Measurement of pulse rate

Pulse definition.

Pulse is the expansion and contraction of an artery (blood vessel).

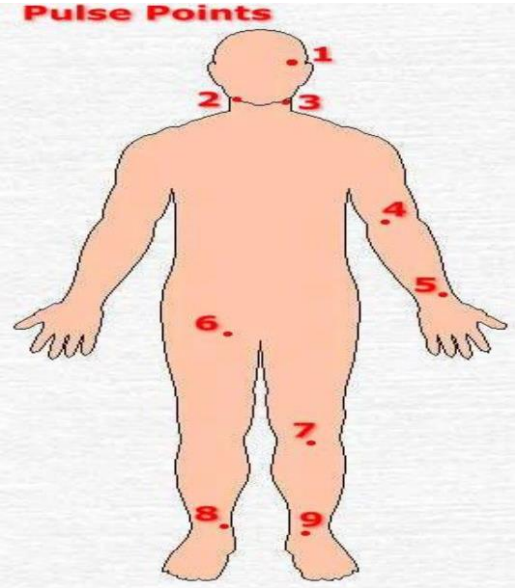
Pulse rate.

Pulse rate indicates how fast the heart is beating.

Pulse rate may be measured at several body sites.

Radial (wrist) pulse is most common site.

Pulse points



a. Temporal

b. External maxillary (facial)

c. Carotid

d. Brachial

e. Radial

f. Femoral

g. Popliteal

h. Posterior tibias

i. Dorsalis pedis

Rate of Pulse – number of beats per minute

Rate varies with individuals –depends on age, sex, body size and exercise.

Usually pulse rate goes up as temperature increases.

Normal adult resting rate is 60-80 beats per minute.

Pulse rates of the elderly are affected by disease conditions and some medications.

What else can affect the heart rate?

Caffeine & alcohol –increases the strength and frequency of the heartbeat therefore increasing the rate

Exercițiul fizic crește ritmul cardiac, dar cineva care face exerciții fizice în mod regulat poate avea un ritm mic de odihnă.

Exercise increases the heart rate, but someone who exercises regularly may have a low resting rate.

Disease affect the heart rate. Thyroid disease can either make the rate faster or slower depending type of disease.

Drugs (medical & recreational) e.g. digoxin & bets blockers slow the HR. Recreational drugs tend to increase HR.

Girls ages 12 and older and women, in general, tend to have faster heart rates than do boys and men.

Athletes, such as runners, may have heart rates in the 40's and experience no problems.

Pulse characteristics.

The normal pulse for healthy adults ranges from 60 to 100 beats per minute. Under 60 bpm is bradycardia, over 100 bpm is tachycardia

Normal pulse rates at rest, in beats per minute:

- newborn (0–3 months old) - 100-150 b/m
- infants (3 – 6 months) - 90-120 b/m
- infants (6 – 12 months) - 80-120 b/m
- children (1 – 10 years) - 70-130 b/m
- children over 10 years & adults, including seniors - 60-100 b/m
- well-trained adult athletes - 40-60 b/m

Pulse rhythm – regularity.

- normal pulse – smooth, equal time between beats, equal pressure
- irregular – time between beats is not equal
- intermittent – period of some normal beats followed by irregular or skipped beats.

Measuring a Radial Pulse, purpose:

- To determine number of heart beats occurring per minute (rate)
- To gather information about heart rhythm and pattern of beats
- To evaluate strength of pulse
- To assess heart's ability to deliver blood to distant areas of the blood viz. fingers and lower extremities
- To assess response of heart to cardiac medications, activity, blood volume and gas exchange
- To assess vascular status of limbs

Measuring a radial pulse.

Wash your hands.

Prepare all equipment required on tray -gloves (if necessary), stopwatch

Patient should be at rest.

- Explain the purpose of the procedure to the patient, ask about his agreement :
- *Now I would like to check your pulse. The pulse is an important vital sigh, in dependence of it I will prescribe you investigations and treatment, do you agree?*

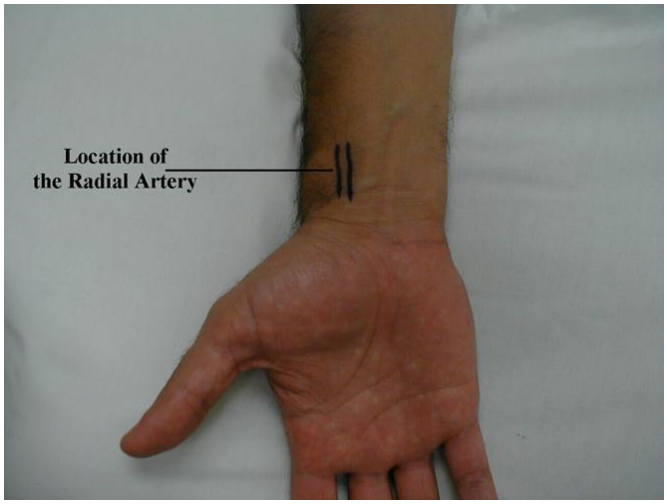
After that, you should explain what do you want to do:

- *Please, relax, don't worry, this procedure is safe and not complicated, I will check your pulse on radial artery, don't move and speak during the procedure, it will take at about 1 minute. Please, place your arm on a table.*

Main steps:

Use tips of 2nd, 3rd and 4th fingers; never use thumb because you may feel your own pulse in thumb.

Place the tips of your fingers just proximal to the patients wrist on the thumb side, orienting them over the length of the vessel(the radial pulse is typically on the radial side of the palmer aspect of the wrist, about two centimeters proximal to the thenar eminence).



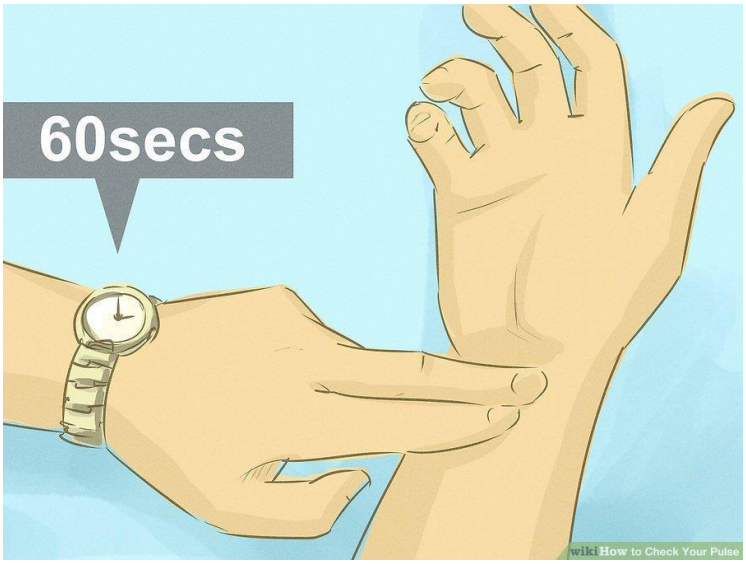
Press gently, compressing blood vessel between your fingers and patient's radial (wrist) bone.

- •Note pulse rate and rhythm.
- •Use a watch or clock with a second hand or digital second display.

Count the pulse beats for a full minute.

Counting a full minute permits a more accurate reading and allows assessment of pulse strength and rhythm.

If pulse is regular, count for 30 seconds, double and record number



Explain the result to the patient:

Your pulse rate is…and it is regular, thank You

Dispose of the equipment properly.

Wash your hands.

Knowledge verification questions:

1. **Give the pulse definition.**
   - Pulse is the expansion and contraction of an artery (blood vessel).
2. **Pulse rate, what is it?**
   - Pulse rate indicates how fast the heart is beating.
   - Pulse rate may be measured at several body sites.
3. **Where is the most common point of pulse checking?**
   - Radial (wrist) pulse is most common site.
4. **Name the pulse points, arteries, and places where the pulse can be checked.**
   a. Temporal
   b. External maxillary (facial)
   c. Carotid
   d. Brachial
   e. Radial
   f. Femoral
   g. Popliteal
   h. Posterior tibias
   i. Dorsalis pedis
5. **Rate of Pulse – number of beats per minute, on what does its value depend?**
   - Rate varies with individuals –depends on age, sex, body size and exercise.
   - Usually pulse rate goes up as temperature increases.
   - Normal adult resting rate is 60-80 beats per minute.
   - Pulse rates of the elderly are affected by disease conditions and some medications.
6. **What can affect the heart rate?**
   - Caffeine & alcohol –increases the strength and frequency of the heartbeat therefore increasing the rate
   - Exercise increases the heart rate, but someone who exercises regularly may have a low resting rate.

- Disease affect the heart rate. Thyroid disease can either make the rate faster or slower depending type of disease.
- Drugs (medical & recreational) e.g. digoxin & bets blockers slow the HR. Recreational drugs tend to increase HR.
- Girls ages 12 and older and women, in general, tend to have faster heart rates than do boys and men.
- Athletes, such as runners, may have heart rates in the 40's and experience no problems.

7. **Name the pulse characteristics.**
   - The normal pulse for healthy adults ranges from 60 to 100 beats per minute.
   - Under 60 bpm is bradycardia, over 100 bpm is tachycardia
8. **Normal pulse rates at rest, in beats per minute:**
   - newborn (0–3 months old) - 100-150 b/m
   - infants (3 – 6 months) - 90-120 b/m
   - infants (6 – 12 months) - 80-120 b/m
   - children (1 – 10 years) - 70-130 b/m
   - children over 10 years & adults, including seniors - 60-100 b/m
   - well-trained adult athletes - 40-60 b/m
9. **Pulse rhythm – regularity.**
   - normal pulse – smooth, equal time between beats, equal pressure
   - irregular – time between beats is not equal
   - intermittent – period of some normal beats followed by irregular or skipped beats.
10. **Measuring a radial pulse, purpose:**
    - To determine number of heart beats occurring per minute (rate)
    - To gather information about heart rhythm and pattern of beats
    - To evaluate strength of pulse
    - To assess heart's ability to deliver blood to distant areas of the blood viz. fingers and lower extremities
    - To assess response of heart to cardiac medications, activity, blood volume and gas exchange
    - To assess vascular status of limbs

11. Measuring a radial pulse, what does the first stage entail?

- Wash your hands.
- Prepare all equipment required on tray -gloves (if necessary), stopwatch
- Patient should be at rest.

12. How to explain correct the purpose of the procedure to the patient?

- *Now I would like to check your pulse. The pulse is an important vital sigh, in dependence of it I will prescribe you investigations and treatment, do you agree?*

13. How should you explain what do you want to do?

- *Please, relax, don't worry, this procedure is safe and not complicated, I will check your pulse on radial artery, don't move and speak during the procedure, it will take at about 1 minute. Please, place your arm on a table.*

14. The main steps of pulse checking technic on radial artery are:

- Use tips of 2^{nd}, 3^{rd} and 4^{th} fingers; never use thumb because you may feel your own pulse in thumb.
- Place the tips of your fingers just proximal to the patients wrist on the thumb side, orienting them over the length of the vessel (the radial pulse is typically on the radial side of the palmer aspect of the wrist, about two centimeters proximal to the thenar eminence).
- Press gently, compressing blood vessel between your fingers and patient's radial (wrist) bone.
  - Note pulse rate and rhythm
  - Use a watch or clock with a second hand or digital second display.
- Count the pulse beats for a full minute.
- Counting a full minute permits a more accurate reading and allows assessment of pulse strength and rhythm.
- If pulse is regular, count for 30 seconds, double and record number

15. How to explain the result to the patient?

- *Your pulse rate is…and it is regular, thank You*

16. What is important at the end of the process not to forget?

- Dispose of the equipment properly.
- Wash your hands.

Tests.

a. Give the pulse definition.

a. * Pulse is the expansion and contraction of an artery (blood vessel).
b. Pulse is the elasticity of an artery**.**
c. The pulse is the result of contraction of the atria.
d. The pulse is the result of contraction of aorta.
e. No one answer is correct.

b. Pulse rate, what is it?

a. * Pulse rate indicates how fast the heart is beating.
b. * Pulse rate may be measured at several body sites.
c. Pulse rate does not indicates how fast the heart is beating.
d. Pulse rate can not be measured at several body sites.
e. Pulse rate is the result of pressure.

c. Where is the most common point of pulse checking?

a. Temporal
b. Mandibulary
c. Carotid
d. Brachial
e. * Radial

d. Name the pulse points, arteries, and places where the pulse can be checked.

a. * Temporal
b. Mandibulary
c. * Carotid
d. * Brachial
e. * Radial

5. Name the pulse points, arteries, and places where the pulse can be checked.

a. * Femoral
b. * Popliteal
c. * Posterior tibias
d. * Dorsalis pedis
e. Mandibulary

6. **Rate of Pulse – number of beats per minute, on what does its value depend?**
    a. * Rate varies with individuals –depends on age, sex, body size and exercise.
    b. * Usually pulse rate goes up as temperature increases.
    c. * Normal adult resting rate is 60-80 beats per minute.
    d. * Pulse rates of the elderly are affected by disease conditions and some medications.
    e. Usually, the pulse increases as the temperature decreases.
7. **What can affect the heart rate?**
    a. * Caffeine & alcohol –increases the strength and frequency of the heartbeat therefore increasing the rate.
    b. * Exercise increases the heart rate, but someone who exercises regularly may have a low resting rate.
    c. * Disease affect the heart rate. Thyroid disease can either make the rate faster or slower depending type of disease.
    d. * Drugs (medical & recreational) e.g. digoxin & beta-blockers slow the HR. Recreational drugs tend to increase HR.
    e. Girls ages 12 and older and women, in general, tend to have slower heart rates than do boys and men.
8. **What can affect the heart rate?**
    a. * Athletes, such as runners, may have heart rates in the 40's and experience no problems.
    b. * Exercise increases the heart rate, but someone who exercises regularly may have a low resting rate.
    c. * Disease affect the heart rate. Thyroid disease can either make the rate faster or slower depending type of disease.
    d. * Drugs (medical & recreational) e.g. digoxin & beta-blockers slow the HR. Recreational drugs tend to increase HR.
    e. Girls ages 12 and older and women, in general, tend to have slower heart rates than do boys and men.
9. **Name the pulse characteristics.**
    a. * The normal pulse for healthy adults ranges from 60 to 100 beats per minute.
    b. * Under 60 bpm is bradycardia, over 100 bpm is tachycardia.

c. The normal pulse for healthy adults ranges from 100 to 140 beats per minute.
d. Under 60 bpm is tachycardia, over 100 bpm is bradycardia.
e. The normal pulse for healthy adults ranges from 16 to 25.

10.Normal pulse rates at rest, in beats per minute:

a. * newborn (0–3 months old) - 100-150 b/m
b. * infants (3 – 6 months) - 90-120 b/m
c. * infants (6 – 12 months) - 80-120 b/m
d. children (1 – 10 years) - 60-80 b/m
e. children over 10 years & adults, including seniors - 60-80 b/m

11.Normal pulse rates at rest, in beats per minute:

a. * children (1 – 10 years) – 70-130 b/m.
b. * children over 10 years & adults, including seniors - 60-100 b/m.
c. * well-trained adult athletes - 40-60 b/m.
d. infants (3 – 6 months) - 60-80 b/m.
e. infants (6 – 12 months) - 80-85 b/m.

12.Pulse rhythm – regularity, list and describe the types of regularity.

a. * normal pulse – smooth, equal time between beats, equal pressure.
b. * irregular – time between beats is not equal.
c. * intermittent – period of some normal beats followed by irregular or skipped beats.
d. abnormal – instable pulse.
e. permanent pulse - a pulse without deviations from the normal ranges.

13.Measuring a radial pulse, purpose:

a. * To determine number of heart beats occurring per minute (rate).
b. * To gather information about heart rhythm and pattern of beats.
c. * To evaluate strength of pulse.
d. To evaluate the electrical activity of the heart.
e. To determine the internal body temperature.

14.Measuring a radial pulse, purpose:

a. * To assess heart's ability to deliver blood to distant areas of the blood viz. fingers and lower extremities.
b. * To assess response of heart to cardiac medications, activity, blood volume and gas exchange.
c. * To assess vascular status of limbs.

d. To evaluate the electrical activity of the heart.
e. To determine the internal body temperature.

15.Measuring a radial pulse, what does the first stage entail?

a. * Wash your hands.
b. * Prepare all equipment required on tray -gloves (if necessary), stopwatch.
c. * Patient should be at rest.
d. Wash the patient's hand thoroughly.
e. No equipment is required.

16.How to explain correct the purpose of the procedure to the patient?

a. * Now I would like to check your pulse.
b. * The pulse is an important vital sigh, in dependence of it I will prescribe you investigations and treatment.
c. ,* Do you agree?
d. I have to examine you.
e. Pulsometry follows.

17.How should you explain what do you want to do?

a. * Please, relax, don't worry, this procedure is safe and not complicated.
b. * I will check your pulse on radial artery.
c. * Don't move and speak during the procedure.
d. * It will take at about 1 minute. Please, place your arm on a table.
e. Pulsometry follows.

18.The main steps of pulse checking technic on radial artery are:

a. * Use tips of 2^{nd}, 3^{rd} and 4^{th} fingers; never use thumb because you may feel your own pulse in thumb.
b. * Place the tips of your fingers just proximal to the patients wrist on the thumb side, orienting them over the length of the vessel (the radial pulse is typically on the radial side of the palmer aspect of the wrist, about two centimeters proximal to the thenar eminence).
c. * Press gently, compressing blood vessel between your fingers and patient's radial (wrist) bone.
d. * Count the pulse beats for a full minute
e. Count the pulse for 10 sec. and multiply the result by 6.

19.How to explain the result to the patient?

a. *Your pulse rate is…and it is regular, thank You.

b. The patient does not need to be told the pulse rate.
c. You have a good pulse.
d. You have a sign of illness from the measurement result.
e. No answer is correct.

20. What is important at the end of the process not to forget?

a. *Dispose of the equipment properly.
b. *Wash your hands.
c. Wash the patient's hand.
d. Wash your hands only before the procedure.
e. Dispose of the equipment after the last patient.