

UNIT-I

Respiratory system analysis to clinical conditions

Clinical Physiology

Course No. – VPY- 607

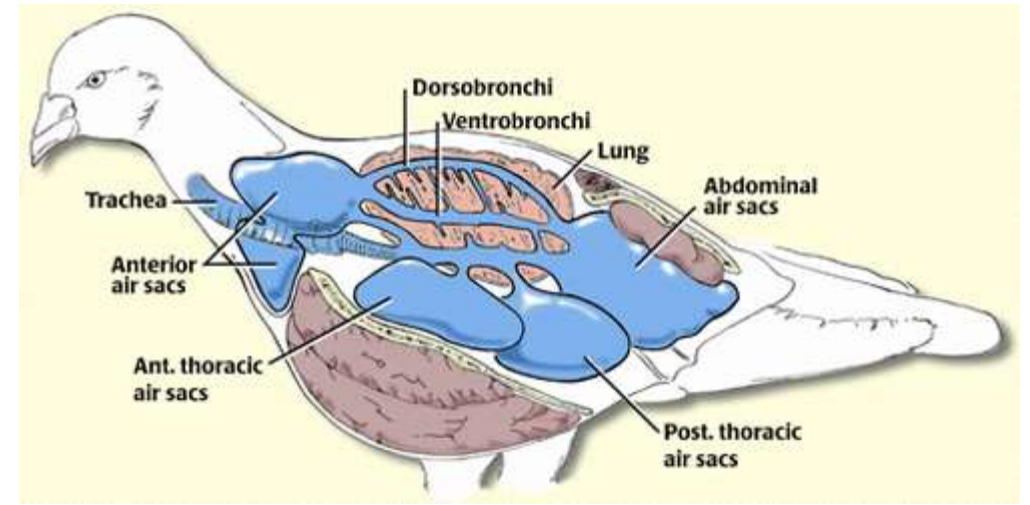
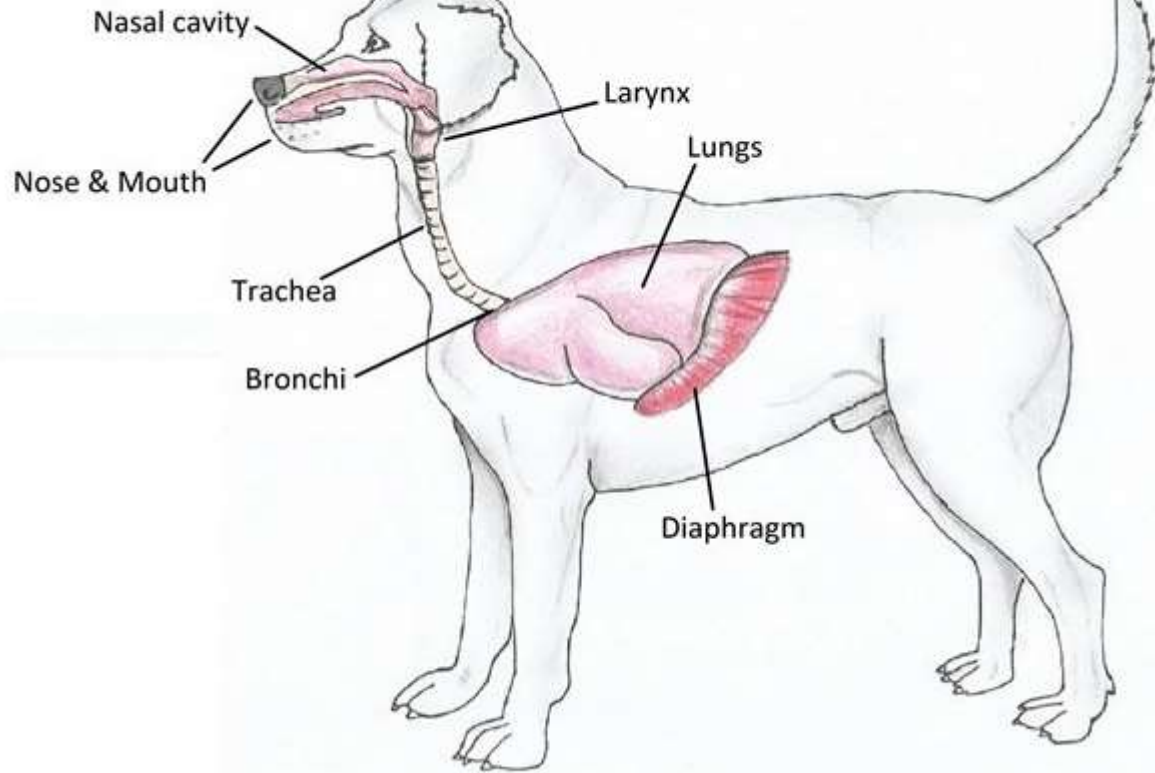
Credit Hrs. – 2+1=3

Dr. Pramod Kumar

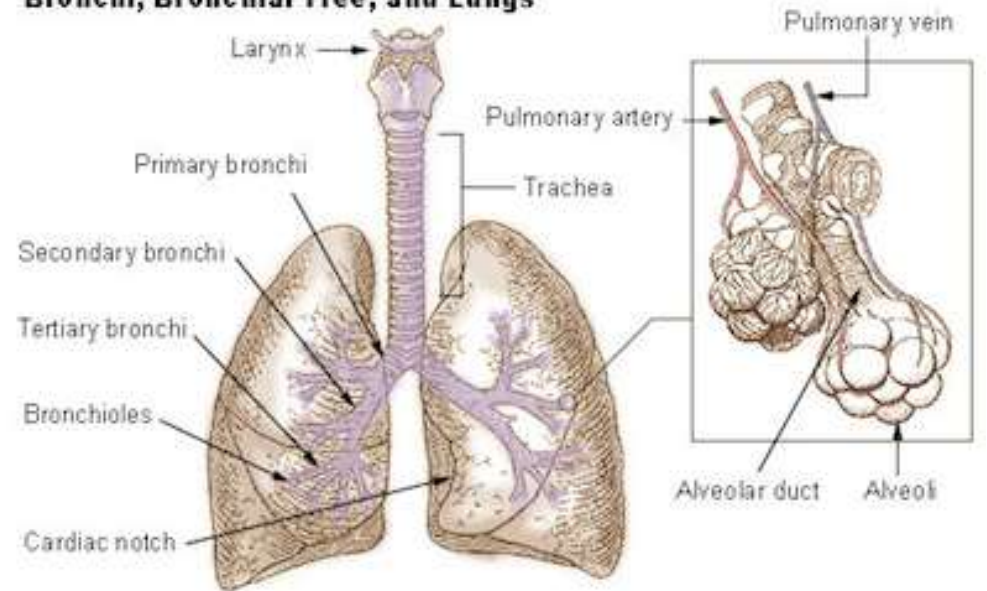
Asstt. Professor

Deptt. of Veterinary Physiology

BVC, Patna



Bronchi, Bronchial Tree, and Lungs



The Lungs

- The respiratory system is a series of organs responsible for taking in oxygen and expelling carbon dioxide. The primary organs of the respiratory system are the lungs, which carry out this exchange of gases during breathing.
- The lungs work with the circulatory system to pump oxygen-rich blood to all cells in the body. The blood then collects carbon dioxide and other waste products and transports them back to the lungs, where they're pumped out of the body when exhale.
- The animals needs oxygen to sustain itself. After only about five minutes without oxygen, brain cells begin dying which can lead to brain damage and ultimately death.

- As the animals breathe, oxygen enters the nose or mouth and passes the sinuses, which are hollow spaces in the skull that help regulate the temperature and humidity of the air they breathe.
- From the sinus, air passes through the trachea also called the windpipe into the bronchial tubes having two tubes that carry air into each lung. The bronchial tubes are lined with tiny hairs called cilia that move back and forth carrying mucus up and out. Mucus is a sticky fluid that collects dust, germs and other matter that has invaded the lungs and is expelled when animals sneeze and cough.
- The bronchial tubes split up again to carry air into the lobes of each lung. The right lung has three lobes while the left lung has only two, to accommodate room for the heart. The lobes are filled with small spongy sacs called alveoli, which is where the exchange of oxygen and carbon dioxide occurs.

- The alveolar walls are extremely thin (0.2 μm) and are composed of a single layer of tissues called epithelial cells and tiny blood vessels called pulmonary capillaries. Blood in the capillaries picks up oxygen and drops off carbon dioxide. The oxygenated blood then makes its way to the pulmonary vein. This vein carries oxygen-rich blood to the left side of the heart, where it is pumped to all parts of the body. The carbon dioxide, the blood left behind moves into the alveoli and gets expelled in from exhaled breath.
- The diaphragm, a dome-shaped muscle at the bottom of the lungs controls breathing and separates the chest cavity from the abdominal cavity. When air gets taken in, the diaphragm tightens and moves downward making more space for the lungs to fill with air and expand. During exhalation, the diaphragm expands and compresses the lungs, forcing air out.

- The respiratory system has built-in methods to keep harmful things in the air from entering the lungs. Nostril hairs help filter out large particles. Tiny hairs, called cilia, along the air passages move in a sweeping motion to keep the passages clean.
- Cells in trachea and bronchial tubes make mucus that keeps air passages moist and helps keep things like dust, bacteria, viruses, and allergy causing things out of your lungs.
- Mucus can bring up things that reach deeper into the lungs. Then animals may cough out or swallow them.

- Respiratory diseases are highly complex, being driven by host–environment interactions and manifested by inflammatory, structural and functional abnormalities that vary over time.
- Diseases and conditions of the respiratory system fall into two categories: Infections, such as influenza, bacterial pneumonia and enterovirus respiratory virus, and chronic diseases, such as asthma and chronic obstructive pulmonary disease (COPD).