and improving patient outcomes. Many of these conditions, especially in their early stages, may present with subtle or no symptoms, underscoring the importance of regular health check-ups and screening for individuals at risk.

Medical science is constantly advancing, leading to improved diagnostic tools and therapeutic strategies. It is crucial to rely on qualified healthcare professionals for accurate diagnosis, personalized treatment plans, and ongoing management of any medical condition. This document serves as a general informational resource and should not replace professional medical consultation.

Remember, proactive engagement in your health, including adopting a healthy lifestyle, being aware of potential symptoms, and seeking timely medical advice, can make a significant difference in preventing and managing common diseases.