



WHITE PAPER



The Major Challenges in Teaching and Learning Veterinary Anatomy

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The quality of tomorrow's veterinary care depends on the quality of today's anatomy education.

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Executive Summary

Every anatomical insight learned today becomes a life saved tomorrow.



Veterinary anatomy forms the foundation of veterinary education, yet it remains one of the most intellectually demanding disciplines for both educators and students. As expectations for veterinary graduates continue to evolve, there is a growing need to re-evaluate how anatomy is taught and learned. This white paper examines the major challenges shaping veterinary anatomy education and explores how digital innovations, such as VetroViz, can help address these challenges while complementing traditional teaching approaches.





Problem Statement

Traditional approaches to veterinary anatomy education, including lectures, cadaveric dissection, and prosected specimens, have long formed the cornerstone of anatomical training¹. However, they are increasingly challenged by several key educational challenges:



**Teaching Comparative Anatomy
Across Multiple Species**



**Minimizing the Risk
of Zoonotic Disease**



**Standardizing Practical
Anatomy Education**



**Challenges of learning
from Cadaveric Anatomy**



**Integrating Veterinary Sciences
for Better Clinical Learning**



Addressing these challenges is essential to delivering standardized, integrated, and clinically relevant veterinary anatomy education.





Teaching Comparative Anatomy Across Multiple Species

Mastering Anatomy Beyond a Single Species



THE CHALLENGE

Unlike human anatomy, which focuses on a single species with standardized anatomical structures, veterinary anatomy requires students to develop a comparative understanding across **multiple species**, including canine, feline, equine, bovine, and avian. Moreover, comparative anatomy is learned using a combination of cadaveric specimens, anatomical models, textbooks, atlases, and digital resources, creating a **fragmented** learning experience².



Critical Impediments Include:



Multiple Resources: Learning is distributed across different educational resources.



Inconsistent Terminology: Anatomical nomenclature varies between resources.



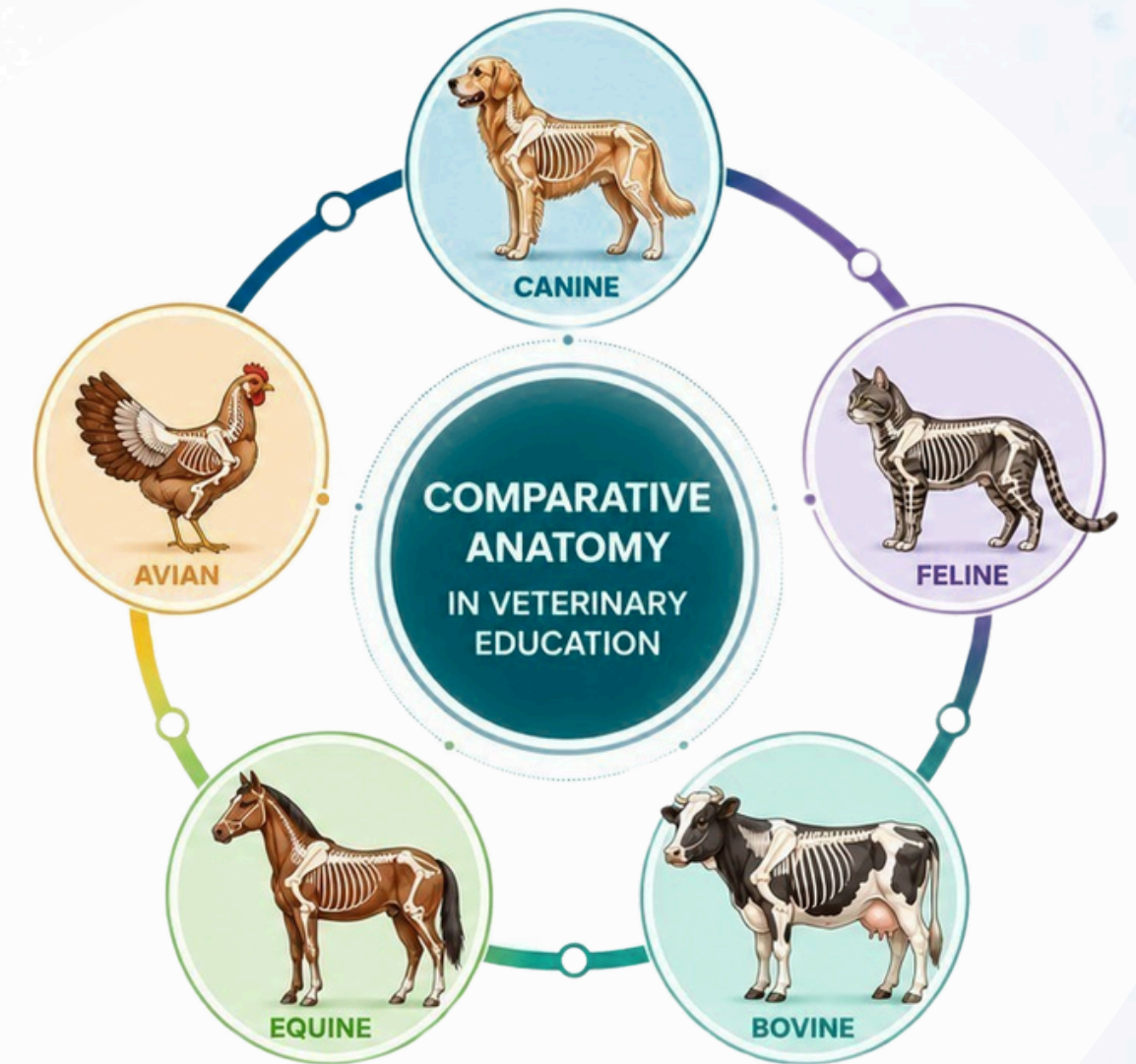
Variable Visualizations: Differences in illustrations and levels of anatomical detail.



Fragmented Learning: Anatomical information is presented in disconnected formats.



Higher Cognitive Load: Integrating information from multiple sources makes it difficult to build a coherent understanding of comparative anatomy across species.





The Solution: Comparative Anatomy with VetroViz

VetroViz brings detailed anatomical models of 10+ animal species together within a single, unified digital platform, enabling students to study and compare species without switching between multiple resources.



Standardized visualization for consistent comparison across species.



Consistent anatomical terminology to reinforce core anatomical concepts.



Interactive three-dimensional models that help students recognize species-specific variations and build a more integrated understanding of veterinary anatomy.



Together, these features support efficient comparative learning while complementing traditional teaching.





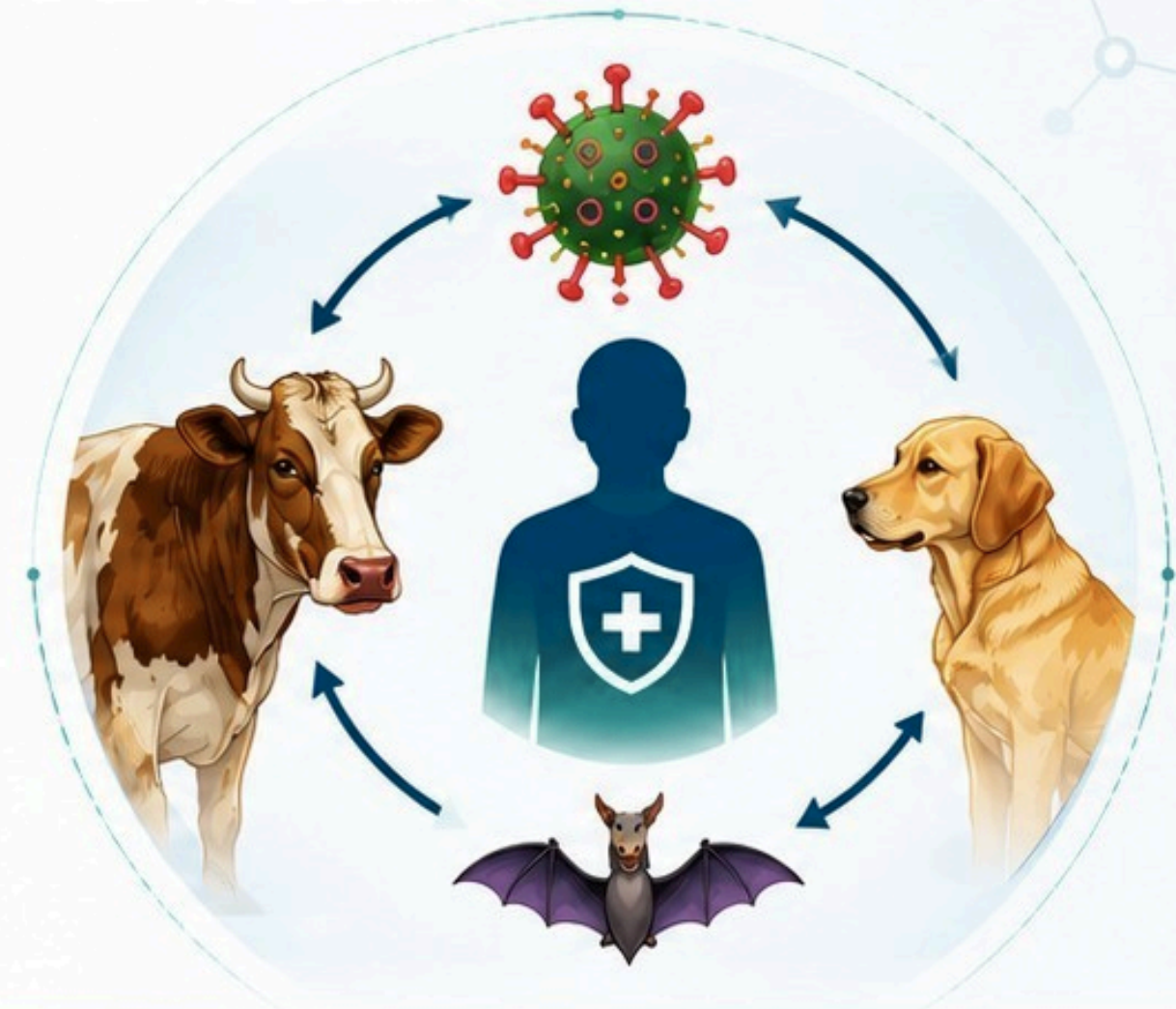
Minimizing the Risk of Zoonotic Disease

Creating Safer Learning Environments



THE CHALLENGE

Zoonotic diseases are infectious diseases that can be transmitted between animals and humans through direct contact, biological tissues, body fluids, or contaminated environments. They are a well-recognized occupational hazard in veterinary education and practice, where students may be exposed to zoonotic pathogens while handling animal cadavers, biological specimens, and live animals during anatomy training³.



A study published in **BMC Public Health**⁴ reported that nearly one-third of veterinary students self-reported experiencing at least one suspected zoonotic infection during their studies.



85.2%

reported one
suspected infection



12.7%

reported two,
highlighting the
potential for repeated exposure



These findings emphasize the importance of educational approaches that support **effective anatomical learning** while minimizing unnecessary exposure to biological hazards.





The Solution: Safer Anatomy Training with VetroViz

VetroViz enables students to master anatomy in an immersive three-dimensional virtual environment before progressing to cadaveric specimens or live animals, reducing unnecessary exposure to pathogens and associated biosafety risks during the early stages of learning.

How VetroViz helps reduce zoonotic risk:



Develop anatomical competence before handling cadaveric specimens or live animals.



Unlimited practice through virtual dissection without biological exposure.



Reduce repeated handling of animal specimens during foundational training.



Build knowledge and confidence before cadaveric and clinical sessions.



Maximize hands-on training by focusing laboratory time on skill application.



Minimize unnecessary exposure to animal tissues and potential zoonotic pathogens while complementing traditional anatomy teaching.





Standardization of Practical Learning

Consistent Anatomy Education for Every Student



THE CHALLENGE

An **international Delphi study** involving 23 veterinary anatomy educators established a Veterinary Anatomy Core Syllabus with 160 essential learning outcomes, reinforcing the need for standardized, competency-based anatomy education for every veterinary graduate⁵. However, achieving this consistency in practice remains challenging. Students' learning opportunities are largely determined by the clinical cases and specimens available during their training.

Variation in exposure includes:



For Example:



While one student might only examine pregnant cows during a rotation, another might encounter cystic or infertile animals.

Although both experiences are valuable, they **do not provide equivalent learning opportunities.**

A benchmark survey among member institutions of the **American Association of Veterinary Medical Colleges (AAVMC)** revealed considerable variation in primary-care clinical education. Such differences inevitably lead to unequal exposure consequently, students graduate with varying levels of anatomical and clinical experience, making it difficult to ensure consistent competency across cohorts⁶.



The Solution: Standardized Learning with VetroViz

No two practical sessions are ever exactly the same. Specimens, clinical cases, and anatomical variations naturally differ from one cohort to another. VetroViz complements this real-world diversity by providing every student with access to the same comprehensive collection of normal and pathological anatomy, creating a consistent foundation for learning.

How VetroViz supports consistent anatomy education:



Provides a shared learning experience with identical anatomical models for every student.



Expands exposure to rare, clinically significant, and species-specific anatomical variations.



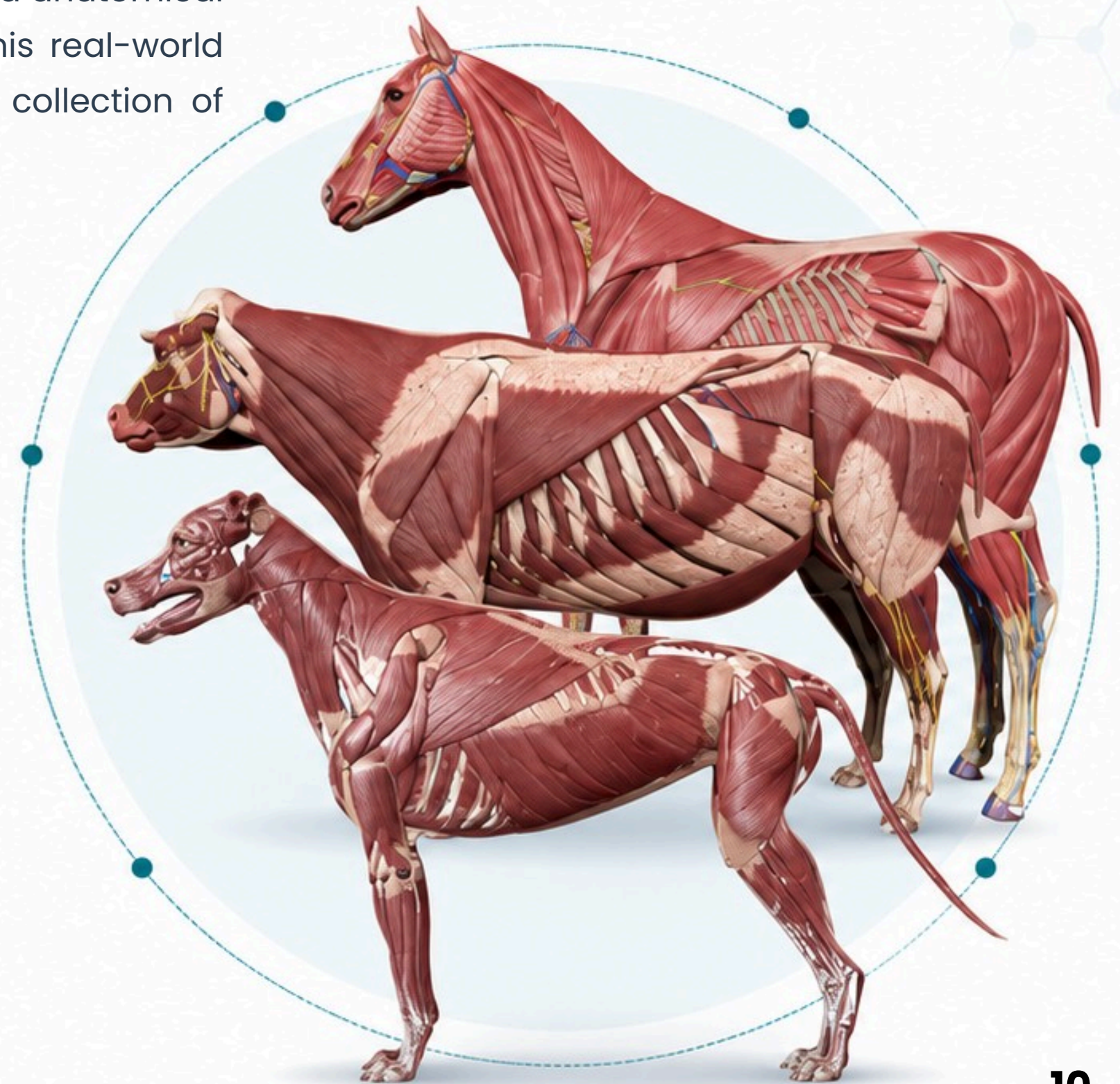
Enables repeated exploration of both normal and pathological anatomy without specimen constraints.



Reinforces practical teaching by allowing students to revisit complex structures before and after laboratory sessions.



Supports standardized competency development while preserving the value of cadaveric and clinical learning.





Challenges of learning from Cadaveric Anatomy

From Limited Specimens to Unlimited Learning Opportunities



THE CHALLENGE

A recent publication in **Frontiers in Veterinary Science**⁷ reaffirmed that cadaveric dissection remains a cornerstone of veterinary anatomy education. However, its use is accompanied by several practical challenges:



Cost

of specimen acquisition and maintenance



Ethical

Consideration



Limited

availability of cadavers



Biosafety

concerns



Prolonged

to chemical preservatives such as formaldehyde



In addition, cadaveric specimens are **finite resources**, limiting opportunities for repeated dissection and independent practice.



Overcoming these challenges is crucial to ensuring equitable learning experiences and unlocking the full potential of cadaveric anatomy education.



The Solution: Hybrid Learning with VetroViz

VetroViz extends cadaveric anatomy education through immersive three-dimensional animal anatomy, allowing students to build knowledge, practice repeatedly, and enter the laboratory better prepared. By shifting foundational learning to a digital environment, it maximizes the educational value of every cadaveric specimen.



How VetroViz Helps



Optimize specimen use



Reduce repeated animal handling during foundational learning.



Support ethical education



Complement cadaveric teaching with virtual practice



Expand anatomy access



Learn without specimen limitations



Standardized Multi-Species Anatomy Learning



Minimize unnecessary exposure to biological hazards



Enhance laboratory safety



Reduce preservative exposure



Practice without limits



Dissect, restore, and revisit anatomy anytime



Outcome: From finite specimens to limitless learning.





Integrated Veterinary Learning

Connecting Anatomy, Pathology, Imaging, and Beyond



THE CHALLENGE

Understanding veterinary medicine requires more than learning anatomy in isolation. Every anatomical structure must be understood in the context of its development, microscopic organization, pathological changes, imaging appearance, and clinical relevance. However, these disciplines are often taught separately using different learning resources, making it difficult for students to build meaningful connections between foundational sciences and clinical practice⁸.



This fragmented approach can make it challenging to:



Connect

Connect anatomy with histology, histopathology, and imaging.



Relate

Relate structure to function in health and disease.



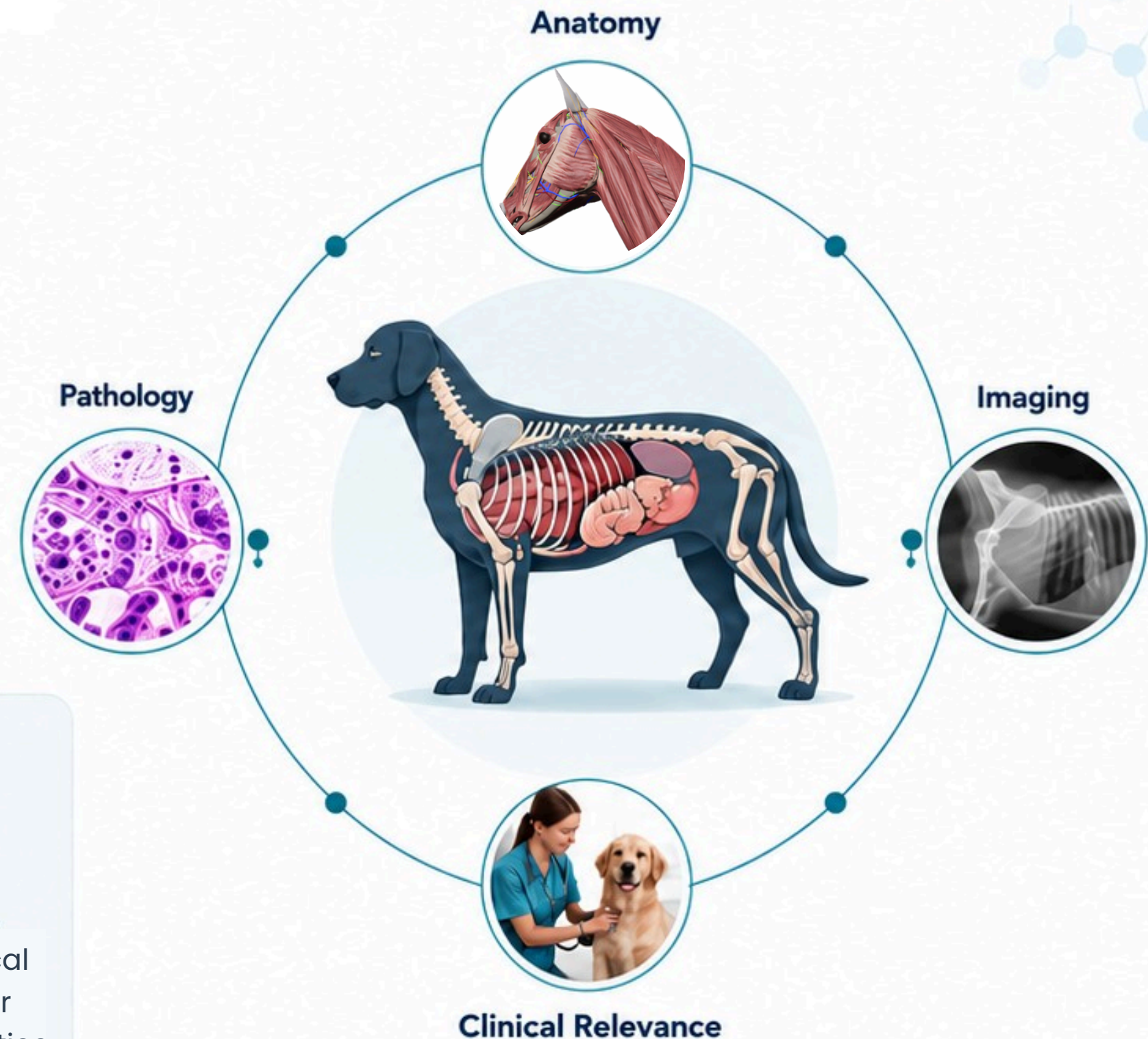
Interpret

Interpret clinical findings through integrated learning.



Develop

Develop clinical reasoning for veterinary practice.





The Solution: Integrated Veterinary Learning with VetroViz

VetroViz unifies anatomy, histology, histopathology, embryology, diagnostic imaging, and clinical sciences within a single interactive platform, enabling students to explore veterinary anatomy in its complete clinical context.



VetroViz brings together:



1,000+ diagnostic imaging datasets



500+ veterinary clinical case studies



300+ histology and histopathology slides



1,000+ curriculum-aligned assessments



Designed to help students:



Connect disciplines through a unified learning experience.



Correlate anatomy with pathology, imaging, and embryology.



Develop clinical reasoning through integrated, case-based learning.



Bridge preclinical and clinical education within a single platform.



By presenting veterinary sciences as a connected learning experience rather than isolated subjects, VetroViz fosters deeper understanding and prepares students to apply knowledge with confidence in clinical practice.



Closing Statement

When tradition meets technology, learning becomes limitless.

Grounded in real animal cadavers and reconstructed from authentic DICOM CT and MRI datasets, VetroViz extends the value of traditional anatomy teaching through an immersive, anatomically accurate learning experience. By bringing together the essential elements of veterinary anatomy education within a single integrated platform, it helps address the major challenges in teaching and learning while preserving the strengths of established educational practices.



One Platform. Five Solutions.



Simplifying

comparative anatomy across multiple species.



Creating

safer learning before specimen handling



Standardizing

practical anatomy education for every learner.



Extending

cadaveric learning through unlimited digital exploration.



Integrating

pathology and imaging to strengthen clinical reasoning.



*The confidence **to care** begins with the confidence **to understand**.*

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