coordination of swallowing mechanism.

- Thus, they may become susceptible to aspiration of food and liquid, which have high risk of pneumonia (It is lung infection that can make very sick. you may cough, run a fever and have a hard time breathing)

- With some of infections, epiglottis and arytenoids can become edematous (swollen) and have continuous airflow resistance.

II. Lower airways: It includes Lungs, trachea, Bronchi, Bronchioles, Respiratory unit(alveole)

---

Components of the lower Respiratory Tract

**LUNGS:** In humans has one pair of lungs 1. right lung and 2.
- It occupies 2% to 4% of surface area.

- Type II cells synthesize pulmonary surfactant which reduces the surface tension of alveolar fluid and it is also responsible for regeneration of alveolar structure when it cause injury.

- Red blood cells pass through network within 1 sec which it is sufficient for gas exchange.

- In response of injury type I cells dead and then type II cells start regeneration this process is called phylogeny recapitulating ontogeny.

**- During embryonic development the epithelial cells are type II cells at late gestation the type II cells replicate and differentiates into Type I cells.

III. Lung interstitium: *

- The lung interstitium is composed of connective tissue, smooth muscle, lymphatics, capillaries, and variety of cells.

- Under normal conditions, the interstitium space is very small and sometimes we can't be discerned by light microscope.

- However, in pathological conditions it can become enlarged with inflammatory cell and edema fluid which it is interfere with exchange of gases.

- Fibroblasts are the prominent cells in interstitium of lungs which synthesize and secrete collagen and elastin.

- These are extracellular proteins which acts as martix formation
- The PNS has somatic motor neurons which are innervate in skeletal muscles.

- The PNS has autonomic neurons which are innervate in smooth, cardiac muscles and glands. so, lungs are innervate by autonomic neurons.

- *In automonic nervous system has four distinct components:
  i. parasympathetic (constrict)
  ii. sympathetic (relax)
  iii. non adrenergic noncholinergic inhibitory (relax)
  iv. nonadrenergic noncholinergic stimulatory (constrict)

- Stimualtion of parasympathetic leads to airways constriction, blood vessels relaxation, glandular secretion.

- Stimulation of sympathetic leads to airways relaxation, blood vessels constriction, glandular inhibition.

- The functional unit of autonomic nervous system is preganglionic and postganglionic neurons.

- The CNS and PNS works togther to maintain the homeostatis of all organ system.

- There are no voluntary motor neurons in lungs nor pain fibers but, pain fibers are found in pleuras.

- The parasympathetic innervation of lungs are orginates from medulla of brain stem (cranial nerve X, vagus).