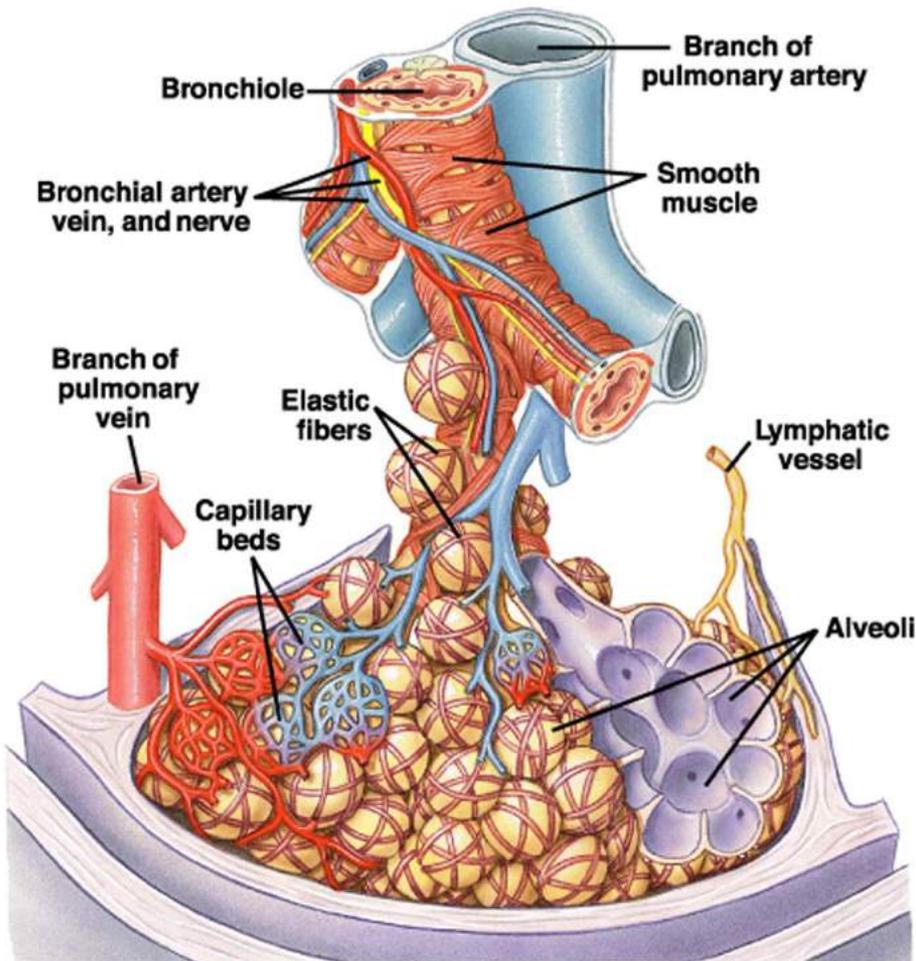


# Structure of the Respiratory System

## 2. Exchange Surface (Alveoli)



### ● The alveoli:

Is where oxygen and carbon dioxide move between the air and the blood.

● Two types of alveolar cells exist, in equal numbers:

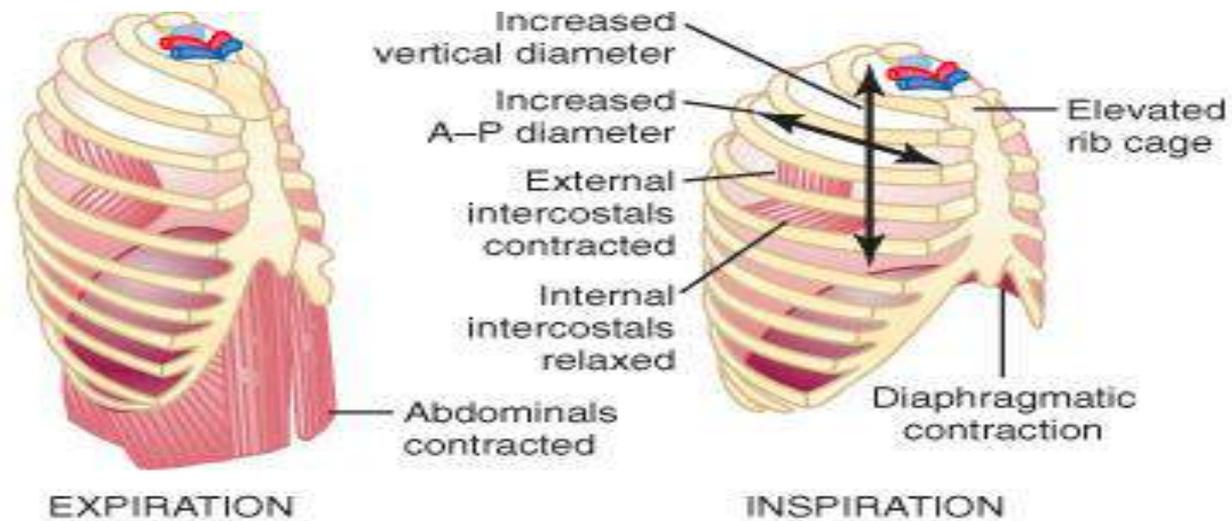
● Type I alveolar cells are the thin **gas-exchange** cells,

● Type 2 alveolar cells synthesize a chemical called **surfactant**.

# Surfactant

- Surfactants are typically lipoproteins acts to **ease the expansion** of the lungs during inspiration.
- The fluid that moisturizes the alveolar wall tends to produce **surface tension**, which increases the **resistance** of the lung to stretch or expand.
- Surfactant **disrupt cohesive forces** between water molecules.
- **Loss of surfactant** leads to a **reduction of lung compliance** and many alveoli would collapse.
- Surfactants are not produced until about **8 weeks** before birth, which explains why **premature infants** have a **hard** time in **breathing**.

# Respiratory muscles



- The **size** of the closed thoracic cavity can be altered by the actions of the **respiratory “pump” muscles**.
- The **enlargement** of the thoracic cavity increases **negative intrathoracic pressure**, which **“sucks” air** into the lungs (like a vacuum cleaner).
- **The major respiratory muscles are:**
  - **1. The diaphragm.**
  - **2. The abdominal muscles** which is used during heavy breathing.
  - **3. The external and internal intercostal muscles.**

# Pleura & pleural fluid

## Pleura

layers of elastic connective tissue represents the outer coverings of the lungs and the walls of the thoracic cavity

## pleural fluid

It provides a moist, slippery surface so that the lungs can easily hold & slip along the walls of the thorax.

# Characters of The Pulmonary Circulation

1. The **same amount** of blood flows through the lungs per minute as flows through the rest of the body.
2. **Flow rate** through the lungs tends to be **high**, because area of the vessels in the lungs is much smaller than in the rest of the body,.
3. **Pressure** in the pulmonary circulation tends to be **low** because the right ventricle does not contract as powerfully as the left ventricle and resistance in the pulmonary circulation is low.