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Department of Internal Medicine

CARE OF PATIENTS:

VITAL SIGNS ARE VITAL
VITAL SIGNS ESTIMATION

Babiy Olha

Definition

- Vital signs reflect the body's physiologic status and provide information critical to evaluating homeostatic balance
- The term "vital" is used because the information gathered is the clearest indicator of overall health status

Vital Signs

- T Temperature
- PS Pulse
- RR Respiratory Rate
- BP Blood Pressure

https://medlineplus.gov/vitalsigns.html

Times to Assess Vital Signs

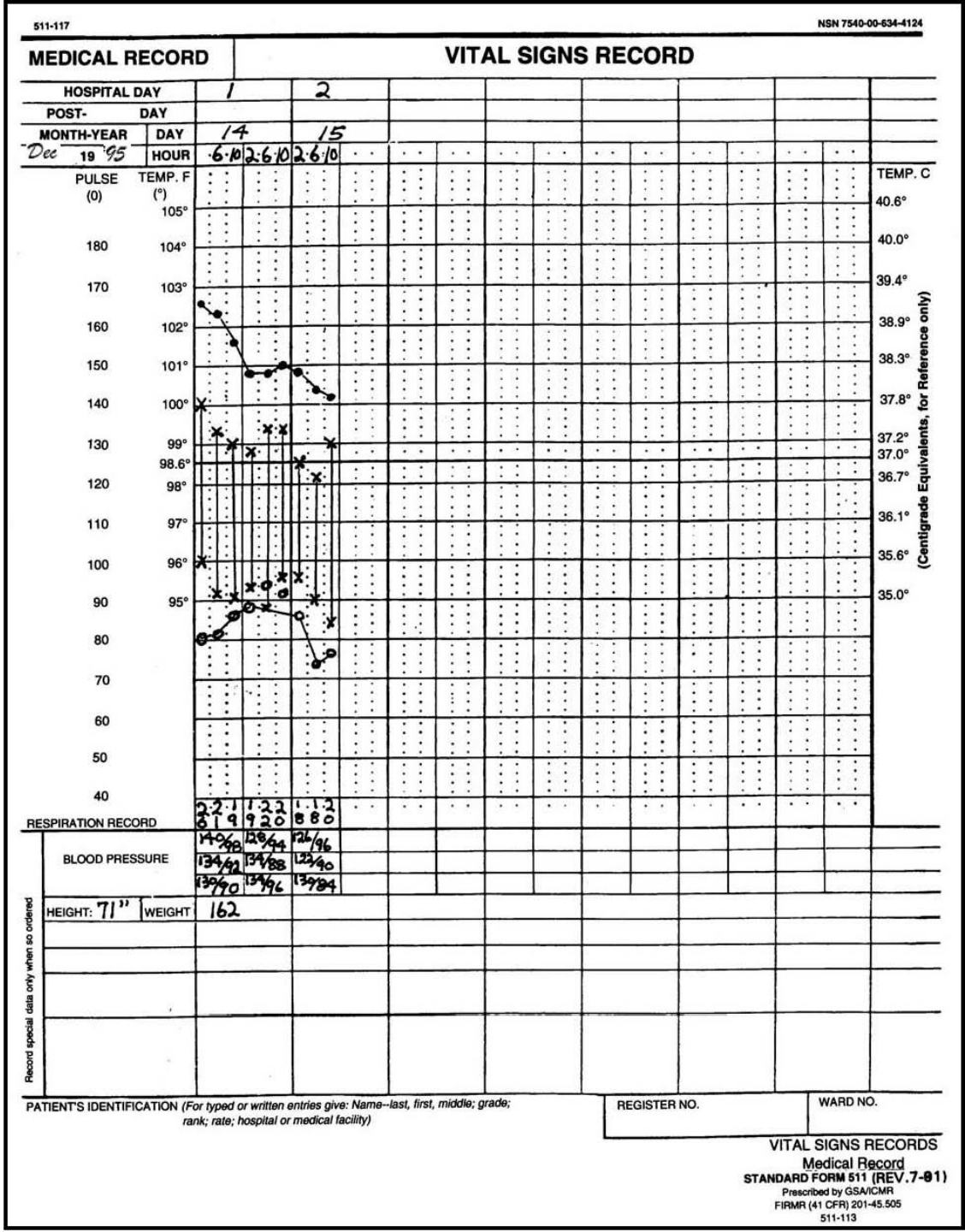
1. On admission – to obtain baseline date
2. When a patient has a change in health status or reports symptoms such as chest pain or fainting
3. According to a medical order
4. Before and after the administration of certain medications that could affect RR or BP (respiratory and cardiovascular systems)
5. Before and after surgery or an invasive diagnostic procedures
6. Before and after any nursing intervention that could affect the vital signs (e.g. administering medicines)

Equipment

- Vital sign trolley
- Stethoscope
- Sphygmomanometer
- Thermometer (glasses, electronic and tympanic)
- Hand watch
- Red and blue pen
- Pencil
- Vital sign sheet
- Disposable gloves if available

http://www.medicalexpo.com/medical-manufacturer/trolley-tray-28905.html

Example of Vital Sign Sheet


511-117

NSN 7540-00-634-4124

MEDICAL RECORD — **VITAL SIGNS RECORD**

HOSPITAL DAY		1		2													
POST- DAY																	
MONTH-YEAR	DAY	14		15													
Dec 19 95	HOUR	6	10	2	6	10	2	6	10								
PULSE (0)	TEMP. F (°)																TEMP. C
	105°																40.6°
180	104°																40.0°
170	103°																39.4°
160	102°																38.9°
150	101°																38.3°
140	100°																37.8°
130	99°																37.2°
	98.6°																37.0°
120	98°																36.7°
110	97°																36.1°
100	96°																35.6°
90	95°																35.0°
80																	
70																	
60																	
50																	
40																	
RESPIRATION RECORD		22	19	22	20	12	8	12	0								
BLOOD PRESSURE		140/98	134/92	128/94	134/88	126/96	122/90										
		130/90		134/96		130/84											
HEIGHT: 71"	WEIGHT	162															

(Centigrade Equivalents, for Reference only)

Record special data only when so ordered

PATIENT'S IDENTIFICATION *(For typed or written entries give: Name--last, first, middle; grade; rank; rate; hospital or medical facility)*

REGISTER NO.

WARD NO.

VITAL SIGNS RECORDS
Medical Record
STANDARD FORM 511 (REV. 7-91)
Prescribed by GSA/ICMR
FIRMR (41 CFR) 201-45.505
511-113

http://brooksidepress.org/vitalsigns/lessons/lesson-6-recording-vital-signs/6-1-what-are-some-of-the-forms-on-which-vital-signs-are-recorded/

Temperature

Body temperature is the measurement of heat inside a person's body (core temperature)

http://medical-dictionary.thefreedictionary.com/body+temperature

Kinds of Body Temperature

1. Core Temperature

- Is the temperature of the deep tissues of the body, such as the cranium, thorax, abdominal cavity, and pelvic cavity
- Remains relatively constant
- Is the temperature that we measure with thermometer

2. Surface Temperature

- The temperature of the skin, the subcutaneous tissue and fat

http://www.webmd.com/children/tc/fever-temperatures-accuracy-and-comparison-topic-overview

Comparison of temperatures in Fahrenheit by method

Axillary/Forehead (°F)	Oral (°F)	Rectal/Ear (°F)
98.4-99.3	99.5-99.9	100.4-101
99.4-101.1	100-101.5	101.1-102.4
101.2-102	101.6-102.4	102.5-103.5
102.1-103.1	102.5-103.5	103.6-104.6
103.2-104	103.6-104.6	104.7-105.6

http://www.webmd.com/children/tc/fever-temperatures-accuracy-and-comparison-topic-overview

Comparison of temperatures in Centigrade by method

Axillary/Forehead (°C)	Oral (°C)	Rectal/Ear (°C)
36.9-37.4	37.5-37.7	38-38.3
37.5-38.4	37.8-38.5	38.4-39.1
38.5-38.9	38.6-39.1	39.2-39.7
39-39.5	39.2-39.7	39.8-40.3
39.6-40	39.8-40.3	40.4-40.9

http://www.webmd.com/children/tc/fever-temperatures-accuracy-and-comparison-topic-overview

Factors Affecting Body Temperature

1. Age
2. Gender
3. Exercise and activity
4. Hormones
5. Emotions and stress
6. Climate
7. Food intake
8. Circadian rhythms
9. Illness or injury
10. Medications

https://books.google.com.ua/books?id=M4HWH5IxT0C&pg=PA188&lpg=PA188&dq=nursing+oral+temperature&source=bl&ots=yhMPMPfl5w&sig=HSpOfRf4rWOGICF-qd_VTfPiLSI&hl=ru&sa=X&ved=0ahUKEwjbxZfGrb3VAhXEPRQKHVAtAOEQ6AEIXDAI#v=onepage&q=nursing%20oral%20temperature&f=false

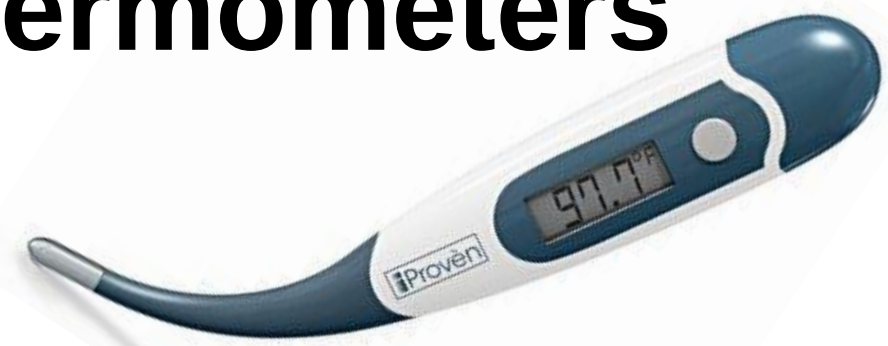
Sites to Measure Temperature

- Oral
- Rectal
- Axillary
- Tympanic

http://www.webmd.com/children/tc/fever-temperatures-accuracy-and-comparison-topic-overview

Types of Thermometers

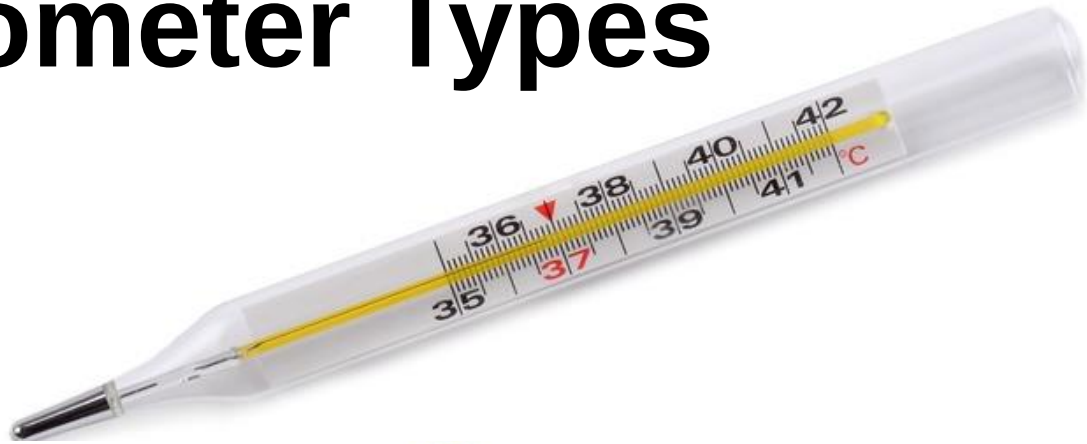
1. Oral thermometer
- Has long slender tips
2. Rectal thermometer
- Short, rounded tips
3. Axillary
- Long and slender tip
4. Tympanic



http://www.mayoclinic.org/diseases-conditions/fever/in-depth/thermometers/art-20046737?pg=2

Thermometer Types

- Mercury
- Digital
- Electronic



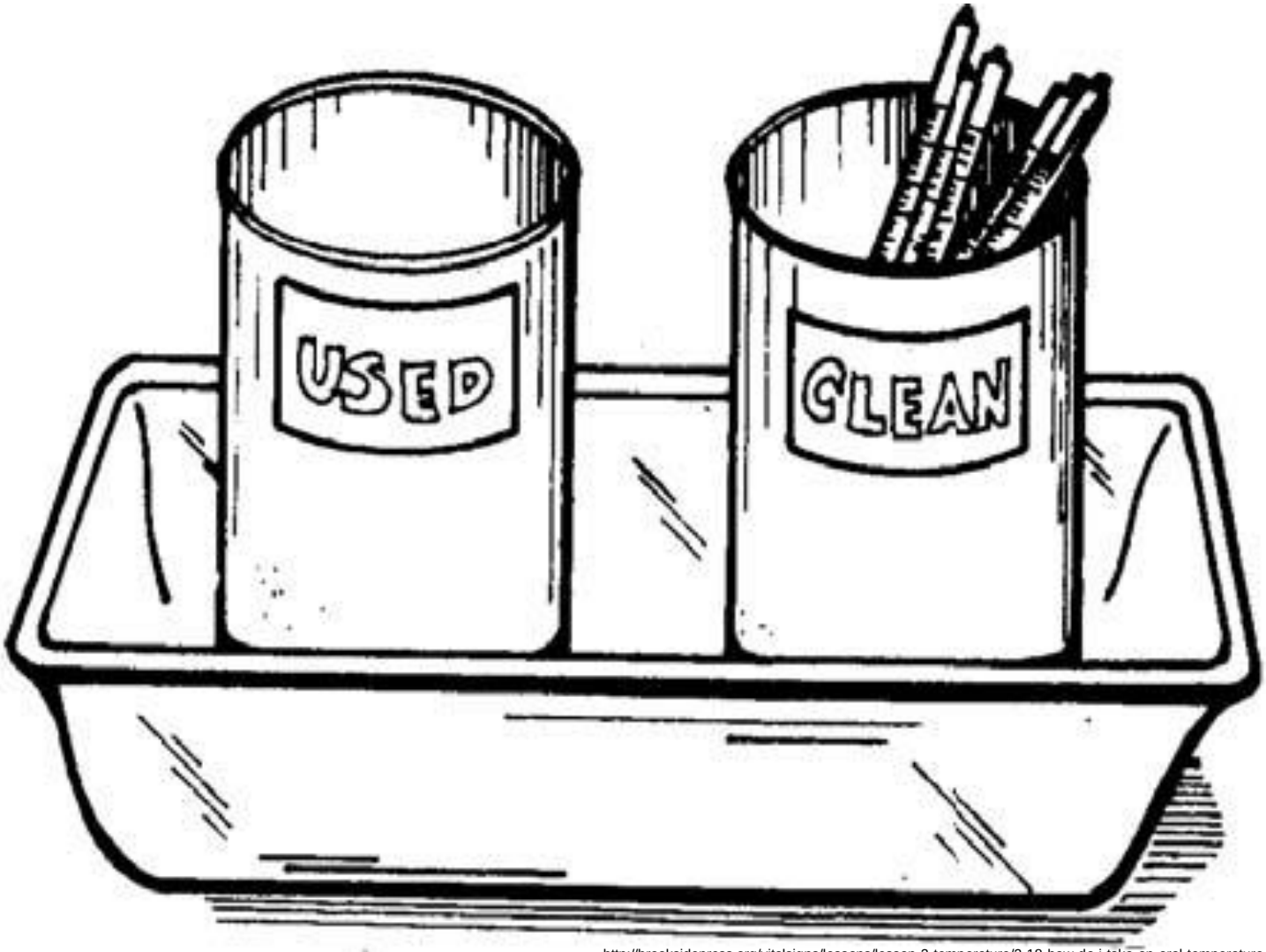
http://www.mayoclinic.org/diseases-conditions/fever/in-depth/thermometers/art-20046737?pg=2

Thermometer Types

- Non-contact infrared forehead thermometer

https://philmedicalsupplies.com/product/non-contact-infrared-forehead-thermometer-tms/

A Thermometer Tray.



http://brooksidepress.org/vitalsigns/lessons/lesson-2-temperature/2-18-how-do-i-take-an-oral-temperature-with-a-glass-thermometer/

Oral Thermometry

Equipment

- Undamaged, intact, functional, clean and disinfected thermometers
- Replacement covers for probes in cases digital thermometers
- Clean tissue
- Kidney bowl
- Patient documentation

Oral Thermometry

At least 30 min prior to oral temperature assesment

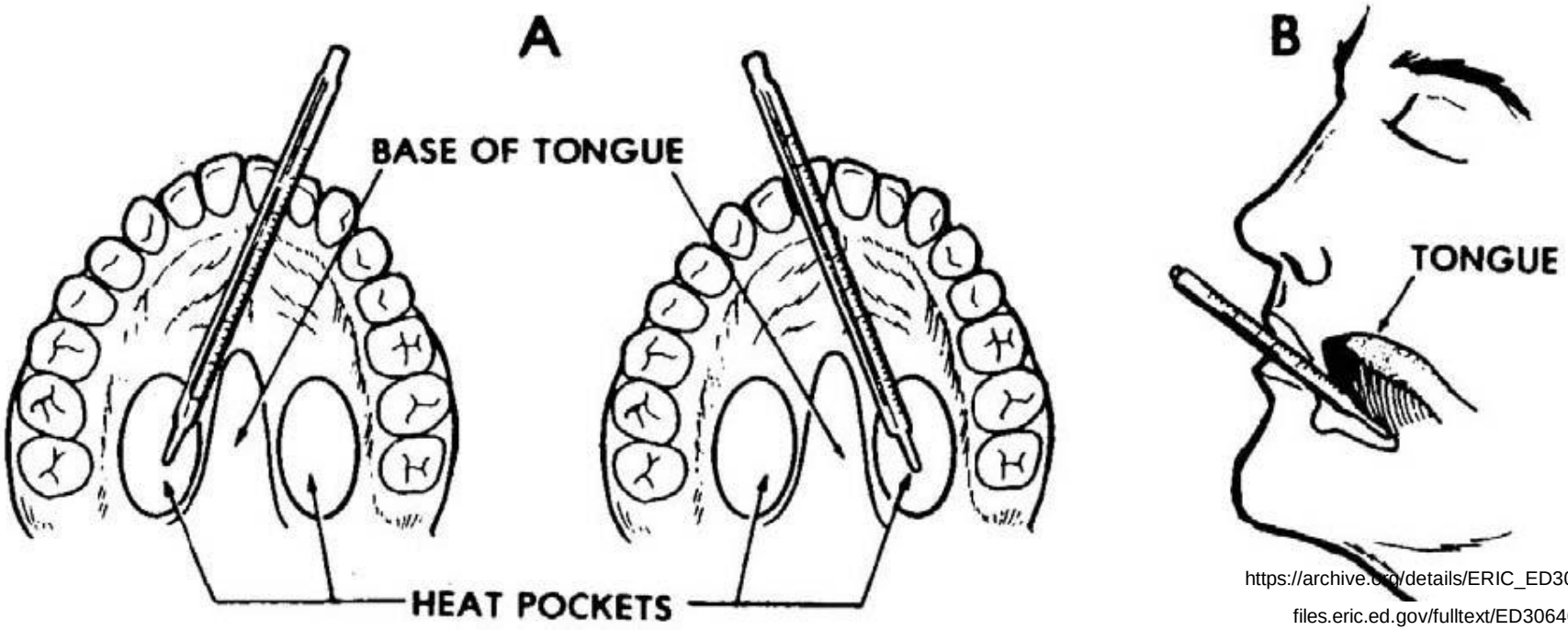
- No hot or cold drinks or beverages
- Smoking a cigarette
- Chewing gum

Oral Thermometry

1. Wash hands
2. Assemble necessary equipment
3. Identify and greet the patrient
4. Identify yourself
5. Explain procedure to the patient
6. Provide privacy
7. Rinse thermometer with cool water if it has been soaked in disinfectant solution
8. Check thermometer for breaks or chips
9. Shake down thermometer to 35°C/ 95°F or below

Oral Thermometry

10. Instruct/assist the patient in sitting or lying down position
11. Ask patient to open mouth and rise the tongue
12. Place the thermometer bulb in the rear sublingual pocket at the base of the tongue
13. Instruct the patient to hold the thermometer in place by tight closing his/her lips around the thermometer
14. Leave in place for at least 3 min

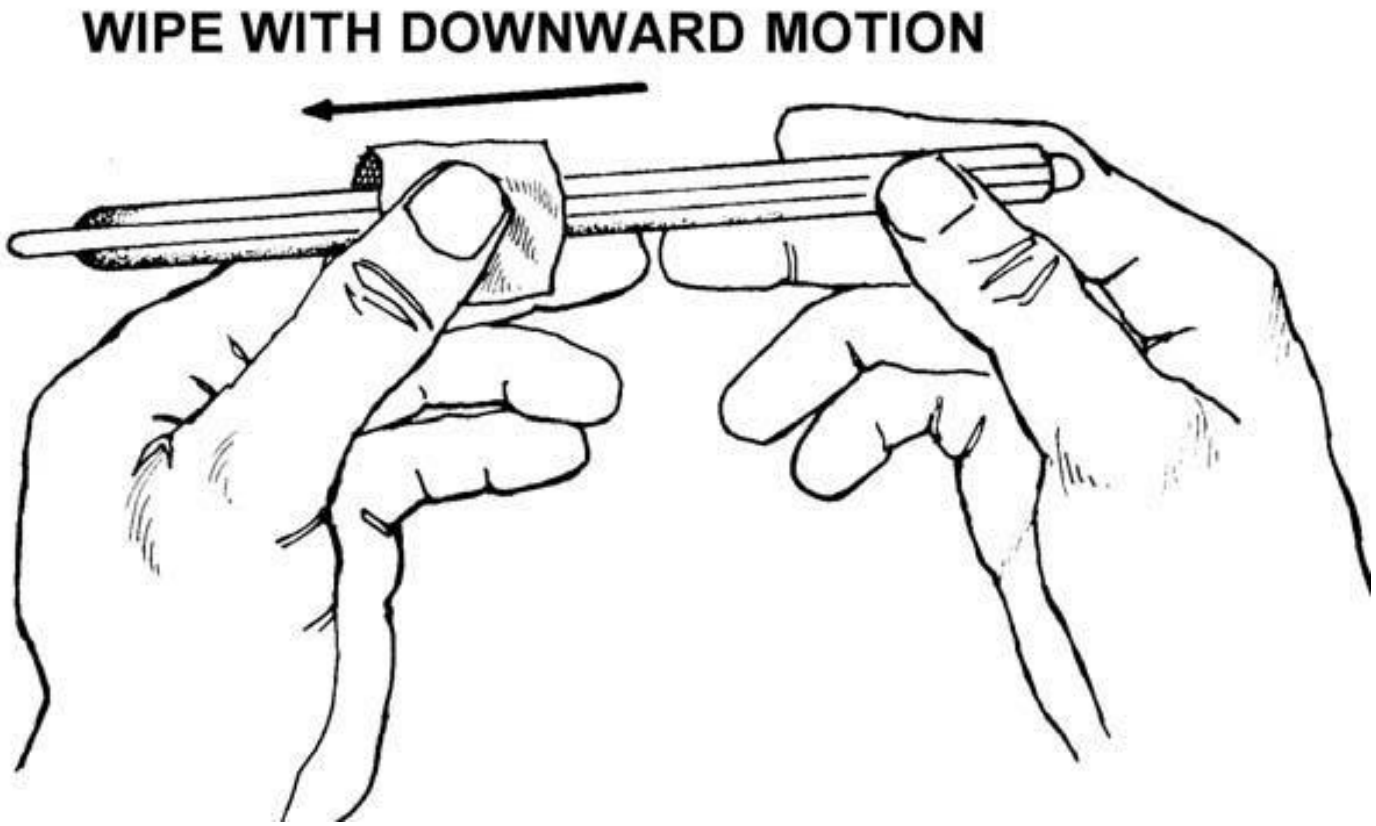


https://archive.org/details/ERIC_ED306462

files.eric.ed.gov/fulltext/ED306462.pdf

Oral Thermometry

15. Grasp the stem of the thermometer and remove it from the patient's mouth
16. Wipe it from the stem toward the bulb end (from clean to dirty) with a tissue
17. Read the thermometer
18. Record the temperature to vital sign sheet
19. Wash hands



Oral Thermometry

Contraindications:

- Child below 7 yrs
- If the patient is delirious, mentally ill
- Unconscious
- Uncooperative or in severe pain
- Surgery of the mouth
- Nasal obstruction
- If patient has nasal or gastric tubs in place

Rectal Thermometry

Equipment

- Undamaged, intact, functional, clean and disinfected thermometers
- Gloves
- Lubricant
- Clean tissue
- Replacement covers for probes in cases digital thermometers
- Kidney bowl
- Patient documentation

Rectal Thermometry

1. Wash hands
2. Assemble necessary equipment
3. Identify and greet the patrient
4. Identify yourself
5. Explain procedure to the patient
6. Provide privacy
7. Rinse thermometer with cool water if it has been soaked in disinfectant solution
8. Check thermometer for breaks or chips
9. Instruct the patient to lie on his/her side with upper leg flexed
10. Wear disposable gloves
11. Rinse thermometer with cool water if it has been soaked in disinfectant solution
12. Check thermometer for breaks or chips
13. Shake down thermometer to 35°C/ 95°F or below

Rectal Thermometry

14. Put a small amount of lubricant on a tissue and lubricate the bulb end of the thermometer
15. Rise the upper buttock to expose the anus
16. Insert the bulb end of the thermometer 2-3 cm into the rectum
17. Hold the thermometer in place 3-4 min
18. Remove the thermometer

https://archive.org/details/ERIC_ED306462
files.eric.ed.gov/fulltext/ED306462.pdf

Rectal Thermometry

19. Wipe it from the stem toward the bulb end (from clean to dirty) with a tissue
20. Place the thermometer on clean tissue
21. Wipe the anal area to remove excess lubricant
22. Cover the patient
23. Read the thermometer
24. Record the temperature to the vital sign sheet
25. Shake down the thermometer
26. Wash hands

Rectal Thermometry

Contraindications:

- Rectal or perineal surgery;
- Fecal impaction
- Rectal infection;
- Neonates

Axillary Thermometry

Equipment

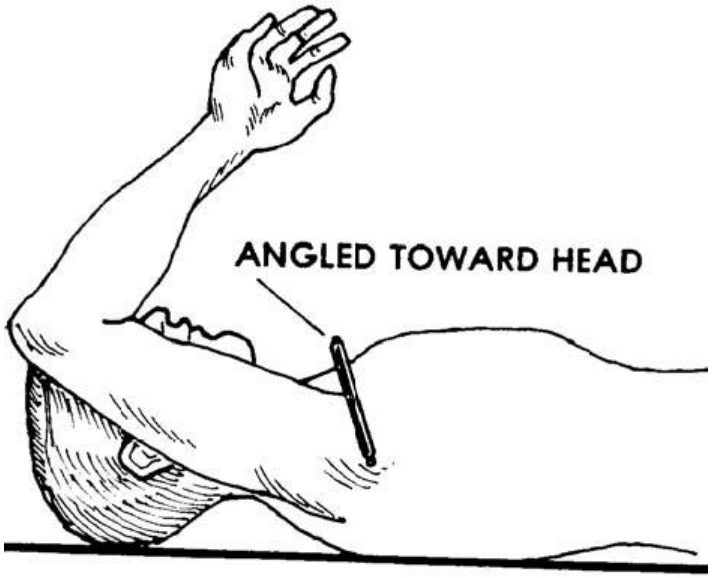
- Undamaged, intact, functional, clean and disinfected thermometers
- Replacement covers for probes in cases digital thermometers
- Kidney bowl
- Patient documentation

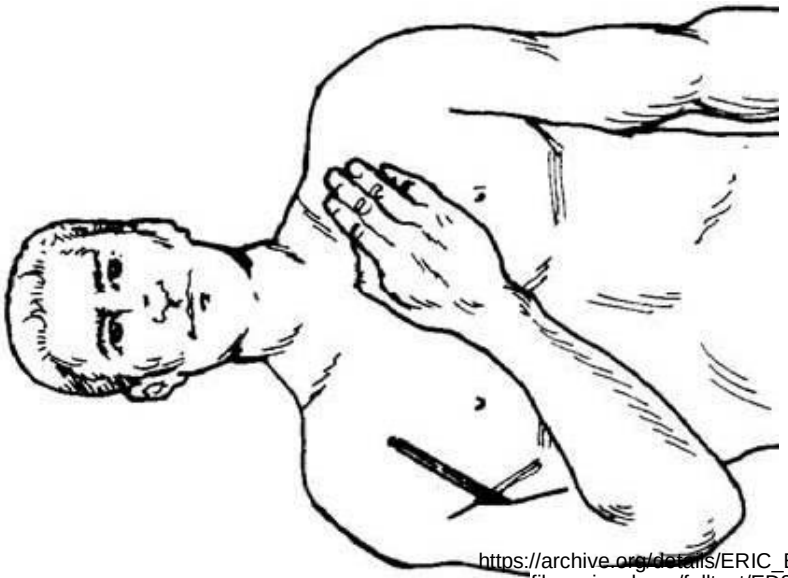
Axillary Thermometry

1. Wash hands
2. Assemble necessary equipment
3. Identify and greet the patrient
4. Identify yourself
5. Explain procedure to the patient
6. Provide privacy
7. Rinse thermometer with cool water if it has been soaked in disinfectant solution
8. Check thermometer for breaks or chips
9. Shake down thermometer to 35°C/ 95°F or below

Axillary Thermometry

1. Instruct/assist the patient in sitting or lying down position
2. Help the patient remove an arm from the sleeve of the gown without exposing patient
3. Dry axilla of excessive perspiration with towel
4. Place bulb end the thermometer in the center of axilla
5. Bring the arm across the chest to snugly hold the termometer in place for 10-12 min





Axillary Thermometry

1. Remove the thermometer
2. Wipe it from the stem toward the bulb end (from clean to dirty) with a tissue
3. Read the thermometer
4. Record the temperature to vital sign sheet
5. Wash hands

Hypothermia

- Add extra layers of thin clothing or bedding
- Cotton is preferable
- Encourage the patient to wear a hat or cover the head
- If possible close any open windows and doors
- Give the patient warm drinks if allowed
- If possible increase the room temperature
- Warmed intravenous fluids

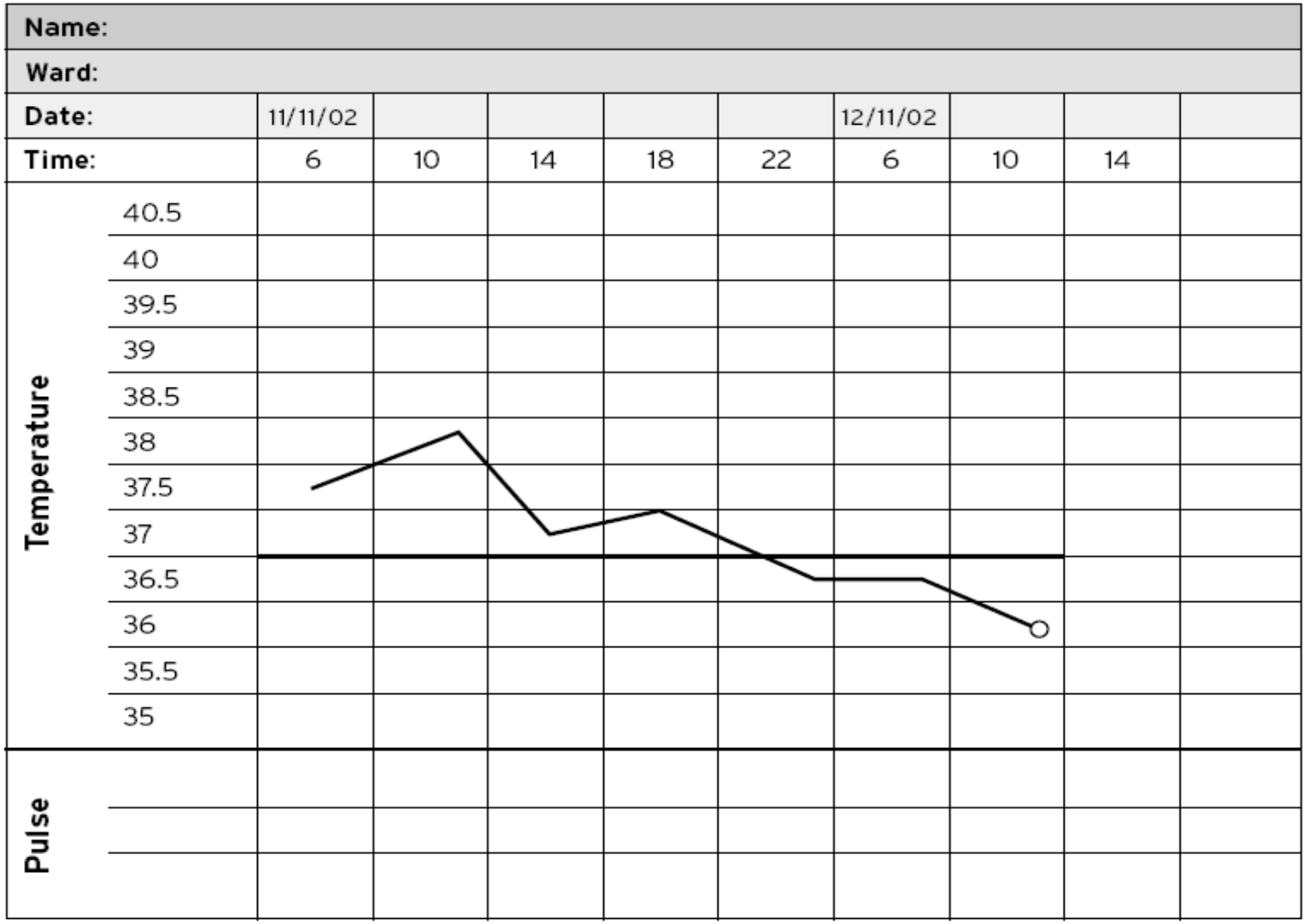
Fever

- Remove layers of clothing/bedding
- Encourage the patient to wear natural cotton fibres as these absorb heat
- Use a fan positioned on the patient’s back as this forms a larger surface area
- Give the patient cold drinks if allowed or ice to suck
- Reduce the room temperature or place the patient near an open window but not in a draught
- Patient can be helped or encouraged to wash their hands and face in tepid water.
- Tepid sponging of thewhole body where the patient is allowed

Fever

- Monitor the patient’s temperature
- An antipyretic (paracetamol) may be prescribed

Patient's Temperature Chart



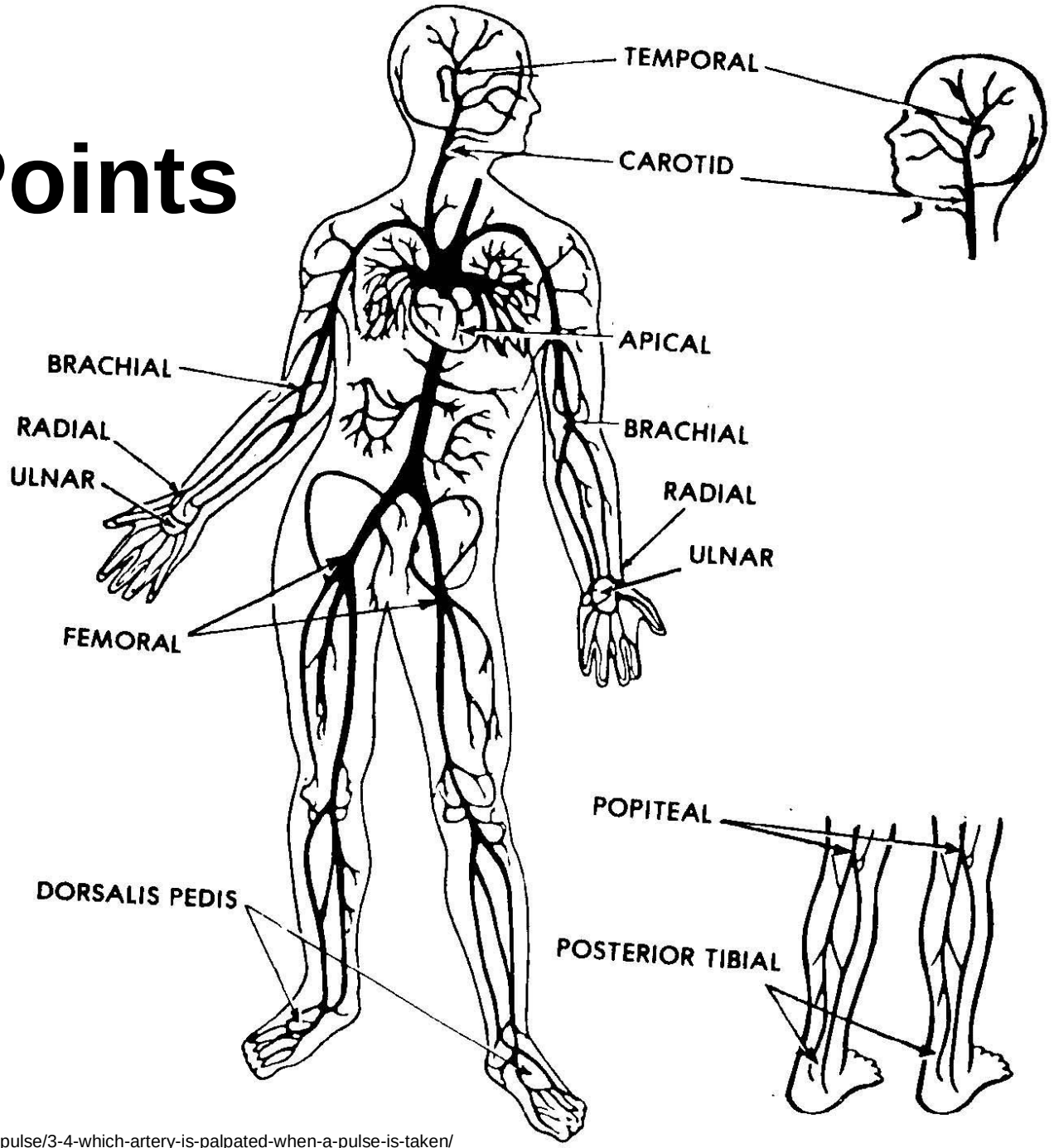
Pulse

Definition

The arterial pulse is the abrupt expansion of an artery resulting from the sudden ejection of blood into the aorta and its transmission throughout the arterial system

https://www.ncbi.nlm.nih.gov/books/NBK278/#A577

Pulse Points



http://brooksidepress.org/vitalsigns/lessons/lesson-3-pulse/3-4-which-artery-is-palpated-when-a-pulse-is-taken/

Apical Pulse (Central)

Place your right hand on the chest at the level of 3rd - 6th ribs to the left; flex the terminal phalanges of your fingers and move them medially along the intercostal spaces until you feel the apex beat

https://www.google.com.ua/search?q=apical+pulse&rlz=1C1AOHY_enUA708UA708&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjMjLvN4PTVAhVqOJoKHSSZBwEQ_AUICigB&biw=1422&bih=756#imgrc=KiDfeOfNuMSrUM:

Radial Artery

- Use your 1st and 2nd fingers to feel just lateral to the tendon of the flexor carpi radialis, medial to the radial styloid process at the wrist

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and Practical Skills

Brachial Artery

- Feel at the medial side of the antecubital fossa, just medial to the tendinous insertion of the biceps

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Carotid Artery

- Find the larynx, move a couple of centimetres laterally and press backwards medial to the sternomastoid muscle

NB! not to compress both carotids at once for fear of stemming blood flow to the brain—particularly in the frail and elderly

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Clinical Examination
and Practical Skills

Femoral Artery

- The patient is usually undressed by this point in the examination and should be lying on a bed or couch with their legs outstretched
- Ask the patient to lower their clothes a little more, exposing the groins
- The femoral pulsation can be felt midway between the pubic tubercleand the anterior superior iliac spine

Popliteal Artery

- With the patient lying flat and knees slightly flexed, press into the centre of the popliteal fossa with tips of the fingers of the left hand and use the fingers of the right hand to add extra pressure to these

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Posterior Tibial Artery

- Palpate at the ankle just posterior and inferior to the medial malleolus.

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and Practical Skills

Dorsalis Pedis

- This runs lateral to the exterior hallucis longus tendon on the superior surface of the foot between the bases of the 1st and 2nd metatarsals.

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Clinical Examination
and Practical Skills

Charecteristics of Pulse

- **Pulse rate:** ‘beats per minute’

The most accurate method is to count the pulse for a full minute

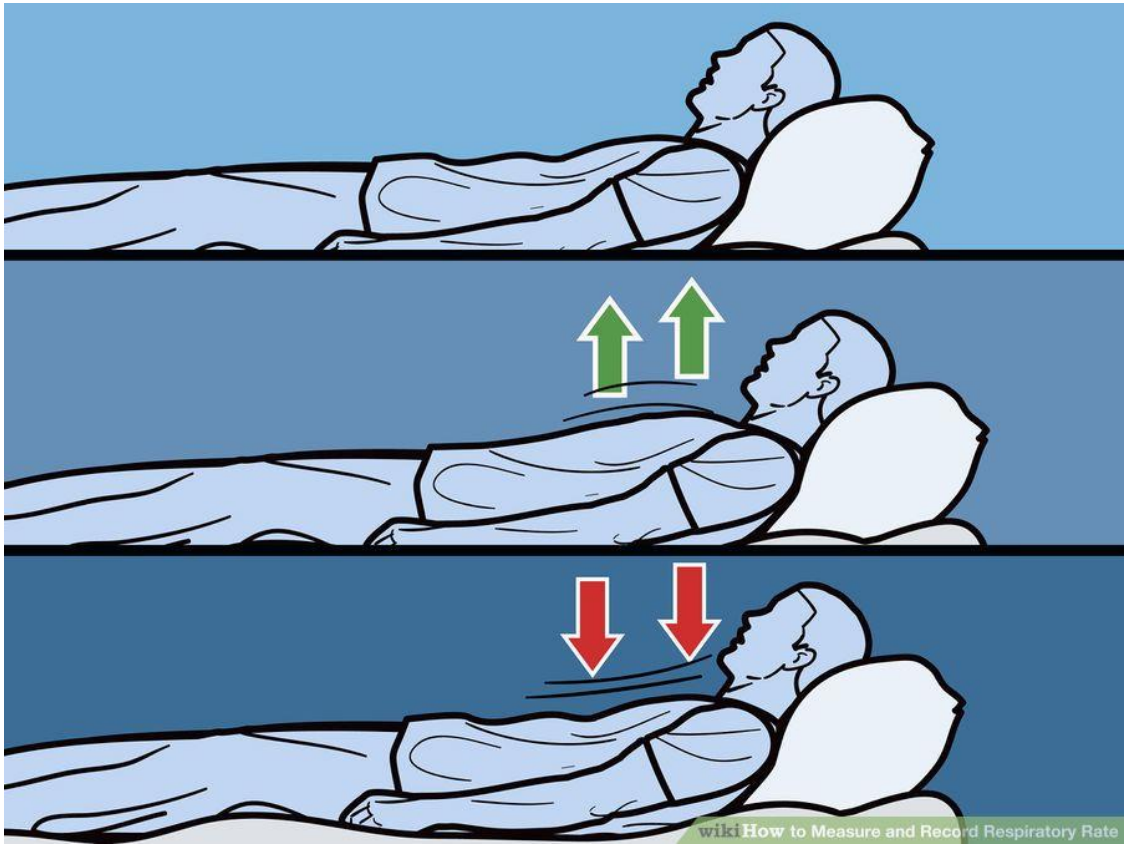
In practice, you count for a portion of this and calculate the rate by multiplication; commonly, people count for 15 seconds and multiply by 4

- **Rhythm:** regular or irregular

Respiration

- One respiration consists of one complete rise and fall of the chest, or the inhalation and exhalation of air
- The rate is noted by observing the frequency of the inspiratory phase, since this phase is active and easy to count

• Pretend to be checking the pulse if you think your observation is changing the patient's breathing pattern



http://www.wikihow.com/Measure-and-Record-Respiratory-Rate
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3639494/

Charecteristics of Respiration

- Simple inspection of the respiratory cycle, observing rate, rhythm, inspiratory volume, and effort of breathing
- **Rate:** normal in healthy adult RR = 15- 20/ min
- **Rhythm:** normal is automatic & effortless
- **Depth:** normal/ deep/ shallow

Factors affecting respiration

- Age
- Physical activity
- Stress
- Fear
- Worry
- Altitude
- Medications
- Smoking
- Sedentary job & Lack of exercise
- Diseases – lung disease, heart disease, anaemia, metabolic disease, disease of central nervous system, intoxication

Blood Pressure

Methods of Measuring Blood Pressure

- **Direct:** invasive method, consists of using an intra-arterial catheter to obtain a measurement
- **Indirect:**

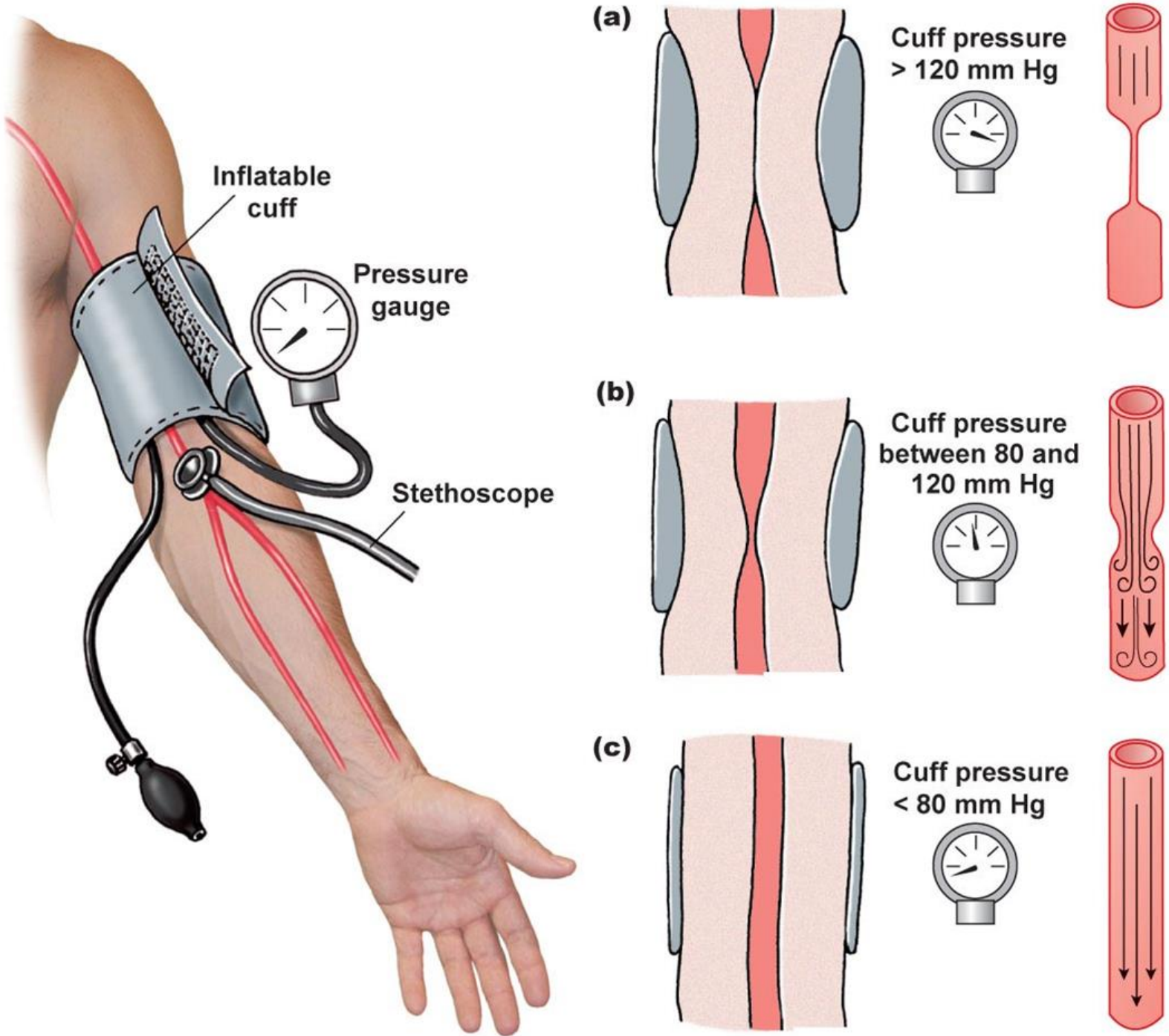
The auscultatory

The palpatory

http://emedicine.medscape.com/article/1948157-overview#a7

Korotkoff's sound

- **Phase 1:** The pressure level at which the 1st joint clear tapping sound is heard, these sounds gradually become more intense. To ensure that they are not extraneous sounds, it should identify at least two consecutive tapping sounds
- **Phase 2:** The period during deflation when the sound has a swishing quality
- **Phase 3:** The period during which the sounds are crisper and more intense
- **Phase 4:** The time when the sounds become muffled and have a soft blowing quality
- **Phase 5:** The pressure level when the sounds disappear



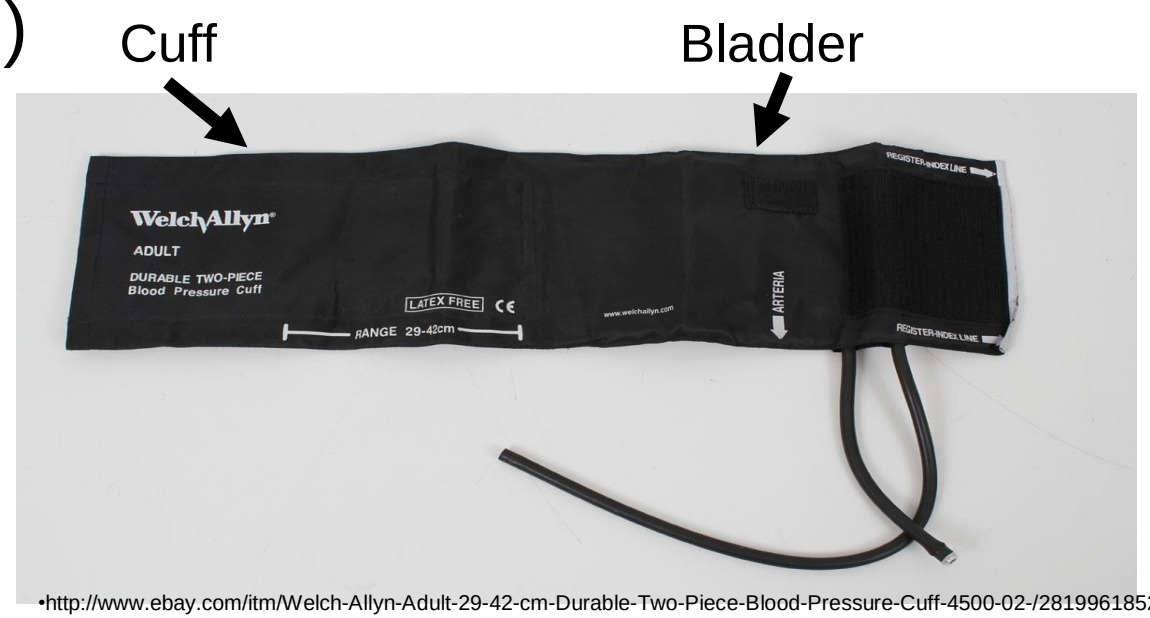
http://www.bari-assoc.com/kowuc/systolic-and-diastolic-definition-pegy.php

EQUEPMENT

- Stethoscope
- Blood pressure cuff of the appropriate size
- Sphygmomanometer

THE CORRECT BLOOD PRESSURE CUFF SIZE

- Width of the inflatable bladder of the cuff should be about 40% of upper arm circumference (about 12–14 cm in the average adult)
- Length of inflatable bladder should be about 80% of upper arm circumference (almost long enough to encircle the arm)



•http://www.ebay.com/itm/Welch-Allyn-Adult-29-42-cm-Durable-Two-Piece-Blood-Pressure-Cuff-4500-02-/281996185264

Prepare the Patient

- Ask the patient to avoid smoking or drinking caffeinated beverages, and exercising for 30 minutes before the blood pressure is taken and to rest for at least 5 minutes
- Check to make sure the examining room is quiet and comfortably warm
- Make sure the arm selected is *free of clothing.* There should be no arteriovenous fistulas for dialysis, scarring from prior brachial artery cutdowns, or signs of lymphedema (seen after axillary node dissection or radiation therapy)
- Palpate the brachial artery to confirm that it has a viable pulse
- Position the arm so that the brachial artery, at the antecubital crease, is *at heart level*—roughly level with the 4th interspace at its junction with the sternum

https://archive.org/details/ERIC_ED306462
http://emedicine.medscape.com/article/1948157-overview#a7

Blood Pressure Measurement

1.Wash your hands.

Handwashing prevents the spread of infection

2.Gather all equipments.

Organization facilitates performance of the skill

Cleanse the stethoscope 's ear pieces and diaphragm with a spirit swab wipe

Cleansing the stethoscope prevents spread of infection

3. Check the client's identification; explain the purpose and procedure to the patient

Providing information fosters the patient's cooperation and understanding

4. Have the patient rest at least 5 minutes before measurement

Allow the patient to relax and helps to avoid falsely elevate readings

5. Determine the previous baseline blood pressure, if available, from the patient's record

To avoid misreading of the client's blood pressure and find any changes his/her blood pressure from the usual

Blood Pressure Measurement

7. Setting the position:

I)Assist the patient to a comfortable position.

Be sure room is warm, quiet and relaxing

The client's perceptions that the physical or interpersonal environment is stressful affect the blood pressure measurement

II) Support the selected arm

The arm is at heart level for accurate measurement

Turn the palm upward

Rotate the arm so the brachial pulse is easily accessible

III) Remove any constrictive clothing

Not constricted by clothing is allowed to access the brachial pulse easily and measure accurately

Do not use an arm where circulation is compromised in anyway

Blood Pressure Measurement

8.Checking brachial artery and wrapping the cuff:

I) Palpate brachial artery

II) Center the cuff's bladder approximately 2.5 cm (1 inch) above the site where you palpated the brachial pulse

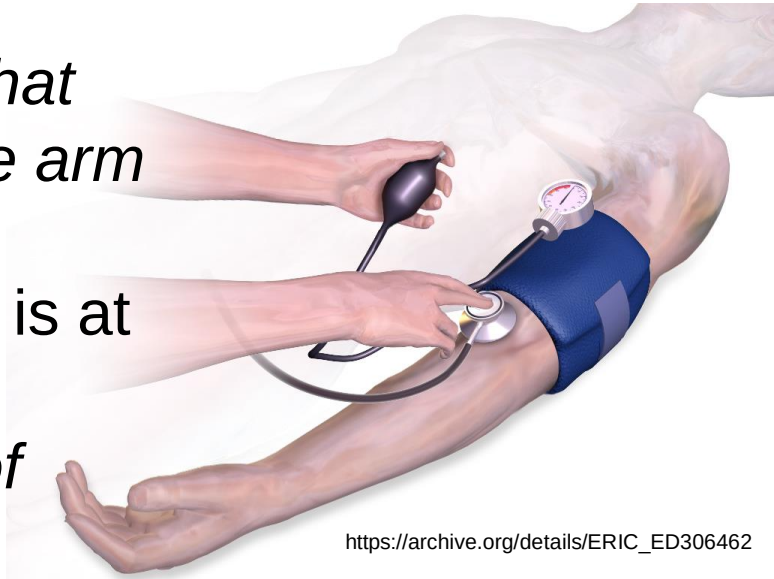
Center the bladder to ensure even cuff inflation over the brachial artery

III) Wrap the cuff snugly around the client's arm and secure the end approximately

Loose-fitting cuff causes false high readings; appropriate way to wrap is that you can put only 2 fingers between the arm and cuff

IV) Check the manometer whether if it is at level with the client's heart

Improper height can alter perception of reading



https://archive.org/details/ERIC_ED306462

Blood Pressure Measurement

9.Meausre blood pressure

I) Position the stethoscope's earpieces comfortably in your ears(turn tips slightly forward); be sure sounds are clear, not muffled

Each earpiece should follow angle of ear canal to facilitate hearing

II) Place the diaphragm over the patient's brachial artery; do not allow chestpiece to touch cuff or clothing

Proper stethoscope placement ensures optimal sound reception

Stethoscope improperly positioned sounds that often result in false low systolic and high diastolic readings

III) Close the screw clamp on the bulb and inflate the cuff to a pressure 30 mmHg above the point where the pulse had disappeared

Ensure that the systolic reading is not underestimated

Blood Pressure Measurement

IV) Open the clamp and allow the aneroid dial to fall at rate of 2 to 3mmHg per second

If deflation occurs too rapidly, reading may be inaccurate

V) Note the point on the dial when first clear sound is heard; the sound will slowly increase in intensity

This first sound heard represents the systolic pressure or the point where the heart is able to force blood into the brachial artery

VI) Continue deflating the cuff and note the point where the sound disappears; listen for 10 to 20 mmHg after the last sound

This is the adult diastolic pressure, it represents the pressure that the artery walls exert on the blood at rest

VII) Release any remaining air quickly in the cuff and remove it

Continuous cuff inflation causes arterial occlusion, resulting in numbness and tingling of patient's arm

VIII) If you must recheck the reading for any reason, allow a 1 minute interval before taking blood pressure again

The interval eases any venous congestion and provides for an accurate reading when you repeat the measurement

Blood Pressure Measurement

10. Assist the client to a comfortable position, advise the patient of the reading

Indicate your interest in the client's well-being and allow him/her to participate in care

11.Wash your hands

Handwashing prevents the spread of infection

12. Record blood pressure on the patient’s chart

Documentation provides ongoing data collection

Sign on the chart

Giving signature maintains professional acountability

Report any findings to senior staffs

13. Replace the instruments to proper place and discard

To prepare for the next procedure

Sites for Measuring Blood Pressure

- Upper arm using brachial artery (commonest)
- Thigh around popliteal artery
- Fore -arm using radial artery
- Leg using posterior tibial or dorsal pedis