

DC MOTOR

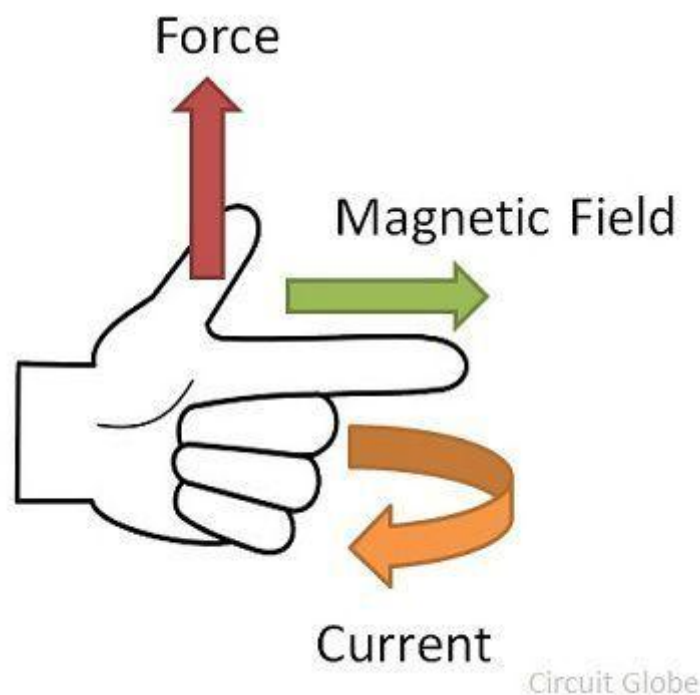
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DC MOTOR

PRINCIPLE:-

The DC motor is the device which converts the direct current into the mechanical work. It works on the principle of Lorentz Law, which states that “*the current-carrying conductor placed in a magnetic and electric field experience a force*”. The experienced force is called the Lorentz force. The Flemming left-hand rule gives the direction of the force.



If the thumb, middle finger and the index finger of the left hand are displaced from each other by an angle of 90° , the middle finger represents the direction of the magnetic field. The index finger represents the direction of the current, and the thumb shows the direction of forces acting on the conductor.

Power Transformer

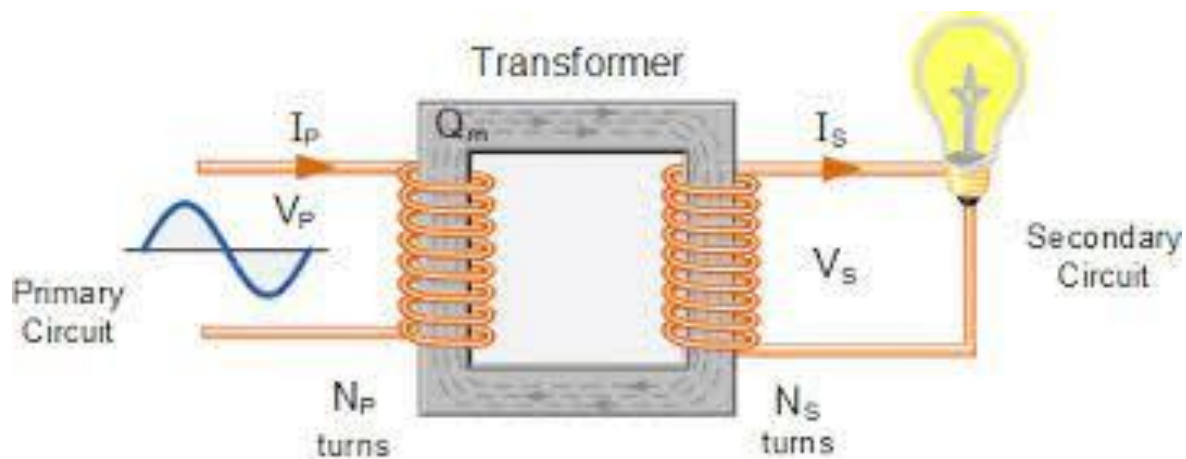
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POWER TRANSFORMER

Working principle of transformer:

A Transformer is a static electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. A varying current in one coil of the transformer produces a varying magnetic field, which in turn induces a varying electromotive force (e.m.f) or “voltage” in a second coil. Power can be transferred between the two coils through the magnetic field, without a metallic connection between the two circuits. Faraday’s law of induction discovered in 1831 described this effect. Transformers are used to increase or decrease the alternating voltages in electric power applications. Since the invention of the first constant-potential transformer in 1885, transformers have become essential for the transmission, distribution, and utilization of alternating current electrical energy. A wide range of transformer design is encountered in electronic and electric power applications



Human skeleton

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Skeletal System

A human skeleton: Image as overview of the human skeletal system.

The skeletal portion of the system serves as the main storage system for calcium and phosphorus. The importance of this storage is to help regulate mineral balance in the bloodstream. When the fluctuation of minerals is high, these minerals are stored in bone; when it is low, minerals are withdrawn from the bone.

The skeleton also contains critical components of the hematopoietic (blood production) system. Located in long bones are two distinctions of bone marrow: yellow and red. The yellow marrow has fatty connective tissue and is found in the marrow cavity. In times of starvation, the body uses the fat in yellow marrow for energy.

The red marrow of some bones is an important site for hematopoiesis or blood cell production that replaces cells that have been destroyed by the liver. Here, all erythrocytes, platelets, and most leukocytes form in bone marrow from where they migrate to the circulation.

Muscular System

Muscles contract (shorten) to move the bone attached at the joint. Skeletal muscles are attached to bones and arranged in opposing groups around joints. Muscles are innervated—the nerves conduct electrical currents from the central nervous system that cause the muscles to contract.

Three types of muscle tissue exist in the body. These are skeletal, smooth, and cardiac muscle.

- Only skeletal and smooth muscles are considered part of the musculoskeletal system.
- Skeletal muscle is involved in body locomotion.
- Examples of smooth muscles include those found in intestinal and vessel walls.
- Cardiac and smooth muscle are characterized by involuntary movement (not under conscious control).
- Cardiac muscles are found in the heart.

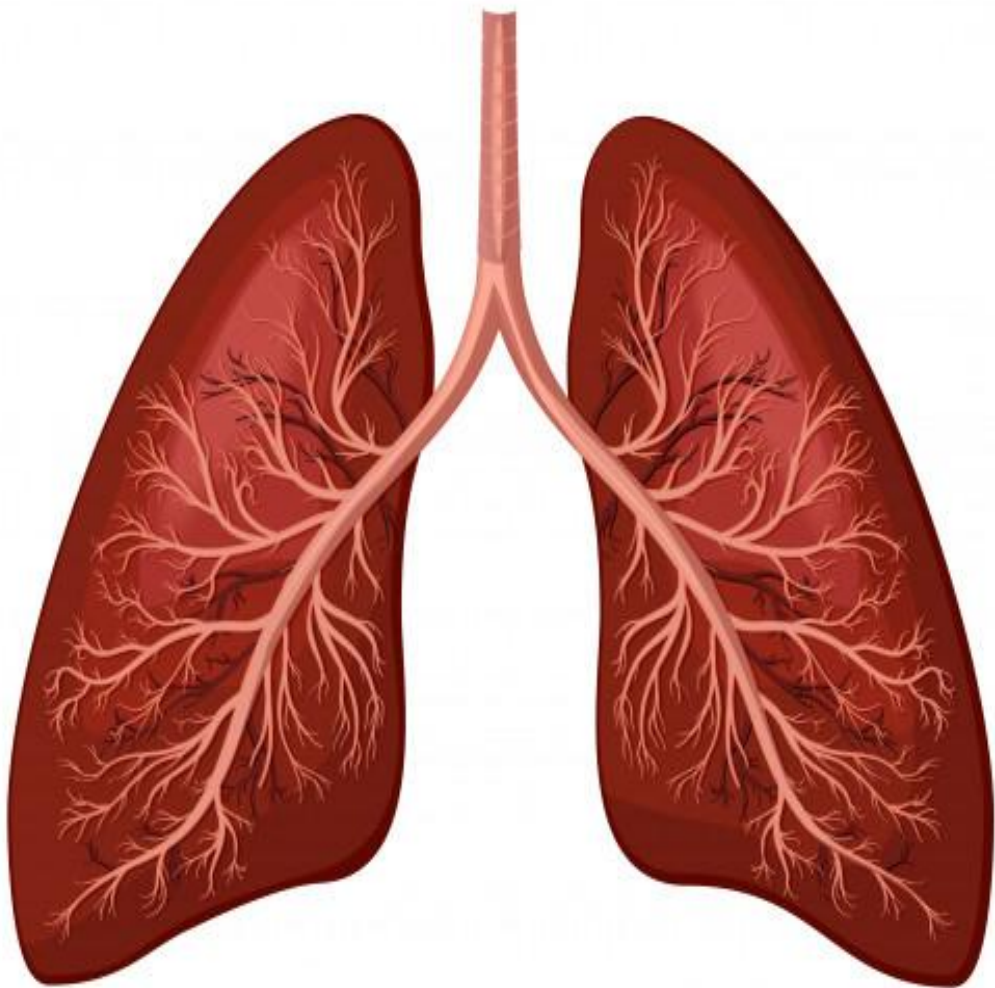
Tendons, Joints, Ligaments, and Bursae

A tendon is a tough, flexible band made of fibrous connective tissue, and functions to connect muscle to bone. Joints are the bone articulations allowing movement. A ligament is a dense, white band of fibrous elastic tissue.

Ligaments connect the ends of bones together in order to form a joint. These help to limit joint dislocation and restrict improper hyperextension and hyperflexion. Also made of fibrous tissue are bursae. These provide cushions between bones and tendons and/or muscles around a joint.

HUMAN LUNGS

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Lung anatomy

This spongy, pinkish organ looks like two upside-down cones in your chest. The right lung is made up of three lobes. The left lung has only two lobes to make room for your heart.

Bronchial tree

The lungs begin at the bottom of your **trachea** (windpipe). The trachea is a tube that carries the air in and out of your lungs. Each lung has a tube called a bronchus that connects to the trachea. The trachea and **bronchi** airways form an upside-down “Y” in your chest. This “Y” is often called the **bronchial tree**.

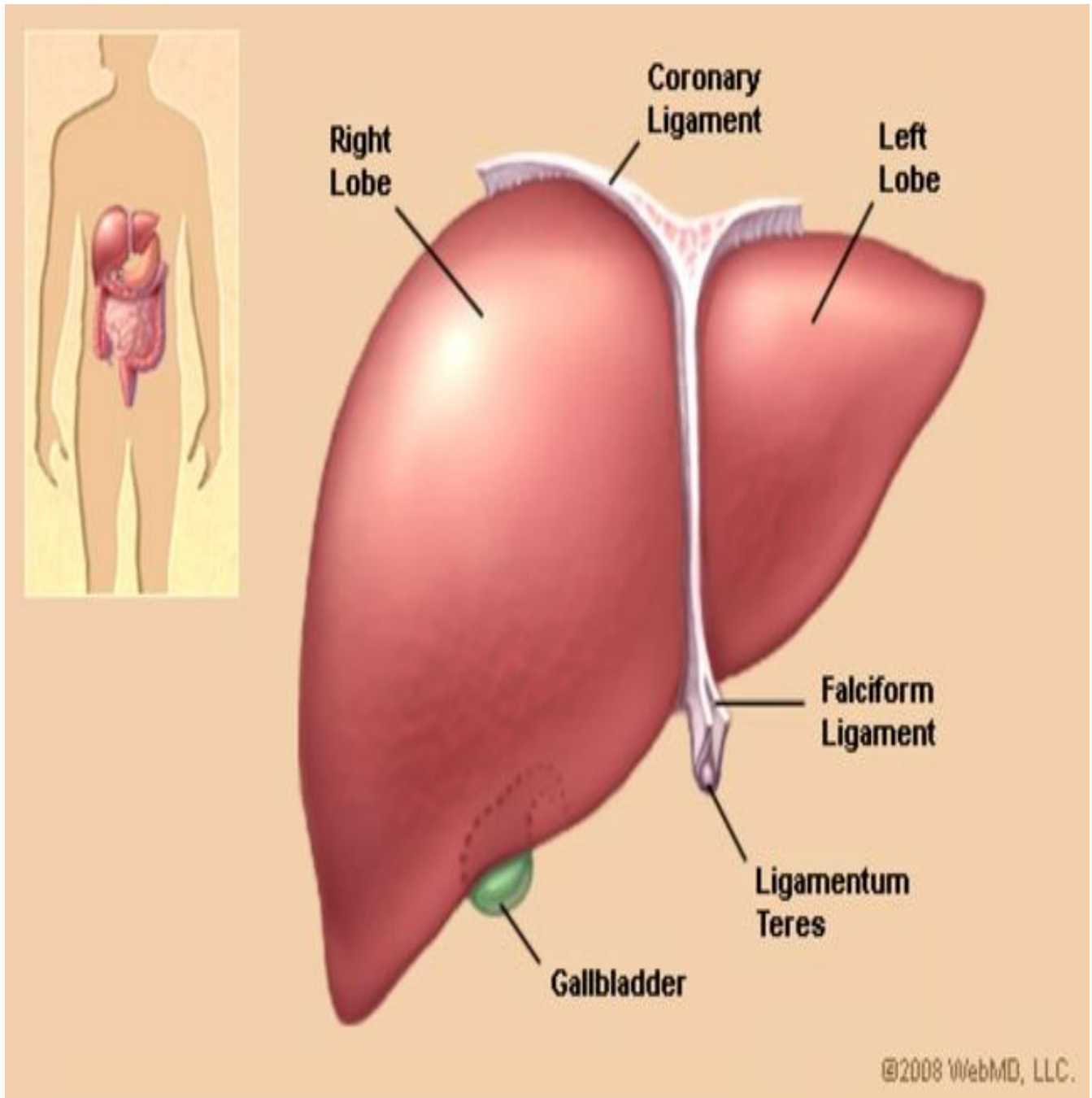
The **bronchi** branch off into smaller bronchi and even smaller tubes called **bronchioles**. Like the branches of a tree, these tiny tubes stretch out into every part of your lungs. Some of them are so tiny that they have the thickness of a hair. You have almost 30,000 bronchioles in each lung.

Each bronchiole tube ends with a cluster of small air sacs called **alveoli** (individually referred to as alveolus). They look like tiny grape bunches or very tiny balloons. There are about 600 million **alveoli** in your lungs. The small bubble shapes of the alveoli give your lungs a surprising amount of surface area — equivalent to the size of a tennis court. This means there's plenty of room for vital oxygen to pass into your body.

SUMMARY Each lung is divided into lobes. The bronchial tree running through your lungs is made up of the windpipe, bronchi, bronchioles, and alveoli.

HUMAN LIVER

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Front View of the Liver

The liver is a large, meaty organ that sits on the right side of the belly. Weighing about 3 pounds, the liver is reddish-brown in color and feels rubbery to the touch. Normally you can't feel the liver, because it's protected by the rib cage.

The liver has two large sections, called the right and the left lobes. The gallbladder sits under the liver, along with parts of the pancreas and intestines. The liver and these organs work together to digest, absorb, and process food.

The liver's main job is to filter the blood coming from the digestive tract, before passing it to the rest of the body. The liver also detoxifies chemicals and metabolizes drugs. As it does so, the liver secretes bile that ends up back in the intestines. The liver also makes proteins important for blood clotting and other functions.

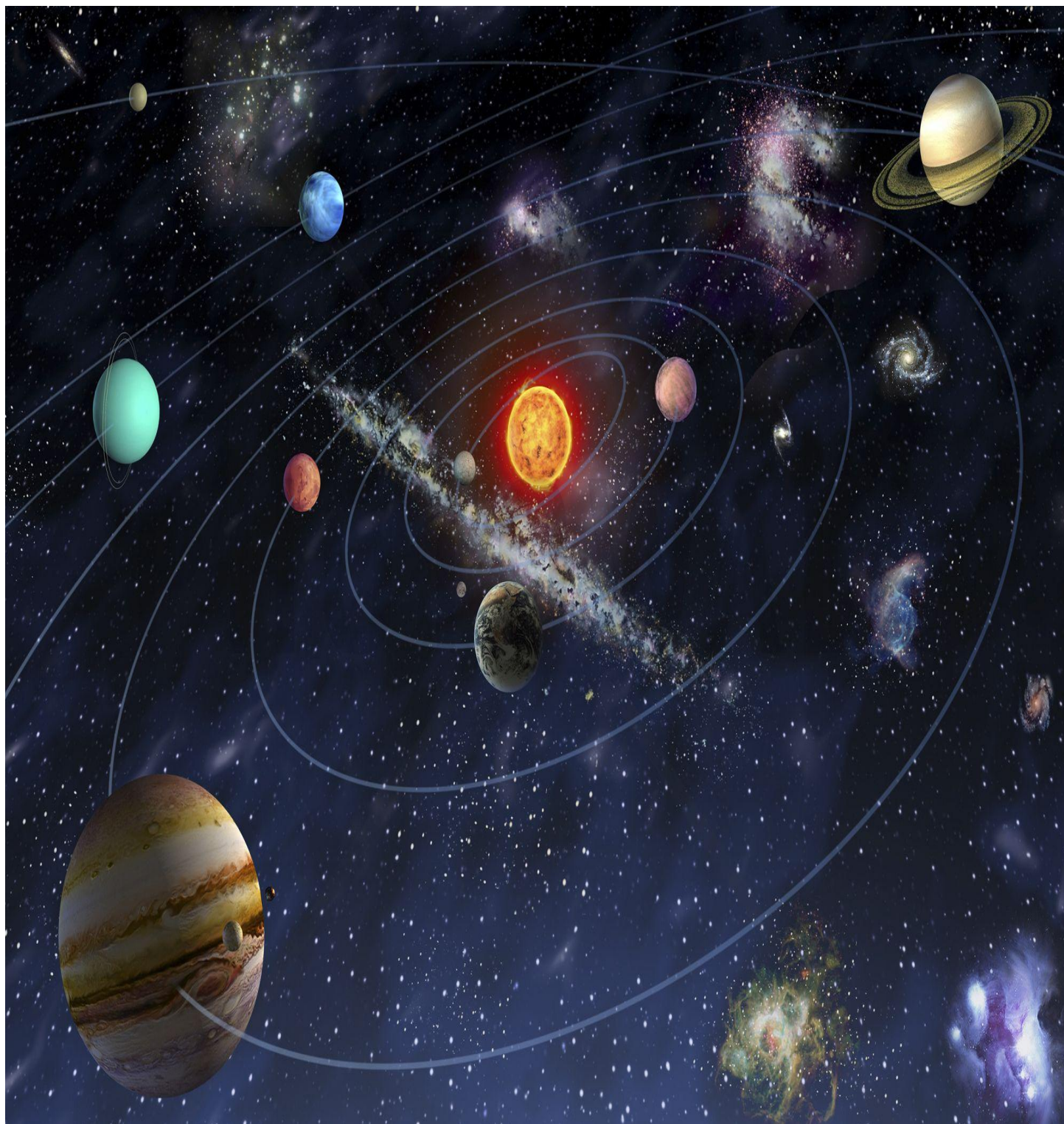
Liver Conditions

Types of liver disease include:

- Hepatitis: Inflammation of the liver, usually caused by viruses like hepatitis A, B, and C. Hepatitis can have non-infectious causes too, including heavy drinking, drugs, allergic reactions, or obesity.
- Cirrhosis: Long-term damage to the liver from any cause can lead to permanent scarring, called cirrhosis. The liver then becomes unable to function well.
- Liver cancer: The most common type of liver cancer, hepatocellular carcinoma, almost always occurs after cirrhosis is present.
- Liver failure: Liver failure has many causes including infection, genetic diseases, and excessive alcohol.
- Ascites: As cirrhosis results, the liver leaks fluid (ascites) into the belly, which becomes distended and heavy.
- Gallstones: If a gallstone becomes stuck in the bile duct draining the liver, hepatitis and bile duct infection (cholangitis) can result.
- Hemochromatosis: Hemochromatosis allows iron to deposit in the liver, damaging it. The iron also deposits throughout the body, causing multiple other health problems.
- Primary sclerosing cholangitis: A rare disease with unknown causes, primary sclerosing cholangitis causes inflammation and scarring in the bile ducts in the liver.
- Primary biliary cirrhosis: In this rare disorder, an unclear process slowly destroys the bile ducts in the liver. Permanent liver scarring (cirrhosis) eventually develops.

SOLAR SYSTEM

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The background of the entire image is a teal-colored damask pattern. It features a repeating design of stylized floral and foliate motifs, including acanthus leaves and circular medallions, creating a rich, textured appearance.

AR BOOK

BY - Team Kira

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