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
  o Inspiration (inhalation) – breathing in oxygen; chest rises
  o 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
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:

<table>
<thead>
<tr>
<th>“Start”</th>
<th>“Stop”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second hand on 3</td>
<td>Second hand on ?</td>
</tr>
<tr>
<td>Second hand on 6</td>
<td>Second hand on ?</td>
</tr>
<tr>
<td>Second hand on 10</td>
<td>Second hand on ?</td>
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<tr>
<td>Second hand on 12</td>
<td>Second hand on ?</td>
</tr>
<tr>
<td>Second hand on 8</td>
<td>Second hand on ?</td>
</tr>
<tr>
<td>Second hand on 1</td>
<td>Second hand on ?</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
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<td>Second hand on ?</td>
</tr>
<tr>
<td>Second hand on 6</td>
<td>Second hand on ?</td>
</tr>
</tbody>
</table>
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

\[ \frac{120}{80} \]
(systolic)
(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

- Binaurals
- Ear Pieces
- Bell
- Chest-piece
- Diaphragm
- Tubing
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)

Short lines 2 mm Hg

Long lines 10 mm Hg
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
  - (#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 – 98.6°F
  - Normal range – 97.6°F to 99.6°F
- **Rectal**
  - Baseline – 99.6°F
  - Normal range – 98.6°F to 100.6°F
- **Axillary**
  - Baseline – 97.6°F
  - Normal range – 96.6°F to 98.6°F
Temperature Values (2)

• Tympanic membrane
  o Baseline – 98.6°F
  o Normal range – 97.6°F to 99.6°F

• Temporal
  o Baseline – 98.6°F
  o Normal range – 97.6°F to 99.6°F
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
  o Encourage fluids – increased fluids
  o Restrict fluids – limited fluids
  o Nothing by mouth (NPO) – no fluids (or food)
  o 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
  o Measures
  o 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)

\[ \frac{2}{3} \] of 240 mL of coffee

**Numerator** tells the number of parts resident drank

**Denominator** tells the total number of parts originally in container

**Amount** of fluid served to resident
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

\[
\frac{2}{3} \text{ of } 240 \text{ mL of coffee} = \frac{2}{3} \times \frac{240}{1} = \frac{160}{1} = 160 \text{ mL}
\]
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

\[
\frac{1}{2} \text{ of } 240 \text{ mL of coffee} \\
\frac{1}{2} \times \frac{240}{1} = \frac{120}{1} = 120 \text{ mL}
\]
Recall Determining Intake – Fractions

\[
\frac{2}{3} \text{ of 240 mL of coffee}
\]

- **Numerator** tells the number of parts resident drank
- **Denominator** tells the total number of parts originally in container
- **Amount** of fluid served to resident
Determining Intake – Fractions (Quick)

\[ \frac{2}{3} \text{ of } 240 \text{ mL of coffee} \]

- 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
  o During mouthcare
  o 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)

Not Eaten 50%
Eaten 50%

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
  o Weight may be measured in pounds or kilograms
  o Height may be measured using feet and inches or just inches
• After admission
  o Height typically not measured again
  o 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
  o Facility-wide scales are calibrated and functioning appropriately
  o 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
  o Weighed using chair, wheelchair, bed, or mechanical lift, as directed by nurse or care plan
  o Height measured in bed using tape measure and ruler
Physician Mechanical Beam Scale (2)

- Balance Beam + Upper & Lower Poise Bars
- Pillar Head
- Pillar
- Scale Platform
- Weight Indicators
- Balance Bar & Window
- Resting Head Piece
- Height Rod With Upper & Lower Sections
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 $\frac{1}{4}$ pounds each; increments include $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
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
  o Long lines represent inches
  o Shorter lines represent ¼ inch each; increments include ¼, ½, ¾

• Read height to the nearest ¼ inch

1 inch

¼ inch increments (¼, ½, ¾)
Measuring the Height (2)

How tall is the resident?

The resident is 68 inches tall.
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

1 foot = 12 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