Disclosures

• The presenter serves as a clinical education consultant for ∆V∆NOS through Kelly Outsourcing and Consulting Group.

• This program may contain the mention of drugs or brands presented in a case study or comparative format using evidence-based research. Such examples are intended for educational and informational purposes and should not be perceived as an endorsement of any particular supplier, brand or drug.
Issues in Enteral Feeding: Malnutrition

Objectives

• Explain why malnutrition is a significant clinical problem in acute health care settings in the United States

• Describe how to recognize when a patient is malnourished and would benefit from nutritional support

• Discuss use of enteral & parenteral feeding in malnourished patients

• Summarize the importance of establishing a multidisciplinary care team to improve nutrition intervention.
Malnutrition is a dietary deficiency when intake of nutrients is too high, too low or poorly balanced.
The prevalence of malnutrition in older adults (aged ≥ 65y) in Europe and North America is:

- 1-15% in noninstitutionalized older adults
- 25-60% in geriatric care facilities
- 35-65% in hospitals

Malnutrition

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In the year 2050, it is predicted that the percentage of people in developed countries over the age of 80 will grow from 9% to 19%

RESULT: An increase of older adults at risk of malnourishment

Malnutrition

The prevalence of illness-related malnutrition in hospitalized children: 6-51%

*Malnutrition is probably under recognized*

Malnutrition

- 1/3rd of patients have some degree of malnutrition when admitted to hospital

- 2/3rds of those patients will have further decline in nutrition during inpatient stay if left untreated

In your estimation, what percentage of adult patients are malnourished when admitted to your hospital/healthcare facility?

A. 5%
B. 10%
C. 20%
D. 30%
E. >30%
Causes of Malnutrition

- Inadequate food intake
- Mental health conditions
- Eating disorder
- Digestive disorders/stomach conditions
- Alcoholism
- Difficulty obtaining/preparing healthy food
- Increased/changed metabolic demands
Causes of Malnutrition

Additional risk factors:

• Older age
• Hospitalization
• Residence in a long-term care facility

*Older patients are at high risk, with malnutrition impacting up to 60% of hospitalized older adults*
Signs and Symptoms of Malnutrition

- Lack of appetite
- Fatigue/irritability
- Inability to concentrate
- Feeling cold
- Loss of fat/muscle/body tissue
Signs and Symptoms of Malnutrition

- Lack of appetite
- Fatigue/irritability
- Inability to concentrate
- Feeling cold
- Loss of fat/muscle/body tissue
- Frequent illness/delayed recovery
- Delayed wound healing
- Complications after surgery
- Depression
- Reduced sex drive
- Problems with fertility
Signs and Symptoms of Malnutrition

In more severe cases:

- Dyspnea
- Skin that is thin, dry, inelastic, pale, cold
- Hollow cheeks
- Sunken eyes
- Hair that is dry and sparse
- Respiratory failure
- Heart failure
- Unresponsiveness
Consequences of Malnutrition

MALNUTRITION

↓ quality of life

↑ hospital costs

↑ readmissions

↑ morbidity/mortality

↑ length of hospital stay

↑ hospital costs
Diagnosis & Treatment of Malnutrition

MALNUTRITION

Dietary deficiency  Imbalance  Too little  Complications

Dietary deficiency  Imbalance  Too much  Complications
Diagnosis of Malnutrition

- Two or more characteristics needed for malnutrition diagnosis
  - Insufficient energy intake
  - Weight loss
  - Loss of muscle mass
  - Loss of subcutaneous fat
  - Localized/generalized fluid accumulation
  - Diminished functional status
Nutrition Screening is a process to:

- identify an individual who is malnourished or who is at risk for malnutrition

- determine if a detailed nutrition assessment is indicated

A.S.P.E.N.: American Society for Parenteral and Enteral Nutrition
Nutrition screening should be done:

A. on patients who appear malnourished
B. on all hospitalized patients
C. at the discretion of the admitting physician
D. none of the above
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Nutrition Screening

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Nutrition Screening is recommended for all hospitalized patients

A.S.P.E.N.: American Society for Parenteral and Enteral Nutrition
Nutrition Screening Tools

- Malnutrition Screening Tool (MST)
- Malnutrition Universal Screening Tool (MUST)
- Mini Nutritional Assessment – Short Form (MNA-SF)
- Nutritional Risk
The MST Screening Tool asks questions on:

• Weight Change
• Appetite
1. Have you lost weight recently without trying?

**WEIGHT LOSS SCORE:**

<table>
<thead>
<tr>
<th>Response</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
</tbody>
</table>

If YES, how much weight (kg) have you lost?

<table>
<thead>
<tr>
<th>Range</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>1</td>
</tr>
<tr>
<td>6-10</td>
<td>2</td>
</tr>
<tr>
<td>11-15</td>
<td>3</td>
</tr>
<tr>
<td>&gt;15</td>
<td>4</td>
</tr>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
</tbody>
</table>
2. Have you been eating poorly because of a decreased appetite?

<table>
<thead>
<tr>
<th>Response</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>0</td>
</tr>
<tr>
<td>YES</td>
<td>1</td>
</tr>
</tbody>
</table>

APPETITE SCORE: __________
Nutrition Screenings

MST Screening Tool

Total MST Score =

WEIGHT LOSS SCORE:

APPETITE SCORE:
Determination of Nutrition Support

- Type of nutritional support utilized
  - Severity of malnutrition
  - Presence of underlying conditions/complications
  - Ability to feed oneself
  - Ability to eat/digest food normally
  - Age
  - Mental state
  - Setting
Types of Nutrition Support

- Oral Nutrition Supplements
- Enteral Nutrition Supplements
- Parenteral Nutrition Supplements
Oral Nutrition Supplements

• Nutritionally complete supplements
• Nutritionally incomplete supplements
• Modular supplements
• Disease-specific supplements
Enteral Nutrition

Definition of Enteral Nutrition (EN):

The delivery (via a tube) of a nutritionally complete liquid food mixture consisting of proteins, carbohydrates, fats, mineral, vitamins and water into the stomach, duodenum or jejunum of patients with normally functioning GI tracts.
Enteral Nutrition
Types of Feeding Tubes

- Nasogastric
- Nasoduodenal
- Nasojejunal
- Orogastric
- Orojejunal
- Transesophageal
- Gastrostomy (G-tube)
- Percutaneous endoscopic gastrostomy (PEG)
- Jejunostomy (J-tube)
- Percutaneous endoscopic jejunostomy (PEJ)
- Gastrojejunostomy
Enteral Feeding Formulas

- Standard polymeric
- High-calorie polymeric
- High-protein polymeric
- Polymeric with fiber
- Oligomeric
- Diabetic
- Immunomodulating
- Modular
- Pulmonary
- Renal
Potential Complications of Enteral Feeding

- Obstruction
- Lesions
- Sinusitis
- Aspiration
- Pulmonary complications
Potential Complications of Enteral Feeding

- Obstruction
- Lesions
- Sinusitis
- Aspiration
- Pulmonary complications

- Diarrhea
- Intestinal ischemia
- Epistaxis
- Metabolic disturbances
Parenteral Nutrition

Definition of Parenteral Nutrition (PN):

The intravenous administration of nutrients.

- Central PN: delivered into a large-diameter vein, usually the superior vena cava adjacent to the right atrium.
- Peripheral PN: delivered into a small-diameter peripheral vein, usually of the hand or forearm.

*Parenteral nutrition should only be used when enteral nutrition is not possible*
Examples of Conditions that may require Parenteral Nutrition

• May be required for those suffering from
  o Short-bowel syndrome
  o Gastrointestinal fistula
  o Bowel obstruction
  o Severe acute pancreatitis
Parenteral Feeding Formulas

Typical Concentrations:

- Central venous access
  - 25-35% dextrose, 2.75-6% amino acids

- Peripheral infusion
  - 5-10% dextrose, 2.75-4.25% amino acids
Potential Complications of Parenteral Feeding

• Associated with higher risk of:
  o Biliary diseases
  o Osteoporosis, osteomalacia
  o Catheter-related infections
  o Central venous access complications
  o Electrolyte imbalances
  o Hyperglycemia, Hyperlipidemia
  o Liver diseases, Thrombosis
Potential Complications of Parenteral Feeding

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  o Liver diseases, Thrombosis

Infectious complications are frequently related to inadequate catheter care and patient education
Benefits of Nutritional Recovery

• Lower mortality rates
• Decreased complication rates
• Fewer wound infections
• Improved respiratory function
• Lower infective complications
• Earlier return to GI function
• Improved liver function
• Improved physical, emotional function
• Shorter rehabilitation
Considerations for Pediatric Patients

www.nutritioncare.org
Considerations for Pediatric Patients

- Study of tertiary care children’s hospitals
  - 24% of children were malnourished
  - Can be related to
    - Illness (Secondary)
    - Non-illness (Environmental/behavioral)
Consequences

• Malnourished children are at risk of
  o Compromised immune systems
  o Increased susceptibility to infectious diseases
  o Negatively affected growth and development
  o Limited total bone growth long term
  o Hindered brain development
  o Delays in motor, cognitive development
Diagnosis of Malnutrition in Children

Factors

- Breastfeeding
- Contact with TB
- Cough lasting over 2 weeks
- Watery/bloody diarrhea
- Persistent/frequent diarrhea, vomiting
Diagnosis of Malnutrition in Children

Factors

- Breastfeeding
- Contact with TB
- Cough lasting over 2 weeks
- Watery/bloody diarrhea
- Persistent/frequent diarrhea, vomiting
- Known/suspected HIV infection/exposure
- Loss of appetite
- Recent contact with measles
- Decreased intake of food, fluids
Diagnosis of Malnutrition in Children

Symptoms

• Shock
• Dehydration
• Severe palmar pallor
• Bilateral pitting edema
• Ocular signs of vitamin A deficiency
• Localized signs of infection
Diagnosis of Malnutrition in Children

Symptoms

• Shock
• Dehydration
• Severe palmar pallor
• Bilateral pitting edema
• Ocular signs of vitamin A deficiency
• Localized signs of infection

• HIV infection
• Fever
• Mouth ulcers
• Skin changes
• Reduced appetite
A.S.P.E.N. Guidelines for Nutrition Support of Critically Ill Child

1. Provide screening & assessment; develop care plan
2. Assess energy expenditure
3. Determine individual’s macronutrient requirements
4. Prefer enteral nutrition over parenteral nutrition
5. Recommendation against immune-enhancing diets/nutrients
6. Establish specialized nutrition support team in PICU

A.S.P.E.N.: American Society for Parenteral and Enteral Nutrition
Clinical and economic benefits of treating malnutrition
Economic Implications of Malnutrition

- Study of data from NHANES, NHIS
  - Estimated burden of disease-associated malnutrition (DAM) for 8 diseases studied was > $15.5 Billion
  - Dementia accounted for > $8.7 Billion
  - Depression accounted for $2.46 Billion

NHANES: National Health and Nutrition Examination Survey
NHIS: National Health Interview Survey
DAM: Disease-associated malnutrition
Economic Implications of Malnutrition

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○ Canadian study of moderately malnourished patients
  ▪ Length of hospital stay increased 23-34%
  ▪ Total costs were 38% higher
Challenges and Opportunities in the Affordable Care Act (ACA)

Challenge:

• Reimbursement for costs associated with preventable events WILL be reduced

• ACA penalizes hospitals for higher than expected 30-day readmission rates
Opportunity:

- Prevention and treatment of malnutrition can:
  - Reduce readmissions
  - Optimize the quality of patient care
  - Improve clinical outcomes
  - Reduce costs
Study focused on:

- malnutrition risk screening at admission
- prompt initiation of oral nutritional supplementation for at-risk patients
- nutrition support
- education for patients during the hospital stay and after discharge

Results:

- shortened length of stay from 7.2 days to 5.4 days
- 27% reduction in patients returning to hospitals within 30 days
- ~ cost savings of >$3800 per patient treated for malnutrition
At the Johns Hopkins Hospital, a team approach to the assessment and early intervention of malnutrition resulted in:

- reduced LOS by an average of 3.2 days in severely malnourished
- cost savings of $1,514 per patient
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**Six principles used to drive improvement**
Multidisciplinary Care Model to Improve Nutrition Intervention

1. Create a culture where all stakeholders value nutrition
2. Redefine clinicians’ roles to include nutrition care
3. Recognize and diagnose all malnourished and at risk patients
Multidisciplinary Care Model to Improve Nutrition Intervention

1. Create a culture where all stakeholders value nutrition
2. Redefine clinicians’ roles to include nutrition care
3. Recognize and diagnose all malnourished and at risk patients
4. Implement comprehensive nutrition interventions and continued monitoring
5. Communicate nutrition care plans
6. Develop a discharge nutrition care and education plan
Issues in Enteral Feeding: Malnutrition

Resource

• American Society for Parenteral and Enteral Nutrition (ASPEN)
  o Website: [www.nutritioncare.org/](http://www.nutritioncare.org/)
Malnutrition is a significant clinical problem in acute and alternative health care settings in the United States. Early recognition and treatment of malnourished patients has both clinical and economic benefits. Establishing a multidisciplinary care model to improve nutrition intervention can drive meaningful improvement in the care of patients with or at risk for malnutrition.
Issues in Enteral Feeding: Malnutrition

Thank you!
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