

## UPPER RESPIRATORY TRACT

### The external nose – Nasus externus

**Radix nasi**

**Dorsum nasi**

**Apex nasi**

**Nares (nostrils)**

**Alae nasi**

### **Cartilagine nasales:**

**Cartilago septi nasi - processus posterior**

**Cartilago nasi lateralis**

**Cartilago alaris major - crus mediale  
- crus laterale**

**Cartilago alaris minor**

**Cartilagine nasales accessoriae - inconstant**

### The nasal cavity - Cavum nasi

**Vestibulum nasi - limen nasi**

**vibrisae**

**recessus apicis nasi**

**Cavum nasi proprium – meatus nasi superior – sinus sphenoidalis, cellulae ethm. post.**

- **meatus nasi medius – sinus maxillaris, frontalis, cellulae ethm. ant et mediae**

- **meatus nasi inferior - ductus nasolacrimalis**

- **choanae**

- **meatus nasi communis**

- **meatus nasopharyngeus**

**Septum nasi - pars membranacea**

- **pars cartilaginea** - cartilago septi nasi, crus mediale cartilaginis alaris nasi

- **pars ossea** - lamina perpendicularis ossis ethmoidalis, vomer

**The roof of the nasal cavity** - cartilago nasi lateralis, os nasale, pars nasalis ossis frontalis, lamina cribrosa ossis ethmoidalis, corpus ossis sphenoidalis

**The lower wall** – processus palatinus maxillae, lamina horizontalis ossis palatini

**ductus incisivus**

**Mucosa - regio respiratoria - plexus cavernosi concharum, epistaxis**

- **regio olfactoria**

A. sphenopalatina (A. maxillaris)

A. ethmoidalis ant. et post. (A. ophthalmica)

N. nasopalatinus, n. palatinus major (N. maxillaris – CNV)

N. ethmoidalis ant (N. nasociliaris – N. ophthalmicus – CNV)

### The paranasales sinuses – Sinus paranasales

**Sinus maxillaris ( Antrum Highmori)- recessus frontalis, zygomaticus, palatinus, alveolaris**

medial wall neighbours on the nasal cavity

roof - the orbit

dorsal wall - fossa infratemporalis

ventrolateral wall - to the face

**hiatus sinus maxillaris - infundibulum ethmoidale - hiatus semilunaris**

Rr. alveolares sup. (A. maxillaris)  
Rr. alveolares sup. (N. maxillaris – CNV)

#### **Sinus frontalis - septum sinuum frontium**

A. supraorbitalis (A. ophthalmica)  
N. supraorbitalis (N. ophthalmicus – CNV)

#### **Sinus ethmoidales (3-18 cellulae ethmoidales)**

- **anteriores** - infundibulum ethmoidale
- **mediae (bulla ethmoidalis)** – infundibulum ethmoidale
- **posteriores** - meatus nasi superior

A. ethmoidalis ant. et post. (A. ophthalmica)  
N. ethmoidalis ant. et post. (N. nasociliaris - CNV)

#### **Sinus sphenoidalis - septum sinuum sphenoidalium** - apertura sinus sphenoidalis

### **LOWER RESPIRATORY TRACT**

#### **Larynx**

- **prominentia laryngis**

#### **Cartilagine laryngis:**

**Cartilago thyroidea** - **lamina dextra et sinistra**  
– **incisura thyroidea sup.**  
– **incisura thyroidea inf.**  
– **cornua superiora - lig. thyroidea lateralia**  
– **cornua inferiora - facies art. cricoidea**  
– **linea obliqua**  
– **foramen thyroideum** - n. laryngeus sup

**Cartilago cricoidea** - **lamina**  
- **arcus**  
- **facies art. arytaenoidea**  
- **facies art. thyroidea**

**Cartilago arytaenoidea** - **apex - facies art. cricoidea**  
- **basis**  
- **facies anterolateralis - colliculus**  
– **crista arcuata**  
– **fossa triangularis**  
– **fovea oblonga**  
  
- **facies posterior**  
- **facies medialis**  
- **proc. vocalis**  
- **proc. muscularis**

**Cartilago epiglottica** - **petiolus epiglottidis**  
- **lamina epiglottidis**

**Cartilago corniculata** – tuberculum corniculatum  
**Cartilago cuneiformis** – tuberculum cuneiforme  
**Cartilago triticea** - lig. thyrohyoideum laterale

### Laryngeal joints

**Articulatio cricoarytaenoidea - lig. cricoarytaenoideum post.** - abduction and adduction of the vocal cords.

**Articulatio cricothyroidea** - oscillating movements of the thyroid cartilage

**Membrana thyroidea (thyrohyoidea) - lig. thyroideum medianum**  
– **lig. thyrohyoideum laterale**

**Conus elasticus - lig. cricothyroideum (coniotomy)**

**Ligamentum vocale - plica vocalis.**

**Lig. cricotracheale**

**Lig. thyroepiglotticum**

**Lig. hyoepiglotticum - spatium preepiglotticum**

**Membrana quadrangularis - lig. ventriculare (vestibulare) plica vestibularis**

**Membrana fibroelastica laryngis**

### Laryngeal muscles

Muscles moving with the epiglottis

**M. thyroepiglotticus** opens the aditus laryngis.

**M. aryepiglotticus** closes the aditus laryngis.

Muscles ensuring abduction or adduction of vocal cords (movement in the cricoarytaenoid joint)

**M. cricoarytaenoideus post. (posticus) - respiratory position** - abduction of vocal cords

**M. cricoarytaenoideus lateralis** - adduction of the vocal cords (**phonation**)

**M. arytaenoideus** - strongest adductor of the vocal cords (**phonation**)

Muscles ensuring tension or relaxation of vocal cords (movement in the cricothyroid joint)

**M. cricothyroideus** - tension of the vocal cords

**M. thyroarytaenoideus** relaxation of vocal cords

**M. vocalis** - fine regulation of the vocal cord tension

N. laryngeus sup. (m. cricothyroideus)

N. laryngeus inf - other muscles

**Cavum laryngis:**

**Vestibulum laryngis**

**Aditus laryngis – epiglottis**

- **plicae aryepiglotticae – tuberculum cuneiforme**
- **tuberculum corniculatum**
- **plica - incisura interarytaenoidea**

**Plicae ventriculares s. vestibulares - rima vestibuli**

**Glottis – ventriculus laryngis - sacculus laryngis**

**Plicae vocales – rima glottidis - pars intermembranacea rimae glottidis**  
- **pars intercartilaginea rimae glottidis**

The pitch of voice is influenced by the length of vocal cords - lower voice in males (24 mm) than in females (20 mm).

**Cavum infraglotticum**

### **Function of the larynx**

Both functions of the larynx – breathing and voice production – are associated with the position of vocal folds. During respiration the rima glottidis is open (depending on depth and intensity of breathing) – **respiration position**.

During phonation the vocal folds tighten and adduct – **phonation position**. The rima glottidis is closed in both pars intermembranacea and pars intercartilaginea. The expired air gets through the closed rima glottidis to shake the column of air above vocal folds. The pitch of voice depends on the length, tension and shape of vocal folds. The intensity is influenced by the strength of passing air. The tone obtains its characteristic timbre after its formation in the pharynx, oral and nasal cavities and paranasal sinuses. The change of the voice to the speech takes place in the oral cavity by means of the tongue, teeth, lips and palate.

**Indirect laryngoscopy** - laryngoscopic mirror

**Direct laryngoscopy** - laryngoscope.

**Cough** clears away mucus or foreign body from the lower respiratory tract. It is a short closure of the rima glottidis after a deep inspiration followed by intensive spasmodic expiration. Abdominal muscles participate at the cough too.

## TRACHEA

**Pars cervicalis and pars thoracica**

**Bifurcatio tracheae (T4) - bronchus principalis dexter et sinister**

**Carina tracheae**

The **isthmus glandulae thyroideae** - in contact with the 2<sup>nd</sup> and 3<sup>rd</sup> tracheal cartilages

Vv. thyroideae inf. - below the isthmus.

The sides of the trachea - **lobes of the thyroid gland**.

**Paratracheal space** - A. carotis com., v. jugularis int. and n. vagus

Oesophagus – posteriorly

**N. laryngeus recurrens** - in the groove between the trachea and oesophagus.

**Nodi lymphatici paratracheales, tracheobronchiales**

15 – 20 hyaline cartilages (**cartilagine tracheales**) connected by **ligg. anularia**

**paries membranaceus**

**glandulae tracheales**

**Tracheotomy**

The incision is commonly made through the second and third tracheal rings. As the isthmus of the thyroid gland covers the 2<sup>nd</sup> and 3<sup>rd</sup> tracheal rings, it is retracted inferiorly (**tracheotomia superior**) or incision is performed through lower tracheal rings (**tracheotomia inferior**).

**Tracheostomy**, when the duration of endotracheal intubation is expected to be longer than 72 hours.

## BRONCHI

**Arbor bronchialis**

**Bronchi principales dexter et sinister (bifurcatio tracheae) - bronchi lobares (3 right and 2 left) - bronchi segmentales**

## LUNG (PULMO)

**Basis pulmonis**

**Apex pulmonis - sulcus arteriae subclaviae and the sulcus costae primae**

**Facies diaphragmatica**

**Facies costalis**

**Facies mediastinalis - hilum pulmonis - radix pulmonis.** The craniocaudal order of the root structure is different on the right (bronchus, pulmonary artery and veins) than on the left (artery, bronchus, veins).

The mediastinal surface of the right lung– **sulcus v. cavae sup., sulcus v. azygos, sulcus oesophageus, impressio cardiaca.**

The mediastinal surface of the left lung - **sulcus aorticus, impressio cardiaca, sulcus oesophageus**

**Margo inferior, anterior, posterior**

**Incisura cardiaca - lingula pulmonis sinistri**

**Fissurae interlobares - fissura obliqua, fissura horizontalis - lobus medius**

## BRONCHOPULMONARY SEGMENTS (segmenta bronchopulmonalia)

The right lung: segmentum apicale 1, posterius 2, anterius 3 in the superior lobe, segmentum laterale 4 and mediale 5 in the middle lobe, and segmentum apicale (superius) 6, basale mediale 7, basale anterius 8, basale laterale 9, basale posterius 10 in the inferior lobe.

The left lung: segmentum apicoposterius 1+2, segmentum anterius 3, segmentum lingulare superius 4, segmentum lingulare inferius 5 in the superior lobe. Segmentum apicale (superius) 6, segmentum basale mediale 7 that is variable and often combined with segmentum basale anterius 8 into anteromedial basal segment, basale laterale 9, basale posterius 10 in the inferior lobe.

**Segmentectomy – lobectomy - pneumonectomy**

**Bronchioli** have no cartilages - **terminal bronchioli - 2-3 bronchioli respiratorii - ductuli alveolares - sacculi alveolares - alveoli**

The whole number of alveoli is 300-400 milion and their surface is 50-80 m2.

**Borders of the lungs**

## **PLEURA**

**Pleura visceralis - pleura costalis, pleura diaphragmatica, pleura mediastinalis**

**Pleura parietalis**

**Lig. pulmonale**

**Cavum pleurae**

**Cupula pleurae**

**Lig. scalenopleurale, vertebropleurale, costopleurale**

**Recessus pleurae**

**Recessus costodiaphragmaticus**

**Recessus costomediastinalis**

**Recessus phrenicomediastinalis**

**Pneumothorax**

**Borders (lines of reflection) of the parietal pleura**

**Cupula pleurae**

**Area interpleuralis sup. s. thymica**

**Area interpleuralis inferior s. pericardiaca**

## **THYROID GLAND**

**Lobus, dexter, sinister, isthmus (lobus pyramidalis)**

**Capsula propria**

**Fascia externa s. perithyroidea**

**Folliculi - colloid - thyroglobulin (thyroxin, trijodthyronin)**

## **PARATHYROID GLANDS (GLANDULAE PARATHYROIDEAE)**

**parathormone** - regulates plasmatic levels of calcium and phosphorus.

## **THYMUS**

**Lobus dexter et sinister**

**Capsula thymi**

**Lobuli thymi**

**Cortex, medulla thymi**

**T-lymphocytes**