CLASS ROOM LESSONS.

PHYSICAL DIAGNOSIS.

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MAMMARY :

Third rib, sixth rib, sternum, vertical line from outer boundary of infra clavicular.

INFRA MAMMARY :

Sixth rib, edge of false ribs, inferior portion of sternum, vertical line from outer boundary of mammary region.

SUPRA STERNAL :

Sterno mastoid muscles, sternum.

SUPERIOR STERNAL :

Portion of sternum above third rib.

INFERIOR STERNAL :

Portion of sternum below third rib.

SUPRA SCAPULAR AND SCAPULAR :

Portion between second and seventh ribs on either side.

INFRA SCAPULAR :

Angle of scapular above, twelfth rib below.

INTER SCAPULAR :

Between Supra Scapular und scapular regions on either side, from second to seventh ribs.

AXILLARY REGION :

Axilla above, below line from lower border of mammary region.

INFRA AXILLARY :

Axillary region above, below false ribs.

CLASS ROOM LESSON No. 1.

PHYSICAL DIAGNOSIS.

TOPOGRAPHY OF THE WALLS OF THE CHEST.

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The term Physical Diagnosis is used to represent those methods, by the aid of which we are enabled to determine disease in organs during life, by the deviation from their normal condition.

The chest has been divided into various regions by different writers; the following, which has been adopted by some, is the simplest and easiest understood.

We divide the chest into three general divisions, Anterior, Lateral and Posterior.

DIVISIONS.		*SUB-DIVISIONS.*	
Anterior Region of Chest:	Lateral, on either side,	Supra Clavicular.	
		Clavicular.	
		Infra Clavicular.	
		Mammary.	
		Infra Mammary.	
	Middle,	Supra Sternal.	
		Sternal.	
		Infra Sternal.	
Lateral Region of Chest:	Axillary.		
	Infra Axillary.		
Posterior Region of Chest:	Lateral, on either side,	Supra Scapular.	
		Scapular.	
		Infra Scapular.	
	Middle,	Inter Scapular.	

(For contents see Anatomy)

Boundaries of Sub-Divisions.

Supra Clavicular:

Trachea, clavicle, line from outer third of clavicle to upper rings of trachea.

Clavicular:

Inner three-fifths of clavicle.

Infra Clavicular:

Clavicle, third rib, edge of sternum, line vertically from junction of outer and middle third of clavicle.

CLASS ROOM LESSON No. 2.

PHYSICAL DIAGNOSIS.

PHYSICAL METHODS OF DIAGNOSIS.

INSPECTION, PALPATION, MENSURATION, SUCCUSSION AND PERCUSSION.

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THE PHYSICAL METHODS OF DIAGNOSIS are six in number: (1) Inspection; (2) Palpation; (3) Mensuration; (4) Succussion; (5) Percussion; (6) Auscultation.

(1) INSPECTION:

Is the act of looking on to obtain an idea of the form, size and movements of the chest and impulse of the heart.

(2) PALPATION:

Is the application of the hand to the chest, in order to determine certain impressions, that may be perceived by the sense of touch.

Useful in determining size and shape of chest walls and amount of local expansion in lungs; ascertaining various kinds of fremitus.

Cardiac impulse and condition of large arteries and veins in neck.

(3) MENSURATION:

Used to determine size and amount of movement of chest more accurately than by inspection and palpation.

(4) SUCCUSSION:

Performed by placing the ear against chest walls, and at the same time giving the body of the patient a sudden shake.

Useful in pneumo-hydrothorax.

(5). PERCUSSION:

The act of striking the chest and eliciting certain sounds, which are of great value in diagnosis.

Percussion is either mediate or immediate. *Mediate* when there is some intervening substance applied to the chest walls, upon which the stroke is made. *Immediate* when the surface of the chest receives the percussion stroke.

Percussion may be performed with the finger, or by means of instruments. The substance upon which the stroke is made is termed Plessimeter, which are of various shapes, made of wood, ivory, and such substances. The first two or three fingers of the left hand are better used; the stroke being made with the tips of the index and middle fingers of the right hand.

In order that a proper estimate may be put upon the percussion notes, sound has been divided into its various elements, viz : Intensity, Pitch, Quality, and Duration.

INTENSITY :

Is simply the loudness of a sound ; it varies in different chests and in different regions of same chest, and will also vary according to force of percussion stroke.

PITCH :

This term explains itself, and is the most important element of sound.

QUALITY :

Is the peculiarity of the sound, and that element by which we distinguish it from all other sounds.

DURATION :

The length of the sound. Always direct relationship between duration and pitch ; if duration is short, pitch is high, and *vice versa*.

CLASS ROOM LESSON No. 3.

PHYSICAL DIAGNOSIS.

PHYSICAL METHODS OF DIAGNOSIS.

PERCUSSION IN HEALTH AND DISEASE. AUSCULTATION AND AUSCULTATORY PERCUSSION.

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PERCUSSION IN HEALTH AND DISEASE.

All abnormal sounds are to be compared to the sounds in health, therefore, it is necessary that the sounds of health should be thoroughly appreciated.

In percussing a healthy chest the sound differs according to the part percussed. The anterior division gives a clearer sound than the posterior; the posterior thoracic walls being thicker than the anterior.

In supra clavicular regions the sound is somewhat tympanitic near the trachea.

The sound in the infra clavicular regions may be regarded as the type of pulmonary resonance. The left side giving a clearer pulmonary sound than the right.

In the mammary and infra mammary regions the resonance is not so marked, the liver being on the right side and the heart on the left.

The posterior portion of chest varies according to part and organ over which percussion stroke is made.

Percussion in Disease:

The modifications of healthy sounds caused by disease are: (1). Exaggerated Pulmonary Resonance. (2). Dulness. (3). Flatness. (4). Tympanitic Resonance. (5). Vesiculo Tympanitic Resonance. (6). Amphoric Resonance. (7). Cracked-Pot Resonance.

(1). Exaggerated Pulmonary Resonance:

Intensity increased; Pitch lower; Quality unchanged; Duration longer.

(2). Dulness:

Intensity diminished; Pitch raised; Quality, diminution of pulmonary resonance, or "hardened;" Duration shortened.

(3). Flatness:

Loss of pulmonary quality.

(4). Tympanitic Resonance:

Intensity greater than normal pulmonary resonance; Pitch lower; Quality, change from pulmonary resonance, the type being a tympanitic abdomen; Duration longer.

(5). Vesiculo-Tympanitic Resonance:

Intensity increased; Pitch lower; Duration longer; Quality vesicular and tympanitic.

(6) Amphoric Resonance:

Is a sound which gives the impression of emptiness.

(7). Cracked Pot Resonance:

Is a sound resembling that produced by the hands loosely folded across each other being struck against the knee.

AUSCULTATORY PERCUSSION.

This is the combined methods of auscultation and percussion.

AUSCULTATION.

This signifies the act of listening, and as in percussion, is either immediate or mediate. Immediate when the ear is placed directly against the bared or thinly covered chest. Mediate when the sound is conveyed through a stethoscope. The sound that reaches the ear during a normal respiratory act is a soft breezy murmur, divided into two periods: The first corresponds to the period of inspiration; the second shorter and fainter, corresponds to the period of expiration, termed respectively inspiratory and expiratory sounds.

The elements of the respiratory sounds are the same as those in percussion, to which we add rhythm, which corresponds to the relative order of the respiratory acts. These respiratory sounds differ according to the portion of the chest at which they are heard, and are named from the regions in which they occur. We have the Vesicular, Bronchial, Tracheal and Laryngeal respiration. The left infra clavicular space gives us the purest vesicular respiration, and may be taken as the true type of the respiratory sound.

CLASS ROOM LESSON No. 4.

PHYSICAL DIAGNOSIS.

CHANGES IN THE VESICULAR MURMUR.

ALTERATIONS, INTENSITY, RHYTHM AND QUALITY.

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CHANGE IN VESICULAR MURMUR.

It is important that the healthy respiratory sounds should be thoroughly learned, in order to appreciate the abnormal sounds. The abnormal sounds consist in changes from the normal respiratory sounds as regards *intensity*, *rhythm* and *quality*.

ALTERATIONS IN INTENSITY:
- Increased or puerile breathing.
- Diminished or feeble respiration.
- Absent or suppressed respiration.

ALTERATIONS IN RHYTHM:
- Interrupted.
- Prolonged interval between inspiration and expiration.
- Expiration prolonged.

ALTERATIONS IN QUALITY:
- Rude respiration.
- Bronchial respiration.
- Cavernous respiration.
- Amphoric respiration.

INTENSITY

INCREASED OR PUERILE BREATHING:

Depends upon an increased action of air vesicles—more air, or air with greater force entering them. There is an increase in the intensity and duration of the respiratory sounds; this does not indicate disease, but rather an increased action of the lung, which compensates for deficient action of other parts. When one lung is solidified from any cause, there is increased action in the unaffected lung.

DIMINISHED OR FEEBLE RESPIRATION:

This consists in a diminution of the intensity and duration of both the inspiratory and expiratory sounds. The causes of diminished respiration are variable. Any thing that obstructs the entrance of air or prevents it from fully reaching the pulmonary tissue, may give rise to it; also deficient respiratory action or any condition that may cause a mechanical interference with the free expansion of the air cells.

ABSENT OR SUPPRESSED RESPIRATION:

This is a step further than diminished or feeble respiration, as the name indicates, there is absence of the respiratory sounds. It occurs when from any cause the play of the lung is suppressed, and may occur from causes internal and external, such as complete obstruction of the bronchial tube, extensive deposit in lung tissue, or where lung is compressed by fluid.

RHYTHM.

Interrupted Respiration:

The respiratory sounds in health are even and continuous, but the murmur may be interrupted, especially the inspiratory, heavy or jerking character, termed by some "cog-wheel" respiration. This condition is most frequently associated with phthisis.

Prolonged Interval between Ispiration and Expiration:

The interval between inspiration and expiration in health is very short; when prolonged the inspiration is shortened or the expiration is delayed. Inspiration is shortened in pulmonary consolidation. Delayed expiration is due to the want of proper elasticity in pulmonary tissue.

Prolonged Expiration:

Here the expiration is longer than the inspiration; this is due either to some obstruction to egress of air or a want of proper pulmonary contractility.

QUALITY.

Rude Respiration or Broncho-vesicular Respiration:

Both the inspiratory and expiratory sounds loose their natural softness in this variety; the sounds are higher pitched and tubular in sound. Expiration more marked than inspiration.

It is heard where a lung is more or less solidified. The vesicular element of the sound is lessened and the bronchial element increased.

Bronchial Respiration:

In this variety there is a complete absence of the vesicular quality. The pitch of both sounds is raised; they are tubular in character. The expiratory is as long, or longer, than the inspiratory. This, in abnormal positions, indicates solidification.

Cavernous Respiration:

Resembles Bronchial respiration. In this variety the expiratory sound is lower pitched than inspiratory, and always prolonged and puffing. Produced in a cavity empty near the surface, and having communication with a bronchial tube.

Amphoric Respiration:

Sound similar to that produced by blowing gently into the mouth of an open bottle accompanies both the respiratory acts. For its production it is necessary that there be a large cavity with tense walls opening into bronchial tube. The sound is produced by the vibration of air in the cavity.

CLASS ROOM LESSON No. 5.

PHYSICAL DIAGNOSIS.

CHANGES IN THE VESICULAR MURMUR.

NEW OR ADVENTITIOUS SOUNDS. DRY RALES AND MOIST RALES. PLEURITIC FRICTION SOUNDS. AUSCULTATION OF THE VOICE, AND WHISPER RESONANCE.

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NEW OR ADVENTITIOUS SOUNDS:

These sounds are termed adventitious because they are not heard in health; they have no analogue in health and are, therefore, not considered as modifications of the healthy sounds.

There are two divisions of rales or rhonchi: dry and moist:

DRY RALES: { Sibilant Rales. Sonorous Rales.

MOIST RALES: { Crepitant Rales. Sub-Crepitant or Rale Redux. Gurgles, large and small. Mucous Rales. Sub-Mucous Rales. Mucous click.

Most Rales are sounds generated in air tubes which are contracted or contain fluid.

DRY RALES.

SIBILANT RALE:

This is produced by a narrowing of the small bronchial tubes; the sound is high pitched, often whistling, hissing or musical. Present as a rule during inspiration and expiration.

SONOROUS RALE:

This is produced by a contraction in the larger bronchial tubes; the sound is low pitched; the quality varies from a snoring to a cooing sound.

MOIST RALES.

CREPITANT RALE:

This is a series of fine sounds heard only on inspiration during the early stage of pneumonia. It has been compared to the sound heard by rubbing the hair between the fingers or to burning salt.

There are two theories as to its production; one that it is due to air passing through air vesicles that have been stuck together by a viscid secretion; another, that the sound is produced by air bubbling through the secretions in the air cells and interlobular spaces.

"Sub-Crepitant or Rale Redux:"

This is a sound heard both during inspiration and expiration, in the advanced stages of pneumonia and in other diseases. It is produced by the breaking of air bubbles of unequal size, and larger than in the sub-crepitant rale; its seat is the smaller bronchial tubes.

Gurgles:

Are produced in cavities filled with fluid, having a bronchial tube entering it below the level of the fluid. Gurgles may be heard during both the respiratory acts, and vary according to the size of the cavity in which they are produced. The sound has a peculiar quality which may be hollow or ringing, but is generally metalic.

Mucous Rale and Sub-Mucous Rale:

These sounds are produced by the passage of air through fluid contained in the bronchial tubes. The sounds vary considerably in quality, pitch and number. If they are large or of medium size they are called mucous; if small sub-mucous.

Mucous Click:

This is a single sound resembling a sub-crepitant rale, not removed by coughing. It is produced by the sudden passage of air through a bronchial tube whose calibre has been diminished from some cause, either internal or external.

Pleuritic Friction Sounds:

The pleural membranes in health make no sound, but when roughened by an inflammation they produce sounds which are distinctly audible. The sounds are superficial, and vary in quality and intensity.

Auscultation of the Voice:—

The voice varies when heard over different portions of the chest. If the stethoscope be placed over the larynx or trachea the voice will be transmitted to the ear with great intensity and the words indistinctly articulated; this is called *Laryngophony* and *Tracheophony*. If placed over the bronchial tubes we hear a sound not so distinctly articulated, less intense and more diffused, this is called *Bronchophony*.

If the ear or stethoscope be applied over the healthy lung substance we get the normal vocal resonance. The intensity of this sound is less, the pitch lower, and the words less distinctly articulated than in either of the varieties mentioned. In disease vocal resonance may be *increased* or *diminished*. Diminished vocal resonance occurs when lung is compressed by air or fluid.

The varieties of increased intensity are Exagerated Vocal Resonance, Bronchophony, Pectoriloquy, Egophony and Amphoric Voice.

Exagerated Vocal Resonance :

Is an increase in the intensity and denotes solidification in some part of lung.

Bronchophony :

Described.

Pectoriloquy :—

This is a complete transmission of the voice to the ear.

Egophony :

This is a tremulous sound, like the bleating of a goat, produced by the passage of sound through different media.

Amphoric Voice :

In this variety the voice is not heard distinctly articulated, it has a metalic or musical character, and is produced in large cavities or heard in pneumo-hydro-thorax.

Whisper Resonance :

There is a soft blowing sound with each whispered word, varying in intensity in different persons.

The modifications of the normal whisper resonance are, according to Dr. Flint's classifications, *Exagerated bronchial whisper*, *whispering bronchophony*, *whispering pectoriloquy*, *cavernous whisper*, and *amphoric whisper*.

CLASS ROOM LESSON No. 6.

PHYSICAL DIAGNOSIS.

PHYSICAL SIGNS OF PNEUMONIA, PLEURISY, BRONCHITIS, PHTHISIS, PULMONALIS, AND PULMONARY EMPHYSEMA.

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PNEUMONIA.

FOUR STAGES :

I. Stokes' Stage of Arterial Injection.
II. Stage of Engorgement.
III. Red Hepitization.
IV. Grey Hepitization or Resolving Stage.

INSPECTION :

I. ———
II. Movements of affected side are restrained partly on account of pain.
III. Movements impaired, especially expansive.
IV. Return of the respiratory movements.

PALPATION :

I. ———
II. Vocal fremitus normal, or may be increased.
III. Movements impaired.
IV. Return of vocal fremitus.

MENSURATION :

I. ———
I. ———
III. Affected side is somewhat enlarged.
IV. Lung may be somewhat retracted at end of this stage.

PERCUSSION :

I. ———
II. Slight dulness over engorged part.
III. Marked dulness over affected part, and increased resonance over healthy lung.
IV. At latter part of this stage the dulness disappears, and there is a return of the pulmonary resonance.

AUSCULTATION :

I. Harshness or exagerated breathing sound.
II. In the early part of this stage the respiratory murmur is diminished; after exudation has taken place the crepitant rale is heard.
III. From a filling of the air cells with fluid the crepitant rale ceases and we have bronchial breathing over affected lung. Bronchophony, heart sounds are intensified over diseased part of lung.
IV. Gradual disappearance of the sounds mentioned and appearance of sub-crepitant rale.

PLEURISY.

INSPECTION :

In Early Stages :—Diminished movement on affected side.
Fluid Effusion :—Enlargement and bulging.

PALPATION :

In Early Stages :—Vocal fremitus diminished.
Fluid Effusion :—Movements diminished or absent, vocal fremitus increased above, absent below. Fluctuation may be detected.

MENSURATION :

In Early Stages :—
Fluid Effusion :—Amount of enlargement may be determined.

PERCUSSION :

In Early Stages :—
Fluid Effusion :—Dulness.

AUSCULTATION :

In Early Stages :—Grazing friction sound may be heard.
Interrupted Respiration :—Respiratory sounds absent or feeble below ; exagerated above.

BRONCHITIS.

INSPECTION :

Chest may be somewhat enlarged and movements altered.

PALPATION :

Bronchial fremitus. Vocal fremitus normal.

MENSURATION :

PERCUSSION :

May have pulmonary resonance increased in extent and degree from enlargement of bronchial tube. Resonance may be deficient ; due to large amount of secretion.

AUSCULTATION :

In dry stage we frequently have sibilant and sonorous rales. After secretion has taken place we may also have the mucous rales. Ratio between inspiration and expiration may be altered ; vocal resonance normal.

PHTHISIS PULMONALIS.

INSPECTION :

May be local depression or bulging in commencement, but the tendency is to sink in usually at the infra-clav. regions.

PALPATION :

Local movements over affected part diminished ; vocal fe m-itus usually increased.

PERCUSSION :

More can be determined by comparing corresponding sides of the chest than by the quality of the sound. The quality of the sound varies from slight deficiency of resonance to absolute dulness. The sound may be extra resonant, due to emplyrematous lung tissue surrounding solidified portion.

AUSCULTATION :

The varieties of respiratory sound vary greatly ; we may have diminition or entire absence of sound ; may also have "cog-wheel" respiration, rude or bronchial breathing, prolonged expiration, and in healthy parts puerile breathing ; various rales may be heard ; vocal resonance usually increased.

If cavities are present we occasionally have distinct bulging. Percussion sound may be tubular, metalic, "cracked-pot" or amphoric. Rales may be heard, vocal resonance intensified, having a metalic character. Pectoriloquy and whispering pectoriloquy may be observed.

PULMONARY EMPHYSEMA.

INSPECTION :

In well marked examples of this disease the chest is more or less enlarged, may become "barrel shaped" or almost circular. Ribs more horizontal, spaces wider in upper, narrower in lower part of chest. Shoulders elevated and brought forward. Entire chest moves as one piece, both with inspiration and expiration.

PALPATION :

Vocal fremitus may be lower or above normal, apex beat may be out of normal position.

MENSURATION :

Marked increase in diameter of chest.

PERCUSSION :

The intensity is increased, pitch lowered, quality diminished, pulmonary, called "vesiculo-tympanitic."

AUSCULTATION :

Inspiratory sound feeble, or may be suppressed expiratory sound greatly prolonged ; ratio between the sounds being reversed, pitch of both sounds low.

CLASS ROOM LESSON No. 7

PHYSICAL DIAGNOSIS.

METHODS OF CARDIAC PHYSICAL EXAMINATION.

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INQUIRE into history of case before proceeding to make Physical Examination ; such symptoms as are indicated by expression of face, eyes, circulation, breathing, cough, dropsical effusion and palpitation.

METHODS OF PHYSICAL EXAMINATION OF HEART :

(1). Inspection.
(2). Palpation.
(3). Mensuration.
(4). Percussion.
(5). Auscultation.

POSITION :

For convenience and to facilitate examination, patient should be at rest, either leaning back in chair or propped up in bed with pillows.

(1). INSPECTION : By this method we determine—

(*a*). Shape of cardiac region.
(*b*). Cardiac impulses in health and disease.

(2). PALPATION :

(*a*). Degree of cardiac pulsation.
(*b*). Rate of heart's action.
(*c*). Character of its movements.
(*d*). Friction fremitur.
(*e*). " Purring tremor."
(*f*). Analysis of heart sounds.

(3). MENSURATION :

By this means we determine the size of heart by measurement.

(4). Percussion:

Forms the best means of judging the exact size of the organ.

(5). Auscultation:

As in examination of the lungs, we employ both mediate and immediate; mediate preferable.

All abnormal sounds must be compared to sounds in health. Two sounds in health; First and Second. Interval of silence between these two sounds.

First Sound:

Heard with greatest intensity in fifth interspace to right of left nipple, produced by closure of mitral and tricurpid valves, sound of apex against thoracic walls, contraction of ventricles and sound produced by blood coming in contact with valves and ventricles.

Second Sound:

Heard with greatest intensity at junction of third left rib with sternum, produced by sudden closure of aortic and pulmonary valves.

Pathological Modifications may be:

- Increase in Intensity.
- Change in Quality and Pitch.
- Alterations in Seat.
- Alterations in Rythm.
- Irregularity of Heart Sounds.

CLASS ROOM LESSON No. 8

PHYSICAL DIAGNOSIS.

ABNORMAL SOUNDS OF THE HEART.

MURMURS.

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The term murmur is used to represent those sounds which do not resemble the normal sounds, and overshadow them, or take their place :

MURMURS :

- Endocardial, { Organic or Inorganic.
- Pericardial, { Irregularities on the Membrane.

MURMURS :

- Organic, { Organic change.
- Inorganic, { Unnatural condition of blood, or functional trouble.

DIFFERENTIAL DIAGNOSIS:

PERICARDIAL MURMURS:

- May be :
  Rubbing murmur, grazing, scratching, creaking, whistling, or clicking and resemble the valvular sound, one constant quality superficiality.
  Sound limited, altering its seat, change of character, following movements of heart.

ENDOCARDIDAL MURMUR :

- More or less blowing.
  Not at all times same in same case.
  Accompany a sound throughout the whole, or a part of its duration.
  May take place of sound. Corresponds to first or second sound, attends each motion of heart that can give rise to it.

Murmurs may precede the first sound of the heart, and end at the moment of the sound.

May take the place or follow the first sound, or it may take the place of and follow the second sound.

Endocardial murmurs are eight in number, four systolic and four diastolic.

Pathological significance shown in table :

FULLER'S TABLE OF CARDIAC MURMURS:

PERIOD OF HEART'S ACTION.		*SEAT OF MURMUR.*	*CAUSE OF MURMUR.*
SYSTOLIC:	Left side of heart,	Aortic,	Obstruction to the onward flow of blood through the aortic orifice, or through the aorta.
		Mitral,	Regurgitation of blood through the mitral valve into left auricle.
	Right side of heart,	Pulmonary,	Obstruction to the onward flow of blood through pulmonary orifice, or through pulmonary artery.
		Tricuspid,	Regurgitation of blood through the tricuspid orifice into right auricle.
DIASTOLIC:	Left side of Heart.	Aortic,	Regurgitation of blood though the aortic orifice into left ventricle.
		Mitral,	Obstruction to the flow of blood from left auricle to left ventricle.
	Right side of Heart.	Pulmonary,	Regurgitation of blood through the pulmonary orifice into right ventricle.
		Tricuspid,	Obstruction to flow of blood from right auricle into right ventricle.

Murmurs are generally on left side of heart, and in a great majority of cases, are either aortic obstructive or mitral regurgitant.

To determine pathological significance of murmurs, get its relation to physiological acts which constitute cardiac impulse, also the exact point at which the abnormal sound is heard with greatest intensity.

Anemic or functional murmurs have a blowing quality, and are always systolic, and generally aortic.

CLASS ROOM LESSON No. 9

PHYSICAL DIAGNOSIS.

PERICARDITIS, ENDOCARDITIS, CARDIAC HYPERTROPHY AND DILATATION,

WITH

Differential Diagnosis of Pericarditis from Endocarditis and Dilatation of Heart from Chronic Pericarditis with Effusion,

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PERICARDITIS—*Three Stages.*

1. Vascularization.
2. Fluid effusion.
3. Absorption.

INSPECTION :

1st stage.—Interference with respiratory function.

2d stage.—Bulging of cardiac region, which may extend from second to seventh cartilage.

3d stage.—In this stage of the disease the physical signs disappear and heart returns to natural condition.

PALPATION :

1. Diminished cardiac action.
2. Impulse presents changes as to (*a*) Position, (*b*) Force, (*c*) Rhythm.

(*a*). Change according to amount of fluid.
(*b*). May be visible when not perceptible.
(*c*). Impulse delayed slightly after systole.

MENSURATION :

1. ———
2. Measurements altered.

PERCUSSION :

1. ———
2. Cardiac dullness, altered in extent, degree and shape.

AUSCULTATION :

1. Pericardial friction, which may be absent.
2. Heart sounds feeble at apex but increased at base, may be systolic murmur due to pressure on aorta. Pulmonary sounds diminished over cardiac region.

———

ENDOCARDITIS.

INSPECTION :

———

PALPATION :

Impulse forcible.

MENSURATION :

PERCUSSION :

Increased dullness may arise from stagnation of blood and coagulation.

AUSCULTATION :

Murmurs : mitral, regurgitant, aortic, obstructive and pulmonary obstructive ; frequency in order mentioned.

DIFFERENTIAL DIAGNOSIS AFTER DACOSTA.

ENDOCARDITIS.	PERICARDITIS.
Blowing sound, excited action of the heart.	Friction sound, excited action of the heart.
Slight, if any, increase of percussion, dullness.	In stage of effusion marked and extended percussion, dullness.
Impulse strong.	Impulse wavy and feeble.
Sounds normal or more distinct, except at seat where murmur is heard.	Sounds feeble and muffled ; no blowing sounds.

HYPERTROPHY.

INSPECTION :

Bulging.

PALPATION :

Impulse altered and area increased.

MENSURATION :

PERCUSSION :

Area of cardiac dullness enlarged, generally laterally and downwards.

AUSCULTATION :

First sound obscure, with muscular element in excess of valvular ; second sound heard with distinctness at base of heart and may be taken for first sound ; murmurs intensified if present.

DILATATION.

INSPECTION :

Area of apex beat increased.

PALPATION :

Feeble impulse.

MENSURATION :

———

PERCUSSION :

Extended dullness.

AUSCULTATION :

Sounds clearer than in health. No murmurs unless produced by watery state of blood or by valves incapable of preventing regurgitation.

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(*) DIFFERENTIAL DIAGNOSIS.

DILATATION OF HEART.	CHRONIC PERICARDITIS WITH EFFUSIONS.
Percussion, dullness increased in extent, but square in outline.	Percussion, dullness increased, but of pyramidal shape.
Heart sounds clear and sharp; sometimes, however, feeble.	Heart sounds feeble and distant-sounding at the apex, but distinct near upper part of sternum.
No friction sound.	Often friction sound still heard at the base of the heart.
Dropsy; signs of venous stagnation; severe cough, and dyspnœa.	Neither dropsy or venous stagnation is observed; or, if at all, only in a very limited degree. Cough and dyspnœ are not such prominent symptoms.
History of disease shows it to be gradually developed.	The history frequently points to the acute attack.

*DACOSTA.

CLASS ROOM LESSON No. 10

PHYSICAL DIAGNOSIS.

PHYSICAL EXAMINATION OF ABDOMEN

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THE ABDOMEN is divided into three general zones, upper, middle and lower. Each of these zones is divided into three regions: the middle region of upper zone called epigastric, the two lateral regions of same zone are called right and left hypochondriac; central region of middle zone called umbilical, lateral right and left lumbar; central region of lower zone, hypogastric, lateral right and left inguinal.

TABLE OF CONTENTS AFTER GRAY.

Right Hypochondriac.	*Epigastric Region.*	*Left Hypochondriac.*
The right lobe of the liver and gall bladder, the duodenum, hepatic flexure of colon, upper part of the right kidney, and right supra-renal capsule.	The middle and pyloric end of the stomach, left lobe of the liver and lobus Spigelii, the hepatic vessels, cœliac axis, semilunar ganglia, pancreas, parts of the aorta, vena cava, vena azygos, and thoracic duct.	The splenic end of the stomach, the spleen and extremity of the pancreas, the splenic flexure of the colon, upper half of the left kidney, and left supra-renal capsule.
Right Lumbar.	*Umbilical Region.*	*Left Lumbar.*
Ascending colon, lower part of the right kidney, and some convolutions of the small intestines.	The transverse colon, part of the great omentum and mesentery, transverse part of the duodenum, and some convolutions of the jejunum and ileum.	Descending colon, lower part of left kidney, and some convolutions of the small intestines,
Right Inguinal.	*Hypogastric Region.*	*Left Inginal.*
The cæcum, appendix cæci, ureter and spermatic vessels.	Convolutions of the small intestines, the bladder in children, and in adults if distended, and the uterus during pregnancy.	Sigmoid flexure of the colon, ureter, and spermatic vessels.

The methods employed in the physical examination of the abdomen are, (1) Inspection; (2) Palpation; (3) Mensuration; (4) Percussion; (5) Auscultation.

POSITION:

The ordinary position for abdominal examination is on back, with head and shoulders raised and knees and thighs bent, other positions may have to be assumed in an examination.

(1) Inspection :

By this we ascertain, 1st, The general shape and condition of the superficial parts ; 2d, The respiratory movements, if abdominal ; 3d, Movements or pulsations in cavity.

(2) Palpation :

The most valuable method of abdominal examination reveals, 1st, Condition of the abdominal walls, their shape and size, more accurately than by inspection ; 2d, Extent of respiratory movements; 3d, Sensations as regards rigidity, mobility, &c., presence or absence of tumor, or any movements set up in abdomen, such as gurgles caused by gas.

(3) Mensuration :

Measurements required are circular and semicircular ; from umbilicus to ensiform cartilage, to pubes and to anterior superior spine of ilium on each side.

(4) Palpation :

Its use is to bring out sounds by which we are enabled to determine condition and outlines of organ or viscus. Percussion sounds over abdomen are dull, flat and tympanitic. Fluctuation indicates the presence of fluid. Mediate percussion generally practiced in abdominal examination.

(5) Auscultation :

Not so useful as percussion ; generally gives negative information.

CLASS ROOM LESSON No. 11

PHYSICAL DIAGNOSIS.

STOMACH, INTESTINES AND LIVER.

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STOMACH.

To determine the limits of the Stomach and intestines by percussion requires us to be able to discriminate between shades of sound of the same character rather than between sounds of different character.

PERCUSSION:

Gives a metalic or tympanitic resonance; sometimes the sound is distinctly amphoric.

To determine the boundaries of the stomach it is necessary to detect the lower margin of the liver, the heart and the inner border of the spleen.

To ascertain its lower border we percuss gently down until we reach the alteration of sound in striking over the colon. Limits of Stomach easier traced if organ is filled with some solid or liquid. Mailliot advices that the patient take a glass of water previous to the examination.

GASEOUS DISTENTION:

Indicated by an increased area of the tympanitic sound. Solids or liquids in stomach give dullness on percussion, if stomach is filled with a liquid or fluid the line of dullness will be continuous from liver.

CANCER OF STOMACH:

When Stomach is empty a sense of fulness or resistance is felt over the epigastrium.

Dullness on percussion over the tumor. A distinct tumor can be detected by palpation.

Tumor small, circumscribed, hard and irregular. Stomach may be dilated; abdomen generally retracted.

The seat of cancer of the stomach is generally the pyloric extremity.

INTESTINES:

The large intestine furnishes a more amphoric sound than the stomach. When intestines are filled with fluid or solid the exact location can be determined by percussion, there being dullness.

The nature of these enlargements can generally be determined by palpation.

Accumulations most frequently collect in descending colon.

The percussion sound over the small intestines, unless they are distended with gas, are higher pitched and less amphoric.

LIVER:

The diagnosis of diseases of the liver rests mainly upon our ability to trace out the normal outlines of the organ.

The upper boundary can be determined by commencing at right nipple, and percussing downwards until we get a flat sound, which indicates the presence of a solid organ. Percuss downwards from axilla from a point a little to the right of the median line in front until flatness is obtained. The lower boundary of liver is found by percussing downwards from the line of flatness already marked. The flatness of the left lobe generally extends two inches to the left of the median line.

CLASS ROOM LESSON No. 12

PHYSICAL DIAGNOSIS.

DISEASES OF LIVER:

FATTY LIVER, HEPATIC ABSCESS, CONGESTION OF LIVER, ATROPHY OF LIVER, WAXY LIVER AND HYDATID TUMORS OF LIVER.

THE SPLEEN.

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FATTY LIVER:

Physical diagnosis is the only positive means of diagnosing this disease. Organ found to gradually enlarge in a downward direction. Normal shape little altered; surface feels smooth and regular; Liver soft; never tender on pressure; flatness over organ.

CIRCUMSCRIBED OR SUPPURATIVE INFLAMMATION.

HEPATIC ABSCESS:

The ease with which diagnosis of this affection is made depends upon location of abscess.

If superficial, enlargement general, with bulging at some point, generally observed at epigastrium, or right hypochondrium. Surface of Liver generally feels smooth, but we may find local prominence. Late in disease, fluctuation. Line of hepatic dulness altered.

Pus can be obtained with an exploratory trocar.

Pulsation may be felt transmitted from aorta, which may cause abscess to be mistaken for aneurism.

CONGESTION OF LIVER:

Enlargement, normal shape; surface and margin increased in firmness; on percussion, flatness.

CIRRHOSIS OF LIVER:

Diminished hepatic dulness; nodulated condition of the surface of the Liver. Dropsical effusion frequently obscures examination, and we have to resort to paracentesis. We occasionally have a friction sound.

ATROPHY OF LIVER:

Diminution in size rapid; area of percussion dulness less; surface remains smooth; no ascites.

Waxy Liver:

Great enlargement, chiefly in a downward direction; surface being smooth. Consistency harder than normal. Margin well defined. This condition is generally accompanied by ascites.

Hydatid Tumor of Liver:

Liver increased in size. Shape of liver is altered. Cysts may be felt on surface of organ.

Enlargements may be in one direction, so as to greatly alter shape of organ. Percussion may give rise to the hydatid fremitus; may be fluctuation. Exploratory puncture reveals true nature of tumor.

THE SPLEEN.

Not easily circumscribed. Place patient on left side, with his legs flexed for examination. Percussion dulness from ninth or tenth rib to about the twelfth rib; dulness horizontally about three inches.

CLASS ROOM LESSON No. 13

PHYSICAL DIAGNOSIS.

EXAMINATION OF URINE.

AVERAGE PROPORTION OF CHIEF CONSTITUENTS. POINTS TO BE NOTED IN AN EXAMINATION. APPARATUS.

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It is necessary to be able to detect any abnormal elements in urine, or change in the proportion of its normal constituents.

* Average Proportion of the Chief Constituents:

Water,		954.81
Solid matters,		45.19
Urea,		21.57
Uric Acid,		0.36
Extractives:	Creatin, creatinin, Ammonia, hippuric acid, Xanthin, hypoxanthin, Sarcine, pigment, unoxidized sulphur and phosphorus, mucus, &c., &c.,	6.53
Fixed Salts:	Chlorine	4.57
	Sulphuric acid	1.31
	Phosphoric acid,	2.09
	Potash,	1.40
	Soda,	7.19
	Lime,	0 11
	Magnesia,	0.12

* After Roberts.

The points to be noted in an examination are:

1. The general appearance and color.
2. Odor.
3. Quantity passed in twenty-four hours.
4. Reaction.
5. Specific gravity.
6. Presence or absence of albumen, if present an approximative estimate of its quantity.
7. Presence or absence of sugar, if present an estimate of its quantity.

If there be a deposit it is necessary to note.

8. Its aggregation, color and general character.
9. Its solubility or insolubility by heat, acid or alkalies,
10. By microscope the character of deposit.

The apparatus required consists of:

Nitric acid.
Acetic acid.
Hydrochloric acid.
Liquor potassæ.
Liquor ammoniæ.
Solution of nitrate of silver.
Sulphate of copper solution.
Neutral tartrate of potash solution.
Ferrocyanide of potassium.
Solution of soda.
German yeast.
Ether.
Mercury.
Solution of chloride of sodium.
Solution of chloride of barium.
Litmus paper.
Urinometer.
Thermometer.
Graduated glasses.
Drop tubes and stirring rods.
Porcelain evaporating dishes.
Watch glasses.
Test-tube stand and tubes.
Funnels and filtering paper.
Alcohol lamp or Bunsen's burner.
Burette and stand.
Swabs and brushes for cleaning.
Platinum spoon.
Blow pipe.
Water bath.
Urine glasses.
Balance delicate enough to turn with 1-50 grain.

CLASS ROOM LESSON No. 14

PHYSICAL DIAGNOSIS.

EXAMINATION OF URINE.

COLOR. ODOR. QUANTITY PASSED IN TWENTY-FOUR HOURS.
REACTION. SPECIFIC GRAVITY. ALBUMEN. SUGAR. DEPOSIT.

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(1). Color:

In health urine varies in color from straw tint to a brownish-yellow color.

(2). Odor:

Different kinds of food may transmit to urine their peculiar odor, but it is generally ammoniacal aromatic, fetid or sweetish.

(3). Quantity Passed in Twenty-Four Hours:

The average daily discharge is between forty and fifty fluid ounces. The range in health is very large. We should, therefore, be guarded in pronouncing any specimen a morbid quantity.

(4). Reaction:

The reaction of healthy urine is usually acid.

To dertermine this, delicately tinted litmus paper is most convenient, acid turning the blue red and alkaline turning the red blue.

(5). Specific Gravity:

The most convenient way of estimating the specific gravity is by means of the urinometer, consisting of a bulb of mercury and a graduated stem.

The specific gravity of urine ranges between 1010 and 1030, but the average is about 1021.

(6). Albumen:

Two tests if used together will easily determine the presence or absence of albumen, these are heat and nitric acid. If albuminous urine be of acid reaction, and heated it will become turpid or opaque.

(7). Sugar:

Sugar cannot be detected in healthy urine by the most delicate tests. Its presence always indicates a grave pathological condition.

Trommer's Test:

Put a small quantity of urine in a test tube, to this add one or two drops of a solution of sulphate of copper, then add about half as much liquor potassæ as there is urine. Shake well and bring to a boiling point. If sugar be present a pale reddish precipitate of suboxide of copper will be present. Albumen obscures the examination.

Fehling's Test:

To a small quantity of Fehling's solution at about 212° F. add the suspected urine drop by drop. The first few drops, if sugar be present, will produce a reddish or yellowish deposit.

"If the urine be added to about the volume of the test liquid, or the mixture be again brought to the boiling point without any precipitate, you may be certain no sugar is present."—*Flint.*

Fermentation Test:

This test is on the principle of converting the sugar into alcohol and carbonic acid by means of yeast.

(8.). Aggregation and General Character:

A scanty light deposit is natural in healthy urine after standing several hours. This may sink to the bottom or may float about middle or near surface.

Urinary Deposits are *Inorganic* or *Organic:*

Inorganic Deposits are composed of the normal ingredients of the urine in an insoluble state.

Organic Deposits are composed of organic matter not normally present in urine. This group includes pigmentary matter, epithelial cells from uriniferous tubes, or any part of genito-urinary passages, casts or molds of uriniferous tubes, oily particles, pus, blood, &c. These are insoluble in ordinary acids and alkalies.

(9). Solubility or Insolubility:

Inorganic deposits are soluble, either by heat, acids or alkalies. Organic deposits are insoluble.

(10).

By the microscope we determine the presence or absence of crystals, epithelial cells, blood corpuscles, spermatozoa, &c., and the general character of the deposit.

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Table Exhibiting the Action of the Main Reagents employed in the Examination of the Urine.

Specific Gravity.	High	Urine high colored	Increase of urea, uric acid, etc.
		Urine pale	Diabetes.
	Low	Urine high colored or normal.	Certain forms of Bright's disease.
		Urine pale	Excess of water.
Heat	Throws down deposit	Soluble in Acid	Phosphates.
		Insoluble in acid.	Albumen.
	Dissolves deposit.	Urates.	
	Does not dissolve deposit	Uric Acid.	
		Phosphates.	

TABLE EXHIBITING THE ACTION OF THE MAIN REAGENTS EMPLOYED IN THE EXAMINATION OF THE URINE.—*Continued.*

NITRIC ACID	Precipitates	Quickly	Albumen.
		More gradually	Uric acid. Crystals of nitrate of urea.
	Dissolves	Earthy phosphates. Alkaline phosphates. Oxalates.	
	Causes Decomposition under effervescence	With heat	Urea decomposed into carbonate of ammonia.
		Without heat	Carbonate of lime. Uric acid.
HYDROCHLORIC ACID	Precipitates	Uric acid.	
	Transforms	Urates into uric acid.	
	Detects, by violet change of color.	Uroxanthus or indican.	
SULPHURIC ACID	Changes color of urine	Brown	Urohæmatin.
		Crimson or violet (if sugar have been added)	Biliary acids.
		Violet	Indican.
ACETIC ACID	Precipitates deposit (not soluble) in excess of the acid.	Mucus.	
LIQUOR POTASSÆ	Precipitates	Earthy phosphates.	
	On boiling, turns urine brown	Sugar.	
	Dissolves	Uric acid. Deposits of urates.	
	Forms gelatinous mass	Pus.	
LIQUOR AMMONIÆ	Precipitates	Earthy phosphates.	
	Dissolves	Cystine.	
SOL. OF CHLOR. OF BARIUM	Precipitates	Deposit soluble in free acid	Phosphates.
		Deposit insoluble in acids	Sulphates.
NITRATE OF SILVER	Precipitates	Yellow deposit, soluble in nitric acid & ammonia.	Alkaline phosphates.
		White deposit, insoluble in nitric acid, but soluble in ammonia.	Chloride of sodium.
ALCOHOL OR ETHER	Precipitates	Albumen.	
	Dissolves	Hippuric acid.	
	Does not Dissolve	Uric acid.	
ETHER	Dissolves	Fat.	

CLASS ROOM LESSON No. 15

PHYSICAL DIAGNOSIS.

EXAMINATION OF URINE.

QUANTITATIVE ESTIMATE OF ALBUMEN AND SUGAR. TESTS, URO-HÆMATIN, HÆMATIN, BILE, UREA, CHLORIDES, PHOSPHATES AND SULPHATES.

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ALBUMEN :

Precipitate by acetic acid and boiling, separate from urine by filtration, dry and weigh, remembering to subtract the weight of filter, which has been previously determined.

An approximate estimate may be gotten in an easier way : Boil the urine in a test tube, add a few drops of nitric acid and let it stand aside for twenty-four hours. The proportion of bulk occupied, one fourth, one eighth, etc., is used to indicate quantity of albumen.

SUGAR :

Vogel has determined that solutions of grape sugar, when boiled with half their bulk of liquor potassæ, will give the following changes of color : A 1 per cent, solution becomes canary yellow ; a 2 per cent. a dark amber ; a 5 per cent. a dark Jamaica rum ; and a 10 per cent. a dark black brown.

Robert's Fermentation Test.—It is claimed by Dr. Roberts that every degree of specific gravity lost by fermentation corresponds to one grain of sugar per fluid ounce.

Heller's Test for Urophain is as follows : "About 2 c. c. (32.4 minums) of colorless sulphuric acid are poured into a small beaker glass, and upon it in a fine stream from a height of about four inches, two parts of urine are allowed to fall. The urine mingles itself intimately with the sulphuric acid, and in normal urine, of which the specific gravity is 1020 and the quantity 1500 c. c. in twenty-four hours, produces a deep garnet red coloration."

Dr. Harley's Test for Urohæmatin.—Dilute or concentrate the urine passed in twenty-four hours to sixty fluid ounces. To two drachms of this add half drachm of pure nitric acid. Allow the mixture to stand for some time. If the coloring matter be in normal quantity the mixture will alter very slightly ; if it is increased in quantity the mixture will become pink, red, crimson or purple, according to the amount present.

HÆMATIN :

Precipitate from urine the earthy phosphates by caustic potash and gentle heat ; the phosphates carry with them the hæmatin, coloring the precipitate.

BILE :

Gmelin's Nitrous Acid Test.—Urine is placed in a tube and a small quantity of fuming nitric acid is allowed to pass down sides of test tube and underlie urine. If bile is present, at the juncture of urine and acid, we will have a play of colors ; if typical should be green, blue, violet, red and yellow, one or more of these colors may be wanting.

UREA :

This is detected by means of nitric or oxalic acid, which causes the urea to crystallize. A small quantity of urine is placed upon a glass slide, to this a drop of nitric acid is added ; the slide is then gently warmed over a spirit lamp. If urea is present this will cause the urea to crystallize in characteristic six sided or quadrilateral forms.

"A specimen of urine containing neither albumen or sugar, a normal proportion of chlorides and a specific gravity of 1020-4, to a quantity of 1500 c. c. (50 oz.) in twenty-four hours, may be taken as a standard normal specimen, containing 2 per cent. to 2½ per cent. of urea."

CHLORIDES :

Solution of nitrate of silver throws down both the chlorides and phosphates. If a few drops of nitric acid be added the phosphates will be held in solution and the chlorides only will fall, as an opaque white precipitate.

PHOSPHATES :

These are earthy and alkaline. The earthy phosphates are insoluble in water, but soluble in acids. They are precipitated by alkalies. The alkaline phosphates are soluble in water and not precipitated by alkalies.

SULPHATES :

Any of the barium compounds throw down a white precipitate of barium sulphate.