# Urinary Physiology

Ex. 29 - Human Urinary Physiology

Urinalysis:

I. Terminology

| | |
|---|---|
| Urochrome | Hematuria |
| Glucosuria | Crystals |
| Ketonuria | Casts |
| Pyuria | Renal Calculi |

II. Analysis of Unknowns ("fake" urine)

A. **Appearance** – check color and transparency

Normal color: _____

Urochrome

Abnormal colors:

Reddish amber – urobilinogen (produced by action of intestinal bacteria on bile pigment)

Red to smokey brown: blood and blood pigments

Normal transparency: _____

Abnormal transparency:

Cloudy – bacterial infection, pus, fat

B. **Specific Gravity** – use **urinometer** [read at meniscus to 3 decimal places]

Normal range: 1.003 to 1.030

Abnormal: low – chronic nephritis, diabetes insipidus

high – diabetes mellitus, acute nephritis

C. **Multistix (urine test strips)** – know what is considered normal for each test and know one abnormal situation for each urine component.

| | Normal | Abnormal |
|---|---|---|
| Glucose: | | |
| Ketones: | | |
| Specific Gravity: | | |
| Blood: | | |
| pH: | | |
| Protein: | | |

D. **Sediments** - examine sediment slide. You are responsible for naming 2 sediments, not for identifying them on the slide.

***Urinalysis Questions:***

1. What is a typical volume of urine that would be excreted in a day?

2. What substance is responsible for the normal “yellow” color of urine?

3. Which has a greater specific gravity: 1 ml of $dH_2O$ or 1 ml of urine? Why?

4. Glucosuria is indicative of what clinical situation?

# Urinary and Reproductive System Anatomy

Ex. 28 - Anatomy of the Urinary System
Ex. 9 - Dissection of the Cat Urinary System
Ex. 30, 31 - Male / Female Reproductive System
Ex. 10 - Dissection of the Cat Reproductive System

## KIDNEY

Locate the following structures on the sheep kidney and human kidney models:

| Sheep Kidney | Kidney Models | Nephron Model |
|---|---|---|
| renal capsule | renal artery and vein | nephron |
| cortex | adipose capsule | Glomerular capsule |
| medulla | cortex | (Bowman's capsule) |
| pelvis | medulla | convoluted tubules |
| ureter | hilum | PCT |
| pyramids | pyramids | DCT |
| | minor calyces | loop of Henle |
| | major calyces | collecting ducts |
| | pelvis | |

## UROGENITAL SYSTEM

Locate the following structures on the cat and on models and charts of the human:

Kidneys
Adrenal glands
Renal arteries
Renal veins
Ureters
Urinary bladder
Urethra

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| Female | Male |
|---|---|
| Ovaries | Scrotum |
| Uterine tube | Testes |
| Uterus | Epididymis |
| *Uterine horns | Vas deferens |
| Uterine body | Spermatic cord |
| Cervix | Inguinal canal |
| Vagina | Urethra |
| Broad Ligament | Prostate gland |
| *Urogenital sinus | Penis |
| Vulva | |

*Found in cat only, not in the human.

***Urogenital System Questions***:

1. Name the following structures:
    a. Cup-shaped structure that surrounds the glomerulus:
    b. Cone-shaped areas in the medulla of the kidney:
    c. Fibrous outer covering of kidney:
    d. Functional unit of kidney:
    e. Tubes that drain the kidneys:
2. Describe the function:
    a. Vas deferens:
    b. Prostate gland:
    c. Uterine tubes:
    d. Uterine horns:

# RESPIRATORY SYSTEM

Ex. 24 - Anatomy of the Respiratory System , Ex. 25 - Respiratory Physiology

Locate these structures on the models and chart for the human:

*Diaphragm
Pleura
    Visceral
    Parietal
Pleural Cavity
*Lungs
    Lobes
Mediastinum
*Phrenic Nerves
*Larynx
*Vocal Cords
*Epiglottis
*Glottis
Thyroid Cartilage
Cricoid Cartilage
*Tracheal Cartilage
Primary Bronchi
Secondary Bronchi

*Locate these structures on the cat.

**Respiratory Physiology:**

Define these lung volumes and know the number of milliliters for each:

Tidal Volume

Inspiratory Reserve Volume

Expiratory Reserve Volume

Vital Capacity

Residual Volume

**Bell Jar Model:**

Identify the part of the Bell Jar Model that represents the following:

A. lungs

B. pleural cavity

C. diaphragm

D. thoracic cavity wall

**Respiratory Slides:**

Normal lungs

Emphysema

Pneumonia

Lung Volumes:

Label the following lung volumes and capacities:

TLC

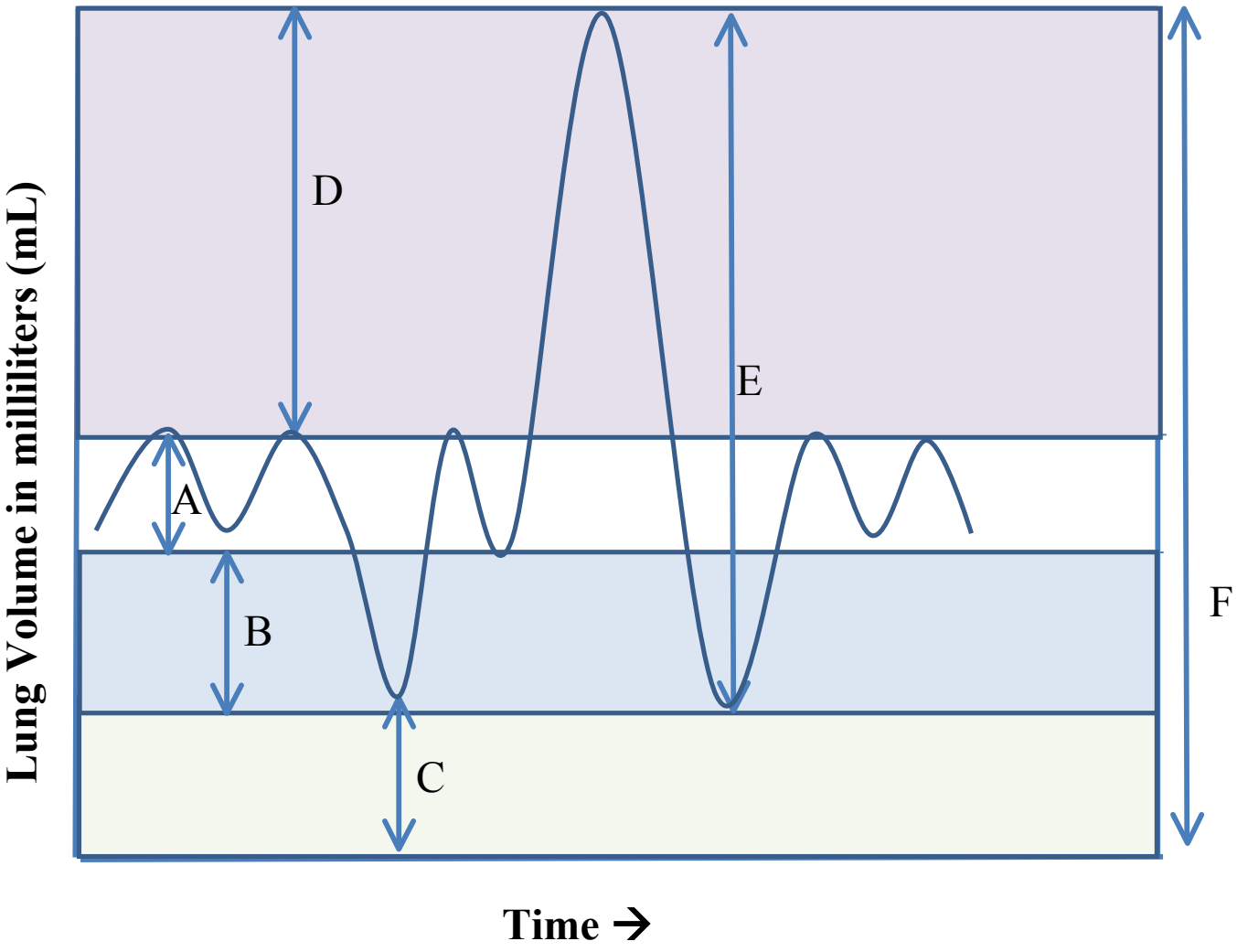
TV

IRV

ERV

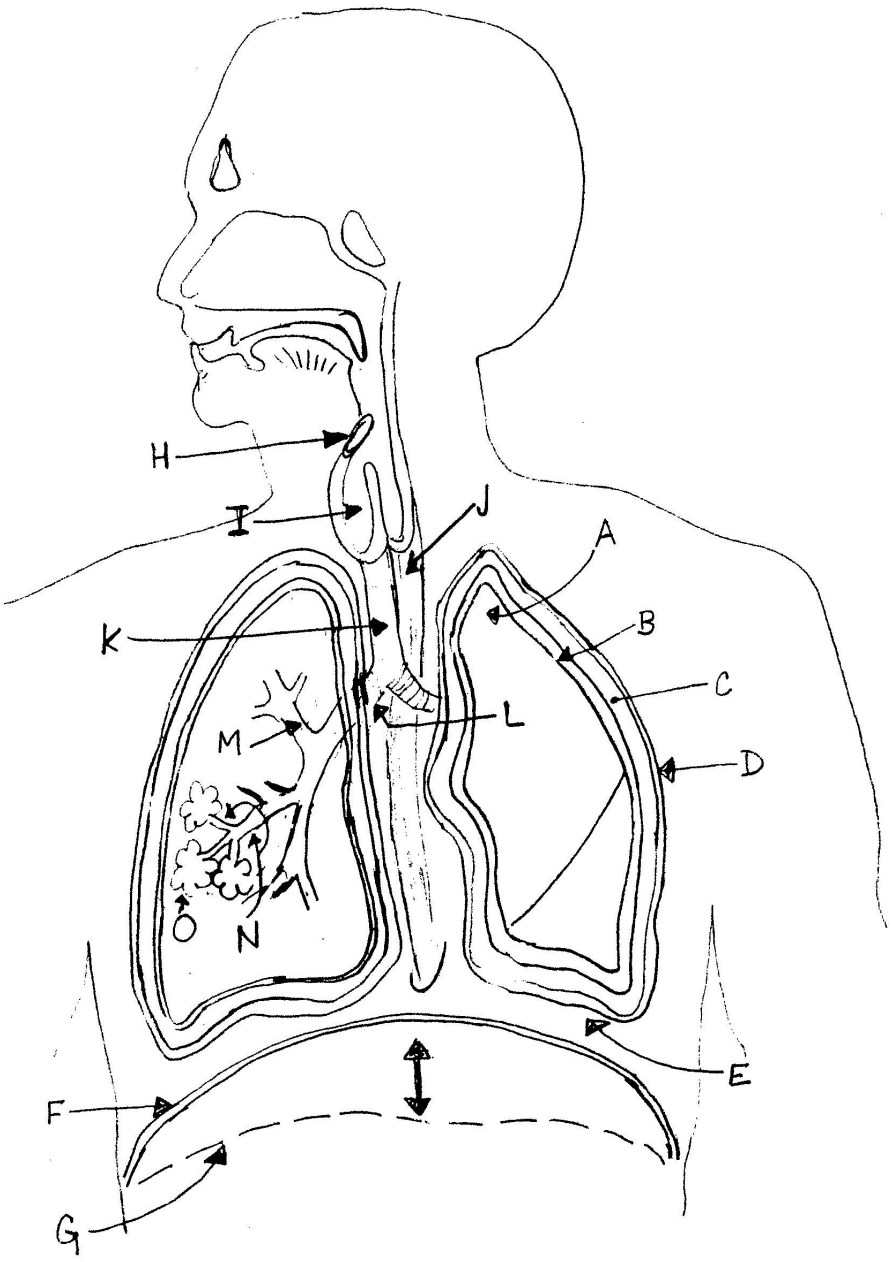
RV

VC



**Identify the following structures on the Respiratory System diagram:**

| | | |
|---|---|---|
| Alveoli | Epiglottis | Tertiary bronchi and bronchioles |
| Apex | Esophagus | Visceral pleura |
| Base | Trachea | Pleural cavity |
| Diaphragm (contracted) | Primary bronchus | Parietal pleura |
| Diaphragm (relaxed) | Secondary bronchus | Larynx |



***Respiratory System Questions***:

1. How does the number of lung lobes in the human compare to the cat?

   Human:_____ Cat:_____

2. The trachea bifurcates in to two primary _____.

3. The cartilaginous flap that deflects food and liquid into the esophagus and away from the respiratory tree is the _____.

4. The phrenic nerve innervates the _____.

5. How many pleural cavities are there? _____.

6. What pressure change occurs in the Bell Jar when the “diaphragm” is pulled down _____.

7. What pressure change occurs in the Bell Jar when the “diaphragm” is released _____.