UPPER RESPIRATORY TRACT

The external nose – Nasus externus

radix nasi
dorsum nasi
apex nasi
nares (nostrils)
alae nasi

Cartilagines nasales:
cartilago septi nasi - processus posterior
cartilago nasi lateralis
cartilago alaris major - crus mediale
- crus laterale
cartilago alaris minor
cartilagines 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 frontalium
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

Cartilagines 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.