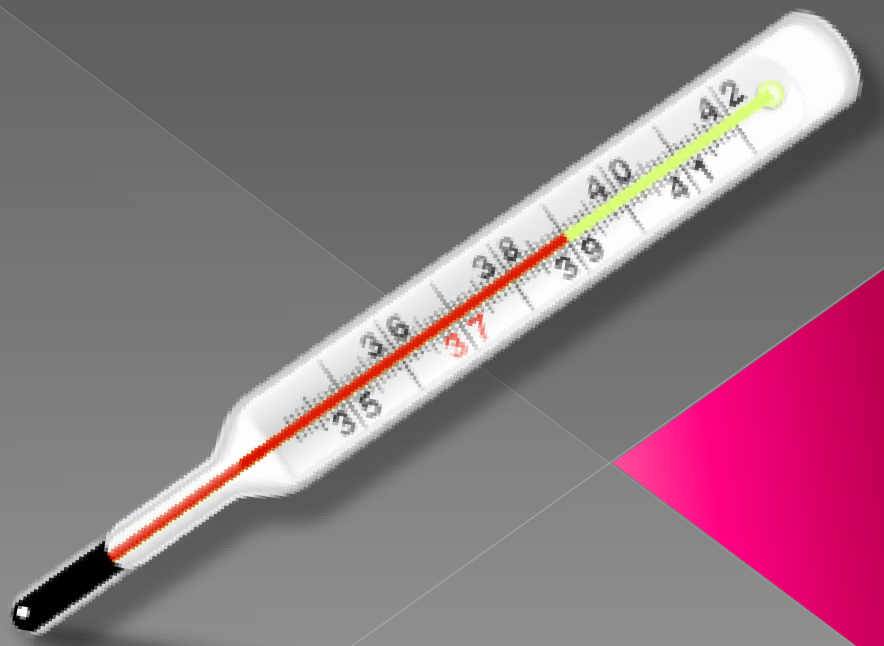
USMF

"NICOLAE TESTEMIȚANU"

Temperature Measurement



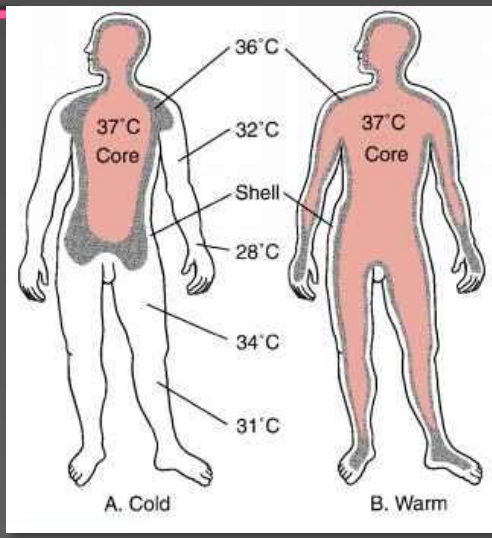
The Importance of Temperature is:

- To maintain the ideal homeostasis;
- The rate of chemical reactions in body is regulated by the temperature;
- If the temperature is too high or too low, the body's fluid balance is also affected.

Types of Body Temperature

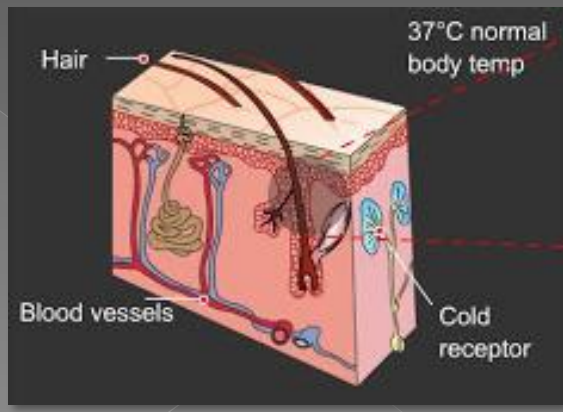
1. The Core Temperature is the temperature of the deep tissues of the body.

- It remains relatively constant unless exposed to severe extremes in environmental temperature.
- It is assessed by using a thermometer.



2. The Surface Temperature is the temperature of the skin.

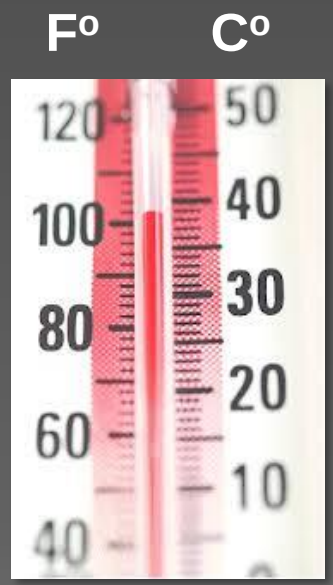
- It may vary a lot in response to the environment temperature.
- It is assessed by touching the skin.



Measuring the Temperature

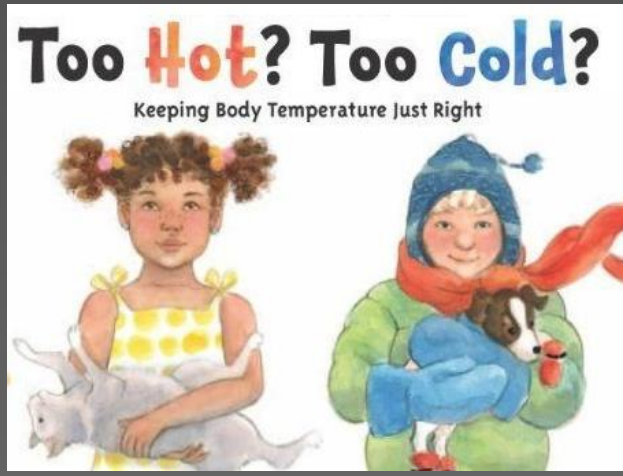
- The temperature is measured using a thermometer on Fahrenheit or Celsius scale.

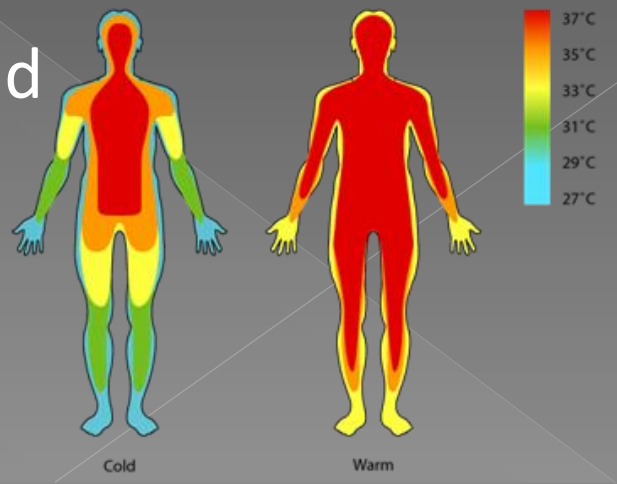
- **The factors that may affect the temperature are:**
  - Eating, drinking hot or cold liquids and/or smoking can affect oral temperature.
  - The doctor should make sure that the patient has had nothing to eat, drink or smoke for at least 15 minutes prior to taking temperature.



Normal Variation In Body Temperature

- The temperature is usually lower in the morning after the body has rested.
- The temperature is higher in the evening after muscular activity and food intake.
- The parts of the body where the temperature is measured can also lead to variations.





Types of Thermometers

- **1. Glass thermometers**
  - Consist of a slender glass tube containing mercury, which expands when exposed to heat.
  - They are not commonly used because of risk of mercury poisoning and trauma if the glass breakes.

Types of Thermometers

2. Heat-sensitive patches

- The patch is placed on the skin.
- The colour changes on the patch and indicates the temperature readings.

Types of Thermometers

- **3. Electronic thermometers**

- They register the temperature on a display in a few seconds.
- They are used to take oral, rectal and axillary temperature.
- The disposable cover is placed over the thermometer prior to using to prevent cross-contamination from patient to patient.

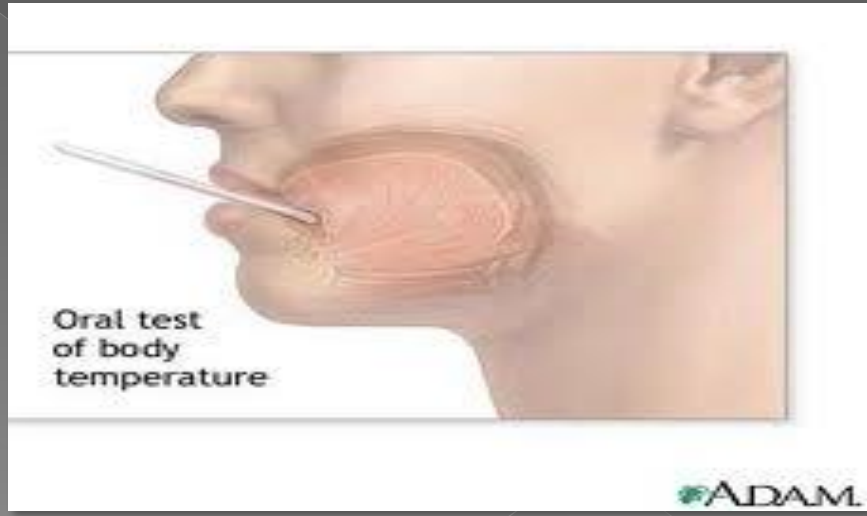
Types of Thermometers

- **4.Tympanic thermometer**
  - It is a special form of electronic thermometer; it is inserted into auditory canal.
  - The disposable cover is placed over probe prior to using to prevent cross-contamination from patient to patient.

Sites to measure the temperature:

1. Oral temperature measurement:

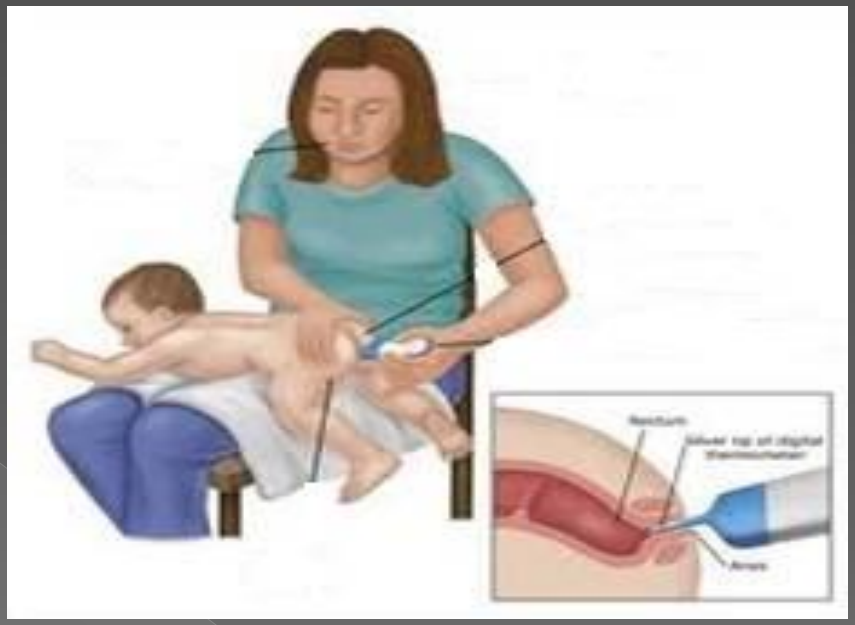
- The thermometer is placed in the mouth under the tongue.
- It is the most common, convenient and comfortable method.
- The clinical thermometer is left in place for 3 to 5 minutes.
- The normal ranges are from 36.6-37.2^0 C.



Sites to measure the temperature:

2. Rectal temperature measurement

- It is the most accurate method because it is an internal measurement.
- The clinical thermometer is left in place for 3 to 5 minutes.
- The normal ranges are from 36.8-37.6^0 C.



Sites to measure the temperature:

3. Axillary temperature measurement

- The axillary measurement is taken in armpit while the upper arm is held close to the body and the thermometer is inserted between two folds of skin.

- It is less accurate because it is the external body temperature.
- The clinical thermometer is left in place for 10 minutes.
- The normal ranges are from 36.2-36.9^0 C.

Sites to measure the temperature:

4. Aural temperature measurement

- It is taken with a special thermometer that is placed in the ear or auditory canal.

- The thermometer detects and measures the thermal, infrared energy radiating from blood vessels in the tympanic membrane.

- Since this provides a measurement of body core temperature, there is no normal range for aural temperature.

The causes of high Body Temperature may be the following:

- Illness and infection;
- Exercise and/or excitement;
- High temperatures in the environment.

The causes of low Body Temperature may be the following:

- Starvation or fasting;
- Sleep;
- Decrease in muscular activity;
- Mouth breathing;
- Cold temperatures in the environment.

Interpretation

1. Normal body temperature is shown in this table:

Route	Normal Range °F / °C	Sites
Oral	98.6 °F / 37.0 °C	Mouth
Tympanic	99.6 °F / 37.6 °C	Ear
Rectal	99.6 °F / 37.6 °C	Rectum
Axillary	97.6 °F / 36.6 °C	Axilla (armpit)

2. Fever (Hyperthermia): the temperature is above the normal range.

3. Hypothermia: the core body temperature is lower than 35°C (below 95° F).

4. Hyperpyrexia: the body temperature exceeds 40-41°C (104-106°F) rectally.

Taking axillary temperature by using a glass thermometer

Definition:

- Measuring/ monitoring patient's body temperature using clinical thermometer.

Purpose:

- To determine the body temperature;
- To assist in diagnosis;
- To evaluate the patient's recovery from illness;
- To determine if immediate measures should be taken to reduce dangerously elevated body temperature or converse body heat when body temperature is dangerously low.

Procedure

The main steps are:

- Wash your hands - Handwashing prevents spreading of infection.
- Prepare all the necessary equipment – the glass thermometer, gloves (if necessary), cotton pads.

Main steps:

- Explain the purpose of the procedure to the patient, ask about his or her consent:

- ***Now, I would like to take your temperature. The temperature is an important vital sign; depending on it, I will prescribe you investigations and treatment, do you agree?***

Main steps:

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

- ***Please, relax, don't worry, this procedure is safe and not complicated. I will put the glass thermometer in the axillary region, don't speak and try to be still during the procedure, it will take about 10 minutes. Please, open your axillary region.***

Main steps:

- Take the thermometer and wipe it with a cotton spirit pad from the bulb towards the tube.
- If the thermometer was disposed in desinfectant solution, wash and dry it.
- Shake the thermometer with strong wrist movements until the mercury line falls to at least 35 ℃.
- Make sure the patient’s axilla is dry. If it is moist, dry gently before placing the thermometer.

Main steps:

- Place the bulb of the thermometer in the hollow of axilla at anterior inferior with 45 degree or horizontally.
- Keep the arm flexed across the chest, close to the body.
- Hold the thermometer for 10 minutes.

Main steps:

- Remove the thermometer and read the level of mercury at eye level.
- Shake the mercury down carefully and wipe the thermometer from the stem to bulb with a cotton spirit pad.
- Explain the result to the patient.
- Dispose of the equipment properly. Wash your hands.

Varianta romana

Impotranța temperaturii corpului:

- Menţine homeostaza ideală;
- Viteza reacţiilor chimice în organizm este reglată de temperatura corpului;
- Dacă temperatura corpului este prea mare sau prea mica, balanţa lichidului in organizm este deasemenea afectată.

- To maintain the ideal homeostasis;
- The rate of chemical reactions in body is regulated by the temperature;
- If the temperature is too high or too low, the body’s fluid balance is also affected.

Tipurile de temperatură ale corpului

1. Temperatura Internă este temperatura țesuturilor profunde ale corpului.

- Aceasta rămâne relativ constantă dacă nu este expusă la temperaturi extreme ale mediului ambiant.
- Acesta este evaluată prin utilizarea unui termometru.

2. Temperatura de suprafață este temperatura pielei.

- Aceasta poate varia foarte mult ca răspuns la temperatura mediului ambiant.
- Acesta este evaluată prin atingerea pielii.

1. The Core Temperature is the temperature of the deep tissues of the body.

- It remains relatively constant unless exposed to severe extremes in environmental temperature.
- It is assessed by using a thermometer.

2. The Surface Temperature is the temperature of the skin.

- It may vary a lot in response to the environment temperature.
- It is assessed by touching the skin.

Masurarea Temperaturii

- Temperatura se măsoară cu ajutorul unui termometru pe scara Fahrenheit sau Celsius.
- **Factorii care pot afecta temperatura sunt:**
- Mâncarea, băuturile calde sau reci și / sau fumatul pot afecta temperatura cavității bucale.
- Medicul trebuie să se asigure că pacientul nu a mâncat, băut nimic si nu a fumat timp de cel puțin 15 minute înainte de a măsura temperatura.

- The temperature is measured using a thermometer on Fahrenheit or Celsius scale.
- **The factors that may affect the temperature are:**
- Eating, drinking hot or cold liquids and/or smoking can affect oral temperature.
- The doctor should make sure that the patient has had nothing to eat, drink or smoke for at least 15 minutes prior to taking temperature.

Variații Normale ale Temperaturii Corpului

- Temperatura corpului este de obicei mai joasă dimineața după ce organismul s-a odihnit.
- Temperatura corpului este mai mare seara după activitatea musculară si ingestia de alimente.
- Părțile corpului unde se măsoară temperatura pot duce la variații.

- The temperature is usually lower in the morning after the body has rested.
- The temperature is higher in the evening after muscular activity and food intake.
- The parts of the body where the temperature is measured can also lead to variations.

Tipuri de Termometre

- **1. Termometre din sticlă**
  - Constau dintr-un tub subțire de sticlă care conține mercur, care se dilată când este expus la căldură.
  - Ele nu sunt de obicei folosite din cauza riscului de intoxicare cu mercur si traumatizare în cazul în care sticla se sparge.

- **1. Glass thermometers**
  - Consist of a slender glass tube containing mercury, which expands when exposed to heat.
  - They are not commonly used because of risk of mercury poisoning and trauma if the glass breaks.

Tipuri de Termometre

2. Patch-uri termosensibile

- Patch-ul se pune pe piele.
- Culoarea patch-ului se scimbă si indică temperatura.

2. Heat-sensitive patches

- The patch is placed on the skin.
- The colour changes on the patch and indicates the temperature readings.

Tipuri de Termometre

- **3. Termometre electronice**
  - Acesta înregistrează temperatura pe un ecran în câteva secunde.
  - Acesta este utilizat pentru a măsura temperatura orală, rectală și axilară.
  - Capacul de unică folosință este plasat peste termometru înainte de a fi utilizt pentru a evita contaminarea de la pacient la pacient.

- **3. Electronic thermometers**
  - They register the temperature on a display in a few seconds.
  - They are used to take oral, rectal and axillary temperature.
  - The disposable cover is placed over the thermometer prior to using to prevent cross-contamination from patient to patient.

Tipuri de Termometre

- **4. Termometre timpanice**
  - Este o formă specială de termometru electronic; acesta este introdus in canalul auditiv.
  - Capacul de unică folosință este plasat peste termometru înainte de a fi utilizt pentru a evita contaminarea de la pacient la pacient.

- **4.Tympanic thermometers**
  - It is a special form of electronic thermometer; it is inserted into auditory canal.
  - The disposable cover is placed over the themometre prior to using to prevent cross-contamination from patient to patient.

Locuri de masurare a temperaturii

1. Masurarea temperaturii orale

- Termometrul se introduice în cavitatea bucală, sub limbă .
- Aceasta este cea mai frecventă, comodă și confortabilă metodă.
- Termometrul este lăsat pe loc de 3 până la 5 minute.
- Valorile normale sunt 36.6-37.2^0 C.

1. Oral temperature measurement:

- The thermometer is placed in the mouth under the tongue.
- It is the most common, convenient and comfortable method.
- The clinical thermometer is left in place for 3 to 5 minutes.
- The normal ranges are from 36.6-37.2^0 C.

Locuri de masurare a temperaturii

2. Măsurarea temperaturii rectale

- Aceasta este metoda cea mai precisă, deoarece este o măsurare internă.
- Termometrul este lăsat pe loc de 3 până la 5 minute.
- Valorile normale sunt $36.8\text{-}37.6^0$ C.

2. Rectal temperature measurement

- It is the most accurate method because it is an internal measurement.
- The clinical thermometer is left in place for 3 to 5 minutes.
- The normal ranges are from $36.8\text{-}37.6^0$ C.

Locuri de masurare a temperaturii

3. Măsurarea temperaturii axilare

- Măsurarea axilară este efectuată în axilă în timp ce brațul superior este ținut aproape de corp și termometrul este introdus in centrul axilei.
- Acesta este mai puțin precisă, deoarece este măsurată temperatura externă.
- Termometrul este lăsat pe loc 10 minute.
- Valorile normale sunt 36.2-36.9^0 C.

3. Axillary temperature measurement

- The axillary measurement is taken in armpit while the upper arm is held close to the body and the thermometer is inserted between two folds of skin.
- It is less accurate because it is the external body temperature.
- The clinical thermometer is left in place for 10 minutes.
- The normal ranges are from 36.2-36.9^0 C.

Locuri de masurare a temperaturii:

4. Măsurarea temperaturii auriculare

- Se efectuează cu un termometru special, care este plasat în ureche sau canalul auditiv.
- Termometrul detectează și măsoară energia termică infraroșie care radiază din vasele de sânge în membrana timpanică.
- Deoarece această metodă măsoară temperatura internă a corpului, nu există valori normale pentru temperatură auriculară.

4. Aural temperature measurement

- It is taken with a special thermometer that is placed in the ear or auditory canal.
- The thermometer detects and measures the thermal, infrared energy radiating from blood vessels in the tympanic membrane.
- Since this provides a measurement of body core temperature, there is no normal range for aural temperature.

Cauzele temperaturei corporale ridicate sunt:

- Boala și infecția;
- Exercitarea și / sau agitația;
- Temperaturile ridicate în mediu.

Cauzele temperaturei corporale joase sunt:

- Foame sau post;
- Somnul;
- Scăderea activității musculare;
- Respirație pe gură;
- Temperaturi scăzute în mediu

The causes of high Body Temperature may be the following:

- Illness and infection;
- Exercise and/or excitement;
- High temperatures in the environment.

The causes of low Body Temperature may be the following:

- Starvation or fasting;
- Sleep;
- Decrease in muscular activity;
- Mouth breathing;
- Cold temperatures in the environment.

Interpretare

1. Temperatura normală a corpului:

1. Normal body temperature is shown in this table:

Metoda	Cifre Normale°F / °C	Calea
Oral	98.6 °F / 37.0 °C	Gura
Tympanic	99.6 °F / 37.6 °C	Urechiul
Rectal	99.6 °F / 37.6 °C	Rect
Axillar	97.6 °F / 36.6 °C	Fosa axilara

2. Febra (Hipertermia): temperatura este peste limitele normale.

3. Hipothermia: temperatura interna este mai mică decât 35°C (95°F).

4. Hiperpirexia: Temperatura corpului depășește 40-41°C (104-106°F) rectal.

2. Fever (Hyperthermia): the temperature is above the normal range.

3. Hypothermia: the core body temperature is lower than 35°C (below 95°F).

4. Hyperpyrexia: the body temperature exceeds 40-41°C (104-106°F) rectally.

Măsurarea temperaturii axilare cu termometrul din sticla

Definiție:

- Măsurarea/monitorizarea temperaturii corpului pacientului folosind termometru clinic.

Scopul:

- A determina temperatura corpului;
- A asista la stabilirea diagnozei;
- A evalua recuperarea pacientului de o boală;
- A determina daca trebuie sa fie implementate măsurile imediate pentru a reduce temperatura corpului periculos de ridicată sau extrem de joasă.

Definition:

- Measuring/ monitoring patient's body temperature using clinical thermometer.

Purpose:

- To determine the body temperature;
- To assist in diagnosis;
- To evaluate the patient's recovery from illness;
- To determine if immediate measures should be implemented to reduce dangerously elevated body temperature or converse body heat when body temperature is dangerously low.

Procedura
Etapele principale sunt:

- Spălați-vă pe mâini - spălarea mâinilor previne răspândirea infecției.
- Pregătiți tot echipamentul necesar - termometrul de sticlă, mănuși (dacă este cazul), tampoane de bumbac.
- Wash your hands - Handwashing prevents spreading of infection.
- Prepare all the necessary equipment – the glass thermometer, gloves (if necessary), cotton pads.

Etapele principale :

- Explicați scopul procedurii pacientului, întrebați despre consimțământul său:

- ***Acum eu Vă voi masura temperatura corpului. Temperatura este un parametru important al stării de sanatate, în dependența de nivelui temperaturei eu voi prescri investigațiile necesare și tratament. Sunteți de acord?***

- Explain the purpose of the procedure to the patient, ask about his or her consent:

- ***Now, I would like to take your temperature. The temperature is an important vital sign; depending on it, I will prescribe you investigations and treatment, do you agree?***

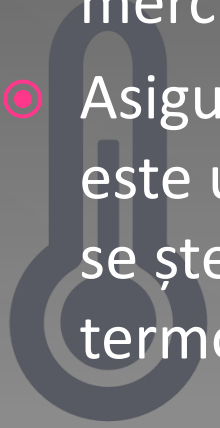
Etapele principale

- După aceea, trebuie să explicați ce doriți să faceți:
- ***Vă rog, nu retrăiți, relaxați-vă, procedura dată este inofensivă, eu Vă voi plasa termometrul în regiunea fosei axilare, nu Va mișcați și nu vorbiți în timpul procedurei. Durata este de 10 minute. Eliberați, Va rog, regiunea fosei axilare.***

- After that, you should explain what you want to do:
- ***Please, relax, don't worry, this procedure is safe and not complicated. I will put the glass thermometer in the axillary region, don't speak and try to stand still during the procedure, it will take about 10 minutes. Please, open your axillary region.***

Etapele principale

- Luați termometrul și ștergeți-l cu un tampon de bumbac de la bulb spre tu..
- Dacă termometrul a fost ținut în soluție de dezinfectare, se spală și se usucă.
- Scuturați termometrul cu mișcări puternice a încheieturii mâinii până când linia de mercur cade la cel puțin 35 ℃.
- Asigurați-vă că axilă pacientului este uscată. Dacă este umedă, se șterge ușor înainte de a plasa termometrul.



- Take the thermometer and wipe it with a cotton spirit swab from the bulb towards the tube.
- If the thermometer was disposed in desinfectant solution, wash and dry it.
- Shake the thermometer with strong wrist movements until the mercury line falls to at least 35 ℃.
- Make sure the patient’s axilla is dry. If it is moist, dry gently before placing the thermometer.

Etapele principale

- Puneti bulbul termometrului in fosa axilară la anterior inferior cu 45 de grade sau orizontal.
- Tineti brațul flexat peste piept, aproape de partea laterală a corpului.
- Țineți termometrul timp de 10 minute..

- Place the bulb of the thermometer in the hollow of axilla at anterior inferior with 45 degree or horizontally.
- Keep the arm flexed across the chest, close to the side of the body.
- Hold the thermometer for 10 minutes.

Etapele principale :

- Scoateți termometrul și citiți nivelul mercurului la nivelul ochilor.
- Scuturați mercurul în jos cu atenție și ștergeți termometrul de la tijă către bec cu un tampon.
- Explicați rezultatul pacientului.
- Aranjați echipamentul corespunzător. Spălați-vă pe mâini.

- Remove the thermometer and read the level of mercury at eye level.
- Shake the mercury down carefully and wipe the thermometer from the stem to bulb with a spirit swab.
- Explain the result to the patient.
- Dispose of the equipment properly. Wash your hands.