

TEMPERATURE, PULSE, AND RESPIRATION

OBJECTIVES/RATIONALE

The Certified Nurse Aide is responsible for the accurate performance of fundamental nursing skills, including the assessment of vital signs. The student will accurately measure an oral, axillary, and rectal temperature, as well as radial pulse and respiration.

Prerequisites: Anatomy and Physiology-The Cardiovascular and Respiratory Systems

TEKS: 5C, 7A, 7I, 8A, 10A

KEY POINTS

PowerPoint

I. Vital signs include

- A. Temperature
- B. Pulse
- C. Respiration
- D. Blood Pressure

II. Temperature

- A. Refers to temperature inside the body or core body heat.
- B. Can be measured by four basic routes
 1. Oral
 2. Rectal
 3. Axillary
 4. Tympanic
- C. Several types of thermometers
 1. Electronic/Digital
 2. Mercury, Glass
 3. Thermoscan for Tympanic measurement
- D. Normal temperature ranges
 1. Oral 97.6 degrees F. – 99.6 degrees F.
 2. Axillary 96.6 degrees F. – 98.6 degrees F.
 3. Rectal 98.6 degrees F. – 100.6 degrees F.
 4. Tympanic: Manufacturer's guidelines suggest that the measurement is the same as rectal temperatures.
 5. Axillary is one degree Fahrenheit lower than Oral
 6. Rectal is one degree Fahrenheit higher than Oral
- E. Reading temperatures
 1. By degree and tenth of a degree
 2. Place thermometer at eye level and look for silver line of mercury
 3. Never place fingers on bulb of thermometer as this might change the value
- F. Thermometers and routes

1. Probes for electronic and mercury ends are color coded for route.
 2. Red = rectal; Blue = oral/axillary
 3. If no color present, the route will be written on the thermometer
- G. Measurement of temperature
1. Use protective cover on each thermometer
 2. Tympanic probe placed in ear
 3. Rectal thermometer or probe placed in rectum one inch with lubrication applied before insertion.
 4. Oral thermometer placed in mouth under the tongue
 5. Do not take oral temperatures on
 - a. preschool children
 - b. patients with oxygen
 - c. delirious, confused, disoriented patients
 - d. comatose patients
 - e. patients with nasogastric tubes in place
 - f. patients who have had oral surgery
 - g. patients who are vomiting or are quite nauseated
 6. Do not take rectal temperatures on
 - a. infants or children unless a core temperature is needed
 - b. patients who have had rectal surgery
 - c. combative patients
- H. Duration of taking temperature
1. Tympanic – a couple of seconds – long enough to gently press a button.
 2. Oral and rectal mercury – three minutes.
 3. Axillary mercury – 10 minutes
 4. Electronic temperatures – when beep sounds, temperature is obtained
- I. Abnormal temperatures
1. Fever, febrile, hyperthermia all indicate someone who has an elevated temperature (greater than 100 degrees Fahrenheit).
 2. High fever would include anything over 103 degrees Fahrenheit.
 3. Moderate fever would include anything 100 – 103 degrees Fahrenheit.
 4. Hypothermia is subnormal temperature. This can be equally problematic for a person. Anything under 96 degrees Fahrenheit would indicate hypothermia.
- II. Pulse
- A. Wave of blood produced by beating of heart and travelling along the artery
 - B. Can feel at points where the artery is between finger tips and a bony area
 - C. These areas are called pulse points and include
 1. Temporal
 2. Carotid
 3. Apical
 4. Brachial
 5. Radial
 6. Femoral
 7. Popliteal
 8. Dorsal Pedalis

- D. Measured by index, middle, and ring fingers over pulse point.
- E. Do not take with the thumb, since it has a pulse of its own.
- F. Count for 30 seconds and multiply by 2, or count for 60 seconds
- G. Normal range is 60 – 100 beats per minute. The area of 90-100 is a gray area in that a pulse should never constantly remain in this area.
- H. > than 100 = tachycardia
- I. < than 90 = bradycardia
- J. Quality of pulse is determined as well as rate
 - 1. Rhythm – regular or irregular
 - 2. Strength – Bounding or thready
- K. Circumstances affecting pulse rate
 - 1. Body temperature
 - 2. Emotions
 - 3. Activity level
 - 4. Health of heart
- L. Perfusion is the flow of blood throughout the body. Someone with sufficient perfusion has a strong enough heart beat to adequately oxygenate the body.

III. Respiration

- A. Each breath includes inspiration and expiration.
- B. Measure by observing chest rise and fall.
- C. Measured in breaths per minute.
- D. Normal range = 12-24 breaths per minute.
- E. > than 24 = tachypnea – if breathing in great depth then called hyperpnea
- F. < than 12 = bradypnea
- G. Difficulty in breathing is called dyspnea
- H. Quality of breathing is determined as well as the rate of breathing
 - 1. Depth
 - 2. Clarity of breath sounds
 - 3. Pain with breathing
 - 4. Difficulty breathing – use of accessory muscles – sternocleidomastoid and intercostal muscles

IV. Procedure for taking TPRs

- A. If using mercury thermometer insert the thermometer. If axillary or rectal hold the thermometer throughout the time. If oral, insert the thermometer and proceed to take the pulse and respiration.
- B. If using electronic – take the temperature first, then proceed to the pulse and respiration.
- C. When taking the pulse and respiration, do not drop the wrist until both the pulse and respiration are taken. This way the person does not know when his/her respirations are being measured – insuring a more accurate measurement.
- D. When measuring axillary temperature, remove any clothing that could impede the accuracy of the temperature. Also clean the axilla if there is excessive deodorant or perspiration present.

- E. When measuring the rectal temperatures, always lubricate the thermometer with water-soluble gel before inserting into the rectum.
 - F. Never touch the bulb end of the thermometer with the fingers.
- V. Charting
- A. Chart in order of TPR
 - B. Do not write T =, P =, etc., simply 98.6 – 84 – 22.
- VI. Instruct on the correct reading of a mercury/glass thermometer
- A. Read between the markings and numbers.
 - B. Large lines indicate full degrees.
 - C. Small lines are two-tenths of a degree.
 - D. If the mercury line is between lines, either read to the last tenth or the next tenth of degree.

ACTIVITIES

- I. Individually practice the procedures for taking oral temperature, radial pulse, and respiration.
- Teacher's note:** Give each student the TPR Safety Sheet, an oral mercury thermometer, and have a clock with a second hand in the classroom. Have students shake down the thermometer, place in their mouth under the tongue, and time for three minutes. As the students remove their thermometers and read their temperatures, record each temperature on the board. After recording all temperatures, have the students formulate a normal oral temperature range for the class. Compare the results with the textbook range of normal. Do the same for radial pulse and respiration.*
- II. Practice the combined skill of taking temperature, pulse, and respiration by taking the TPR of each class member and record it on a sheet of paper in the format T-P-R and on a graphic sheet. See Module Graphing TPRs in number 4, below.
- III. Check skill of taking oral, axillary, and rectal temperature, pulse, and respiration by completing a peer evaluation with another classmate (Check 1 on Skill Examination Checklist).
- IV. As students are waiting to test, they will complete all related modules. See Module Handouts: Terminology and Abbreviations for Temperature, Pulse, and Respiration Skill, Calculating an Apical/Radial Pulse and Determining a Pulse Deficit, Find your Pulse Points/Calculate Your Target Heart Rate, Interpreting Pulse and Respiration Strips, and Graphing TPRs.
- Teacher Note:** Obtain a copy of a local facility's graphic sheet to use with the station/module on graphing TPRs.*

MATERIALS NEEDED

PC with PowerPoint and Powerpoint presentation for TPR.
Manikin with orifice for insertion of rectal thermometer
Mercury, electronic, and ThermoScan thermometers

KY jelly
Protective covers for all thermometer types
Clock
Timer for test
Skill checklist
PowerPoint TPR program
Container for thermometers
Alcohol
Handouts for modules, and TPR Safety Handout
Graphic Sheet used to chart vital signs (Obtain from your local hospital)
Videos – Mosby’s Nursing assistant Skills Video Series

Sorrentino, Sheila A. *Mosby’s Textbook for Nursing Assistants, 5th edition*. St. Louis, Mosby Year Book, 1999.

Texas Department of Human Services Curriculum for Long Term Care Providers.

<http://www.muhealth.org/~shrp/rtwww/rcweb/docs/sounds.html>

Excellent source to teach breath sounds. Could be worked into a module for TPR skills

ASSESSMENT

Successful performance of the TPR skill test in 10 minutes– Instructor to use Check 2
Successful completion of the written objective test.

ACCOMMODATIONS

For reinforcement, the student will take 15 oral mercury TPRs of a biology class in the high school, analyzing each for any abnormality, and submitting their findings before the skills and written test.

For enrichment, the student will prepare and present a presentation on temperature, pulse, and respiration for an elementary class. See Presentation Rubric.

REFLECTIONS

CALCULATING AN APICAL/RADIAL PULSE AND DETERMINING A PULSE DEFICIT

Divide the class into groups that are divisible by three.

Each of the three people will assume the roles of a) counting the radial pulse
b) counting the apical pulse
c) being the patient/resident

Materials: Stethoscopes, pen, and paper.

1. The person who is taking the apical pulse must have a stethoscope. Locate the apical pulse in the left nipple region of the chest.
2. The person who is taking the radial pulse finds the pulse on either arm.
3. The person taking the apical pulse gives the signal to start counting.
4. The pulses are counted for one full minute.
5. Record the apical and radial pulses. Subtract the radial pulse from the apical pulse for the pulse deficit. Note whether the pulse is regular or irregular.
6. Exchange roles and repeat until each person has served as a patient.
7. Finally take each other's radial pulse for 15 seconds and multiply by 4, then 30 seconds and multiply by 2, and finally one minute.

Questions:

1. Should the pulses ever show a deficit?
2. Would the apical pulse ever be less than the radial?
3. What are some circumstances that could cause a pulse deficit?
4. When measuring the pulse rates for different spans of time, were the results essentially the same? If not, which measurement was likely to be the most inaccurate?

FIND YOUR PULSE POINTS

CALCULATE YOUR TARGET HEART RATE

Materials: Stethoscope, Assignment sheet, jump rope. Each student brings paper and pencil to group.

Select another person to be your partner. On his/her body find the following pulses points: Temporal

Carotid
Brachial
Radial
Apical with a stethoscope
Popliteal
Dorsal Pedalis

On yourself, find the Femoral pulse.

CALCULATE YOUR TARGET HEART RATE

1. Subtract your age from 220 $220 - \text{age} = \text{MHR}$ (Maximum Heart Rate)
2. Multiply your MHR by 0.6 $\text{MHR} \times 0.6 =$ Lower end of your Target Heart Rate
3. Multiply your MHR by 0.8 $\text{MHR} \times 0.8 =$ Upper end of your Target Heart Rate

When taking your pulse after (or during) exercise, measure the carotid pulse.

Next, take turns using the jump rope and jump long enough to fall within your Target Heart Rate range. If a person was to exercise safely, they should:

- a. exercise within the Target Heart Rate range
- b. exercise for 20-60 minutes each time
- c. exercise 3 – 5 times per week

GRAPHING TEMPERATURE/PULSE/RESPIRATION

Using the Graphic Record that you received in this packet, chart the TPR of each of the students that you obtained when practicing the skill of measuring Temperature, Pulse, and Respiration.

Each student will represent a time slot, as though you obtained TPR every four hours on the same patient. Connect the lines for each of the graphs. Can you draw any conclusions about the Temperature, Pulse, and Respiration of each of your classmates.

For example: Are all temperatures basically within the same range?

Using this graph, what would you say the normal range was for oral temperatures?

What does your book say is the normal range?

Are the pulses basically within the same range?

Using this graph, what would you say the normal range was for pulses?

What does your book say the normal range is?

Are the respiratory rates within the same range?

Using this graph, what would you say the normal range was for respiration?

What does your book say the normal range is?

TEST: VITAL SIGNS: TEMPERATURE, PULSE, RESPIRATION

NAME: _____

Fill in the Blank: For each of the questions, write the correct answers in the corresponding blanks provided.

1. – 4. List the four vital signs of body function.

5. – 8. Give the four routes for measuring temperature.

9. What would you ask a patient before measuring his/her oral temperature?

_____ 10. The ____ should not be used to take the pulse because it has a pulse of its own.

_____ 11. Each ____ involves one inhalation and one exhalation.

_____ 12. The pulse should be taken one full minute if it is ____, a word meaning abnormal in rhythm.

_____ 13. Difficult, labored, or painful breathing is called ____.

_____ 14. Respirations and pulse are counted for ____ each, unless they are abnormal in rhythm or rate.

_____ 15. The speed of the heart beating or of breathing is called ____.

_____ 16. Faster than normal, shallow breathing is called ____.

_____ 17. Faster than normal, deep breathing is ____.

_____ 18. Slower than normal breathing is ____.

_____ 19. No breathing is ____.

_____ 20. Normal breathing is ____.

- _____ 21. A heartbeat greater than 100 beats per minute is _____.
- _____ 22. A heartbeat less than 60 beats per minute is _____.
- _____ 23. The normal respiratory range is _____.
- _____ 24. The normal oral temperature range is _____.
- _____ 25. We would expect a rectal temperature to be _____
_____ than an oral temperature.
- _____ 26. The normal adult pulse range is _____.
- _____ 27. How far is a rectal thermometer inserted?
- _____ 28. How long is an axillary thermometer left in place?
- _____ 29. – 30. You are taking vital signs of a 65-year-old woman. Her TPR is 95.7 ° - 56 – 22. Which, if any, of the vital signs would you report?
- _____ 31. The abbreviation SOB means _____.
- _____ 32. If taking a rectal temperature with a mercury thermometer, you would choose the thermometer that is _____ in color.
- _____ 33. When taking a radial pulse, you would press on the _____ side of the wrist.
- _____ 34. Respirations gradually increasing in rapidity and volume, reaching a climax, and then gradually subsiding until they cease are known as _____.

Multiple Choice: For each of the following, select the best answer and write the letter in the space provided.

- _____ 35. An oral mercury temperature is taken for
- a. 5 minutes
 - b. 3 minutes
 - c. 2 minutes
 - d. 10 minutes

- _____36. A rectal mercury temperature is taken for
- 5 minutes
 - 3 minutes
 - 2 minutes
 - 10 minutes
- _____37. The most accurate temperature is the
- oral
 - axillary
 - rectal
 - tympanic
- _____38. A temperature of 103 – 105 degrees F. is
- normal oral
 - high fever
 - normal rectal
 - borderline fever
- _____39. A temperature below 96 degrees F. is
- normal axillary
 - below normal
 - normal oral
 - borderline fever
- _____40. A temperature of 100 – 103 degrees F. is
- normal oral
 - moderate fever
 - normal rectal
 - borderline fever
- _____41. A temperature of 99.6 degrees F. is
- normal oral
 - normal axillary
 - below normal
 - moderate fever
- _____42. If a person's heart doesn't always beat hard enough to produce a wave of blood, their pulse would be
- irregular
 - regular
 - bounding
 - thready

- _____43. The number of pulse, heartbeats, or respirations per minute is
- quality
 - rate
 - volume
 - vital signs
- _____44. Volume, strength of pulse beats
- quality
 - rate
 - vital signs
- _____45. On a Fahrenheit mercury thermometer, how many degrees do the short lines indicate?
- 1 degree
 - 2 degrees
 - 0.1 degree
 - 0.2 degree
- _____46. If you count the chest rising 15 times in one minute, you would report
- 30 respirations per minute
 - 15 respirations per minute
 - 7 respirations per minute
- _____47. If you count nine respirations in 30 seconds, you would report
- 27 respirations per minute
 - 9 respirations per minute
 - 18 respirations per minute
- _____48. A popliteal pulse is found
- in the groin
 - behind the knee
 - on top of the foot
 - at the neck
- _____49. A femoral pulse is found
- in the groin
 - behind the knee
 - on top of the foot
 - at the neck
- _____50. A temporal pulse is found
- at the neck
 - at the side of the head
 - at the elbow
 - behind the ear

_____51. If a person has a blue cast to their nail beds and feel cold to the touch, we way the they have

- a. a pulse deficit
- b. an irregular pulse rate
- c. poor perfusion
- d. a bounding pulse

_____52. Temperatures are not taken orally if a patient is receiving oxygen.

- a. true
- b. false

_____53. Temperatures are taken orally on children younger than 4-5 years of age.

- a. true
- b. false

_____54. Oral temperatures are not taken on someone who is delirious, restless, confused, or disoriented.

- a. true
- b. false

_____55. A rectal temperature is not taken when a person

- a. is unconscious
- b. needs a core body temperature measurement
- c. has a nasogastric tube
- d. has had rectal surgery

56. – 60 Record the temperature found on the glass/mercury thermometers placed in the classroom.

56.

57.

58.

59.

60.

**KEY FOR TEST: VITAL SIGNS: TEMPERATURE, PULSE,
RESPIRATION**

- 2. – 4. Blood Pressure Temperature Pulse Respiration
- 5. – 8. Oral Rectal Axillary Tympanic
- 10. Have you had anything hot or cold to drink, smoked or chewed gum in the last 15 minutes?
- 10. Thumb
- 11. Respiration
- 12. Irregular
- 13. Dyspnea
- 14. 30 seconds
- 15. Rate
- 16. Tachypnea
- 17. Hyperpnea or Hyperventilation
- 18. Bradypnea
- 19. Apnea
- 20. Eupnea
- 21. Tachycardia
- 22. Bradycardia
- 23. 12-24 breaths per min.
- 24. 97-99 degrees F.
- 25. One degree higher
- 26. 60-100 beats per min.
- 27. 1 inch

28. 10 minutes

29-30 Temperature and pulse

31. Short of Breath

32. Red

33. Thumb

34. Cheyne-Stokes

35. B

36. B

37. C

38. B

39. B

40. B

41. A

42. A

43. B

44. A

45. D

46. B

47. C

48. B

49. A

50. A

51. C

52. A

53. F

54. A

55. D

TERMINOLOGY AND ABBREVIATIONS FOR TEMPERATURE, PULSE, AND RESPIRATION

For each of the following abbreviations and terms, make a flash card. Select another person in your group to be your partner, and drill the terms.

Abbreviations:

SOB	q4h
qid	
–	tid
q	
–	bid
s	
–	hs
c	
	prn
TPR	
	Ad lib
B/P	–
	qod
V/S or VS	–
	qd

Terminology:

tachypnea	hyperventilation
bradypnea	dyspnea
tachycardia	fever
bradycardia	febrile
systole	afebrile
asystole	angina
eupnea	wheezing
apnea	rales
hyperpnea	rhonchi
bounding	orthopnea
thready	

THE THERMOMETER CONTROVERSY: INSTRUCTOR GUIDESHEET

1. There is tremendous controversy about the use of mercury thermometers in the classroom. In the web site www.stao.org/safeart2.htm there are some startling facts.
Breakage of 4 thermometers in a standard classroom constitutes excessive exposure to mercury.
2. If you continue to use mercury thermometers, very stringent fines and guidelines must be adhered to. Also mercury spill kits must be kept in the classroom. The website www.epsross.com offers 800- numbers to call about spill kits.

TPR SAFETY HANDOUT

1. Mercury is a very toxic substance. If there are four thermometers broken in this classroom, the level of mercury would be considered in excess of tolerable limits.
2. All mercury thermometers will be held above the waist when in use.
3. Students will not shake down thermometers around overbed tables, bedside stands, etc. They will also shake down all thermometers at shoulder level.
4. If a student breaks a mercury thermometer, they will be fined \$10.00. The cost of a spill kit is in excess of \$100.00, and must be used if the thermometer is broken.
5. After the thermometer has been used and is being prepared for storage, it must be carefully cleaned with **COOL**, soapy water and placed in the storage container filled with alcohol.
6. There will be no horseplay during this skill. This must be taken very seriously. If a student chooses not to observe these guidelines, they will not be allowed to continue the skill and will be given a failing grade. They will also be required to research the effects of mercury on humans and a 3 – 5 page research paper.

I understand the danger involved in handling mercury thermometers. I will conduct myself with care and remind my fellow classmates to do the same. I understand that I will not continue with the skill if I engage in any horseplay, teasing, or any behavior that jeopardizes myself or my classmates. If I am unable to follow these guidelines, I understand that I will be writing a research paper in lieu of performing the skill and will receive 0s for each of the assignments related to the skill. Should I break a thermometer, I will pay \$10.00 for a new thermometer.

Name

Date

Interpretation of Rhythm Strips Worksheet

Read the sets of characteristics of each of the cardiac arrhythmias below. Match the characteristics with the correct strip on the following page. (Remember that each strip represents a 6-second period of time.) Write the number of the description of the characteristics in the space provided by the arrhythmia strip.

- 1. SINUS BRADYCARDIA**
RATE: Both the atria and ventricles are less than 60 beats/minute.
RHYTHM: Regular rhythm throughout.
PQRST INFORMATION: Has P wave, QRS complex, and T wave present.
- 2. SUNUS ARRHYTHMIA**
RATE: Atrial and ventricular contractions are present and measure between 60-100 beats/minute.
RHYTHM: Slightly irregular.
PQRST INFORMATION: Has P wave, QRS complex, and T wave present.
- 3. SINUS TACHTCARDIA**
RATE: Atria and ventricular contractions are present and the rate measures 100-160 beats/minute.
RHYTHM: Regular
PQRST INFORMATION: Has P wave, QRS complex, and T wave present.
- 4. ATRIAL FLUTTER**
RATE: Has many atrial contractions for one ventricular contraction. Atrial rate is 250-350 beats/minute. Ventricular rate is usually between 60-100 beats per minute.
RHYTHM: Both atrial and ventricular patterns are regular, but they don't match in rate.
PQRST INFORMATION: Has P wave (saw-toothed or flutter waves), QRS complex, but the T wave is not seen because it is covered by the many P waves.
- 5. VENTRICULAR FLUTTER**
RATE: There is no evidence of atrial rate. The ventricular rate is 150-300 beats/minute.
RHYTHM: The ventricular rhythm can be regular or irregular. There is no visible P wave or T wave.
PQRST INFORMATION: No P wave, QRS complex is wide and not in a typical pattern. T wave not visible.
- 6. ASYSTOLE (VENTRICULAR STANDSTILL)**
RATE: No rate observable because the atrial pattern may be visible or not and the ventricular pattern is not present.
RHYTHM: Atria rate, if present, is regular. Ventricular rate not shown/visible.
PQRST INFORMATION: P wave often present, QRS complex absent, and no T wave visible.
- 7. ATRIAL FIBRILLATION**
RATE: Atrial pattern is like a quivering line - > 400 beats/minute. Ventricular pattern is not present and can be normal or faster than normal.
RHYTHM: Both the atrial rhythm and the ventricular rhythm are irregular.
PQRST INFORMATION: There is no actual P wave, but rather a fine wavy line. QRS complex is present. The T wave is not evident.
- 8. VENTRICULAR TACHYCARDIA(V-tach, VT)**
RATE: There is no atrial contraction visible – the ventricular contraction is present and rapid (100-250 beats/minute).
RHYTHM: Atrial rhythm is not apparent; ventricular rhythm is usually regular.
PQRST INFORMATION: P wave is not visible. QRS complex is wide and bizarre. The T wave is present and always pointing in the opposite direction of the QRS complex.
- 9. VENTRICULAR FIBRILLATION**
RATE: Not apparent.

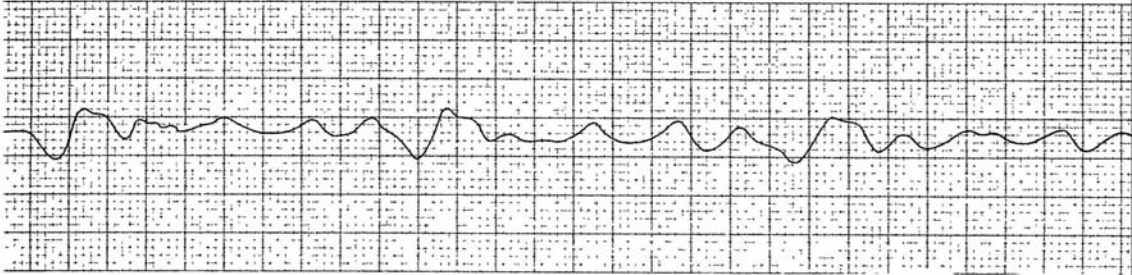
RHYTHM: Rapid and chaotic – looks like an uneven line.

PQRST INFORMATION: No P wave, no QRS complex, and no T wave.

RHYTHM STRIPS

Name: _____

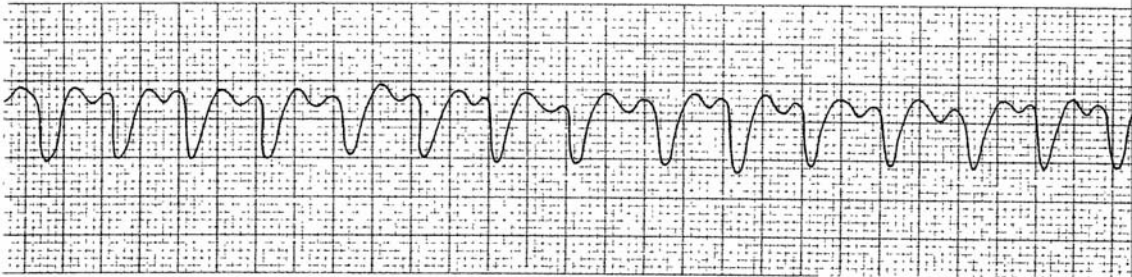
1. _____



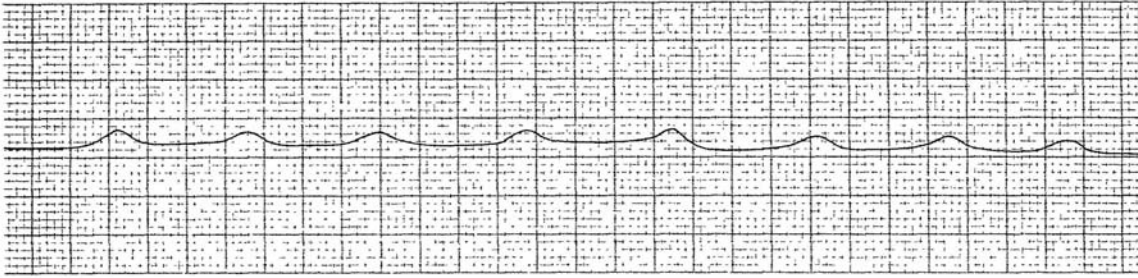
2. _____



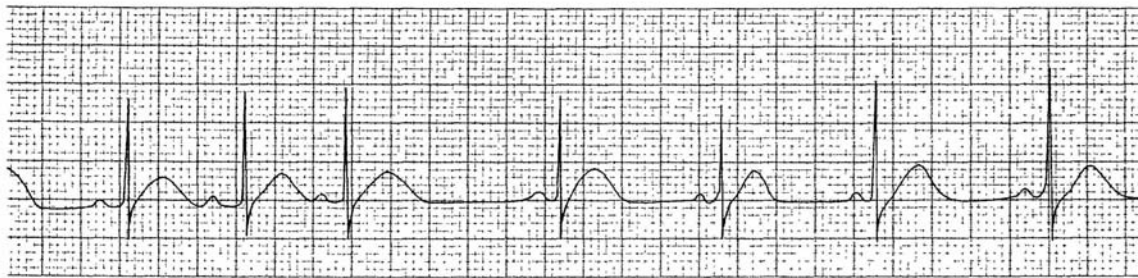
3. _____



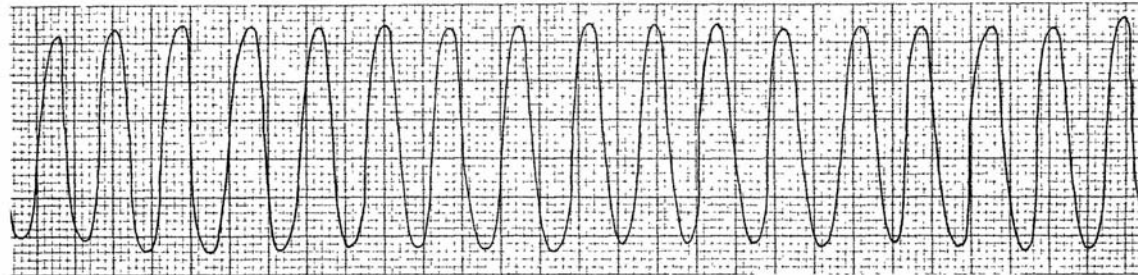
4. _____



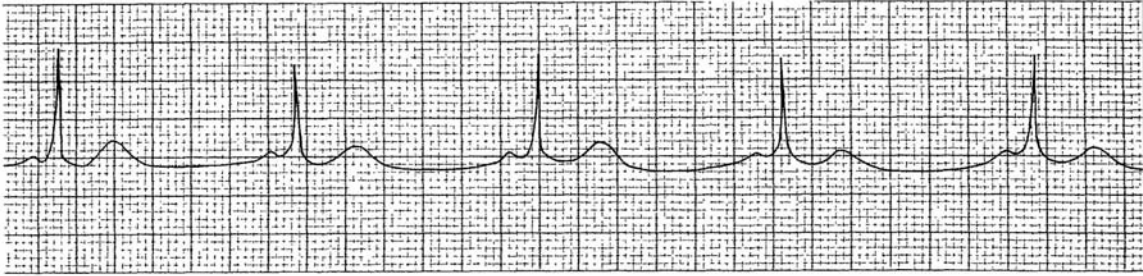
5 _____



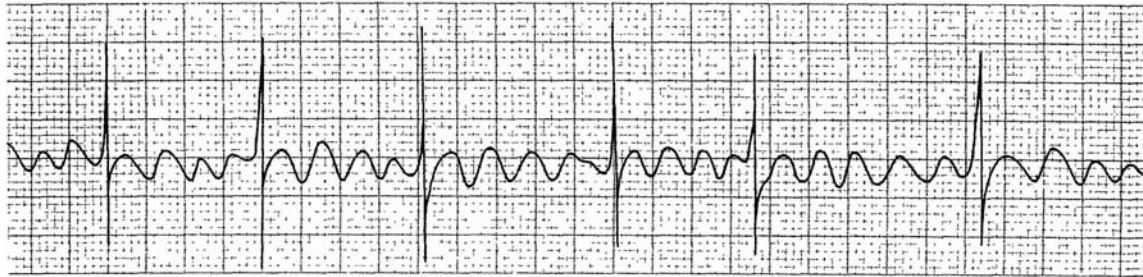
6 _____



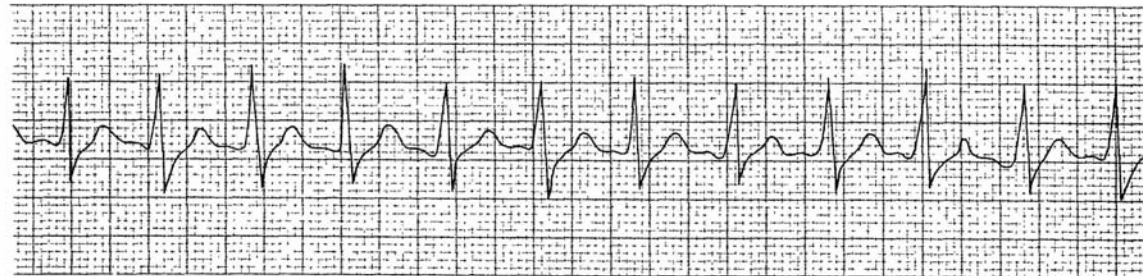
7. _____



8. _____



9. _____



Interpretation of Respiratory Patterns

Read the sets of characteristics of each of the respiratory patterns below. Match the characteristics with the correct strip on the following page. (Remember that each strip represents a 30-second period of time). Write the number of the description of the characteristics in the space provided by the respiratory pattern strip.

- 1. NORMAL ADULT RESPIRATION**
RATE: 12-24 breaths per minute
PATTERN: even and regular
DEPTH: Air is moving in and out with each respiration.
- 2. NORMAL ADULT RESPIRATION WITH A SIGH**
RATE: Same as number 1.
PATTERN: Even with occasional deep breaths/sighs punctuating the normal breathing pattern.
DEPTH: Same as number 1.
- 3. TACHYPNEA**
RATE: Increased rate > 24 breaths per minute.
PATTERN: Overall even and regular.
DEPTH: Shallow breathing.
INCIDENCE: Normal response to fear, fever, or exercise. Also seen with respiratory insufficiency, pneumonia, alkalosis, pleurisy, and lesions in the pons.
- 4. BRADYPNEA**
RATE: Less than 10-12 per minute.
PATTERN: Overall even and regular.
DEPTH: Air moving in and out with each respiration with essentially the same depth as normal adult respirations.
INCIDENCE: Seen in drug-induced depression of the respiratory center in the medulla, increased intracranial pressure, and diabetic coma.
- 5. HYPERVENTILATION**
RATE: Increased rate > 24 breaths per minute.
PATTERN: Overall even and regular.
DEPTH: Increased above normal respirations.
INCIDENCE: Normally occurs with extreme exertion, fear, or anxiety. Also occurs with diabetic ketoacidosis (called Kussmaul's respirations), hepatic coma, salicylate overdose, lesions of the midbrain, and alteration in blood gas concentration.
MECHANISM: Hyperventilation blows off carbon dioxide, causing a decreased level in the blood leading to respiratory alkalosis.

6. HYPOVENTILATION

RATE: Can be within normal limits of 12-24 breaths per minute, or less.

PATTERN: Irregular

DEPTH: Shallow

INCIDENCE: May be seen in overdose of narcotics or anesthetics. Also may be seen with prolonged bed rest or conscious splinting of the chest if pain is present with respiration.

7. CHEYNE-STOKES RESPIRATION

RATE: Difficult to determine due to variation of respiratory pattern

PATTERN: Cyclical pattern with respirations gradually waxing and waning in a regular pattern. There are alternating periods of breathing and periods of apnea.

DEPTH: The periods of breathing show increased depth as respirations continue, gradually decreasing again in depth before the apneic phase.

INCIDENCE: Severe congestive heart failure, renal failure, meningitis, drug overdose, and increased intracranial pressure. Can be seen normally in infants and elderly during their sleep.

8. BIOT'S RESPIRATION

RATE: Difficult to determine due to variation of respiratory pattern.

PATTERN: Similar to Cheyne-Stokes respiration, except that the pattern is irregular.

DEPTH: Similar in nature to Cheyne-Stokes respiration.

INCIDENCE: Seen with head trauma, brain abscess, heat stroke, spinal meningitis and encephalitis.

9. CHRONIC OBSTRUCTIVE RESPIRATION

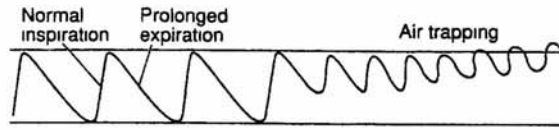
RATE: Irregular due to prolonged expiration and periods of air trapping.

PATTERN: Irregular, with normal inspiration and prolonged expiration including periods of shallow, rapid respiratory pattern as the person attempts to get rid of air trapped in the lungs.

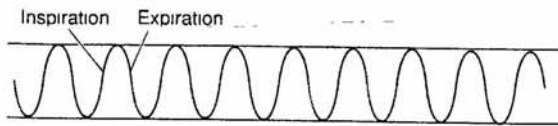
DEPTH: With each regular breath the depth is normal. But the depth becomes very shallow during the periods of air trapping, exhibited by increasingly shallow rapid respiration.

RESPIRATORY PATTERN STRIPS

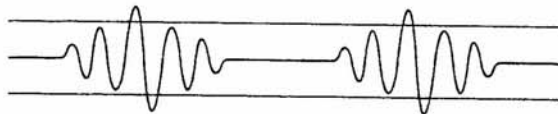
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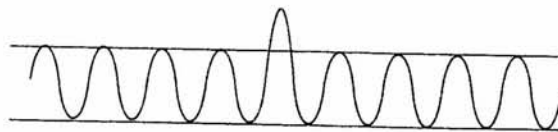
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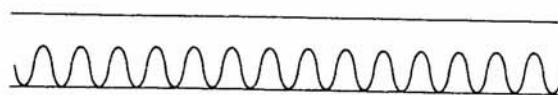
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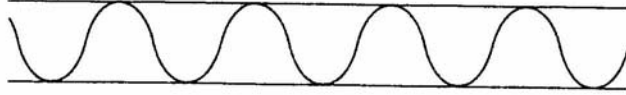
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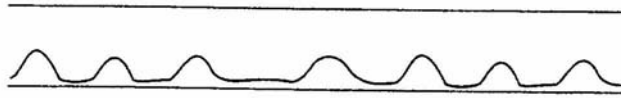
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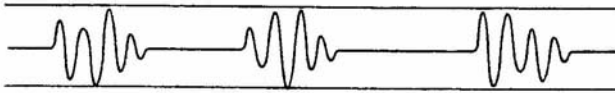
6. _____



7. _____



8. _____



9. _____

