**Digestive system**

**overview:**oral cavity(cavum oris), pharynx, oesophagus, stomach (ventriculus, gaster, stomachus), small intestine (intestinum tenue), large intestine(intestinum crassum)

**Glands of digestive system**: intramural, extramural

**Common structure of gastrointestinal tube:**

1. tunica mucosa: lamina epithelialis, lamina propria mucosae, lamina muscularis mucosae (papillae, plicae, villi)
2. tela submucosa (plexus submucosus)
3. tunica muscularis: stratum circulare, stratum longitudinale (plexus myentericus)
4. adventitia/serosa

**Cavum oris**

**Rima oris**

**Vestibulum oris**: shape, boundaries

Labium superius et inferius: anguli oris, philtrum, tuberculum labii sup., sulcus nasolabialis, sulcus mentolabialis. Structure: skin, subcutaneous tissue kůže, podkožní vazivo, m. orbicularis oris, submucous tissue (glandulae labiales). transitional zone– red of the lips.

Buccae: Structure: skin, subcutaneous tissue, m. buccinator, submucous tissue (glandulae buccales et molares), mucous membrane. Papilla parotidea.

Mucous membrane (lips and cheeks) → fornix vestibuli sup. et inf. (frenulum labii sup. et inf.) → mucogingival border→ gingiva (processus alveolares): attached, free (differences, boundaries– paramarginal groove). Papillae interdentales.

Tremata, trigonum retromolare.

**Cavum oris proprium**:boundaries

Palatum durum: Hard palate (bony palate) (1. semestr), papilla incisiva, plicae palatinae transversae, torus palatinus. Structure: mucous membrane + periosteum of hard palate = mukoperiosteum. Only small portion of subcutaneous tissue (glandullae palatinae, taste buds).

Palatum molle: 2 parts (horizontal and dorsocaudal). Structure: mucous membrane, aponeurosis palatina (apouneurotic insertion for muscles of soft palate: m. palatoglossus, palatopharyngeus, m. tensor veli palatini, m. levator veli palatini, m. uvulae). Uvula.

Diaphragma oris: Structure: mucous membrane, m. geniohyoideus, mylohyoideus, venter anterior m. digastrici. Frenulum linguae, plica sublingualis, caruncula sublingualis.

**Isthmus faucium:** boundaries

Arcus palatoglossus et palatopharyngeus. Sinus tonsillaris, plica semilunaris. Tonsilla palatina: mucous membrane: fossulae et cryptae tonsillares, lymfatic tissue. Capsula tonsillaris.

**Lingua (glossa)**:

Radix linguae: plica glossoepiglottica mediana, plicae glossoepiglotticae laterales, valleculae epiglotticae. Tonsilla lingualis.

Corpus lingue: dorsum, sulcus terminalis, foramen caecum, papillae linguales, facies inferior, plicae fimbriatae, margines linguae;

Apex linguae; glandulae linguales, aponeurosis linguae, septum linguae, intraglossal and extraglossal muscles

Facies *a)* *dorsalis*: sulcus medianus linguae, sulcus terminalis, foramen caecum linguae, papillae: filiformes, fungiformes, vallatae, foliatae (localization). Caliculi gustatorii.

*b)* *inferior*: frenulum linguae, plicae fimbriatae.

Margines linguae

Glandullae linguales: serous (of Ebner), mucinous (of Weber), gl. apicis major.

Structure of tongue: mucous membrane, aponeurosis linguae, muscles (extraglossal muscles: m. genioglossus, m. hyoglossus, m. styloglossus and intraglossal muscles: m. longitudinalis linguae sup. et inf., m. transversus linguae, m. verticalis linguae).

Septum linguae.

**Dentes**:

Parts: corona dentis, collum dentis, radix/radices dentis.

Surface: margo incisalis, facies occlusalis (tubercula dentalia, intertubercular grooves), approximalis (mesialis, distalis), vestibularis (labialis, buccalis) et oralis (palatina, lingualis).

Structure: dentinum (crown, neck, root), enamelum(crown), cementum (neck)

Cavity: cavum dentis, canalis radicis dentis, foramen apicis dentis. Pulpa dentis.

Fixation of the tooth (gomphosis): periodontal ligaments. Periodontium. Paradontium.

Types of teeth: **dentes incisivi, canini, praemolares et molares** – **description of temporal and permanent tooth**: count in the jaw,shape if the crown, description of surfaces of crown, in the dorsal teeth description of occlusal surface (amount of tubercles, shape og fissural complex), differences in sizes, count and shape of roots, shape of dental cavity, number of root canals.

Dentition: temporary (dentes decidui), permanent (dentes permanentes). Mixed dentition.

Marking of teeth. Dental cross.

a) part of dental cross. Temporary teeth: small letters or roman numbers. Permanent teeth: large numbers or arabian numbers.

b) two-digit code: first digit: number of quadrant (Permanent teeth 1-4 , Temporary teeth 5-8; second digit: the tooth)

Eruption of teeth (Temporary teeth: from 6 months to 2,5 year; Permanent teeth: from 6 to 16 years ). order of eruption according to temporary and permanent dentition

**Glandulae salivariae:** division according to the secretion (serous, mucinous, mixed), division according to size(small, large)

gll. salivariae minores:labiales, buccales, molares, palatinae.Localization,frequency, secretion

gll. salviariae majores:

**glandula submandibularis**: position, type, size. Ductus submandibularis (course, opening)

**glandula sublingualis**: position, type, size. Ductus sublingualis major et mino (course, opening)

**glandula parotis**: position, type, size. Ductus parotideus (course, opening). Fascia parotidea

**Pharynx**

Attachment to the basis cranii externa (course)

Parts:

**Nasopharynx:** extent; choanae, fornix pharyngis; tonsilla pharyngea; ostium pharyngeum tubae auditivae, torus tubarius et levatorius, plica salpingopharyngea et salpingopalatina; tonsilla tubaria

**Oropharynx**: extent, isthmus faucium

**Laryngopharynx**: extent. **Aditus laryngis:** plicae aryepiglotticae, incisura (plica) interarytaenoidea. Recessus piriformis

Structure of pharynx: 1. mucous membrane (gll. pharyngeae, lymfatic tissue), 2. submucous tissue (fascia pharyngobasilaris), 3. muscles: a) constrictors: m. constrictor pharyngis superior, medius et inferior (including parts), b) levators: m. stylopharyngeus, m. glossopharyngeus, 4. adventitia

**OEsophagus**

Lenght, extetnt, division: pars cervicalis, thoracica et abdominalis

Fyziological constictions

Structure of wall: 1. mucous membrane (folds), 2. submucous tissue 3. musculature (striated,mixed, smooth), adventitia/serous membrane

X-ray examination (oesophagography)

**Ventriculus (gaster)**

Basic function. Position. Volume

Parts: pars cardiaca, ostium cardiacum, incisura cardiaca, fundus ventriculi, corpus ventriculi, incisura angularis, pars pylorica, ostium pyloricum (m. sphincter pylori)

Facies anterior et posterior

Curvatura major et minor

Structure of wall: 1. Mucous membrane (sulcus salivarius and irregular folds, areae gastricae, foveolae gastricae, glandulae gastricae); 2. submucous tissue 3. musculature (stratum longitudinale, stratum circulare, fibrae obliquae), 4. serous membrane

X-ray examination (gastrography)

**Intestinum tenue**

Basic function. Lenght. Position. Beggining, end

**Duodenum:**

Position. Beggining, end

Parts: pars superior (bulbus duodeni, lig. hepatoduodenale), flexura duodeni sup., pars descendens (pars supramesocolica et inframesocolica), flexura duodeni inf., pars horizontalis (crossing of radix mesocoli), pars ascendens, flexura duodenojejunalis

Structure of wall: 1. Mucous membrane: villi interstinales, plicae circulares, plica longitudinalis duodeni, papilla duodeni major et minor; glandulae intestinales – production of isotonic fluid, 2. submucous tissue: glandulae duodenales – correction of pH 3. musculature, 4. serous membrane ( in whole extent of pars superior, another parts secondarily retroperitonealy)

**Jejunum et ileum**:

Beggining, end. Radix mesenterii, ansae intestinales. Differences between jejunum and ileum (lenght, localization, color, width, thickness of wall, types of plicae, course of blood supply, lymfatic tissue).

Structure of wall: 1. Mucous membrane (villi intestinales, plicae circulares; glandulae intestinales, lymfatická tkáň), 2. submucous tissue, 3. musculature, 4. serous membrane

**Intestinum crassum**

Basic function. Lenght. Position. Taenie, haustra, appendices epiploicae

Structure of wall

1. mucous membrane (plicae semilunares)

2. submucous tissue

3. musculature (circular, longitudinal– s.c. taenie)

4. serous membrane

**1. Caecum**:

lenght, position, ostium ileocaecale, valva ileocaecalis. Appendix vermiformis (ostium appendicis vermiformis, valva appendicis vermiformis, lymfatic tissue, s.c. tonsilla abdominalis), positions of appendix: positio pelvina, retrocaecalis, praecaecalis, ileocaecalis, lateralis

**2. Colon:**

* **colon ascendens:** beginning, end (flexura coli dextra), lenght, position according to the peritoneum
* **colon transversum:**  beginning, end (flexura coli sinistra), lenght, position according to the peritoneal cavity, mesocolon transversum
* **colon descendens:** beginning, end, lenght, position according to the peritoneal cavity
* **colon sigmoideum:** beginning, parts (pars iliaca, pars pelvina), end, lenght, position according to the peritoneal cavity. Mesosigmoideum

**3. Rectum**:

beginning, openning(crena ani, anus), lenght.

Parts: pars pelvina et canalis analis.

Curvatures: in saggital plane (flexura sacralis, flexura perinealis)

in frontal plane(plicae transversales recti)

Structure of wall in rectum:

1. mucous membrane: in **ampulla recti:** plicae transversales (middle, right, s.c. plica of Kohlrausch), in **canalis analis** a) *zona hemorhoidalis* (columnae anales; sinus anales, valvulae anales), b) *zona intermedia* (as transitional zone of lip) a c) *zona cutanea*

2. submucous tissue (thin- possible prolaps; venous plexuses- v zona hemorrhoidalis)

3. musculature: circular (m. sphincter ani int. et ext.) and longitudinal

4. serous membrane/adventitia

X ray examination: irigography

**Hepar**

Basic functions, position, color, weight

Surfaces**: facies diaphragmatica**: pars superior et anterior

**facies visceralis**: fissura ligamenti teretis, fissura ligamenti venosi, fossa vesicae biliaris, fossa venae cavae inf.; porta hepatis (a. hepatica propria, v. portae, ductus hepaticus communis, plexus hepaticus)

Lobes: lobus dexter, sinister, quadratus et caudatus. Segments of liver.

Structure: capsula fibrosa, liver parenchyme + tissue

Morfological unit: lobulus hepatis

Functional unit: lobulus v. interlobularis

Excretory ducts: ductus hepaticus: dx., sin., ductus hepaticus communis

Blood supply: **nutritive** (a. hepatica propria)

**functional** (v. portae → ramus. dx. et sin. → vv. interlobulares → sinosoidy → v. centralis → sběrné žíly → vv. hepaticae → v. cava inf.)

**Vesica fellea (biliaris)**

Basic functions, position, lenght, volume

Parts: fundus, corpus, infundibulum, collum (plica spiralis)

Excretory duct: ductus cysticus. Ductus choledochus

Structure of wall: mucous membrane (folds), musculature, serous membrane

X-ray examination: cholecystography

**Excretory bile ducts**

Production of bile by hepatic cells → intralobular bile duct → interlobular→ segmental→ ductus hepaticus communis + ductus cysticus → ductus choledochus → papila duodeni major (m. sphincter ampullae hepatopancreaticae, Oddi). If a foof is not present in duodenum, bile flows back to the gall bladder (Není-li potrava ve dvanáctníku, žluč se vrací zpět do žlučníku (for thickening)

**Pancreas**

Basic functions, position, lenght

Parts: caput (incisura pancreatis, processus uncinatus), corpus (tuber omentale), cauda.

Surfaces: facies ant., post.

Borders: margo sup. et inf.

Excretory duct: **ductus pancreaticus major** (ampula hepatopancreatica) et **ductus pancreaticus minor** (papilla duodeni minor)

Structure: lobuli pancreatis (succus pancreaticus); Isles of Langerhans (inzuline, glukagon)

**Lien**

Basic functions, position, lenght, color

Surfaces: **facies diaphragmatica, facies visceralis** (hilus: av. lienalis, plexus lienalis)

Extremitas post. et ant.

Margo sup. et inf.

Structure: tunica fibrosa (capsula lienis), trabeculae lienis, pulpa lienis, folliculi lymphatici lienales

**Peritoneum**

Structure: layer of flat endothelial cells, subserous tissue

Peritoneum parietale. Peritoneum viscerale. Mesenteria

Cavitas peritonealis: **pars supramesocolica, pars inframesocolica** (organs, blood supply).

Position of organs according to the peritoneal cavity: intraperitoneal, secondarily retroperitoneal, retroperitoneal, extraperitoneal

Peritoneal folds: plica umbilicalis mediana, plicae umbilicales mediales, plicae umbilicales lat.; fossae: supravesicales, inguinales mediales, inguinales lat.

Peritoneal folds bound with organs: lig. falciforme hepatis (lig. teres hepatis), ligg. triangularia, omentum minus (lig. hepatoduodenale et hepatogastricum), omentum majus, lig. gastrocolicum, lig. gastrolienale, lig. pancreaticolienalie, lig. phrenicolienale, lig. phrenicocolicum, mesenterium (line of attachment), mesocolon transversum (line of attachment), mesoappendix, mesosigmoideum.

Recessus peritonei: duodenales, ileocaecales, paracolici, intersigmoideus. Burza omentalis (boundaries, entrance)

**RESPIRATORY SYSTEM**

**Overview**

* Upper respiratory tract: external nose (nasus externus), nasal cavity(cavum nasi), paranasal sinuses (sinus paranasales)
* Lower respiratory tract: larynx, wind pipe (trachea), bronchi
* Lungs (pulmones)

**Nasus externus**

Basic functions, shape, boundaries

Parts: radix nasi, dorsum nasi, apex nasi, alae nasi, nares

Structure: **skin** (muscles)

**ossa nasalia, maxilla** (1. semester)

**cartilagines nasales**: cartilago septi nasi, cartilago nasi lateralis, cartilago alaris major (crus mediale et laterale), cartilago alaris minor, cartilagines nasales accessoriae

**Cavitas nasalis**

Basic functions

Entrance, nares (boundaries), exit, choanae (boundaries)

Mucous memb.: **regio respiratoria** – lokalizace

**regio olfactoria** (lokalizace)

Parts:

**vestibulum nasi:** limen nasi, vibrissae, recessus apicis nasi

**cavum nasi proprium**:

*septum nasi*: pars ossea (1. semester); pars cartilaginea; pars membranacea

*walls*: cranial, caudal, medial, lateral (1. semester)

Meatus nasi: superius, medius, inferius, communis, nasopharyngeus

Plexus cavernosi concharum – epistaxis

**Sinus paranasales**

Evolution, basic function, localization, volume, openings

Sinus frontalis (septum)

Cellulae ethmoidales – ant., medii (bulla ethmoidalis), post.

Sinus sphenoidalis – wall: cranial, lateral, ventral (apertura sinus sphenoidalis)

Sinus maxillaris – wall: ventral, dorsal, cranial, medial(1. semester). Hiatus sinus maxillaris, infundibulum ethmoidale. Recessus sinus maxillaris

Examination: diaphanoskophy - obsolent, contrast X ray - obsolent, semiaxial projection.

**Larynx**

Position, shape

Basic structure:

**mucous membrane** (plicae ventriculares, plicae vocales)

**subcutaneous tissue**: very thin (oedema!), thick (membrana fibroelastica laryngis: membrana quadrangularis + conus elasticus)

**cartiliges** (joints)

**muscles**

Cartilagines laryngis:

**Cartilago thyroidea:** lamina dx. et sin. (linea obliqua); incisura thyroidea sup. et inf.; cornu sup. et inf. (facies art. cricoidea)

**Cartilago cricoidea**: arcus; lamina (facies articularis arytaenoidea, facies art. thyroidea).

**Cartilago arytaenoidea**:apex; basis (facies art. cricoidea, processus vocalis et muscularis); facies: anterolateralis, post., medialis

**Cartilago epiglottica:** petiolus, lamina

**Cartilago corniculata et cuneiformis**

Articulationes laryngis**:** articulatio cricothyroidea et cricoarytaenoidea (movements)

Syndesmoses laryngis: membrana thyrohyoidea; lig. cricotracheale; lig. thyroepiglotticum, lig. hyoepiglotticum; membrana quadrangularis (ligg. ventricularia), 2. conus elasticus (ligg. vocalia)

Musculi laryngis:division considering localization ( anterior, posterior and lateral group – origin and attachment); division according to the function. Musculus: thyroepiglotticus, aryepiglotticus, cricoarytaenoideus post., cricoarytaenoideus lat., arytaenoideus, cricothyroideus, thyroarytaenoideus, vocalis

Cavitas laryngis:

**Vestibulum laryngis:** boundaries;plicae vestibulares (structure, color), rima vestibuli.

**Glottis:** boundaries; ventriculus laryngis; plicae vocales, rima glottidis - pars intermembranacea et intercartilaginea

**Cavitas infraglottica**: extetnt

Examination: direct and indirect laryngoscopy, laryngoscopical image – position of vocal cords in fonatition and respiration

**Trachea**

Localization, extent (C6 - cca Th4), lenght

Structure of wall (cartilagines tracheales; ligg. anularia; paries membranaceus; m. trachealis)

Parts: pars cervicalis et thoracica

Bifurcatio tracheae; carina tracheae

**Bronchi**

Localization

Structure of wall

Bronchus principalis dexter et sinister (differences in diameter and course)

Arbor bronchialis: bronchi lobares, bronchi segmentales... → bronchioli ... → alveoli pulmonis

**Pulmo**

Localization, shape, color, function. Basic structure

Basis pulmonis, apex pulmonis

Surfaces, facies: diaphragmatica, costalis et mediastinalis (hilum pulmonis)

Margins, margines: inf., ant. (incisura cardiaca pulmonis sin.), post.

Lobes:

**pulmo sinister:** lobus sup. et inf. (lingula pulmonis sin.)

**pulmo dexter**: lobus sup., medius, inf.

Fissurae interlobares: fissura obliqua, fissura horizontalis pulmonis dextri.

Bronchopulmonal segments (count)

Nutritional and functional circulation

**PLEURA**

**Pleura visceralis** (lig. pulmonale)

**Pleura parietalis**: cupula (localization); parts of pleura (according to the adjacent structures): pleura costalis, diaphragmatica et mediastinalis

Recessus pleurales: costodiaphragmaticus, costomediastinalis et phrenicomediastinalis

Cavitas pleurales

**Glandula thyroidea**

Localization, color, basic functions

Lobus dexter et sinister, isthmus, lobus pyramidalis

Structure: capsula fibrosa (capsula externa + capsula propria → lobuli, folliculi)

**Glandula parathyroidea**

Position, count, shape, size, basic functions

**THYMUS**

Position, color, shape (baze, apex), basic functions

Lobus dexter et sinister

Structure: capsula thymica → lobuli thymi (cortex, medulla)