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REVISION PAPER

Veterinary Anatomy MCQs and Exam Questions

100 MCQs + Model Answers

100 multiple-choice questions on veterinary anatomy, in six areas: terminology and orientation, osteology and joints, the viscera and body cavities, vessels, nerves and the motor system, and the species differences that separate the dog, cat, horse, ox, sheep, pig and bird.

PAGES	SECTIONS	FIGURES	TABLES	QUESTIONS
72	10	6	7	120

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04 Viscera and the body cavities — 18 questions
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07 Species differences — 25 questions
08 Written exam questions — 20, with model answers
09 What your score means, and what to do next
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IN SHORT

One hundred original multiple-choice questions on veterinary anatomy and twenty written exam questions with model answers, free and on the page — terminology and orientation, osteology, viscera, vessels, nerves and species differences. **Every question carries a labelled anatomical plate**, because anatomy is not asked in words alone. Each MCQ has four plausible options, one answer, **a worked explanation saying why**, and a link to the article on this site that teaches it; each written question is followed by the marking points an examiner would tick. The answer key is even and shuffled — 25 each of A, B, C and D, in no guessable order — so it cannot be gamed, and every question was checked mechanically against the page it cites before it shipped. There is a printable version with the answer key on its own page, so it can be covered and the paper sat properly.

KEY POINTS

1. **Every question has a picture.** Anatomy is not asked in words alone, and it is not learned in words alone. All 120 questions on this page carry a labelled plate from the article that teaches the answer, credited to the atlas it came from, so you can look at the structure while you decide.
2. **Two formats, because they fail differently.** The 100 multiple-choice questions ask you to recognise the right answer among four. The 20 written questions give you nothing to recognise: you produce the answer, and the marking points an examiner would tick are printed underneath. Students who score well on the first and badly on the second have a retrieval problem, not a knowledge problem.
3. **Every question has a reason, not a letter.** A key that says "C" tells you nothing you can use next time. Each answer here explains why the right option is right, and where a tempting wrong one goes wrong.
4. **Every question links to where the answer is taught.** 17 of our published articles sit behind these 100 questions, and the link under each answer goes to the one that covers it. A question you got wrong becomes something you can go and fix in the same click.
5. **A question we could not point at did not get written.** That is a real constraint and it shaped the paper: every answer had to be traceable to a phrase in a page of ours that is actually published, checked mechanically, before the question could ship.
6. **The answer key is even by construction, and shuffled.** 25 each of A, B, C and D. Written naturally the key came out 34/36/23/7, which a student could have exploited, so the options are rotated until it is flat. Flat is not enough on its own: the first attempt at that made the key run A, B, C, D straight down the paper, which is perfectly even and can be scored 100/100 without reading a word. The order is now shuffled as well, no letter repeats more than twice in a row, and the build fails if either property is lost.
7. **Six areas, and the sizes are honest.** Terminology 15 · osteology 17 · viscera 18 · vessels 13 · **nerves 12** · species differences 25. The counts follow what this site has published, not what a syllabus would ask for.
8. **Nerves is the smallest section, and the page says why.** Our neuroanatomy guide is still in draft, and a draft page cannot be linked — so rather than pad the section with questions nothing of ours can answer, it is 12 and it is labelled.
9. **Mark yourself by area, not just out of 100.** A total of 70 with 4 out of 17 on osteology is not a general anatomy problem; it is a bones problem, and it is fixable in an evening. The last section maps each weak area to the page to read.
10. **These are not past papers and a score is not a prediction.** They are original questions written to test material we teach, and the score bands are a study signal.

About the images

All six figures on this page are diagrams of our own, drawn for this article. **Nothing here is reproduced from a textbook**, which is deliberate: this page exists to publish original questions rather than to repackage anyone else's teaching material, and that applies to the pictures as much as to the words. Each card is credited beneath it, and the data behind each one is named.

01 How to use these 100 questions

These are 100 original multiple-choice questions on veterinary anatomy, written to be sat rather than read. Each has four options, one correct answer, and — the part that matters — **a worked explanation saying why**. A letter on its own teaches nothing.

They are grouped into six areas: terminology and orientation, osteology, viscera, vessels, nerves, and species differences. Work through one area at a time, or take all 100 as a mock. The last section tells you what a score in each area means and which page to read if it was poor.

How each question was built

Every question here had to clear four tests before it could ship. **One:** its answer had to be taught on a page of ours that is actually published — a draft page cannot be linked, so it cannot be used. **Two:** a phrase from the explanation had to be findable in that page, checked mechanically, so the question is traceable to the teaching it claims. **Three:** all four options had to be plausible, because a wrong option nobody would pick teaches nothing. **Four:** the answer key had to be even *and* shuffled — 25 each of A, B, C and D, in no order a reader can follow — so that it cannot be gamed.

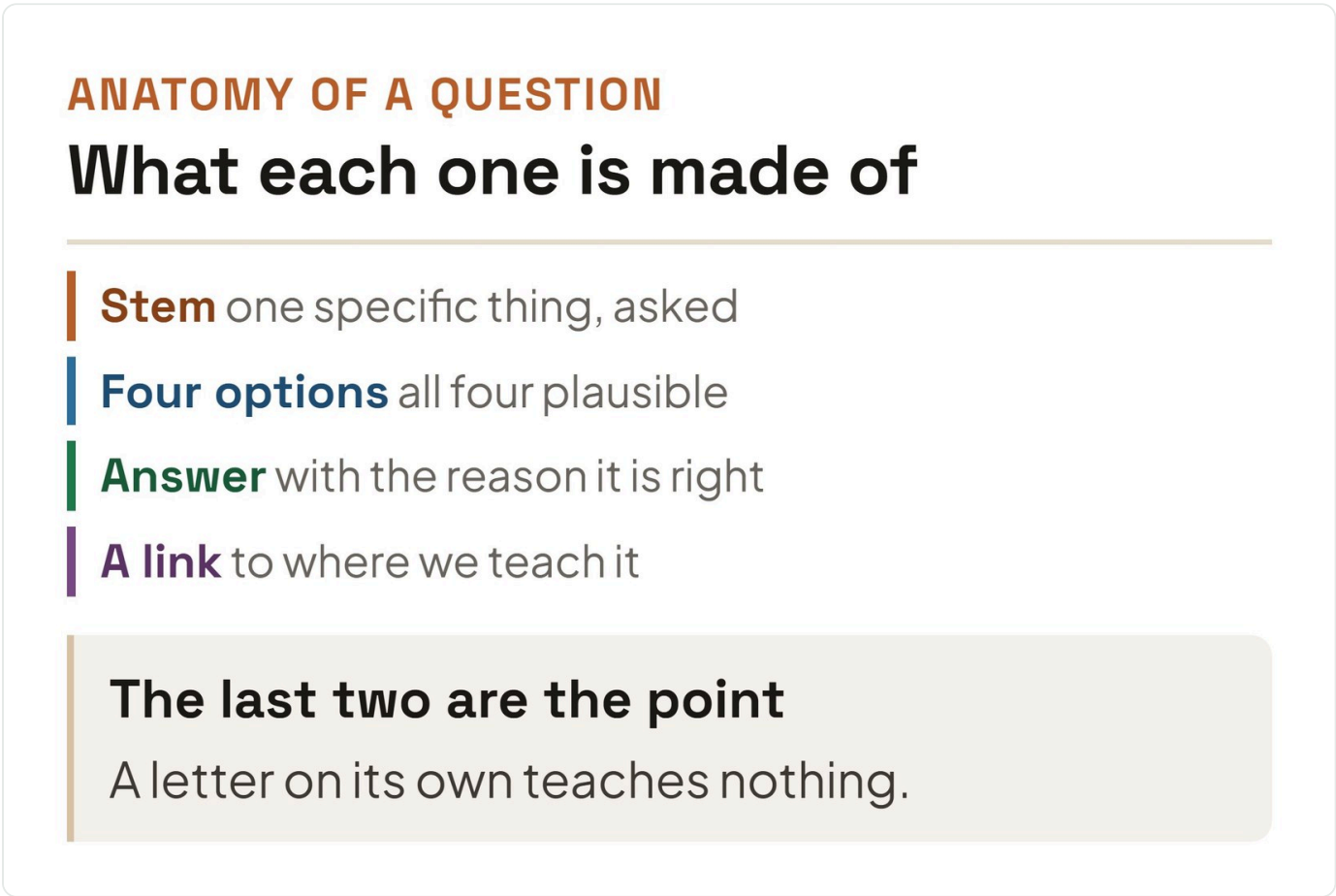


Fig 1 — What every one of these questions is made of Four parts, and the last two are the ones most question banks leave out. The stem asks something specific; four plausible options follow; the answer comes with **the reason it is the answer**; and a link says **where the material is taught**, so a question you got wrong turns into something you can go and fix.

Diagram — Vet-eBooks.com, drawn for this guide. The question shown is question 1 of this article.

How to sit them honestly

- **Cover the answer box before you read the options.** The explanation sits directly under each question so the reasoning is there when you want it — which also means it is there when you do not. Looking at an answer is not the same as retrieving it, and only one of the two is revision.
- **Write your answer down.** A letter you thought is not a letter you chose.
- **Mark the ones you guessed, even when you get them right.** A lucky guess is a gap.
- **Do the printable version if you want a real mock.** The condensed PDF is a practice sheet with the answer key on its own page, so it can be covered properly.

⛔ What these questions are not

- **They are not taken from any exam**, and they are not past papers. They are original questions written to test material we teach.
- **They are not taken or adapted from any question-bank book.** Every one was written from our own published articles.
- **A score is not a prediction.** The bands in The last section are a study signal, not a pass forecast.
- **They are anatomy questions.** Physiology, pharmacology and clinical medicine are not here.

Where the answers come from

Every question is answerable from an article on this site, and the link under each answer goes to the page that teaches it — 17 of them in all. That is a deliberate constraint rather than a convenience: a question we cannot point at is a question a reader cannot go and learn from, so it did not get written. If you want the whole subject rather than a test of it, our illustrated veterinary anatomy notes is the place to start.

One consequence is worth stating plainly. Some areas of anatomy are covered more deeply on this site than others, and the number of questions per area follows what is published rather than what a syllabus would ask for. **Nerves is the smallest section for that reason**, and it will grow when the neuroanatomy guide is published.

02 Terminology and orientation — 15 questions

This is the area that costs first-years the most marks for the least interesting reason: not because the anatomy is hard, but because the vocabulary is precise and looks as though it is not. There is one median plane and infinitely many sagittal ones; *rostral* exists only on the head; and below the carpus the words change. Get these wrong in an exam and the examiner cannot tell whether you knew the structure.

TERM	WHAT IT MEANS	THE TRAP
Median plane	The single plane dividing the body into equal right and left halves	There is exactly **one**. Parallel planes are sagittal, and there are infinitely many
Dorsal plane	Parallel to the back; the old “frontal” plane	Renamed because *frontal* describes a human forehead
Transverse plane	At right angles to the long axis of the body or of the part	Defined against the **part**, not against the ground
Rostral	Toward the nose	A **head term only**. There is no rostral end of a tail
Dorsal / palmar / plantar	The surfaces of the limb below the carpus and tarsus	Cranial and caudal stop at the carpus and tarsus
Anterior, posterior, superior, inferior	Human directional terms	In a quadruped they are restricted to certain structures of the **head**

ORIENTATION

Planes and directions

Median one only — sagittal are many

Dorsal the old "frontal" plane

Transverse across the part's long axis

Rostral toward the nose. Head only

Below the carpus dorsal and palmar

Anterior head structures only

Fig 2 — The orientation card, if you want to revise before you answer The four planes and the directional terms, with the two places students most often slip: there is only one median plane, and at the carpus and tarsus cranial and caudal become dorsal and palmar or plantar.

Diagram — Vet-eBooks.com, drawn for this guide. Data from our own guide to anatomical planes in animals.

1 **How many median planes does an animal have?**

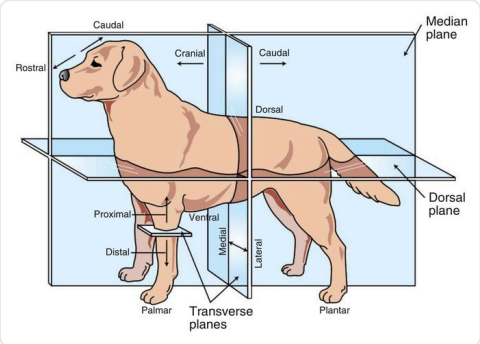


Image — Colville T, Bassert JM. Clinical Anatomy and Physiology for Veterinary Technicians, 4th ed. Elsevier — Fig. 1.1. Reproduced for educational reference.

A Infinitely many

B One per body region

C One

D Two — a left and a right

C There is exactly **one** median plane: the single plane that divides the body into equal right and left halves. Planes parallel to it are **sagittal**, and of those there are infinitely many. The common error is to use "midsagittal" as though it were a separate thing — it is just the median plane under another name.

Where this is taught: Anatomical Planes in Animals

2 **Older texts call it the frontal plane. What does veterinary nomenclature call it, and why was it renamed?**

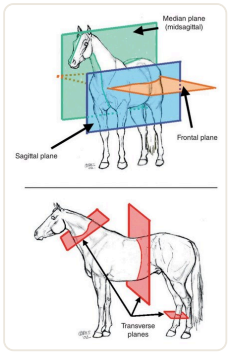


Image — Akers RM, Denbow DM. Anatomy and Physiology of Domestic Animals, 3rd ed. Wiley — Fig. 1.7. Reproduced for educational reference.

A The coronal plane, because it follows the coronary suture

B The horizontal plane, because it is parallel to the ground

C The transverse plane, because it cuts across the body

D The dorsal plane, because "frontal" refers to the plane of the human forehead

D It is the **dorsal plane**. The old name came from human anatomy, where the frontal plane is the plane of the forehead — a description that means nothing on a quadruped standing on four legs. Veterinary nomenclature renamed it after the surface it parallels.

Where this is taught: Anatomical Planes in Animals

3 **A section is taken at right angles to the long axis of a cannon bone. Which plane is it?**

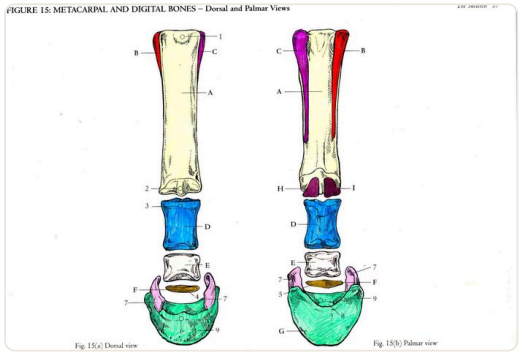


Image — Raynor M. The Horse Anatomy Workbook, Figure 15, Metacarpal and Digital Bones. Reproduced for educational reference; copyright remains with the original author and publisher.

A Dorsal

B Transverse

C Median

D Sagittal

B **Transverse**. The trap is that transverse is defined against the long axis of *the body or of the part* — not against the ground and not against the animal as a whole. A transverse section of a limb bone is at right angles to that bone, whatever angle the limb is held at.

Where this is taught: Anatomical Planes in Animals

4 **Below the carpus and the tarsus, which pair of directional terms replaces cranial and caudal?**

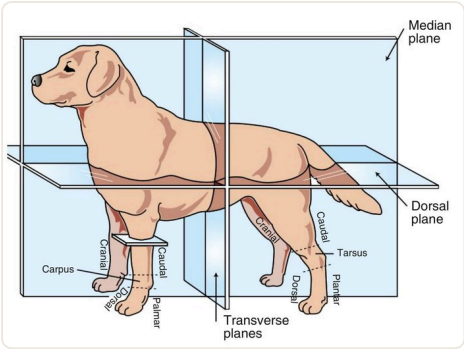


Image — Colville T, Bassert JM. Clinical Anatomy and Physiology for Veterinary Technicians, 4th ed. Elsevier — Fig. 1.1. Reproduced for educational reference.

A Superior and inferior

B Medial and lateral

C Dorsal and palmar or plantar

D Rostral and caudal

C **Dorsal and palmar** (forelimb) or **plantar** (hindlimb). The switch happens at the carpus and tarsus, and it catches people out constantly: the front of a dog's paw is its *dorsal* surface, not its cranial one.

Where this is taught: Anatomical Planes in Animals

5 **Which term means "toward the nose", and where may it be used?**

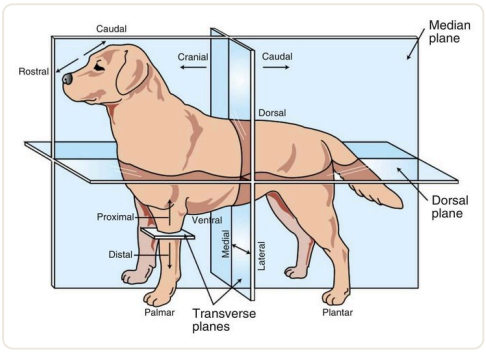


Image — Colville T, Bassert JM. Clinical Anatomy and Physiology for Veterinary Technicians, 4th ed. Elsevier — Fig. 1.1. Reproduced for educational reference.

A Anterior, on the head and neck

B Dorsal, on the head only

C Cranial, anywhere on the body

D Rostral, on the head only

D **Rostral**, and it is a **head term only**. There is no rostral end of a tail. Cranial means toward the head and is used on the body; rostral is used within the head, toward the nose.

Where this is taught: Anatomical Planes in Animals

6 **In a quadruped, where may “anterior”, “posterior”, “superior” and “inferior” still be used?**

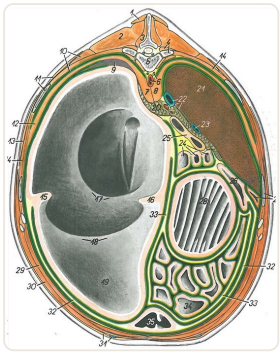


Image — Popesko P. Atlas of Topographical Anatomy of the Domestic Animals, Vol. II: Trunk, 6th ed. Saunders — Fig. 43. Reproduced for educational reference.

A Anywhere — they are synonyms for cranial, caudal, dorsal and ventral

B On the limbs only

C For certain structures of the head only

D In radiography only

C They are restricted to **certain structures of the head**. On the body you use cranial, caudal, dorsal and ventral. Using “anterior” for “cranial” on a dog is importing human terminology into an animal standing horizontally, and it is marked wrong.

Where this is taught: Anatomical Planes in Animals

7 **A radiographic view is named dorsopalmar. What does that tell you?**

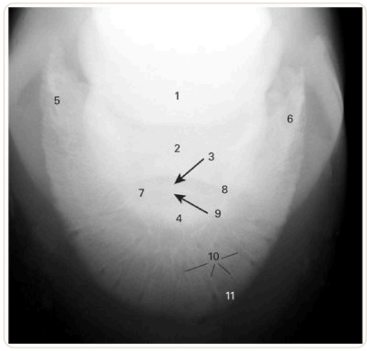


Image — Ashdown RR, Done SH. Clinical Anatomy of the Horse. Mosby/Elsevier — Fig 4.73, dorsopalmar view radiograph of distal phalanx. Reproduced for educational reference.

A The beam enters palmar and exits dorsally

B The plate is dorsal and the beam is palmar

C The limb is held in a dorsal plane

D The beam enters dorsally and exits palmar

D Views are named by the beam's **point of entry, then its point of exit**. So a dorsopalmar view has the beam entering the dorsal surface and leaving the palmar one. Read the name in that order and the view describes itself.

Where this is taught: Anatomical Planes in Animals

8 **A Greek-derived clinical term has up to four parts. In what order should you read it?**

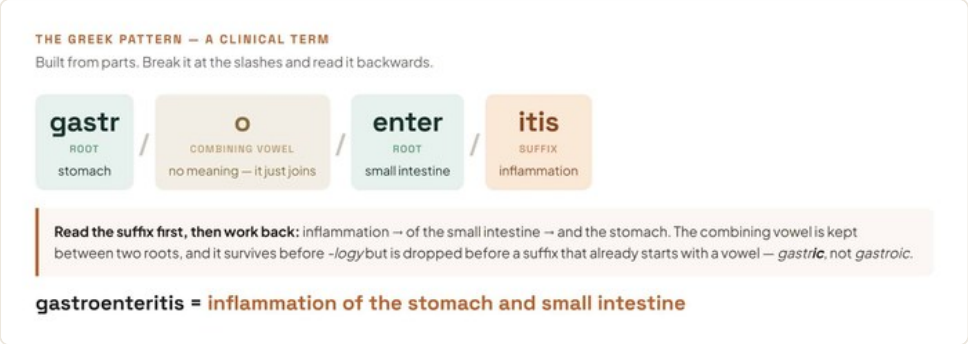


Diagram — Vet-eBooks.com, built for this guide. The word parts and the rules it illustrates are from Taibo A. Veterinary Medical Terminology Guide and Workbook, 2nd ed. Wiley.

A Root first, then the prefix, then the suffix

B The suffix first, then work backwards

C The combining vowel first, because it carries the sense

D Prefix first, then straight through to the end

B Read the **suffix first, then work backwards**. The suffix tells you what kind of thing the word is — a condition, a procedure, an inflammation — and the root then tells you what it happened to. The four parts are prefix, root, combining vowel and suffix.

Where this is taught: Veterinary Anatomy Terminology

9 **What does the combining vowel in a term such as *gastrology* contribute to its meaning?**

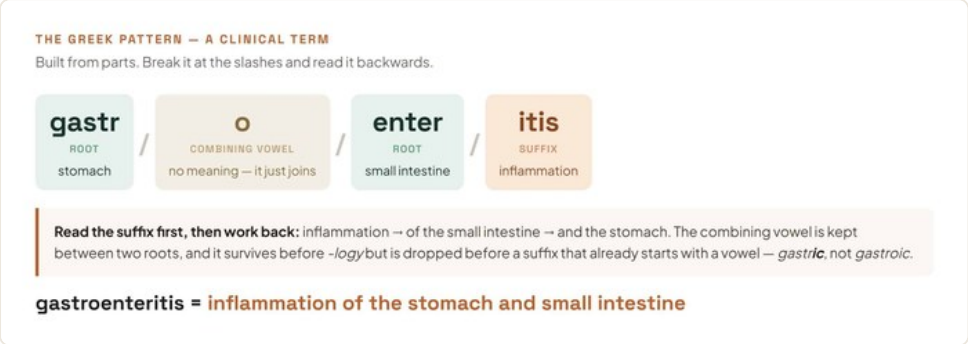


Diagram — Vet-eBooks.com, built for this guide. The word parts and the rules it illustrates are from Taibo A. Veterinary Medical Terminology Guide and Workbook, 2nd ed. Wiley.

A It links the term to a body system

B It marks the term as Greek rather than Latin

C Nothing — it exists only to make the word sayable

D It indicates a plural

C **Nothing.** The combining vowel carries no meaning at all; it exists only to make the word pronounceable. That is why dropping it never changes the sense — and it is dropped before a suffix that already begins with a vowel (*gastric*), kept before one that does not (*gastrology*), and always kept between two roots.

Where this is taught: Veterinary Anatomy Terminology

10 **In the muscle name *extensor carpi radialis*, what does the ending *carpi* signal?**

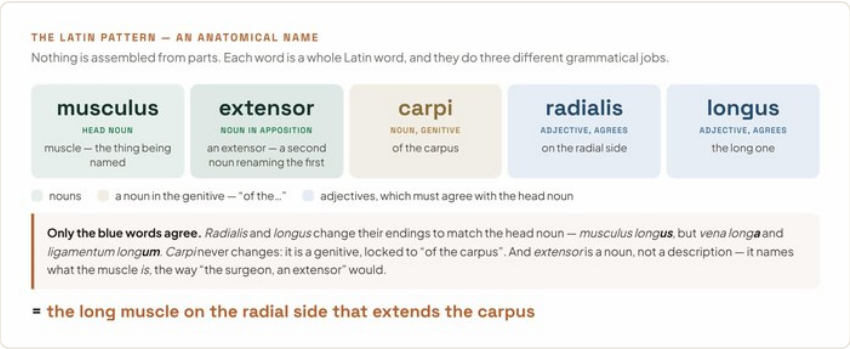


Diagram — Vet-eBooks.com, built for this guide. The word parts and the rules it illustrates are from Taibo A. Veterinary Medical Terminology Guide and Workbook, 2nd ed. Wiley.

A A genitive — "of the" carpus

B An adjective agreeing with extensor

C A diminutive

D A plural — more than one carpus

A It is a **genitive**: *carpi* means "of the carpus". Latin anatomical names are built as a head noun with modifiers — agreeing adjectives, genitive nouns, or a second noun renaming the first — and unlike a Greek clinical term there is nothing to break into prefix and suffix.

Where this is taught: Veterinary Anatomy Terminology

11 **Which statement best describes the division of labour between Latin and Greek in veterinary vocabulary?**



Diagram — Vet-eBooks.com, drawn for this guide. Regional terms and their definitions taken from Schaller O, Constantinescu GM (eds.). Illustrated Veterinary Anatomical Nomenclature, 4th ed. Thieme — the illustrated companion to the Nomina Anatomica Veterinaria.

A As a strong tendency, Latin names the parts and Greek describes what goes wrong

B Latin is anatomical and Greek is never used in anatomy

C The two are used interchangeably with no pattern

D Latin is used for animals and Greek for humans

A As a **strong tendency**, Latin names the parts and Greek describes what goes wrong. But it is a tendency and not a rule: the two are mixed, and the official Latin nomenclature itself contains Greek roots. Treat it as a first guess to be checked, not a law.

Where this is taught: Veterinary Anatomy Terminology

12 **Anatomy is traditionally divided into gross, microscopic and developmental. Which statement is correct?**

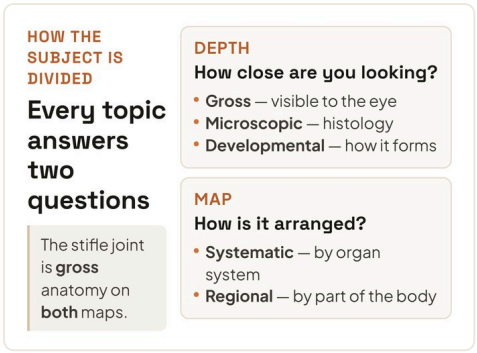


Diagram — Vet-eBooks.com, drawn for this guide. Data from Dyce, Sack and Wensing's Textbook of Veterinary Anatomy, 5th ed., ch. 1.

A Developmental anatomy stops at birth

B Microscopic anatomy taught in its own right is histology

C Developmental anatomy and embryology are the same subject

D Gross anatomy includes everything visible under a light microscope

B **Microscopic anatomy taught in its own right is histology.** The other trap in this list is the second and fourth options: developmental anatomy runs from conception to old age and is *broader* than embryology, which stops at birth.

Where this is taught: Veterinary Anatomy Notes

13 **What is the difference between systematic and regional anatomy?**

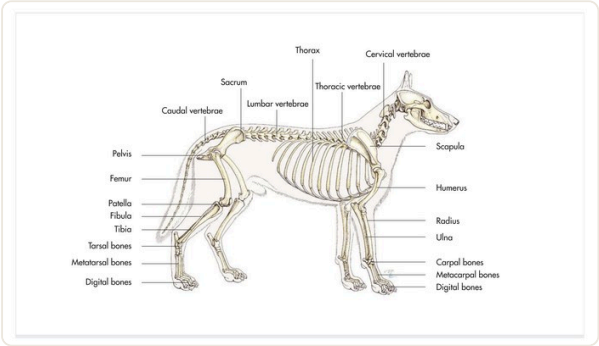


Image — König HE, Liebich H-G. Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas, 7th ed. Thieme — Fig. 1.26. Reproduced for educational reference.

A Systematic is gross; regional is microscopic

B There is no difference — they are two names for the same approach

C Systematic is for animals, regional is for humans

D Systematic follows a system; regional follows a place

D **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 it has to be taught species by species, which is why a regional course is longer.

Where this is taught: Veterinary Anatomy Notes

14 **Surface, applied, surgical and radiographic anatomy are best described as:**

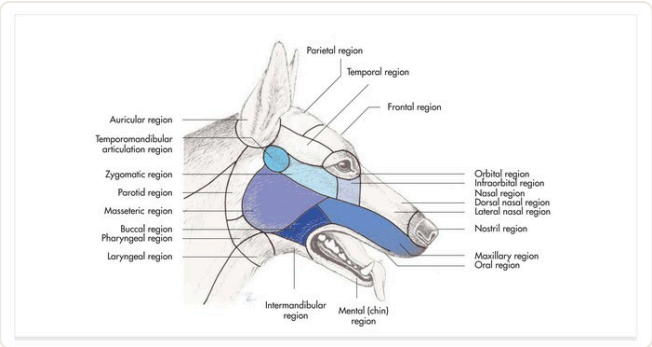


Image — König HE, Liebich H-G. Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas, 7th ed. Thieme — Fig. 20.1. Reproduced for educational reference.

A Four separate branches of the nomenclature

B Regional anatomy pursued with a particular aim

C Subdivisions of microscopic anatomy

D Modern replacements for systematic anatomy

B They are **regional anatomy pursued with a particular aim** — not separate subjects. The same regional knowledge is being put to a different use each time: to find a landmark through the skin, to plan an approach, to read a radiograph.

Where this is taught: Veterinary Anatomy Notes

15 **Which of these is *not* one of the branch names fixed by the anatomical nomenclature?**

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

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.

A Osteologia

B Splanchnologia

C Aesthesiology

D Angiologia

C **Aesthesiology.** It is a syllabus word rather than a textbook one and appears in none of the four standard references behind our notes; the material is filed under two headings instead — the sense organs, and the common integument. The nomenclature's branches are Osteologia, Arthrologia, Myologia, Splanchnologia, Angiologia, Systema nervosum, Organa sensuum and Integumentum commune.

Where this is taught: Veterinary Anatomy Notes

03 Osteology, joints and the skeleton — 17 questions

Formulae and counts are the most checkable material in anatomy, which is why they turn up in every written paper. They are also the material most often half-remembered: the dog's dental formula is not symmetrical, seven cervical vertebrae is conserved and almost nothing else is, and five digits was never the starting point.

SPECIES	PERMANENT DENTAL FORMULA	TOTAL	UPPER INCISORS
Dog	3–1–4–2 / 3–1–4–3	**42**	Present
Cat	3–1–3–1 / 3–1–2–1	**30**	Present
Horse	3–1–3(4)–3 / 3–1–3–3	**36–42**	Present

SPECIES	PERMANENT DENTAL FORMULA	TOTAL	UPPER INCISORS
Ox	0–0–3–3 / 3–1–3–3	**32**	None — a dental pad
Sheep	0–0–3–3 / 3–1–3–3	**32**	None — a dental pad
Goat	0–0–3–3 / 3–1–3–3	**32**	None — a dental pad
Pig	3–1–4–3 / 3–1–4–3	**44**	Present

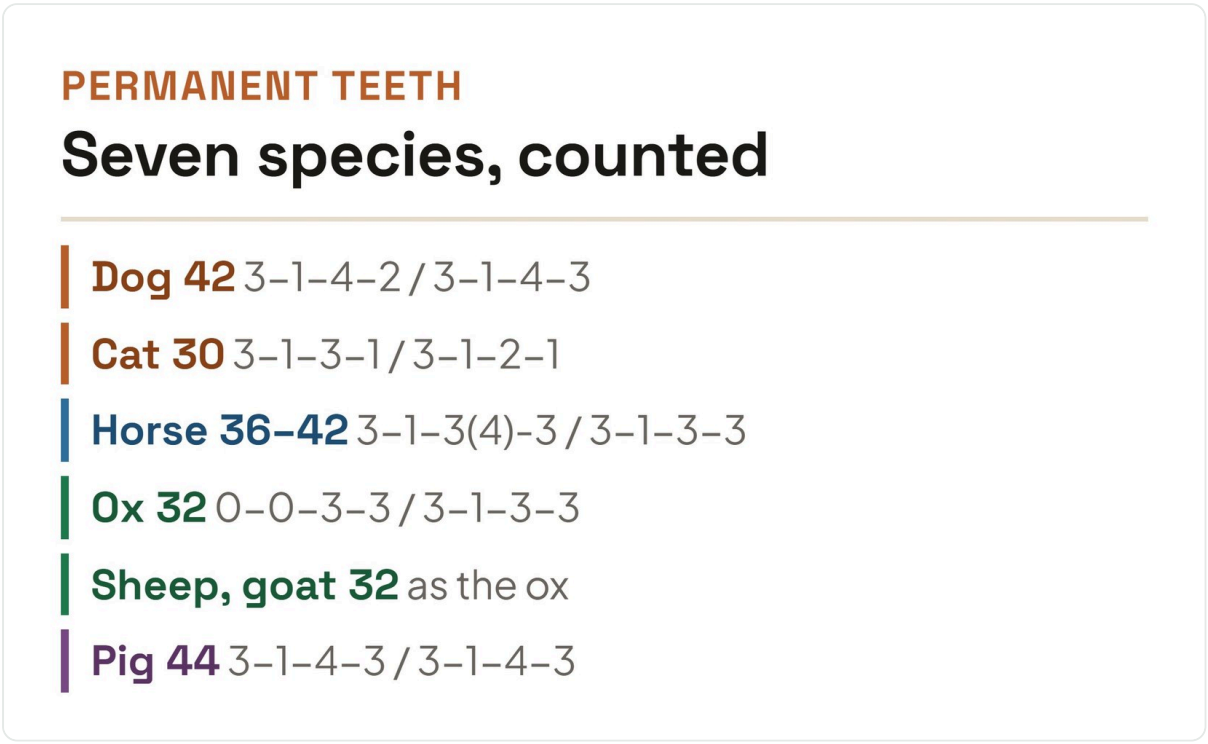


Fig 3 — The seven formulae, on one card The same seven formulae as the table beside it, in the form that fits on a screen. The pig has the most complete dentition at 44 and the cat the most reduced at 30; the ruminants are the ones with no upper incisors at all.

Diagram — Vet-eBooks.com, drawn for this guide. Data from our own comparative anatomy guide, which tabulates all seven species.

16 **Why is a bone described as an organ rather than as a tissue?**

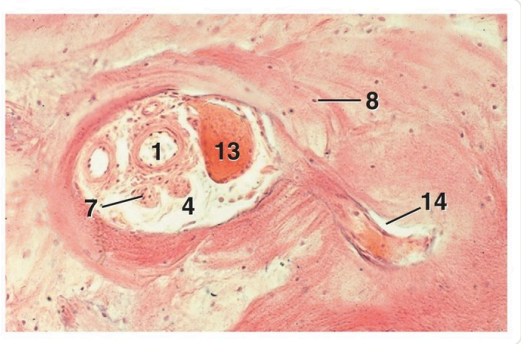


Image — Bacha WJ, Bacha LM. Color Atlas of Veterinary Histology, 3rd ed. Wiley-Blackwell — Fig. 5.19. Reproduced for educational reference.

A Because it contains bone tissue, periosteum and endosteum, marrow, and its own vessels and nerves

B Because it can be dissected out whole

C Because it belongs to the skeletal system

D Because it is hard and tissues are soft

A An organ is several tissues working together, and a bone qualifies: **bone tissue, periosteum and endosteum, marrow, and its own blood vessels and nerves**. Calling it a tissue is the commonest first-year slip — bone *tissue* is one of the things inside the organ.

Where this is taught: Veterinary Anatomy Notes

17 **Roughly what proportion of a bone is mineral, and what does that explain?**

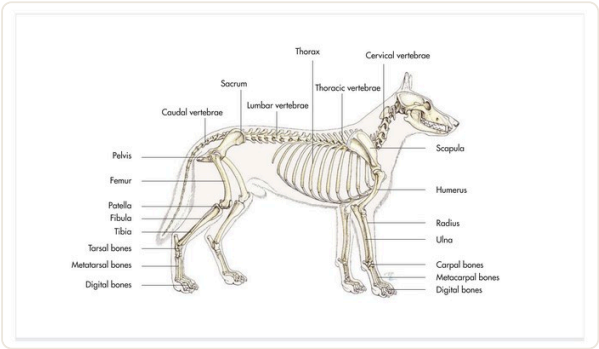


Image — König HE, Liebich H-G. Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas, 7th ed. Thieme — Fig. 1.26. Reproduced for educational reference.

A 90–95%, which is why bone is brittle

B 10–20%, which is why bone is flexible in life

C 30–40%, which is why bone bleeds

D 60–70%, which is why bone does not change after death the way soft tissue does

D About **60–70% mineral**. That is the reason a skeleton survives when everything else has gone, and the reason osteology is the one branch you can still study from a specimen prepared a century ago.

Where this is taught: Veterinary Anatomy Notes

18 **Joints are first split on a single question. What is it?**

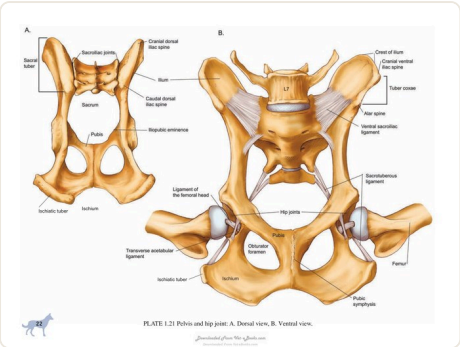


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 1.21 (p. 22). Reproduced for educational reference; copyright remains with the original authors and publisher.

A Whether they contain cartilage

B Whether they move

C Whether there is a gap

D Whether they are in the limb or the trunk

C **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. Movement follows from the structure; it is not the primary criterion.

Where this is taught: Veterinary Anatomy Notes

19 **A tooth is held in its socket by the periodontal ligament. What kind of joint is that?**

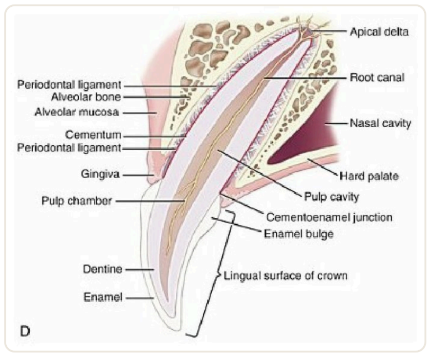


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 7.7D, diagrammatic section through a superior canine. Reproduced for educational reference.

A A gomphosis

B A synchondrosis

C A suture

D A symphysis

A A **gomphosis** — a fibrous synarthrosis, the peg-in-socket joint. It is worth knowing because it is the one joint most students meet without realising it is a joint at all: a tooth is not fused to the jaw, it is articulated with it.

Where this is taught: Canine Skull & Dental Anatomy

20 **What is the permanent dental formula of the dog, and how many teeth does it give?**

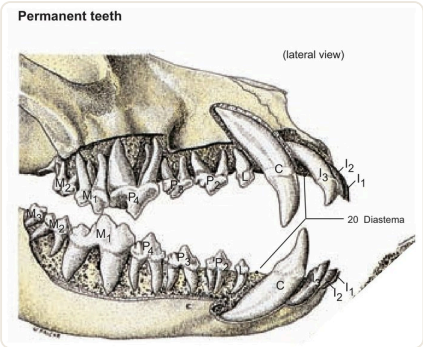


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. — plate: permanent teeth, lateral view. Reproduced for educational reference.

A 2 × (I 3/3, C 1/1, P 4/4, M 2/3) = 42

B 2 × (I 3/3, C 1/1, P 4/4, M 3/3) = 44

C 2 × (I 3/3, C 1/1, P 3/2, M 1/1) = 30

D 2 × (I 3/3, C 1/1, P 3/3, M 3/3) = 40

A **2 × (I 3/3, C 1/1, P 4/4, M 2/3) = 42.** The asymmetry is the thing to hold: the dog has *four* premolars in each quadrant but *two* upper and *three* lower molars. 44 is the pig; 30 is the cat.

Where this is taught: Canine Skull & Dental Anatomy

21 **Which teeth have no deciduous precursor in the dog?**

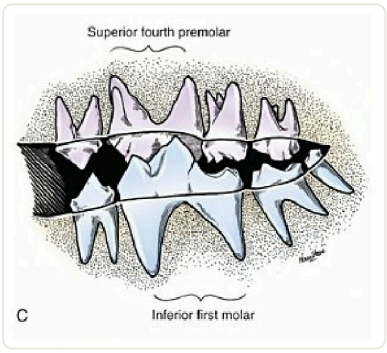


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 7.7C, bite of the shearing teeth, medial view. Reproduced for educational reference.

A The canines

B The incisors

C P1 and every molar

D The carnassials

C **P1 and every molar.** The deciduous formula is 2 × (I 3/3, C 1/1, P 3/3) = 28, and the missing entries are exactly those. It matters clinically: a retained "deciduous molar" is a contradiction in terms, so a tooth in that position is something else.

Where this is taught: Canine Skull & Dental Anatomy

22 **Which two teeth are the carnassials of the dog?**

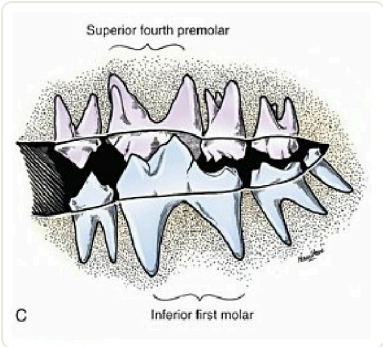


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 7.7C, bite of the shearing teeth, medial view. Reproduced for educational reference.

A Upper M1 and lower M2

B Upper P4 and lower M1

C Upper C and lower C

D Upper P3 and lower P4

> **B** **Upper P4 and lower M1.** They shear past one another like scissor blades — the definition of a secodont carnivore. The upper P4 has **three roots** and is the strongest tooth of the upper jaw, which is why it is the one that fractures on bones and the one that takes the longest to extract.

Where this is taught: Canine Skull & Dental Anatomy

23 **Working from outside in, what is the correct order of the tissues of a tooth?**

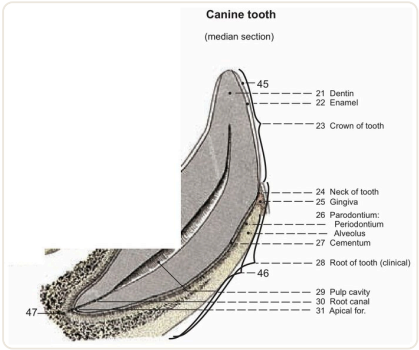


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. — plate: canine tooth, median section. Reproduced for educational reference.

A Enamel throughout, with pulp immediately beneath it

B Dentine over the crown, enamel in between, cementum in the centre

C Cementum over the crown, enamel over the root, pulp in between

D Enamel over the crown and cementum over the root, dentine in between, pulp in the centre

> **D** **Enamel over the crown, cementum over the root, dentine in between, pulp in the centre.** Enamel and cementum never cover the same surface: the crown is the part covered by enamel, the root the part covered by cementum, and where the two coverings meet is the neck.

Where this is taught: Canine Skull & Dental Anatomy

24 **Which foramen is the landmark for a maxillary nerve block in the dog?**

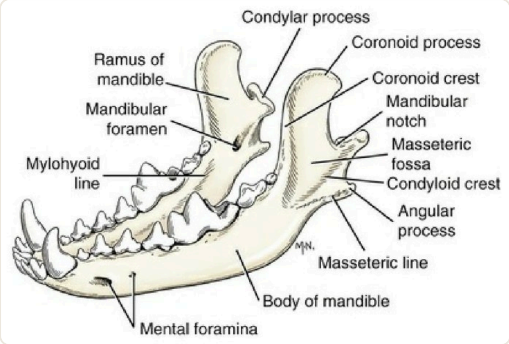


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 4.38, left and right mandibles. Reproduced for educational reference.

A The infraorbital foramen
B The palatine foramen
C The mental foramen
D The mandibular foramen

A The **infraorbital foramen**. The three that matter are worth learning as a set, because they are the nerve-block map: **infraorbital** for the maxillary block, **mental** for the mental block, and **mandibular** for the inferior alveolar block.

Where this is taught: Canine Skull & Dental Anatomy

25 **The canine skull is usefully described as two boxes joined by the face. Which bones make the braincase?**

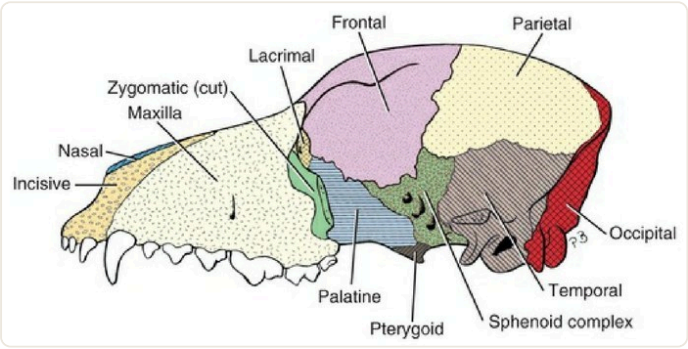


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 4.3, bones of the skull, lateral aspect. Reproduced for educational reference.

A Frontal, maxilla, zygomatic and temporal
B Occipital, atlas, axis and sphenoid
C Incisive, maxilla, nasal, palatine and mandible
D Occipital, parietal, temporal, frontal, sphenoid and ethmoid

D The braincase is **occipital, parietal, temporal, frontal, sphenoid and ethmoid**. The other list — incisive, maxilla, nasal, palatine, mandible — is the facial skeleton, the part that carries the teeth. Splitting the skull that way makes the foramina findable instead of memorised.

Where this is taught: Canine Skull & Dental Anatomy

26 **Every tetrapod limb has three segments. What are they, in order from the body outwards?**

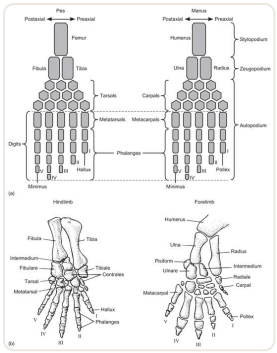


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 9.23, basic organization of the fore- and hindlimbs, after Smith and Jarvik. Reproduced for educational reference.

A Zeugopodium, stylopodium, autopodium

B Stylopodium, autopodium, zeugopodium

C Autopodium, zeugopodium, stylopodium

D Stylopodium, zeugopodium, autopodium

D **Stylopodium, zeugopodium, autopodium** — humerus or femur; radius and ulna or tibia and fibula; then the hand or foot. Almost all of the species variation is packed into the third one, which is why the humerus is recognisably the same bone in every domestic species and the foot is not.

Where this is taught: Comparative Veterinary Anatomy

27 **How many digits did the earliest tetrapods have?**

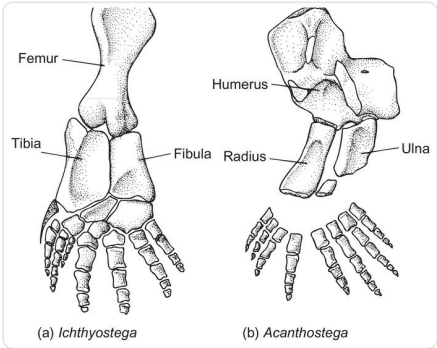


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 9.24, polydactylous limbs of the earliest tetrapods, after Coates and Clark. Reproduced for educational reference.

A Seven and eight — five is an early settlement, not the starting point

B Three, which the horse has retained

C Five — the number every land vertebrate started from

D Four, with a fifth appearing later

A **Seven and eight.** Five was never the starting point — it is an early settlement, and the domestic species have been subtracting from it ever since. Getting this the wrong way round makes digit reduction look like loss from a perfect original rather than one more edit.

Where this is taught: Comparative Veterinary Anatomy

28 **Which vertebral count is the most conserved across mammals?**

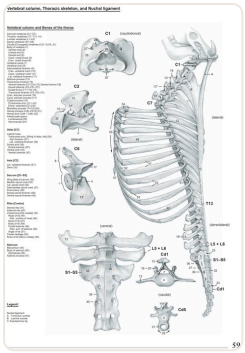


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Vertebral column, thoracic skeleton and nuchal ligament. Reproduced for educational reference.

A Thoracic

B Lumbar

C Sacral

D Cervical

D **Cervical — seven**, in almost every mammal from the giraffe to the mouse. Thoracic, lumbar and sacral counts are not conserved at all: the horse has 18 thoracic vertebrae to the dog's 13. If you remember one vertebral number, remember that the neck is the one that does not vary.

Where this is taught: Comparative Veterinary Anatomy

29 **In the horse's foot, what suspends the coffin bone (P3)?**

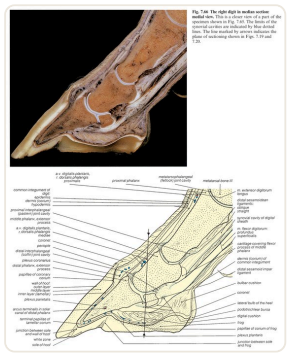


Image — Ashdown RR, Done SH. Color Atlas of Veterinary Anatomy, Vol. 2: The Horse, 2nd ed. Elsevier — Fig 7.66, the right digit in median section: medial view. Reproduced for educational reference.

A It hangs from the navicular bone

B It is supported by the digital cushion

C It rests directly on the sole

D It is suspended from the inside of the wall by interlocking lamellae

D It is **suspended from the inside of the hoof wall by interlocking lamellae** and does *not* rest on the sole. That single fact is the whole of laminitis: destroy the lamellar attachment and the bone is no longer held up by anything.

Where this is taught: Horse Hoof Anatomy

30 **The hoof wall has three layers. Which one holds a nail?**

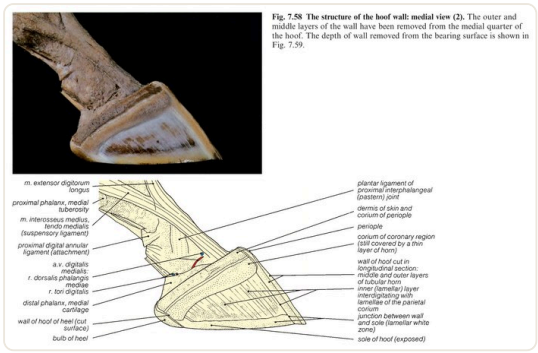


Fig. 7.58 The structure of the hoof wall: medial view (2). The outer and middle layers of the wall have been removed from the medial quarter of the hoof. The depth of wall removed from the bearing surface is shown in Fig. 7.59.

Image — Ashdown RR, Done SH. Color Atlas of Veterinary Anatomy, Vol. 2: The Horse, 2nd ed. Elsevier — Fig 7.58, the structure of the hoof wall: medial view (2). Reproduced for educational reference.

A The middle tubular horn

B The inner lamellar layer

C All three equally

D The outer periople

A Only the **middle layer — the tubular horn** — is thick enough to hold a nail. That is why the white zone matters to a farrier: it marks where the wall ends and the sole begins, and therefore where the nail must go.

Where this is taught: Horse Hoof Anatomy

31 **Which bones does the deep digital flexor tendon pass over to reach P3, and why does that matter?**

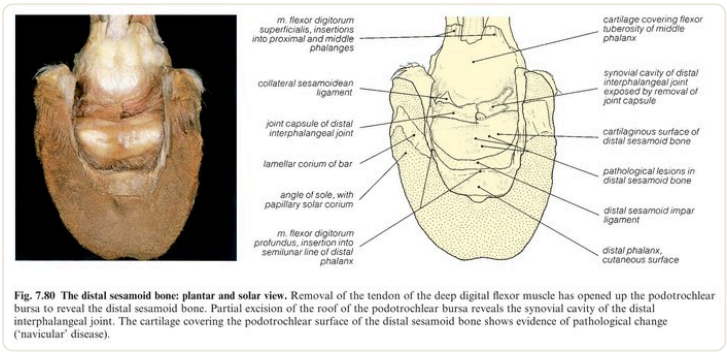


Fig. 7.80 The distal sesamoid bone: plantar and solar view. Removal of the tendon of the deep digital flexor muscle has opened up the podotrochlear bursa to reveal the distal sesamoid bone. Partial excision of the roof of the podotrochlear bursa reveals the synovial cavity of the distal interphalangeal joint. The cartilage covering the podotrochlear surface of the distal sesamoid bone shows evidence of pathological change ('navicular' disease).

Image — Ashdown RR, Done SH. Color Atlas of Veterinary Anatomy, Vol. 2: The Horse, 2nd ed. Elsevier — Fig 7.80, the distal sesamoid bone: plantar and solar view. Reproduced for educational reference.

A Over the proximal sesamoids — it explains fetlock injury

B Over the navicular bone — it explains why the tendon features in both navicular syndrome and laminitic rotation

C Over the pastern joint — it explains ringbone

D Over the coronet — it explains coronary band injury

B Over the **navicular bone**. The tendon is the link between two conditions that look unrelated: it runs over the navicular bone on its way to P3, so it features in navicular syndrome, and it is also the force that rotates P3 in laminitis.

Where this is taught: Horse Hoof Anatomy

32 **Why is movement part of hoof health?**

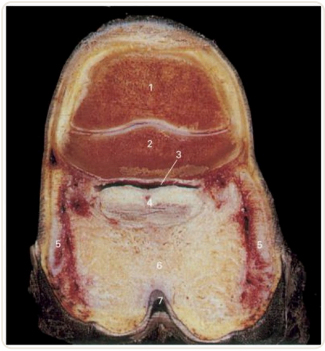


Image — Ashdown RR, Done SH. Clinical Anatomy of the Horse. Mosby/Elsevier — Fig 4.77, frontal section of left hoof, palmar view. Reproduced for educational reference.

A Because the foot has no muscle, and the frog, digital cushion and ungular cartilages form a pump driven by loading

B Because the sole thickens with wear

C Because exercise strengthens the hoof wall directly

D Because the coronet only grows under load

> **A** **The foot has no muscle at all.** Circulation through it depends on a pump made of the frog, the digital cushion and the ungular cartilages, and that pump is driven by the foot being loaded and unloaded. A horse that does not move does not perfuse its feet properly.

Where this is taught: Horse Hoof Anatomy

04 Viscera and the body cavities — 18 questions

The single idea worth carrying into this section is that **the organ is not in the cavity**. A serous cavity is a closed sac holding a few millilitres of fluid; the organ is outside it, pushed into it. Almost every mistake in this area comes from picturing the intestines floating in a space called the peritoneal cavity.

SEROUS CAVITY	LIES INSIDE	WHAT IS WORTH KNOWING
Left pleural	The thoracic cavity	Counted separately from the right, because it is a separate sac
Right pleural	The thoracic cavity	⚠ In the dog and adult horse the mediastinum leaks, so a unilateral pneumothorax usually becomes bilateral
Pericardial	The thoracic cavity, in the mediastinum	The only one with a **fibrous coat** outside its serous layers — which is why a small fast effusion tamponades and a large slow one may not
Peritoneal	The abdominal and pelvic cavities	Holds a few millilitres of fluid. Kidneys, ureters and terminal rectum are **retroperitoneal** — behind the sac, reachable without opening it

FOUR CLOSED SACS

The organ is outside

Left pleural a sac of its own

Right pleural counted separately

Pericardial plus a fibrous coat

Peritoneal a few millilitres of fluid

A fist in a balloon

The fist is never inside the balloon.

Fig 4 — Four sacs, and why the organ is outside them The four serous cavities — left pleural, right pleural, pericardial and peritoneal — and the relationship that explains the whole set: one continuous sheet lines the wall, folds back and covers the organ, so the organ is pushed into the sac rather than lying in it. A fist in a balloon is never inside the balloon.

Diagram — Vet-eBooks.com, drawn for this guide. Data from our own guide to body cavities and serous membranes.

33 **How many serous cavities are there, and what are they?**

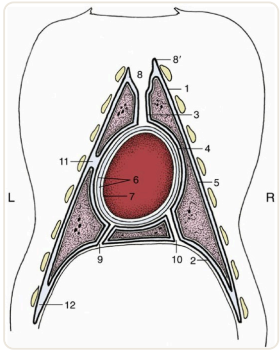


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Elsevier — Fig. 4.21, the distribution of the pleura and pericardium. Reproduced for educational reference.

A Three — pleural, pericardial and peritoneal

B Two — thoracic and abdominal

C Five — the four above plus the vertebral canal

D Four — left pleural, right pleural, pericardial and peritoneal

D **Four**: left pleural, right pleural, pericardial and peritoneal. The two pleural sacs count separately *because they are separate sacs* — that is the whole basis of the count. The vertebral canal and the cranial cavity are regional cavities, not serous ones.

Where this is taught: Body Cavities & Serous Membranes in Animals

34 **A student says "the intestine lies in the peritoneal cavity". Why is that wrong?**

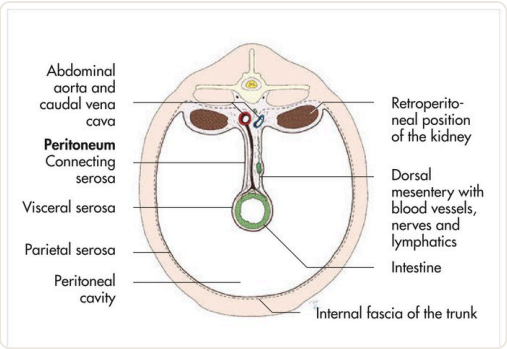


Image — König HE, Liebich H-G. Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas, 7th ed. Thieme — Fig. 1.62, schematic illustration of the serous membranes. Reproduced for educational reference.

A The peritoneal cavity is in the pelvis, not the abdomen

B The organ is outside the sac, pushed into it — the cavity holds only a few millilitres of fluid

C The intestine lies in the abdominal cavity, which is a serous cavity

D The intestine is retroperitoneal

B **The organ is not in the cavity.** The peritoneal cavity is the space *inside the closed sac*, and it holds only a few millilitres of fluid; the intestine is outside the sac, pushed into it — a fist in a balloon. The fist is never inside the balloon's cavity.

Where this is taught: Body Cavities & Serous Membranes in Animals

35 **What is the relationship between a parietal and a visceral serous layer?**

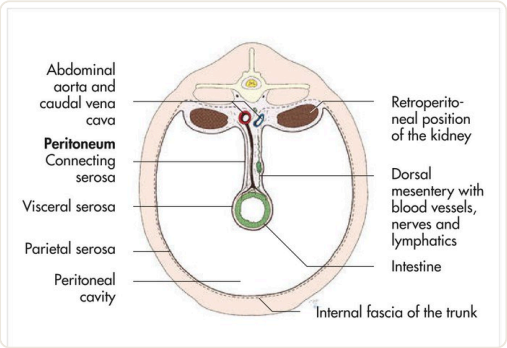


Image — König HE, Liebich H-G. Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas, 7th ed. Thieme — Fig. 1.62, schematic illustration of the serous membranes. Reproduced for educational reference.

A They are one continuous sheet: it lines the wall, folds back, and covers the organ

B The parietal layer is serous and the visceral layer is fibrous

C The visceral layer is a remnant of the parietal layer in the embryo

D They are two separate membranes that face each other

A **One continuous sheet does both jobs.** It lines the wall as the parietal layer, folds back, and covers the organ as the visceral layer — and *the fold carries the vessels and nerves*. That is why a mesentery is both a suspension and a conduit.

Where this is taught: Body Cavities & Serous Membranes in Animals

36 **Which set of organs is retroperitoneal?**

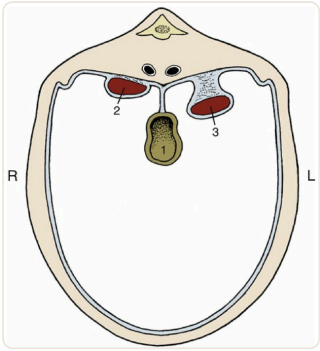


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Elsevier — Fig. 5.22, position of the kidneys in relation to the peritoneal cavity. Reproduced for educational reference.

A Liver, spleen and stomach

B Jejunum, ileum and descending colon

C Ovaries, uterine horns and bladder

D Kidneys, ureters and terminal rectum

D **Kidneys, ureters and terminal rectum.** They sit behind the sac with peritoneum on one face only — which is the practical point: they can be approached without opening the peritoneal cavity at all.

Where this is taught: Body Cavities & Serous Membranes in Animals

37 **Most dogs given a unilateral pneumothorax show it bilaterally. Why?**

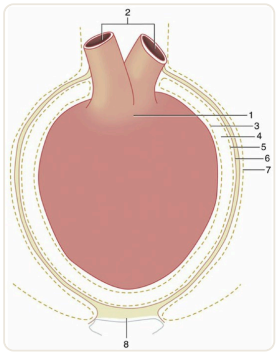


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Elsevier — Fig. 7.5, schematic illustration of the pericardium. Reproduced for educational reference.

A The mediastinum leaks

B Air tracks through the diaphragm

C The dog has no mediastinum

D The two pleural sacs are a single cavity in the dog

A **The mediastinum leaks.** The two pleural sacs are anatomically separate — that is why they are counted separately — but in the dog and the adult horse the mediastinum is not a reliable barrier, so a unilateral pneumothorax usually becomes bilateral. The foal is the exception.

Where this is taught: Body Cavities & Serous Membranes in Animals

38 **Why can a small, fast pericardial effusion tamponade the heart when a large, slow one may not?**

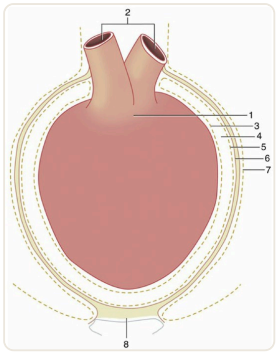


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Elsevier — Fig. 7.5, schematic illustration of the pericardium. Reproduced for educational reference.

A Because the pericardium has no fibrous coat

B Because a fast effusion is always larger in the end

C Because the fibrous coat outside the serous layers resists distention in the short term

D Because a slow effusion drains itself through the mediastinum

C The pericardium is the one serous sac with a **fibrous coat outside its two serous layers**, and that coat resists distention *in the short term*. Given time it stretches, so a slowly accumulating effusion can become very large without tamponading; a sudden one cannot.

Where this is taught: Body Cavities & Serous Membranes in Animals

39 **What is the difference between a regional cavity and a serous cavity?**

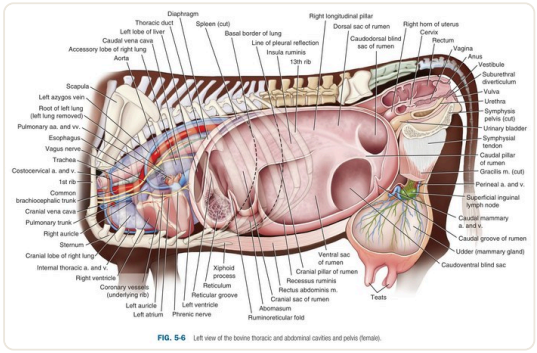


FIG. 5-6 Left view of the bovine thoracic and abdominal cavities and pelvis (female).

Image — Orsini JA, Grenager NS, de Lahunta A (eds). Comparative Veterinary Anatomy: A Clinical Approach. Academic Press/Elsevier — Fig 5–6, left view of the bovine thoracic and abdominal cavities and pelvis (female). Reproduced for educational reference.

A Regional cavities are in the trunk; serous cavities are in the head

B Regional cavities contain organs; serous cavities are empty of everything

C They are two names for the same thing

D Regional cavities are named by where they are; serous cavities are closed sacs lying inside the regions

D **Both classifications are correct and they are answering different questions.** Regional cavities — thoracic, abdominal, pelvic, plus the cranial cavity and vertebral canal — are named by where they are. Serous cavities are closed sacs lined by a serous membrane and lie *inside* the regions. The thoracic cavity is a region; a pleural cavity is a sac within it.

Where this is taught: Body Cavities & Serous Membranes in Animals

40 **In a midline coeliotomy, which layer is the holding layer of the closure?**

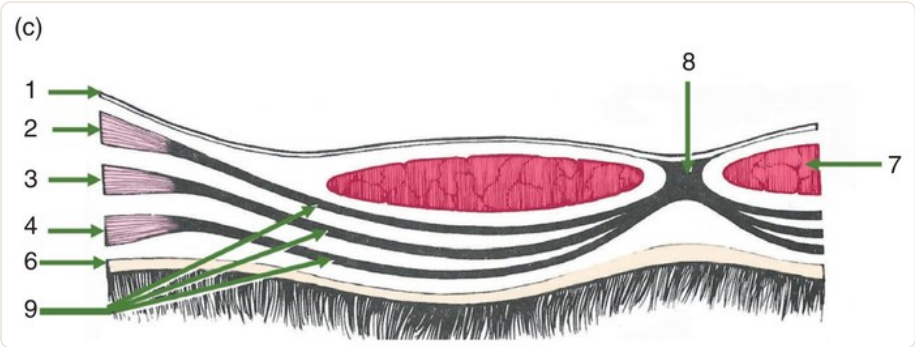


Image — Skerritt G. King's Applied Anatomy of the Abdomen and Pelvis of Domestic Mammals. Wiley — Fig 1.10(c), transverse section of the ventral body wall of the dog. Reproduced for educational reference.

A The subcutaneous fat

B The external lamina of the rectus sheath

C The peritoneum

D The skin

B **The external lamina of the rectus sheath.** Skin and fat contribute nothing to the strength of a midline closure. Getting this wrong is not a theoretical error — a closure that misses the external rectus sheath is a dehiscence waiting to happen.

Where this is taught: Dog Abdominal Anatomy

41 **What changes about the rectus sheath behind the umbilicus?**

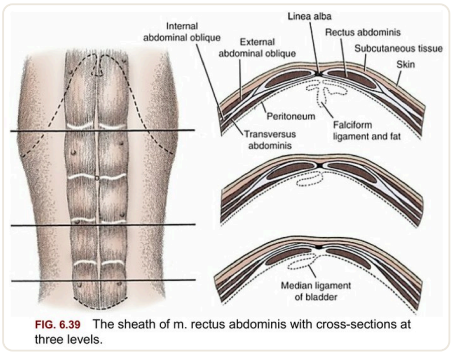


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig 6.39, the sheath of m. rectus abdominis. Reproduced for educational reference.

A The sheath is replaced by the linea alba

B The external lamina disappears

C The internal lamina disappears, leaving only transversalis fascia and peritoneum deep to the rectus

D Both laminae fuse into one thick layer

C **The internal lamina disappears** behind the umbilicus, so deep to the rectus there is only transversalis fascia and peritoneum. It is worth knowing before you cut, because the depth from muscle to abdominal contents changes along the incision.

Where this is taught: Dog Abdominal Anatomy

42 **Why does a "full" exploratory coeliotomy run from xiphoid to pubis?**

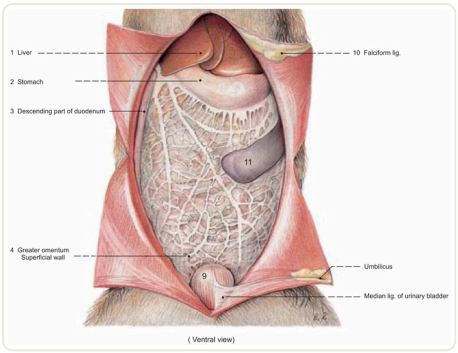


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. Schlütersche — Abdominal cavity and digestive apparatus, ventral view. Reproduced for educational reference.

A Because the bladder cannot be reached otherwise

B Because a shorter incision cannot be extended

C To make closure easier

D Because the abdomen's cranial third hides inside the rib cage

D **The cranial third of the abdomen hides inside the rib cage.** The abdomen runs from the diaphragm to the pelvic inlet, and a good deal of it is under ribs — so an incision that starts behind the costal arch has already missed the liver, the stomach and the cranial duodenum.

Where this is taught: Dog Abdominal Anatomy

43 **Which structure bounds the epiploic foramen ventrally?**

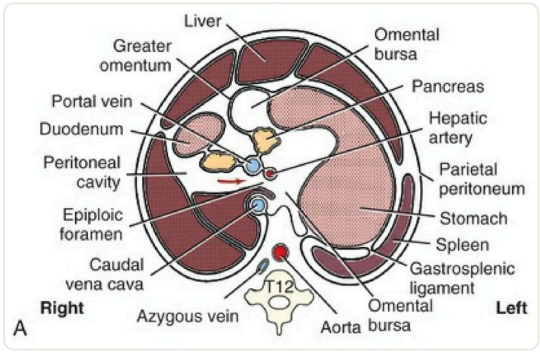


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig 7.36A, peritoneal schema, transverse section. Reproduced for educational reference.

A The aorta

B The portal vein

C The hepatic artery

D The caudal vena cava

B The **portal vein** ventrally and the **caudal vena cava** dorsally. That is the anatomy behind the Pringle manoeuvre: a finger through the epiploic foramen can compress the portal triad and control haemorrhage from the liver.

Where this is taught: Dog Abdominal Anatomy

44 **In the dog, what is routinely done with the falciform ligament at coeliotomy, and why?**

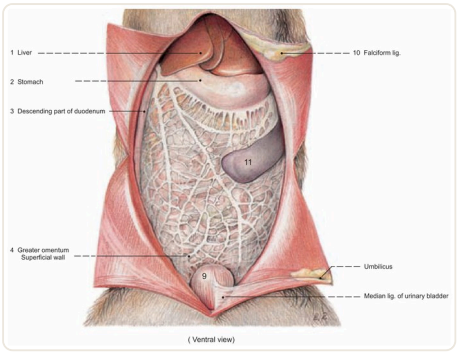


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. Schlütersche — Abdominal cavity and digestive apparatus, ventral view. Reproduced for educational reference.

A It is preserved as a closure layer

B It is used to wrap an anastomosis

C It is resected, because it is fat-laden and obscures the cranial abdomen

D It is sutured to the diaphragm

C It is **resected**. In the dog the falciform ligament is fat-laden, and it sits exactly where you need to see. Removing it is not a complication of the approach; it is part of it.

Where this is taught: Dog Abdominal Anatomy

45 **The ruminant stomach is best described as:**

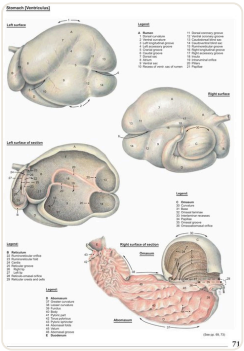


Image — Budras KD, Habel RE, Mülling CKW, Greenough PR. Bovine Anatomy: An Illustrated Text, 2nd ext. ed. Schlütersche — Stomach [Ventriculus], p. 71. Reproduced for educational reference.

A One glandular stomach with three diverticula

B Four stomachs in series

C One stomach with four compartments, three of them non-glandular forestomachs

D Two stomachs, each with two chambers

C **One stomach with four compartments**, and only the **abomasum** secretes acid. The other three — rumen, reticulum and omasum — are non-glandular forestomachs. “Four stomachs” is a useful shorthand and a wrong answer.

Where this is taught: Ruminant Stomach Anatomy

46 **About what proportion of the ruminant stomach is rumen, and what does that explain clinically?**

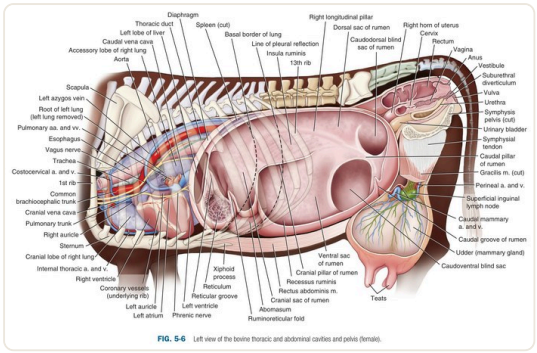


Image — Orsini JA, Grenager NS, de Lahunta A (eds). Comparative Veterinary Anatomy: A Clinical Approach. Academic Press/Elsevier — Fig 5-6, left view of the bovine thoracic and abdominal cavities and pelvis (female). Reproduced for educational reference.

A About 60%, which is why bloat is right-sided

B About 80%, which is why you auscultate the left paralumbar fossa

C About 95%, which is why the other compartments are vestigial

D About 40%, which is why the rumen is hard to find

B About **80%**. The rumen fills virtually the entire left half of the abdomen, which is why the left paralumbar fossa is where you listen — and, in cattle, why it is the surgical window.

Where this is taught: Ruminant Stomach Anatomy

47 **Inside the rumen, where do gas, fibre and fluid sit?**

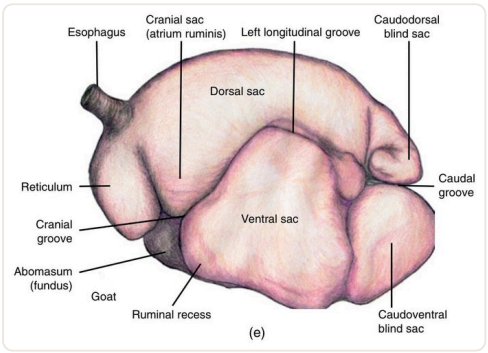


Image — Sarhan MS, Reece WO et al. Guide to Ruminant Anatomy: Dissection and Clinical Aspects, 2nd ed. Wiley — Fig 3.18e, goat stomach, left surface. Reproduced for educational reference.

A Fibre ventrally, gas in the middle, fluid dorsally

B Gas ventrally, fibre dorsally, fluid in the middle

C Gas dorsally, fibre floating in the middle, fluid ventrally

D They are continuously mixed and do not stratify

C **Gas dorsally, fibre in the middle, fluid ventrally.** The rumen is divided by muscular pillars into dorsal, ventral and cranial sacs plus two caudal blind sacs, and the contents stratify by density inside them — which is why a stomach tube passed to the dorsal sac relieves free-gas bloat and one passed into fluid does not.

Where this is taught: Ruminant Stomach Anatomy

48 **Which compartment lies against the diaphragm opposite the heart, and what does that explain?**

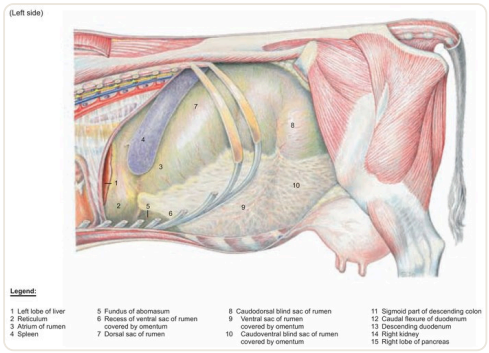


Image — Budras KD, Habel RE, Mülling CKW, Greenough PR. Bovine Anatomy: An Illustrated Text, 2nd ext. ed. Schlütersche — Abdominal cavity and Digestive system, p. 69, left side. Reproduced for educational reference.

A The reticulum — it explains hardware disease

B The rumen — it explains left-sided bloat

C The omasum — it explains impaction

D The abomasum — it explains displacement

A The **reticulum**, the most cranial and ventral compartment. It traps swallowed metal, and it lies against the diaphragm directly opposite the heart — which is the whole anatomical basis of hardware disease and of why it can become a pericardial problem.

Where this is taught: Ruminant Stomach Anatomy

49 **What does the reticular groove do in the suckling calf?**

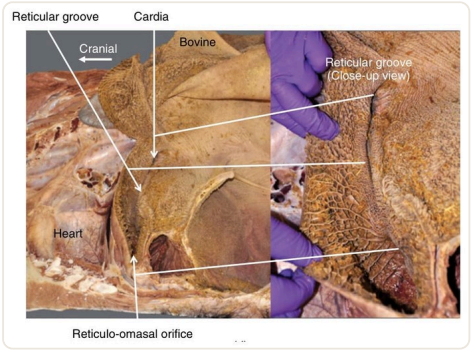


Image — Sarhan MS, Reece WO et al. Guide to Ruminant Anatomy: Dissection and Clinical Aspects, 2nd ed. Wiley — Fig 3.19d, reticular groove, with close-up. Reproduced for educational reference.

A It closes so that milk bypasses the forestomachs and goes straight to the abomasum

B It opens to admit milk to the rumen for fermentation

C It separates the reticulum from the omasum

D It closes to trap swallowed metal

A It **closes**, so milk bypasses the forestomachs and goes straight to the abomasum. A calf's rumen is not yet a fermentation vat and milk in it would simply putrefy; the groove is the workaround, and it is why a ruminant can be a monogastric for its first weeks.

Where this is taught: Ruminant Stomach Anatomy

50 **Where does the abomasum normally lie, and what happens when it fills with gas?**

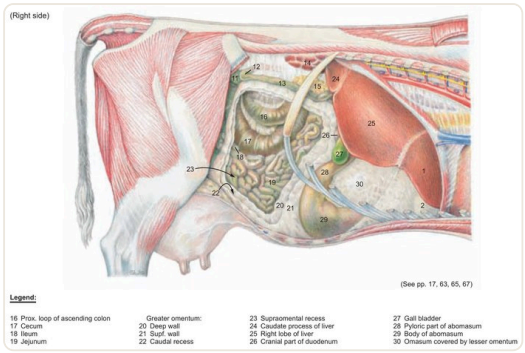


Image — Budras KD, Habel RE, Mülling CKW, Greenough PR. Bovine Anatomy: An Illustrated Text, 2nd ext. ed. Schlütersche — Abdominal cavity and Digestive system, p. 69, right side. Reproduced for educational reference.

A Dorsally, and gas has no effect on its position

B On the floor of the abdomen mostly to the right; gas can float it left (LDA) or right, where it may twist

C In the pelvis, and gas displaces it cranially

D On the left, and gas moves it right

B It lies **on the floor of the abdomen, mostly to the right**. Gas can float it to the left — the left displaced abomasum — or to the right, where it may then twist. The displacement is a consequence of where the organ normally sits and how light gas is.

Where this is taught: Ruminant Stomach Anatomy

05 Vessels and circulation — 13 questions

Vessels are easier to learn as landmarks than as a list, because that is how they are used. The adrenal glands are found by the vessel they sit on, the pancreas by the vein behind it, and the kidney is measured against the aorta rather than in centimetres. Several of these questions are therefore about *using* a vessel rather than naming one.

51 **On abdominal ultrasound, which vessel is the landmark for the left adrenal gland?**

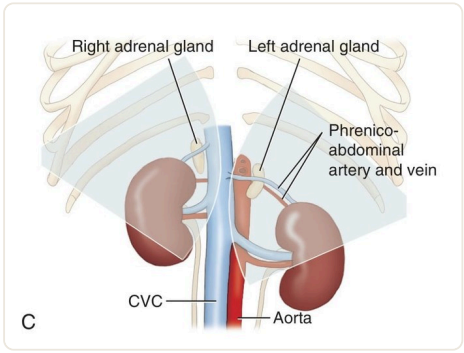


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.24, C. Reproduced for educational reference.

A The left renal vein

B The caudal vena cava

C The aorta

D The portal vein

C The **aorta** carries the left adrenal; the **caudal vena cava** carries the right. The working rule is *find the vessel, then the gland* — the adrenals are small, variable and hard to find directly, and the vessels are neither.

Where this is taught: Veterinary Abdominal Ultrasound

52 **Where does the portal vein lie in relation to the body of the pancreas?**

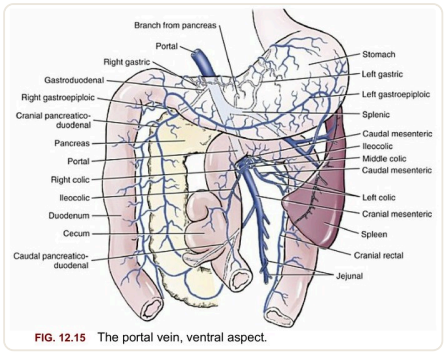


FIG. 12.15 The portal vein, ventral aspect.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig 12.15, the portal vein, ventral aspect. Reproduced for educational reference.

A Ventral to it

B Dorsal to it

C Within it

D Lateral to it on the right only

> **B** **Dorsal** to the body of the pancreas. It is the same principle as the adrenals: the pancreas is difficult to see and the portal vein is not, so the vessel is used to find the organ rather than the other way round.

Where this is taught: Veterinary Abdominal Ultrasound

53 **Canine kidney size on ultrasound is assessed how?**

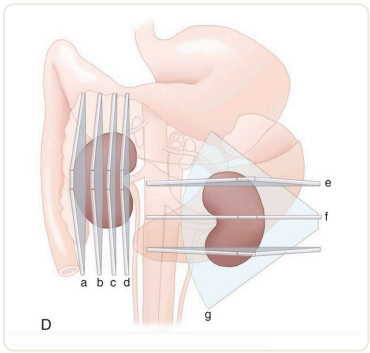


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.23, D. Reproduced for educational reference.

A As an absolute length in centimetres

B As a ratio to the aorta, 5.5–9.1

C As a ratio to the length of L2

D By volume, calculated from three measurements

> **B** As a **ratio to the aorta — 5.5 to 9.1**. An absolute length means nothing across the range of body sizes in the dog, which is exactly why the measurement is a ratio: the aorta scales with the animal and gives you the denominator for free.

Where this is taught: Veterinary Abdominal Ultrasound

54 **Embryonic aortic arch IV becomes the aorta. Which side do mammals keep, and which do birds?**

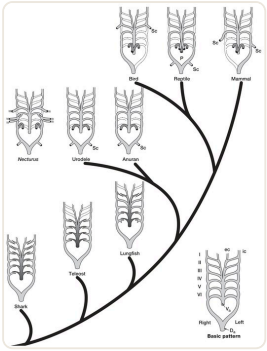


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 12.19, evolution of the aortic arches, after Goodrich. Reproduced for educational reference.

A Mammals the right, birds the left

B Both keep the left

C Mammals the left, birds the right

D Both keep the right

> **C** **Mammals keep the left, birds the right.** The clinical payoff is immediate: a mammal that keeps the right instead has a **vascular ring** — a persistent right aortic arch trapping the oesophagus, and the reason a young dog regurgitates solid food.

Where this is taught: Comparative Veterinary Anatomy

55 **For a lymph node on ultrasound, which measurement is more useful than size?**

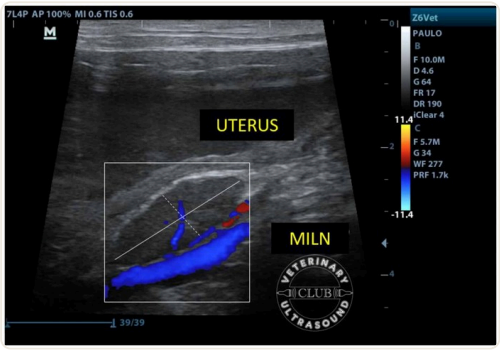


Image — Meirelles A, Aguillera P. Abdominal Ultrasound in Cats and Dogs: An Illustrated Reference Value Guide — Figure 33. Reproduced for educational reference.

A Distance from the nearest vessel

B The number of nodes in the group

C Depth from the skin

D Shape — a short : long axis ratio above 0.7 is a feature of malignancy

> **D** **Shape beats size.** A short-to-long axis ratio above **0.7** — a node becoming round rather than staying oval — is a feature of malignancy. ⚠️ With one stated exception: it does not hold for the jejunal node.

Where this is taught: Veterinary Abdominal Ultrasound

56 **Gain and power are often confused. What is the difference?**

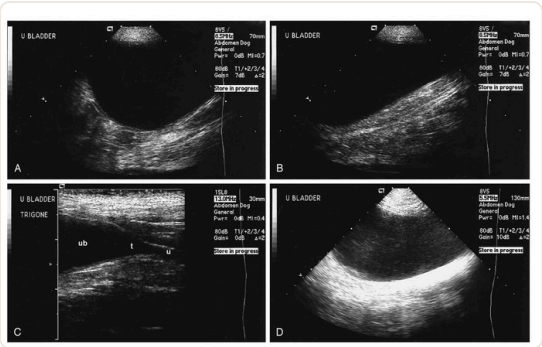


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.28. Reproduced for educational reference.

A They are two names for the same control on modern machines

B Gain amplifies echoes after the fact; power is the energy going into the patient

C Gain affects depth; power affects frequency

D Gain is the energy going into the patient; power amplifies the returning echoes

B **Gain amplifies echoes after the fact; power is the energy going into the patient.** The practical rule that follows is to use the *least power that works* and adjust gain afterwards — turning power up to fix a dark image puts energy into the animal for no diagnostic gain.

Where this is taught: Veterinary Abdominal Ultrasound

57 **A dark far field on an ultrasound image is usually which kind of problem?**



Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.6. Reproduced for educational reference.

A A frequency problem

B A power problem

C A gain problem

D A TGC problem

D A **TGC** problem — time-gain compensation, which corrects for attenuation with depth. Turning overall gain up to fix a dark far field brightens the near field too and the image gets worse, not better.

Where this is taught: Veterinary Abdominal Ultrasound

58 **Every ultrasound artefact is a broken assumption. Which set of assumptions does the machine make?**

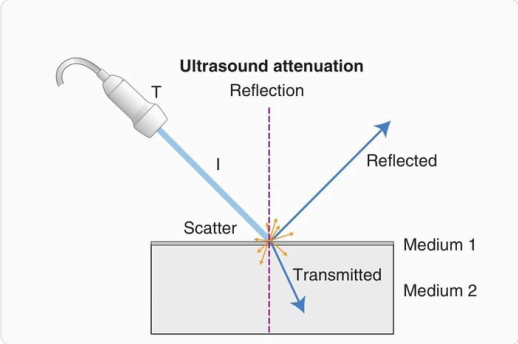


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 1.43. Reproduced for educational reference.

A That fluid is anechoic, that bone shadows, and that gas reverberates

B That tissue is homogeneous, that the probe is perpendicular, and that the patient is still

C That sound travels in a straight line, at a constant 1540 m/s, and only along the main beam

D That echoes return once, that depth is linear, and that gain is uniform

> **C** The machine assumes sound travels **in a straight line**, **at a constant 1540 m/s**, and **only along the main beam**. Break one and you get a predictable artefact — a shadow, a mirror, a duplicate or false sediment. Knowing which assumption broke tells you which artefact you are looking at.

Where this is taught: Veterinary Abdominal Ultrasound

59 **Why start an abdominal scan at the liver?**



Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.5. Reproduced for educational reference.

A Because it is the deepest organ, so depth, power and gain are then reduced working caudally

B Because it is the most commonly diseased

C Because the probe frequency is fixed by it

D Because it is the largest organ

> **A** Because it is the **deepest** organ. Set the machine up for the hardest depth first and then reduce depth, power and gain as you work caudally — the opposite order means re-optimising the machine at every step.

Where this is taught: Veterinary Abdominal Ultrasound

60 **Non-visualisation of the pancreas on ultrasound tells you what?**

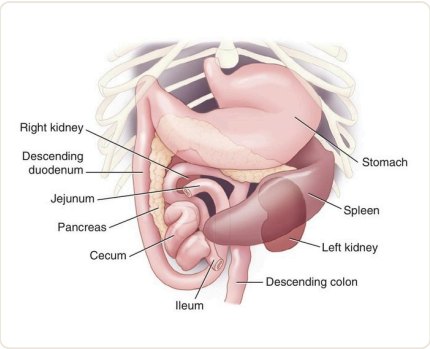


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.18. Reproduced for educational reference.

A That a mass is ruled out, and nothing else

B That the study is non-diagnostic and must be repeated

C That the pancreas is normal

D That pancreatitis is unlikely

A It **rules out a mass, and nothing else**. A normal pancreas is frequently invisible, so "not seen" is not the same as "not diseased" — and reporting it as reassurance is a claim the image does not support.

Where this is taught: Veterinary Abdominal Ultrasound

61 **Which finding is NORMAL in the cat and would be abnormal read with canine expectations?**

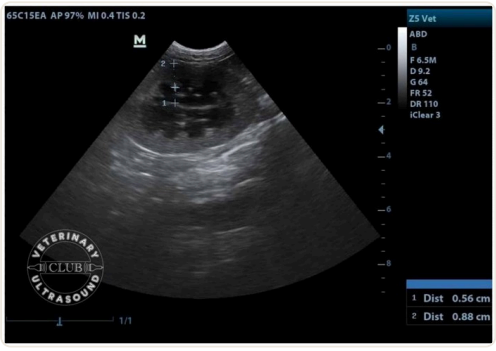


Image — Meirelles A, Aguillera P. Abdominal Ultrasound in Cats and Dogs: An Illustrated Reference Value Guide — Figure 5. Reproduced for educational reference.

A A distended gallbladder with sludge

B Free peritoneal fluid

C A jejunal node that has lost its hilus and turned hypoechoic

D A spoke-wheel stomach and an echogenic renal cortex

D **Cats are not small dogs.** A bilobed gallbladder, thick falciform fat, an echogenic renal cortex, a spoke-wheel stomach and visible ileocecocolic nodes are all normal in the cat — and reading them with canine expectations produces confident diagnoses of disease that is not there. The node option is the near-miss worth naming: the jejunal node is the one place the short-to-long ratio does not apply, but a node that has lost its hilus is abnormal in either species, so it is not an example of feline normality misread.

Where this is taught: Veterinary Abdominal Ultrasound

62 **Why does scanning the same sequence every time matter?**

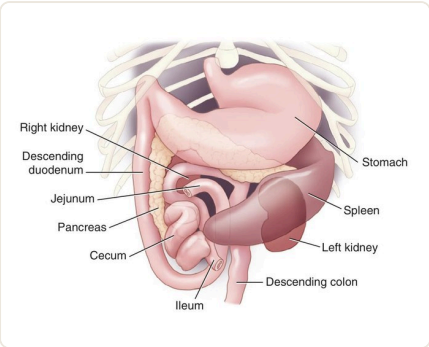


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.18. Reproduced for educational reference.

A It shortens the study

B Missed splenic disease is almost always a sequence failure rather than a knowledge failure

C It is required for image archiving

D It reduces the power delivered to the patient

B Because **missed disease is almost always a sequence failure, not a knowledge failure**. Scanning to the referral question means scanning only where you already suspect the answer is — and the spleen is the organ that pays for it.

Where this is taught: Veterinary Abdominal Ultrasound

63 **Which vessel lies dorsal to the epiploic foramen?**

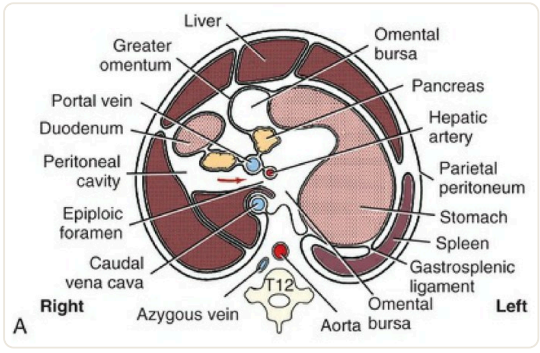


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig 7.36A, peritoneal schema, transverse section. Reproduced for educational reference.

A The caudal vena cava

B The portal vein

C The hepatic artery

D The aorta

A The **caudal vena cava** dorsally, with the **portal vein** ventrally. Holding the pair the right way round is what makes the Pringle manoeuvre a manoeuvre rather than a guess.

Where this is taught: Dog Abdominal Anatomy

06 Nerves and the motor system — 12 questions

This is the smallest section, and here is why

There are **12** questions here against 25 on species differences, and that is not an editorial judgement about what matters. Every question on this page has to be answerable from an article we have **published**, and our neuroanatomy guide is still in draft — a draft page cannot be linked. So this section is built from what is live: the two-neuron chain and how to localise a lesion between them, the radial nerve, the trigeminal and the dental blocks, and the cranial nerves in the equine guttural pouch. It will grow.

The organising idea is the two-neuron chain: an upper motor neuron in the central nervous system commands a lower motor neuron, and only the lower one reaches the muscle. Everything in a neurological examination — tone, reflexes, atrophy — is a way of asking which of the two is damaged.

SIGN	LOWER MOTOR NEURON	UPPER MOTOR NEURON
Paresis	Flaccid	Spastic
Tone	Lost	Increased
Reflexes	Reduced or absent	Normal to exaggerated — by **disinhibition**, because the UMN normally brakes the spinal reflex
Atrophy	Rapid and severe (neurogenic)	Little wasting
Fasciculations	Present	Absent

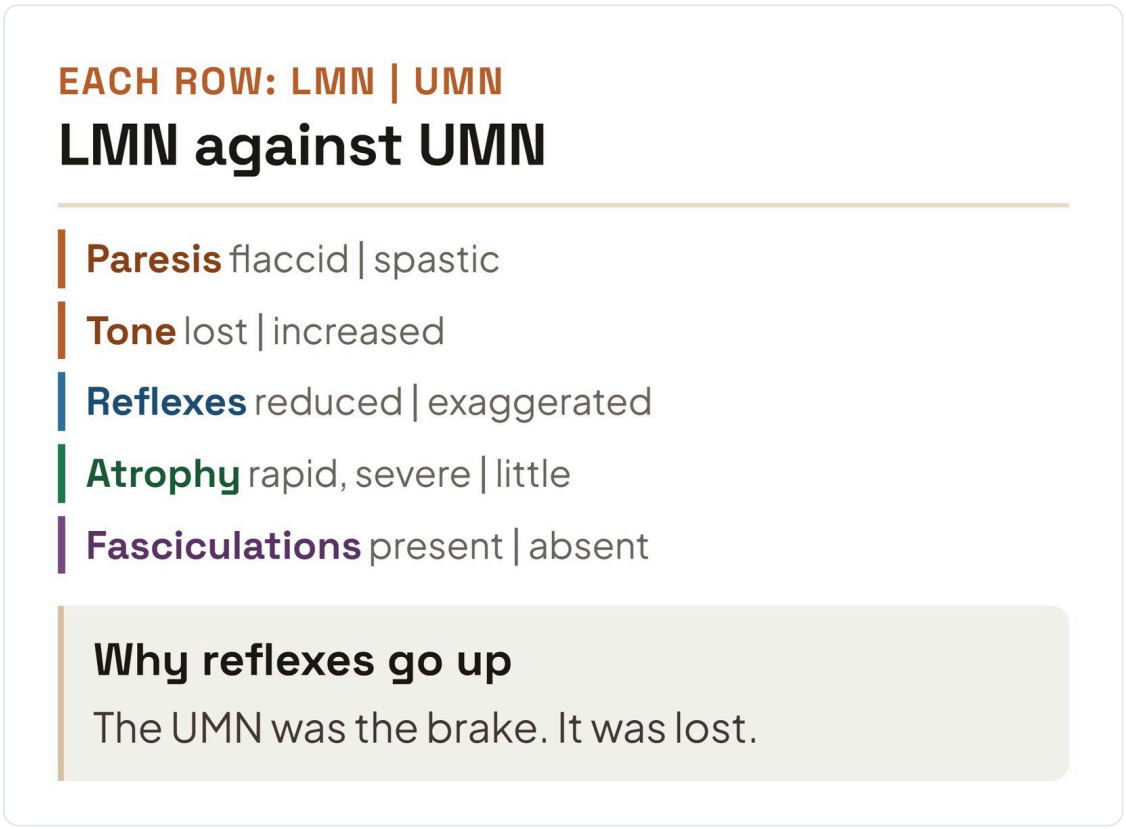


Fig 5 — UMN against LMN, in one card The five findings that separate the two, and the one idea that makes the pattern make sense: reflexes are exaggerated below an upper motor neuron lesion because the brake has been lost, not because anything has been added.

Diagram — Vet-eBooks.com, drawn for this guide. Data from our own guide to upper and lower motor neuron signs.

64 **Every motor command reaches muscle through a two-neuron chain. Which neuron actually reaches the muscle?**

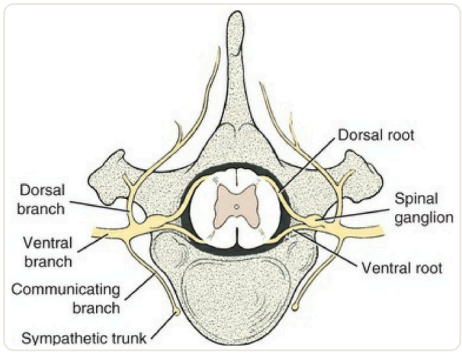


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig. 17.1, diagram of a spinal nerve. Reproduced for educational reference.

A The lower motor neuron
B Both, in parallel
C Neither — an interneuron does
D The upper motor neuron

A Only the **lower motor neuron**. The UMN sits in the CNS and commands the LMN; the LMN is the α motor neuron and the **final common path**. Everything that reaches muscle — voluntary, reflex, postural — goes through it.

Where this is taught: Upper vs Lower Motor Neuron Signs

65 **What is a motor unit?**

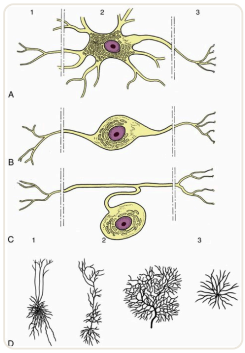


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Saunders/Elsevier — Fig. 8.3, schematic diagrams of multipolar, bipolar and unipolar neurons, with drawings of actual neurons. Reproduced for educational reference.

A One spinal segment and the muscles it supplies
B One α motor neuron plus the muscle fibres it drives
C One muscle spindle and its γ neuron
D One muscle and all the nerves supplying it

B **One α motor neuron plus the fibres it drives.** The CNS grades force in two ways: by *recruiting* units in size order, and by *raising their firing rate*. Neither has anything to do with how hard the individual fibre contracts.

Where this is taught: Upper vs Lower Motor Neuron Signs

66 **Which picture is typical of LOWER motor neuron disease?**

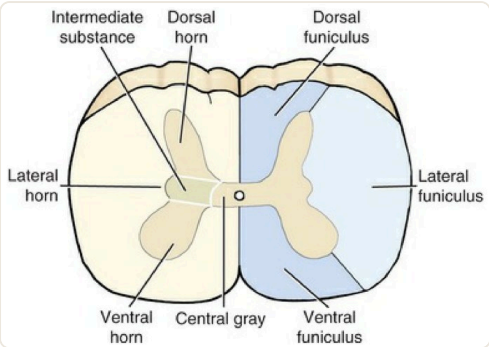


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig. 14.14, major subdivisions of the gray and white matter of the spinal cord. Reproduced for educational reference.

A Spastic paresis, increased tone, hyperreflexia, little wasting

B Flaccid paresis, lost tone, reduced or absent reflexes, rapid severe atrophy

C Normal tone with intention tremor

D Normal strength with lost proprioception only

B **Flaccid paresis, lost tone, reduced or absent reflexes, rapid severe (neurogenic) atrophy, and fasciculations.** The logic is that the LMN is the final common path, so losing it disconnects the muscle from *all* control — reflex as well as voluntary.

Where this is taught: Upper vs Lower Motor Neuron Signs

67 **Why are reflexes exaggerated below an upper motor neuron lesion?**

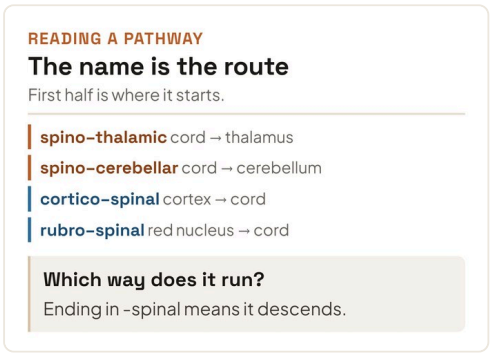


Diagram — Vet-eBooks.com, drawn for this guide. Schematic, not to scale. Data from Skerritt G. King's Applied Anatomy of the Central Nervous System of Domestic Mammals, 2nd ed. Wiley Blackwell, chs 8 and 10–13, and Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Saunders/Elsevier, pp. 479–494.

A Because of disinhibition — the UMN normally brakes the spinal reflex

B Because the LMN becomes hypersensitive

C Because the muscle spindle enlarges

D Because sensory input increases

A **Disinhibition.** The UMN's normal job includes braking the spinal reflex arc, so losing it *releases* the reflex rather than exciting it. This is the single most useful idea in neurolocalisation: hyperreflexia is a sign of something lost, not of something added.

Where this is taught: Upper vs Lower Motor Neuron Signs

68 **Resting muscle tone is best described as:**

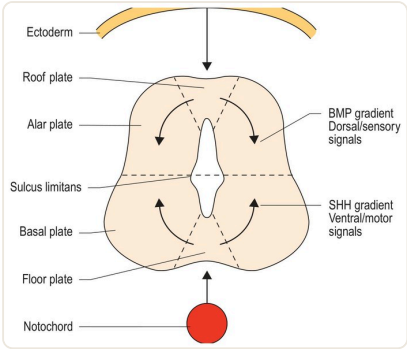


Image — Thomson C, Hahn C. Veterinary Neuroanatomy: A Clinical Approach. Saunders/Elsevier — Fig. 2.3A, dorsoventral differentiation of the neural tube. Reproduced for educational reference.

A Active — slow (type I) units fire tonically and the γ loop keeps the spindle sensitive at every length

B The result of continuous UMN firing directly onto muscle

C An artefact of the way tone is tested

D A passive property of the muscle's connective tissue

A Tone is **active**. Slow, fatigue-resistant type I motor units fire tonically, and the γ loop adjusts the muscle spindle so that it stays sensitive at every muscle length. That is why tone is *lost* in LMN disease rather than merely reduced.

Where this is taught: Upper vs Lower Motor Neuron Signs

69 **Which three findings, read together, localise a lesion to UMN or LMN?**

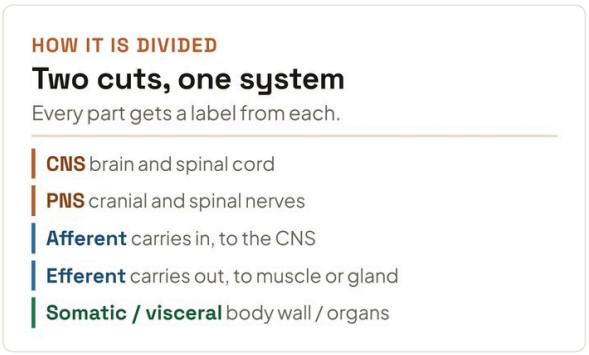


Diagram — Vet-eBooks.com, drawn for this guide. Data from Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Saunders/Elsevier, pp. 439–440.

A Symmetry, onset and progression

B Pain, posture and gait

C Tone, reflexes and atrophy

D Proprioception, nociception and cranial nerves

C **Tone, reflexes and atrophy.** Read as a set they separate UMN from LMN, and the same examination also rules the neuromuscular junction and the muscle itself in or out. Any one of the three alone is ambiguous.

Where this is taught: Upper vs Lower Motor Neuron Signs

70 **Which nerve supplies every extensor of the elbow, carpus and digits in the dog?**

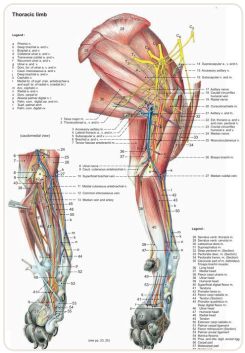


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. — plate: Thoracic limb. Reproduced for educational reference.

A The ulnar nerve
B The musculocutaneous nerve
C The radial nerve
D The median nerve

C The **radial nerve** — and that single fact explains the classic knuckling dog. Lose the radial nerve and every extensor of the elbow, carpus and digits goes with it, so the limb cannot be placed. It is the best argument for learning muscles by *nerve group* as well as by region.

Where this is taught: Dog Muscle Anatomy

71 **All the teeth of the dog are supplied by which single cranial nerve?**

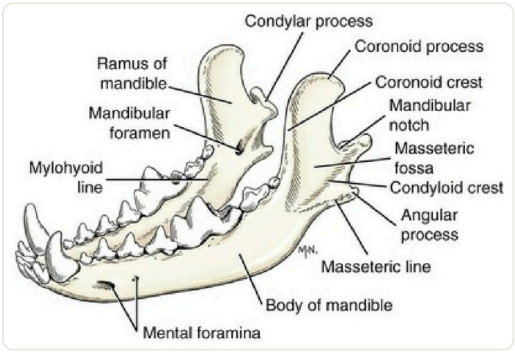


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 4.38, left and right mandibles. Reproduced for educational reference.

A The trigeminal nerve (CN V)
B The glossopharyngeal nerve (CN IX)
C The hypoglossal nerve (CN XII)
D The facial nerve (CN VII)

A The **trigeminal, CN V**. Every tooth in both arcades is supplied by branches of it, which is why three foramina — infraorbital, mental and mandibular — give you the whole dental nerve-block map between them.

Where this is taught: Canine Skull & Dental Anatomy

72 **Which cranial nerves run in the wall of the equine guttural pouch?**

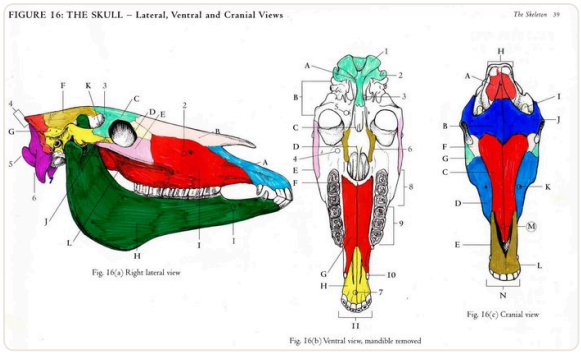


Image — Raynor M. The Horse Anatomy Workbook, Figure 16, The Skull. Reproduced for educational reference; copyright remains with the original author and publisher.

A CN I to CN IV
B CN V and CN VII only
C CN IX to CN XII
D CN II and CN III

C **CN IX to XII**, together with the internal carotid artery. That is why a fungal plaque on the guttural pouch wall is not a local problem: it sits on major vessels and on four cranial nerves at once.

Where this is taught: Horse Anatomy

73 **In the dog, what attaches the forelimb to the trunk?**

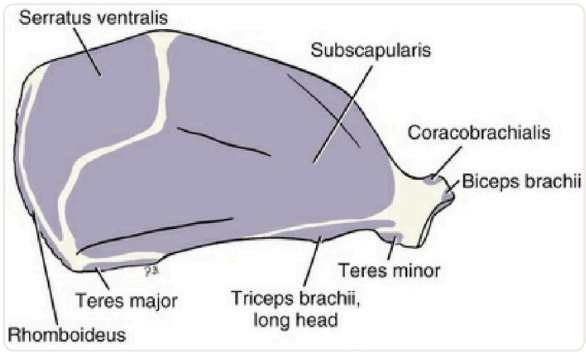


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — Fig. 6.47, left scapula, areas of muscle attachment, medial. Reproduced for educational reference.

A A clavicle articulating with the sternum
B The scapula articulating with the first rib
C Muscle alone — the synsarcosis, with serratus ventralis as the main sling
D A fibrous joint between scapula and thorax

C **Muscle alone.** The dog has no functional clavicle, so there is no bony link at all: the limb is slung from the trunk by the **synsarcosis**, with serratus ventralis as the main sling. The arrangement absorbs concussion, and it is why the forelimb has no true joint with the trunk to dislocate.

Where this is taught: Dog Muscle Anatomy

74 **Which pair of muscles acts as the collateral ligaments of the canine shoulder?**

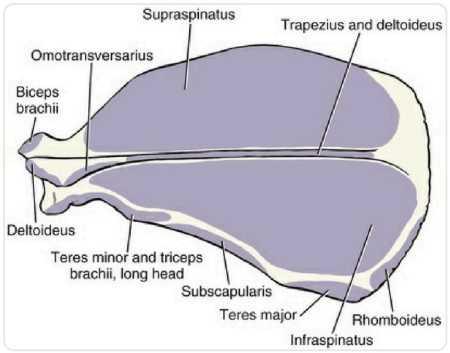


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — Fig. 6.46, left scapula, areas of muscle attachment, lateral. Reproduced for educational reference.

A Infraspinatus and subscapularis
B Teres major and teres minor
C Biceps brachii and triceps brachii
D Supraspinatus and deltoideus

A **Infraspinatus and subscapularis.** The shoulder has no true collateral ligaments of its own, and those two muscles do the job instead — a good example of the general rule that a muscle's action follows from the joints it crosses and the side it crosses them on.

Where this is taught: Dog Muscle Anatomy

75 **Which of these is a two-joint muscle, and therefore one whose action is easy to get wrong?**

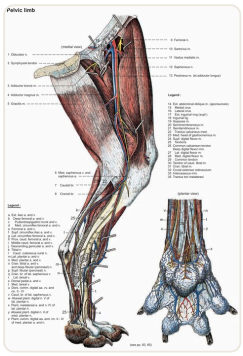


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. — plate: Pelvic limb, medial view and plantar aspect of the paw. Reproduced for educational reference.

A Brachialis
B The long digital extensor, which starts on the femur
C Serratus ventralis
D Supraspinatus

B The **long digital extensor** — it starts on the femur, so it crosses the stifle as well as the joints of the digit. The two-joint muscles are the ones that catch people out: the long head of triceps, rectus femoris, gastrocnemius and this one.

Where this is taught: Dog Muscle Anatomy

07 Species differences — 25 questions

This is the largest section, and it is the one that separates a veterinary anatomy paper from a human one. The examinable material is rarely a single species in isolation — it is the comparison: which species has no upper incisors, which keeps the right aortic arch, where each one's spinal cord ends.

SPECIES	VERTEBRAL FORMULA	THE CORD ENDS AT
Dog	C7 T13 L7 S3 Cd20–23	L6–L7
Cat	C7 T13 L7 S3 Cd18–20	L6 to S3, variably ⚠ The cat's cord can still reach the lumbosacral space
Horse	C7 T18 L6 S5 Cd15–21	S2 The most caudal termination of the domestic species

SPECIES	VERTEBRAL FORMULA	THE CORD ENDS AT
Ox	C7 T13 L6 S5 Cd18–20	S1 in the adult
Sheep	C7 T13 L6(7) S4 Cd16–18	May occupy almost the whole sacrum
Goat	C7 T13 L6(7) S5 Cd16–18	As the sheep
Pig	C7 T14–15 L6–7 S4 Cd20–23	L5–L6 The most cranial termination

76 **Two structures are homologous when:**

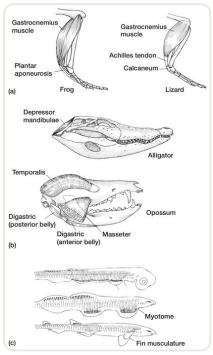


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 10.19, criteria for muscle homology, (c) after Goodrich. Reproduced for educational reference.

A They look alike

B They occupy the same position in the body

C They trace back to the same structure in a common ancestor

D They perform the same function

> **C** **Homology is about ancestry, not function.** A bird's wing and a mole's forelimb are homologous — the same limb doing different work. A bird's wing and an insect's wing are not homologous at all; they are *analogous*, which is a statement about function.

Where this is taught: Comparative Veterinary Anatomy

77 **A tuna and a dolphin have the same streamlined body shape. What is that an example of?**

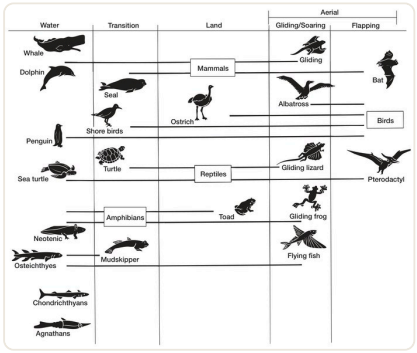


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 1.13, convergence of design. Reproduced for educational reference.

A Serial homology

B Analogy of ancestry

C Homoplasy

D Homology

> **C** **Homoplasy** — the parts simply look alike. Homology is shared ancestry, analogy is shared function, and homoplasy is shared appearance. Keeping the three apart is what stops “they look the same” being mistaken for evidence.

Where this is taught: Comparative Veterinary Anatomy

78 **What is the permanent dental formula of the ox, and what is the total?**

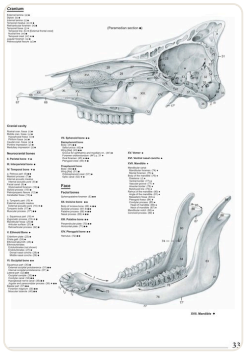


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Cranium and mandible. Reproduced for educational reference.

A 3–1–4–2 / 3–1–4–3, total 42

B 0–0–3–3 / 3–1–3–3, total 32

C 3–1–4–3 / 3–1–4–3, total 44

D 3–1–3–3 / 3–1–3–3, total 36

B **0–0–3–3 / 3–1–3–3 = 32.** The zeros are the point: cattle have **no upper incisors and no upper canines**, tearing grass against a **dental pad** instead. 44 is the pig, 42 the dog and 36–42 the horse.

Where this is taught: Comparative Veterinary Anatomy

79 **Which domestic species has the most complete dentition, and how many teeth?**

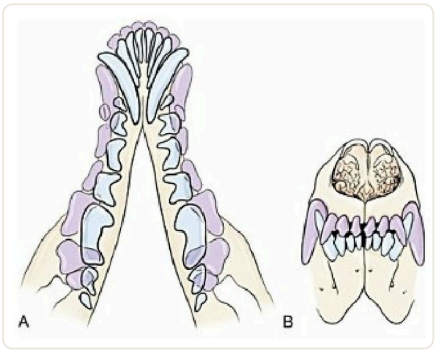


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 7.7 A and B, superimposition of the dental arches and the bite of the incisor and canine teeth. Reproduced for educational reference.

A The horse, with 42

B The ox, with 32

C The pig, with 44

D The dog, with 42

C The **pig, with 44** — 3–1–4–3 / 3–1–4–3, the true omnivore's mouth. The dog has 42 and the cat, at 30, has the most reduced dentition of the domestic species.

Where this is taught: Comparative Veterinary Anatomy

80 **How many permanent teeth does the cat have?**

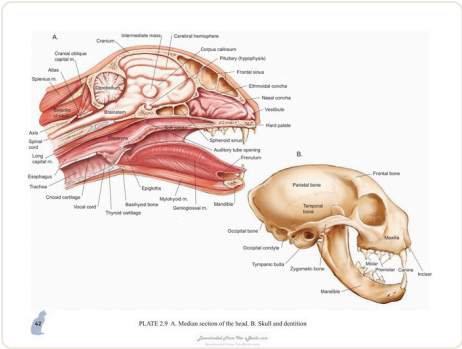


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 2.9 (p. 42). Reproduced for educational reference; copyright remains with the original authors and publisher.

A 42

B 36

C 28

D 30

D **30** — 3–1–3–1 / 3–1–2–1, the most reduced dentition of the domestic species. The cat is an obligate carnivore and its dentition shows it: fewer premolars, and a single molar in each arcade.

Where this is taught: Comparative Veterinary Anatomy

81 **What is the vertebral formula of the horse?**

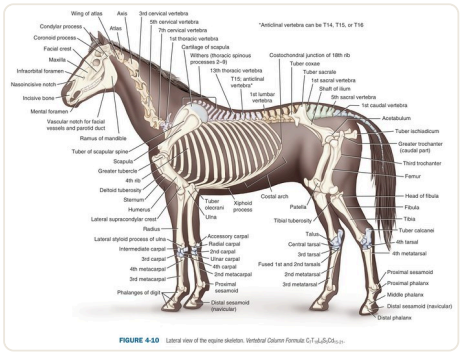


Image — Orsini JA, Grenager NS, de Lahunta A (eds). Comparative Veterinary Anatomy: A Clinical Approach. Academic Press/Elsevier — Fig 4–10, lateral view of the equine skeleton. Reproduced for educational reference.

A C7 T14–15 L6–7 S4 Cd20–23

B C7 T18 L6 S5 Cd15–21

C C7 T13 L7 S3 Cd20–23

D C7 T13 L6 S5 Cd18–20

B **C7 T18 L6 S5 Cd15–21.** Eighteen thoracic vertebrae is the number to hold — the dog has 13 and the ox 13. The second option is the dog, the third the ox and the fourth the pig.

Where this is taught: Comparative Veterinary Anatomy

82 **In which species does the spinal cord end most caudally?**

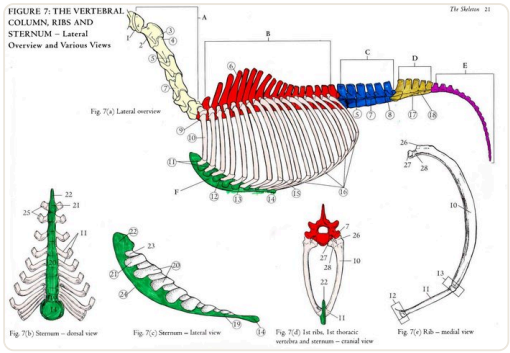


Image — Raynor M. The Horse Anatomy Workbook, Figure 7, The Vertebral Column, Ribs and Sternum. Reproduced for educational reference; copyright remains with the original author and publisher.

A The ox, at S1

B The horse, at S2

C The dog, at L6–L7

D The pig, at L5–L6

B The **horse, at S2** — the most caudal termination of the domestic species. The pig's is the most cranial, at L5–L6. The general point matters more than the list: the cord is shorter than its canal by a different amount in every species, so **vertebral counts are useless without it**.

Where this is taught: Comparative Veterinary Anatomy

83 **Why is a lumbosacral epidural safe in the dog?**

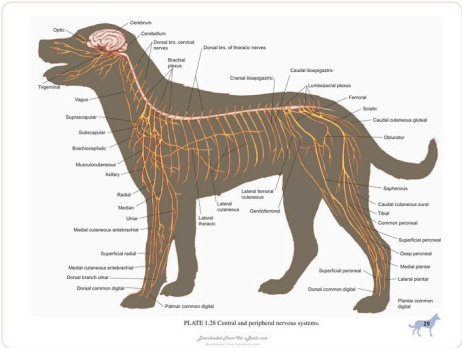


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 1.28 (p. 29). Reproduced for educational reference; copyright remains with the original authors and publisher.

A Because the dog has no cauda equina

B Because the dural sac ends at L3

C Because the dog has three sacral vertebrae

D Because the lumbosacral space is behind the end of the cord

D Because the cord ends at **L6–L7**, so the lumbosacral space is *behind* it. The cat is the caution in the same breath: its cord can still reach the lumbosacral space, so the anatomy that makes the approach routine in a dog does not transfer unexamined.

Where this is taught: Comparative Veterinary Anatomy

84 **Ox, sheep and goat are often treated as one row in a table. Name one way the sheep and the goat differ from each other:**

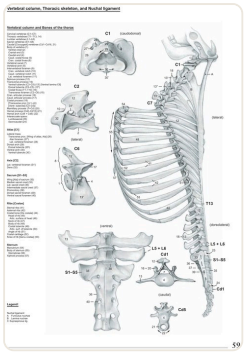


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Vertebral column, thoracic skeleton and nuchal ligament. Reproduced for educational reference.

A The goat is digitigrade

B The sheep has four sacral vertebrae to the goat's five

C The sheep has no dental pad

D The goat has three stomach compartments

> **B** **The sheep has four sacral vertebrae to the goat's five.** They share a dental formula and an identical foot, which is why they get collapsed into one row — but the ox gives 8% of its stomach to the omasum and 7% to the abomasum where the small ruminants invert that to 4% and 13%, and the small ruminant's cord can run on through almost the whole sacrum. **A small ruminant is not a small ox.**

Where this is taught: Comparative Veterinary Anatomy

85 **Which digits bear weight in the ox, and what is the stance called?**

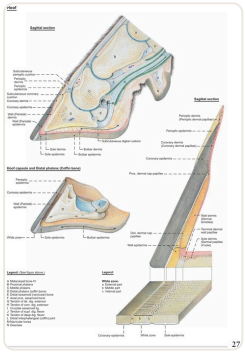


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Hoof. Reproduced for educational reference.

A III and IV; digitigrade

B III and IV; unguligrade

C II–V; digitigrade

D III alone; unguligrade

> **B** **Digits III and IV, unguligrade** — cloven, two claws, with two vestigial digits behind. The dog and cat are digitigrade on II–V; the horse is unguligrade on III alone.

Where this is taught: Comparative Veterinary Anatomy

86 **In cattle, where is most lameness found?**

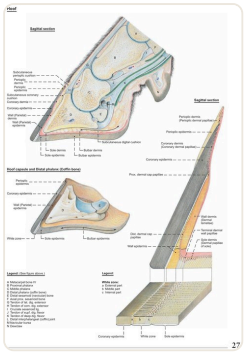


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Hoof. Reproduced for educational reference.

A The lateral claw of the hind foot

B The medial claw of the fore foot

C The lateral claw of the fore foot

D The medial claw of the hind foot

A The **lateral claw of the hind foot**. It is a straightforward consequence of load: cattle are cloven-hoofed and bear weight on digits 3 and 4, and the hind lateral claw takes more of it than its partner.

Where this is taught: Cattle (Bovine) Anatomy for Vet Students

87 **Why does dehorning an adult cow open a sinus?**

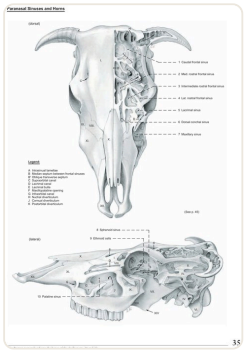


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Paranasal sinuses and horns. Reproduced for educational reference.

A Because the maxillary sinus lies under the horn base

B Because the horn is hollow and continuous with the nasal cavity

C Because the cornual artery runs inside the sinus

D Because the frontal sinuses extend into the horn cores

D Because the **frontal sinuses extend into the horn cores**. Our bovine guide calls it the single most important surgical fact about the bovine skull, and it is why dehorning an adult is a different operation from disbudding a calf.

Where this is taught: Cattle (Bovine) Anatomy for Vet Students

88 **Why is the left paralumbar fossa the surgical window in cattle?**

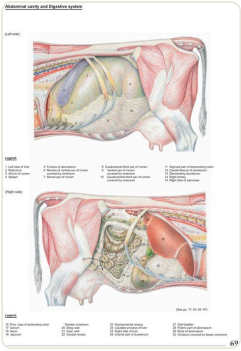


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Abdominal cavity and digestive system. Reproduced for educational reference.

A The abomasum always lies there

B The spleen is absent on that side

C The left kidney is retroperitoneal

D The rumen is the only viscus touching the left flank

D Because the **rumen occupies most of the left abdomen and is the only viscus touching the left flank**. That is what makes a standing left-flank approach predictable: you know what is immediately behind the incision before you make it.

Where this is taught: Cattle (Bovine) Anatomy for Vet Students

89 **The bird's lung differs from a mammal's in which fundamental way?**

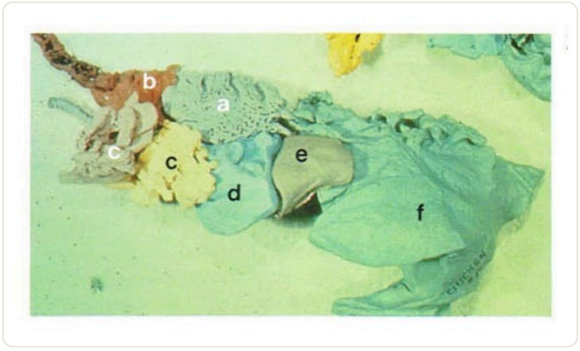


Image — McLelland J. A Colour Atlas of Avian Anatomy, Wolfe — plate 288, air sacs of an adult chicken, latex cast. Reproduced for educational reference.

A It is rigid and does not inflate; air sacs drive air one way through the parabronchi

B It inflates twice per cycle rather than once

C It has alveoli but no bronchi

D It is ventilated by the diaphragm alone

A **The bird lung is rigid and does not inflate.** Eight thin-walled air sacs act as bellows and drive air *one way* through the gas-exchanging parabronchi — more efficient than the mammalian tidal lung. And there is **no diaphragm** at all.

Where this is taught: Avian Anatomy

90 **What is a pneumatic bone, and why does it matter clinically?**

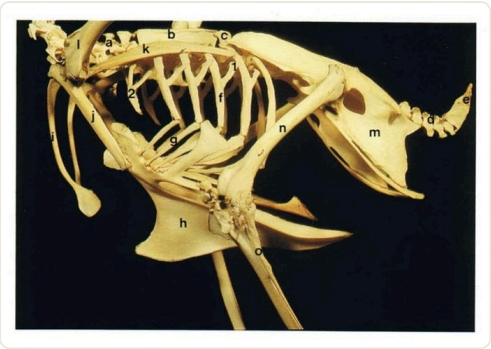


Image — McLelland J. A Colour Atlas of Avian Anatomy, Wolfe — plate 80, trunk skeleton of an adult chicken. Reproduced for educational reference.

A A hollow bone with no marrow, which cannot be used for intraosseous access

B A bone filled by air-sac diverticula, which links the skeleton to the airway

C A bone with an unusually large marrow cavity, which fractures easily

D A bone that ossifies late, so it is radiolucent in the juvenile

B A bone **filled by air-sac diverticula** — humerus, sternum, vertebrae, pelvis and skull in the bird. It saves weight, and it **links the skeleton to the airway**, which is why the pneumatic bones are avoided for intraosseous fluids in birds.

Where this is taught: Avian Anatomy

91 **Where does most proteolysis occur in the bird?**

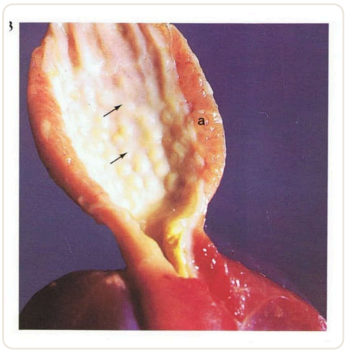


Image — McLelland J. A Colour Atlas of Avian Anatomy, Wolfe — plate 123, interior of the proventriculus of an adult chicken. Reproduced for educational reference.

A The proventriculus

B The cloaca

C The gizzard

D The crop

C The **gizzard**, which both grinds and digests. Food is stored in the crop and mixed with acid and pepsinogen in the **proventriculus**, but it is in the gizzard that most proteolysis actually happens — the reverse of the intuition that the acid-secreting chamber must be where digestion occurs.

Where this is taught: Avian Anatomy

92 **Which statement about the bird's urinary and reproductive tracts is correct?**

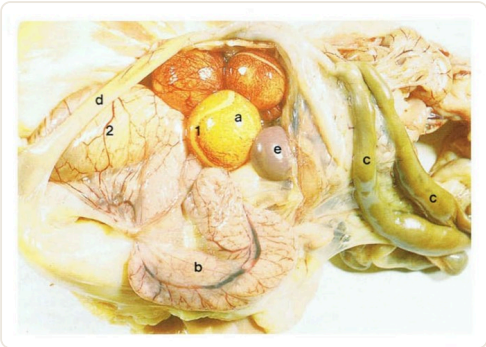


Image — McLelland J. A Colour Atlas of Avian Anatomy, Wolfe — plate 161, ovary and oviduct of an in-lay chicken. Reproduced for educational reference.

A Birds are ureotelic and have a small bladder

B Birds have paired functional ovaries and a urinary bladder

C Birds excrete urea through the cloaca and have no kidneys

D Birds are uricotelic, have no urinary bladder, and in most species only the left ovary develops

D **Uricotelic, no urinary bladder, and in most species only the left ovary and oviduct develop.** Urine, faeces and gametes all leave through the **cloaca**. The single ovary is a weight saving that shapes the whole reproductive tract.

Where this is taught: Avian Anatomy

93 **The bird is often called the outlier that proves the rule. Why?**

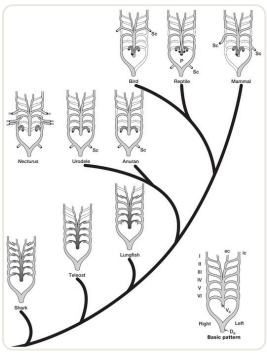


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 12.19, evolution of the aortic arches, after Goodrich. Reproduced for educational reference.

A Because birds are not tetrapods

B Because fused vertebrae, no diaphragm, a right aortic arch and a cloaca are the shared plan edited, not replaced

C Because birds share no homologies with mammals

D Because the bird skeleton has no limb segments

B Because every one of those differences is **the shared plan edited, not replaced**. Fused vertebrae, no diaphragm, a right aortic arch, a cloaca — each is a modification of the same tetrapod design, which is why a bird can be understood by a student who knows the dog.

Where this is taught: Comparative Veterinary Anatomy

94 **What is the strongest evidence that two muscles in different species are homologous?**

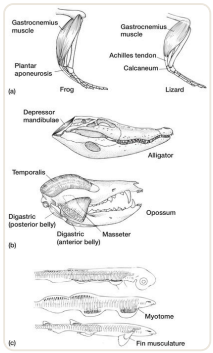


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 10.19, criteria for muscle homology, (c) after Goodrich. Reproduced for educational reference.

A They keep the same nerve supply

B They have the same action

C They have the same attachments

D They have the same name in both species

A **Nerve supply.** A muscle keeps its nerve even when its attachments migrate, so the nerve is the reliable marker. **Shared function proves nothing** — that is analogy, not homology.

Where this is taught: Comparative Veterinary Anatomy

95 **How do a cat's claws differ from a dog's, mechanically?**

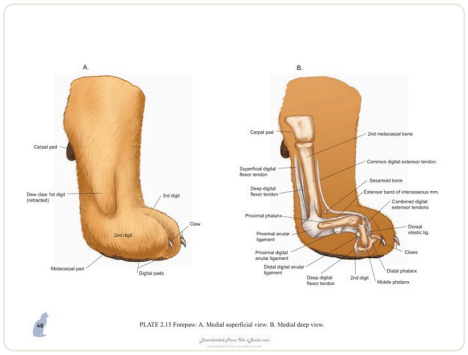


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 2.15 (p. 48). Reproduced for educational reference; copyright remains with the original authors and publisher.

A They are protractible — sheathed at rest by an elastic ligament and extended by the deep digital flexor

B They are retracted by an extensor and extended by an elastic ligament

C They are permanently extended but shorter

D They are held out by the deep digital flexor at rest

A The cat's claws are **protractible**: held sheathed at rest by an **elastic ligament** and extended by the **deep digital flexor**. The dog's are non-retractable and blunt, for traction — the opposite arrangement, and the reason a dog's claws wear and a cat's do not.

Where this is taught: Cat Anatomy

96 **Why can a cat fit through any gap its head clears?**

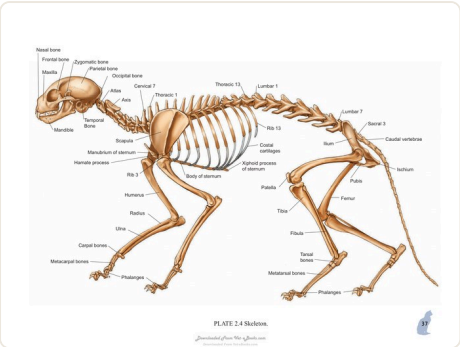


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 2.4 (p. 37). Reproduced for educational reference; copyright remains with the original authors and publisher.

A The cat has no clavicle at all and no shoulder girdle

B The feline ribs are cartilaginous throughout life

C The scapulae are fused to the sternum

D A vestigial, free-floating clavicle means the forelimb hangs by muscle alone

D Because the clavicle is **vestigial and free-floating**, so the forelimb hangs by muscle alone and the shoulders can be drawn together. The dog has the same vestigial clavicle; the cat's slighter frame is what turns it into the party trick.

Where this is taught: Cat Anatomy

97 **Which pair correctly describes the dog and the cat as feeders?**

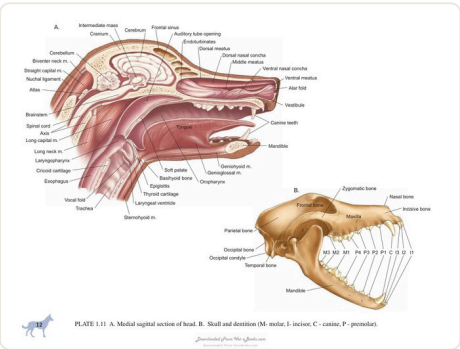


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 1.11 (p. 12). Reproduced for educational reference; copyright remains with the original authors and publisher.

A Both obligate carnivores

B Dog omnivore; cat facultative carnivore

C Both facultative carnivores, the cat more so

D Dog facultative carnivore, able to digest starch; cat obligate carnivore

D The **dog is a facultative carnivore** — more omnivorous than the cat, and able to digest starch because it has pancreatic amylase. The **cat is an obligate carnivore**, and its teeth, short gut and metabolism are all built for a meat-only diet.

Where this is taught: Dog Anatomy

98 **Which two structures are found in the male dog and not in the male cat's equivalent arrangement?**

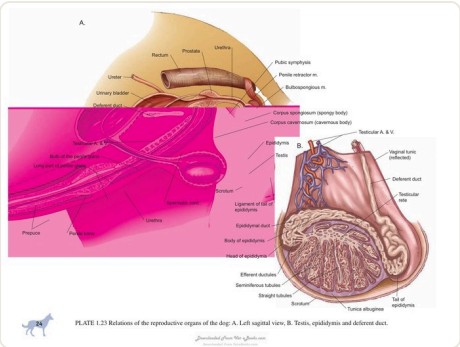


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 1.23 (p. 24). Reproduced for educational reference; copyright remains with the original authors and publisher.

A A scrotum and an epididymis

B A prepuce and a retractor penis muscle

C An os penis and a bulbus glandis

D A prostate and a bulbourethral gland

C The **os penis** — a penile bone — and the **bulbus glandis**, the swelling responsible for the copulatory tie. The bitch, in the same paragraph of our dog guide, is a **spontaneous ovulator**, which the queen is not.

Where this is taught: Dog Anatomy

99 **Which species is the exception to the usual blood-volume figure, and what is it?**

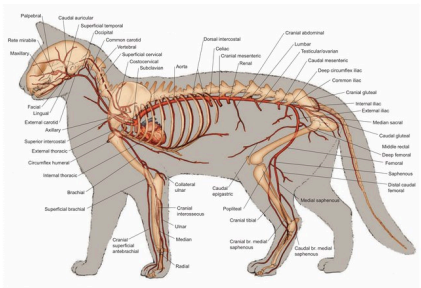


Image — McCracken TO, Kainer RA. Color Atlas of Small Animal Anatomy: The Essentials, Plate 2.22 (p. 55). Reproduced for educational reference; copyright remains with the original authors and publisher.

A The dog, at about 4%

B The ox, at about 10%

C The cat, at about 4% of body weight against 6–8% in the other domestic animals

D The horse, at about 12%

C The **cat, at about 4%** of body weight, against 6–8% in the other domestic animals. It is not a piece of trivia: it is why cats tolerate blood loss less well, and why the same volume of haemorrhage means something different in a cat.

Where this is taught: Veterinary Anatomy Notes

100 **Horn, claw, hoof, foot pads and the mammary gland are all filed under which heading, and why?**

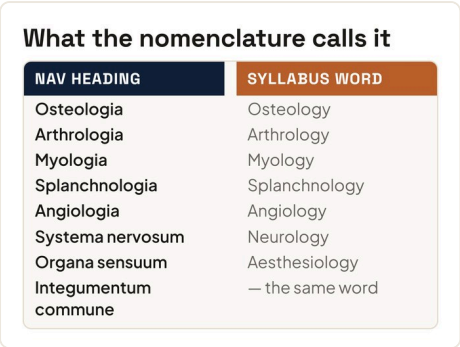


Diagram — Vet-eBooks.com, drawn for this guide. Data from the contents of Constantinescu's Illustrated Veterinary Anatomical Nomenclature, 4th ed., and Sisson and Grossman's The Anatomy of the Domestic Animals, Vol. I.

A The musculoskeletal system, because they are all keratinised

B The integument for horn and hoof only; the mammary gland is reproductive

C Splanchnologia, because they are all appendages

D The common integument — they are the same organ specialised

> **D** All of them sit under the **common integument**, because they are the same organ specialised. **The hoof is skin.** It is the single most useful reframing in the whole subject: it makes laminitis a disease of skin, and the mammary gland a modified skin gland, which is exactly what it is.

Where this is taught: Veterinary Anatomy Notes

08 Written exam questions — 20, with model answers

The hundred questions above are answered by recognition: the right answer is on the page, among four. A written paper gives you nothing to recognise. These 20 ask for the same anatomy in the harder form — produce it, in order, from memory — and each one is followed by the **marking points an examiner would actually tick**, in the order they expect them.

Use them second. Sit the hundred, mark yourself by area, then take the written questions from the two areas that went worst. A student who scores well above and badly here has a retrieval problem rather than a knowledge problem, and it is fixed by writing answers out rather than by reading more.

> **How to mark a written answer**
>
> Give yourself one mark per point you produced *before* looking, not per point you recognise afterwards. The order matters in an examination and it matters here: a model answer that arrives in the wrong order usually means the underlying structure was learned as a list rather than as a sequence.

W1 **Define the median plane, and explain how it differs from a sagittal plane.**

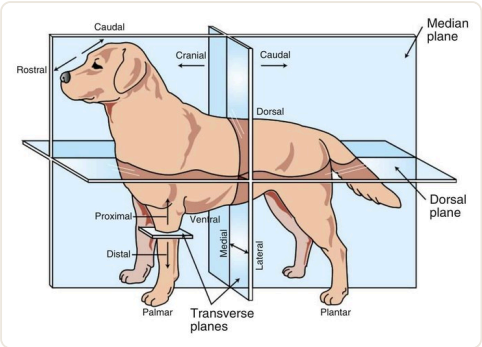


Image — Colville T, Bassert JM. Clinical Anatomy and Physiology for Veterinary Technicians, 4th ed. Elsevier — Fig. 1.1. Reproduced for educational reference.

Model answer

1. The **median plane** divides the body into **equal right and left halves**. There is exactly one.
2. A **sagittal** plane is any plane **parallel to the median plane**. There are infinitely many.
3. "Midsagittal" is not a third plane: it is the median plane under another name, and using it as though it were separate is the commonest error in this vocabulary.

Where this is taught: Anatomical Planes in Animals

W2 **A radiographic view is requested as a dorsopalmar projection of the equine foot. Say what that describes, and name the rule that lets you read any view's name.**

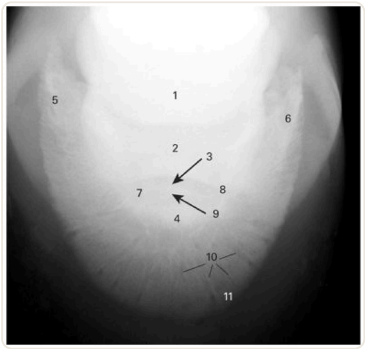


Image — Ashdown RR, Done SH. Clinical Anatomy of the Horse. Mosby/Elsevier — Fig 4.73, dorsopalmar view radiograph of distal phalanx. Reproduced for educational reference.

Model answer

1. The beam **enters the dorsal surface and leaves the palmar surface**.
2. The rule is **point of entry, then point of exit**, in that order.
3. **Palmar** rather than plantar tells you this is a **forelimb**: below the carpus the caudal surface is palmar, and below the tarsus it is plantar.

Where this is taught: Anatomical Planes in Animals

W3 **Take the term *gastroenterology* apart, and say what each part contributes.**

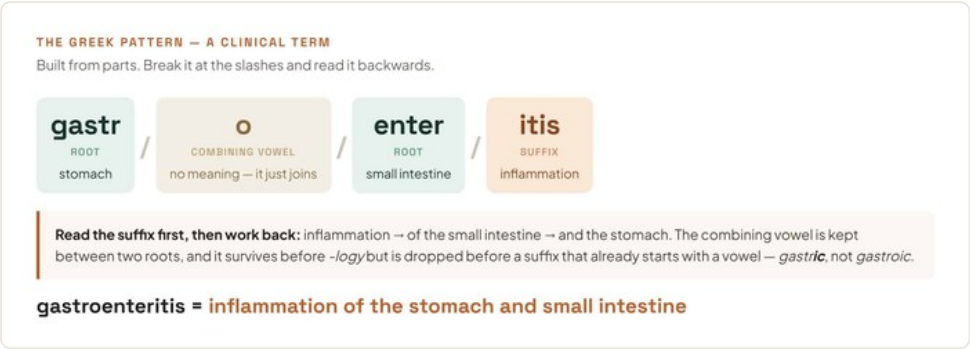


Diagram — Vet-eBooks.com, built for this guide. The word parts and the rules it illustrates are from Taibo A. Veterinary Medical Terminology Guide and Workbook, 2nd ed. Wiley.

Model answer

1. **Two roots** — *gastr* (stomach) and *enter* (intestine) — which carry the meaning.
2. **Combining vowels**, the *o* in each join, which carry **no meaning at all** and exist to make the word pronounceable.
3. A **suffix**, *-logy*, which says what kind of word it is: a study, not a condition or a procedure.
4. Read a clinical term **suffix first, then work backwards**: the suffix tells you what kind of thing the word is before the root tells you where.

Where this is taught: Veterinary Anatomy Terminology

W4 **Give the permanent dental formula of the dog and of the cat, and account for the difference.**

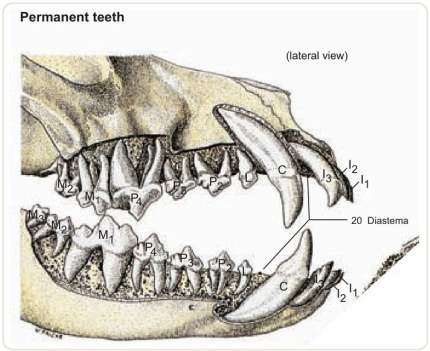


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. — plate: permanent teeth, lateral view. Reproduced for educational reference.

Model answer

1. Dog: **2 × (I 3/3, C 1/1, P 4/4, M 2/3) = 42**.
2. Cat: **2 × (I 3/3, C 1/1, P 3/2, M 1/1) = 30**.
3. The cat has lost **premolars and molars**, not incisors or canines — the reduction is at the back of the arcade.
4. That reduction is what an **obligate carnivore**'s mouth looks like: a shearing dentition with nothing kept for grinding.

Where this is taught: Canine Skull & Dental Anatomy

W5 **Name the two carnassial teeth of the dog and explain why they matter clinically.**

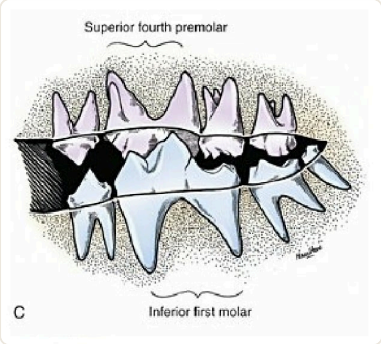


Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. — FIG 7.7C, bite of the shearing teeth, medial view. Reproduced for educational reference.

Model answer

1. The **upper fourth premolar (P4)** and the **lower first molar (M1)**.
2. They **shear past one another** like scissor blades — the defining occlusion of a secodont carnivore.
3. The upper P4 has **three roots** and is the strongest tooth of the upper jaw, which is why it is the one that fractures on bones and the one that takes longest to extract.

Where this is taught: Canine Skull & Dental Anatomy

W6 **Working from the outside in, name the tissues of a tooth and say where each one stops.**

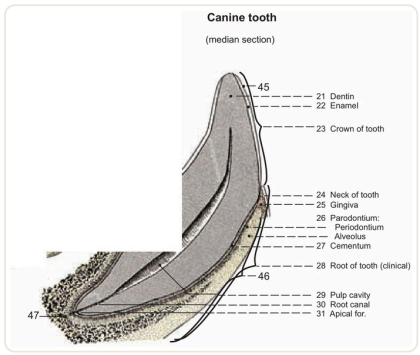


Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog, 5th ed. — plate: canine tooth, median section. Reproduced for educational reference.

Model answer

1. **Enamel** covers the crown.
2. **Cementum** covers the root.
3. **Dentine** lies under both and makes up the bulk of the tooth.
4. **Pulp** is in the centre, carrying the vessels and nerves.
5. Enamel and cementum **never cover the same surface**; where the two coverings meet is the **neck**.

Where this is taught: Canine Skull & Dental Anatomy

W7 **Name the three segments of a tetrapod limb from the body outwards, and say which one carries most of the species variation.**

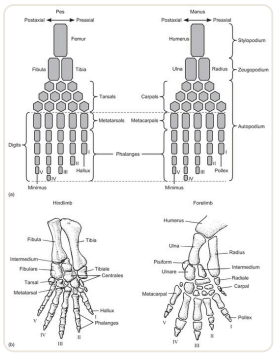


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 9.23, basic organization of the fore- and hindlimbs, after Smith and Jarvik. Reproduced for educational reference.

Model answer

1. **Stylopodium** — humerus or femur.
2. **Zeugopodium** — radius and ulna, or tibia and fibula.
3. **Autopodium** — the hand or the foot.
4. Almost all the variation is in the **autopodium**: the humerus is recognisably the same bone in every domestic species, and the foot is not.

Where this is taught: Comparative Veterinary Anatomy

W8 **Name the four serous cavities and explain, in one sentence, why an organ is never inside the cavity it appears to occupy.**

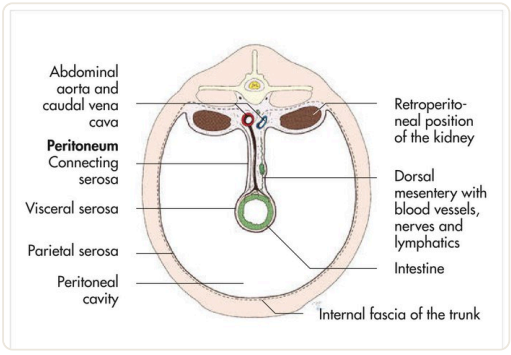


Image — König HE, Liebich H-G. Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas, 7th ed. Thieme — Fig. 1.62, schematic illustration of the serous membranes. Reproduced for educational reference.

Model answer

1. **Left pleural, right pleural, pericardial, peritoneal.** The two pleural sacs count separately because they are separate sacs.
2. **One continuous sheet** lines the wall as the parietal layer, folds back, and covers the organ as the visceral layer.
3. The organ is therefore **pushed into the sac from outside** and lies outside its cavity — a fist pushed into a balloon is never inside the balloon's cavity.

Where this is taught: Body Cavities & Serous Membranes in Animals

W9 **Explain why a small, rapidly accumulating pericardial effusion can tamponade the heart when a large, slowly accumulating one may not.**

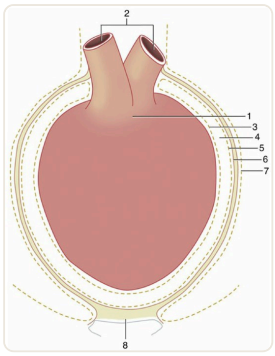


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Elsevier — Fig. 7.5, schematic illustration of the pericardium. Reproduced for educational reference.

Model answer

1. The pericardium is the **one serous sac with a fibrous coat outside its serous layers**.
2. That coat **resists distension in the short term**, so a small volume raises intrapericardial pressure sharply.
3. Given time the fibrous layer **stretches**, so a slowly accumulating effusion can become very large without tamponading.
4. The clinical point: **rate matters more than volume**.

Where this is taught: Body Cavities & Serous Membranes in Animals

W10 **Name the layer that holds a midline coeliotomy closure in the dog, and say what changes about it behind the umbilicus.**

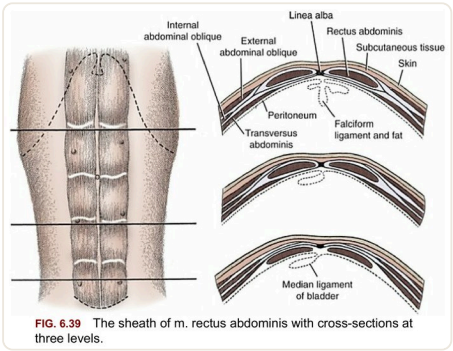


FIG. 6.39 The sheath of m. rectus abdominis with cross-sections at three levels.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog, 5th ed. Elsevier — Fig 6.39, the sheath of m. rectus abdominis. Reproduced for educational reference.

Model answer

1. The **external lamina of the rectus sheath** is the holding layer. Skin and fat contribute nothing to the strength of the closure.
2. Behind the umbilicus the **internal lamina disappears**, so deep to the rectus there is only transversalis fascia and peritoneum.
3. The practical consequence: the **depth from muscle to abdominal contents changes along the incision**, and a closure that misses the external rectus sheath is a dehiscence waiting to happen.

Where this is taught: Dog Abdominal Anatomy

W11 **Describe the ruminant stomach in one sentence, then name the four compartments in the order ingesta meets them, with the side of the abdomen each lies on.**

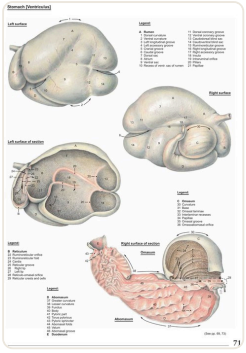


Image — Budras KD, Habel RE, Mülling CKW, Greenough PR. Bovine Anatomy: An Illustrated Text, 2nd ext. ed. Schlütersche — Stomach [Ventriculus], p. 71. Reproduced for educational reference.

Model answer

1. **One stomach with four compartments**, three of them non-glandular forestomachs; only the **abomasum** secretes acid.
2. **Reticulum** — most cranial, across the midline, against the diaphragm.
3. **Rumen** — the whole **left** half of the abdomen.
4. **Omasum** — **right**.
5. **Abomasum** — **right**, on the floor.

Where this is taught: Ruminant Stomach Anatomy

W12 **A colleague cannot find the left adrenal gland on abdominal ultrasound. Set out the approach you would give them.**

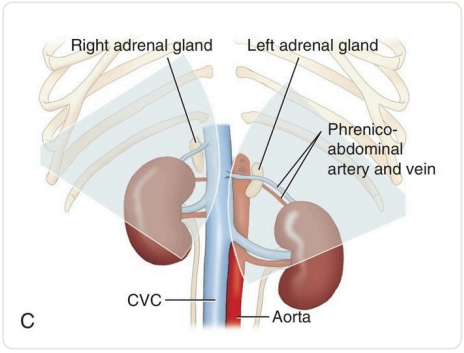


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.24, C. Reproduced for educational reference.

Model answer

1. Find the **vessel first, then the gland**: the adrenals are small, variable and hard to find directly, and the vessels are neither.
2. The **aorta** carries the left adrenal; the **caudal vena cava** carries the right.
3. Non-visualisation **rules out a mass and nothing else** — a normal adrenal that is not seen is not a normal adrenal that has been assessed.

Where this is taught: Veterinary Abdominal Ultrasound

W13 **Distinguish gain from power on an ultrasound machine, and give the working rule that follows.**

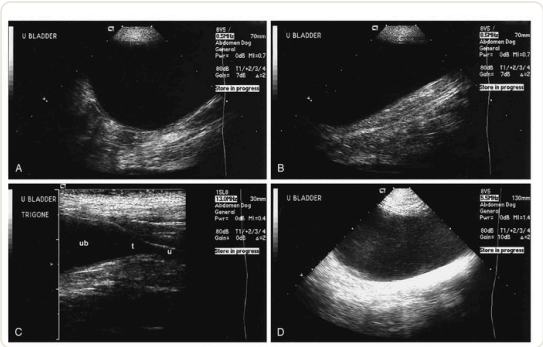


Image — Mattoon JS, Sellon RK, Berry CR (eds). Small Animal Diagnostic Ultrasound, 4th ed. Elsevier — Fig. 4.28. Reproduced for educational reference.

Model answer

1. **Power** is the energy going into the patient.
2. **Gain** amplifies the returning echoes after the fact.
3. The rule: use the **least power that works** and adjust gain afterwards.
4. Turning power up to fix a dark image **puts energy into the animal for no diagnostic gain**.

Where this is taught: Veterinary Abdominal Ultrasound

W14 **Aortic arch IV becomes the aorta. Say which side mammals keep and which side birds keep, and give the clinical consequence of getting it the wrong way round.**

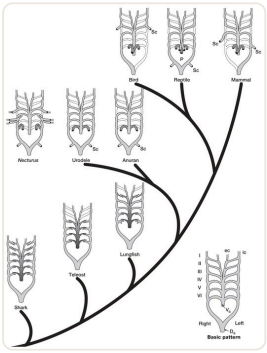


Image — Kardong KV. Vertebrates: Comparative Anatomy, Function, Evolution, 6th ed. McGraw-Hill — Fig 12.19, evolution of the aortic arches, after Goodrich. Reproduced for educational reference.

Model answer

1. **Mammals keep the left** fourth arch.
2. **Birds keep the right**.
3. A mammal that keeps the **right** instead has a **persistent right aortic arch**, a vascular ring that traps the oesophagus.
4. The presenting sign is a young animal **regurgitating solid food** at weaning.

Where this is taught: Comparative Veterinary Anatomy

W15 **Tabulate the five findings that separate upper from lower motor neuron signs, and give the one idea that makes the upper motor neuron column make sense.**

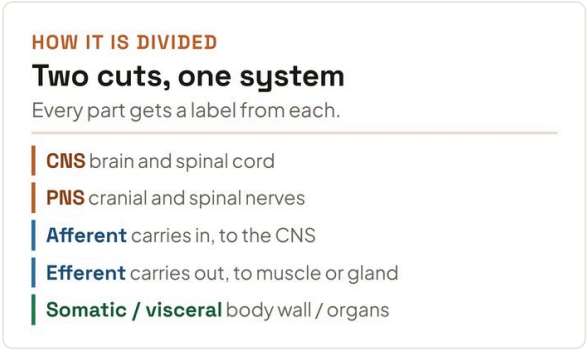


Diagram — Vet-eBooks.com, drawn for this guide. Data from Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Saunders/Elsevier, pp. 439–440.

Model answer

1. **Paresis**: flaccid in LMN, spastic in UMN.
2. **Tone**: lost in LMN, increased in UMN.
3. **Reflexes**: reduced or absent in LMN, normal to exaggerated in UMN.
4. **Atrophy**: rapid and severe (neurogenic) in LMN, little in UMN.
5. **Fasciculations**: present in LMN, absent in UMN.
6. The idea: the **UMN was the brake**. Losing it **releases** the spinal reflex, so hyperreflexia is a sign of something lost, never of something added.

Where this is taught: Upper vs Lower Motor Neuron Signs

W16 **Define a motor unit, and say how the central nervous system grades the force a muscle produces.**

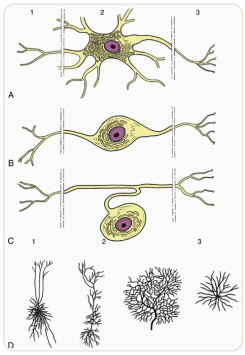


Image — Dyce KM, Sack WO, Wensing CJG. Textbook of Veterinary Anatomy, 5th ed. Saunders/Elsevier — Fig. 8.3, schematic diagrams of multipolar, bipolar and unipolar neurons, with drawings of actual neurons. Reproduced for educational reference.

Model answer

1. A motor unit is **one alpha motor neuron and all the muscle fibres it supplies**.
2. Force is graded by **recruiting more units, in size order** — small units first.
3. And by **raising the firing rate** of the units already recruited.
4. Neither mechanism changes how hard an individual fibre contracts.

Where this is taught: Upper vs Lower Motor Neuron Signs

W17 **Explain why cattle have no upper incisors, and say what takes their place.**

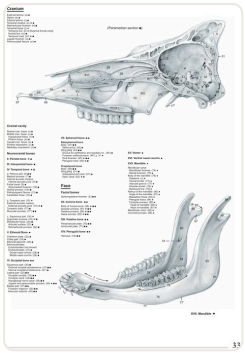


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Cranium and mandible. Reproduced for educational reference.

Model answer

1. The upper incisor **tooth germs do form** in the embryo; their development is **aborted before eruption**.
2. A **dental pad** — dense fibrous tissue bound to the bone — takes their place.
3. The lower incisors **bite against the pad**, so nothing is cut between opposing teeth; the animal tears rather than cuts.
4. The formula records it as zeros: **0–0–3–3 / 3–1–3–3 = 32**.

Where this is taught: Comparative Veterinary Anatomy

W18 **Say why a lumbosacral epidural is a routine procedure in the dog, and why the same anatomy does not transfer to the cat unexamined.**

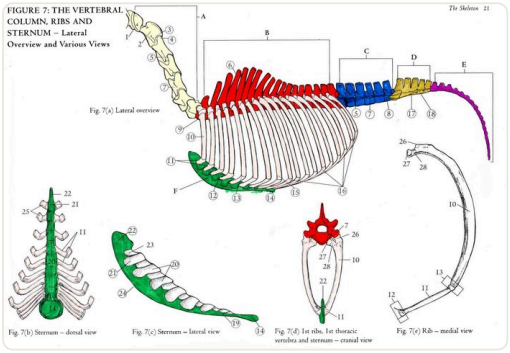


Image — Raynor M. The Horse Anatomy Workbook, Figure 7, The Vertebral Column, Ribs and Sternum. Reproduced for educational reference; copyright remains with the original author and publisher.

Model answer

1. In the dog the spinal cord ends at about **L6–L7**, so the lumbosacral space is **behind the end of the cord**.
2. The needle therefore enters a space containing **cauda equina and cerebrospinal fluid**, not cord.
3. The **cat's cord can still reach the lumbosacral space**, so the anatomy that makes the approach routine in a dog is not present.
4. The general rule this illustrates: a **vertebral count is useless without the termination** that goes with it.

Where this is taught: Comparative Veterinary Anatomy

W19 **Give three ways a bird's body plan differs fundamentally from a mammal's, and say what the differences have in common.**

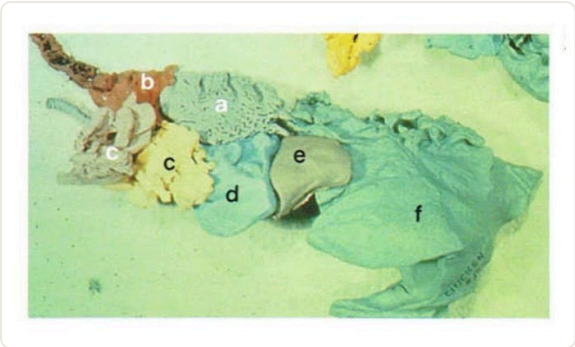


Image — McLelland J. A Colour Atlas of Avian Anatomy, Wolfe — plate 288, air sacs of an adult chicken, latex cast. Reproduced for educational reference.

Model answer

1. The **lung is rigid and does not inflate**: air sacs drive air one way through the parabronchi, and there is **no diaphragm**.
2. **Pneumatic bones** are filled by air-sac diverticula, linking the skeleton to the airway — which is why they are avoided for intraosseous fluids.
3. The bird is **uricotelic**, has **no urinary bladder**, and in most species only the **left ovary and oviduct** develop; urine, faeces and gametes all leave by the cloaca.
4. What they have in common: each is the **shared tetrapod plan edited, not replaced**, which is why a student who knows the dog can understand the bird.

Where this is taught: Avian Anatomy

W20 **Explain why the left paralumbar fossa is the standing surgical window in cattle, and why dehorning an adult cow opens a sinus.**

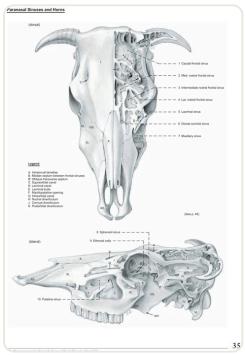


Image — Budras et al., Bovine Anatomy, 2nd ext. ed. — plate: Paranasal sinuses and horns. Reproduced for educational reference.

Model answer

1. The **rumen occupies most of the left abdomen**, so you know what lies immediately behind the incision before you make it.
2. The **paralumbar fossa** is the only part of the abdomen not covered by ribs, which is what makes a standing flank approach possible at all.
3. The **frontal sinuses extend into the horn cores** in the adult.
4. So removing the horn **opens the sinus**, which is why dehorning an adult is a different operation from disbudding a calf.

Where this is taught: Cattle (Bovine) Anatomy for Vet Students

09 What your score means, and what to do next

Mark yourself out of 100, then mark yourself out of each area separately — the second number is the useful one. A student who scores 70 overall but 4 out of 17 on osteology does not have a general anatomy problem; they have a bones problem, and it is fixable in an evening.

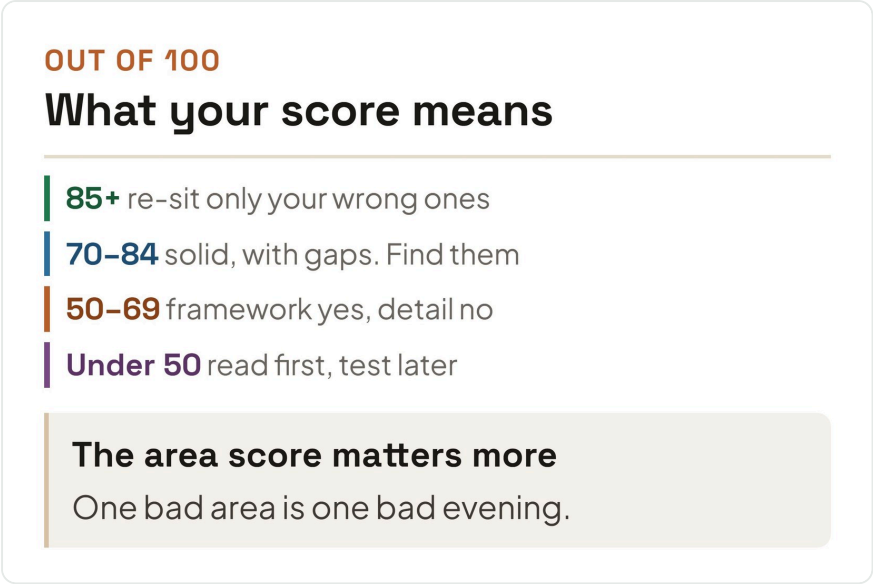


Fig 6 — What a score out of 100 is actually telling you Four bands, and the advice attached to each. The band matters far less than the per-area breakdown underneath it: a low total with one catastrophic area is a different problem from a low total spread evenly, and they need different evenings.

Diagram — Vet-eBooks.com, drawn for this guide. The bands are a study signal, not a pass prediction.

SCORE	WHAT IT MEANS	WHAT TO DO
85–100	You know this material	Re-sit only the questions you got wrong, a week from now
70–84	Solid, with gaps	Find the gaps by area, read those two pages, re-sit those sections
50–69	The framework is there and the detail is not	Work area by area rather than re-sitting the whole paper
Under 50	Too early for a mock	Read first, test later. A test you cannot answer teaches you that you cannot answer it, which you already knew

What to read for each area

Take your weakest area first and read the page beside it, then come back and re-sit that section only. Re-sitting the whole hundred is satisfying and mostly wasted: you will spend most of it answering questions you already know.

IF YOUR WEAKEST AREA WAS…	READ THIS	WHY
Terminology and orientation	Veterinary anatomy terminology and anatomical planes in animals	Between them they cover word-building and every directional term
Osteology, joints and the skeleton	Canine skull and dental anatomy	Formulae, foramina and tooth structure in one place
Viscera and the body cavities	Body cavities and serous membranes	The four sacs and the parietal-visceral relationship
Vessels and circulation	Veterinary abdominal ultrasound basics	The vessels as landmarks, which is how they are used
Nerves and the motor system	Upper vs lower motor neuron signs	The two-neuron chain and how to localise between them
Species differences	Comparative veterinary anatomy	Seven species in fourteen tables

Three things that are worth more than another hundred questions

- **Re-sit the ones you got wrong, a week later.** Spacing beats volume, and it is not close. Our guide to studying veterinary anatomy covers the method properly.

- **Say the answer out loud before you look.** Retrieval you can hear is retrieval you did.
- **Do the last hour of revision in a lab if you can.** A structure you have held is a structure you can name. Our dissection-lab survival guide is about making that hour count.

If you are working toward a licensing examination rather than a course paper, our NAVLE preparation guide sets out a schedule and an exam-day plan; the anatomy in it is the same anatomy, asked differently.

10 Veterinary Anatomy MCQs — frequently asked questions

How many veterinary anatomy questions are on this page, and are they free?

There are **120 — 100 multiple-choice questions** and **20 written exam questions with model answers** — they are free, and they are all on the page: no sign-up, no app and nothing behind a form. Each MCQ has four options, one correct answer and a worked explanation; each written question is followed by the marking points an examiner would tick. There is also a printable PDF version with the answer key on a separate page so you can cover it and sit the paper properly.

Why does every question have a picture, and where do the pictures come from?

Because anatomy asked in words alone is not anatomy. Every question carries a **labelled plate from the article that teaches its answer** — the same figure you would meet if you followed the link under the answer, in its full context. They are drawn from the atlases and textbooks our own articles are built on, and each one is **credited beneath it** to the book it came from.

What is the difference between the multiple-choice and the written questions?

What they ask of you. A multiple-choice question puts the right answer on the page among four and asks you to **recognise** it; a written question asks you to **produce** it, in order, with nothing to recognise. The gap between the two is where most marks are lost in a real examination, which is why both are here. Sit the hundred first, mark yourself by area, then take the written questions from the two areas that went worst.

Are these real exam questions?

No, and nothing on this page claims they are. They are **original questions** written to test material taught on this site — not past papers, and not taken or adapted from any published question bank. That is a deliberate choice: a page of recycled exam questions would be worth less than a page of questions whose answers you can go and read about, and every question here links to the article that teaches its answer.

What areas of veterinary anatomy do the questions cover?

Six: **terminology and orientation** (15 questions), **osteology, joints and the skeleton** (17), **viscera and the body cavities** (18), **vessels and circulation** (13), **nerves and the motor system** (12) and **species differences** (25). The sizes are not arbitrary and they are not equal: each one is capped by how much this site has published on that area, because every question has to be answerable from one of our pages. Nerves is the smallest for exactly that reason, and it will grow.

How should I use them — all at once, or a section at a time?

Either, but mark yourself **by area** whichever you choose. The total out of 100 is much less useful than the six area scores underneath it: a student who scores 70 overall but 4 out of 17 on osteology does not have a general anatomy problem, they have a bones problem, and that is one evening's work rather than a term's. Take your weakest area, read the page the last section points you at, then re-sit that section only.

Do the questions get harder, or are they all the same level?

They are pitched at first- and second-year level throughout rather than ramped, because the point is to find gaps rather than to sort candidates. What varies is the *kind* of recall: some questions ask for a number you either know or do not — a dental formula, a vertebral formula — and others ask you to reason from a principle, such as why reflexes are exaggerated below an upper motor neuron lesion. The second kind is where the explanations earn their place.

What is the difference between this page and a veterinary anatomy question book?

Scale and purpose. A question book gives you several hundred questions to work through over weeks, in print, usually with a short answer key. This page gives you **100 with the reasoning attached**, free, and links each one to a full article on the same topic — so it works as a diagnostic that tells you what to read next, rather than as a body of practice. They are complements, not substitutes, which is why there is a book recommended at the foot of this page for anyone who wants the longer thing.

Sources

1. Vet-eBooks.com — our own published veterinary anatomy articles. ⭐ **The primary source, and the constraint this page is built on.** Every one of the 100 questions is answerable from one of **17 published articles** on this site, and the link under each answer names it. A phrase from each explanation was checked mechanically against the body of the page it cites before the question could ship, so no question can drift away from the teaching it claims.
2. Singh B (ed). *Dyce, Sack and Wensing's Textbook of Veterinary Anatomy*, 5th ed. Elsevier. The comparative anatomy behind the species-differences section reaches this page through our own articles, which cite it: the vertebral and dental formulae, the limb segments, the aortic arches and the species-by-species termination of the spinal cord.
3. König HE, Liebich H-G. *Veterinary Anatomy of Domestic Animals: Textbook and Colour Atlas*, 7th ed. Thieme. Behind the osteology and viscera material on the pages these questions draw from.
4. International Committee on Veterinary Gross Anatomical Nomenclature. *Illustrated Veterinary Anatomical Nomenclature*, 4th ed. The authority for the branch names in §2's questions — Osteologia, Arthrologia, Myologia, Splanchnologia, Angiologia and the rest — and for the directional and sectional terms in the orientation questions.
5. de Lahunta A, Glass E, Kent M. *Veterinary Neuroanatomy and Clinical Neurology*. ⚠️ Behind our upper-and-lower-motor-neuron article, which is where all of §6's questions are answered from. Named here because §6 is the section this page is thinnest on, and a reader is entitled to know where the material behind it comes from.
6. ⛔ No veterinary anatomy question bank. Stated as a source entry because its absence is load-bearing. The plan row for this article protects *300 Questions and Answers in Anatomy and Physiology for Veterinary Nurses*, and three more question-bank titles on this site sell the same thing. **Not one question here is taken, adapted or paraphrased from any of them**, and none of the four is described, summarised or reviewed anywhere on this page.

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