PATIENT CARE ACTIVITIES:

VITAL SIGNS ASSESSMENT II

BLOOD PRESSURE & RESPIRATION

PTA1010

KEY TERMS

Anoxia
Apical pulse
Apnea
Arrhythmia
Auscultation
Bradycardia
Cardiac output
Cyanosis
Diaphoresis
Diastole
Dyspnea
Dysrhythmia
Ectopic
Ecchymosis
Expiration
Fever
Hypertension
Hypotension
Inguinal
Inspiration
Intubation
Jaundice
Korotkoff sounds
Occlude
Orthopnea
Pallor
Petechiae
Pulse
Pulse oximeter
Pyretic
Rale
Rectal
Respiration
SOB
Sphygmomanometer
Stethoscope
Stridor
Syncope
Systole
Tachycardia
Triangle of auscultation
Vital signs

BP is a function of two primary elements:
(1) Cardiac **O**utput (amount of blood flow)

(2) peripheral resistance (impediment to blood flow within a vessel) that the heart must overcome.

Systolic: BP at time of contraction of left ventricle (systole) S1-S2

Diastolic: BP at time of the rest period of the heart (diastole) S2-S1

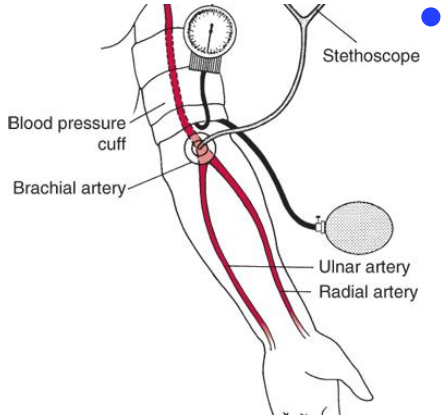
BLOOD PRESSURE

KOROTKOFF'S SOUNDS

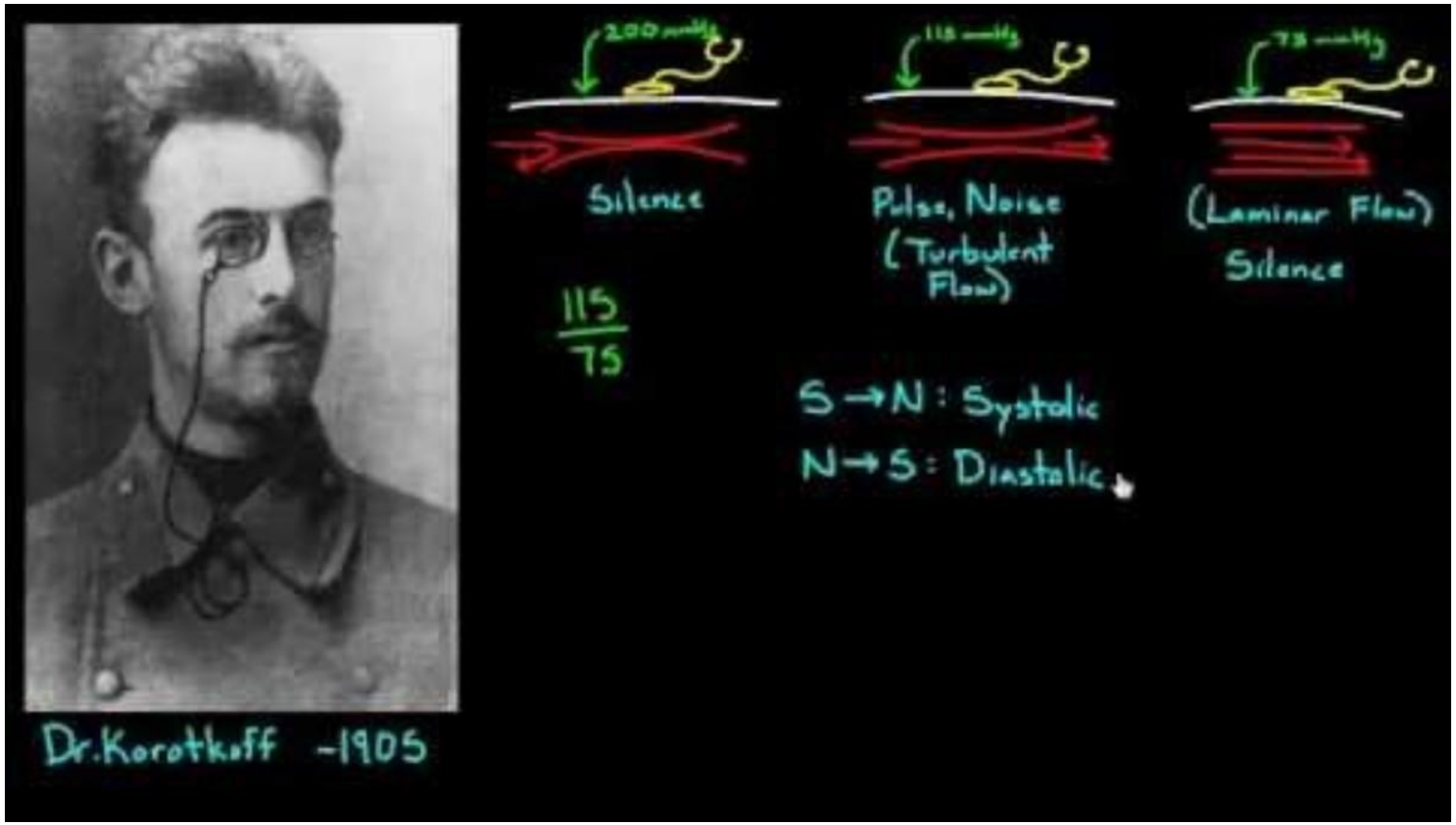
Phase I: The first clear, faint, rhythmic tapping sound, which gradually increases in intensity, is heard. The period when blood initially flows through the artery is recorded as ***systolic pressure***. This represents the highest pressure in the arterial system during ventricular contraction.

- **Phase II:** A murmur or swishing sound is heard as the artery widens and more blood flows through it.
- **Phase III:** Sounds become crisp, more intense, and louder; blood is now flowing relatively unobstructed.
- **Phase IV:** Sound is distinct, with abrupt muffling; soft blowing quality.

Phase V: Last sound is heard; recorded as ***diastolic pressure*** in adults.



BLOOD PRESSURE



BLOOD PRESSURE NORMS

Factors Influencing BP:

Blood Volume
Diameter and elasticity of arteries
Cardiac Output
Age
Exercise
Valsalva Maneuver
Orthostatic Hypotension
Arm Position
Medications

Category	Systolic Pressure (mmHg)	Diastolic Pressure (mmHg)
Normal	<120	<80
Elevated	120-129	<80
Hypertension		
Stage 1	130-139	80-89
Stage 2	>140	>90
Hypertensive Crisis	>180	>120

Orthostatic Hypotension

Associated with **prolonged immobility** and periods of bedrest.

A **sudden drop in BP** with movement to upright postures (sitting or standing).

A gravitational blood **pooling in the lower extremities**. Venous return and cardiac outputs are reduced.

A patient is orthostatic if:

systolic BP drops more than **20 mm Hg, diastolic BP** drops more than **10 mm Hg**

OR if the patient is experiencing light-headedness or dizziness.[70]

HYPOTENSION

Response to Activity/Exercise

Systolic pressure should: gradually increase w/ increase in activity; plateau with activity plateau and decrease as activity decreases.

- **Diastolic pressure should:** remain the same or slightly increase.

- Pressures should return to pre-exercise levels 3-5 minutes post exercise..

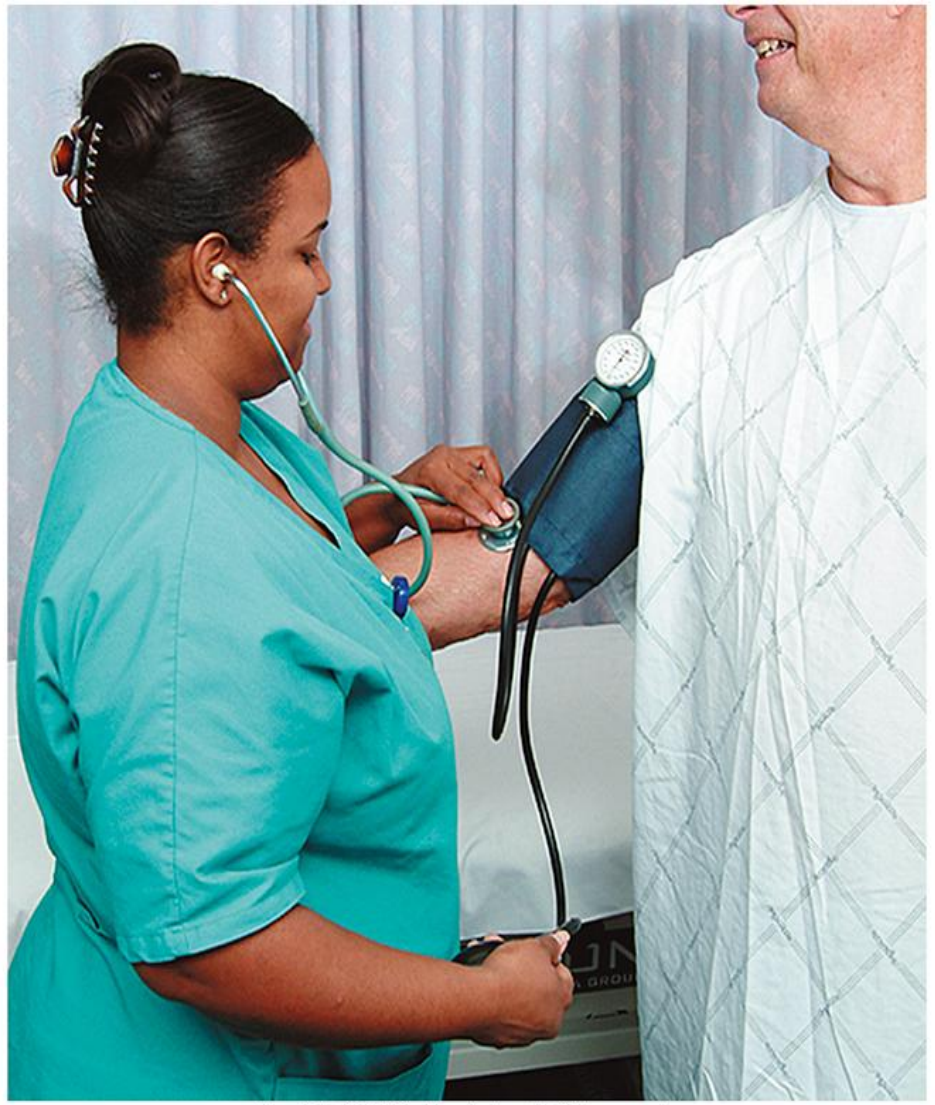
CUFF VARIABILITY

DOCUMENTATION OF BP

Systolic over diastolic= 120/80

Location: arm, leg; right or left

Position: standing, sitting, supine



ANKLE BRACHIAL INDEX:

- Indicator of loss of perfusion to the LE.

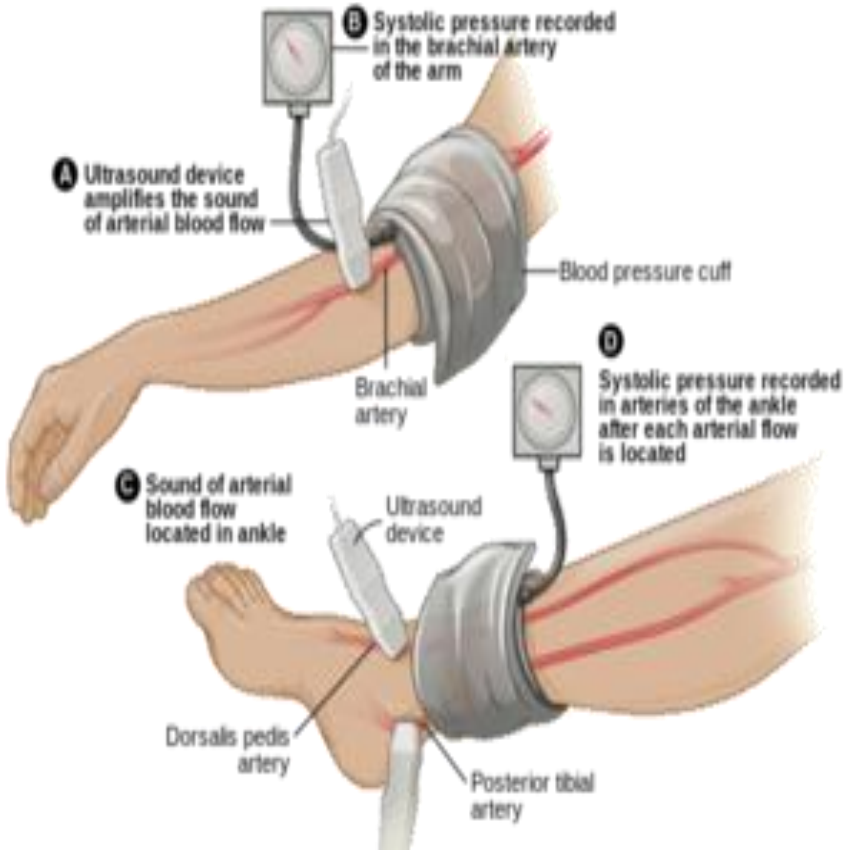
What is an ankle-brachial index (ABI) test

$$\frac{\text{Systolic of ankle}}{\text{Systolic of arm}} = \text{ABI ratio}$$

Ratio is the ABI score and represents the % of blood reaching the ankles.

* If your ABI score is 0.9 or lower, you have PAD

ANKLE BRACHIAL INDEX	CATEGORY
>1.3	Incompressible arteries
1.29-1	Normal
0.99 - 0.91	Borderline
0.90 - 0.41	Mild Occlusion
<0.40	Severe Occlusion



RESPIRATION RATE

Tidal volume: one respiration and one expiration

Normal range for adults: 12-20 respirations per minute (rpm)

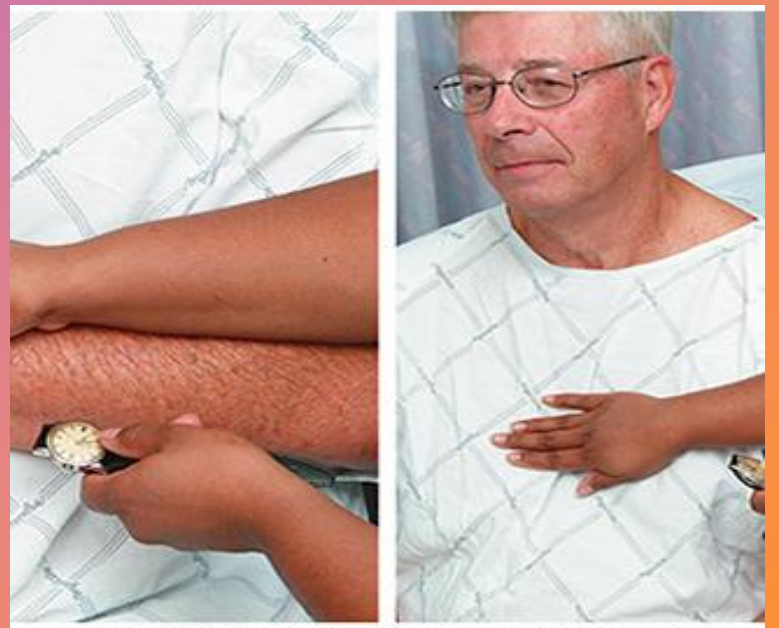
Normal range for infants: 30-50 rpm

Eupnea: normal breathing

Dyspnea: labored breathing

Bradypnea: <10 RPM

Tachypnea: >24 RPM



CHECKING RESPIRATION RATE

A.Wash hands.

B.Ensure patient understanding, safety, modesty, and comfort. Respirations are typically monitored with the patient either supine or sitting.

C.Expose chest area; if area cannot be exposed and respirations are not readily observable, place patient's forearm across chest and keep fingers positioned as if continuing to monitor the radial pulse.

D.As the patient breathes, observe the rise and fall of the chest; note the amount of effort required or audible sounds produced during breathing.

E.Using the second hand of a watch, determine the rate by counting respirations for 30 seconds and multiply by 2.

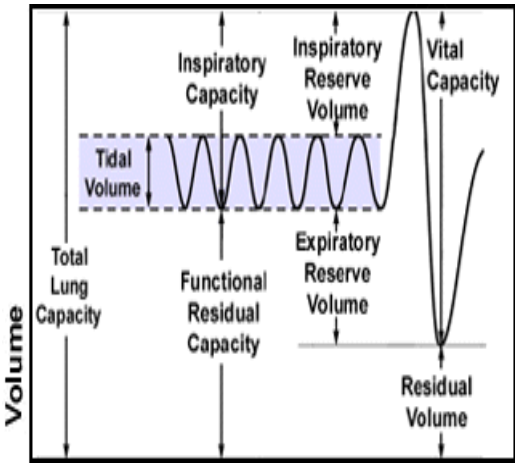
F.Identify the rhythm (regularity of inspirations and expirations); note deviations from normal uninterrupted, even spacing. If any irregularities are noted, count for a full 60 seconds to accommodate the fluctuations and ensure an accurate count.

G.Observe the depth of respiration; determine if a small, large, or approximately normal volume of air is inspired. Observe involvement of accessory muscles, which suggests weakness in the primary muscles of breathing (diaphragm and external intercostal muscles); if difficult to observe, palpation of chest wall excursion can be used to identify depth of respiration. Record as shallow, deep, or normal.

H.Note: Chest wall excursion can also be determined by circumferential chest measures using a tape measure at three specific bony landmarks: (1) the sternal angle of Louis; (2) the xiphoid process; and (3) midway between the xiphoid process and the umbilicus.

I.Return clothing if chest has been exposed.

J.Wash hands.



ASSESSMENT OF RESPIRATION

Rate: number of breaths per minute

Rhythm: regularity of breathing pattern

Depth: amount of air exchanged with each respiration

Character: deviations from normal during resting or quiet respiration

TYPE	DESCRIPTION	ILLUSTRATION
Eupnea	Normal respirations, with equal rate and depth, 12–20 breaths/min	
Bradypnea	Slow respirations, < 10 breaths/min	
Tachypnea	Fast respirations, > 24 breaths/min, usually shallow	
Kussmaul's Respirations	Respirations that are regular but abnormally deep and increased in rate	
Biot's Respirations	Irregular respirations of variable depth (usually shallow), alternating with periods of apnea (absence of breathing)	
Cheyne-Stokes Respirations	Gradual increase in depth of respirations, followed by gradual decrease and then a period of apnea	
Apnea	Absence of breathing	

Source: George D. Fulk, Kevin K. Chui:
O'Sullivan & Schmitz's Physical Rehabilitation, 18th Edition

Auscultation Pattern

NORMAL BREATH SOUNDS:

TRACHEAL

BRONCHIAL

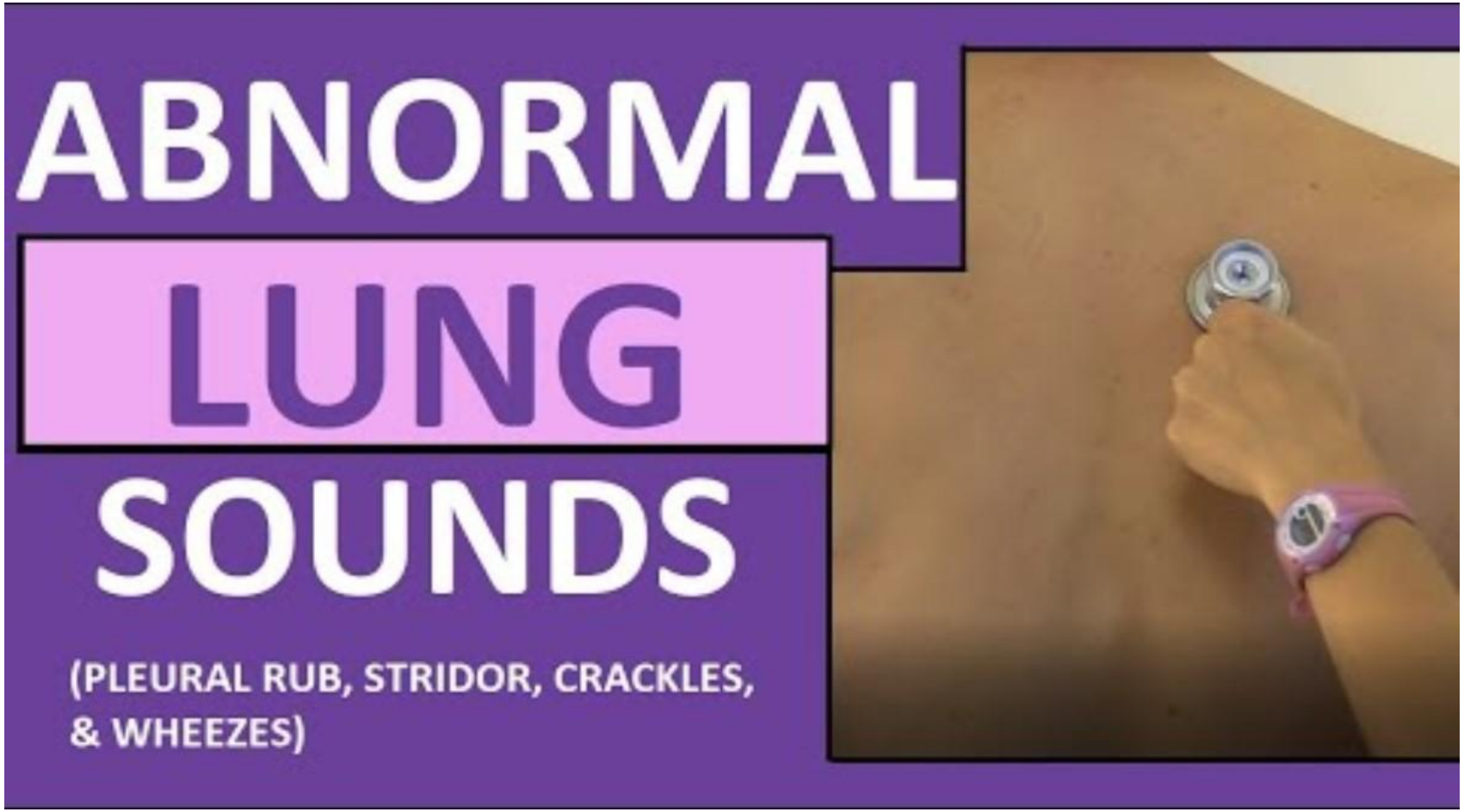
VESICULAR

LUNG AUSCULTATION

ABNORMAL BREATH SOUNDS

Adventitious Sounds:

- Wheeze
- Crackles
- Stridor
- Pleural Rub



FACTORS AFFECTING RESPIRATION

Age – very young and elderly have higher rates

Physical activity – rate/depth increases with exercise*

Emotional status – stress, anxiety increases RR

Air Quality – impurities in air will increase/decrease RR

Altitude – high altitudes will increase RR

Disease – may increase rate and depth

*Exercise- RR should increase rate and depth as the activity increases plateau as activity plateaus and decrease as activity decreases.

DOCUMENTATION OF RESPIRATION

Document the rate: RPM

Describe the depth: amount of air exchanged (small, lg , norm.)

rhythm: regularity of pattern (eupnea)

character: deviation from normal resting pattern

Document any “sounds” heard

Note activity level and changes of respiration with activity changes