

VETERINARY · ILLUSTRATED GUIDE

VETERINARY ANATOMY NOTES

Veterinary Anatomy Notes: Free Illustrated Study Guide for Vet Students (PDF)

Veterinary anatomy is divided twice over, and the two divisions are independent. Depth asks how close you are looking — gross, microscopic (histology) or developmental (with embryology inside it).

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IN SHORT

Veterinary anatomy is divided twice over, and the two divisions are independent. **Depth** asks how close you are looking — gross, microscopic (histology) or developmental (with embryology inside it). **Map** asks how the material is arranged — systematically, by organ system, or regionally, by part of the body. The branches everyone lists — osteology, arthrology, myology, splanchnology, angiology, neurology and the sense organs with the skin — are the headings of the systematic map, and the nomenclature's own names for them are not always the words on your syllabus. These notes give the whole map, one figure per idea, a self-test, and a PDF to keep.

KEY POINTS

1. **Two questions, not one.** Every anatomy topic sits at a **depth** and on a **map**, and the two are independent. Most first-year confusion is these two axes collapsed into one.
2. **Gross, microscopic, developmental.** Microscopic anatomy taught in its own right is histology; developmental anatomy runs from conception to old age and is *broader* than embryology, which stops at birth.
3. **Systematic follows a system; regional follows a place.** Systematic anatomy suits comparison between species and is easier for a beginner; regional anatomy pays less attention to function but has immediate clinical application, and has to be given species by species.
4. **Surface, applied, surgical and radiographic anatomy are not separate subjects.** They are regional anatomy pursued with a particular aim.
5. **The nomenclature fixes the branch names.** *Osteologia*, *Arthrologia*, *Myologia*, *Splanchnologia*, *Angiologia*, *Systema nervosum*, *Organa sensuum* and *Integumentum commune*, preceded by the body regions.
6. **“Aesthesiology” is a syllabus word, not a textbook one.** It appears in none of the four standard references used for these notes; the material is filed under two headings — the sense organs, and the common integument — instead of one.
7. **A bone is an organ.** Bone tissue, periosteum and endosteum, marrow, and its own vessels and nerves. Its 60–70% mineral content is why it does not change after death the way soft tissue does.
8. **Joints split on whether there is a gap.** A synarthrosis is continuous — fibrous (syndesmosis, suture, gomphosis) or cartilaginous (synchondrosis). A diarthrosis has a cavity with synovial fluid in it, and that is the synovial joint.
9. **The cat is the blood-volume exception.** 6–8% of body weight in the domestic animals, about 4% in the cat — which is why cats tolerate blood loss less well.

10. **The hoof is skin.** Horn, claw, hoof, foot pads and the mammary gland all sit under the common integument, because they are the same organ specialised.

About the images

Two of the figures are reproduced for educational reference from *Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas*, 7th edition, by König and Liebich, and one from the *Color Atlas of Veterinary Histology*, 3rd edition, by Bacha and Bacha. Each is credited beneath it and copyright remains with the original authors and publishers. The two diagrams are our own, drawn for this guide from the sources named under them.

01 What veterinary anatomy actually is

Anatomy is the study of the form, arrangement and structure of the tissues and organs that compose the body. The word is Greek and means *cutting apart*: dissection is the traditional method, and the subject is still named after it. Everything else in a veterinary course leans on it — physiology explains how the parts work, pathology what happens when they fail, surgery and imaging assume you can already name them.

Veterinary anatomy is that discipline applied to the domestic animals. In practice that means the dog (*Canis lupus f. familiaris*), cat, pig, cattle, sheep, goat and horse, with the chicken as the usual bird. That list is the reason a veterinary course cannot simply borrow a human one: seven species with different diets, different limbs and different stomachs do not share one description.

The difficulty for a first-year student is rarely the facts. It is that the subject arrives divided in two different ways at once, and most study material leaves you to work that out for yourself. This page does not.

HOW THE SUBJECT IS DIVIDED

Every topic
answers
two
questions

The stifle joint
is **gross**
anatomy on
both maps.

DEPTH

How close are you looking?

- **Gross** — visible to the eye
- **Microscopic** — histology
- **Developmental** — how it forms

MAP

How is it arranged?

- **Systematic** — by organ system
- **Regional** — by part of the body

Fig 1 — Two questions, not one. Every anatomy topic sits at a **depth** — how close you are looking — and on a **map** — how the material is arranged. The two are independent, which is why the same structure appears in two places on a syllabus and looks like two topics. The stifle joint is gross anatomy on both maps: systematic files it under joints, regional puts it in the hindlimb.

Diagram — Vet-eBooks.com, drawn for this guide. Data from Dyce, Sack and Wensing's Textbook of Veterinary Anatomy, 5th ed., ch. 1.

Read this page once to get the shape of the subject, then use it as a switchboard: each branch below links to the page that teaches it properly. If you want anatomy's own method rather than its map, our guide to what actually happens in a first dissection lab covers the other half.

02 The three depths: gross, microscopic and developmental

The first division is about magnification. It decides which room you are in, not which system you are studying.

Gross anatomy — also called macroscopic anatomy — is everything you can resolve with the naked eye: bones, muscles, organs, vessels, nerves. It is the bulk of a first-year course and the whole of the dissection room.

Microscopic anatomy uses light and electron microscopy to study structures invisible to the eye. Taught as its own subject it is called **histology**. It is not a different topic from gross anatomy; it is the same topic one step closer, which is why the same bone appears in both.

Developmental anatomy is the study of the stages an animal passes through from conception through birth, youth and maturity to old age. It is *broader* than classic **embryology**, which confines its attention to the unborn — a distinction worth holding, because the two words are used as synonyms and are not.

A fourth term crosses all three. **Functional anatomy** asks what a structure is *for*, and understanding the relationship between structure and function is described as the central focus of anatomy today. It is a question, not a floor of the building: you can ask it of a whole femur, of an osteocyte, or of a limb bud.

DEPTH	WHAT YOU LOOK AT	WHAT YOU LOOK WITH	WHERE IT STOPS
Gross (macroscopic)	Organs, muscles, bones, vessels, nerves	The naked eye, the scalpel, radiographs and ultrasound	At the limit of unaided vision
Microscopic (histology)	Tissues, cells and their arrangement	Light and electron microscopy	At the limit of the instrument
Developmental	The stages from conception to old age	Staged specimens, imaging, sectioned embryos	Nowhere — it runs the whole life span
Embryology	Embryonic and foetal development from fertilisation	As above, before birth	At birth — it sits inside developmental anatomy

Histology has its own body of material, and we treat it as a branch in its own right below rather than as a footnote to gross anatomy.

03 Two maps of the same animal

The second division is about arrangement, and it is the one that confuses people. The information collected by dissection can be organised in two principal and complementary ways, and a veterinary course teaches both, usually in that order.

Systematic anatomy studies groups of organs that are closely related in their functions and so constitute body systems — the digestive system, the cardiovascular system, and so on. It lends itself to comparison between species, it combines gross, microscopic, developmental and functional aspects readily, and for a beginner it is easier to understand than the alternative. If you want the systems themselves, our guide to the eleven body systems and what each one does is the companion to this section.

Those systems, as König and Liebich list them, are: the **outer skin**; the **skeleton and joints**; the **musculature** of the skeleton; and then the **digestive, respiratory, urogenital, circulatory, nervous, endocrine** and **immune** systems, with the **organs of sense** as the eleventh. Learning that list is worth an evening on its own, because a systematic textbook's contents page is close to being it.

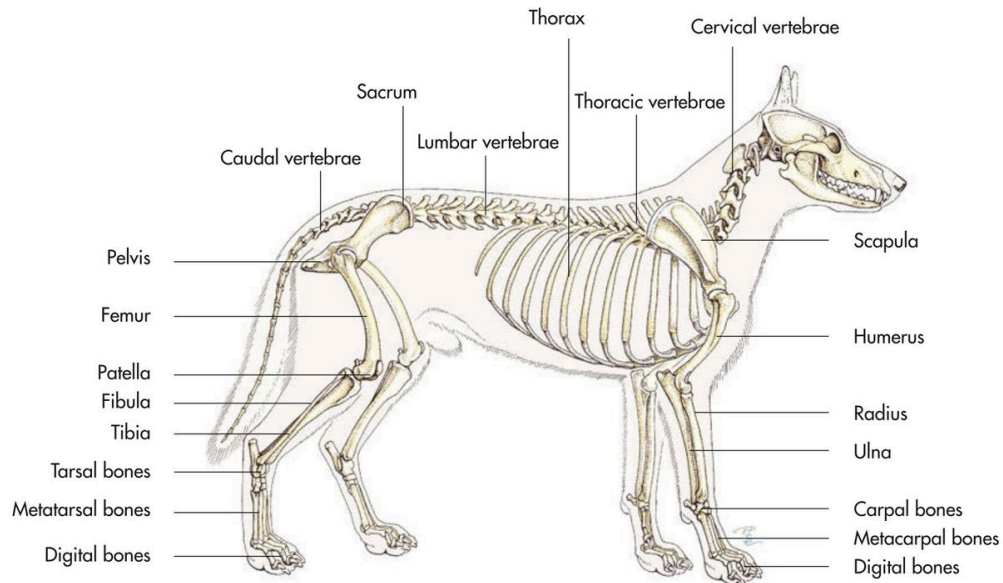


Fig 2 — Systematic anatomy: one system, whole animal. The skeletal system of the dog, from the cervical vertebrae to the digital bones. A systematic view follows one system wherever it goes and ignores everything else in the animal — there is no skin, no muscle and no gut here, because none of those belong to this system.

Image — König HE, Liebich H-G. *Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas*, 7th ed. Thieme — Fig. 1.26. Reproduced for educational reference.

Regional anatomy — also called topographic anatomy — is directly concerned with the form and relationships of all the organs present in one particular part of the body. It pays less attention to function than systematic anatomy, but it has immediate application to clinical work, and because the detail differs so much it has to be given separately for each species.

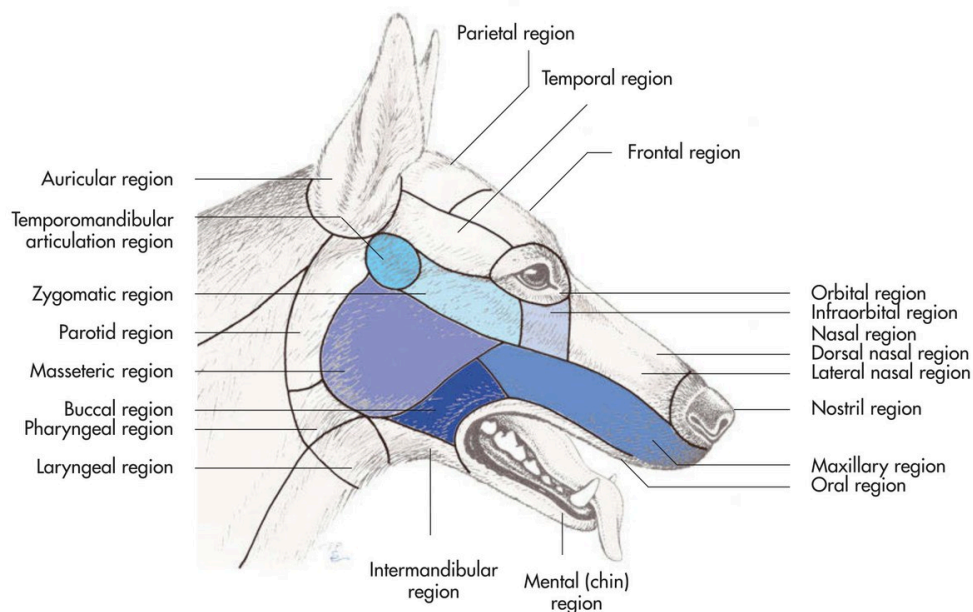


Fig 3 — Regional anatomy: the units it works in. The named regions of the head in the dog — the same animal as the figure above, cut the other way. A regional account takes one of these regions and describes everything inside it, whatever system it belongs to: skin, muscle, vessels, nerves and bone together. This plate is the map of the regions themselves, which is how a clinical record says where a lesion is and how a nerve block is named.

Image — König HE, Liebich H-G. *Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas*, 7th ed. Thieme — Fig. 20.1. Reproduced for educational reference.

Regional anatomy is one of the foundations of clinical practice, and several familiar terms are simply regional anatomy pursued with a particular aim: **surface anatomy**, **applied anatomy**, **surgical anatomy** and **radiographic anatomy**. They are aspects of the same map, not separate subjects. Our surgeon's approach to the canine abdomen, layer by layer is what surgical anatomy looks like when it is written down; the regional tour of the dog is the general form.

The practical difference

Ask which map a resource is on before you open it. A book arranged by system will answer **where does the ureter run in every species** and will not tell you what else your scalpel meets on the way to it. A book arranged by region answers the second question and makes you look in five places for the first. Neither is wrong; using one to answer the other's question is.

04 What the branches are actually called

Anatomical language has to be precise, and for a long time it was not: the same structure went by too many different names, used inconsistently. The answer was an internationally agreed vocabulary, the **Nomina Anatomica Veterinaria** (NAV), introduced in 1968 and revised repeatedly since. Its terms are Latin, and translating them into readable English is permitted — which is why you meet the same structure under two names.

The NAV does not only name structures. It also fixes the **headings** those structures are filed under, and those headings are the branches of systematic anatomy. Printed out in order, they are: *Regiones corporis* (the body regions), *Osteologia*, *Arthrologia*, *Myologia*, *Splanchnologia*, *Angiologia*, *Systema nervosum*, *Organa sensuum* and *Integumentum commune*. A classical reference text runs its general volume in almost exactly that order, which is a useful check that the list is not an invention of the nomenclature committee. Do not try to absorb them from that sentence — the figure and the table below give each one a job.

What the nomenclature calls it

NAV HEADING	SYLLABUS WORD
Osteologia	Osteology
Arthrologia	Arthrology
Myologia	Myology
Splanchnologia	Splanchnology
Angiologia	Angiology
Systema nervosum	Neurology
Organa sensuum	Aesthesiology
Integumentum commune	— the same word

Fig 4 — The heading, and the word on your syllabus. Most syllabus lists print seven branches and are working from an older vocabulary. The two columns agree until the end, where the single word **aesthesiology** is used for what the NAV keeps as two separate headings — the sense organs, and the skin with everything made out of it.

Diagram — Vet-eBooks.com, drawn for this guide. Data from the contents of Constantinescu's Illustrated Veterinary Anatomical Nomenclature, 4th ed., and Sisson and Grossman's The Anatomy of the Domestic Animals, Vol. I.

That last row is worth a sentence, because it is the one place a syllabus and a modern textbook will disagree in front of you. **Aesthesiology** is a real teaching term and you will meet it on course outlines, but it appears in *none* of the four standard references used for these notes — not in Dyce, not in König and Liebich, not in Sisson and Grossman, and not in the illustrated nomenclature itself. If you search a current textbook for it you will find nothing, and the reason is not that the material is missing but that it is filed under two headings instead of one.

Here is the whole thing as one table. Everything below this section is an expansion of a single row of it.

NAV HEADING	WHAT IT OWNS	THE THING THAT CATCHES PEOPLE OUT	GO DEEPER
<i>Osteologia</i> — osteology	Bones: structure, classification, development, and the divisions of the skeleton	A bone is an organ , not a mineral object — it has its own vessels, nerves and marrow	the canine skull and dentition
<i>Arthrologia</i> — arthrology	Joints: how two bones meet, what lies between them, and what movement that allows	The same branch is called syndesmology in older texts; the two words mean one thing	—
<i>Myologia</i> — myology	Muscles: organisation, attachments, actions and innervation	Skeletal muscle is the active half of a system whose passive half is the skeleton	canine muscle origins and insertions
<i>Splanchnologia</i> — splanchnology	The viscera: digestive, respiratory, urogenital and endocrine organs	The word is used in a narrow and a wide sense, and sources differ on which organs are in	the four stomachs of a ruminant
<i>Angiologia</i> — angiology	Heart, arteries, capillaries, veins and the lymphatic system	Lymphatics belong here too, although they are drained rather than pumped	—

NAV HEADING	WHAT IT OWNS	THE THING THAT CATCHES PEOPLE OUT	GO DEEPER
<i>Systema nervosum</i> — neurology	Central, peripheral and autonomic nervous systems	Structure and clinical localisation are different skills built on the same map	telling upper from lower motor neuron signs
<i>Organa sensuum</i> — sense organs	Eye, ear and vestibular apparatus, smell, the vomeronasal organ, taste	Older lists fold this heading and the next into one word, aesthesiology	—
<i>Integumentum commune</i>	Skin, hair, horn, foot pads, claw and hoof, cutaneous glands, the mammary gland	Hoof and horn are skin — they are the same organ specialised, not separate structures	the equine hoof and distal limb

One name that is *not* on the list: **biomechanics**. A classical text gives it a whole chapter, and plenty of courses teach it, but the nomenclature has no heading for it because it describes behaviour rather than structure. If your syllabus has it, expect it beside arthrology and myology.

05 The locomotor branches: bones, joints and muscles

The skeleton and the musculature are treated together as one complex organ system, because neither does anything alone. The skeleton — bones, cartilage, ligaments and the joints between them — is the **passive** part; the musculature is the **active** part. Three NAV headings divide it up.

Osteology

Osteology is the study of the bones that combine to form the skeletons of the different species. Its first and most useful idea is that a bone is an **organ**: it is made of bone tissue, sheathed inside and out by endosteum and periosteum, containing marrow, and supplied by its own blood vessels and nerves. Those components are what earn it the word. Bone is 60–70 per cent mineral, which is why it does not change after death the way soft tissue does, and why **maceration** — soaking a specimen until the soft tissue is gone — leaves a usable skeleton behind.

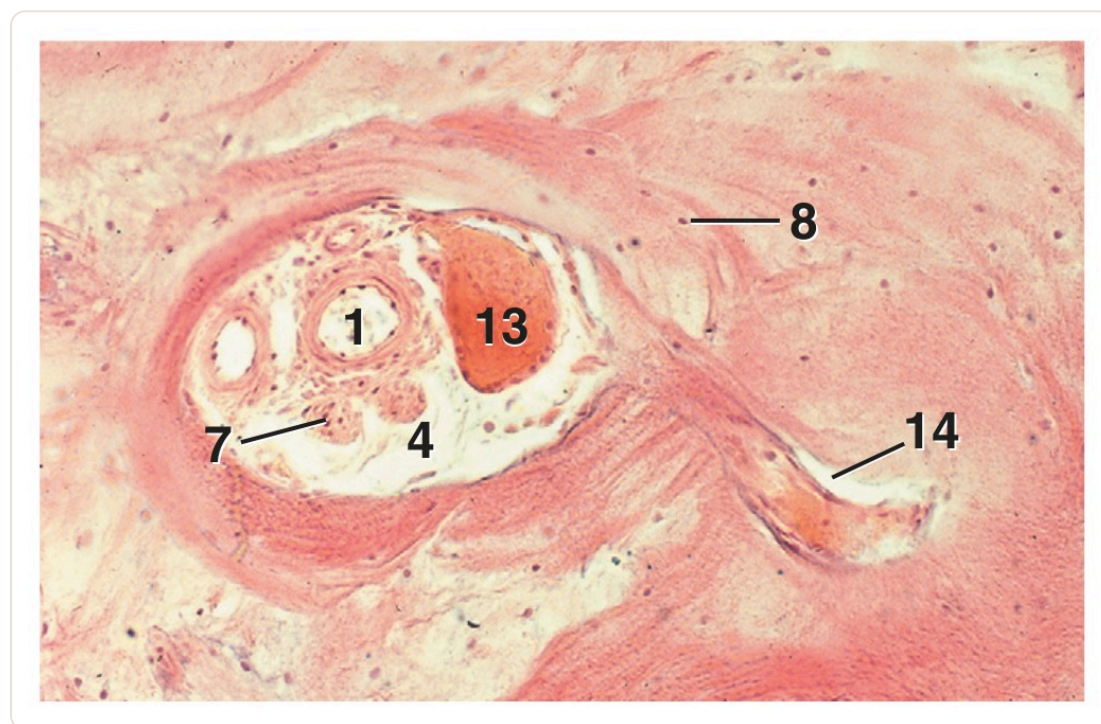


Fig 5 — The same bone, one depth down. Compact bone in cross-section, from the jaw of a dog (×125). The dark hole in the middle is a **Haversian (central) canal** [4] carrying an artery [1], a vein [13] and a nerve [7]; [14] is a **Volkmann's (perforating) canal** joining it to its neighbour; the small dark specks scattered through the matrix [8] are **osteocytes**, the living cells walled into the bone they made. Nothing here is visible in the figure above — it is the same structure at a different depth.

Image — Bacha WJ, Bacha LM. Color Atlas of Veterinary Histology, 3rd ed. Wiley-Blackwell — Fig. 5.19. Reproduced for educational reference.

Arthrology

Arthrology is joints, and older texts call the identical branch **syndesmology**. How much movement a joint allows depends entirely on the form of the gap between the two bones, which gives the whole branch its organising split. A **synarthrosis** is a continuous union with no gap: it may be fibrous — a syndesmosis, a suture between skull bones, or a gomphosis, which is how a tooth root is anchored in its socket — or cartilaginous, a synchondrosis. A **diarthrosis** has a gap. That is the true or **synovial** joint, with a joint cavity holding synovial fluid, and it is the kind that carries a clinical caseload.

Myology

Myology is muscle. Two tissue types are distinguished on morphology and function: **smooth** muscle, which does the contracting inside the viscera, the ducts of glands and the walls of blood and lymphatic vessels, and **striated** muscle, which divides again into skeletal and cardiac. Skeletal muscle is the branch's main business — the active part of the locomotor system, richly supplied with blood and innervated twice over — by the nerves that carry sensation and voluntary movement, and by autonomic nerves you never command — always attaching to bone or cartilage at each end and working as a lever. Fasciae, tendon sheaths and bursae are studied with it, because they are what let it slide.

06 Splanchnology: the viscera

The root *splanchnon* means an internal organ, and the branch is the study of the viscera. It is the one heading whose boundary is genuinely disputed, and it is worth knowing that before a viva rather than during one.

In a **restricted** sense, splanchnology covers only the organs of the systems that keep the individual alive and the species going: the digestive, respiratory, urinary and genital systems. In a **broad** sense it also takes in organs of the vascular system, such as the spleen and the heart, and the endocrine system. One anatomist argued the word should be dropped from the official terminology altogether, a rigorous definition being so hard to write. The committees kept it, and under *Splanchnologia* they list the **digestive, respiratory, urogenital and endocrine** systems — which is the practical answer.

A viscus is defined anatomically as an organ with or without a cavity, always surrounded by, and if hollow lined by, special layers. Hollow viscera typically have three tunics — serous, muscular and mucous — and lie in relation to the peritoneal, pleural and pericardial sacs. Those sacs are a topic of their own, covered in our guide to the body cavities and the four serous sacs. The single largest species difference in this branch is the ruminant stomach, which has **four** chambers — the **rumen, reticulum and omasum**, which together make up the **forestomach**, and the **abomasum**, which is the true glandular stomach. It has its own guide to how the rumen, reticulum, omasum and abomasum divide the work.

07 Angiology: heart, vessels and lymphatics

Angiology treats the cardiovascular system as a closed system of connecting tubes with the heart as the central pump, circulating blood through arteries, capillaries and veins, and it includes the lymphatic system as the drainage half of the same arrangement. What travels in it is the branch's justification: nutrients, blood gases, enzymes, electrolytes, vitamins, hormones, metabolic products, heat, immune components, water and the blood cells themselves.

Two numbers from this branch are worth carrying, because both are species-dependent in a way that matters clinically. **Blood volume** is 6–8 per cent of body weight in the domestic animals — with the cat the single exception at about **4 per cent**, which is the reason cats are more susceptible to anaemia than other species. And the time a blood cell needs to make one circuit of the body is roughly **30 seconds in a large animal, 15 seconds in a medium-sized one and 7 seconds in a cat**.

Two exam traps in one branch

The lymphatic system is part of angiology even though nothing pumps it, and the spleen and thymus are usually taught here rather than under splanchnology. If a question asks you to place them, say which classification you are using and why — the sources genuinely differ.

08 The nervous system, the sense organs and the skin

The last three NAV headings are usually taught late in the year, and they are where structural anatomy hands over most directly to clinical work.

Systema nervosum

The nomenclature divides it exactly as a course does: the **central** nervous system, the **peripheral** nervous system, and the **autonomic** nervous system. Anatomy's job here is the map — where the tracts run, which nerve supplies which muscle, where a root leaves the cord. What you do with the map is a different skill, and the first piece of it is deciding whether a deficit sits above or below the final motor neuron: our guide to reading upper against lower motor neuron signs is where that begins.

Organa sensuum

The sense organs, in the nomenclature's own order: the organ of vision with the accessory structures of the eye, the vestibulocochlear organ with its internal, middle and external divisions, the organ of smell, the vomeronasal organ, and the organ of taste. The vomeronasal organ is the one students forget and the one that most obviously separates a veterinary course from a human one.

Integumentum commune

The common integument is skin and everything made out of it: hair, horn, the digital and metacarpal pads (*tori*), the claw or hoof, the glands of the skin, and the mammary gland. The idea to take away is that **the hoof is skin**. It is not a separate structure bolted on to the end of a limb; it is the integument, heavily specialised, which is why our guide to the horse's foot and distal limb spends as long on the layers as on the bones.

09 Histology and embryology: the other two depths

These two are depths rather than NAV headings, but most curricula teach them as subjects with their own exams, so they belong on any honest map.

Histology

Histology is microscopic anatomy taught in its own right: the tissue types, how each is recognised down a microscope, and how the organs are built out of them. It has a specific veterinary problem that nobody warns students about. Because good veterinary atlases are scarcer than human ones, students rely heavily — sometimes exclusively — on atlases of *human* histology. There are real similarities, which is why it works at all; there are also real differences, and those are rarely covered in a book written for human medicine. If you are learning slide recognition from a human atlas, know that is what you are doing.

Embryology

Embryology, as it applies to domestic animals, is concerned with the sequential stages of embryonic and foetal development, beginning with fertilisation. It draws on cell biology, genetics and biochemistry to explain how a body plan is built, and it earns its place in an anatomy course for a blunt reason: a great many adult arrangements are only explicable as the record of how they formed. Remember that it sits *inside* developmental anatomy rather than being the same thing — embryology stops at birth, developmental anatomy does not.

10 What “all species” actually means here

Veterinary anatomy deals mainly with the domestic mammals, and it is worth seeing the list with its binomials once, because those names appear in the literature you will be asked to read.

SPECIES	BINOMIAL AS THE NOMENCLATURE GIVES IT	WHERE IT MOST UPSETS AN EXPECTATION FORMED ON THE DOG
Dog	<i>Canis lupus f. familiaris</i>	The species both figures on this page show, and the one general-anatomy chapters usually describe first
Cat	<i>Felis sylvestris f. catus</i>	Blood volume about 4% of body weight against 6–8% in the others
Pig	<i>Sus scrofa f. domestica</i>	A single-chambered stomach, but with a diverticulum sitting over the fundus; four digits, with the third and fourth carrying the load
Cattle	<i>Bos primigenius f. taurus</i>	A stomach of four chambers — rumen, reticulum, omasum, abomasum — of which the first three are the forestomach; and horn, which is specialised skin
Sheep	<i>Ovis ammon f. aries</i>	Grouped with cattle for the stomach, but not identical: S4 sacral vertebrae where cattle and goats have S5
Goat	<i>Capra aegagrus f. hircus</i>	S5 like cattle, unlike the sheep; and a small-ruminant stomach that gives the abomasum 13% of its volume against the ox's 7%

SPECIES	BINOMIAL AS THE NOMENCLATURE GIVES IT	WHERE IT MOST UPSETS AN EXPECTATION FORMED ON THE DOG
Horse	<i>Equus przewalskii f. caballus</i>	The third metacarpal (cannon) bone is the only one that carries a digit; the second and fourth survive as the splint bones
Chicken	<i>Gallus gallus f. domestica</i>	The usual poultry specimen — and the point at which mammalian generalisations stop

That last row is a warning, not a footnote. Nearly everything on this page is written about mammals, and a bird is not a small mammal with feathers: the differences reach the skeleton, the respiratory system and the urogenital tract. Our guide to how bird bodies differ from mammal bodies exists because those differences are systematic rather than incidental.

Species comparison is a subject in its own right, and this page deliberately does not try to be it: for side-by-side contrasts across seven domestic species, use our seven-species comparative anatomy reference.

11 The language: why the names are Latin

Two rules will get you through most captions.

The terms are Latin, and they may be translated. The NAV's vocabulary is Latin, and authors are free to use close English equivalents, giving the Latin only where a translation would be doubtful or no handy English word exists. Occasionally a second, older and unofficial term is kept alongside because it is too deeply rooted in clinical use to be removed by decree. That is why you will meet the same structure under two names and neither is wrong. If the roots themselves are the obstacle, our guide to the Latin and Greek roots anatomical names are built from takes them apart.

Direction is defined against a standard position, which for a quadruped is the animal standing square and alert — and which is not the human anatomical position. The practical consequence is that *anterior*, *posterior*, *superior* and *inferior*, all of which are used freely in human anatomy, have very different connotations in a quadruped and are best avoided except for a few specific applications in the head. Use cranial and caudal along the trunk, rostral within the head, dorsal and ventral, medial and lateral, and proximal and distal in the limbs. The full set, with the planes, is laid out in our guide to planes, sections and how to read a veterinary atlas.

12 Why the map matters once you are in the clinic

It is fair to ask whether any of this classification survives contact with a real animal. Three places where it does.

It decides which resource answers your question. Regional anatomy is one of the foundations of clinical practice precisely because a clinician meets structures in the order the region presents them, not in the order a system lists them. Reaching for a systematic text when the question is *what will I cut through* wastes an evening; reaching for a regional one when the question is *where does this vessel go* wastes the same evening in the other direction.

It decides what a term means. Surgical anatomy, radiographic anatomy and surface anatomy are regional anatomy with an aim attached — so a “surgical anatomy” chapter will be organised by approach, and will assume you already know the systematic material it skips.

It decides where a fact is filed. Take one topic: the stifle joint of the dog. Its depth is gross anatomy; on the systematic map it is arthrology, so it sits with joint types, synovial structure and ligaments; on the regional map it is in the hindlimb, next to the muscles that cross it and the nerves at risk in an approach. Both entries describe the same joint, and a student who does not know that has two disconnected sets of notes for one structure.

A test you can run on any topic

Name the topic, then answer three questions in order: **how close am I looking** (gross, microscopic, developmental), **which map am I on** (systematic or regional), and **which heading owns it**. If you can answer all three you can open almost any anatomy text and know where to look; if you cannot answer the third, you have found the gap in your notes.

13 How to use these notes

This page is a map, not a course. Use it as a switchboard.

Start with the two axes. Read the first three sections until the depth-and-map split is automatic. Everything else on this page, and most of the confusion in a first-year syllabus, is downstream of it.

Then go branch by branch. The table above links out wherever we already have a full guide. If you want the systems rather than the branches, the systems reference is the place; for one species end to end, take the cat, the horse or cattle guide.

Then practise retrieving it. Reading a map is not learning it. If revision technique is the problem rather than the material, our evidence-based guide to how to study veterinary anatomy and actually remember it is built on the published research rather than on habit.

Everything we publish on this subject sits in the anatomy articles archive, and the textbooks these notes are built from — along with the rest of the collection — are in the veterinary anatomy books library.

14 Test yourself

Eighteen questions across every section above. Cover the answers first — looking at them is not the same as retrieving them, and only one of the two is revision.

1 What does the word *anatomy* literally mean, and what does that tell you about the method the subject grew out of?

ANSWER It is Greek for **cutting apart**. Dissection is the traditional method of anatomy, and the subject is named after it.

2 Name the seven domestic mammals veterinary anatomy is mainly written about, and the usual bird.

ANSWER Dog, cat, pig, cattle, sheep, goat and horse; the chicken is the usual poultry specimen.

3 A topic is described as “gross anatomy”. Does that tell you whether it is on the systematic or the regional map?

ANSWER No. **Depth** and **map** are independent. Gross anatomy describes how close you are looking; it says nothing about how the material is arranged.

4 What is the difference between developmental anatomy and embryology?

ANSWER Embryology sits inside developmental anatomy. Developmental anatomy covers the stages from conception through birth, youth and maturity to old age; classic embryology confines its attention to the unborn.

5 Microscopic anatomy taught as a subject in its own right is called what?

ANSWER Histology.

6 Which of the two maps groups organs that are closely related in function, and what is the unit it produces?

ANSWER **Systematic anatomy**; the unit is the body system — digestive, cardiovascular and so on.

7 Why does regional anatomy have to be taught separately for each species, when systematic anatomy can be taught comparatively?

ANSWER Because regional anatomy is about the form and relationships of everything present in one part of the body, and matters of detail that differ between species are exactly what a clinician needs. Systematic anatomy lends itself to a comparative approach; regional detail does not.

8 Surgical anatomy, radiographic anatomy and surface anatomy — are these separate branches?

ANSWER No. They are **regional anatomy** pursued with a particular aim, and their meanings overlap.

9 What does NAV stand for, and what is it for?

ANSWER **Nomina Anatomica Veterinaria** — the internationally agreed anatomical vocabulary, introduced in 1968 and revised since, created to end the superfluity of competing terms.

10 List the NAV headings that make up systematic anatomy, in order.

ANSWER *Osteologia, Arthrologia, Myologia, Splanchnologia, Angiologia, Systema nervosum, Organa sensuum, Integumentum commune* — preceded by *Regiones corporis*, the body regions.

11 Your syllabus lists “aesthesiology” as a branch and your textbook has no such chapter. What has happened?

ANSWER The material is there, filed under two separate headings: *Organa sensuum* (the sense organs) and *Integumentum commune* (the skin and its derivatives). The word appears in none of the four standard references used for these notes.

12 Give the older name for arthrology.

ANSWER **Syndesmology**. One classical text heads the chapter “General syndesmology (arthrology)”, so the two are explicitly the same branch.

13 Why does a bone count as an organ rather than as a piece of mineral?

ANSWER Because it is made of bone tissue sheathed by endosteum and periosteum, contains marrow, and has its own blood vessels and nerves. Those components together are what classify it as an organ.

14 A joint has a cavity containing synovial fluid. What is the general class, and what is the class it is *not*?

ANSWER It is a **diarthrosis** — a true or synovial joint. It is not a **synarthrosis**, which is a continuous union with no gap, whether fibrous (syndesmosis, suture, gomphosis) or cartilaginous (synchondrosis).

15 Which is the passive part of the locomotor system and which the active, and name the two morphological classes of muscle tissue.

ANSWER The skeleton is passive, the musculature active. The two classes are **smooth** muscle and **striated** muscle, the latter dividing into skeletal and cardiac.

16 Under the nomenclature, which four systems are listed under *Splanchnologia*?

ANSWER Digestive, respiratory, urogenital and endocrine. A narrower traditional reading takes only the digestive, respiratory, urinary and genital systems; a broader one also pulls in the spleen, the heart and the endocrine glands.

17 A cat and a similarly sized dog both lose the same volume of blood. Why is the cat in more trouble, and what is the second figure that goes with it?

ANSWER Blood volume is about **4 per cent** of body weight in the cat against 6–8 per cent in the other domestic animals, so the same volume is a larger fraction of the total. One circuit of the body takes a blood cell about 7 seconds in a cat, 15 in a medium-sized animal and 30 in a large one.

18 Which NAV heading owns the hoof, and why is that not as odd as it sounds?

ANSWER *Integumentum commune*. Hoof, claw, horn, foot pads, skin glands and the mammary gland are all specialisations of the common integument — the hoof is skin, not a separate structure attached to a limb.

15 Veterinary anatomy notes — frequently asked questions

What are the branches of veterinary anatomy?

The nomenclature files systematic anatomy under eight headings: *Osteologia* (bones), *Arthrologia* (joints), *Myologia* (muscles), *Splanchnologia* (viscera), *Angiologia* (heart, vessels and lymphatics), *Systema nervosum*, *Organa sensuum* (sense organs) and *Integumentum commune* (skin and its derivatives), preceded by *Regiones corporis*, the body regions. Syllabus lists usually print seven and fold the last two into one word. Histology and embryology are usually taught alongside them, although they are depths rather than headings.

What is the difference between systematic and regional anatomy?

Systematic anatomy studies groups of organs related in function — the body systems — and follows each one wherever it goes in the animal. Regional, or topographic, anatomy takes one part of the body and studies everything in it, whatever system it belongs to. Systematic suits comparison between species and is easier to learn first; regional pays less attention to function but is what a clinician actually meets, and has to be given species by species.

Is veterinary anatomy the same as human anatomy?

The principles and much of the vocabulary carry across, and that is why a human atlas is usable at a pinch. What does not carry across is the detail, and the detail is the subject: seven domestic mammals plus poultry differ in dentition, limb structure, stomach design and

reproductive anatomy. Direction words differ too — *anterior*, *posterior*, *superior* and *inferior* mean something different in a quadruped and are largely avoided outside the head.

What is the difference between gross anatomy and histology?

Only magnification. Gross anatomy is everything resolvable with the naked eye; histology is microscopic anatomy taught as its own subject, using light and electron microscopy to reach structures the eye cannot. The same bone appears in both, which is exactly why the two are taught in the same year.

What does NAV mean in anatomy?

Nomina Anatomica Veterinaria — the internationally agreed veterinary anatomical vocabulary, introduced in 1968 and revised repeatedly since. Its terms are Latin, and translation into readable English is permitted, which is why the same structure often has both a Latin and an English name. Where a clinical term is too entrenched to remove, the older word is sometimes kept alongside the official one.

Is aesthesiology still a branch of veterinary anatomy?

It is still a teaching term and you will meet it on course outlines, but it appears in none of the four standard references used for these notes. The nomenclature keeps the material as two separate headings: *Organa sensuum*, the sense organs, and *Integumentum commune*, the skin and everything made out of it. If a search of your textbook returns nothing, look under those two.

Which textbook should I use for veterinary anatomy?

For the systematic-then-regional structure this page describes, Dyce, Sack and Wensing is the standard and its first chapter is the source of the framing here. For a book that defines each branch before describing it, and that is a colour atlas as well as a text, König and Liebich is the better first reference. Both are in our anatomy books library, along with the nomenclature volume if you want the NAV headings first-hand.

Where should I start if I have just begun first year?

Learn the direction words before anything else, because every caption you read assumes them; our guide to planes and directions covers them. Then take one system end to end rather than sampling several, and use retrieval practice rather than re-reading from the start. The dissection room teaches the regional map faster than any book, so go prepared: what to expect in a first lab is written for exactly that.

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