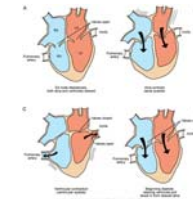
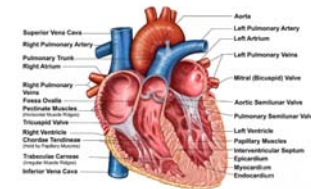


INTRODUCTION TO ANIMAL ANATOMY AND PHYSIOLOGY LABORATORY

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ANATOMY AND PHYSIOLOGY

- **Anatomy:** the form and structure of the body and its parts.
 - What it looks like and where it is located.
- **Physiology:** the function of the body and its parts.
 - How they work and what they do.



INTRODUCTION TO ANATOMY AND PHYSIOLOGY

- All parts of an animal's body are like components to a machine.
- These components include:
 - Cells
 - Tissues
 - Organs
 - Systems
- We must be able to differentiate "Normal" from "Abnormal".

TYPES OF ANATOMY

- **Microscopic anatomy:** study of small structures by using a microscope.
 - Histology
- **Macroscopic anatomy:** study of large body parts that large enough to be seen with the naked eye.
 - Gross anatomy
- **Regional anatomy:** study of individual areas or "regions" of the body.
- **Systemic anatomy:** study of individual systems of the body.

TYPES OF PHYSIOLOGY

- **Cell Physiology** : The study of the functions of cells.
- **Organ Physiology** : The study of the physiology of specific organs.
- **Systemic Physiology** : The study of all aspects of the functioning of specific organ systems.
- **Pathological Physiology** : The study of the effects of diseases on organ functions or system functions.

MAIN BODY SYSTEMS

System	Organs	Functions
Skeletal	bones and joints.	
Integumentary	skin, hair, nails and hooves	
Muscular	skeletal, cardiac, and smooth muscle.	
Nervous	central nervous system (CNS) and peripheral nerves	
Sensory	organs of general and special sense	
Cardiovascular	heart and blood vessels	
Respiratory	lungs and air passageways	
Digestive	gastrointestinal (GI) tube and accessory digestive organs	
Endocrine	endocrine glands and hormones	
Urinary	kidneys, ureters, urinary bladder, and urethra	
Reproductive	male and female reproductive structures	
Immune system	immune cells and immune components	
Lymphatic system	lymphatic organ and lymphatic vessel	

สาขาวิชาที่เกี่ยวข้องกับกายวิภาคศาสตร์และสรีรวิทยา

- **Angiology** หมายถึง การศึกษาเกี่ยวกับระบบหมุนเวียนโลหิตและน้ำเหลือง
- **Arthrology** หมายถึง การศึกษาเกี่ยวกับระบบข้อต่อของร่างกาย
- **Dermatology** หมายถึง การศึกษาเกี่ยวกับระบบผิวหนังร่างกาย
- **Endocrinology** หมายถึง การศึกษาเกี่ยวกับระบบต่อมไร้ท่อ
- **Aesthesiology** หมายถึง การศึกษาเกี่ยวกับระบบรับรู้ความรู้สึก
- **Myology** หมายถึง การศึกษาเกี่ยวกับระบบกล้ามเนื้อ
- **Neurology** หมายถึง การศึกษาเกี่ยวกับระบบประสาท
- **Osteology** หมายถึง การศึกษาเกี่ยวกับระบบโครงกระดูก
- **Immunology** หมายถึง การศึกษาเกี่ยวกับระบบภูมิคุ้มกัน
- **Spanchnology** หมายถึง การศึกษาเกี่ยวกับระบบอวัยวะภายในต่างๆ

TERMINOLOGY

- We need specific anatomical terminology to be **clear** and **accurate** with descriptions of body parts.
- Anatomical terms are based on imaginary slices, called **planes** through the animal body that can be used as points or areas of reference.
- Anatomical terms are also based on **directional terms** that have opposite meanings of one another.

ANATOMICAL PLANES OF REFERENCE

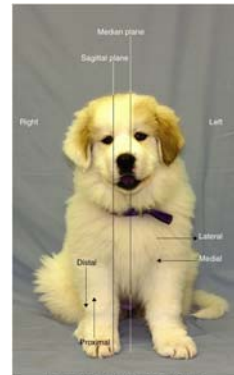
The 4 anatomical planes of reference are:

1. Median plane (mid-sagittal plane):

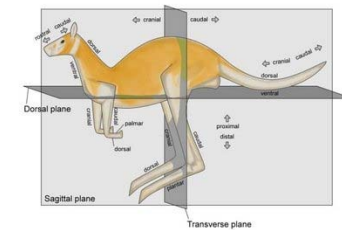
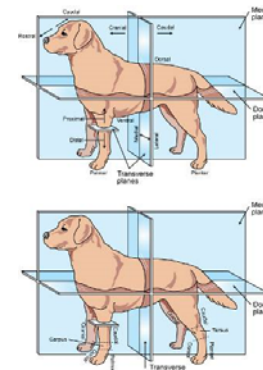
A special kind of plane that runs down the center of the body lengthwise and divides it into equal left and right halves.

2. Sagittal plane:

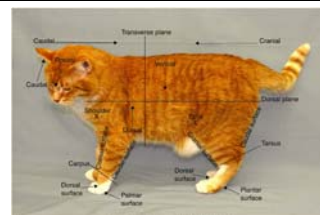
A plane that runs the length of the body and divides it into left and right parts that are not necessarily equal halves.



THE 4 ANATOMICAL PLANES OF REFERENCE



ANATOMICAL PLANES OF REFERENCE



3. Transverse plane:

A plane across the body that divides it into cranial (head-end) and caudal (tail-end) parts that are not necessarily equal.

4. Dorsal plane :

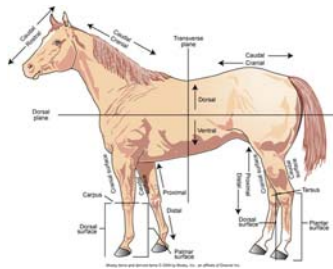
A plane at right angles to the sagittal and transverse planes. It divides the body into dorsal (toward the back) and ventral (toward the belly) parts that are not necessarily equal. In humans, called frontal plane.

DIRECTIONAL TERMS

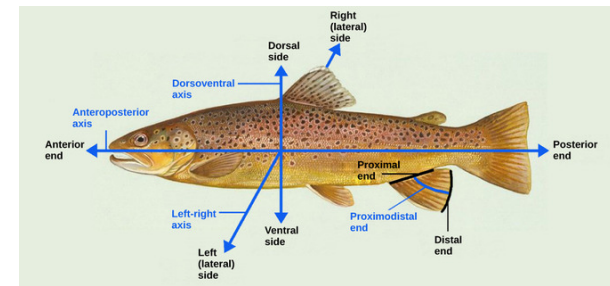
- Provide a common language for accurately and clearly describing body structures, regardless of the position of the animal's body.
- Terms generally occur in pairs that have opposite meanings and are used to describe relative positions of body parts.

DIRECTIONAL TERMS

- **Left and right** refer to the animal's left and right.
- **Cranial and caudal** refer to the two ends of the animal as it stands on four legs.
 - cranial = toward the head
 - caudal = toward the tail
- **Rostral** means towards the tip of the nose and only describes positions or directions on the head.
- **Dorsal and ventral** refer to "up and down" or towards the back and towards the belly.



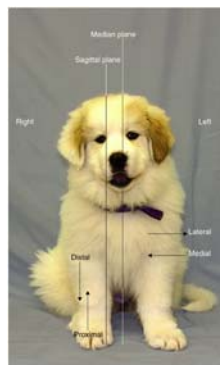
DIRECTIONAL TERMS



<https://courses.lumenlearning.com/boundless-biology/chapter/origonogenesis-and-vertebrate-formation/>

DIRECTIONAL TERMS

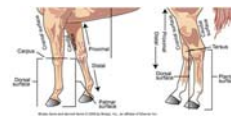
- **Medial and lateral** refer to positions relative to the median plane.
 - Medial = toward the midline
 - Lateral = away from the midline
- **Deep and Superficial** refer to the position of something relative to the surface of the body.
 - Deep = toward the center of the body (internal)
 - Superficial = toward the surface of the body or a body part (external).
- **Proximal and distal** describe positions only on extremities relative to other parts of the body.
 - Proximal = toward the body
 - Distal = away from the body



DIRECTIONAL TERMS OF THE LIMBS

Based on whether one is referring to the portion of the limb and whether it is the **front or hind limb**.

- The proximal/distal **dividing line** for the front leg is the **carpus** (wrist) and for the rear leg it is the **tarsus** (ankle).
- The **front surface** of both the front and hind limbs is termed "**cranial**" proximal to the carpus and "**dorsal**" distal to the carpus.
- The **back surface** of both the front and hind limbs that is **proximal** to the carpus/tarsus is called the **caudal surface**.
- The **back surface** of the **forelimb** distal to the carpus is called the **palmar surface**.
- The **back surface** of the **hindlimb** distal to the tarsus is called the **plantar surface**.



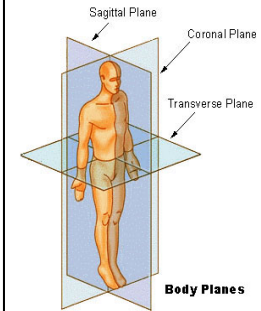
Palmar surface (Fore) or Plantar surface (hind)

EXERCISE: DESCRIBE THE AREA OF LESIONS



DIRECTIONAL TERMS

<u>Direction</u>	<u>Domestic Animal</u>	<u>Human</u>
Individual's left	Left	Left
Individual's right	Right	Right
Toward the head end of the body	Cranial	Superior
Toward the tip of the nose (head only)	Rostral	Nasal
Toward the tail end of the body	Caudal	Inferior
Toward the back	Dorsal	Posterior
Toward the belly	Ventral	Anterior
Toward the median plane	Medial	Medial
Away from the median plane	Lateral	Lateral
Toward the center (whole body or part)	Deep (internal)	Deep (internal)
Toward the surface (whole body or part)	Superficial (external)	Superficial (external)
Toward the body (extremity)	Proximal	Proximal
Away from the body (extremity)	Distal	Distal
"Back" of forelimb distal to carpus	Palmar	Palmar
"Back" of hindlimb distal to tarsus	Plantar	Plantar
"Front" of forelimb & hindlimb	Dorsal	Anterior



http://training.seer.cancer.gov/module_anatomy/unit_1_3_terminology2_planes.html

EXERCISE: DESCRIBE THE AREA OF LESIONS



ANS-211 ปฏิบัติการกายวิภาคและสรีรวิทยาสัตว์
(Animal Anatomy and Physiology Laboratory)
แบบทดสอบก่อนเรียน (Pre-Test)

จงจับคู่ให้ถูกต้อง

- | | | |
|--------------------|-------|----------------------|
| A. Cranial | | ส่วนปลาย |
| B. Caudal | | ส่วนต้น |
| C. Distal | | ด้านบน หรือ ด้านหลัง |
| D. Dorsal | | ด้านท้อง |
| E. Median | | ด้านหน้า |
| F. Lateral | | ด้านหลัง |
| G. Proximal | | แนวกลาง หรือด้านใน |
| H. Ventral | | ด้านข้าง |



