

A tropical beach scene with several wooden boats in the water under a blue sky. The boats are traditional outrigger-style vessels, some with colorful ribbons tied to their prows. The water is clear and turquoise, and the background shows a lush green island under a bright blue sky with a few clouds. The text 'Lymphatic System' is overlaid in the lower half of the image.

Lymphatic System

The Lymphatic System

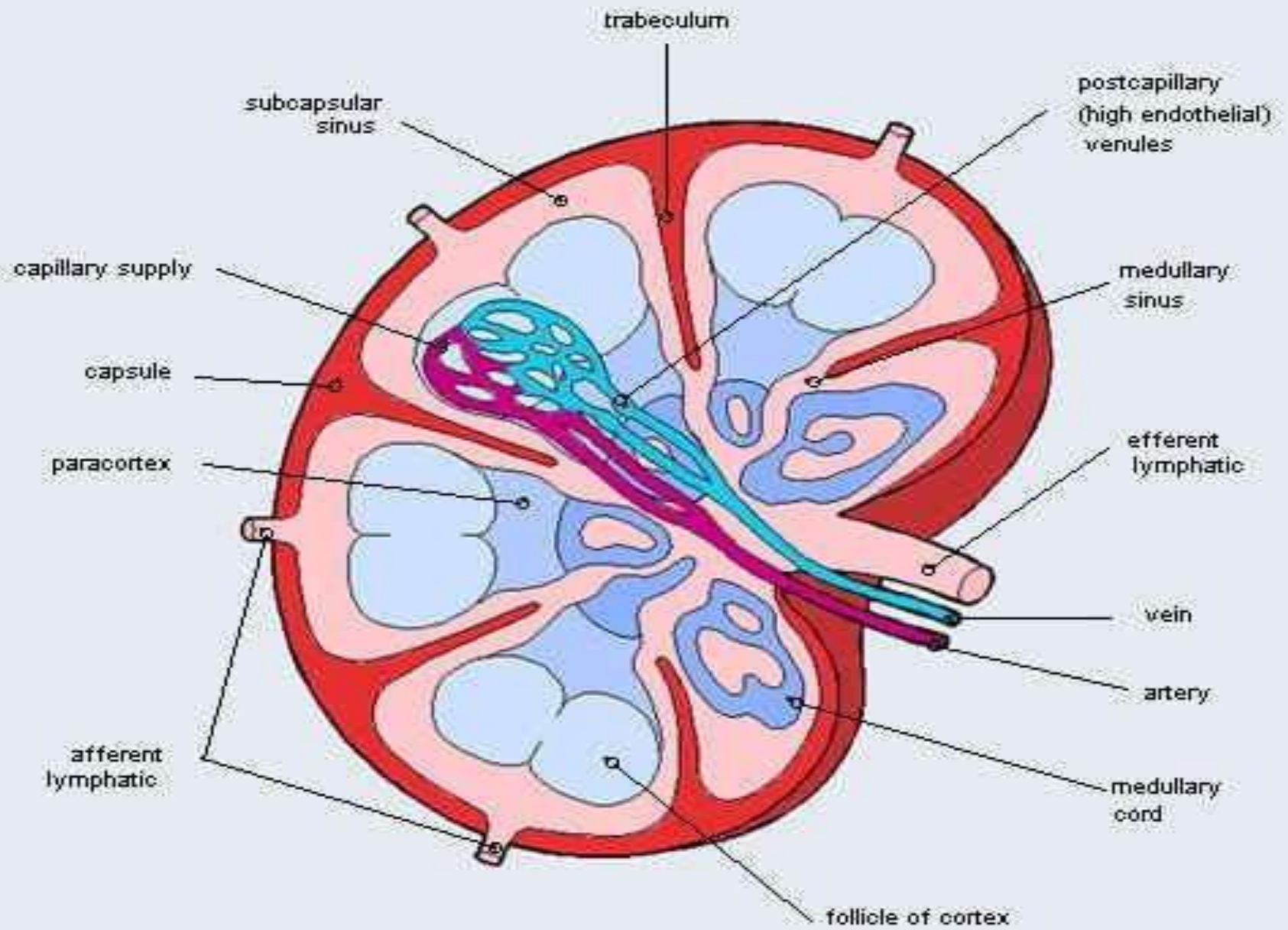
The lymphatic system is considered one of the most important systems occur in the body, because it acts as a **defensive system** for collecting of foreign bodies integrated inside the arteries and veins so we can consider it as **multi-pipe system** for collecting of foreign bodies.

Any region in the body has a specific lymphatic center to collect and filter the blood that goes inside or outside it,

So, if there is a bulge in the lymphocyte

That means;

- There is a defect or disease in the region these lymphocytes are working on.



Lymph centers

I- LYMPH CENTERS OF THE HEAD

**A- MANDIBULAR
LYMPH CENTER**

1- Mandibular lymph node
2- Pterygoid lymph node

**B- PAROTID
LYMPH CENTER:**

1- Parotid lymph node

**C-
Retropharyngeal
LYMPH CENTER**

1- Lateral retropharyngeal In
2- Medial retropharyngeal In
3- Rostral hyoid In
4- Caudal hyoid In

II- LYMPH CENTERS OF THE NECK

A- SUPERFICIAL CERVICAL LYMPH CENTER:

- 1- Superficial cervical In
- 2- Accessory superficial cervical In.

B- DEEP CERVICAL LYMPH CENTER:

- 1- Cranial deep cervical In.
- 2- Middle deep cervical In.
- 3- Caudal deep cervical In.
- 4- Costocervical In.

III- LYMPH CENTERS OF THE THORACIC LIMB

```
graph TD; A["III- LYMPH CENTERS OF THE THORACIC LIMB"] --> B["A- AXILLARY LYMPH CENTER:"]; B --> C["1- Proper axillary In<br/>2- Axillary lymph node of the first rib<br/>3- Accessory axillary In<br/>4- Infraspinatus In"];
```

A- AXILLARY LYMPH CENTER:

- 1- Proper axillary In**
- 2- Axillary lymph node of the first rib**
- 3- Accessory axillary In**
- 4- Infraspinatus In**

IV- Lymph centers of the thoracic cavity

A- DORSAL THORACIC LYMPH CENTERS

- 1- Thoracic aortic lymph nodes
- 2- Intercostal lymph nodes

B- VENTRAL THORACIC LYMPH CENTER:

- 1- Cranial sternal lymph node:
- 2- Caudal sternal lymph node:
- 3- Xiphoid lymph nodes:
- 4- Phrenic lymph node:

C- MEDIASTINAL LYMPH CENTER:

- 1- Cranial mediastinal In
- 2- Middle mediastinal In
- 3- Caudal mediastinal In

IV- BRONCHIAL LYMPH CENTER:

- 1- Left tracheobronchial In
- 2- Right tracheobronchial In
- 3- Middle tracheobronchial In
- 4- Cranial tracheobronchial In
- 5- Pulmonary Ins

V- LYMPH CENTERS OF THE ABDOMINAL AND PELVIC WALLS

A- LUMBAR LYMPH CENTER:

- 1- Lumbar aortic lymph node
- 2- Proper lumbar lymph nodes
- 3- Renal lymph nodes

B- ILIOSACRAL LYMPH CENTER:

- 1- Medial iliac lymph nodes
- 2- Lateral iliac lymph node
- 3- Internal iliac lymph nodes
- 4- Sacral lymph nodes
- 5- Anorectal lymph node

C- INGUINO-FEMORAL LYMPH CENTER:

- 1- Superficial inguinal In
 - A- Mammary In (in female)
 - B- Scrotal In (in male)
- 2- Sub iliac In (pre femoral)
- 3- Coxal In
- 4- Accessory coxal In
- 5- Lns of the Para lumbar fossa

D- ISCHIATIC LYMPH CENTER:

- 1- Ischiatic lymph node
- 2- Gluteal lymph node
- 3- Tuberal lymph node

VI- LYMPHO CENTERE OF THE PELVIC LIMB

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graph TD; A[VI- LYMPHO CENTERE OF THE PELVIC LIMB] --> B[A- ILIOFEMORAL LYMPH CENTERS: (Deep inguinal)]; A --> C[B- POPLITEAL LYMPH CENTER:]; B --> D[1- Ilio-femoral Ins<br/>2- Epigastric Ins]; C --> E[1- Deep popliteal In];
```

**A- ILIOFEMORAL
LYMPH CENTERS:
(Deep inguinal)**

**1- Ilio-femoral Ins
2- Epigastric Ins**

**B- POPLITEAL
LYMPH CENTER:**

1- Deep popliteal In

VII- LYMPH CENTERS OF THE ABDOMINAL VISCERA

A- CELIAC LYMPH CENTER:

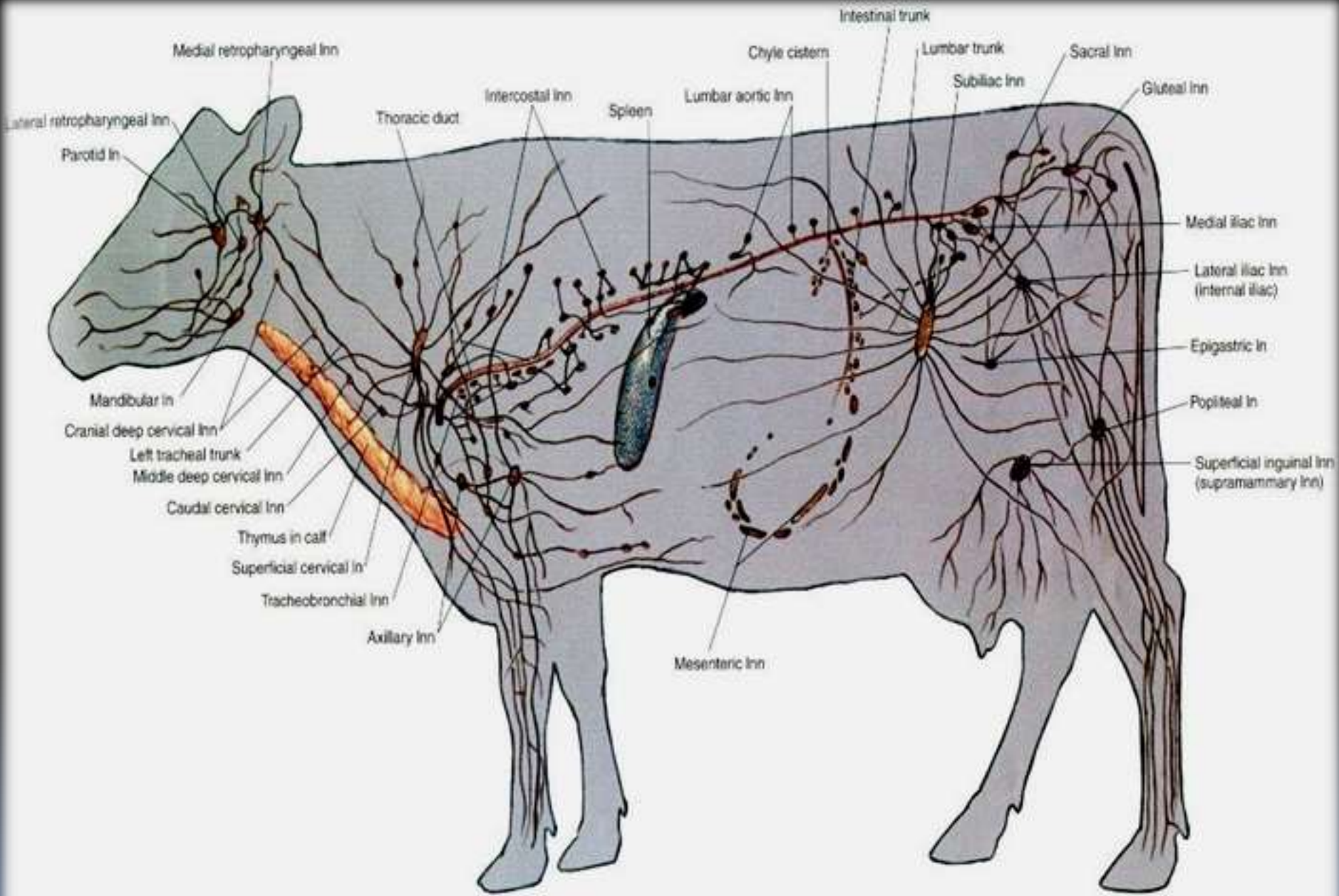
- 1- Celiac lymph nodes
- 2- Gastric lymph nodes
- B- Ruminal lymph nodes
 - 1- Right ruminal In
 - 2- Accessory ruminal In
 - 3- Left ruminal Ins
 - 4- Cranial ruminal Ins
- C- Reticular lymph nodes
- D- Omasal lymph node
- F- Ventral abomasal Ins
- G- Rumino-abomasal Ins
- H- Reticulo-abomasal Ins
- I- Hepatic lymph nodes
- J- Accessory hepatic Ins
- K- Pancreaticoduodenal Ins

B- CRANIAL MESENTRIC LYMPH CENTER

- 1- Cranial mesenteric Ins
- 2- Jejunal lymph nodes
- 3- Caecal lymph nodes
- 4- Colic lymph nodes

C- CAUDAL MESENTRIC LYMPH CENTERS:

Caudal mesenteric Ins




Significant lymphatic organs of the cow. Left lateral view. In = lymph node

Lymph centers of the head

I- LYMPH CENTERS OF THE HEAD


**A- MANDIBULAR
LYMPH CENTER**

- 
- 1- Mandibular lymph node
 - 2- Pterygoid lymph node

**B- PAROTID
LYMPH CENTER:**

- 
- 1- Parotid lymph node

**C-
RETROPHARYN-
GEAL LYMPH
CENTER**

- 
- 1- Lateral retropharyngeal In
 - 2- Medial retropharyngeal In
 - 3- Rostral hyoid In
 - 4- Caudal hyoid In

A- MANDIBULAR LYMPH CENTER:

It consists of many nodes in different regions along the mandible.

1 - Mandibular lymph node:

Position: between sternocephalic m and the mandibular sg.

Shape: oval, 3-4cm in length, 2-3 cm in width, 1-3 in number and sometimes 2 may be present.

Afferent: from the muzzle, lips, cheeks, hard palate, rostral part of the nasal cavity, tip of tongue, parotid sg, sublingual sg, skin, subcutaneous and muscles of the head **except muscles of the eye and ear.**

Efferent: to the lateral retropharyngeal lymph node.

image



2- Pterygoid lymph node:

It sometimes escapes from observation.

Position: located in the dorsal part of the lateral face of the pterygoidus m; it is 1cm in length and width.

Afferent: from hard palate and gum.

Efferent: to the mandibular lymph node.

image



B- PAROTID LYMPH CENTER:

1- The parotid lymph node:

Position: lies on the caudal part of the masseter m, partially or completely covered by the dorsal portion of the parotid sg.

Shape: 6 – 9 cm in length and 2-3 cm in width and it may be represented by 2-3 lymph nodes.

Afferent: from the Skin, subcutaneous muscles of head include eye and ear, muzzle, lips, gum, parotid sg, eyelids, lacrimal apparatus and rostral part of the nasal cavity.

Efferent: to the lateral retropharyngeal lymph node.

image



C- RETROPHARYNGEAL LYMPH CENTER:

1 - Lateral retropharyngeal lymph node:

Position: ventromedial to the wing of atlas and caudoventral to the origin of the digastricus m covered partially or completely by the caudodorsal portion of the mandibular sg.

Size: 3-5 cm in length and 2-3.5 cm in width, one is accompanied by other smaller lymph nodes.

Afferent: from the tongue, oral cavity, lips, hard palate, salivary glands and all lymph nodes of the head.

Efferent: constitute the tracheal lymph trunk.

image



2- Medial retropharyngeal lymph node:

Position: medial to the stylohyoid bone.

Size: 3-6 cm in length, 2.5-4 cm in width.

Afferent: from the tongue, floor of mouth, hard palate, soft palate, tonsils, gums, larynx, pharynx, and caudal portion of the nasal cavity.

Efferent: to the lateral retropharyngeal lymph node.

3- Rostral hyoid lymph node:

Position: lies on the thyrohyoid bone at the insertion of stylohyoid m.

Size: 1-1.5 cm in length.

Afferent: tongue.

Efferent: medial retropharyngeal lymph node.

4- Caudal hyoid lymph node:

Position: at the dorsal end of the stylohyoid bone.

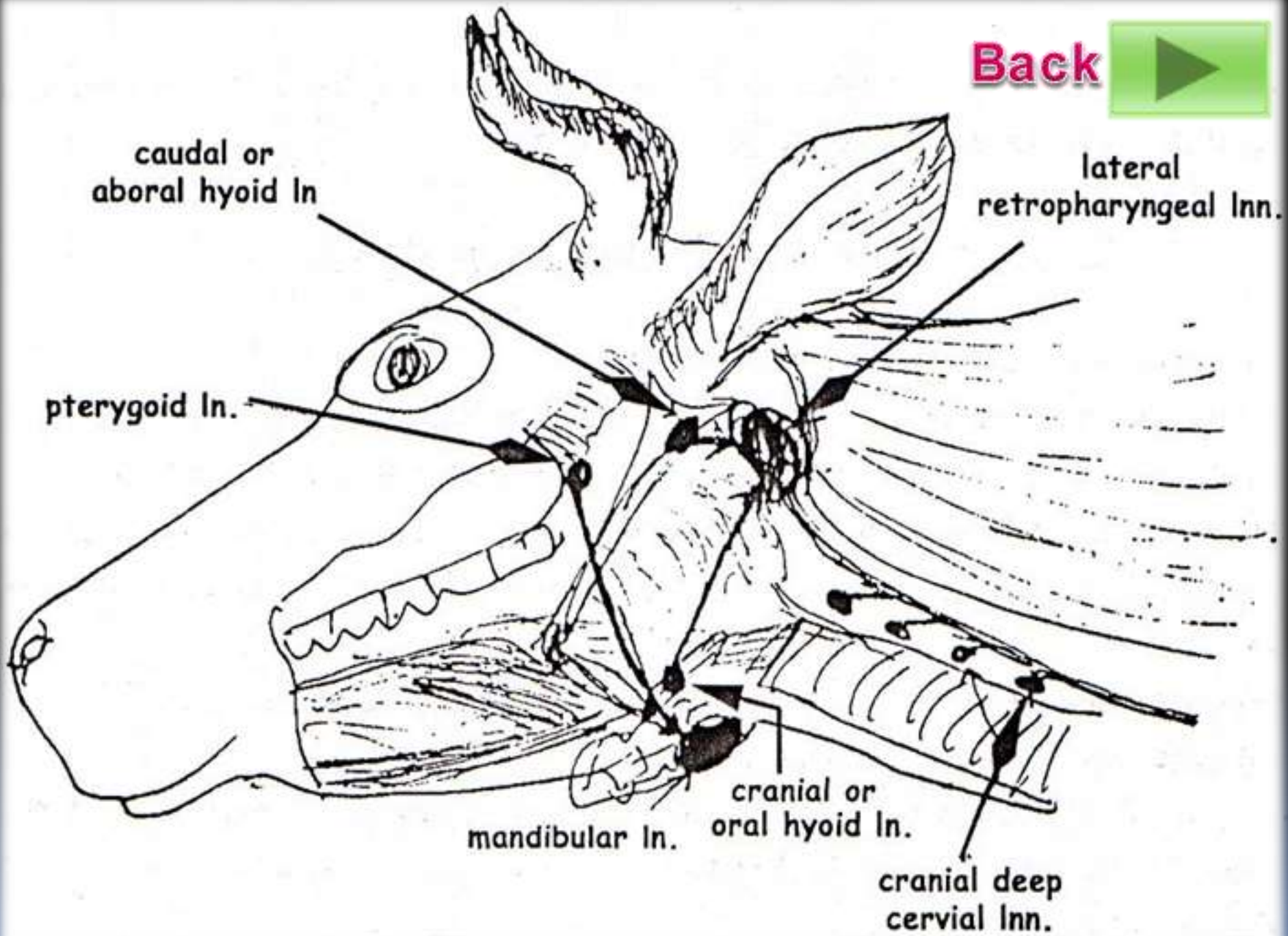
Afferent: mandible.

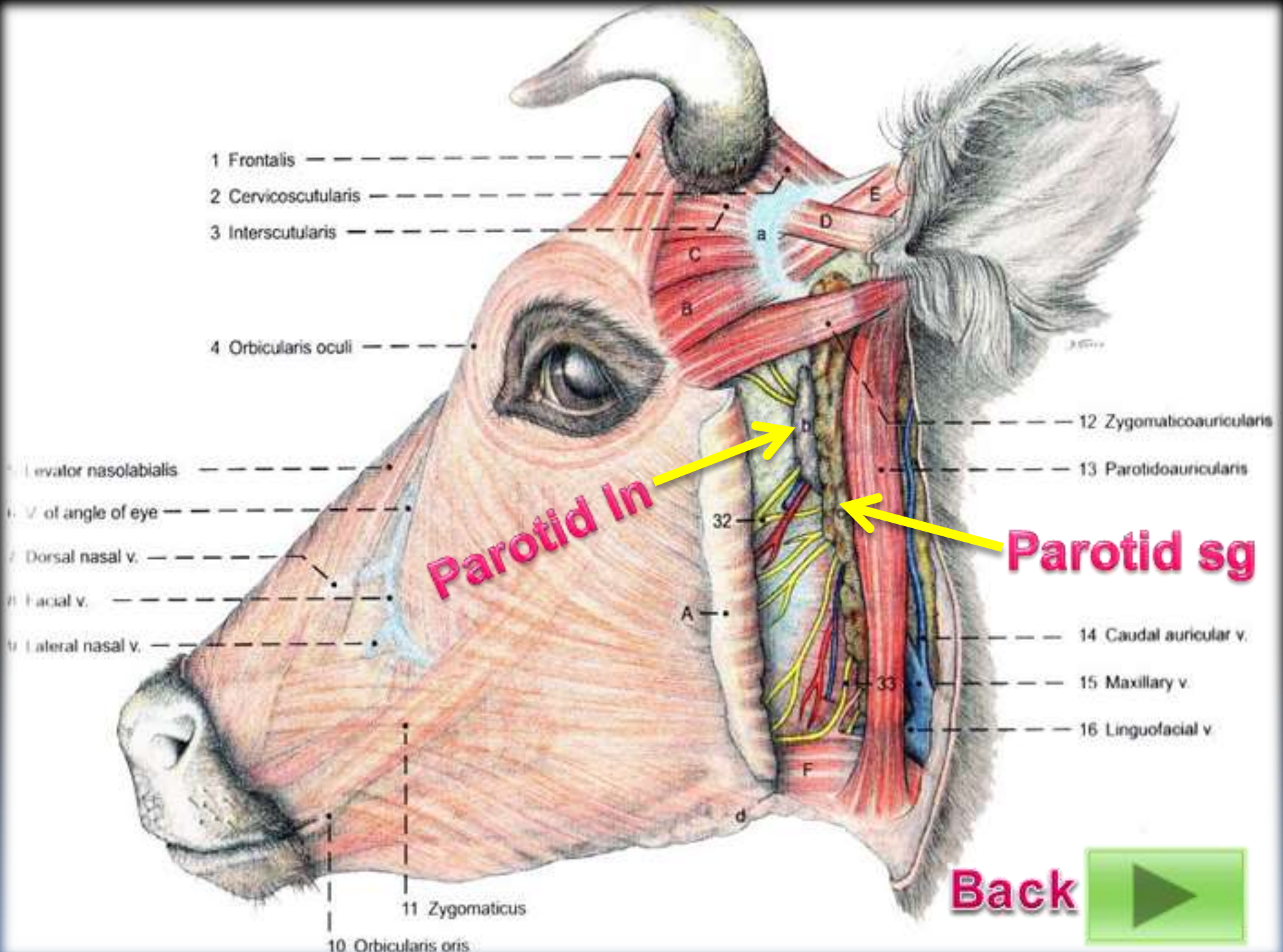
Efferent: lateral retropharyngeal lymph node.

image



Back





- 1 Frontalis
- 2 Cervicoscutularis
- 3 Interscutularis

4 Orbicularis oculi

- 5 Levator nasolabialis
- 6 V of angle of eye
- 7 Dorsal nasal v.
- 8 Facial v.
- 9 Lateral nasal v.

Parotid In

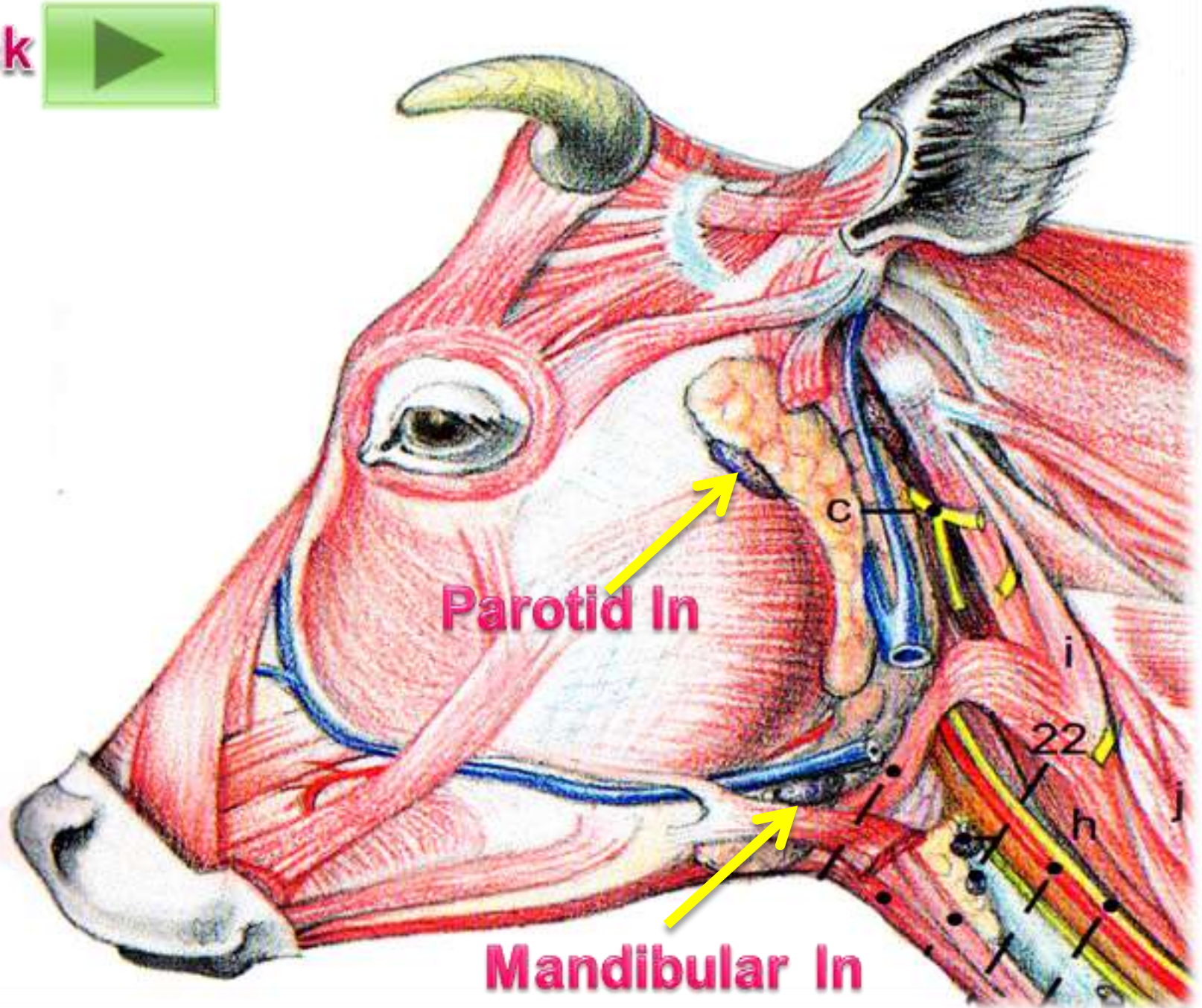
Parotid sg

- 12 Zygomaticoauricularis
- 13 Parotidoauricularis
- 14 Caudal auricular v.
- 15 Maxillary v.
- 16 Linguofacial v.

- 10 Orbicularis oris
- 11 Zygomaticus

Back 

Back




-II-


**LYMPH CENTERS
OF THE NECK**

II- LYMPH CENTERS OF THE NECK

**A- SUPERFICIAL
CERVICAL
LYMPH CENTER:**

- 
- 1- Superficial cervical In
 - 2- Accessory superficial cervical In.

**B- DEEP
CERVICAL
LYMPH CENTER:**

- 
- 1- Cranial deep cervical In.
 - 2- Middle deep cervical In.
 - 3- Caudal deep cervical In.
 - 4- Costocervical In.

II- LYMPH CENTERS OF THE NECK:

A- SUPERFICIAL CERVICAL LYMPH CENTER:

1 - Superficial cervical lymph node:

Position: at the cranial border of the supraspinatus m, its dorsal 2/3 is covered by omotransversus m. and ventral 1/3 is covered by brachiocephalic m.

Size: 1-10 cm in length and 1.5 - 2 in width.

Afferent: from the skin of the neck, shoulder, lateral surface of the thorax cranial to a line drawn from the dorsal extremity of the 10th-12th ribs, skin and subcutaneous of the thoracic limb, ms of the shoulder, tendons of the forearm and digits and joints of the carpal digit

Efferent: right to the right tracheal trunk and left to the thoracic duct or left tracheal trunk.

image



2- Accessory superficial cervical lymph node.

Position: few small several cervical lymph nodes along the border of the supraspinatus m covered by the trapezius m.

Afferent: from the trapezius, serratus ventralis, supraspinatus ms.

Efferent: to the superficial cervical lymph node.

image



B- DEEP CERVICAL LYMPH CENTER:

1- Cranial deep cervical lymph node:

Position: cranial and caudal to the thyroid gland along the course of the carotid artery.

Size: (4-5 in number) from 1 - 2.5 cm

Afferent: thyroid, trachea, larynx, oesophagus, cervical part of the thymus.

Efferent: Joins the tracheal trunks or passes to the middle cervical lymph node.

image



2- Middle deep cervical lymph node:

position: on each side of the middle 1/3 of the trachea, they vary in number and position reach to the cranial deep cervical lymph node and caudal deep cervical lymph node.

Size: 0.3 - 3 cm in length.

Afferent: from the esophagus, trachea, thymus, ventral muscles of the neck and cranial deep cervical lymph node.

Efferent: to the tracheal trunk or caudal deep cervical lymph node.

image



3- Caudal deep cervical lymph nodes:

Position: located near the thoracic inlet, dorsal and ventral to the common jugular vein and cranial to the first rib.

Size: 1 - 5 cm in length.

Afferent: from the trachea, esophagus, thymus, ventral ms of the neck and efferent of the middle deep cervical lymph nodes, axillary proper and costocervical lymph nodes.

Efferent: to the tracheal lymph trunks, thoracic duct or to the common jugular vein.

image



4- Costocervical lymph node:

Position: near the origin of the costocervical trunk, dorsal to the common carotid artery, medial to the first rib.

Size: 1.5 - 3 cm.

Afferent: from ms of the neck and shoulder, costal pleura and trachea and also from the cranial mediastinal and sub rhomboid lymph nodes.

Efferent: to the tracheal lymph trunk or thoracic duct or deep cervical lymph node.

image



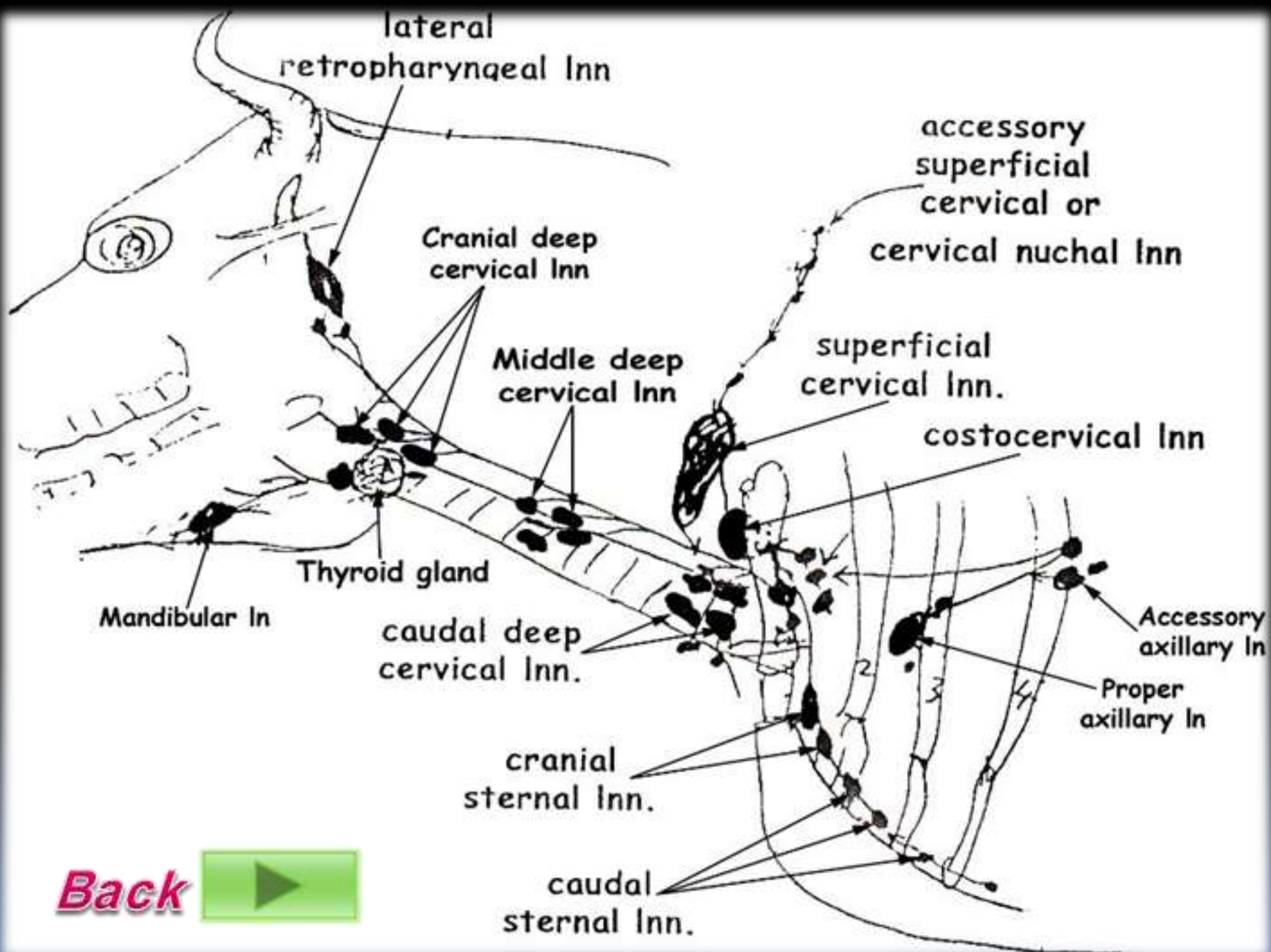
5- Sub rhomboid lymph node:

Position: on the medial face of the cervical portion of the rhomboid muscle.

Size: 0.5-1-5 cm.

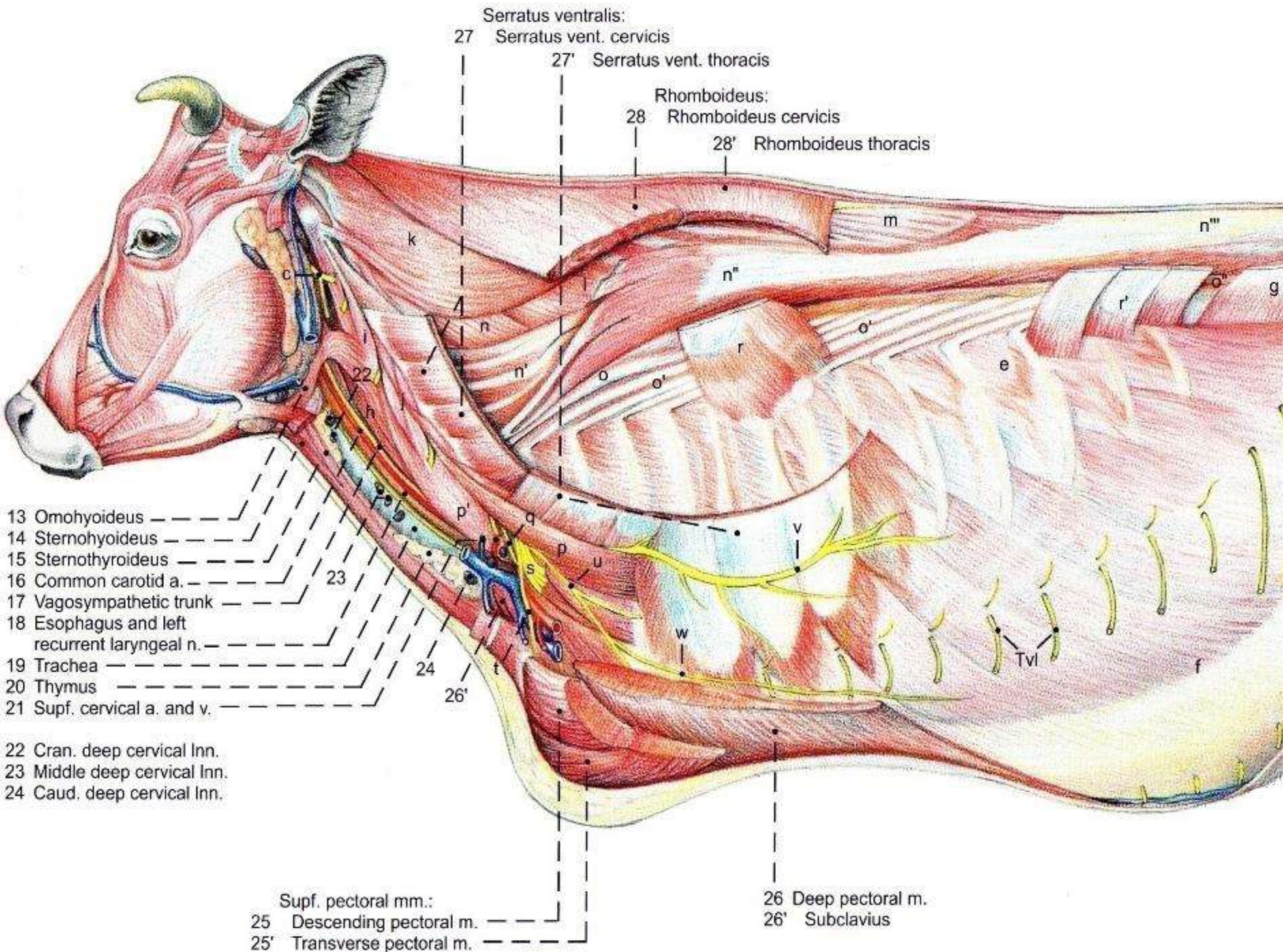
Afferent: from ms of the neck.

Efferent: to the costocervical lymph node.



Back





Serratus ventralis:
 27 Serratus vent. cervicis
 27' Serratus vent. thoracis

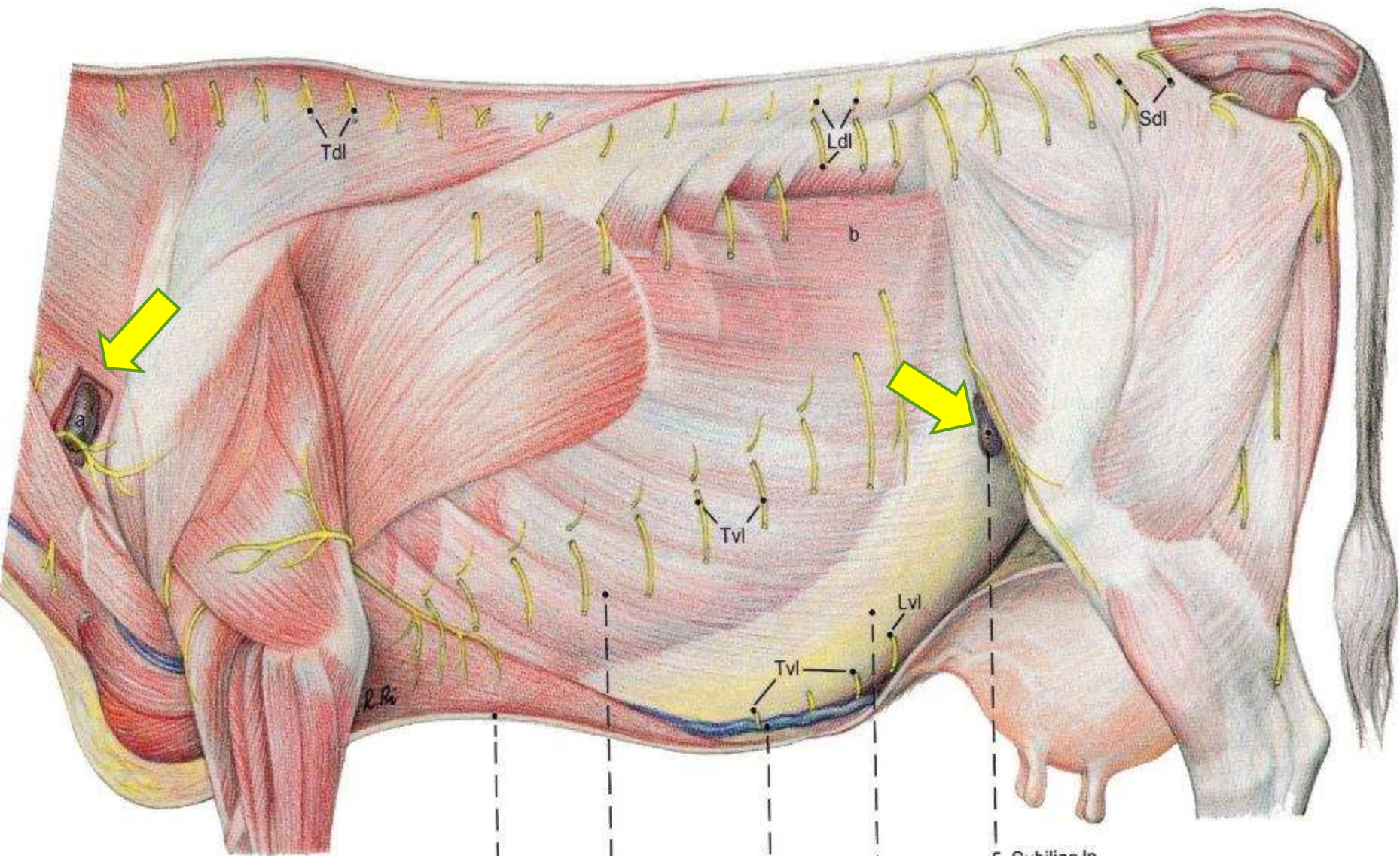
Rhomboideus:
 28 Rhomboideus cervicis
 28' Rhomboideus thoracis

13 Omohyoideus
 14 Sternohyoideus
 15 Sternothyroideus
 16 Common carotid a.
 17 Vagosympathetic trunk
 18 Esophagus and left recurrent laryngeal n.
 19 Trachea
 20 Thymus
 21 Supf. cervical a. and v.

22 Cran. deep cervical Inn.
 23 Middle deep cervical Inn.
 24 Caud. deep cervical Inn.

Supf. pectoral mm.:
 25 Descending pectoral m.
 25' Transverse pectoral m.

26 Deep pectoral m.
 26' Subclavius



Back



1 Skin
2 External oblique abd. m.

3 Cran. supf. epigastric v.
(Milk v.)
4 Yellow abdominal tunic
5 Subiliac In.

-III-

**LYMPH CENTERS
OF THE THORACIC LIMB**

III- LYMPH CENTERS OF THE THORACIC LIMB

```
graph TD; A[III- LYMPH CENTERS OF THE THORACIC LIMB] --> B[A- AXILLARY LYMPH CENTER:]; B --> C[1- Proper axillary In<br/>2- Axillary lymph node of the first rib<br/>3- Accessory axillary In<br/>4- Infraspinatus In];
```

A- AXILLARY LYMPH CENTER:

- 1- Proper axillary In**
- 2- Axillary lymph node of the first rib**
- 3- Accessory axillary In**
- 4- Infraspinatus In**

III- LYMPH CENTERS OF THE THORACIC LIMB:

A- AXILLARY LYMPH CENTER:

1- Proper axillary lymph node:

Position: on medial face of the distal portion of the teres major m.

Shape: oval in outline, 2.5 - 3.5 cm in length.

Afferent: from ms of the shoulder, arm, forearm and pectoralis ms, in addition to the shoulder, elbow and carpal joints and efferent of the infraspinatus lymph node.

Efferent: to the caudal deep cervical lymph node or axillary lymph node of the first rib.

image



2- Axillary lymph node of the first rib:

Position: medial to the deep pectoral m on the lateral face of the first rib or first intercostal space.

Afferent: from the serratus ventralis, pectoralis transversus ms, ms of the shoulder and arm; scapula, humerus, radius and ulna bones; elbow and carpal joints.

Efferent: to the caudal deep cervical lymph node or to the thoracic duct or tracheal lymph trunk.

image



3- Accessory axillary lymph node:

Position: on the dorsal border of the pectoralis profundus m in the level of the 3rd or 4th rib.

Afferent: from the ms of the thoracic wall.

Efferent: to the proper axillary lymph node.

image



4- Infraspinatus lymph node:

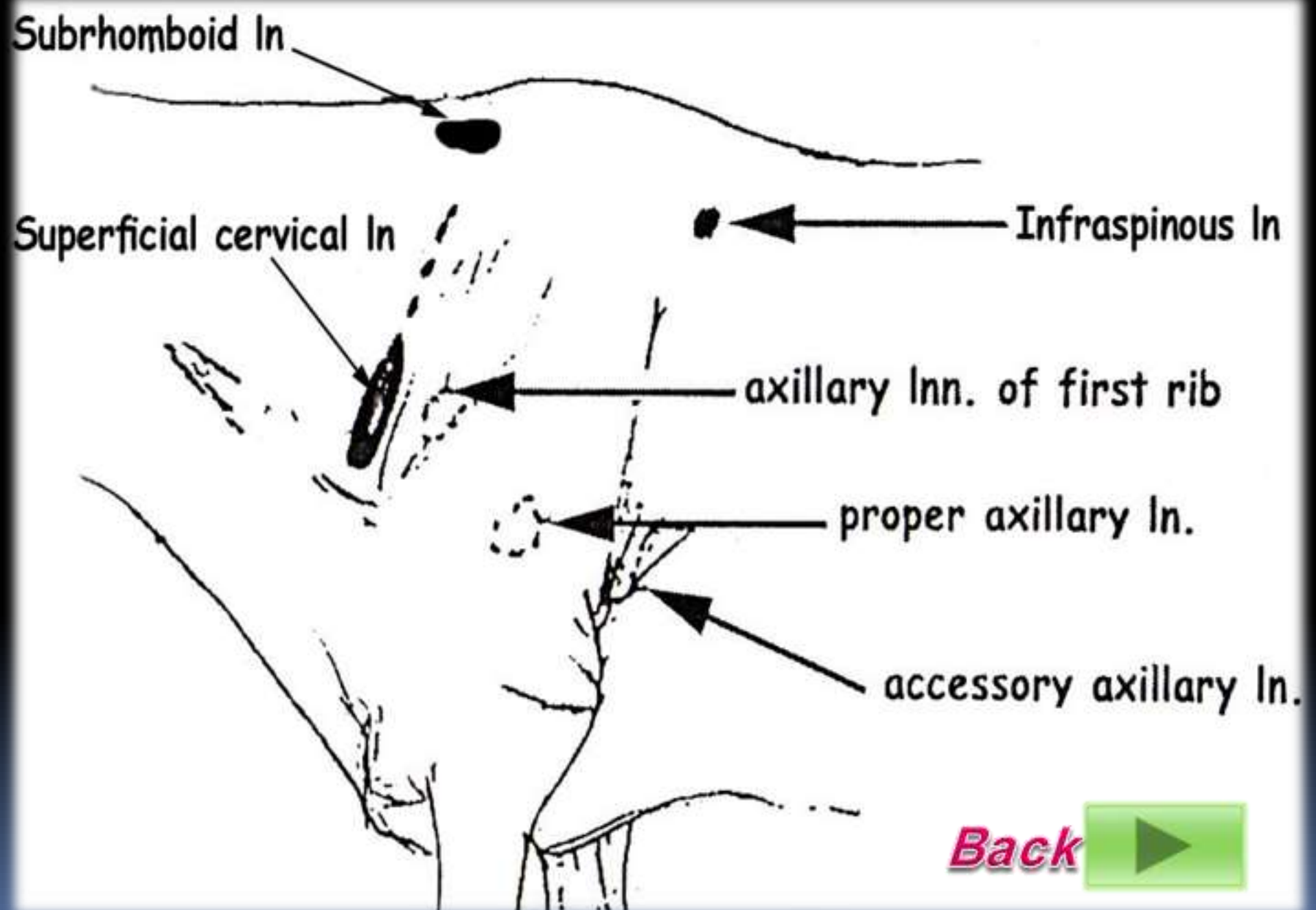
Position: at the caudal border of the infraspinatus m.

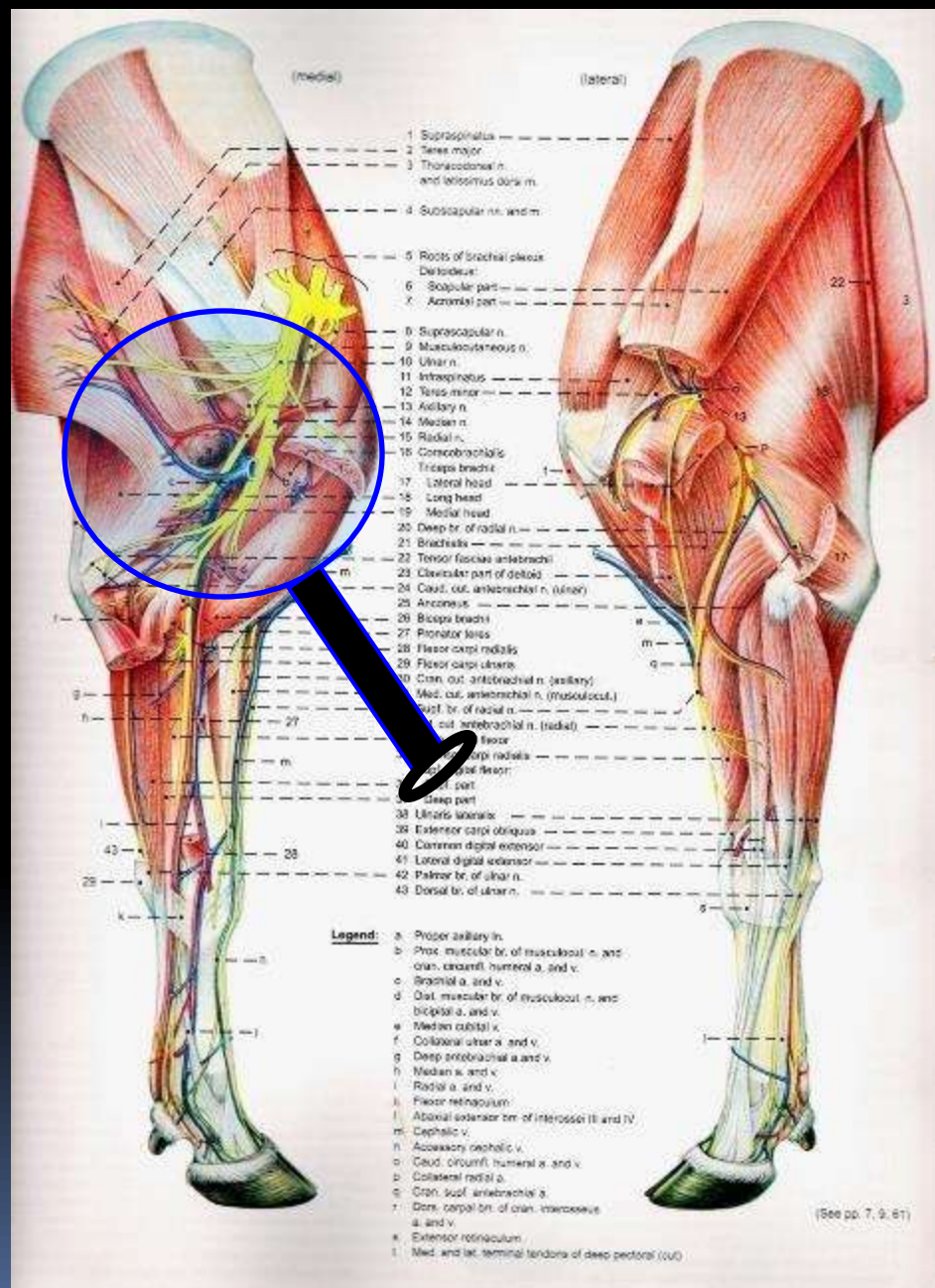
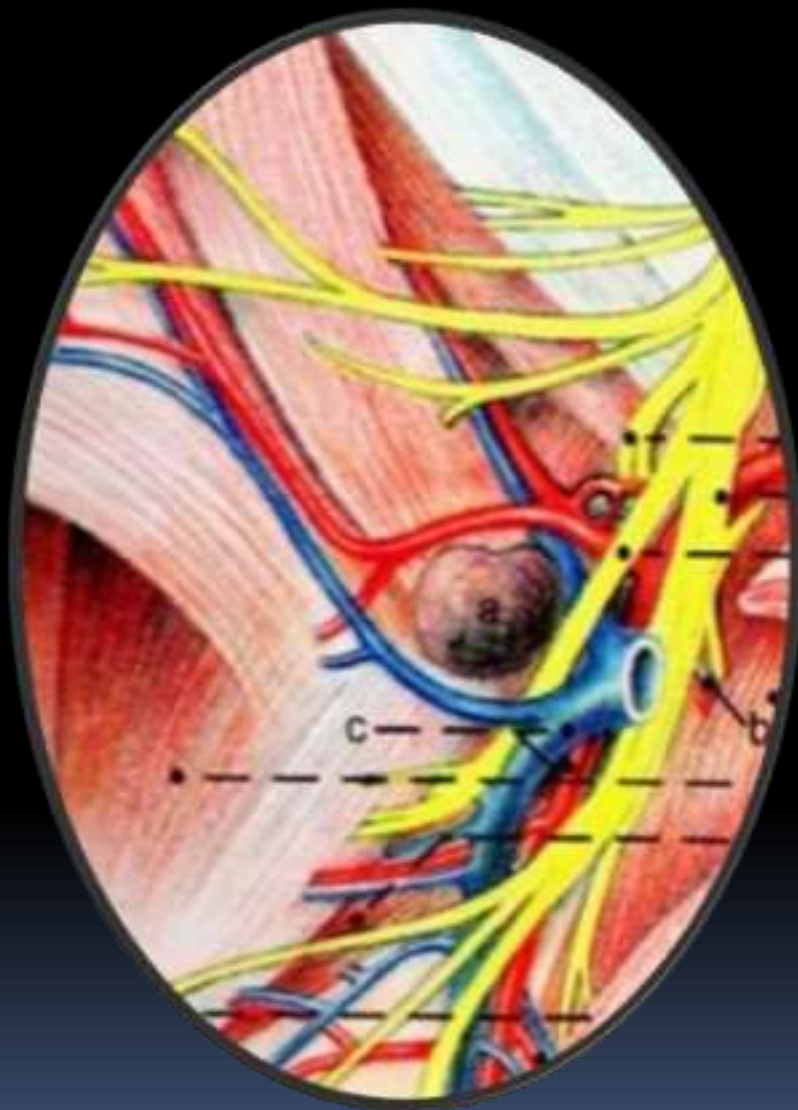
Afferent: from the latissimus dorsi m.

Efferent: to the proper axillary lymph node.

image







Back



-IV-

**LYMPH CENTERS
OF THE
THORACIC CAVITY**

IV- Lymph centers of the thoracic cavity

A- DORSAL THORACIC LYMPH CENTERS

- 1- Thoracic aortic lymph nodes
- 2- Intercostal lymph nodes

B- VENTRAL THORACIC LYMPH CENTER:

- 1- Cranial sternal lymph node:
- 2- Caudal sternal lymph node:
- 3- Xiphoid lymph nodes:
- 4- Phrenic lymph node:

C- MEDIASTINAL LYMPH CENTER:

- 1- Cranial mediastinal In
- 2- Middle mediastinal In
- 3- Caudal mediastinal In

IV- BRONCHIAL LYMPH CENTER:

- 1- Left tracheobronchial In
- 2- Right tracheobronchial In
- 3- Middle tracheobronchial In
- 4- Cranial tracheobronchial In
- 5- Pulmonary Ins

IV- LYMPH CENTERS OF THE THORACIC CAVITY:

A- DORSAL THORACIC LYMPH CENTER:

1 - Thoracic aortic lymph nodes:

Position: along the dorsolateral border of the aorta, ventral to the sympathetic nerve trunk.

Afferent: from the ms of the thoracic wall, diaphragm, pleura, pericardium and intercostals lymph nodes.

Efferent: to the thoracic duct or the caudal mediastinal lymph node.

image



2- Intercostal lymph nodes:

Position: in the intercostal spaces dorsal to the sympathetic nerve trunk along the course of intercostal vessels.

Afferent: from intercostal, spinal, latissimus dorsi, external abdominal oblique ms, costal pleura and ribs.

Efferent: to the thoracic aortic lymph nodes or the thoracic duct.

image



B- VENTRAL THORACIC LYMPH CENTER:

1- Cranial sternal lymph node:

Position: along the course of internal thoracic vessels.

Afferent: from the muscles of ventral and lateral thoracic wall, abdominal muscles, pericardium, costal pleura and diaphragm.

Efferent: to the thoracic duct or cranial mediastinal lymph node.

image



2- Caudal sternal lymph node:

Position: it is covered by the transverse thoracic muscle and some lymph nodes present on the transverse thoracic muscle along the course of the internal thoracic vein.

Afferent: from the diaphragm, intercostal ms, sternum, pericardium, pectoralis profundus m, serratus ventralis m, rectus thoracis m and abdominal ms.

Efferent: to the cranial sternal lymph nodes.

image



3- Xiphoid lymph nodes:

Position: caudal to the last rib in the region of the xiphoid cartilage.

Afferent: from the diaphragm, costal pleura and pericardium.

Efferent: to the caudal sternal lymph nodes.

image



4- Phrenic lymph node:

Position: at the caval foramen and between the caudal vena cava and diaphragm.

Afferent: from the diaphragm.

Efferent: to the caudal mediastinal lymph nodes.

image



C- MEDIASTINAL LYMPH CENTER:

1 - Cranial mediastinal lymph node:

Position: in the mediastinum associated to the large blood vessels, oesophagus and trachea.

Afferent: from the esophagus, trachea, lung, pericardium, heart, costal, sternal lymph nodes.

Efferent: to the thoracic duct.

image



2- Middle mediastinal lymph node:

Position: dorsal or right to the aortic arch.

Shape: numerous, 0.5 - 5 cm.

Afferent: from the esophagus, trachea, lung, intercostal lymph node and right tracheobronchial ln.

Efferent: to the thoracic duct or cranial mediastinal ln.

image



3- Caudal mediastinal lymph node:

Position: caudal to the aortic arch, ventral to the aorta

Size: 1-4 cm in length, one lymph node reaches to 5 cm in length.

Afferent: from the oesophagus, lungs, pericardium, diaphragm, efferent of the phrenic, left tracheo-bronchial and pulmonary lymph nodes.

Efferent: to the thoracic duct.

image



Thoracic aortic Inn

Back



Intercostal Inn

Costocervical In

Cranial
mediastinal In

Cranial
sternal Inn

Ribs

Sternum

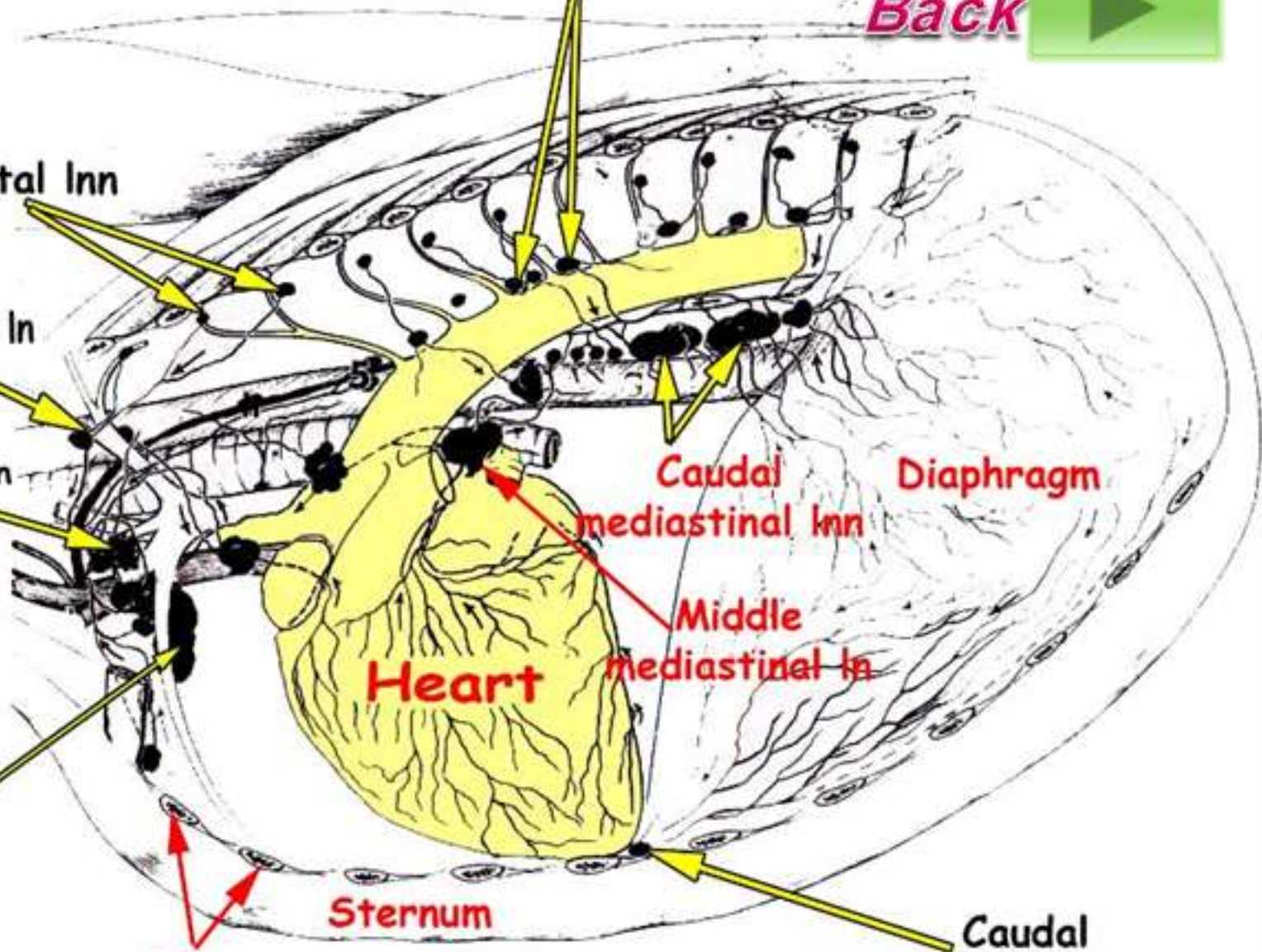
Heart

Caudal
mediastinal Inn

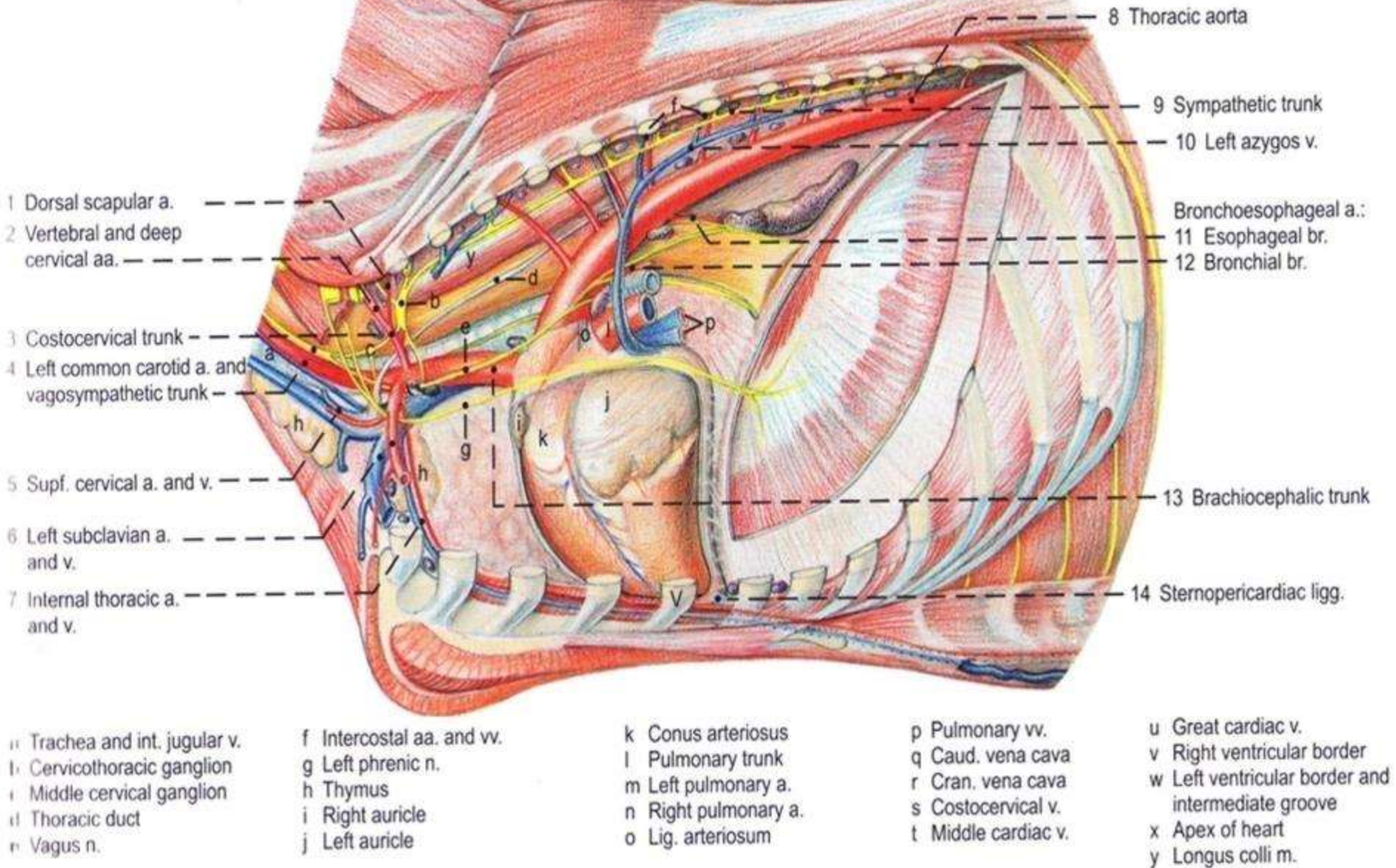
Middle
mediastinal In

Diaphragm

Caudal
sternal In



Back



IV- BRONCHIAL LYMPH CENTER:

1- Left tracheobronchial lymph node:

Position: present between the aortic arch and left division of the pulmonary artery,

Size: 2.5 - 3.5 cm in length and 2.5 cm in width.

Afferent: from the lungs, esophagus and the heart.

Efferent: to the caudal mediastinal lymph node or thoracic duct.

image



2- Right tracheobronchial lymph node:

Position: on the right side of the tracheal bifurcation.

Afferent: from the lungs, middle tracheobronchial and pulmonary lymph nodes.

Efferent: to middle mediastinal lymph node.

image



3- Middle tracheobronchial lymph node:

Position: on the bifurcation of the trachea.

Afferent: from the lungs.

Efferent: to the right tracheobronchial ln or middle mediastinal ln.

image



4- Cranial tracheobronchial lymph node:

Position: at origin of the bronchus of the apical lobe (tracheal bronchus).

Afferent: from the lungs and pulmonary lymph nodes.

Efferent: to the cranial mediastinal lymph nodes.

image



5- Pulmonary lymph nodes:

Position: inconstant in number and of variable in size, present on the chief bronchi of the lungs.

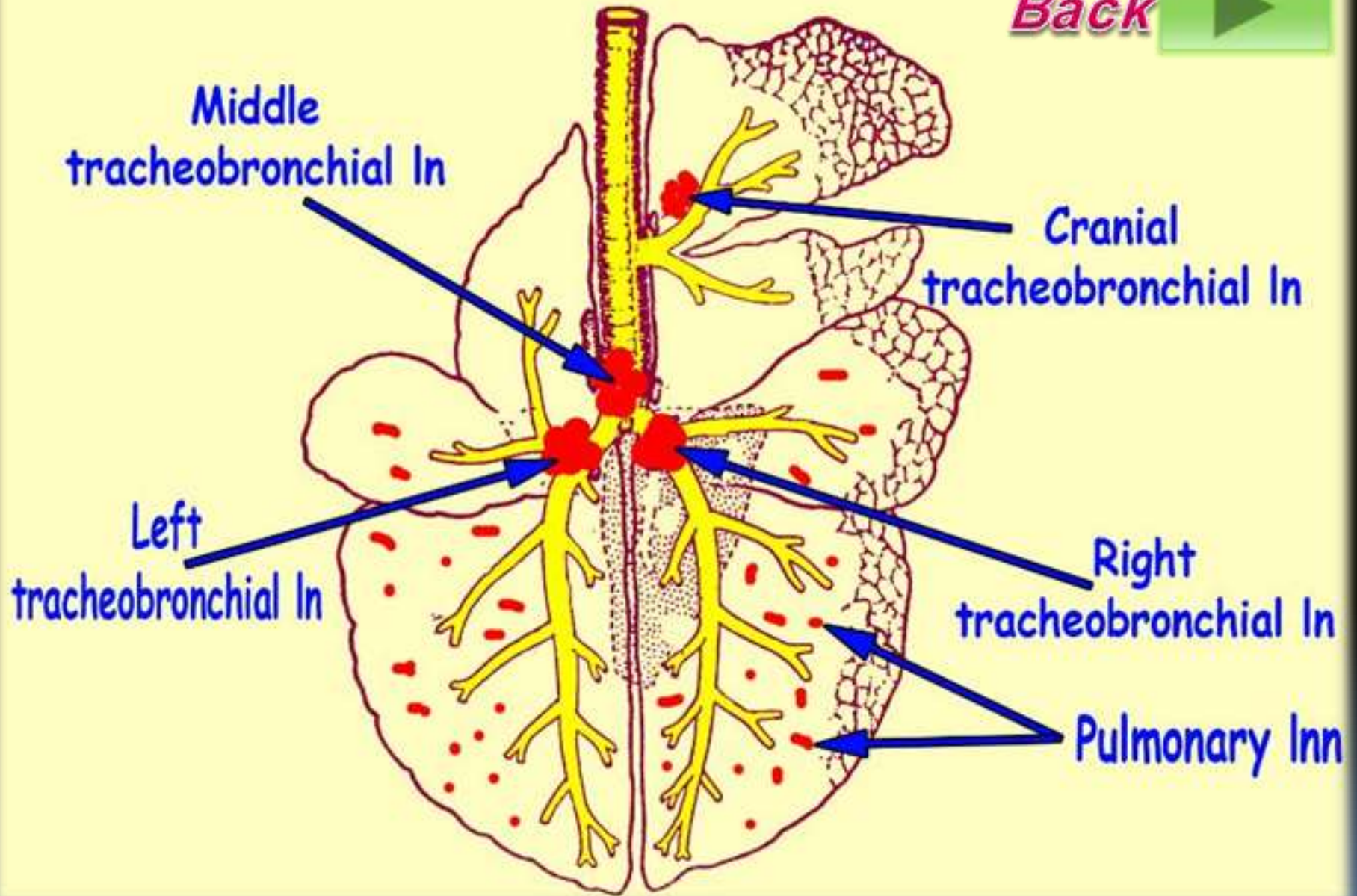
Afferent: from the lungs.

Efferent: to the right tracheobronchial and caudal mediastinal lns.

image

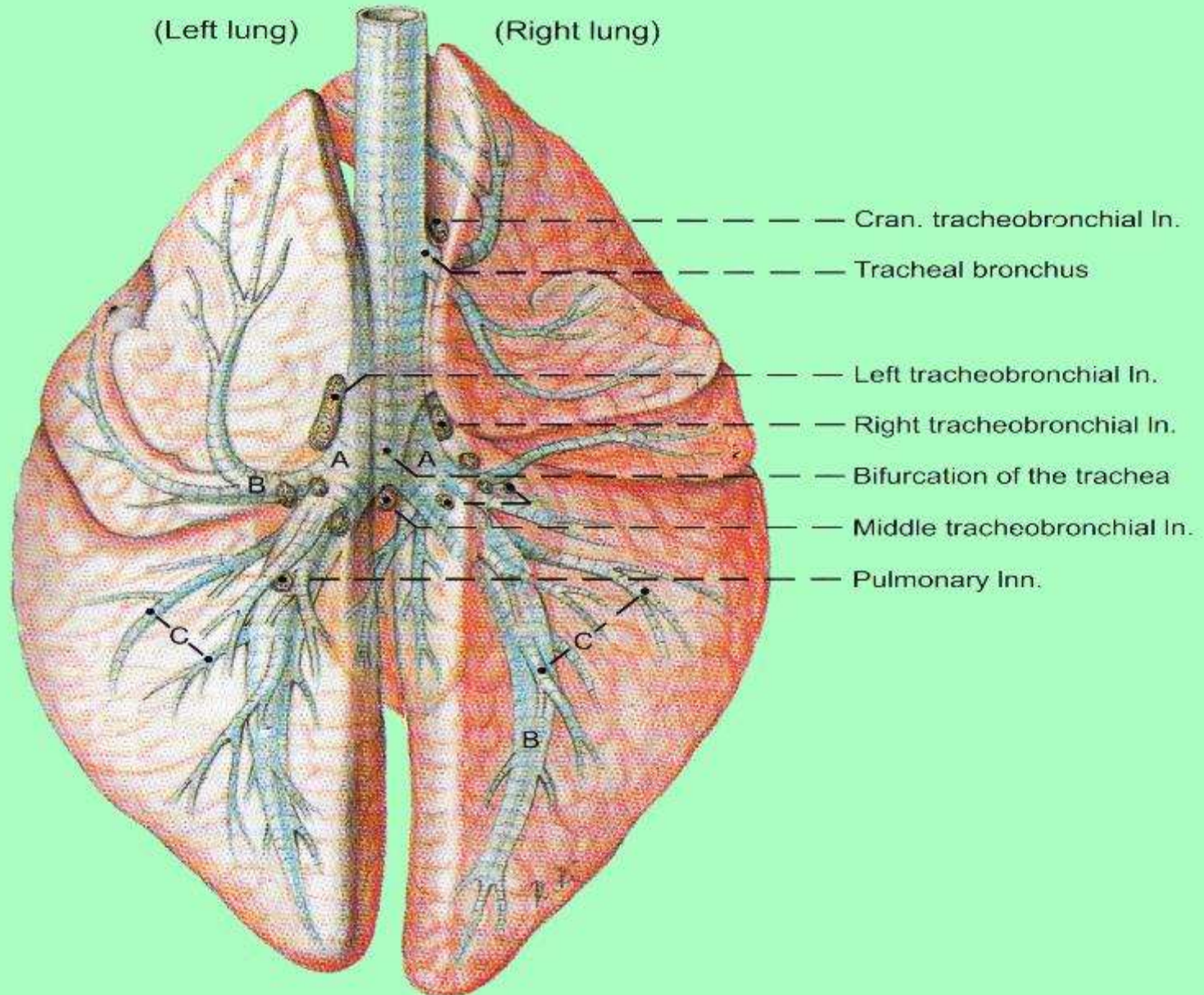


Back



Lungs and Bronchial Inn.

Back



-V-

**LYMPH CENTERS
OF THE ABDOMINAL AND
PELVIC WALLS**

V- LYMPH CENTERS OF THE ABDOMINAL AND PELVIC WALLS

A- LUMBAR LYMPH CENTER:

- 1- Lumbar aortic lymph node
- 2- Proper lumbar lymph nodes
- 3- Renal lymph nodes

B- ILIOSACRAL LYMPH CENTER:

- 1- Medial iliac lymph nodes
- 2- Lateral iliac lymph node
- 3- Internal iliac lymph nodes
- 4- Sacral lymph nodes
- 5- Anorectal lymph node

C- INGUINO-FEMORAL LYMPH CENTER:

- 1- Superficial inguinal In
 - A- Mammary In (in female)
 - B- Scrotal In (in male)
- 2- Sub iliac In (pre femoral)
- 3- Coxal In
- 4- Accessory coxal In
- 5- Lns of the Para lumbar fossa

D- ISCHIATIC LYMPH CENTER:

- 1- Ischiatic lymph node
- 2- Gluteal lymph node
- 3- Tuberal lymph node

V- LYMPH CENTERS OF THE ABDOMINAL AND PELVIC WALLS:

A- LUMBAR LYMPH CENTER:

1 - Lumbar aortic lymph node:

Position: along the abdominal aorta and caudal vena cava from the last thoracic to the last lumbar vertebrae,

Size: 25 in number from 0.25 and 5 cm in length.

Afferent: from the sublumbar ms, fascia, peritoneum, proper lumbar lns, renal lns and kidneys.

Efferent: to the lumbar lymph trunk.

image



2- Proper lumbar lymph nodes:

Position: near the inter vertebral foramina between the lumbar transverse processes and abdominal ms.

Afferent: from the lumbar and abdominal ms.

Efferent: to the lumbar aortic lymph nodes.

image



3- Renal lymph nodes:

Position: on the course of the renal vessels.

Afferent: from the kidneys and adrenal glands.

Efferent: to the lumbar aortic lymph nodes or lumbar trunk or cisterna chyli.

image



B- ILIOSACRAL LYMPH CENTER:

1 - Medial iliac lymph nodes:

Position: cranial and caudal to the origin of deep circumflex iliac vessels. **the cranial group**, lateral and medial to the external iliac vessels integrated with lumbar aortic lymph nodes, while **the caudal group** mainly large located between the external and internal iliac vessels integrated with sacral lymph node.

Afferent: from

- ms of the lumbar and pelvic regions,
- caudal half of the abdominal wall, pelvic limb and bones of the pelvic limb except the digit, hip, stifle and tarsal joints and urogenital organs,
- lateral iliac, sacral, internal iliac lns, mesenteric, superficial, inguinal, ischiatic and popliteal lymph centers.

Efferent: form the lumbar lymph trunks.

image



2- Lateral iliac lymph node:

Position: at the bifurcation of deep circumflex iliac vessels one or two are present.

Afferent: from the abdominal ms, deep gluteal m, tensor fascia lata m and pelvic bones also from coxal, accessory coxal and sub iliac lns.

Efferent: to the medial iliac lymph nodes.

image



3- Internal iliac lymph nodes.

Position: in the medial face of the sacrotubral ligament with the branches of the internal iliac vessels.

Afferent: from ms of the tail, vagina of female, and in male from the prostate gland, urethra and its ms and crura of penis.

Efferent: to the medial iliac lymph nodes.

image



4- Sacral lymph nodes:

Position: in the angle of divergence of internal iliac artery.

Afferent: from the ms of the tail and pelvic region, prostate and seminal vesicle in male and in female from uterus, vagina and vulva.

Efferent: to the medial iliac lymph node.

image

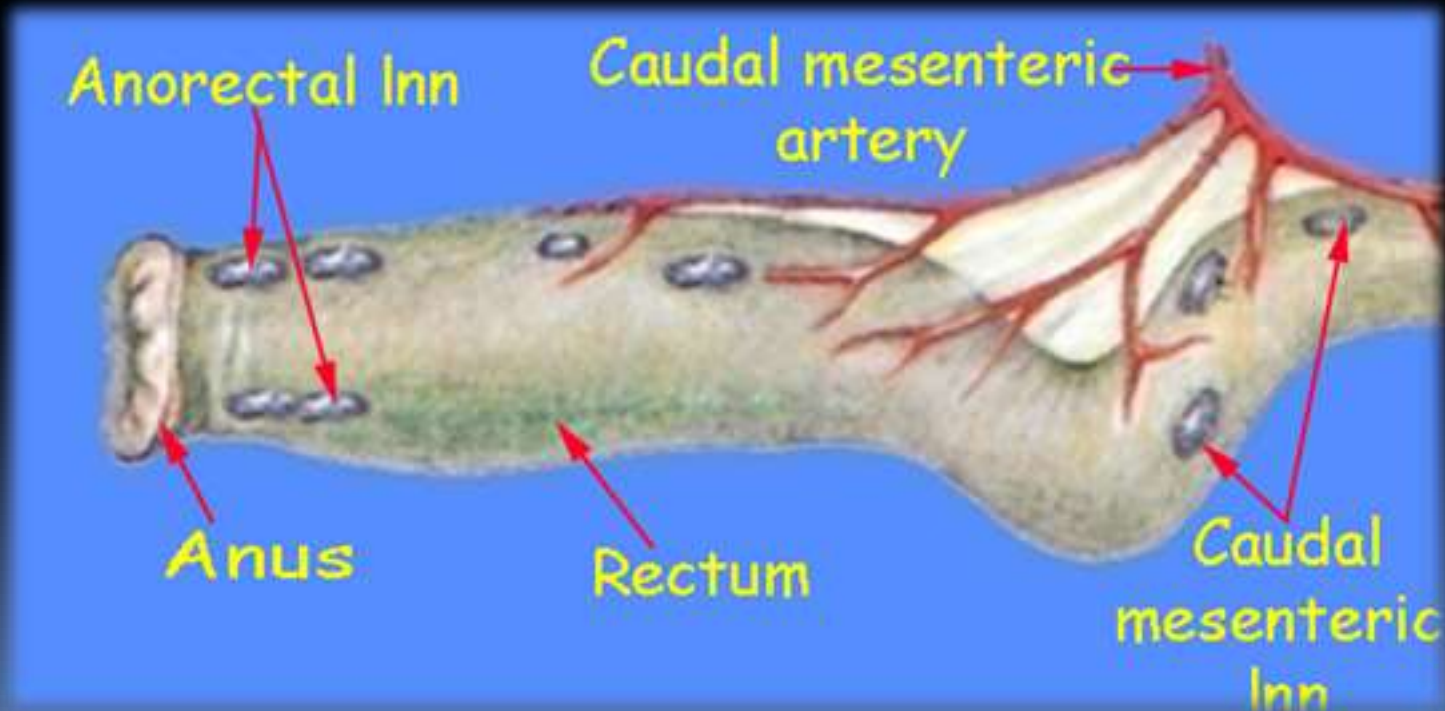


5- Anorectal lymph node:

Position: on the dorsal and lateral aspects of retroperitoneal part of the rectum.

Afferent: from the rectum, anus and terminal part of the colon.

Efferent: to others to form one or two lymph vessels terminate in the medial iliac lymph node.



Abdominal cavity and Urinary organs as seen at autopsy, in dorsal recumbency with stomach and intestines removed



(ventral)

1 Right kidney

2 Renal a. and v.

3 Ureter

4 Medial iliac Inn.

5 Sacral Inn.

6 Iliofemoral Inn.

7 Adrenal gl.

8 Lumbar aortic Inn.

9 Renal Inn.

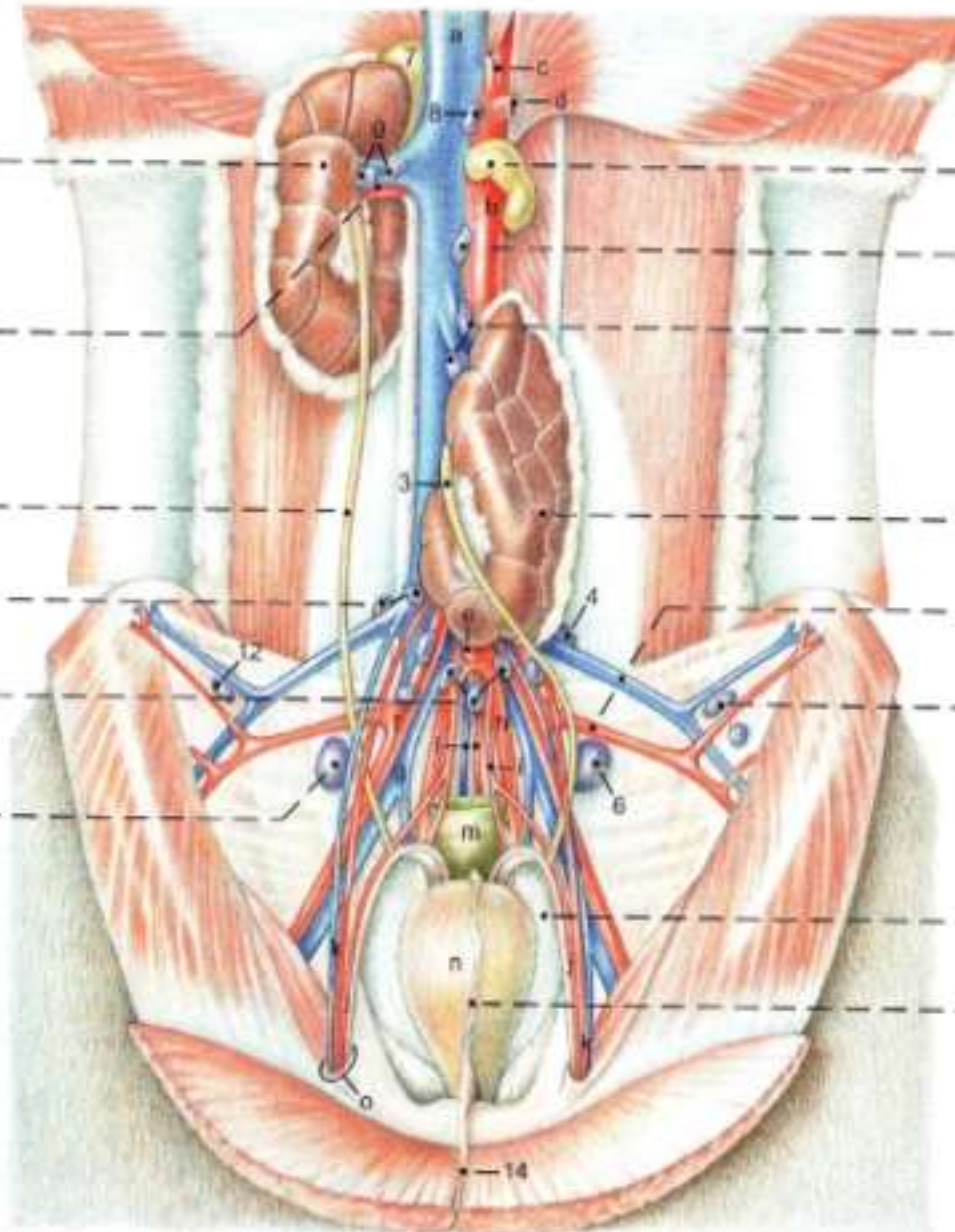
10 Left kidney (on the left in dorsal recumbency only)

11 Deep circumflex iliac a. and v.

12 Lateral iliac Inn.

13 Lat. lig. of bladder

14 Median lig. of bladder



Back



C- INGUINO-FEMORAL LYMPH CENTER:

(Superficial inguinal)

1- Superficial inguinal In:

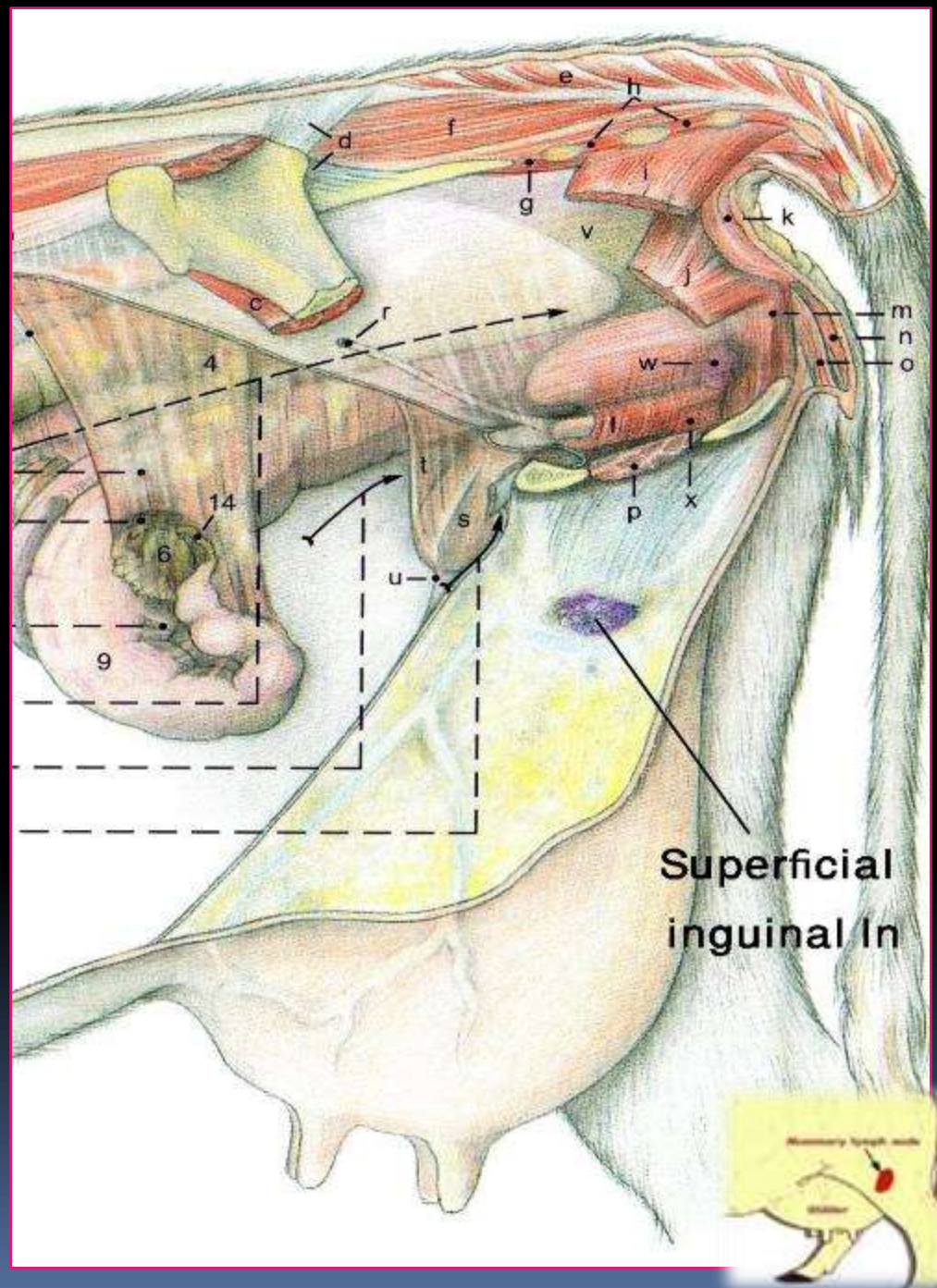
A- Mammary lymph node (in female):

Position: above the caudal border of the base of the udder.

Size: 6-10 cm in length.

Afferent: from the udder, medial and caudal aspect of the thigh and medial aspect of the leg, vulva, and vaginal vestibule clitoris.

Efferent: to the medial iliac lymph node.



B- Scrotal lymph node (in male):

Position: below the pre-pubic tendon in a mass of fat covered by a part of retractor m of the prepuce.

Size: varies from one to several on each side of the penis, about 3-6 cm in length.

Afferent: from the scrotum, penis, prepuce, skin on the caudal medial aspect of the thigh and medial aspect of the leg.

Efferent: to the medial iliac lymph node.

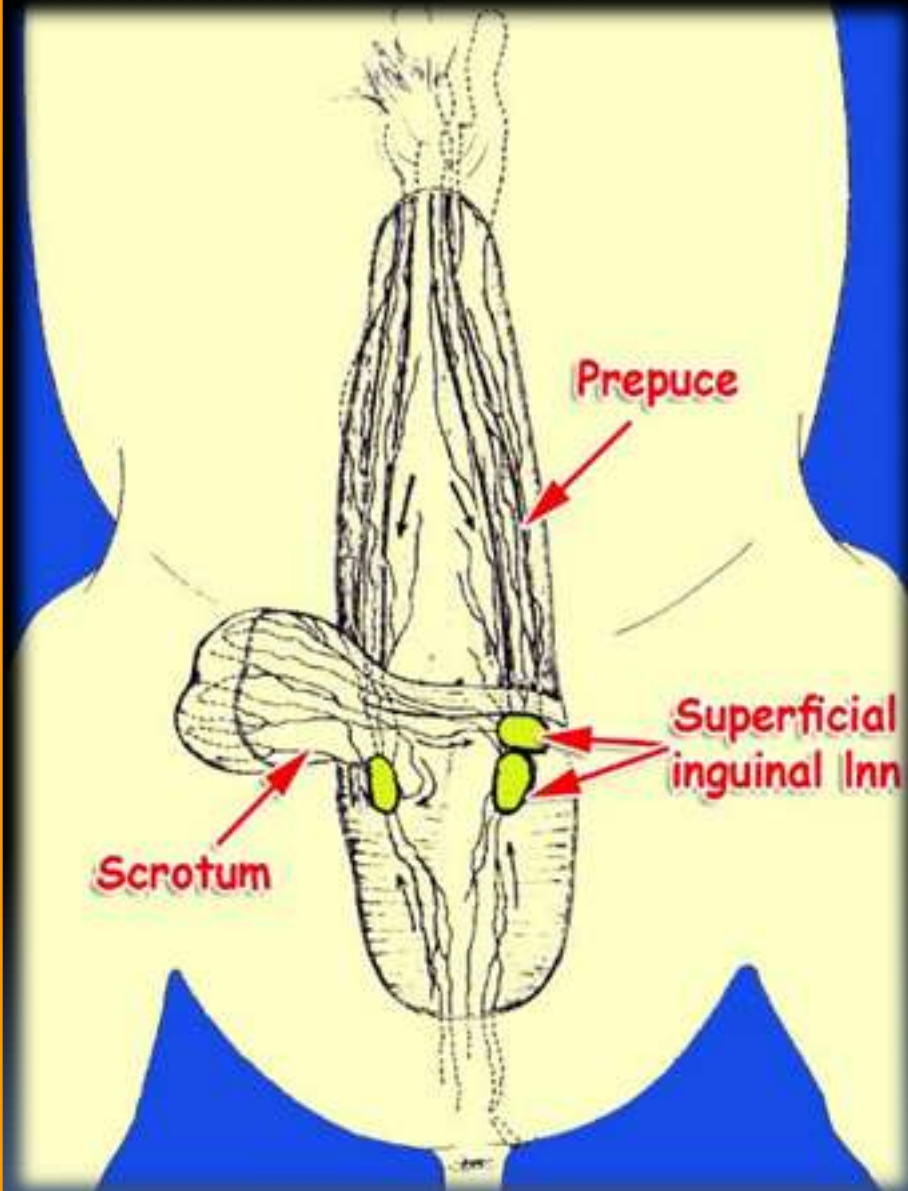
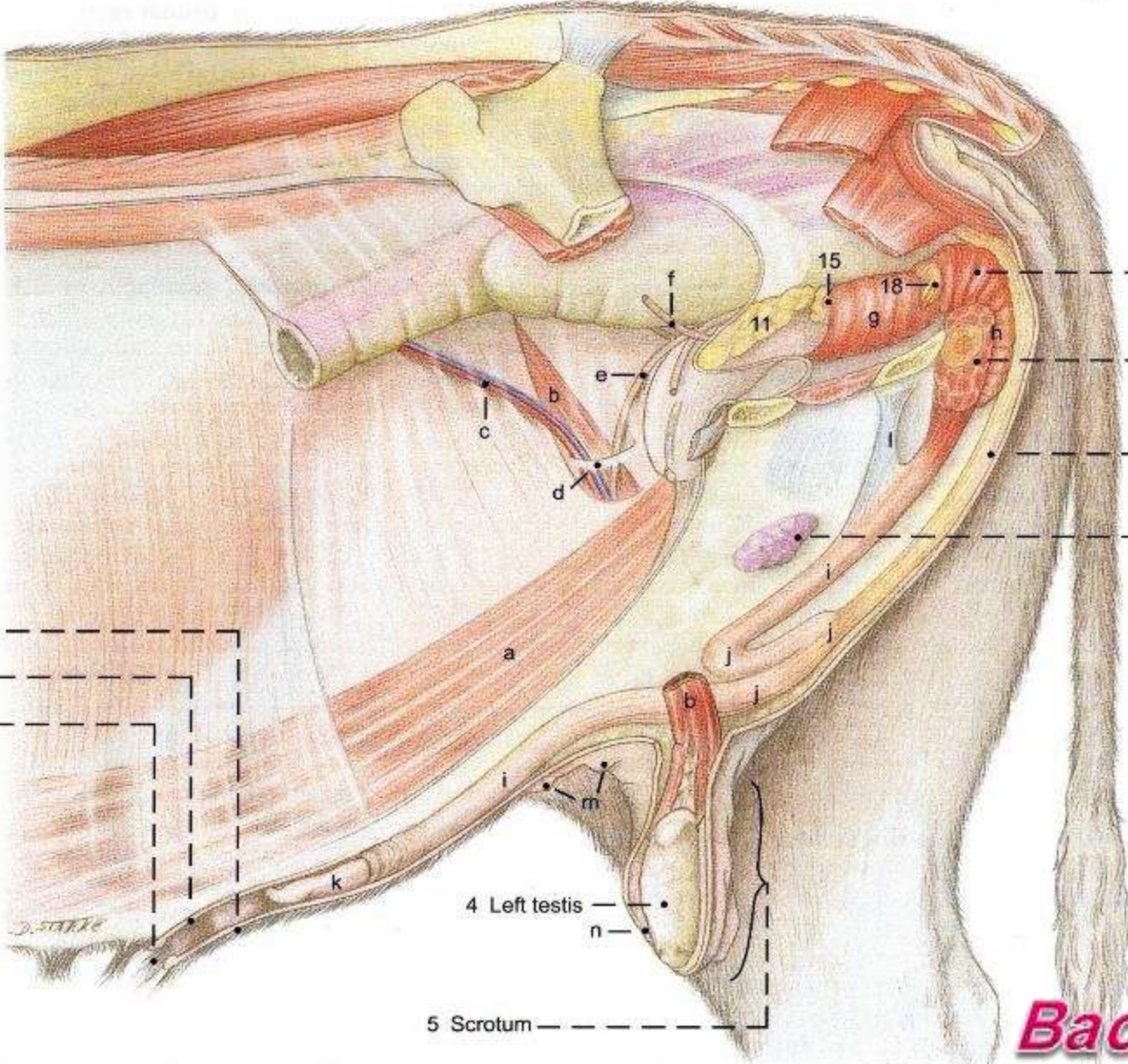


Image 2



Male genital organs

(Left side)



- 6 Bulbospongiosus and Bulb of penis
- 7 Ischiocavernosus and Crus penis
- 8 Retractor penis
- 9 Supf. inguinal Inn.

Prepuce:

- 1 Ext. lamina
- 2 Int. lamina
- 3 Preputial orifice

- 4 Left testis
- 5 Scrotum

2- Sub iliac lymph node (pre femoral):

Position: in the aponuretic part of the external abdominal oblique m in contact with the tensor fascia lata m

Size: elongated 8-10 cm in length and 2.5 cm in width.

Afferent: from the abdominal ms and caudal part of the thorax caudal to the 10-12 ribs, pelvic wall, thigh and leg, tensor fascia lata m, efferent of coxal and accessory coxal and lymph node of para lumbar fossa.

Efferent: to the medial iliac or coxal lymph nodes.

image



3- Coxal lymph node:

Position: under the tuber coxae, cranial to the proximal part of the quadriceps femoris m on the medial face of the tensor fascia lata m.

Afferent: from the quadriceps femoris, tensor fascia lata ms and sub iliac lymph node.

Efferent: to the media iliac lymph nodes.

image



4- Accessory coxal lymph node:

Position: under the tuber coxae, on the lateral face of the tensor fascia lata m.

Afferent: from skin of the hip area.

Efferent: to the medial iliac lymph node.

image



5- Lymph nodes of the Para lumbar fossa:

Position: under the skin of the dorsal part of the flank region, near the transverse processes of the lumbar vertebrae.

Afferent: skin of the adjacent area.

Efferent: to the medial iliac or sub iliac lymph node.

image



D- ISCHIATIC LYMPH CENTER:

1- Ischiatic lymph node:

Position: on the lateral face of the sacroiliac ligament, near the greater ischiatic foramen.

Afferent: from the ms of the pelvic region, hip joint, gluteal and popliteal lymph nodes.

Efferent: to the medial iliac lymph node.

image



2- Gluteal lymph node:

Position: dorsal to the lesser ischiatic foremen and the caudal gluteal vessels

Afferent: from the skin and ms of the pelvic and thigh, hip joints, anus, rectum, vulva, prostate, crura of the penis and tuberal lymph node.

Efferent: to the ischiatic or medial iliac lymph node.

image



3- Tuberal lymph node:

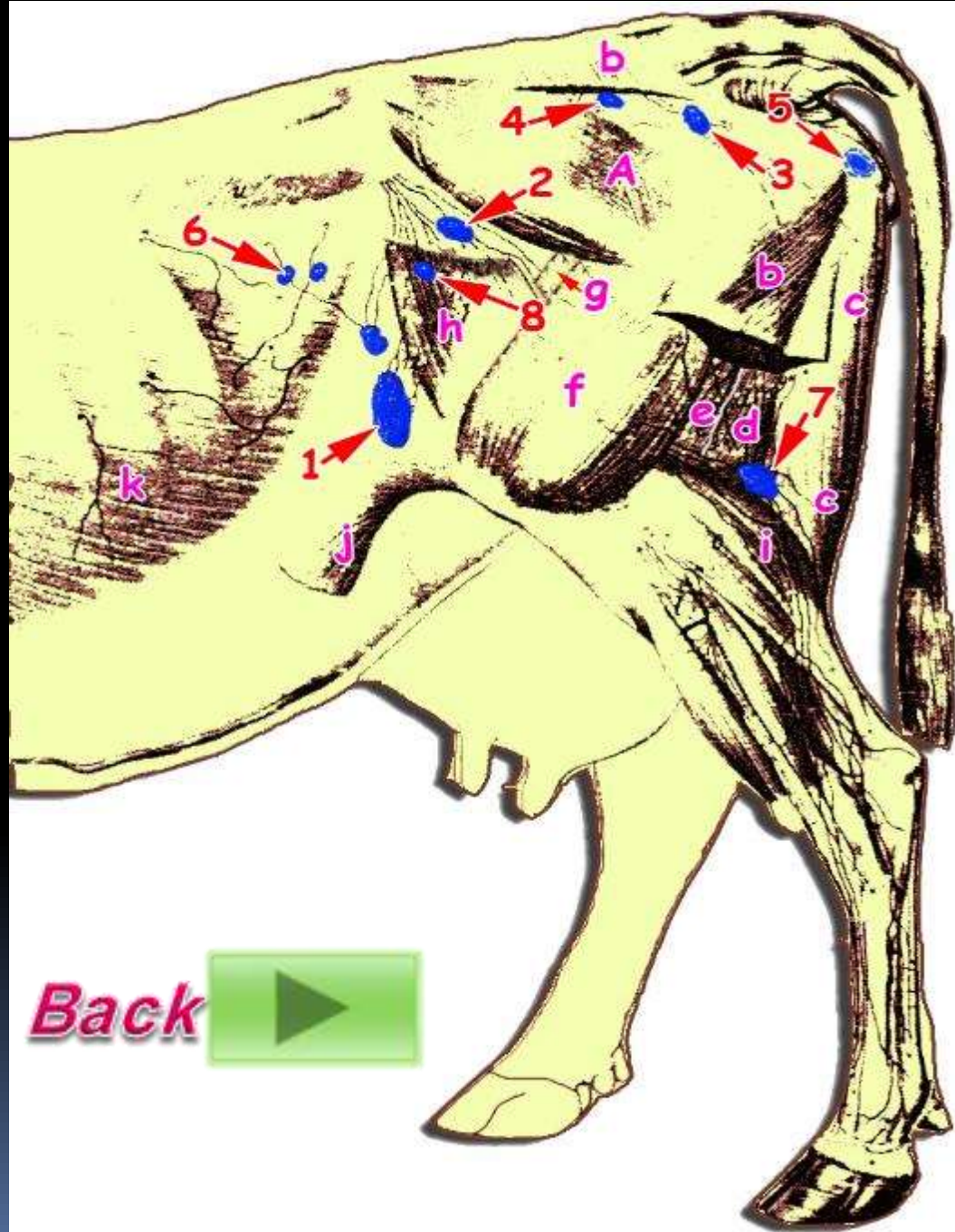
Position: on the medial side of the ischiatic tuber near the attachment of the sacrotubral ligament.

Afferent: from the skin of the pelvic and tail regions and biceps femoris m.

Efferent: to the gluteal or sacral lymph node.

image





Muscles

- A- Gluteus medius m
- b- Biceps femoris m
- c- Semitendinosus m
- d- Semimembranosus m
- e- Adductor m
- f- Vastus lateralis m
- g- Rectus femoris m
- h- M. tensor fascia lata
- i- Lateral head of gastrocnemius m
- j- Cutaneous m in fold of flank
- k- Abdominal muscles

Lymph nodes

- 1- Subiliac ln
- 2- Coxal ln
- 3- Gluteal ln
- 4- Ischiatic ln
- 5- Tuberal ln
- 6- Lnn of the para lumbar fossa
- 7- Popliteal ln
- 8- Accessory coxal ln

Back



-VI-

**LYMPH CENTERS
OF THE PELVIC LIMB**

VI- LYMPHO CENTERE OF THE PELVIC LIMB

```
graph TD; A[VI- LYMPHO CENTERE OF THE PELVIC LIMB] --> B[A- ILIOFEMORAL LYMPH CENTERS: (Deep inguinal)]; A --> C[B- POPLITEAL LYMPH CENTER:]; B --> D[1- Ilio-femoral Ins<br/>2- Epigastric Ins]; C --> E[1- Deep popliteal In]
```

**A- ILIOFEMORAL
LYMPH CENTERS:
(Deep inguinal)**

**1- Ilio-femoral Ins
2- Epigastric Ins**

**B- POPLITEAL
LYMPH CENTER:**

1- Deep popliteal In

VI- LYMPH CENTERS OF THE PELVIC LIMB:

A- ILIOFEMORAL LYMPH CENTER: (Deep inguinal)

1 - Ilio-femoral lymph nodes:

Position: in ox, found related to the deep femoral artery near the origin of pudendo epigastric trunk, while in horse found in the femoral canal.

Afferent: unknown.

Efferent: to the medial iliac lymph nodes.

image



2- Epigastric lymph nodes:

Position: on the course of the caudal epigastric artery on the medial face of the rectus abdominis m.

Afferent: from the peritoneum and abdominal ms.

Efferent: to the medial iliac lymph nodes.

image



B- POPLITEAL LYMPH CENTER:

Deep popliteal lymph node:

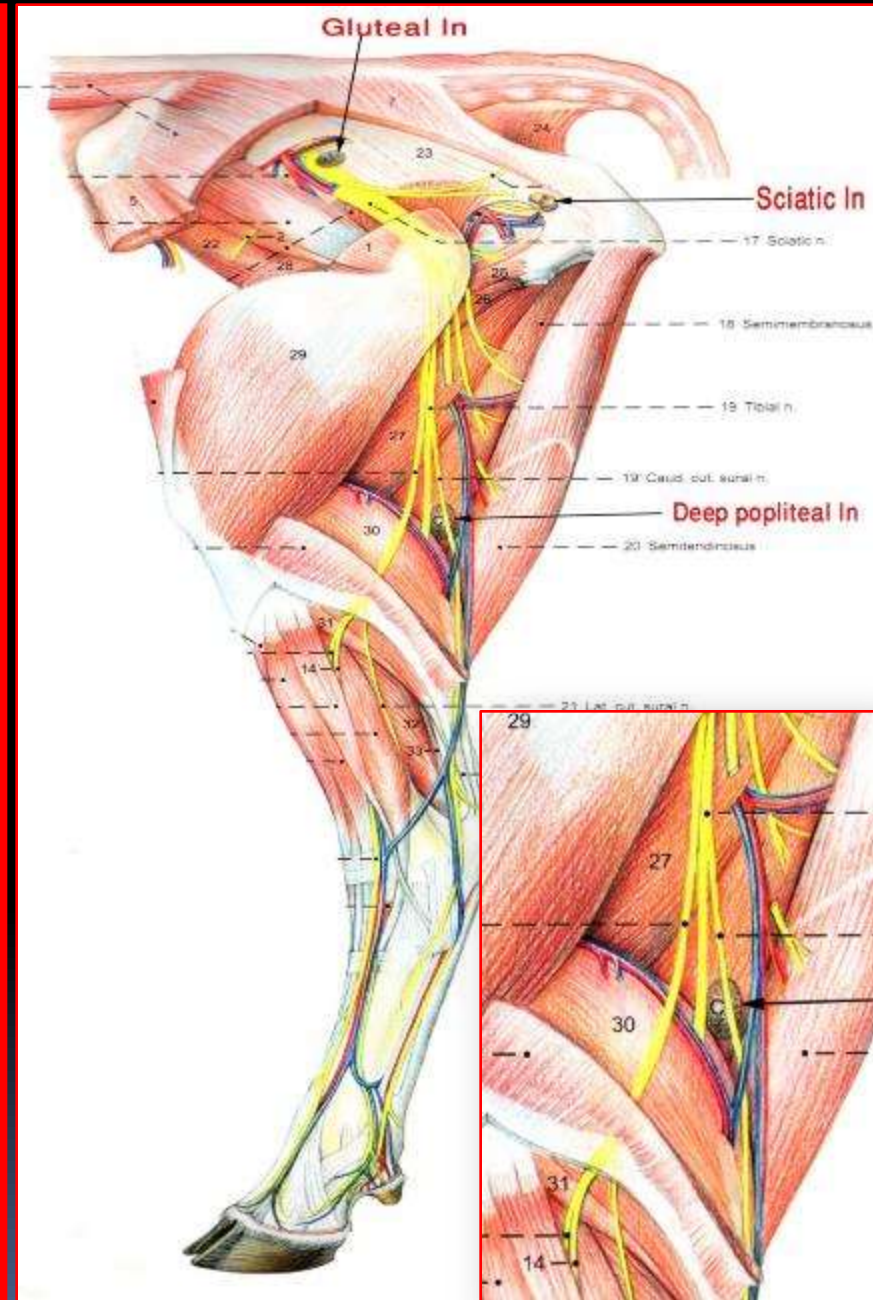
Note that:

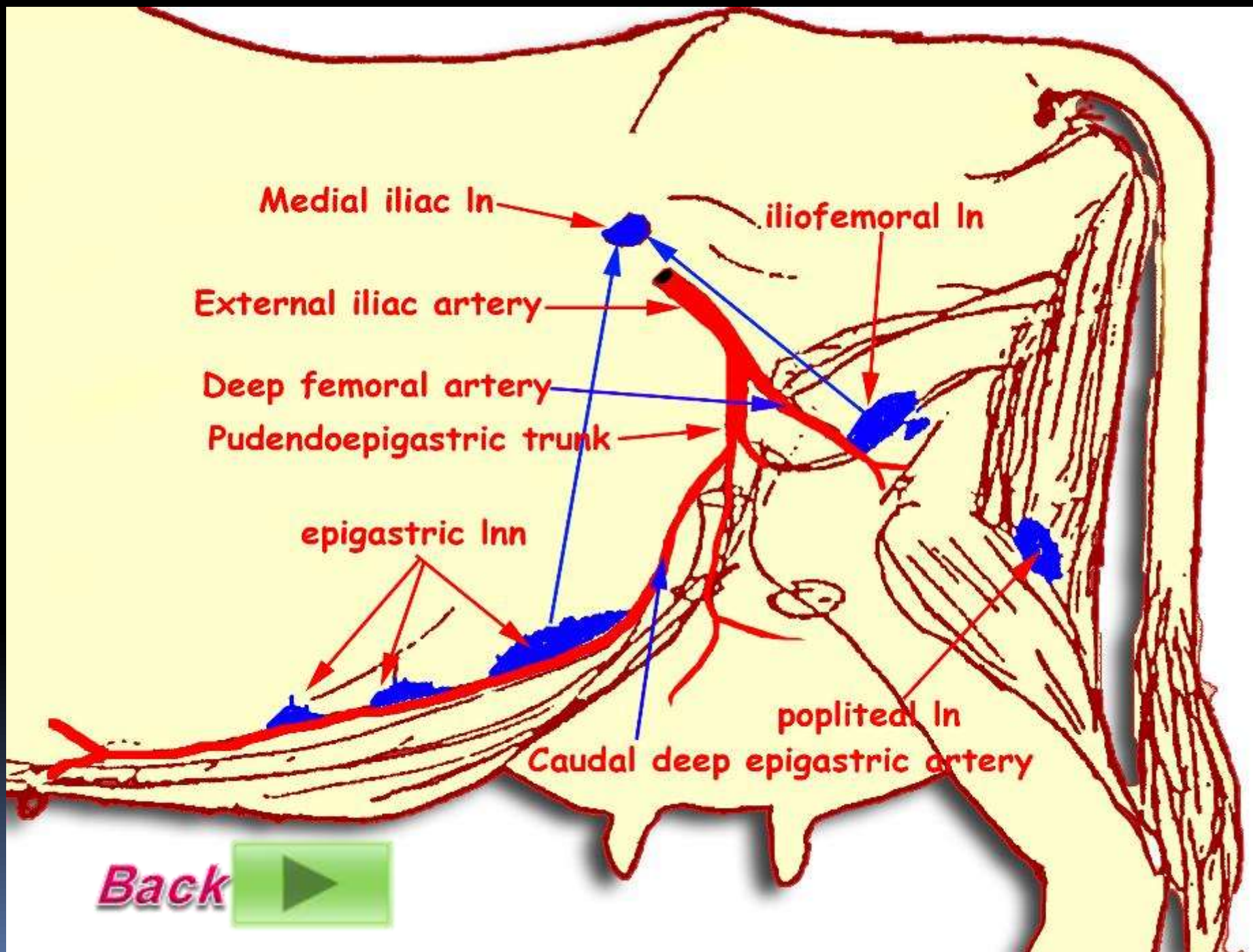
The superficial popliteal lymph node is absent in bovine.

Position: in a mass of fat on the gastrocnemius m between the biceps femoris, semitendinosus ms.

Afferent: from semitendinosus, biceps, skin of the lateral and caudal parts of the leg, ms, joints and tendons of the hind limb distal to the location of the lymph node.

Efferent: to the medial iliac lymph nodes.





Back



-VII-

**LYMPH CENTERS OF
THE ABDOMINAL VISCERA**

VII- LYMPH CENTERS OF THE ABDOMINAL VISCERA

A- CELIAC LYMPH CENTER:

- 1- Celiac lymph nodes
- 2- Gastric lymph nodes
- B- Ruminal lymph nodes
 - 1- Right ruminal In
 - 2- Accessory ruminal In
 - 3- Left ruminal Ins
 - 4- Cranial ruminal Ins
- C- Reticular lymph nodes
- D- Omasal lymph node
- F- Ventral abomasal Ins
- G- Rumino-abomasal Ins
- H- Reticulo-abomasal Ins
- I- Hepatic lymph nodes
- J- Accessory hepatic Ins
- K- Pancreaticoduodenal Ins

B- CRANIAL MESENTRIC LYMPH CENTER

- 1- Cranial mesenteric Ins
- 2- Jejunal lymph nodes
- 3- Caecal lymph nodes
- 4- Colic lymph nodes

Caudal mesenteric Ins

C- CAUDAL MESENTRIC LYMPH CENTERS:

VII- LYMPH CENTERS OF THE ABDOMINAL VISCERA:

A- CELIAC LYMPH CENTER:

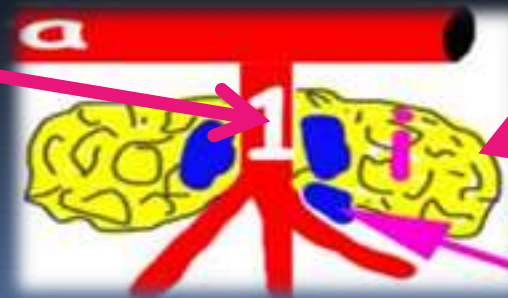
1- Celiac lymph nodes:

Position: dorsal to the pancreas at the origin of the celiac trunk.

Afferent: spleen.

Efferent: celiac, gastric or visceral lymph trunk.

Celiac trunk



pancreas

Celiac Inn

2- Gastric lymph nodes:

Note that:

it is difficult to differentiate into specific group.

A- Atrial lymph nodes:

Position: lie on the visceral surface of the ruminal atrium just caudal to the cardia.

Afferent: atrium, rumen, reticulum and spleen, right, cranial, ruminal, reticular, omasal and dorsal abomasal lymph nodes.

Efferent: to the gastric lymph trunk.

image



B- Ruminal lymph nodes:

1- Right ruminal lymph node:

Position: along the course of the right ruminal a.

Afferent: rumen and other ruminal lns.

Efferent: to the gastric lymph trunk.

2- Accessory ruminal lymph node:

Position: cranial part of the right longitudinal ruminal groove.

Afferent: rumen, atrium, omasum, cranial ruminal ln.

Efferent: to the atrial lymph nodes.

image



3- Left ruminal lymph nodes:

Position: in the left longitudinal ruminal groove.

Afferent: rumen.

Efferent: to the right and cranial ruminal lns.

4- Cranial ruminal lymph nodes:

Position: on the cranial transverse ruminal groove.

Afferent: rumen and left ruminal lymph node.

Efferent: to the atrial and accessory ruminal ln.

image



C- Reticular lymph nodes:

Position: on the reticulum, dorsal and ventral to its attachment with the omasum (2-7 nodes in number).

Afferent: reticulum and adjacent part of omasum and abomasum.

Efferent: to the atrial lymph node.

D- Omasal lymph node:

Position: along the course of the left gastric vessels, on omasum.

Afferent: from omasum.

Efferent: to the atrial lymph node.

image



E- Dorsal abomasal lymph nodes:

Position: along the lesser curvature of the abomasum.

Afferent: abomasum, duodenum and ventral part of the omasum.

Efferent: to the rumino-abomasal or hepatic lymph nodes.

F- Ventral abomasal lymph nodes:

Position: along the greater curvature of the pyloric part of the abomasum.

Afferent: abomasum and duodenum.

Efferent: to the hepatic lymph nodes.

image



G- Rumino-abomasal lymph nodes:

Position: in the groove between the abomasum and ventral ruminal sac.

Afferent: rumen, atrium of the rumen, reticulum, abomasum and dorsal abomasal lymph nodes.

Efferent: to the reliculo-abomasal or reticular lymph nodes.

H- Reticulo-abomasal lymph nodes:

Position: craniodorsal extension of the rumino abomasal lymph node in the angle between the reticulum, omasum, abomasum and rumen.

Afferent: rumen, reticulum, abomasum and ruminoabomasal lymph nodes.

Efferent: to the reticular lymph nodes.

image



I- Hepatic lymph nodes:

Position: ventral to the porta hepatis at the portal fissure, around portal vein, hepatic artery and bile duct covered by pancreas,

Size: number 10-15, Size 1-7 cm.

Afferent: liver, pancreas, duodenum and ventral abomasal lymph nodes.

Efferent: form the hepatic trunk which joins the gastric lymph trunk, to form the celiac Trunk.

image



J- Accessory hepatic lymph nodes:

Position: at the dorsal border of the liver associated with the caudal vena cava.

Afferent: the liver.

Efferent: join the efferent of the hepatic lymph nodes.

K- Pancreaticoduodenal lymph nodes:

Position: lie on the ventral surface of the pancreas (in the pancreatic notch around the portal vein).

Afferent: from pancreas and duodenum.

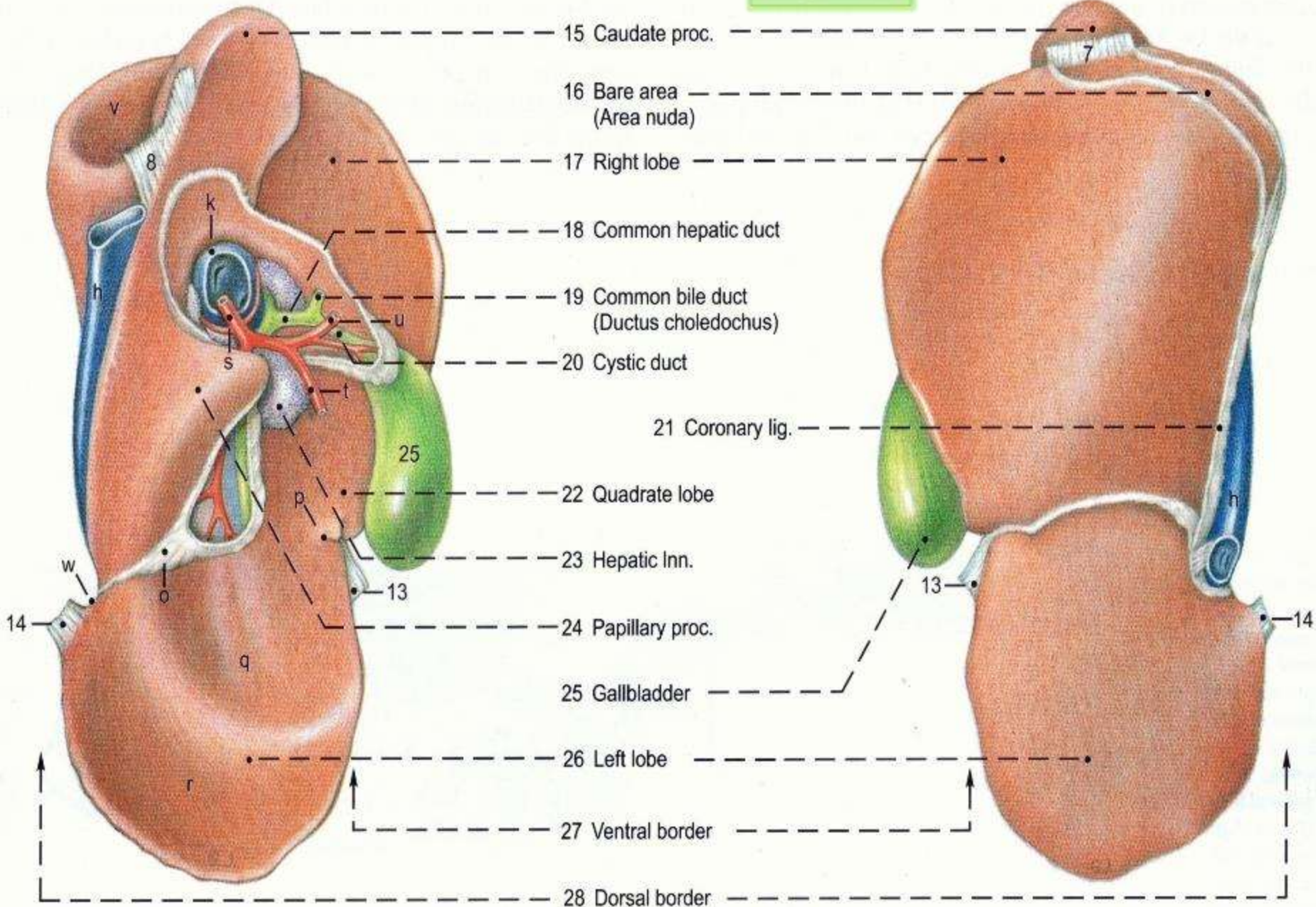
Efferent: join the intestinal lymph trunk.

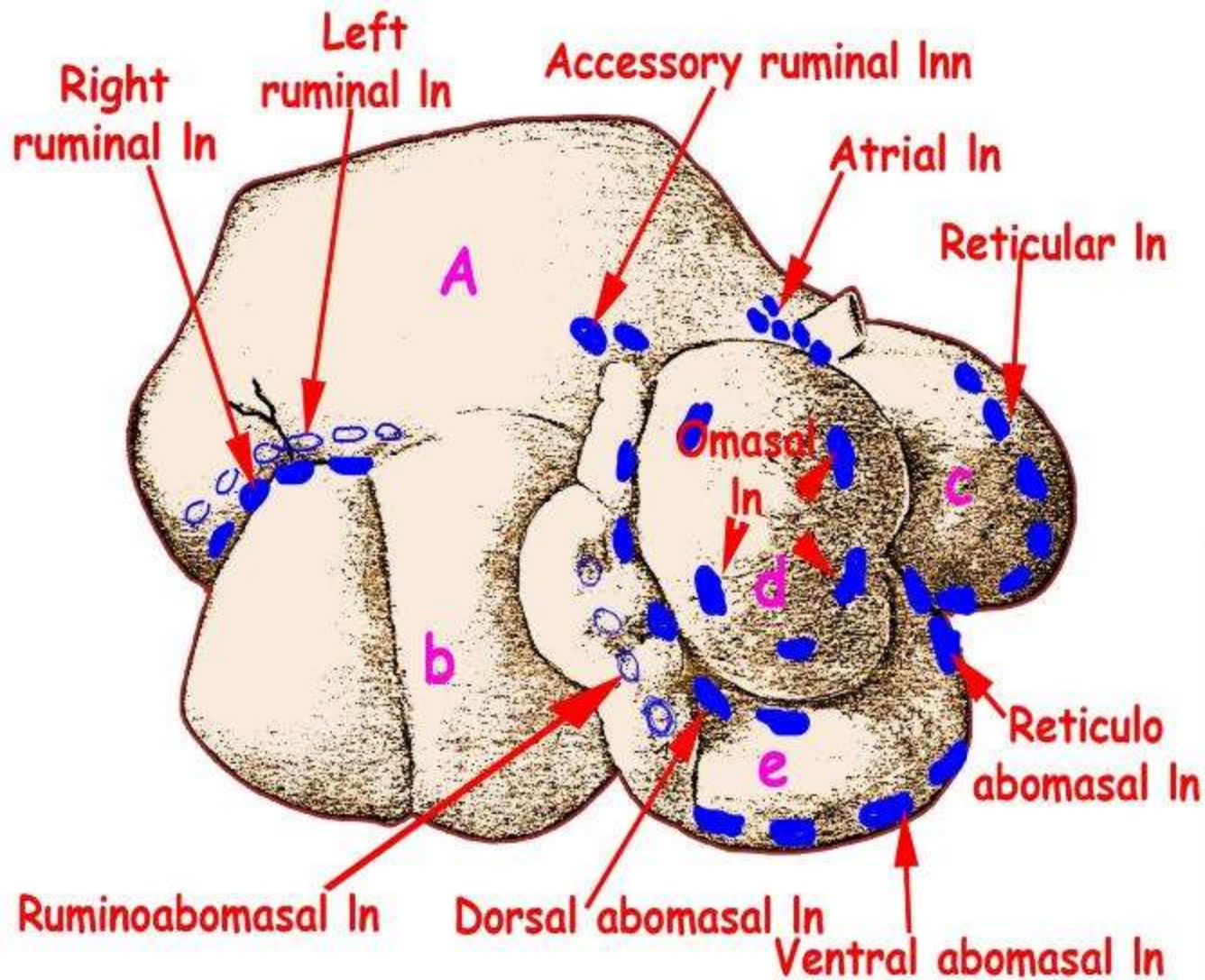
Liver



(Visceral surface)

(Diaphragmatic surface)





- A- Dorsal ruminal sac
- b- Ventral ruminal sac
- c- Reticulum
- d- Omasum
- e- Abomasum

Back

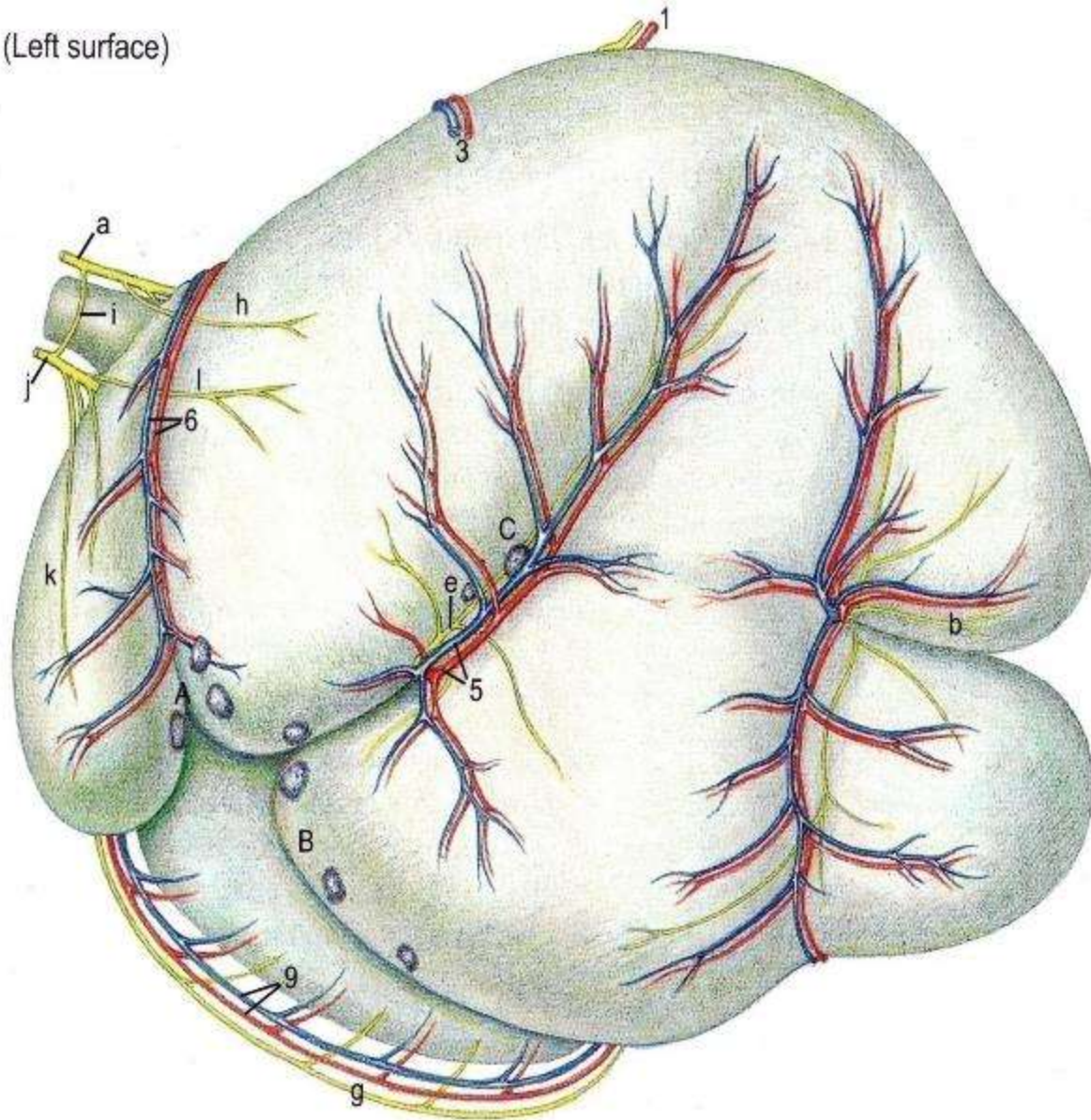


Gastric Vessels, Nerves, and Lymph nodes

Back



(Left surface)



- A Reticuloabomasal Inn.
- B Ruminoabomasal Inn.
- C Left ruminal Inn.
- D Right ruminal Inn.
- E Splenic (or atrial) Inn.
- F Reticular Inn.
- G Dorsal abomasal Inn.
- H Ventral abomasal Inn.

- a Dorsal vagal trunk
- b Right ruminal br.
- c Br. to celiac plexus
- d Dorsal ruminal br.
- e Left ruminal br.
- f Br. of the dorsal vagal trunk
- g Br. to greater curvature of abomasum
- h Atrial brr.
- i Communicating br.
- j Ventral vagal trunk
- k Cran. reticular brr.
- l Atrial brr.
- m Br. of the ventral vagal trunk
- n Omasal brr.
- o Parietal abomasal brr.
- p Long pyloric br.

B- CRANIAL MESENTRIC LYMPH CENTER:

1 - Cranial mesenteric lymph nodes:

Position: at the origin of cranial mesenteric artery.

Afferent: spleen, celiac and atrial lymph nodes.

Efferent: join the intestinal lymph trunk.

image



2- Jejunal lymph nodes:

Position: numerous lymph nodes scattered in the mesentery of the jejunum extends to the coils of the colon, size 0.5 - 120 cm.

Afferent: jejunum and ilium.

Efferent: form the intestinal lymph trunk.

image



3- Caecal lymph nodes (ileocecal Inn):

Not more than 3 lymph nodes.

Position: ileocecal ligament.

Afferent: cecum and ilium.

Efferent: jejunal lns or intestinal lymph trunk.

image



4- Colic lymph nodes:

Position: on the spiral mass of ascending colon and between the coils.

Afferent: ascending colon, jejunal and caecal lns.

Efferent: form the intestinal lymph trunk.

image



C- CAUDAL MESENTRIC LYMPH CENTERS:

Caudal mesenteric lymph nodes:

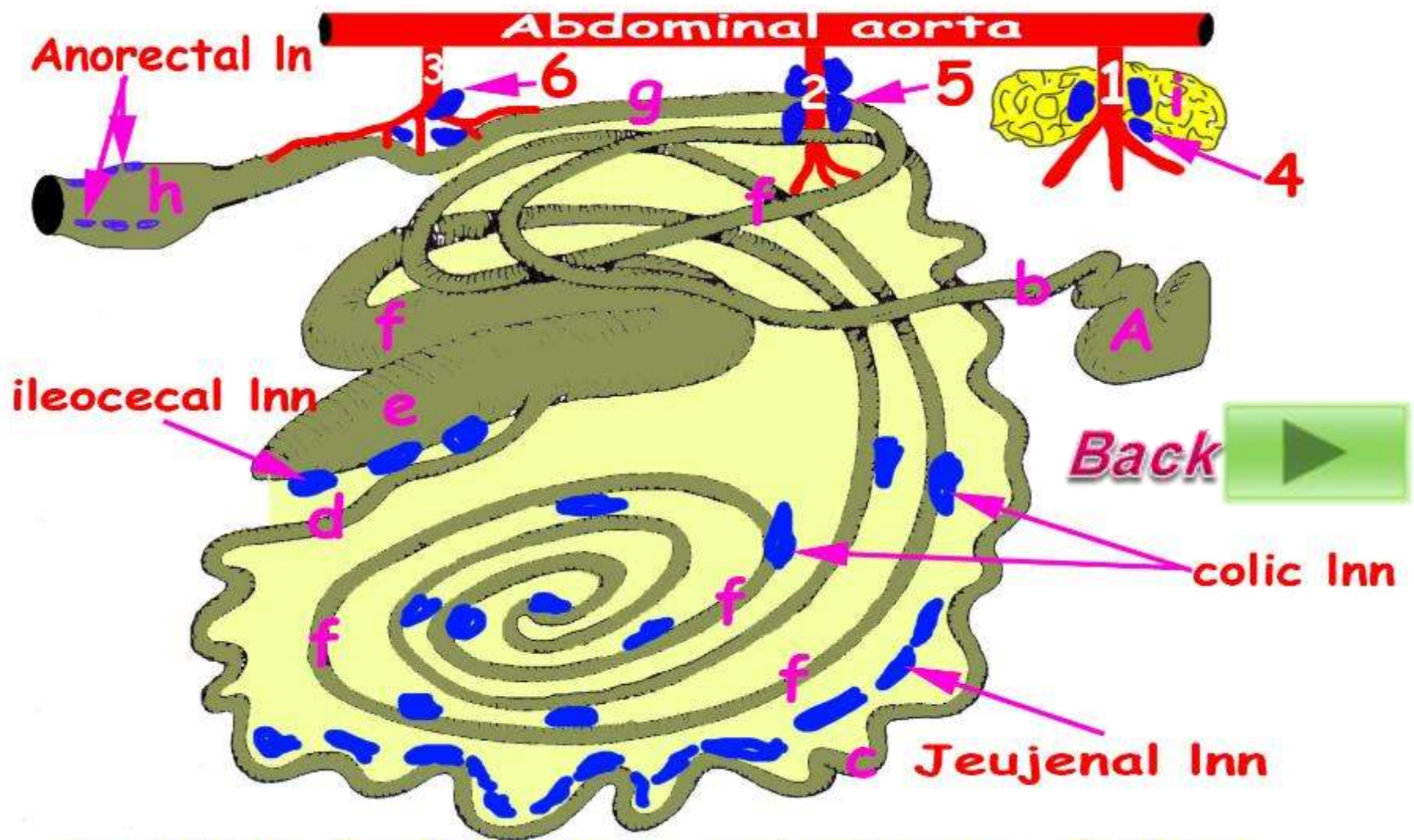
Position: in the mesentery of the descending colon associated with the branches of the caudal mesenteric artery.

Afferent: descending colon and ano-rectal lymph nodes.

Efferent: to the medial iliac lymph nodes.

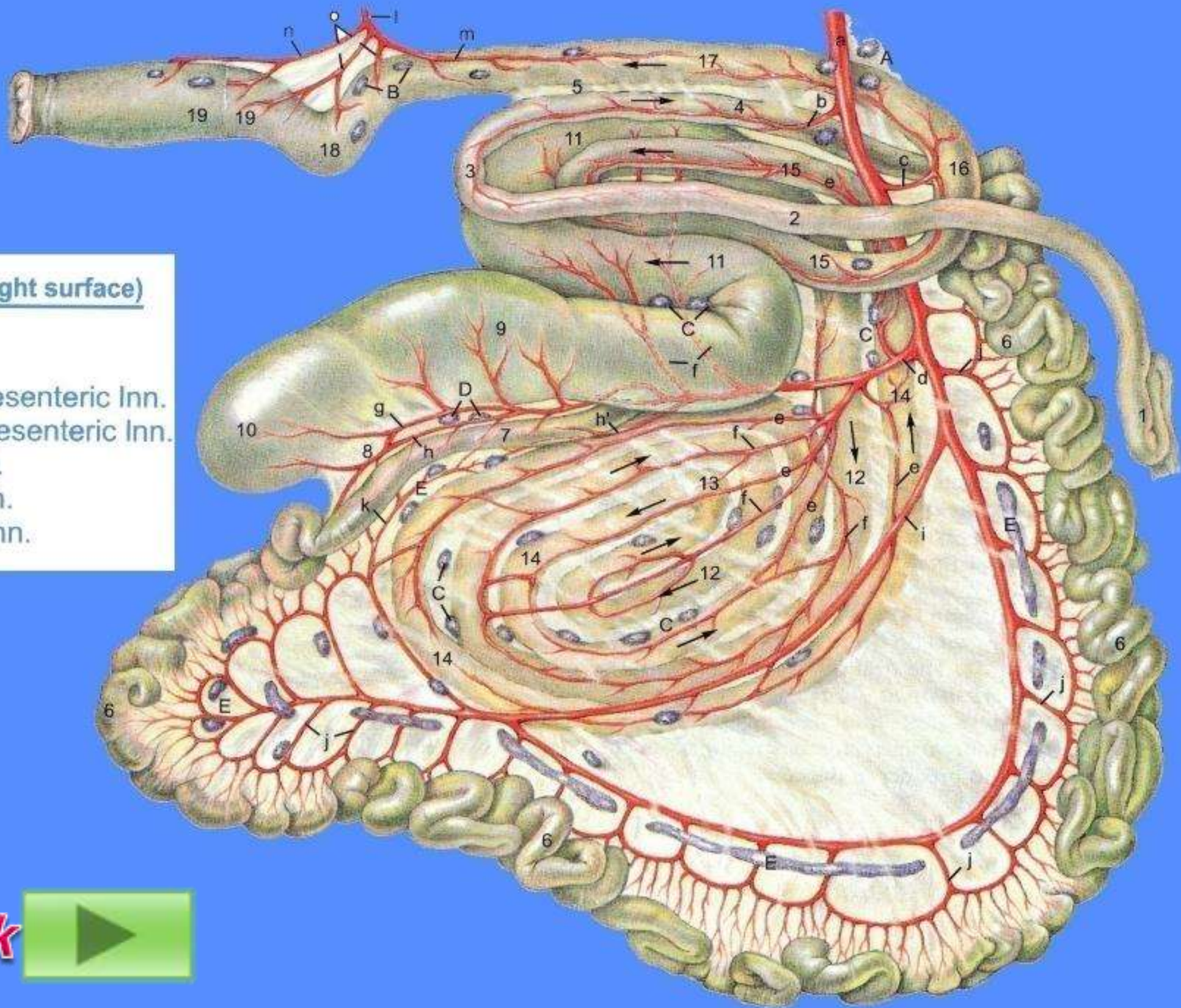
image





A-pylorus, b-duodenum, c-jeujenum, d-ileum, e-cecum, f-ascending colon, g-descending colon, h-rectal canal, i-pancreas.

1- celiac trunk, 2- cranial mesenteric artery, 3- caudal mesenteric artery
 4- celiac In, 5- cranial mesenteric In, 6- caudal mesenteric In.



Intestines (Right surface)

Legend:

- A Cran. mesenteric Inn.
- B Caud. mesenteric Inn.
- C Colic Inn.
- D Cecal Inn.
- E Jejunal Inn.

Back



LARGE LYMPHATIC TRUNKS:

Tracheal lymph trunk:

- It is formed from the efferent of the lateral retro-pharyngeal lymph node (3-6).
- It courses on the lateral aspect of the trachea and receives the efferent of the superficial and deep cervical and costocervical lymph nodes.
- The left tracheal duct mainly join the thoracic duct and rarely join the left common jugular vein. The right trunk not usually does that.

Note that:

The tracheal lymph trunk collects the lymph of the head, neck, thoracic limb and the cranial part of the thorax.

Right lymphatic duct

- It is the extension of the right tracheal duct formed by the efferent of the superficial cervical lymph nodes with the right tracheal tube in addition to the efferent of the costocervical, sternal and cranial mediastinal lymph nodes.

Lumbar trunk:

-Located on the ventral aspect of the caudal vena cava and it constitutes the efferent of the medial iliac lymph nodes and terminate in the cisterna chyli

Hepatic lymph trunk:

-It is formed by the confluence of the efferent of hepatic and accessory hepatic lymph nodes and it usually join the gastric trunk to form the celiac trunk.

Gastric trunk:

It represents the large efferent vessels of the atrial lymph nodes and it forms with the hepatic; the celiac trunk.

Celiac trunk:

The celiac trunk is formed by the union of the hepatic and gastric lymph trunks; it joins the intestinal trunk to form the visceral trunk.

Intestinal trunk:

It is formed by the confluence of the jejunal and colic trunks and form with the celiac trunk; the visceral trunk.

Visceral trunk:

It is located caudal to the liver and it is formed by the union of the celiac and intestinal trunks, sometimes the celiac trunk is absent and gastric, hepatic and intestinal unit to form the visceral trunk and it ends in the cisterna chyli.

Cisterna chyli:

It is fusiform in shape located dorsal to the aorta under the last thoracic; the first and the second lumbar vertebrae. It is 1.5 -2 cm in width, it pierces

The aortic hiatus and continues cranially as thoracic duct.

Thoracic duct:

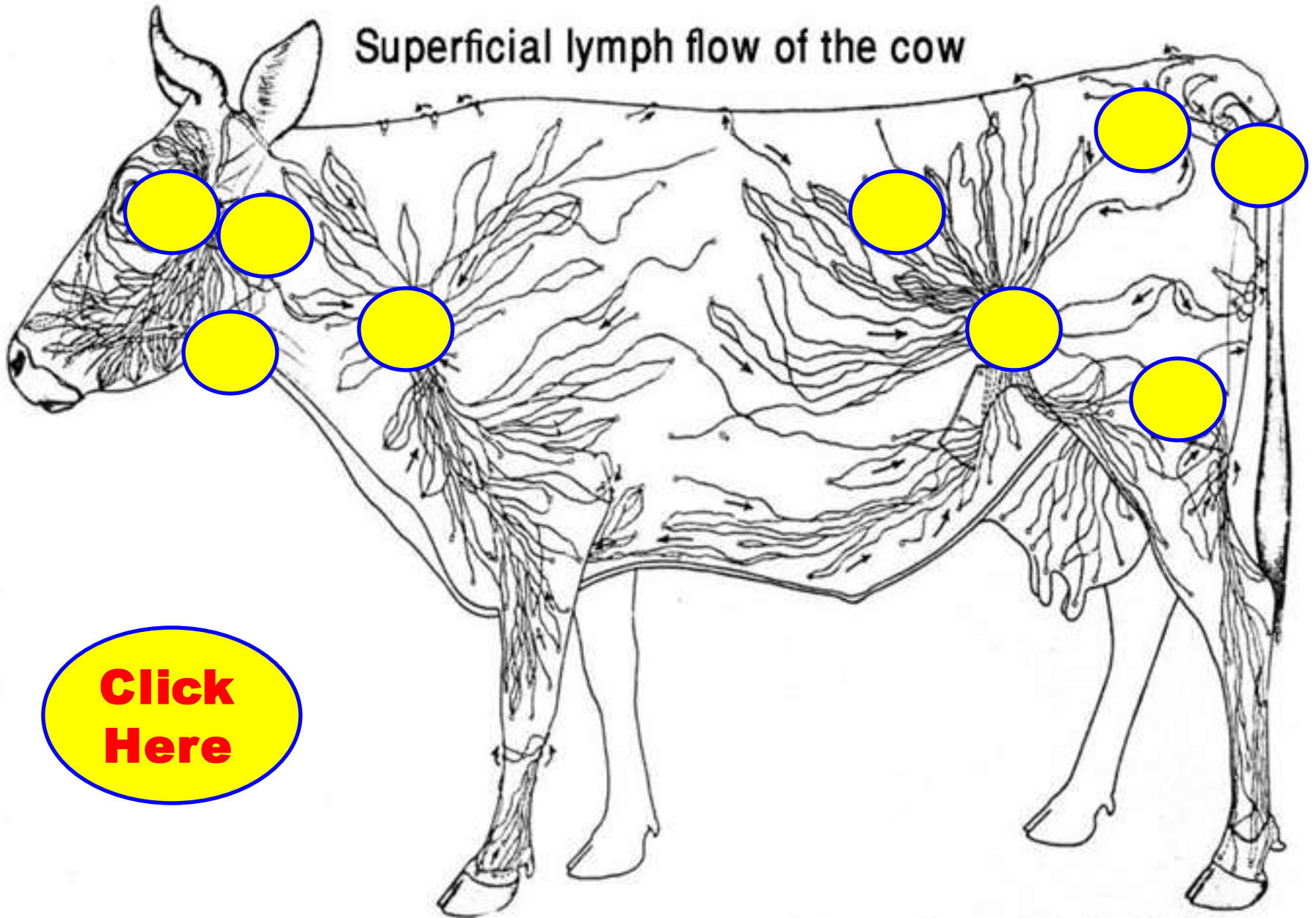
It is the cranial extension of the cisterna chyli; two ducts may present and communicate to each other by intercalated ducts.

They usually unit at the 5th thoracic vertebra before it inclines from the right to the left side of the trachea and oesophagus and it form S-like curve as it terminates in vena cava or to left common jugular vein 2 cm cranial to the 1st rib (extra thoracic part of the duct). The terminal part of the duct is ampullated.

The duct receives either the left tracheal trunk or right and left, in the first case it receives all the lymph of the body, in the second case it receives the lymph of the body except that of the right side of the head, neck and cranial part of the thorax as will as right thoracic limb which is collected by the right tracheal trunk.

Superficial lymph nodes of the cow

Superficial lymph flow of the cow



Click Here

1, Mandibular ln.; 2, parotid ln.; 3, lateral retropharyngeal ln.; 4, superficial cervical ln.; 5, subiliac ln.; 5', Inn. of paralumbar fossa; 6, gluteal ln.; 7, popliteal ln.; 8, tuberal ln.