NC Department of Health and Human Services

NC Nurse Aide I Curriculum

Module AA

Measurement

July 2019

Objectives (1)

- **Identify the structure and function of the cardiovascular and respiratory systems.**
- **Define body temperature and associated terminology.**
- **List equipment needed to measure pulse, respirations, blood pressure, temperature, intake of fluids, output, height, and weight**

Objectives (2)

- **Compare and contrast the various thermometers used to measure temperature**
- **Label components of select equipment used to measure blood pressure, height, and weight**

Objectives (3)

- **Compare and contrast normal and abnormal findings of the following measurements: pulse, respirations, blood pressure, and temperature**
- **Locate sites used to measure pulse, respirations, blood pressure and temperature**

Objectives (4)

- **Describe the nurse aide's role in the care of residents who have not achieved fluid balance – edema and dehydration**
- **Explain how to use equipment that measures blood pressure, temperature, intake of fluids, output, height, and weight**

Objectives (5)

- **Differentiate units of measurement nurse aides use during the care of residents – millimeters of mercury (mm Hg), degrees Fahrenheit, ounces, milliliters (mL), cubic centimeters (cc), inches, and feet**
- **Convert ounces to milliliters and inches to feet/inches**

Module AA Measurement
Vital Signs

Vital Signs

- **Show how well vital organs are functioning**
- **Include temperature, pulse, respiration, and blood pressure**
- **Also called TPR & BP**

Vital Signs – Importance

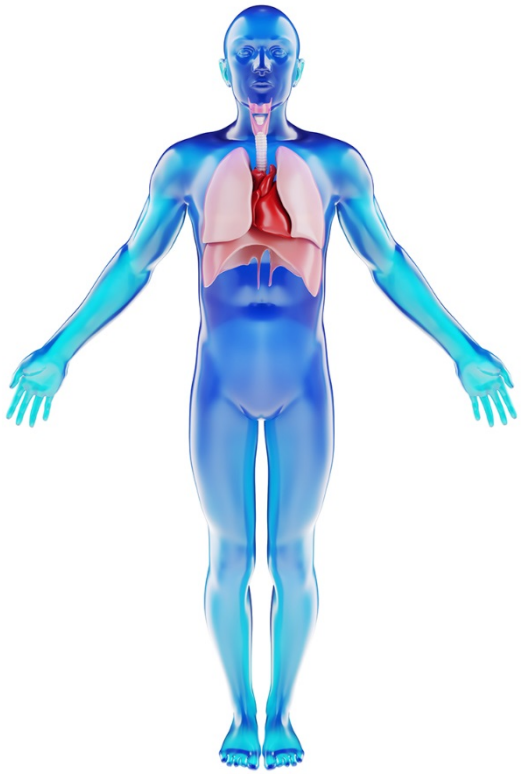
- **Changes can indicate resident's condition worsening**
- **Can reflect response to medication and/or treatment**
- **Value of a vital sign may be basis for a medication**
- **Accuracy when taking vital signs is crucial**
- **Report abnormal vital signs immediately to nurse and per facility policy**

The 5th Vital Sign – Pain

- **Facilities may consider pain the 5th vital sign; considered as important as other vital signs**
- **Pain is subjective and reported to health care provider by resident**
- **Pain is whatever the resident says it is**

Respiratory System

The breathing in of oxygen into the lungs and breathing out of carbon dioxide from the body



Structure and Function – Lungs

- **Location in the respiratory system where exchange of oxygen and carbon dioxide occur**
- **Left lung, 2 lobes; right lung 3 lobes**

Respiration

- **Process that supplies oxygen to cells and removes carbon dioxide from cells**
- **Involves**
  - **Inspiration (inhalation) – breathing in oxygen; chest rises**
  - **Expiration (exhalation) – breathing out carbon dioxide; chest falls**
- **Each respiration = 1 inspiration and 1 expiration**
- **Respiratory rate (or respirations) – the number of inspirations (inhalations) the person takes in a minute**

Respiratory Site

Watch the chest rise and fall; count the chest rises (inspirations) only

Respiration Values – Normal

- Called eupnea
- Between 12 and 20 breaths/minute
- Regular
- Quiet
- Both sides of chest equal

Document

Respiration Values – Abnormal

- **Bradypnea – less than 12 breaths/minute**
- **Tachypnea – more than 20 breaths/minute**
- **Apnea – 0**
- **Hypoventilation**
- **Hyperventilation**
- **Dyspnea**
- **Cheynes-Stokes**

Document and notify nurse

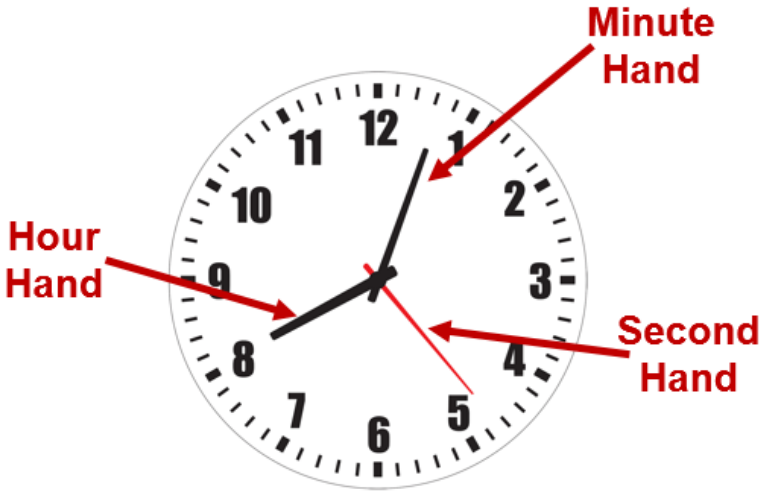
Counting Respirations – Equipment

- **Analog watch with second hand**
- **Note pad and pen**

Analog Watch

- **A watch that has moving hands and typically marked with numbers 1 – 12**
- **Has an hour hand, minute hand, and second hand**

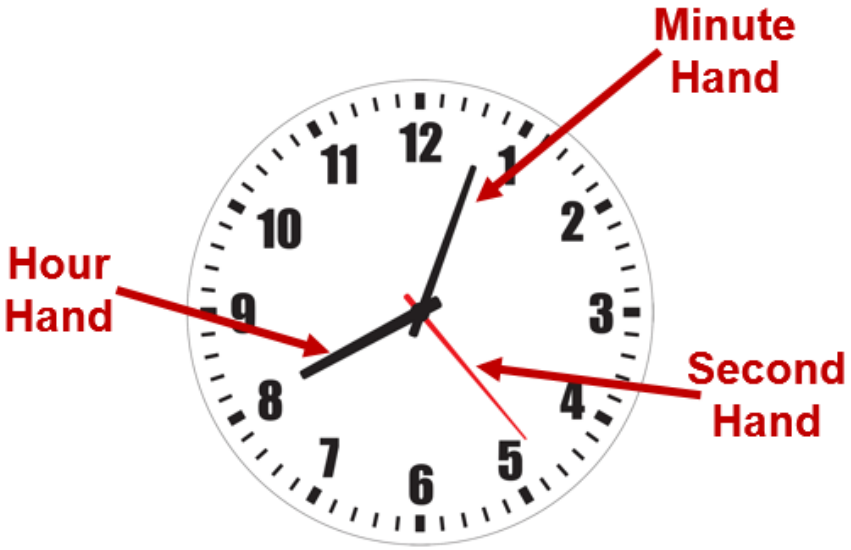
Nurse aide uses the second hand to count respirations and pulse rate



Analog Watch – 60 Seconds (1)

When counting respirations for 60 seconds:

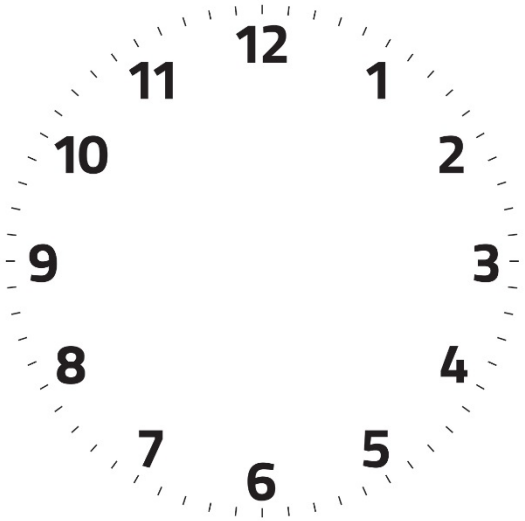
while watching the second hand, start counting and stop counting on the same number



Using an Analog Watch – Practice (1)

Counting respirations for 60 seconds:

"Start"	"Stop"
Second hand on 3	Second hand on ?
Second hand on 6	Second hand on ?
Second hand on 10	Second hand on ?
Second hand on 12	Second hand on ?
Second hand on 8	Second hand on ?
Second hand on 1	Second hand on ?



Observation and Documentation

- **Nurse aide counts respirations for 60 seconds**
- **1 respiration = 1 inspiration (chest rising)**
- **While watching second hand of watch, nurse aide starts and stops counting on same number**
- **Document on record if respirations are normal**
- **Document on record and notify nurse if respirations are abnormal**

Stealth Respirations

Check respirations right after checking pulse (without moving hand from wrist)

Why?

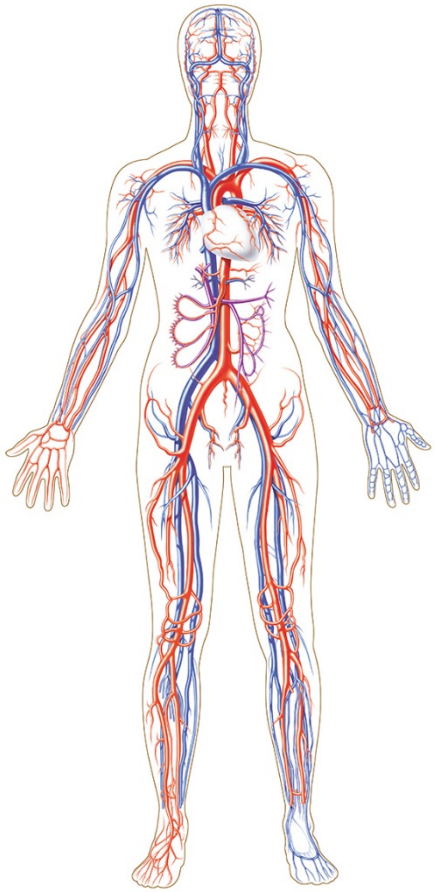
Checking Respirations – Example #1

- **Nurse aide begins counting respirations when the second hand is on 4 and stops counting respirations when the second hand lands on _____**
- **Nurse aide counts 16 chest rises in 60 seconds**
- **16 is the number the nurse aide would document**

Checking Respirations – Example #2

- **Nurse aide begins counting respirations when the second hand is on 10 and stops counting respirations when the second hand lands on _____**
- **Nurse aide counts 24 chest rises in 60 seconds**
- **24 is the number the nurse aide would document**
- **Nurse aide would notify the nurse; why?**

Cardiovascular System

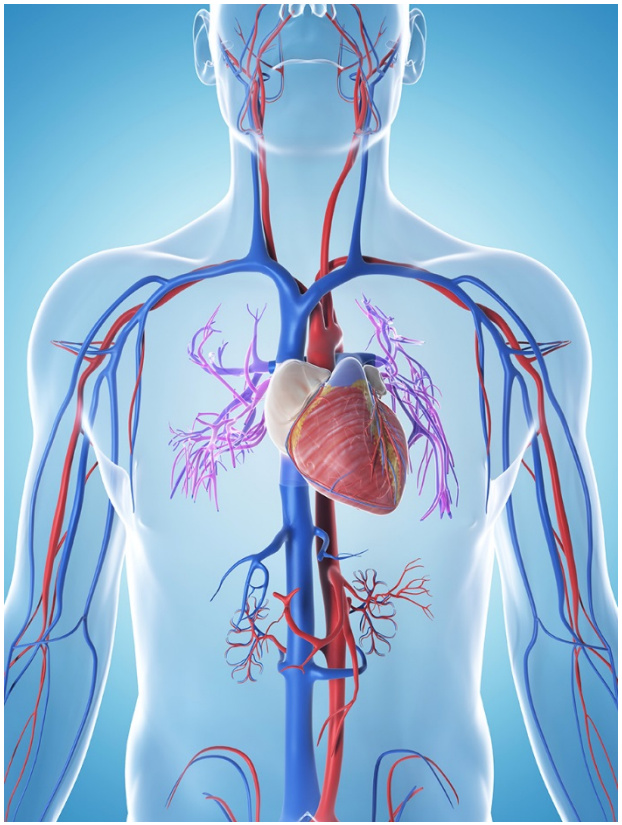


Also called the circulatory system and is the continuous movement of blood though the body

Structure and Function – Blood Vessels (1)

The transportation system of the cardiovascular (circulatory) system

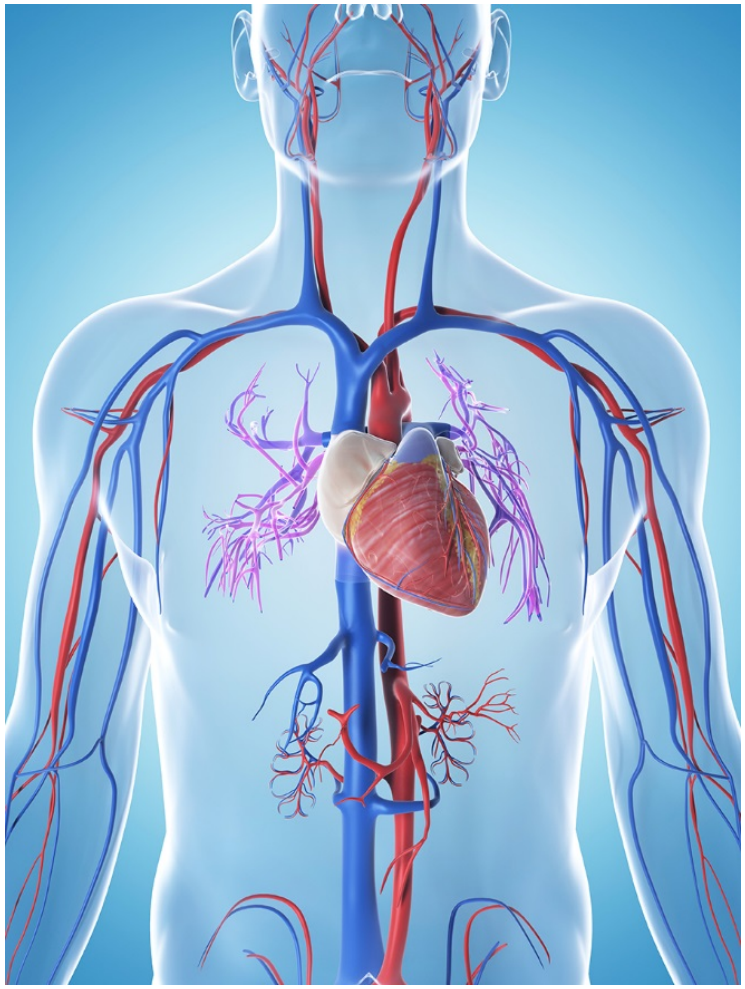
- **Veins – carry blood with waste products away from cells and to heart**
- **Arteries – carry blood with oxygen and nutrients away from heart and to cells**



Structure and Function – Blood Vessels (2)

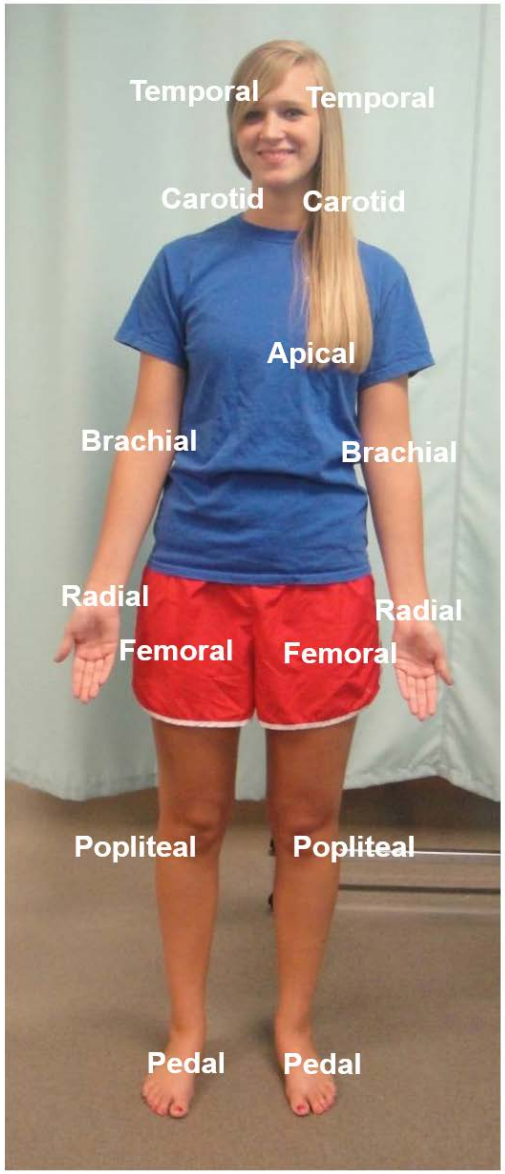
Pulse – the beat of the heart felt at an artery, as a wave of blood passes through the artery

- **Pulse rate**
- **Pulse rhythm**
- **Pulse force**



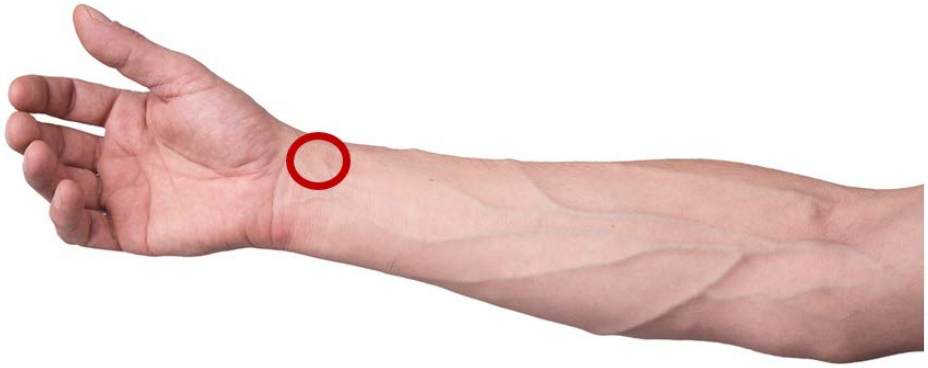
Pulse Sites

- Temporal
- Carotid
- Apical
- Brachial
- Radial
- Pedal



Radial Pulse Site

- **Typically used to take pulse during routine vital signs checks**
- **Does not expose resident**
- **Located on thumb side of wrist**
- **First 2 or 3 fingers used; never use thumb**



Pulse Values

Normal = between 60 and 100 beats per minute; regular and strong (document)

Abnormal pulse (document and notify nurse)

- **Bradycardia – less than 60 beats/minute**
- **Tachycardia – more than 100 beats/minutes**
- **Irregular pulse rhythm**
- **Weak in strength**

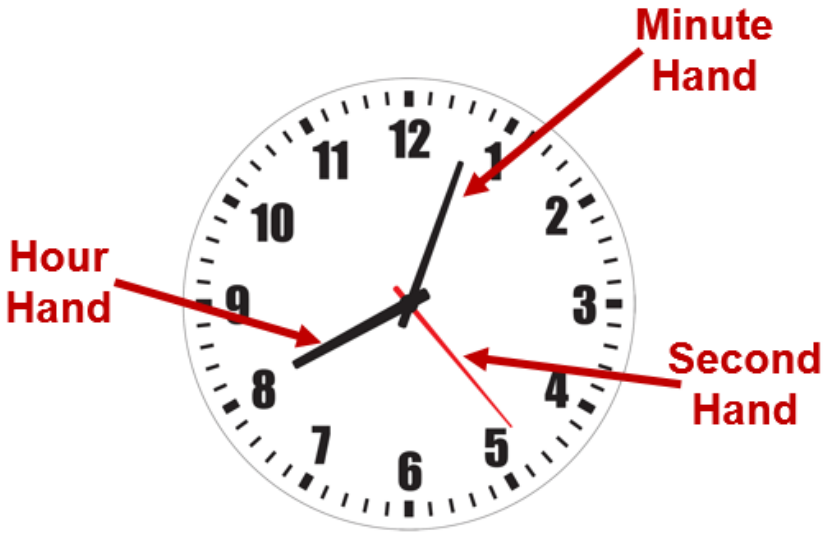
Counting Pulse – Equipment

- **Analog watch with second hand**
- **Note pad and pen**

Analog Watch – 60 Seconds (2)

When counting pulse for 60 seconds:

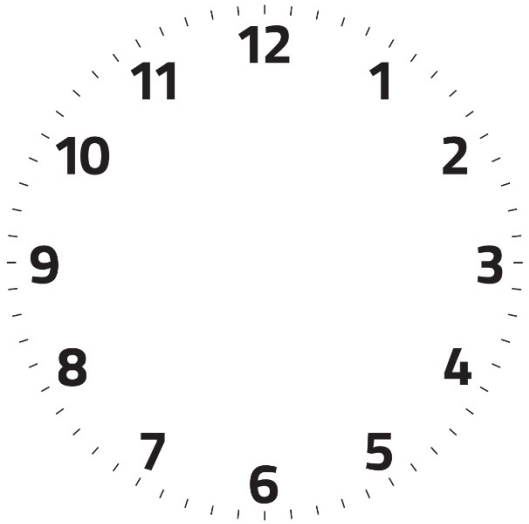
while watching the second hand, start counting and stop counting on the same number



Using an Analog Watch – Practice (2)

Counting pulse for 60 seconds:

"Start"	"Stop"
Second hand on 2	Second hand on ?
Second hand on 5	Second hand on ?
Second hand on 12	Second hand on ?
Second hand on 10	Second hand on ?
Second hand on 4	Second hand on ?
Second hand on 6	Second hand on ?



Checking Pulse and Documentation

- **Nurse aide counts pulse rate for 60 seconds**
- **While watching second hand of watch, nurse aide starts and stops counting on same number**
- **Document on record if pulse is normal**
- **Document on record and notify nurse if pulse is abnormal**

Checking Pulse – Example #1

- **Nurse aide begins counting pulse rate when second hand is on 4 and stops counting pulse rate when the second hand lands on _____**
- **Nurse aide counts a pulse rate of 82 in 60 seconds**
- **82 is the number the nurse aide would document**

Checking Pulse – Example #2

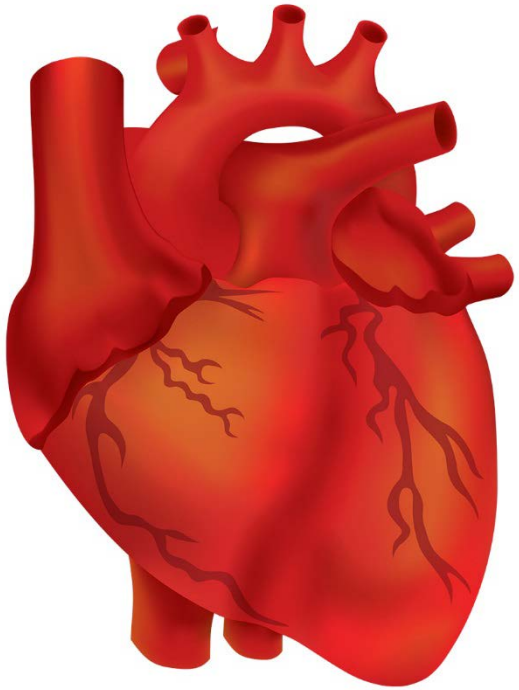
- **Nurse aide begins counting pulse rate when second hand is on 10 and stops counting pulse rate when the second hand lands on _____**
- **Nurse aide counts a pulse rate of 109 in 60 seconds**
- **109 is the number the nurse aide would document**
- **Nurse aide would notify the nurse; why?**

Structure and Function – Heart (1)

The pump of the cardiovascular (circulatory) system

Consists of 4 chambers:

- **Right and left atria, and**
- **Right and left ventricles**

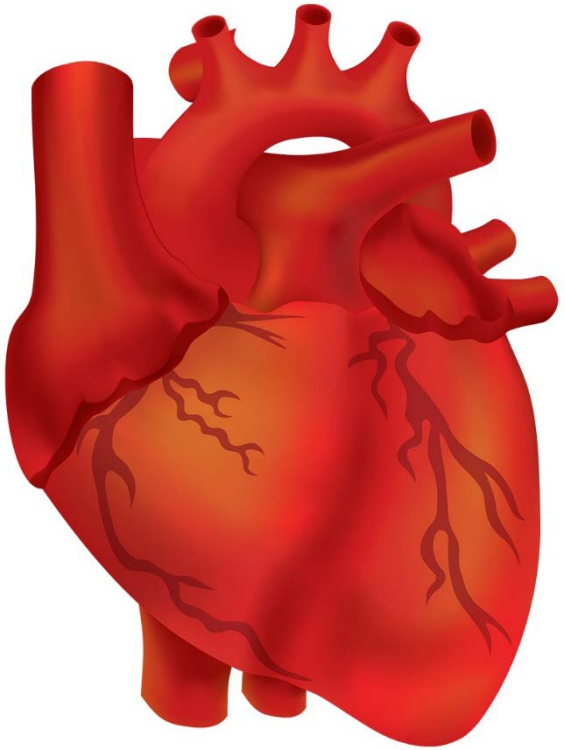


Structure and Function – Heart (2)

2 phases

(1) Working phase (systole) heart is pumping blood to body; top number of blood pressure reading and

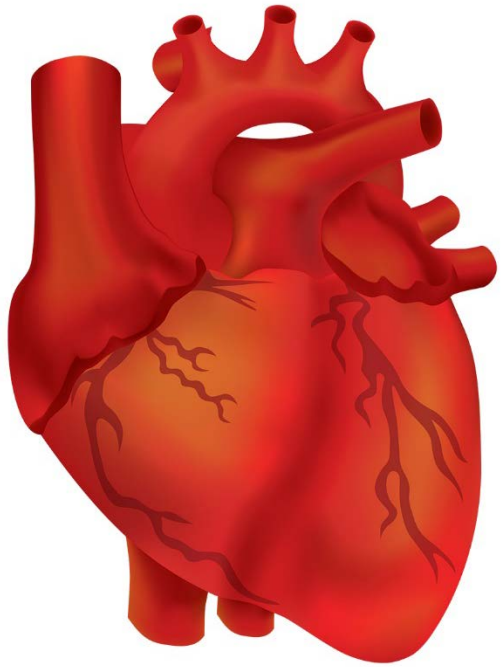
(2) Resting phase (diastole) heart fills with blood; bottom number of a blood pressure reading



Structure and Function – Heart (3)

Blood pressure – the amount of force exerted by the blood against the walls of the artery

- **Top number is the systolic pressure; the pressure when the heart contracts and pumps blood out**
- **Bottom number is the diastolic pressure; when the heart rests as the heart fills with blood**



Blood Pressure (1)

Important indicator of health status; shows how well heart is working; can change from minute to minute depending on:

- **The activity of the resident**
- **Lifestyle choices**
- **Reaction to stress**
- **Acute injury or emergency**
- **Medications**

*Blood Pressure (2)

Genetic factors affect blood pressure

- Age
- Gender
- Race

*Blood Pressure Site

Brachial artery and upper arm – most often used by the nurse aide when checking blood pressure

The Blood Pressure Value

Measured in millimeters of mercury (mm Hg)
Recorded as a fraction

$$\frac{120}{80}$$

120 (systolic)
80 (diastolic)

Pronounced as 120 over 80

Normal Blood Pressure Ranges

- **Systolic – 90 mm Hg to 119 mm Hg**
- **Diastolic – 60 mm Hg to 79 mg Hg**

Document on record

Abnormal Blood Pressure Ranges

- **Elevated blood pressure**
  - **Systolic – 120 mm Hg to 129 mm Hg AND**
  - **Diastolic – below 80 mm Hg**
- **Hypertension**
  - **Systolic – 130 mm Hg or higher OR**
  - **Diastolic – 80 mm Hg or higher**
- **Hypotension**
  - **Systolic – less than 90 mm Hg**
  - **Diastolic – less than 60 mm Hg**

Always document on the record and report abnormal blood pressures to nurse

Using What You Have Learned

Using factors effecting blood pressure and normal/abnormal values for blood pressure, evaluate the health of individuals on the next 3 slides

Example #1

- **BP = 116/72**
- **A 64-year old female**
- **Weighs 130 pounds**
- **She has finished baking an apple pie**
- **She doesn’t smoke or drink**

Example #2

- **BP = 162/86**
- **A 72-year old male**
- **Weighs 260 pounds**
- **He just ate a couple of hot dogs and potato chips for lunch and is on his 4th beer**
- **He just sent his son to the store for more cigarettes**

Example #3

- **BP = 180/94**
- **A 22-year old male**
- **Weighs 170 pounds**
- **He just wrecked his brand new truck**
- **He has a broken leg**
- **He is on a stretcher in the back of an ambulance**

Blood Pressure

The nurse aide uses 3 senses when checking a blood pressure

- **Seeing – watches needle's movement in relation to numbers on the manometer**
- **Hearing – using the stethoscope, listens for changes in blood flow in the brachial artery**
- **Touching – controls inflation and deflation of cuff using thumb and index finger**

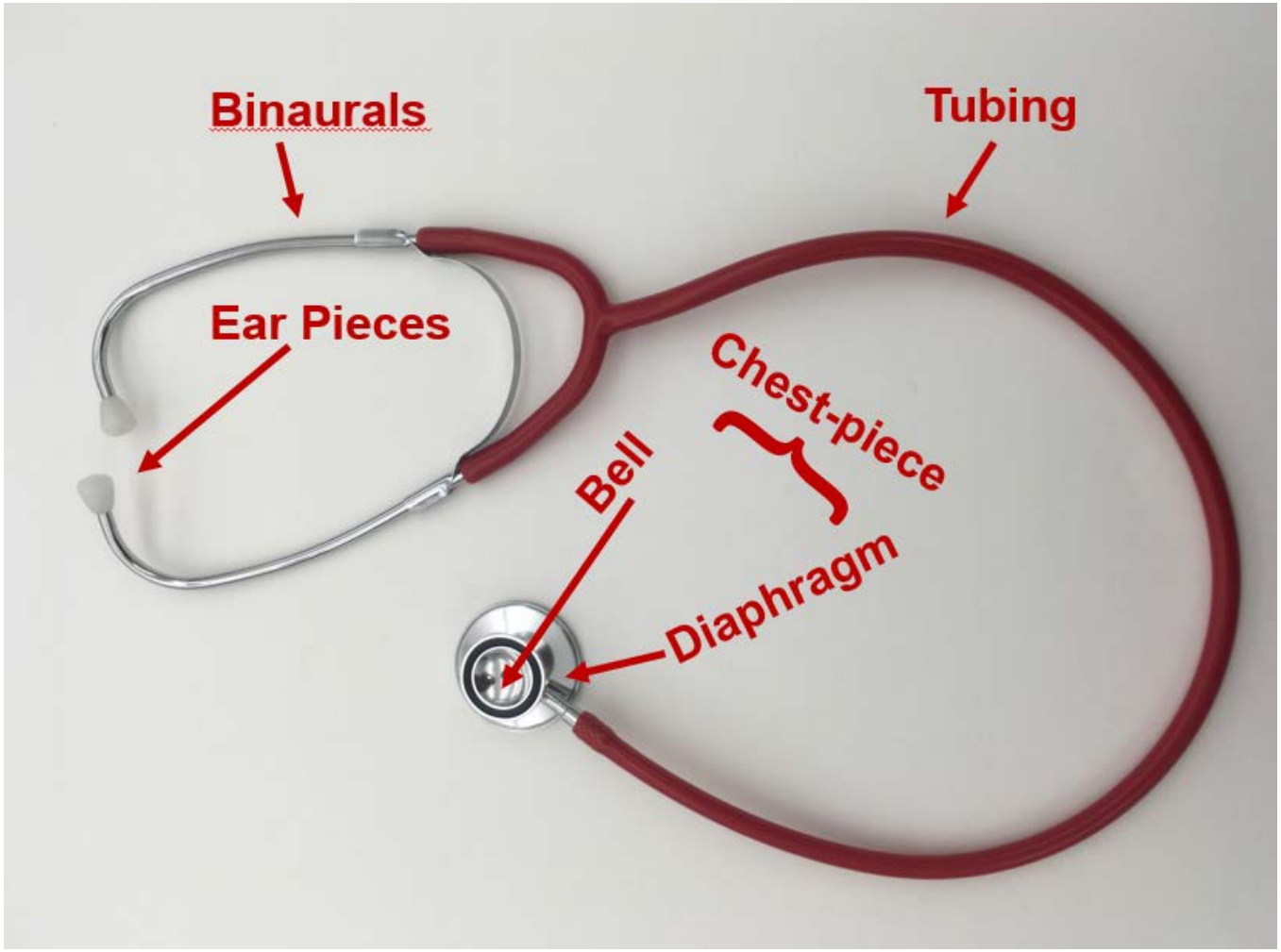
Checking Blood Pressure – Equipment

- **Stethoscope**
- **Sphygmomanometer, also known as blood pressure cuff (BP cuff)**
- **Alcohol wipes**
- **Note pad and pen**

The Stethoscope

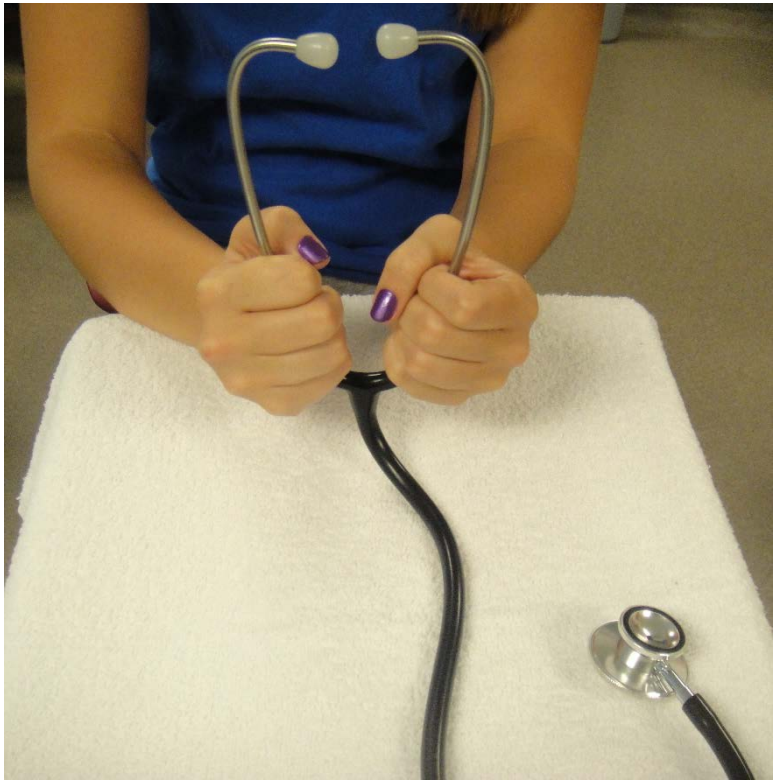
- **Instrument used to listen to heart and lung sounds**
- **For blood pressure checks, used to listen to sounds in brachial artery**
- **May be single-head (with diaphragm only) or dual-head (with diaphragm and bell)**

Stethoscope – Parts



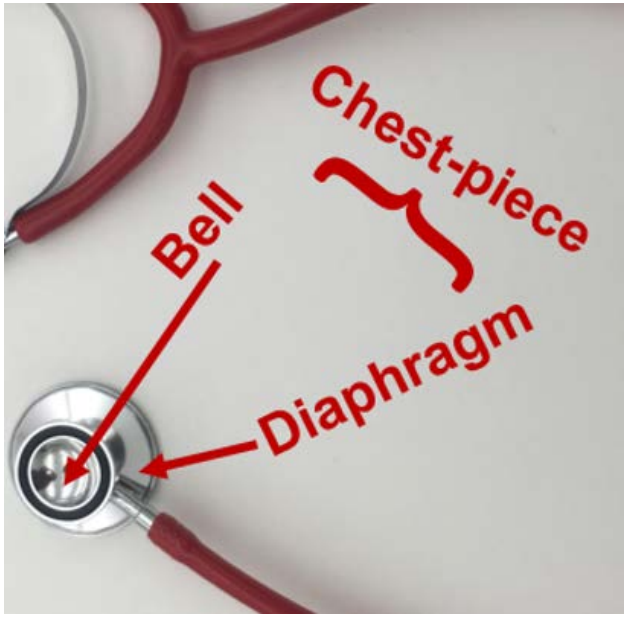
Stethoscope – Ear Pieces

- **Always clean before and after use with alcohol wipes**
- **Insert ear pieces into ears so they point forward toward the nose**
- **Should fit snugly in ears**



Dual-head Stethoscope – Diaphragm

Before using dual-head stethoscope to take blood pressure, determine which side of chest-piece is active; to check blood pressure, diaphragm needs to be active



Two Ways to Check for Active Diaphragm

#1 After inserting ear pieces into ears, tap diaphragm lightly to determine if tap is heard; if tap not heard, rotate chest-piece at tubing, and repeat the tap
#2 If chest-piece has an indicator dot, rotate chest-piece so indicator dot is closed

Diaphragm Concepts

- **Always clean diaphragm with alcohol wipes**
- **Warm diaphragm before making contact with resident**
- **To use diaphragm, apply enough pressure to make seal against brachial artery**

Blood Pressure Cuff – 2 Types

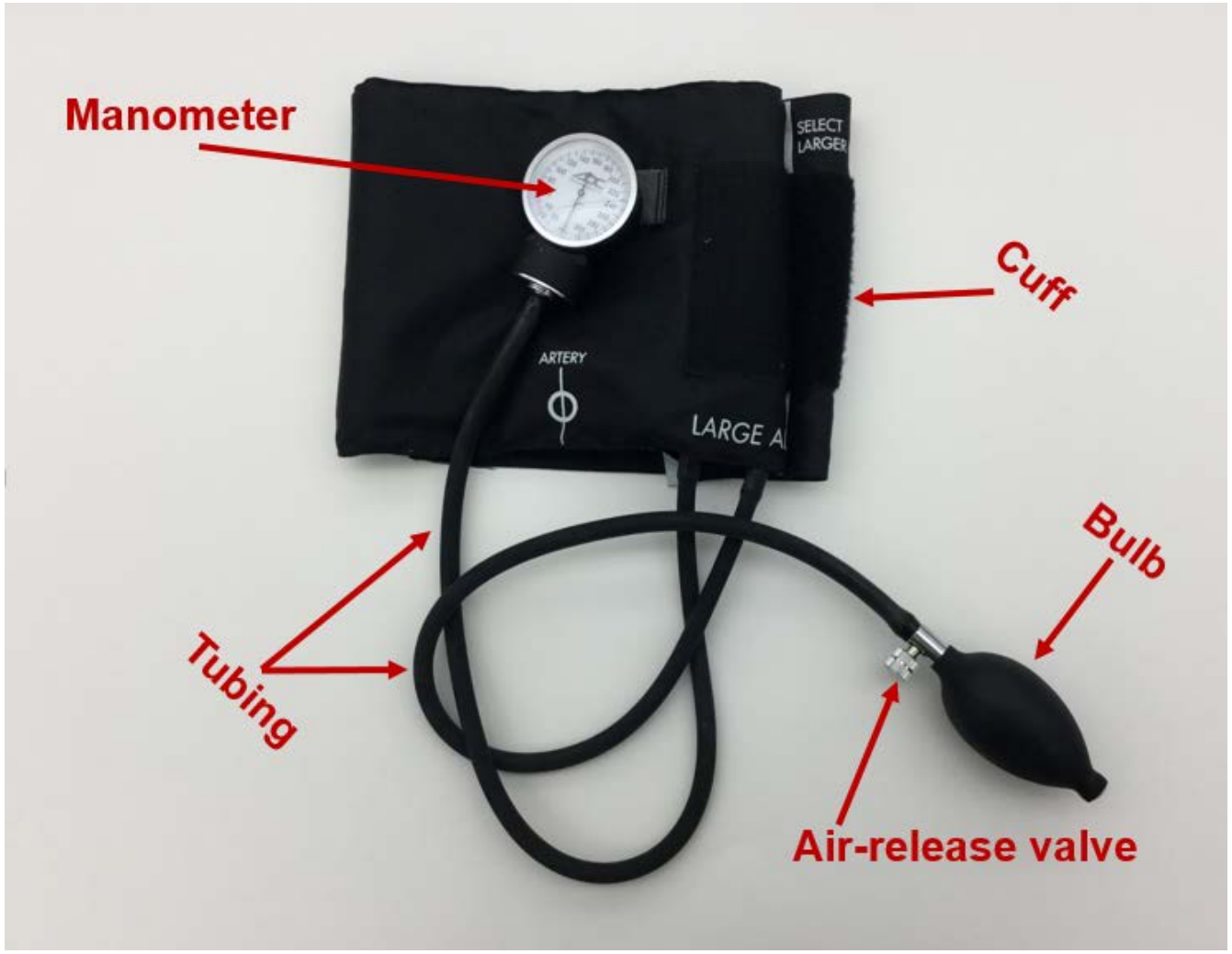
Manual (Aneroid)

Electronic (Digital)

Electronic (Digital)

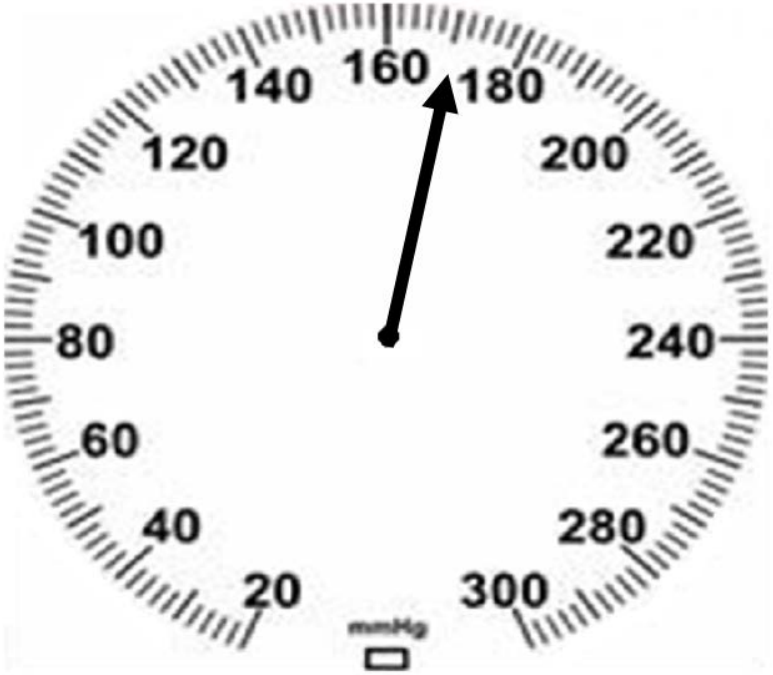
- No stethoscope needed
- After BP cuff is placed on arm, button is pressed causing cuff to inflate/deflate automatically
- BP reading is displayed

Aneroid BP Cuff – Parts



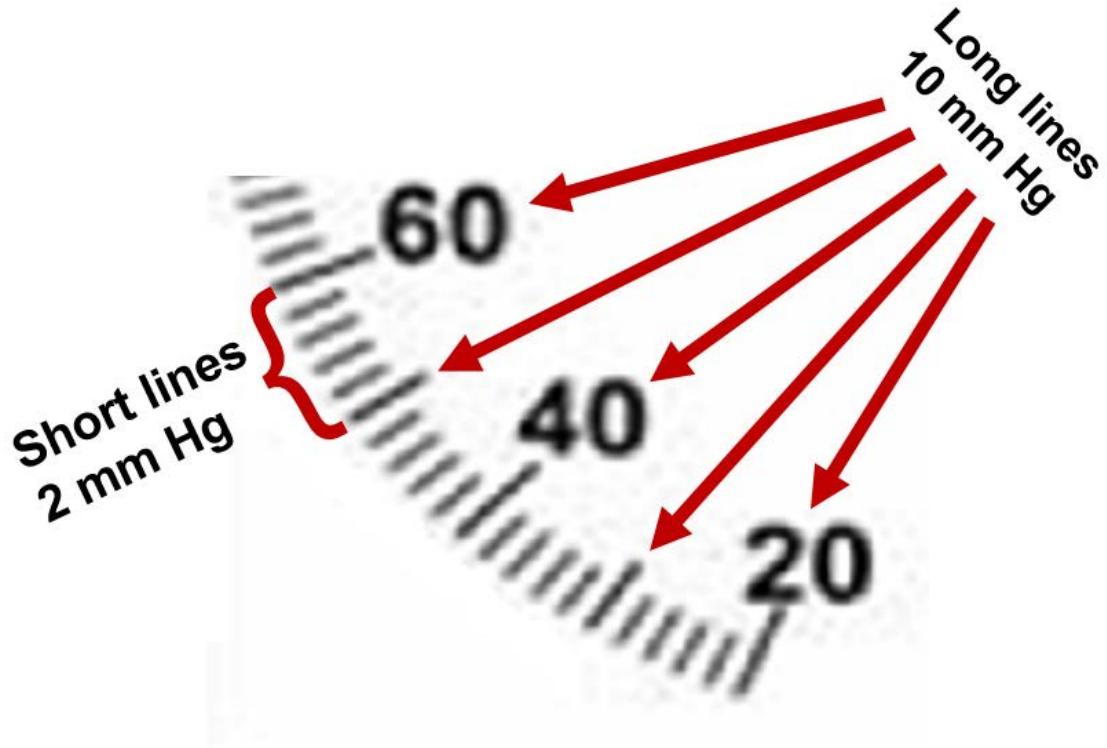
Manometer (1)

Marked with long and short lines and has a needle



- **Long lines mark 10 mm Hg**
- **Short lines mark 2 mm Hg**

Manometer (2)

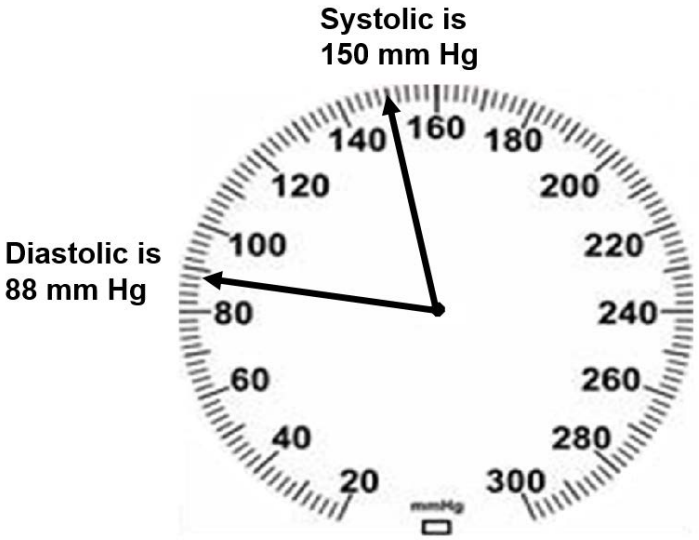


Manometer (3)

When checking blood pressure, the needle drops from a higher number to a lower number, so nurse aide will be counting backwards

Example of Blood Pressure Reading

- **Systolic is 150 mm Hg**
- **Diastolic is 88 mm Hg**
- **BP is written down as 150/88**
- **BP is pronounced as “150 over 88”**



Cuff (1)

After wrapping the cuff around the bare upper arm

- **The cuff inflates and puts pressure on the brachial artery**
- **As cuff deflates, BP is determined**

Cuff (2)

- **Cuffs come in child-sized, small, regular, and extra-large**
- **Important to choose correct size**

Cuff (3)

- **Typically has 1 or 2 arrows (left arm/right arm) on cuff which align with brachial artery**
- **Cuff positioned/wrapped at least an inch above the elbow**
- **Cuff or stethoscope should not be placed over clothing**

Tubing

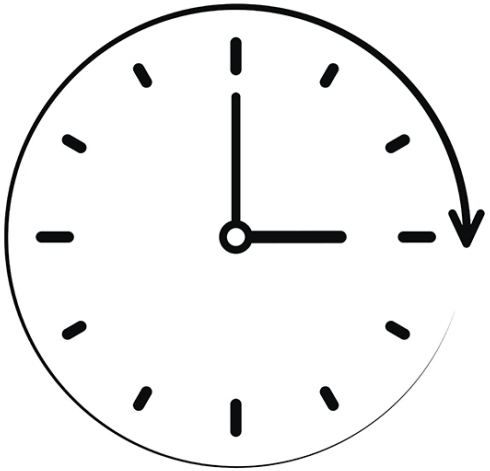
- **Made of rubber**
- **Two tubes connect the:**

  (#1) Cuff to the manometer and

  (#2) Cuff to the handheld inflation bulb

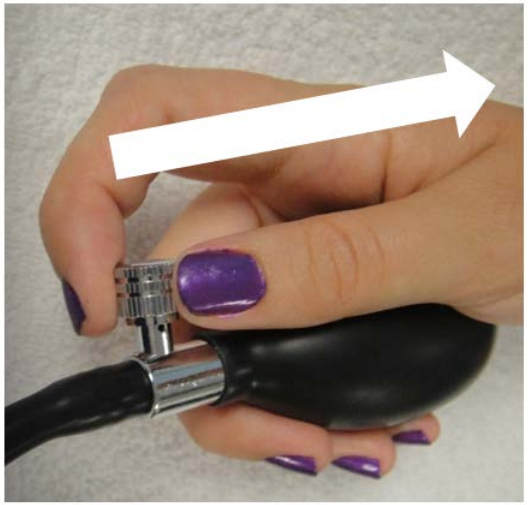
Inflation Bulb with Air-release Valve (1)

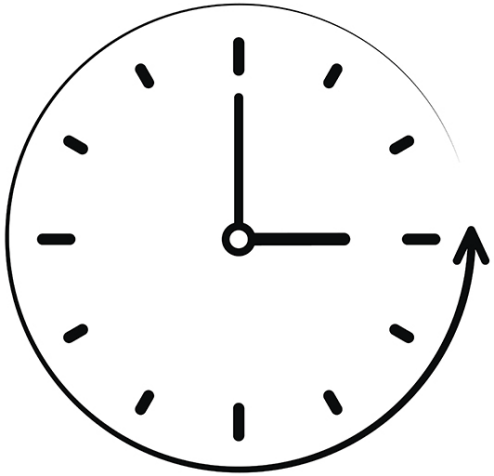
To inflate cuff, turn air-release valve clockwise to close valve; then squeeze the bulb; remember thumb goes up, needle goes up



Inflation Bulb with Air-release Valve (2)

To deflate cuff and open valve, turn air-release valve counterclockwise with the thumb and index finger in a slow and controlled manner; remember thumb goes down, needle goes down





Inflation Bulb with Air-release Valve (3)

- **Inflate cuff to between 160 mm Hg to 180 mm Hg**
- **If beat is heard immediately, deflate the cuff; wait 30 – 60 seconds; inflate cuff to no more than 200 mm Hg**

Inflation Bulb with Air-release Valve (4)

Goal: learn how to inflate the cuff and how to deflate the cuff in a slow, controlled manner

Blood Pressure – Nevers

- **Do not take blood pressure on an arm with an IV, dialysis shunt, or other medical device**
- **Avoid taking blood pressure on a side that has been injured or burned, is paralyzed, has a cast, or has had a mastectomy**

Orthostatic Hypotension

Abnormal low blood pressure that occurs when resident suddenly stands up; complaint of feeling weak, dizzy, faint and seeing spots before the eyes

May be a complication from being on bed rest

Orthostatic Hypotension – Process

Throughout process, check to see if resident is feeling weak, dizzy, faint, or seeing spots

- **BP checked while lying down, record on note pad**
- **Have resident sit up, wait 2 minutes, check BP, record on note pad**
- **Have resident stand up, wait 2 minutes, check BP, record on note pad**
- **Record/report to nurse**

Orthostatic Hypotension – Prevention

- **Per care plan, increase activity in stages**
- **Before standing, while sitting on side of bed (dangling), have resident cough/deep breathe and move legs back-and-forth in circles, 1 to 5 minutes**
- **Ask resident to report weakness, dizziness, faintness and seeing spots**
- **May need 2 people**

Body Temperature

Amount of heat created by the body; balance between the amount of heat produced and the heat lost; typically stable

Produced – when cells use food for energy

Lost – through skin, breathing, urine, and stool

Body Temperature – Terminology

- **Fever – elevated temperature**
- **Febrile – with a fever**
- **Afebrile – without a fever**
- **Thermometer – device to measure body temperature**
- **Fahrenheit and Centigrade**

Factors Affecting Temperature

- Age
- Illness
- Stress
- Environment
- Exercise
- Time of day

Sites

- Mouth (oral)
- Rectum (rectal)
- Armpit (axilla)
- Ear (tympanic)
- Temporal (forehead)

Important to check with nurse or care plan to see what type of thermometer is used

When NOT to Take an Oral Temperature

- Unconscious
- Recent facial/mouth surgery
- Recent injury to face
- Sores/redness/mouth pain
- Confused/agitated
- History of seizure
- Using oxygen
- Mouth-breather
- Feeding tube

When NOT to Take a Rectal Temperature

- Has diarrhea
- Has rectal problem
- Has heart disease
- Recent rectal surgery
- Is confused or agitated

Temperature Values (1)

- **Oral**
  - **Baseline – 98.6ºF**
  - **Normal range – 97.6ºF to 99.6ºF**
- **Rectal**
  - **Baseline – 99.6ºF**
  - **Normal range – 98.6ºF to 100.6ºF**
- **Axillary**
  - **Baseline – 97.6ºF**
  - **Normal range – 96.6ºF to 98.6ºF**

Temperature Values (2)

- **Tympanic membrane**
  - **Baseline – 98.6ºF**
  - **Normal range – 97.6ºF to 99.6ºF**
- **Temporal**
  - **Baseline – 98.6ºF**
  - **Normal range – 97.6ºF to 99.6ºF**

Types of Thermometers

- **Digital – oral, rectal, axillary**
- **Electronic – oral, rectal, axillary**
- **Tympanic – ear**
- **Temporal – forehead**
- **Non-mercury, liquid-filled glass (oral – green tipped; rectal – red tipped)**

Digital Thermometer

- **Oral, rectal, or axillary**
- **Displays results digitally within 2 – 60 seconds; beeps or flashes when done**
- **Battery-operated**
- **Requires a disposable sheath**

Electronic Thermometer

- **Oral, rectal, or axillary**
- **Have oral/axillary and rectal probes; requires probe cover**
- **Displays results digitally 2 – 60 seconds; beeps or flashes when done**
- **Battery-operated; stored in recharging device**

Tympanic Thermometer

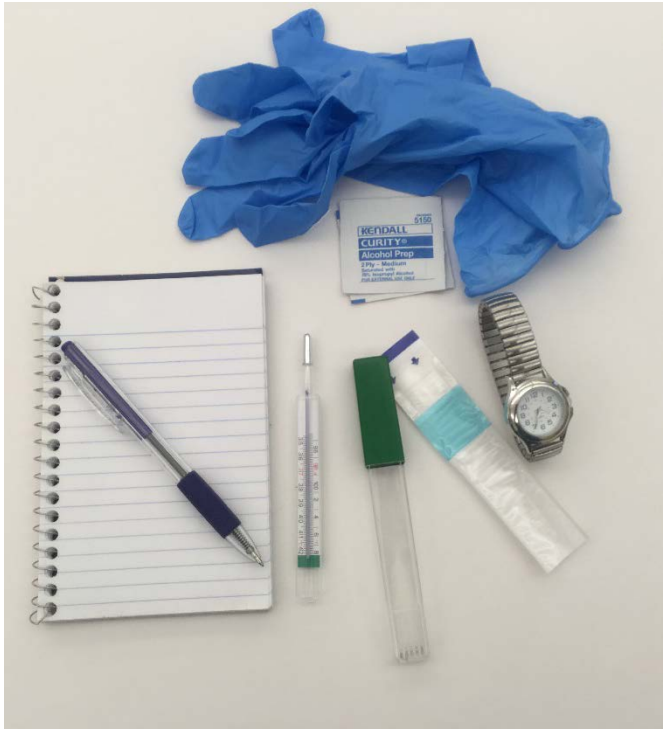
- Ear
- Registers temperature in seconds
- May need practice to operate accurately

Temporal Thermometer

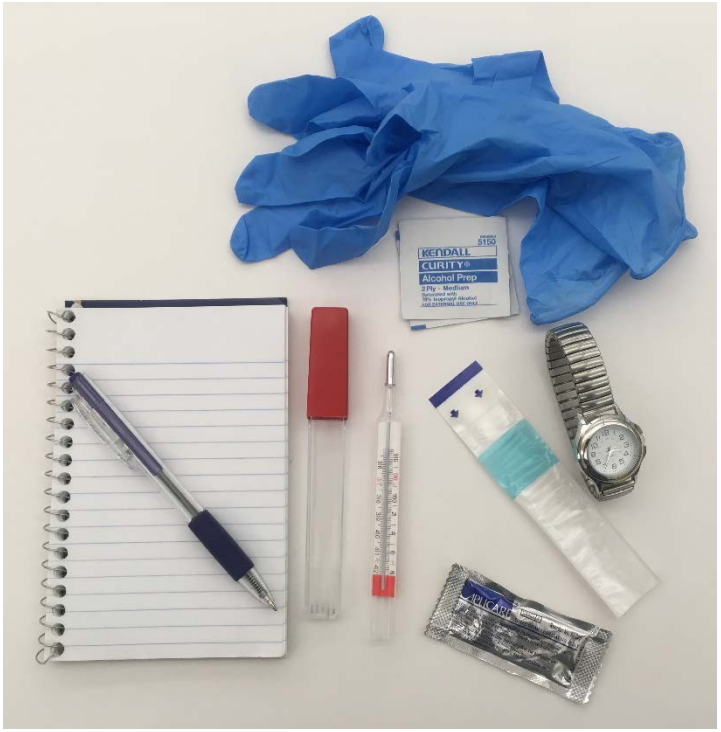
- **Measures heat from skin over the forehead, specifically over temporal artery**
- **Done by a stroke or scan over the area**
- **Registers within 3 seconds**
- **Noninvasive**

Non-mercury, Liquid-filled Glass Thermometer – Equipment

Oral



Rectal



Non-mercury, Liquid-filled Glass Thermometer

- **Oral, rectal, or axillary**
- **Color-coded; blue or green for oral; red for rectal**
- **Takes a long time to register**
- **Nurse aide must read at eye level after it registers temperature; held at stem**
- **Most use Fahrenheit scale to measure temperature**

Non-mercury, Liquid-filled Glass Thermometer – Reading

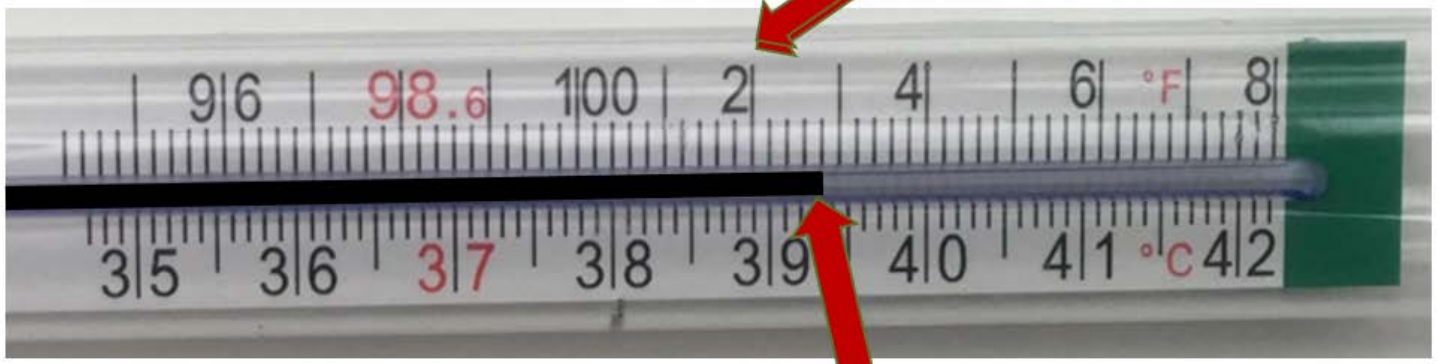
For Fahrenheit readings (the top numbers):

- The long line represents 1 degree
- The short line represents two tenths (2/10) of 1 degree

Example of an Oral Temperature Reading

Temperature = 102.8°

Long Line = 102



Short Lines = eight tenths (.8 or 8/10)

Module AA Measurement
Intake of Foods/Fluids and Output

Fluid Balance (1)

- **Living things need water to survive**
- **Adults need about 1500 mL of water intake daily to survive**
- **Adults need about 2000 to 2500 mL for normal fluid balance**

Hydration – having the right amount of water in the body's tissues

Fluid Balance (2)

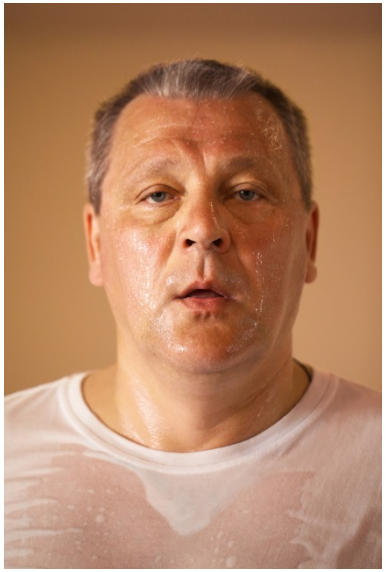
- **Body takes in water by drinking fluids and eating foods**
- **Body loses water by way of urine, bowel movement, vomitus, sweat, and breathing out; plus drainage from wounds or liquids from stomach suctioning**

Death can occur if the body has too much or too little water in the tissues

Intake and Output

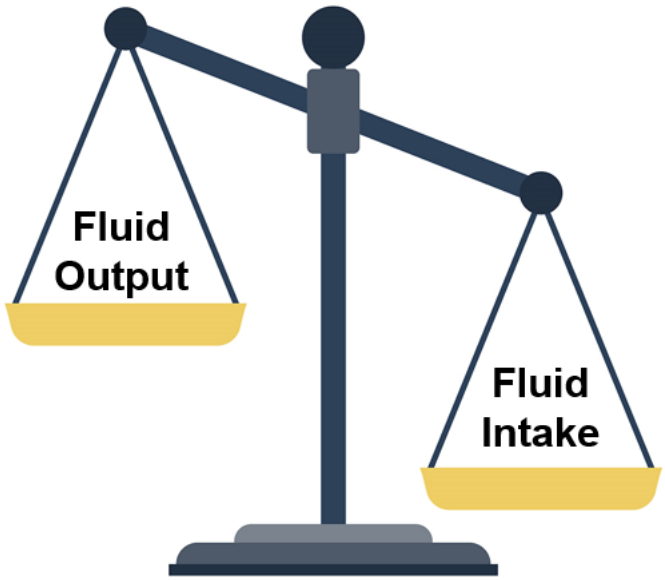
- **Intake (also called input) – the amount of fluid taken in by the body**
- **Output – the amount of fluid lost from the body**
- **Intake and output are typically seen together and commonly abbreviated (I&O)**

For fluid balance to occur fluid intake roughly equals fluid output



Fluid Balance Not Achieved – Edema

- **Fluid intake is greater than fluid output, edema occurs**
- **Body tissues swell with water**
- **May occur from heart or kidney disease**

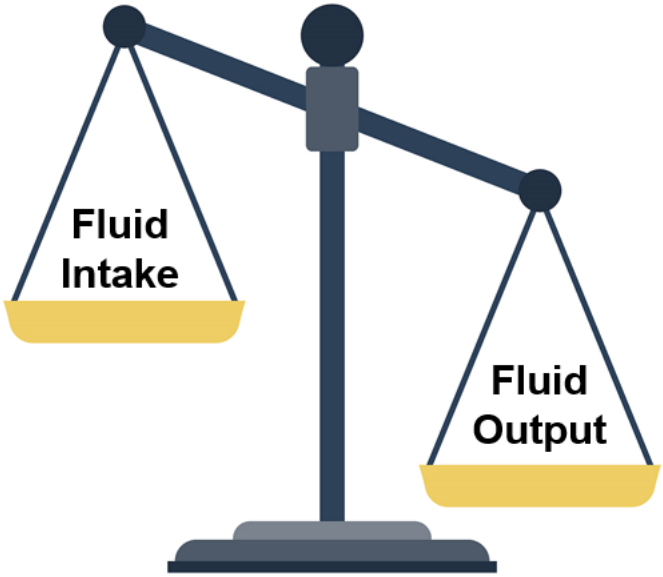


Edema – Nurse Aide's Role

- **Obtain accurate weights per order**
- **Increase pillows per resident's request**
- **Restrict fluids per doctor's order**
- **Measure and record I&O accurately, if ordered**
- **Observe for and report signs/symptoms**

Fluid Balance Not Achieved - Dehydration

- **Fluid intake is less than fluid output, dehydration occurs**
- **Body tissues are lacking in water**
- **May occur from vomiting, diarrhea, fever, or simply refusing to drink fluids**



Dehydration – Nurse Aide's Role

- Determine preferences of fluids and offer
- Assure water pitcher and cup within reach
- Measure and record I&O, if ordered
- Force fluids, if ordered
- Observe for/report signs and symptoms

I&O

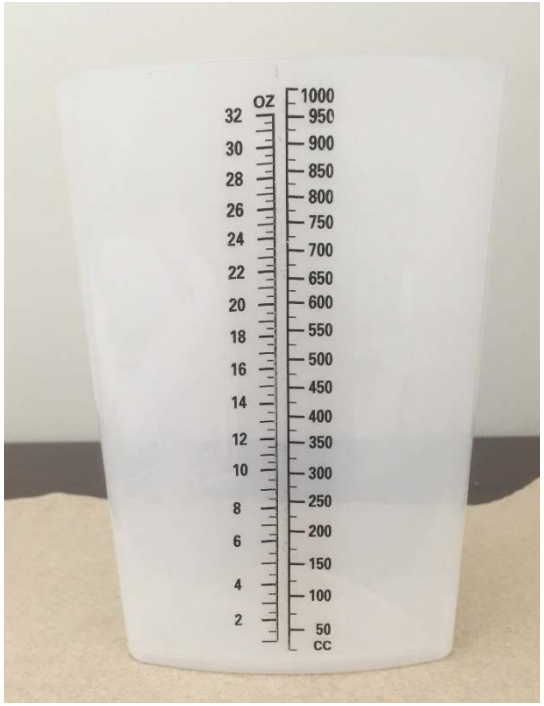
- **Ordered by the doctor; found on care plan and directive from nurse**
- **Typically calculated at end of each shift; totaled every 24-hours**
- **Documented on a facility-specific form**
- **Calculations and totals based on the milliliter (mL)**

The Milliliter (mL)

- A unit of measure in the metric system
- Fluids measured using the milliliter (mL)
- Another unit of measure used in healthcare is called the cubic centimeter (cc); should use the mL instead of cc when documenting
- 1 milliliter is equal to 1 cubic centimeter
- Most people familiar with the teaspoon; there are 5 mL or 5 cc in a teaspoon

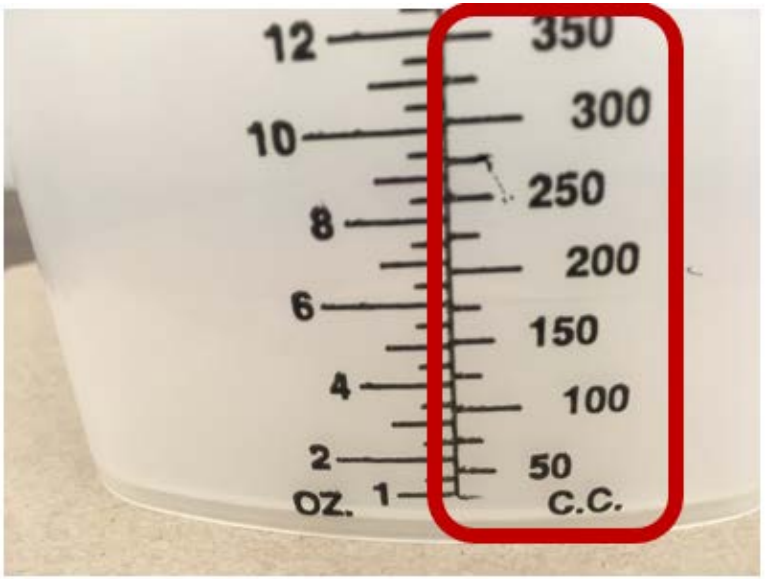
The Graduate

- **Accurate measuring device for fluids when resident is on I&O**
- **Fluid for I&O is measured/ documented in milliliters (mL)**
- **Measure fluid at eye-level on flat surface**
- **If both intake and output to be measured with the graduate, two separate graduates used and labeled**



Units of Measure for the Graduate

- **The C.C. (cubic centimeter) side of the measurement scale is used in health care**
- **Recall 1 C.C. on the graduate = 1 milliliter (mL)**

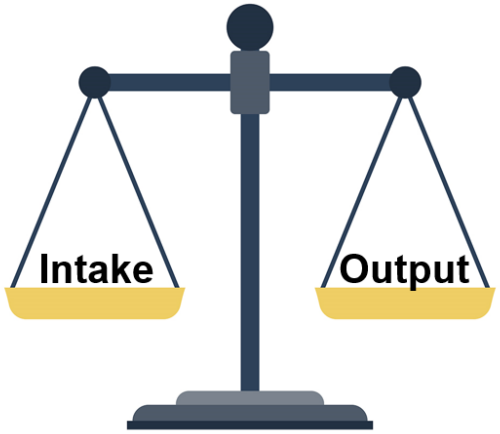


Shortest line represents either 25 cc/mL or 75 cc/mL

Longest lines represent multiples of 50 cc/mL

Measuring I&O – Importance

- **Evaluates fluid balance**
- **Evaluates kidney function**
- **Planning and evaluating medical treatment**
- **Carrying out special fluid orders**
- **Helps prevent or detect complications from fluid intake**
- **Fluid intake is factor that reflects nutritional status**



Fluids Considered as Intake

- **Liquids that the resident drinks**
- **Semi-liquid foods that the resident eats**
- **Other fluids including intravenous (IV) fluids and tube feedings that nurse is responsible for maintaining and measuring**

Fluids – Liquids

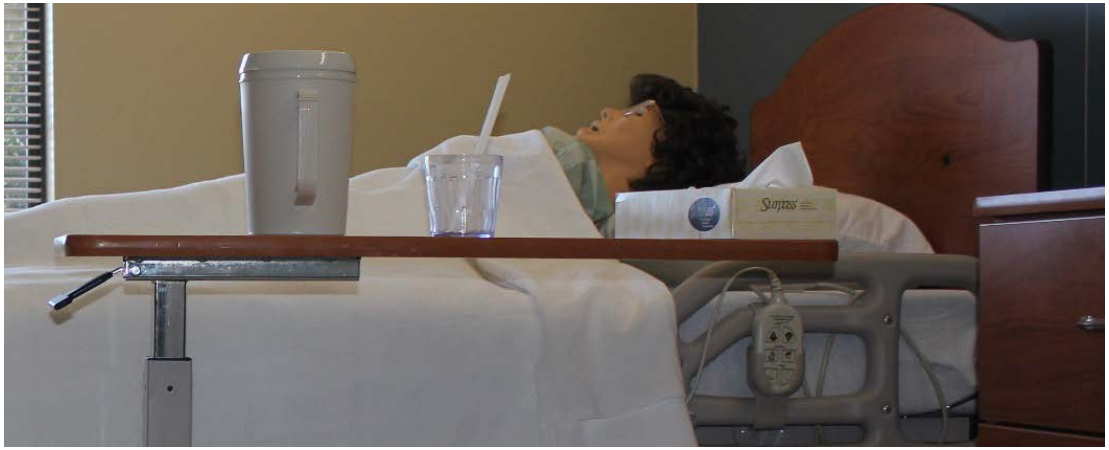
- **Water**
- **Milk**
- **Coffee**
- **Tea**
- **Juices**
- **Soups**
- **Soft drinks**

Fluids – Semi-liquid Foods

- Milkshakes
- Ice cream
- Sherbet
- Custard
- Pudding
- Gelatin
- Popsicles

Providing Drinking Water

- **Residents need fresh drinking water**
- **Before providing water, check with care plan or nurse**
- **Follow facility's procedure regarding time schedule and process**



Providing Drinking Water – Concepts

- **Ensure resident's name and room number are labeled on ice pitcher**
- **Check for cracks and chips in water pitcher and cup; make sure they are clean**
- **Never touch inside or rim**
- **Never take resident's used water pitcher directly to ice machine**
- **Never scoop ice with water pitcher**
- **Always place ice into the water pitcher first**

Special Fluid Orders

- **In order to maintain fluid balance, the doctor may order amount of fluid a resident must drink a day**
  - **Encourage fluids – increased fluids**
  - **Restrict fluids – limited fluids**
  - **Nothing by mouth (NPO) – no fluids (or food)**
  - **Thickened liquids – all fluids are thickened**
- **Located on the care plan**
- **Nurse aide must measure and record intake very carefully**

Determining Oral Fluids as Intake

- **To determine intake, nurse aide must know serving sizes of containers that fluids are served in a facility; typically found on I&O sheet**
- **Two methods**
  - **Measures**
  - **Using fractions**
- **Follow facility policy and/or procedure when determining intake of fluids during and between meals**

Typical Serving Sizes of Liquids

Water glass = 240 mL

Tea glass = 180 mL

Juice glass = 120 mL

Milk carton = 240 mL

Coffee cup = 240 mL

Soft drink can = 360 mL

Gelatin = 120 mL

Soup bowl = 180 mL

Determining Intake – Measures

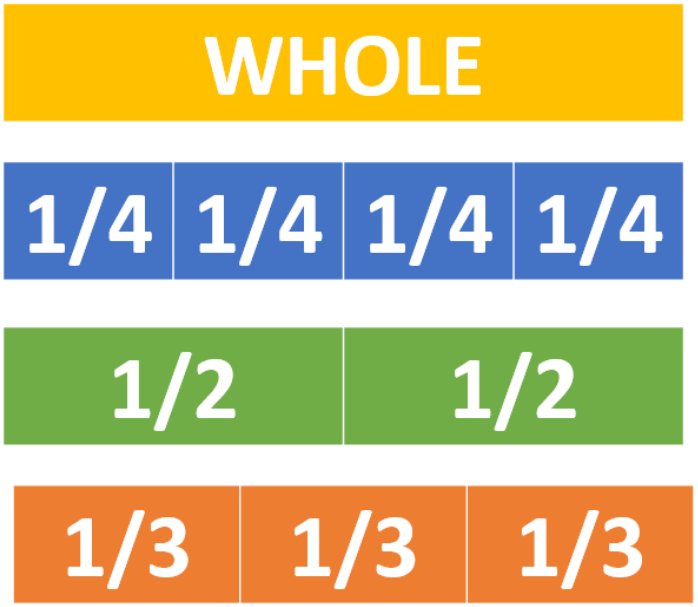
- The glass with the resident's apple juice holds 240 mL of fluid
- Using the graduate and measuring apple juice left in glass, the resident did not drink 120 mL of apple juice
- Subtracting 120 mL of apple juice the resident didn't drink from number of mL the glass holds
- Resident drank 120 mL of apple juice

Determining Intake – Fractions (1)

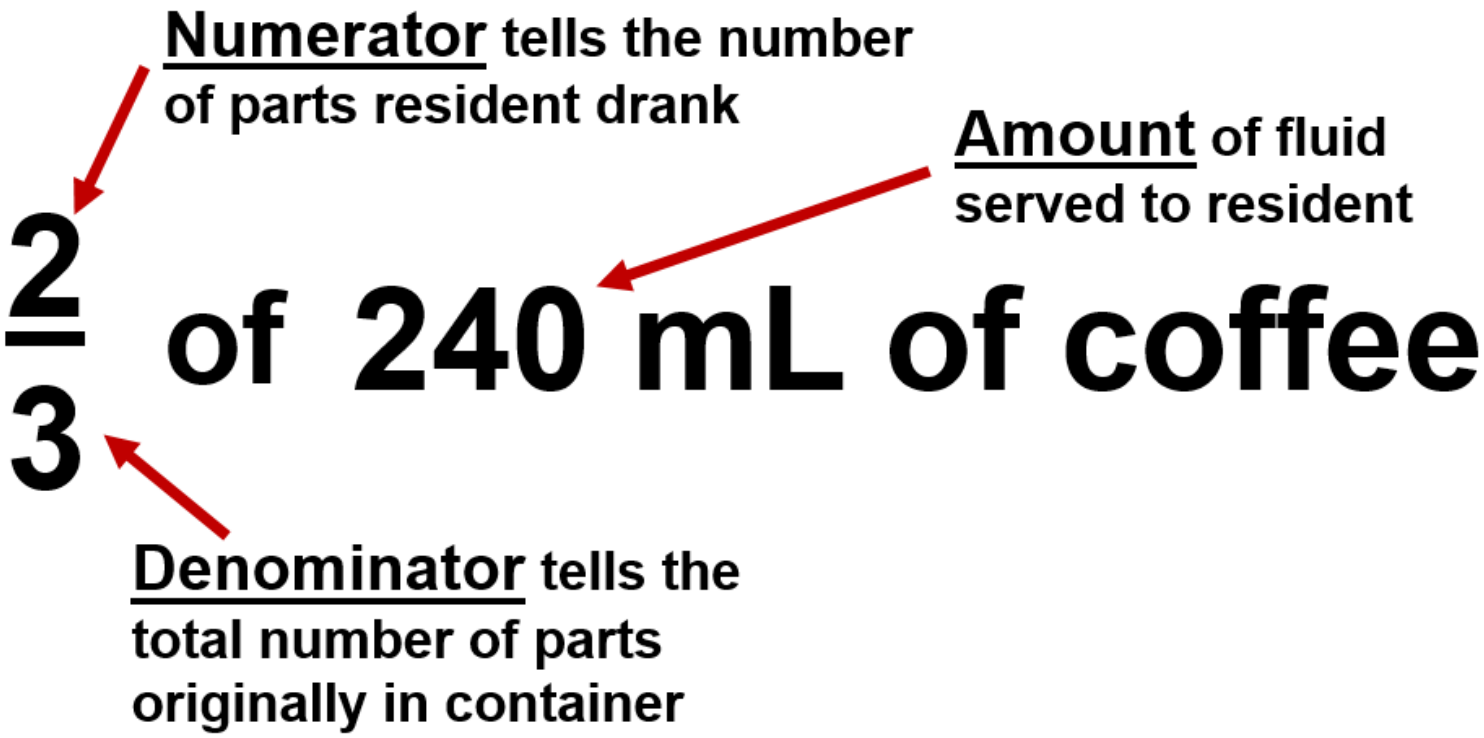
To determine fluid intake using fractions, the nurse aide needs a basic understanding of fractions in relation to a whole, which is 1

The entire bar is = 1 and includes

- **4 equal parts or 4 fourths**
- **2 equal parts or 2 halves**
- **3 equal parts or 3 thirds**



Determining Intake – Fractions(2)



Determining Intake – Fractions (3)

- 240 mL in the resident's coffee cup
- Resident drank 2/3 cup of coffee
- Resident drank 160 mL of coffee

$$\frac{2}{3} \text{ of } 240 \text{ mL of coffee}$$

$$\frac{2}{\cancel{3}_{1}} \times \frac{\cancel{240}^{80}}{1} = \frac{160}{1} = 160 \text{ mL}$$

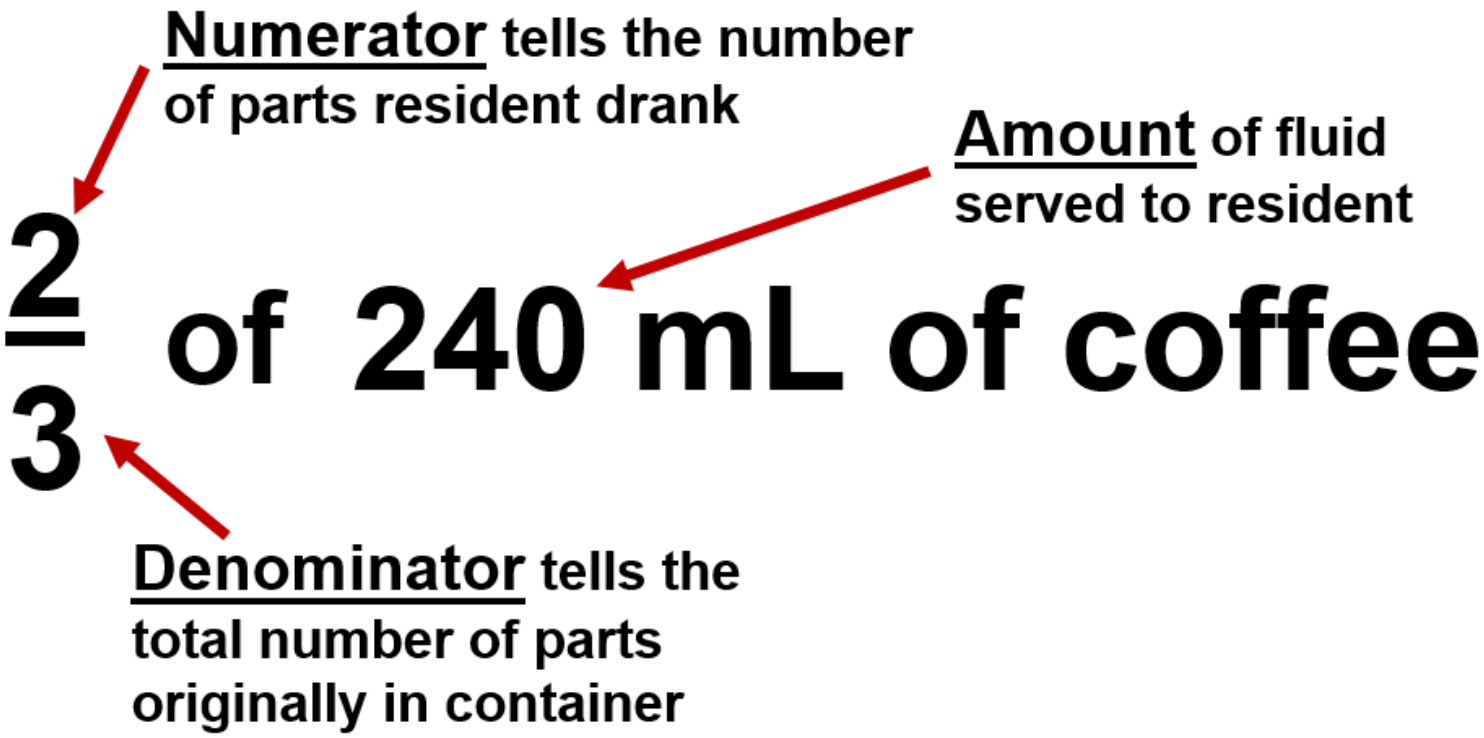
Determining Intake – Fractions (4)

- 240 mL in the resident's coffee cup
- Resident drank 1/2 cup of coffee
- Resident drank 120 mL of coffee

$$\frac{1}{2} \text{ of } 240 \text{ mL of coffee}$$

$$\frac{1}{2_1} \times \frac{\overset{120}{\cancel{240}}}{1} = \frac{120}{1} = 120 \text{ mL}$$

Recall Determining Intake – Fractions



Determining Intake – Fractions (Quick)

$\frac{2}{3}$ of 240 mL of coffee

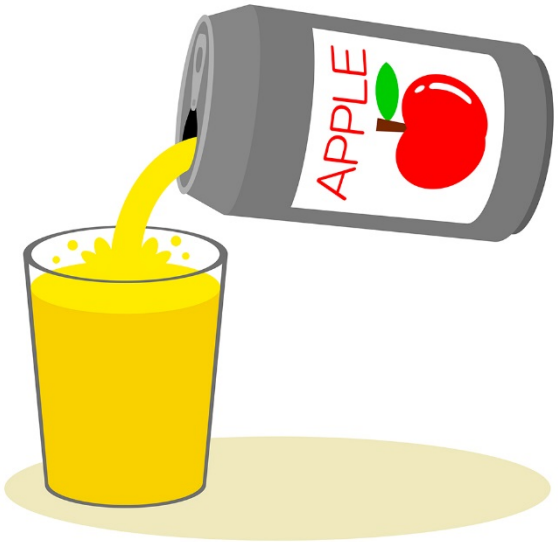
- Determine what 1 part of total coffee equals by dividing the total mL amount of coffee (240) by 3 = 80
- Resident drank 2 of the 3 parts of the coffee, so multiply 80 (which is 1 part) by 2 because the resident drank 2 of the 3 parts = 160
- The resident drank 160 mL of the coffee

Milliliters and Ounces

- **A common conversion in health care is changing (or converting) ounces to milliliters**
- **1 ounce = 30 mL**
- **To convert ounces to milliliters, simply multiply number of ounces by 30**

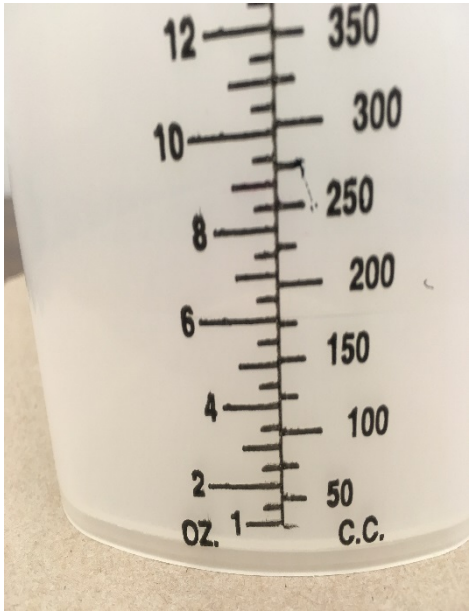
Conversion Problem – Apple Juice

- 8 fluid ounces of apple juice in the glass
- 1 fluid ounce = 30 milliliters (mL)
- 8 x 30 milliliters (mL) = 240 milliliters (mL)
- 240 mL of apple juice in the glass



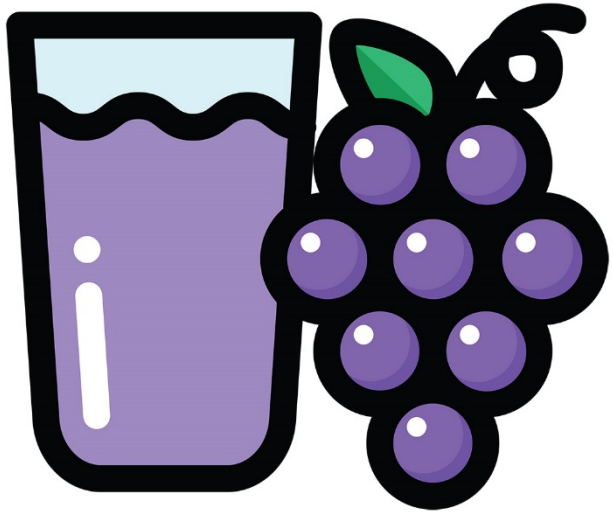
Milliliters and Cubic Centimeters

- Devices in health care are often marked in cubic centimeters (cc)
- A common conversion is changing (or converting) cc to milliliters (mL)
- 1 cubic centimeter (cc) = 1 milliliter (mL)
- To convert cc to mL, simply use the exact number measured

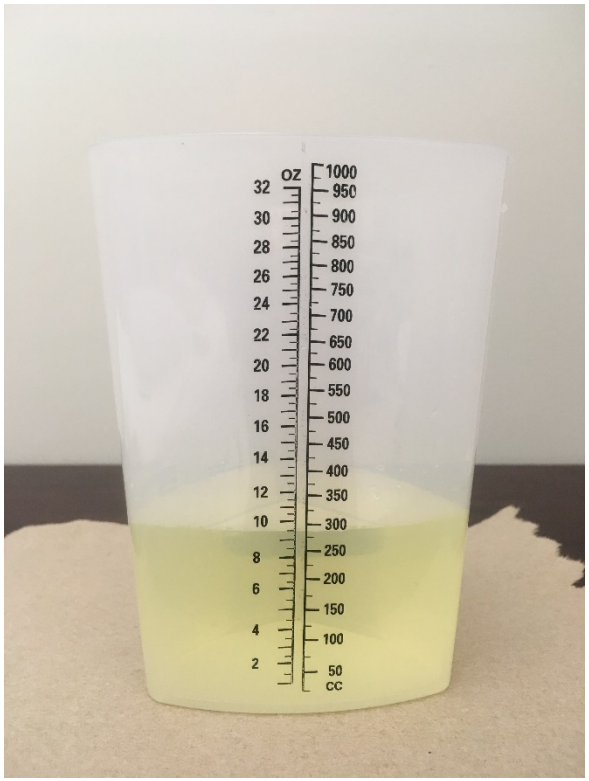


Conversion Problem – Grape Juice

- **120 cubic centimeters (cc) of grape juice in the glass**
- **1 cc = 1 milliliter (mL)**
- **120 mL of grape juice in the glass**



Fluids Considered as Output



Urine

Vomitus

Diarrhea

Wound drainage

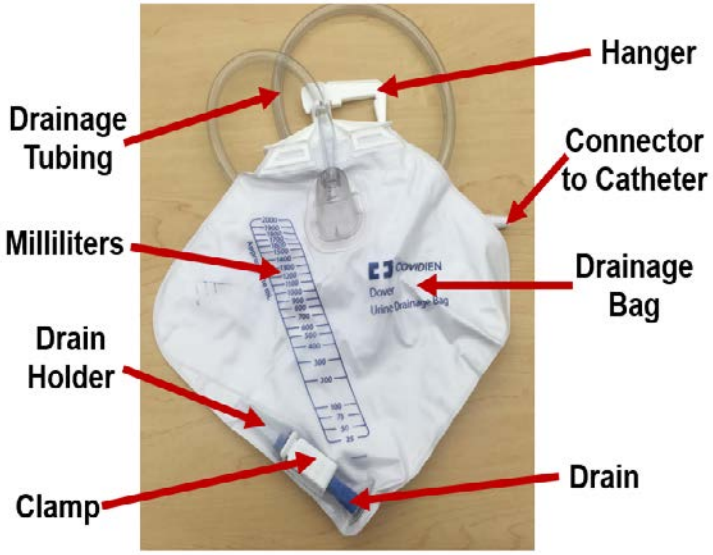
Gastric suction material

Devices That Collect Output

- **Catheter bag**
- **Urinal**
- **Commode hat**
- **Emesis basin**

Foley Catheter Bag

- **Connected to indwelling (Foley) catheter which drains bladder of urine**
- **Emptied into a measuring device at end of shift (or sooner, if full)**
- **Measurement done using measuring device instead of catheter bag**

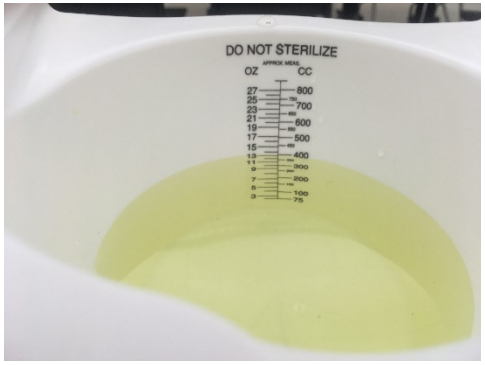


Urinal

- A plastic, elongated device used by men to urinate into
- Meant for single-resident use
- As a measuring device, marked in ounces and cc (same as mL), with 100 cc (mL) increments marked lines and 50 cc (mL) unmarked lines between

Commode Hat (Specimen Pan)

- **Plastic collection container placed under commode lid**
- **Used when resident on bathroom privileges and**
  - **Is on output**
  - **Urine or stool specimen is ordered**
- **Marked in ounces and cc (same as mL); grooved edge**

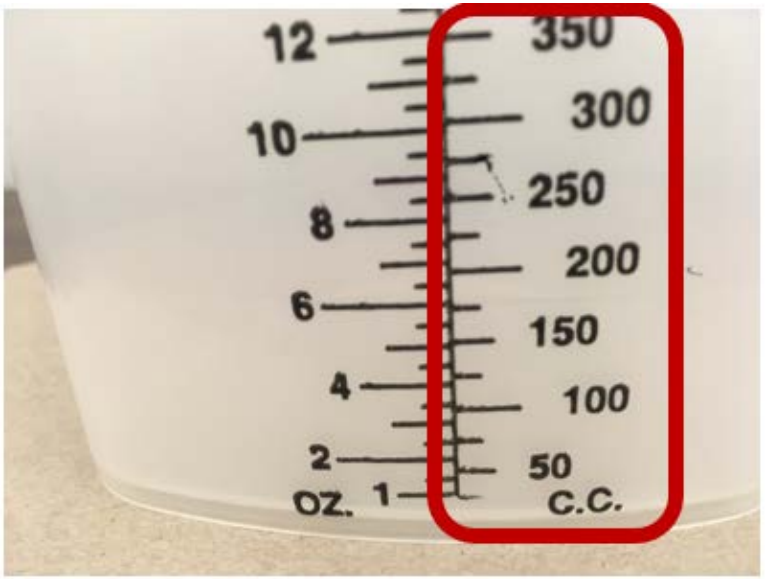


Emesis Basin

- **A plastic, shallow basin shaped like a kidney that fits against resident's neck and collects body fluids**
- **Used**
  - **During mouthcare**
  - **When a resident is nauseated**
- **Marked in ounces and cc (same as mL) with 100 cc (mL) increments**

RECALL: Units of Measure for the Graduate

- **The C.C. (cubic centimeter) side of the measurement scale is used in health care**
- **Recall 1 C.C. on the graduate = 1 milliliter (mL)**

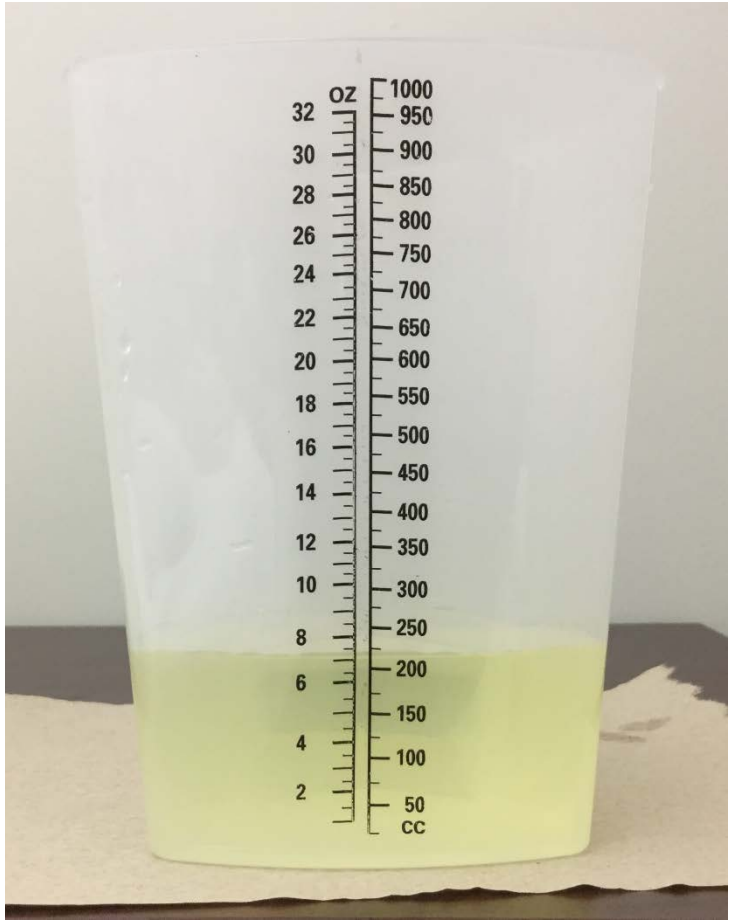


Shortest line represents either 25 cc/mL or 75 cc/mL

Longest lines represent multiples of 50 cc/mL

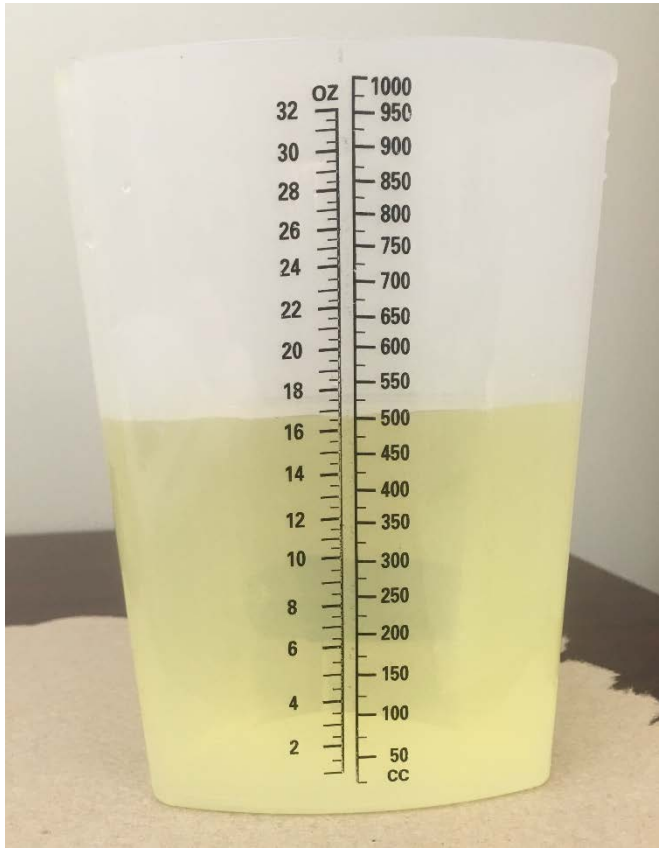
Measuring Urine #1

- **Long line = 200 cc (mL)**
- **Short line = 25 cc (mL)**
- **Amount = 225 cc (mL)**
- **Document = 225 mL**



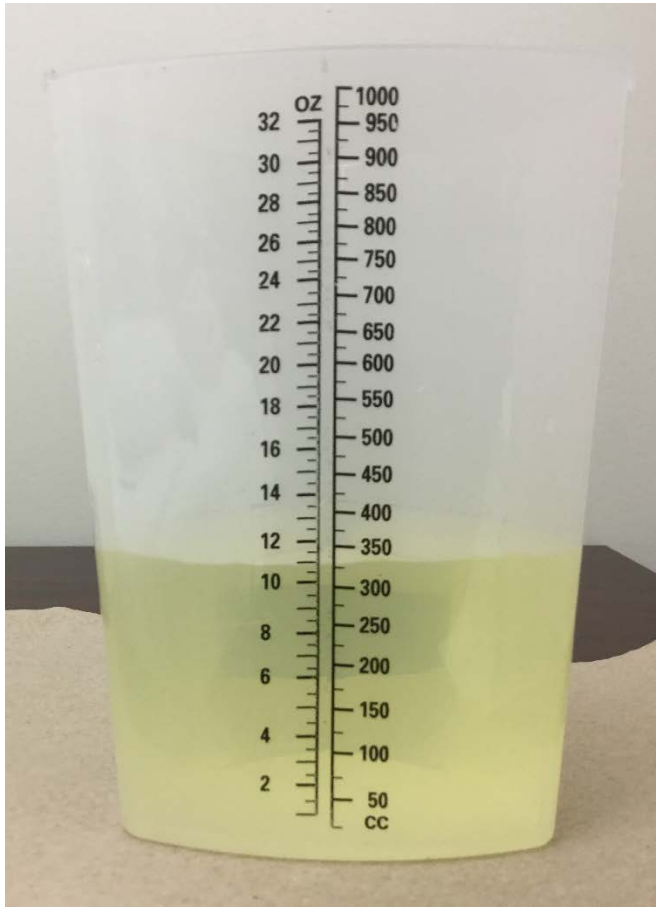
Measuring Urine #2

- **Long line = 500 cc (mL)**
- **Amount = 500 cc (mL)**
- **Document = 500 mL**



Measuring Urine #3

- **Long line = 300 cc (mL)**
- **Short line = 25 cc (mL)**
- **Amount = 325 cc (mL)**
- **Document = 325 mL**



Determining/Documenting Food Intake

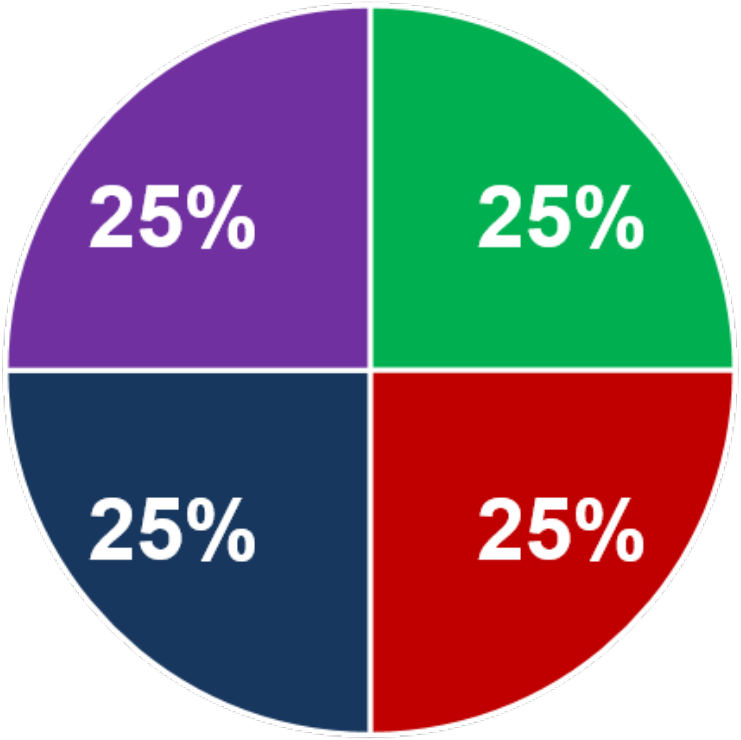
Determining Intake of Meals Accurately

Importance

- **Identifies residents at risk for or already experiencing impaired nutrition**
- **Food intake is one of the factors that reflects the resident's nutritional status**
- **Poor food intake at meals or changes in food intake that persists for multiple meals may indicate underlying problem or illness and should be reported to the nurse**
- **Much of a resident's daily fluid intake comes from meals; when resident has decreased appetite, can result in fluid/electrolyte imbalance**

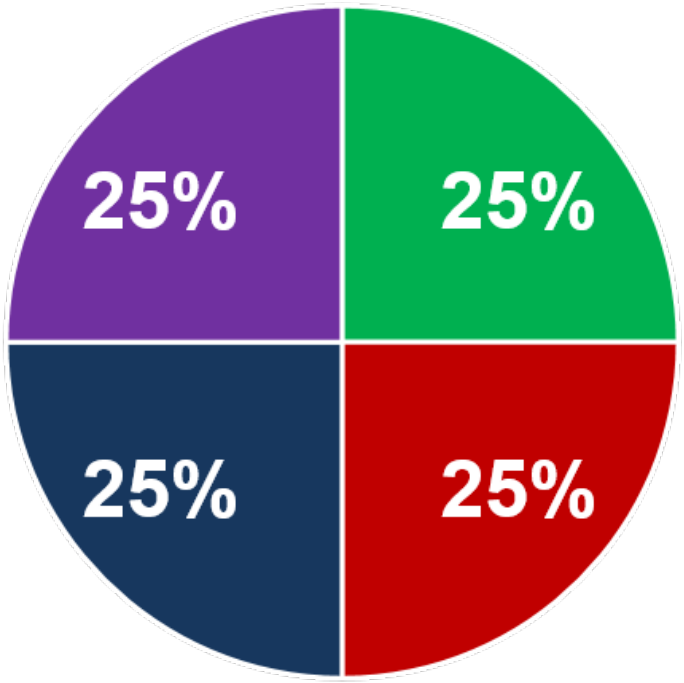
Determining Food Intake

- **Nurse aide compares amount of food eaten with amount of food served**
- **To measure food intake, nurse aide needs a basic understanding of percentages in relation to a whole, which is 100%**



Understanding Percentages of a Whole

- **The entire circle = 100% and includes 4 equal parts**
- **Each 25% is ¼ of the whole**
- **25% + 25% = 50% (or ½ of the whole)**
- **25% + 25% + 25% = 75% (or ¾ of the whole)**



Determining Food Intake (1)

Follow facility procedure regarding determining and documenting food intake, for example

- **Listing exact food eaten (all of chicken, all of green beans, ½ of mashed potatoes, ¼ of biscuit, all of pie)**
- **Using specific words (all, good, fair, poor, refused)**
- **Using percentages of food eaten (100%, 75%, 50%, 25%, 0%)**

The Resident is Served His Meals

Breakfast consists of 2 eggs, 2 slices of bacon, fried apples, grits, biscuit, coffee, and apple juice

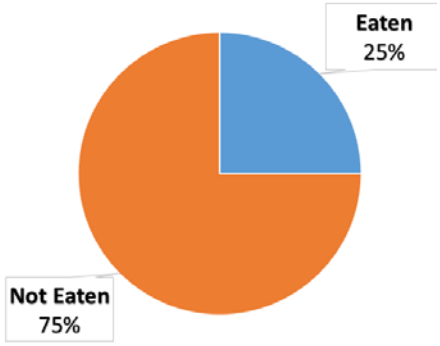
Lunch consists of 4 grilled chicken tenders, mashed potatoes, broccoli, a corn muffin, coffee, and water

Resident Ate 0% of Meals (Refused)

Breakfast

Lunch

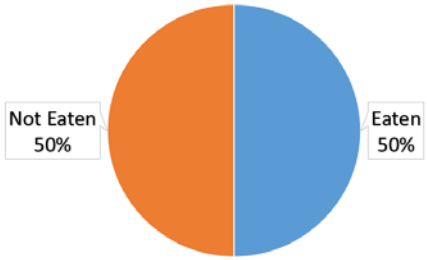
Resident Ate 25% of Meals (Poor)



Breakfast

Lunch

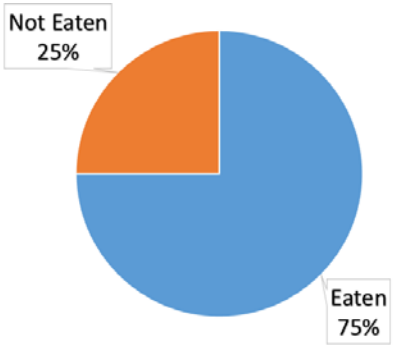
Resident Ate 50% of Meals (Fair)



Breakfast

Lunch

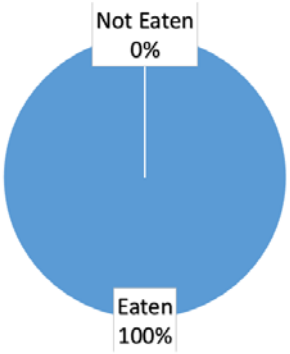
Resident Ate 75% of Meals (Good)



Breakfast

Lunch

Resident Ate 100% of Meals (All)



Breakfast

Lunch

Module AA Measurement
Weight and Height

Weight and Height – Overview

- **Weight and height measured on admission to the facility**
- **Units of measure per facility policy**
  - **Weight may be measured in pounds or kilograms**
  - **Height may be measured using feet and inches or just inches**
- **After admission**
  - **Height typically not measured again**
  - **Weight measured per facility policy and/or doctor's orders as directed by nurse and care plan – daily, weekly, monthly**

Weights of Residents in Long-term Care

- **Current standards of practice recommend weighing resident on admission/readmission, weekly for first 4 weeks after admission, and at least monthly thereafter**
- **Crucial that weight is obtained accurately and consistently**
  - **Facility-wide scales are calibrated and functioning appropriately**
  - **A consistent process in place**

Weights – Consistent Process

Weigh the resident:

- **Wearing a similar type of clothing**
- **At approximately the same time of the day (preferably before breakfast)**
- **Using the same scale**
- **Either consistently wearing or not wearing orthotics or prostheses**

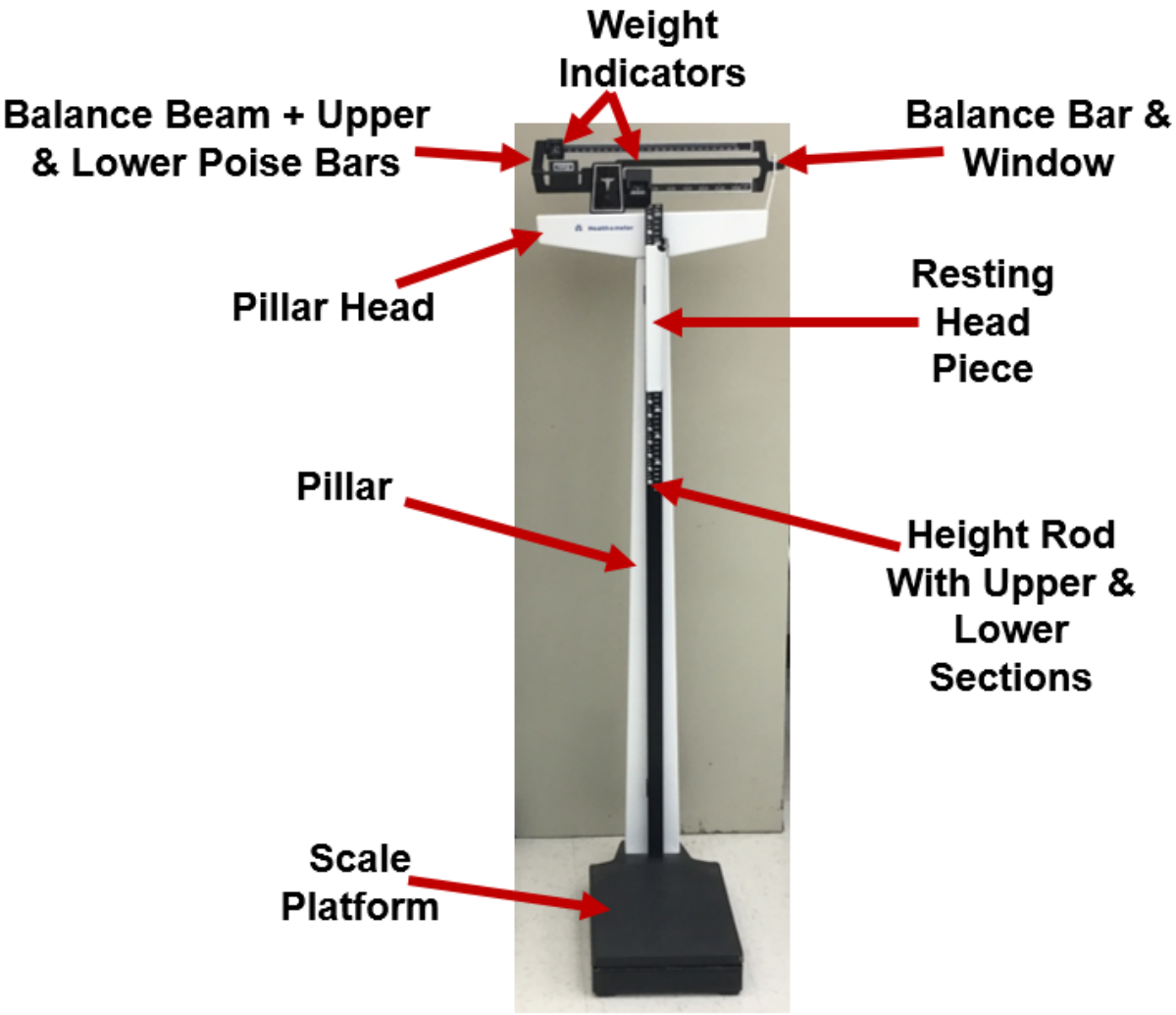
Accurate Weights – Importance

- **Weight is a parameter that reflect resident's nutritional status**
- **Fluid loss or retention can cause short term weight changes; abrupt weight changes along with change in food intake are signs of fluid and electrolyte imbalance**
- **Weight loss may be important indicator of a change in resident's health status or sign of malnourishment**
- **If significant weight loss noted, health care team reviews for possible causes**

Physician Mechanical Beam Scale (1)

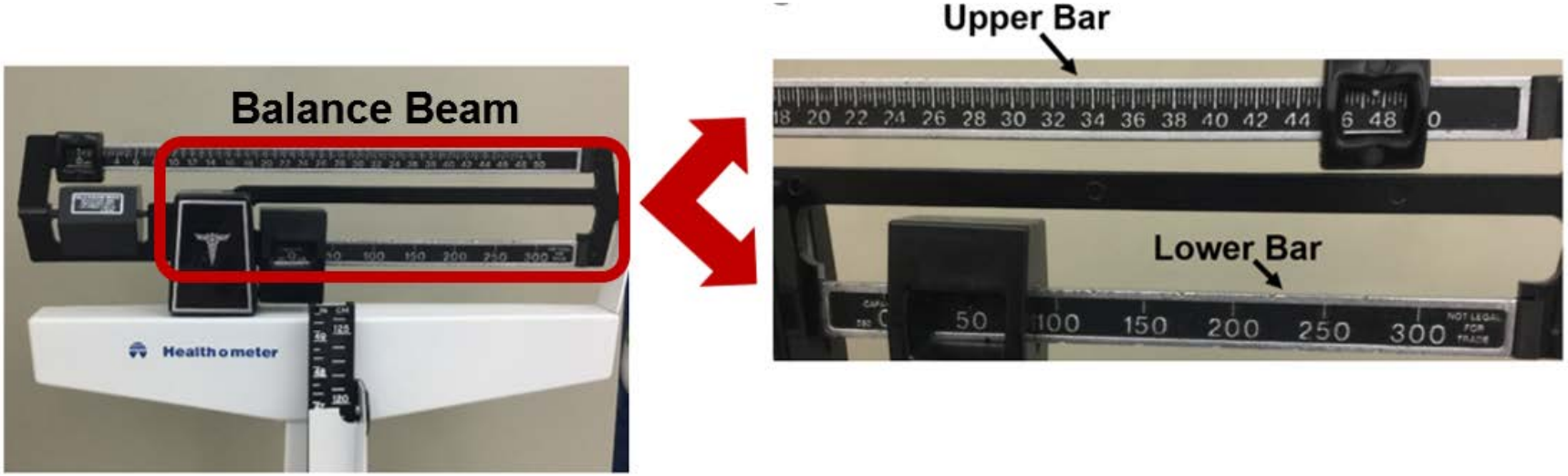
- **Used for measuring weight and height**
- **Residents who cannot stand**
  - **Weighed using chair, wheelchair, bed, or mechanical lift, as directed by nurse or care plan**
  - **Height measured in bed using tape measure and ruler**

Physician Mechanical Beam Scale (2)



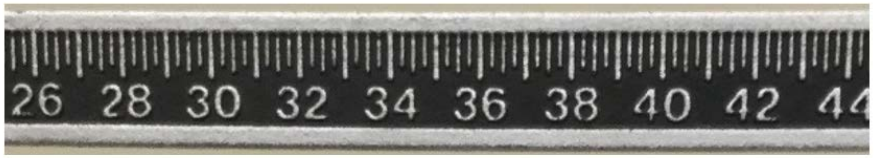
Balance Beam

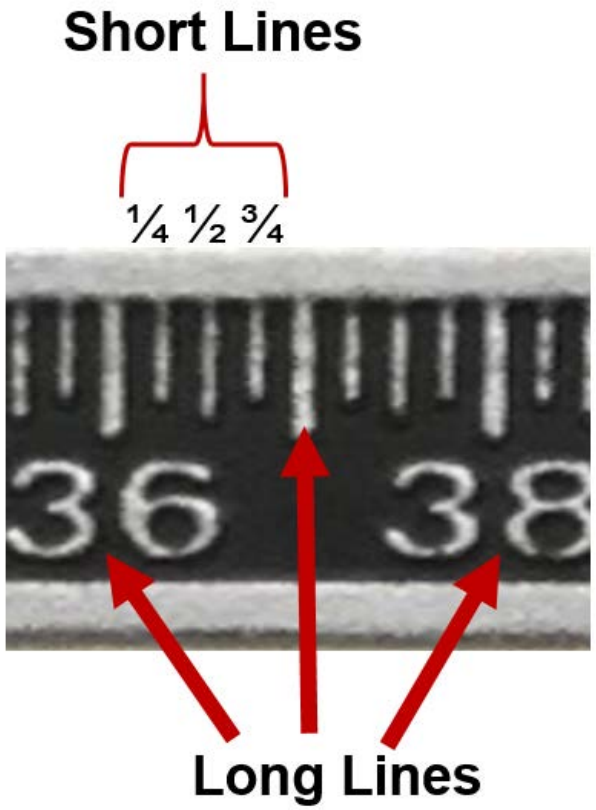
- **Has 2 poise bars – upper and lower**
- **May include pounds only or pounds on the top part of each bar and kilograms on the bottom part of each bar; may have interchangeable pound and kilogram bars**



Upper Poise Bar

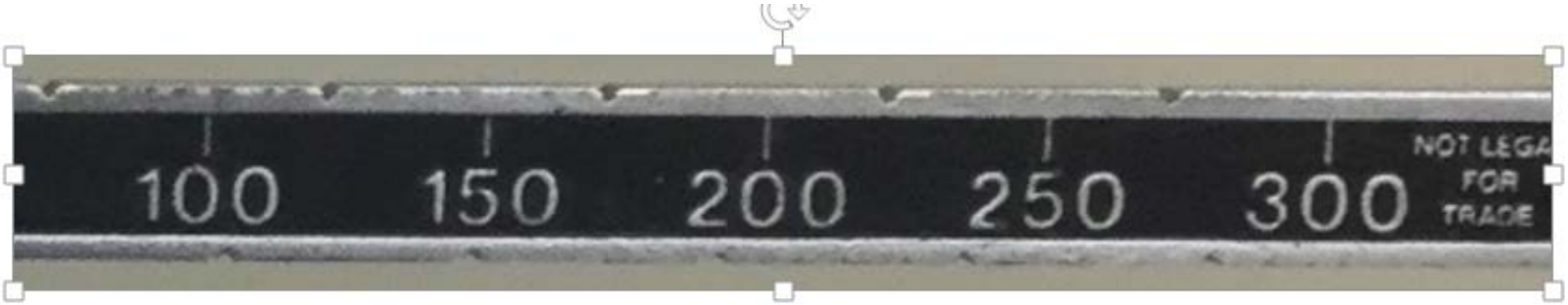
- **Long lines represent pounds**
- **Short lines represent ¼ pounds each; increments include ¼, ½, ¾**





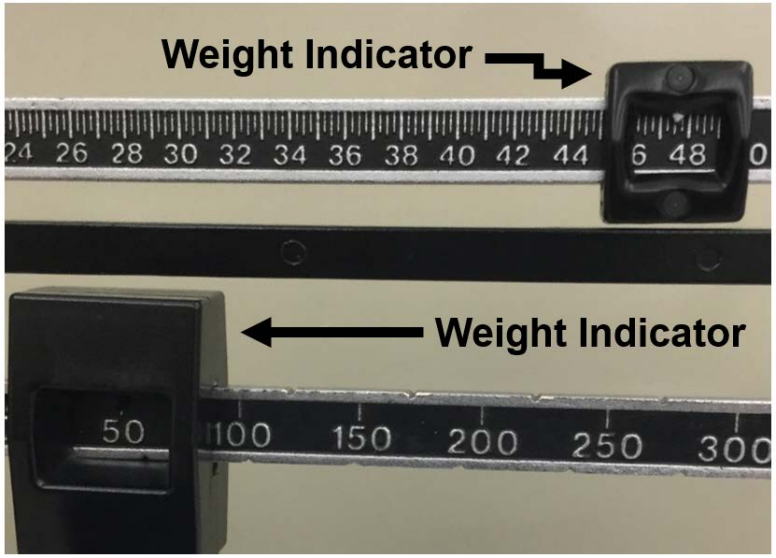
Lower Poise Bar

- **Single lines represent increments of 50 pounds**
- **Grooves located along the top of the lower bar align with weight increments**



Weight Indicators

- **Both upper and lower bars have movable weight indicators**
- **The weight indicator for the lower bar fits into the groove as weight is obtained**

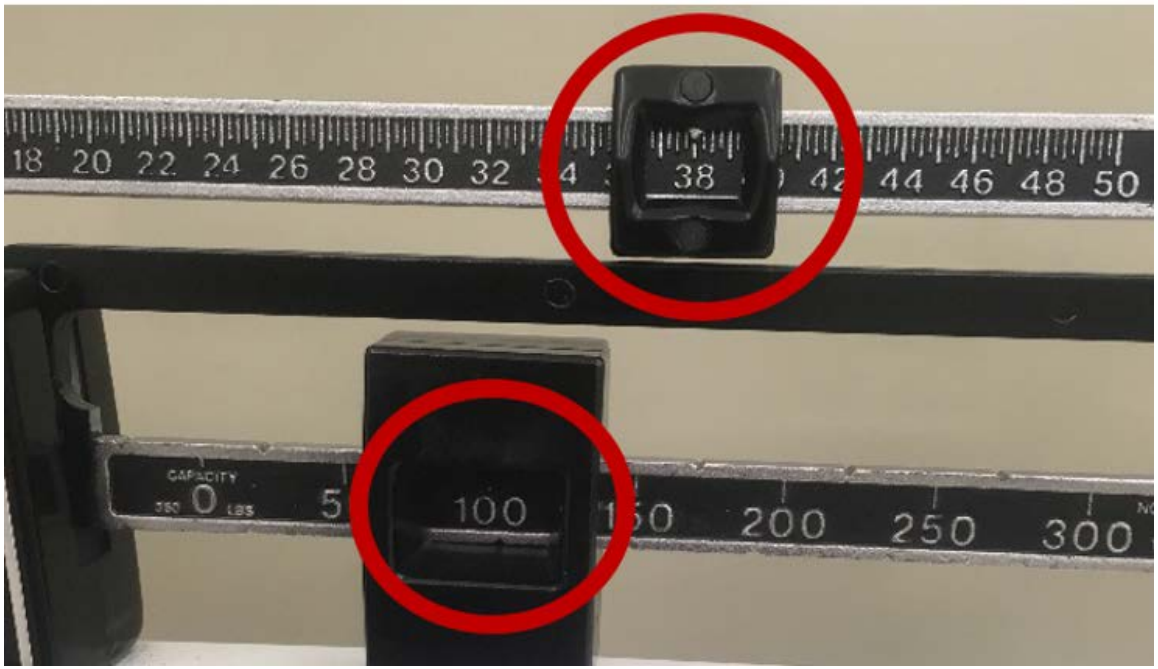


Balance Bar and Balance Window

- **Ensure balance bar floats freely and in center of window when poise bars set on 0 and resident is not standing on scale platform**
- **If balance bar is off-center and/or touching window, do not weigh resident and notify nurse**

Reading the Weight

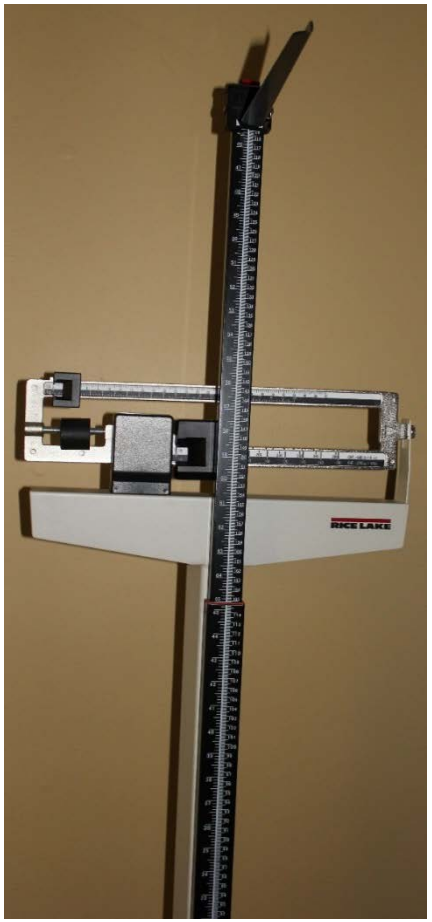
To determine weight: add the value for the lower bar to the value for the upper bar



100 pounds + 38 pounds = 138 pounds

Height Component – Head Piece

- **Becomes active when extended upward in preparation for measuring resident's height**
- **Lowered and placed on resident's head and height measured**
- **Becomes at rest when flat and low against height rod**



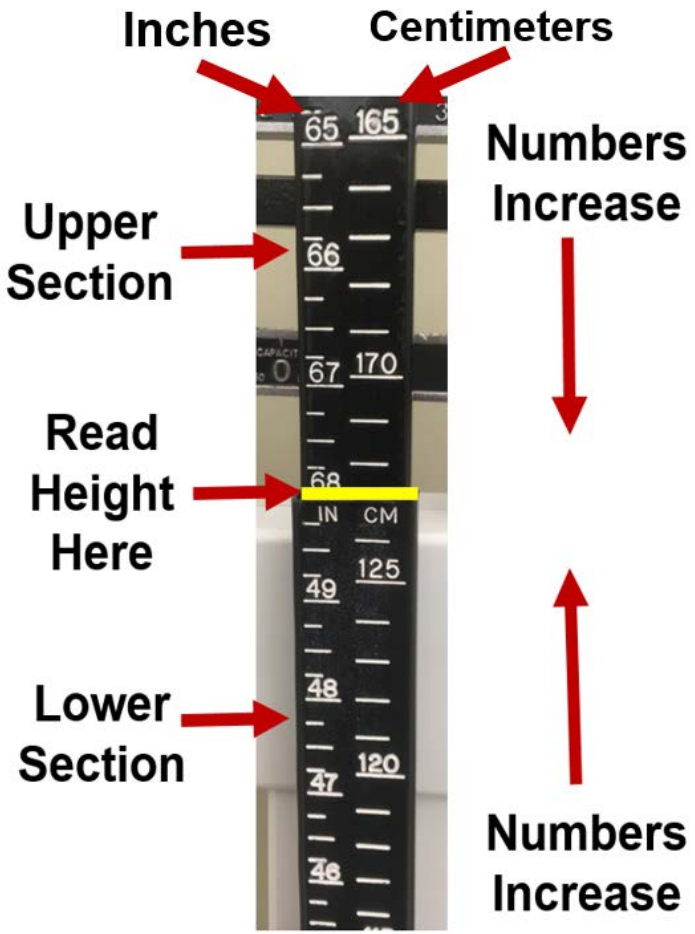
Height Component – Rod (1)

2 Units of measure

- Inches
- Centimeters

2 sections

- Movable upper section
- Non-movable lower section



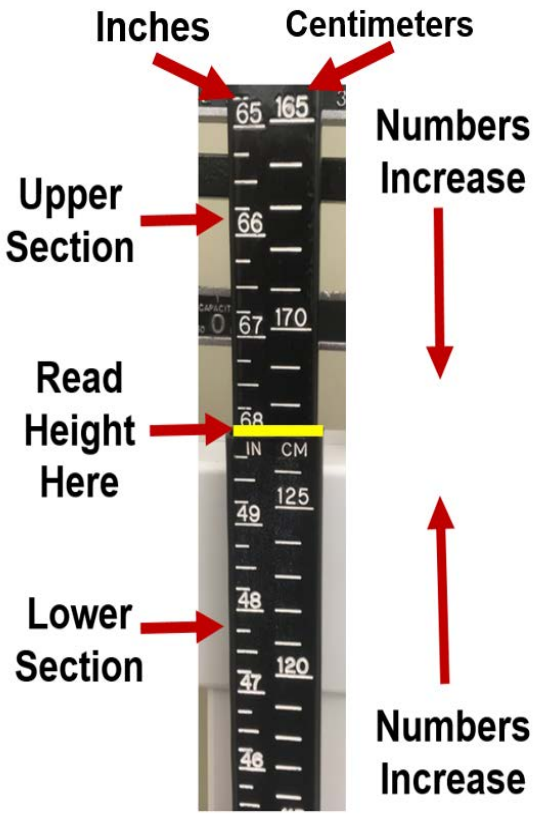
Height Component – Rod (2)

Movable upper section

- Raised or lowered to adjust to resident's height
- "Read height here" area is the location of the weight value if resident's height is located in this section
- Numbers increase from top to bottom

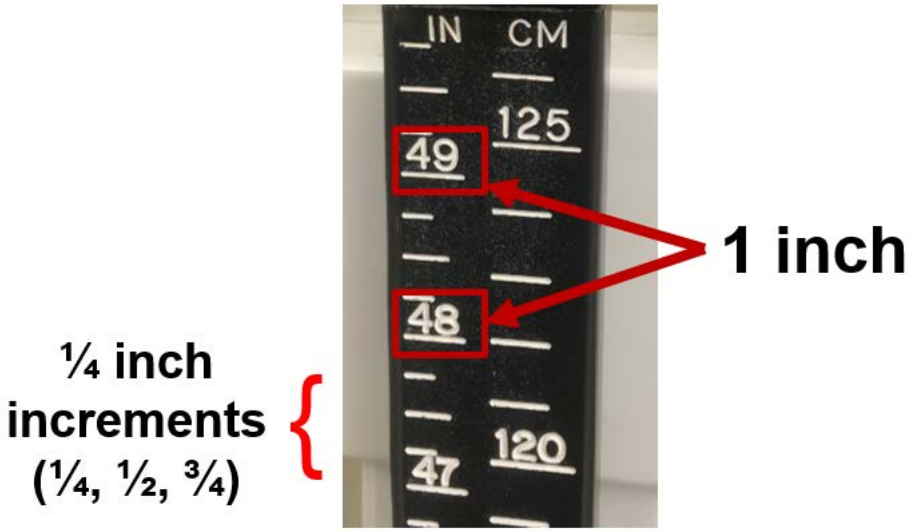
Non-movable lower section

- Height read in lower section if resident's height is located in this area
- Numbers increase from bottom to top



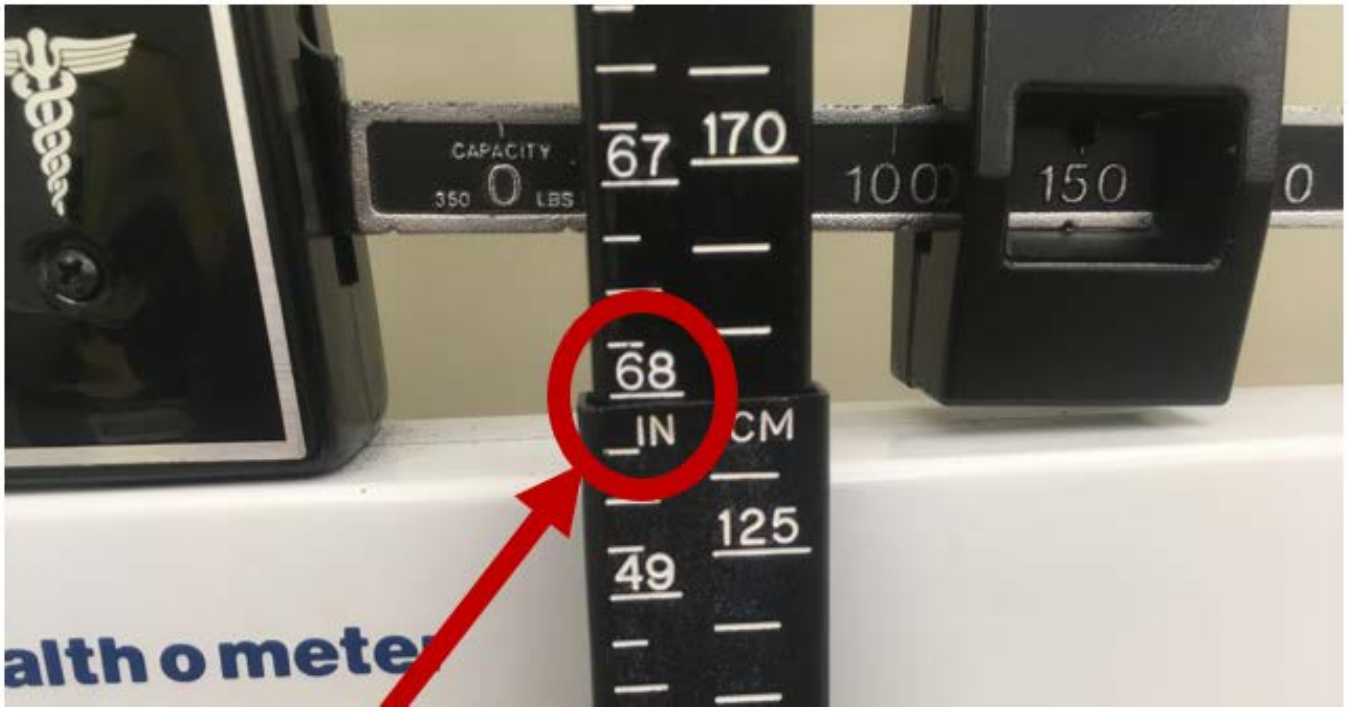
Measuring the Height (1)

- **When measuring in feet and inches using height rod**
  - **Long lines represent inches**
  - **Shorter lines represent ¼ inch each; increments include ¼, ½, ¾**
- **Read height to the nearest ¼ inch**



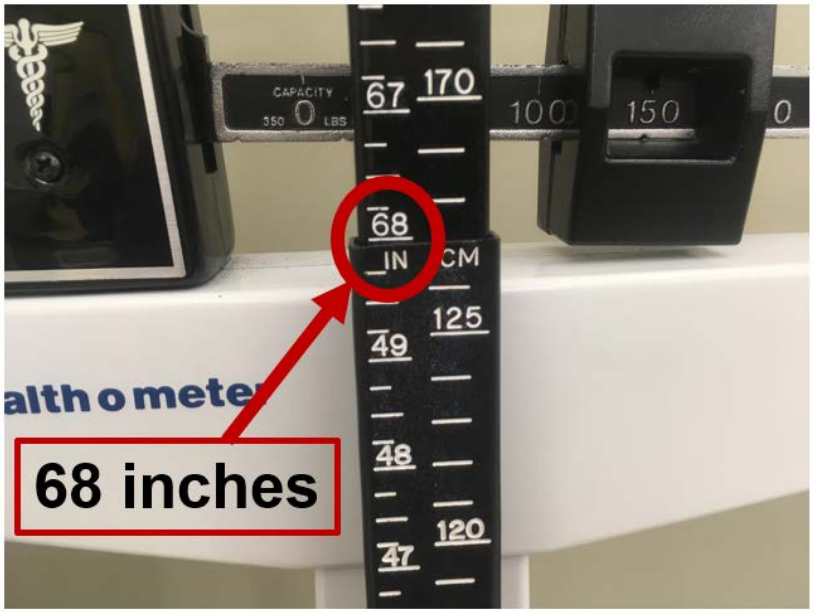
Measuring the Height (2)

How tall is the resident?



Converting Inches into Feet and Inches

- **Resident's height is 68 inches**
- **How does the nurse aide convert 68 inches to feet and inches?**

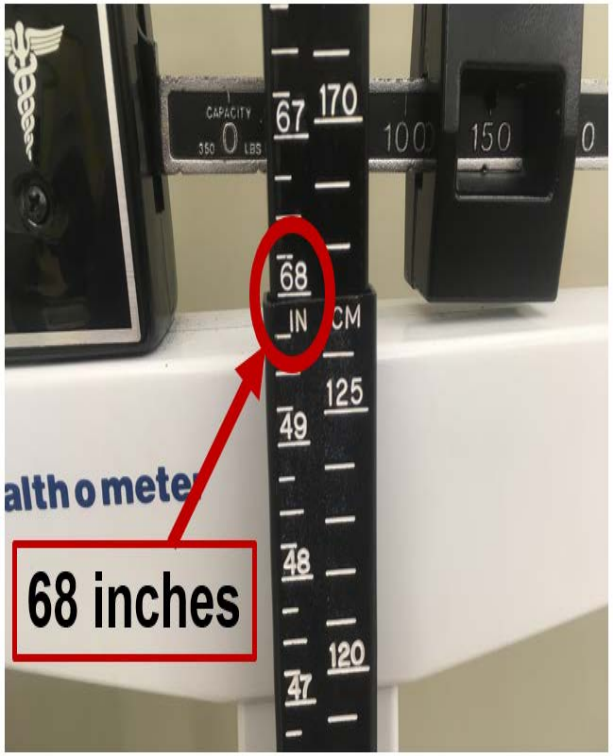


Converting Inches into Feet/Inches

- To convert inches to inches and feet
- Divide the number of inches by 12
- The quotient is the feet and the remainder (if there is one) is the inches

Height in Feet and Inches

- **Resident's height is 68 inches**
- **How does the nurse aide convert 68 inches to feet and inches?**
  - **1 foot = 12 inches**
  - **Divide 68 inches by 12 inches**
  - **Quotient = 5, remainder = 8**
  - **Answer = 5 feet, 8 inches**



Resident's height is 68 inches or 5 feet, 8 inches