

NUTRITION-FOCUSED PHYSICAL EXAM OF THE ONCOLOGY PATIENT

Susan Roberts, MS, RD, LD, CNSC
Area Director of Clinical Nutrition, Baylor Scott & White Health
Dietetic Internship Director, Baylor University Medical Center

Objectives

- Outline the criteria for identifying malnutrition
- Describe components of a nutrition-focused physical exam
- Explain focus areas for nutrition-focused physical exam in the oncology patient population

Malnutrition

- Incidence –15% to 60%, depending on the patient population and criteria used to identify malnutrition
- Etiology
 - Starvation
 - Acute illness
 - ● Chronic illness
- Impact on outcomes
 - Increased complications, length of stay, costs, mortality, readmission

Malnutrition in oncology patients

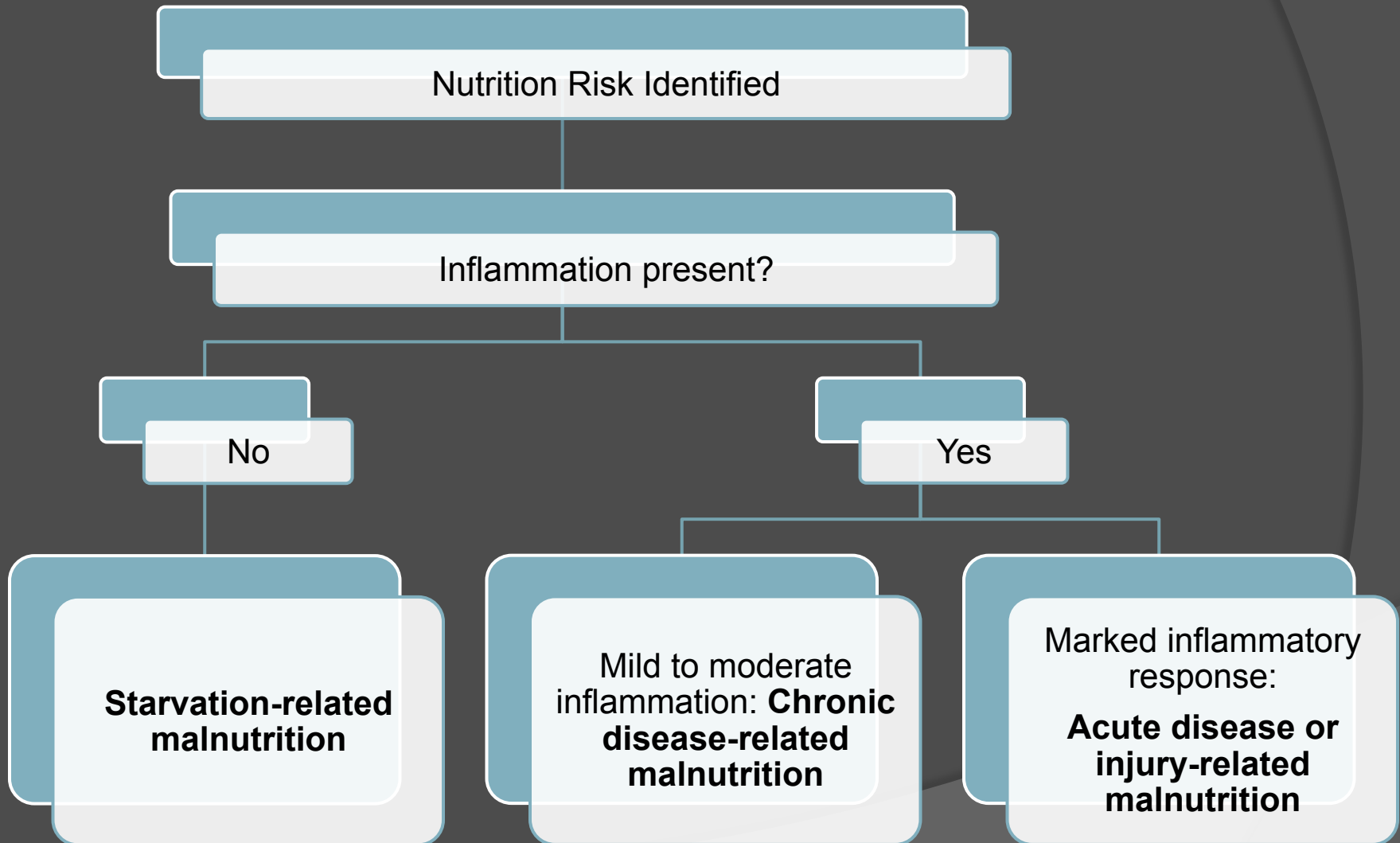
- Occurs for a variety of reasons, including the disease process, oncologic therapies & cachexia
- Incidence

Study	Oncology Population	Incidence
Silander 2013	Advanced head & neck	<ul style="list-style-type: none">66% (>10% wt loss at 6 months)26% (BMI < 20 at 6 months)
Dias do Prado 2013	Gastrointestinal	<ul style="list-style-type: none">45% (PG-SGA)
Percival 2013	Lung	<ul style="list-style-type: none">35% (BMI < 18.5, wt loss > 10%, or BMI < 20 + wt loss > 5%)
Isenring 2010	Medical oncology	<ul style="list-style-type: none">49% (PG-SGA)
Garth 2010	Gastrointestinal	<ul style="list-style-type: none">32% mild – moderate (SGA)16% severe (SGA)
Laky 2010	Gynecological	<ul style="list-style-type: none">25% (PG-SGA)

Malnutrition in the U.S.

- ⦿ Examined data from 2010 Healthcare Cost and Utilization Project (>1000 hospitals)
- ⦿ Malnutrition diagnosis from ICD 9 codes
- ⦿ ~ 1.2 million discharges w/malnutrition dx
 - Longer LOS: 12.6 vs 4.4 days ($p < 0.0001$)
 - Higher costs: ~\$27,000 vs ~\$9,400 ($p < 0.0001$)
 - Twice as many discharged with home care
 - Death 5 times more common
- ⦿ Standardized approach needed

Etiology of malnutrition

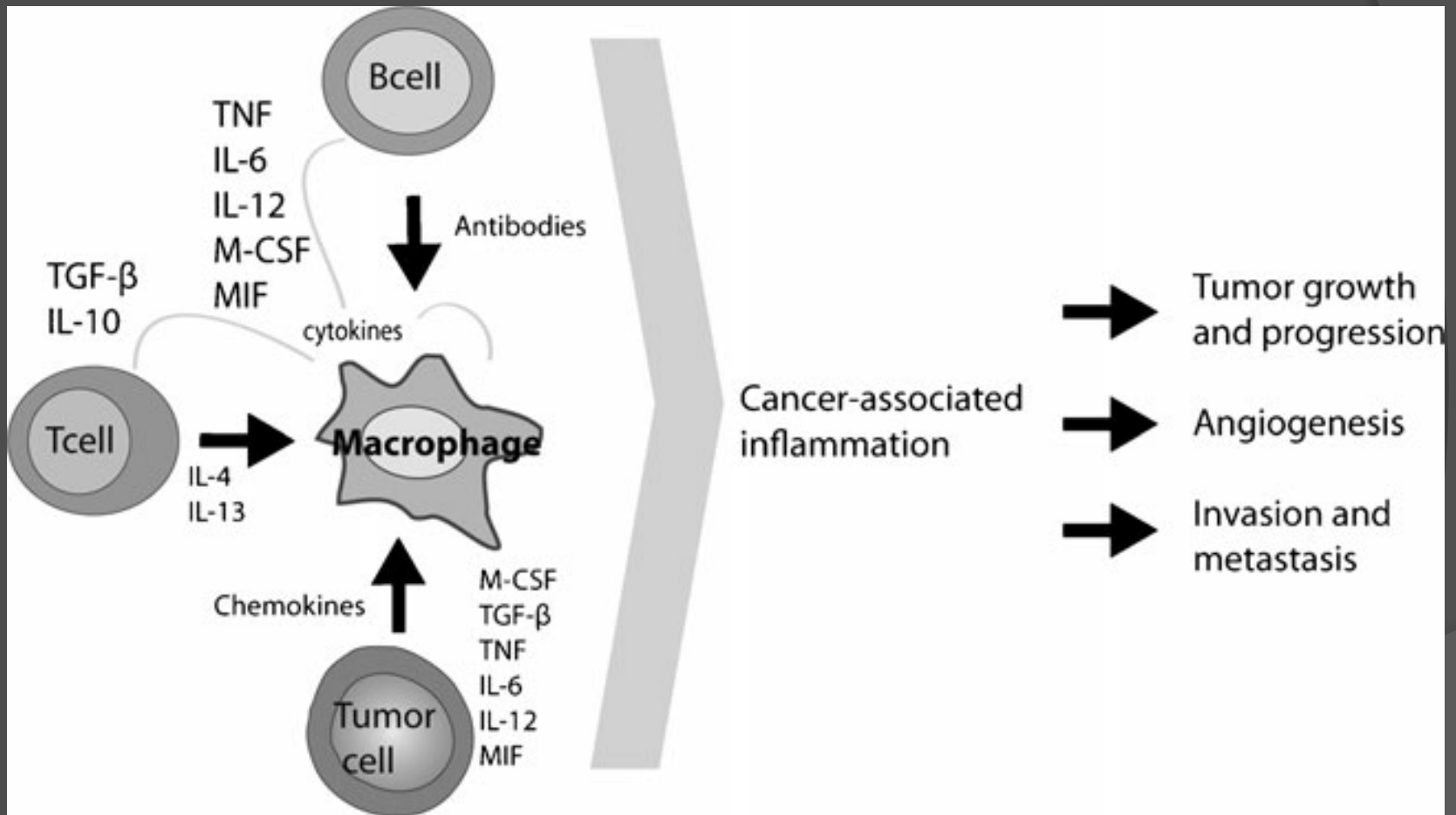


Inflammation present?

- ◎ Signs & symptoms
 - Fever, hypothermia, tachycardia
 - Elevated C-reactive protein
 - Elevated white blood cell count
 - Hyperglycemia
 - Negative nitrogen balance
 - Increased resting energy expenditure

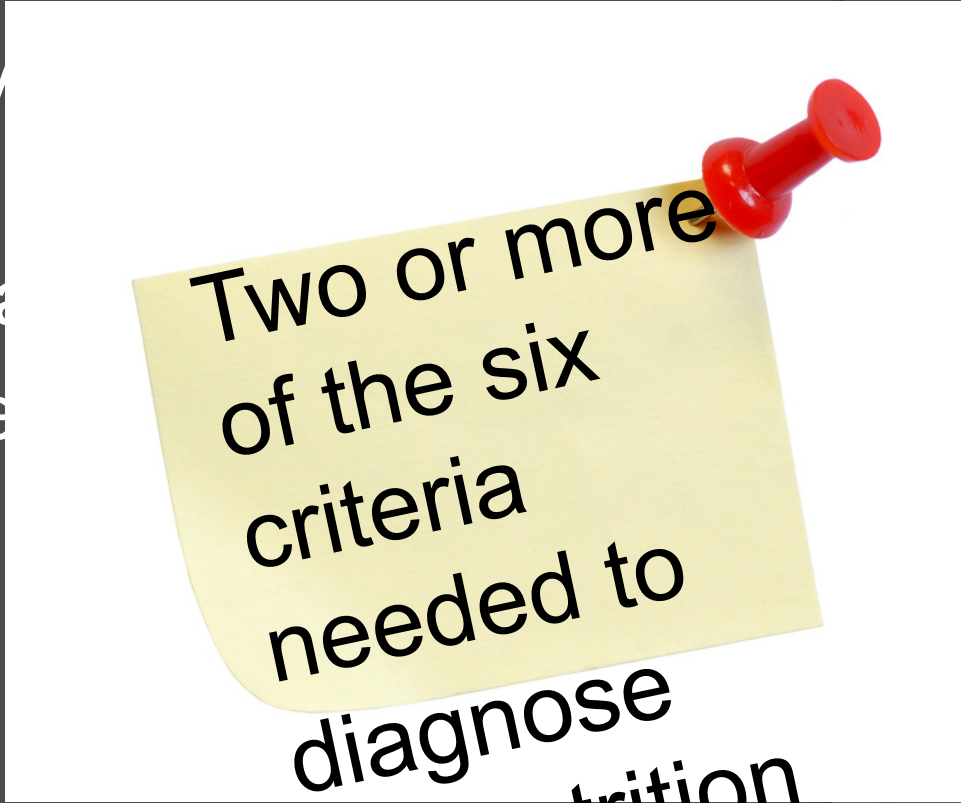


Cancer & Inflammation



Malnutrition criteria

1. Insufficient energy
2. Weight loss
3. Loss of muscle mass
4. Loss of subcutaneous fat
5. Localized or generalized edema or fluid accumulation that is not due to weight loss
6. Diminished functional status as measured by handgrip strength

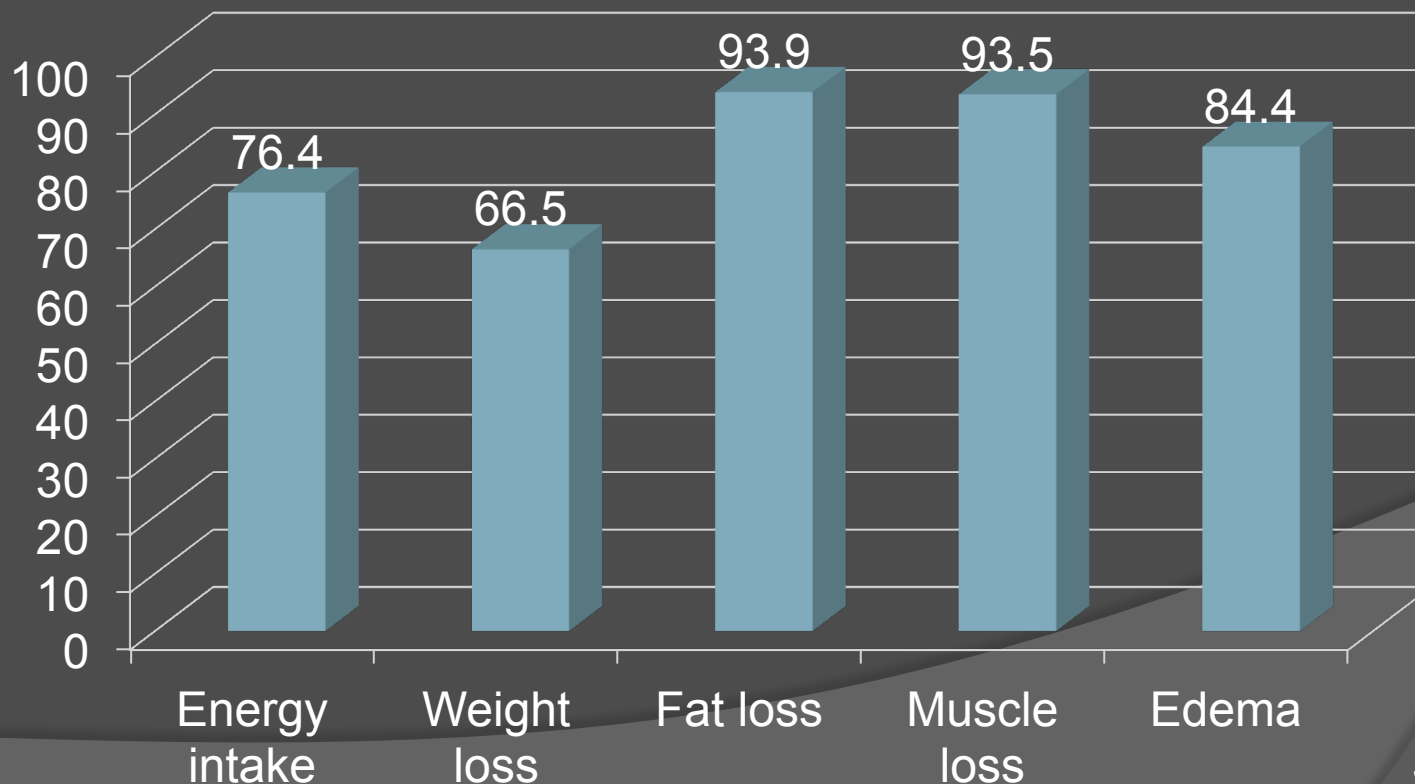


Research in progress related to malnutrition criteria & oncology patients

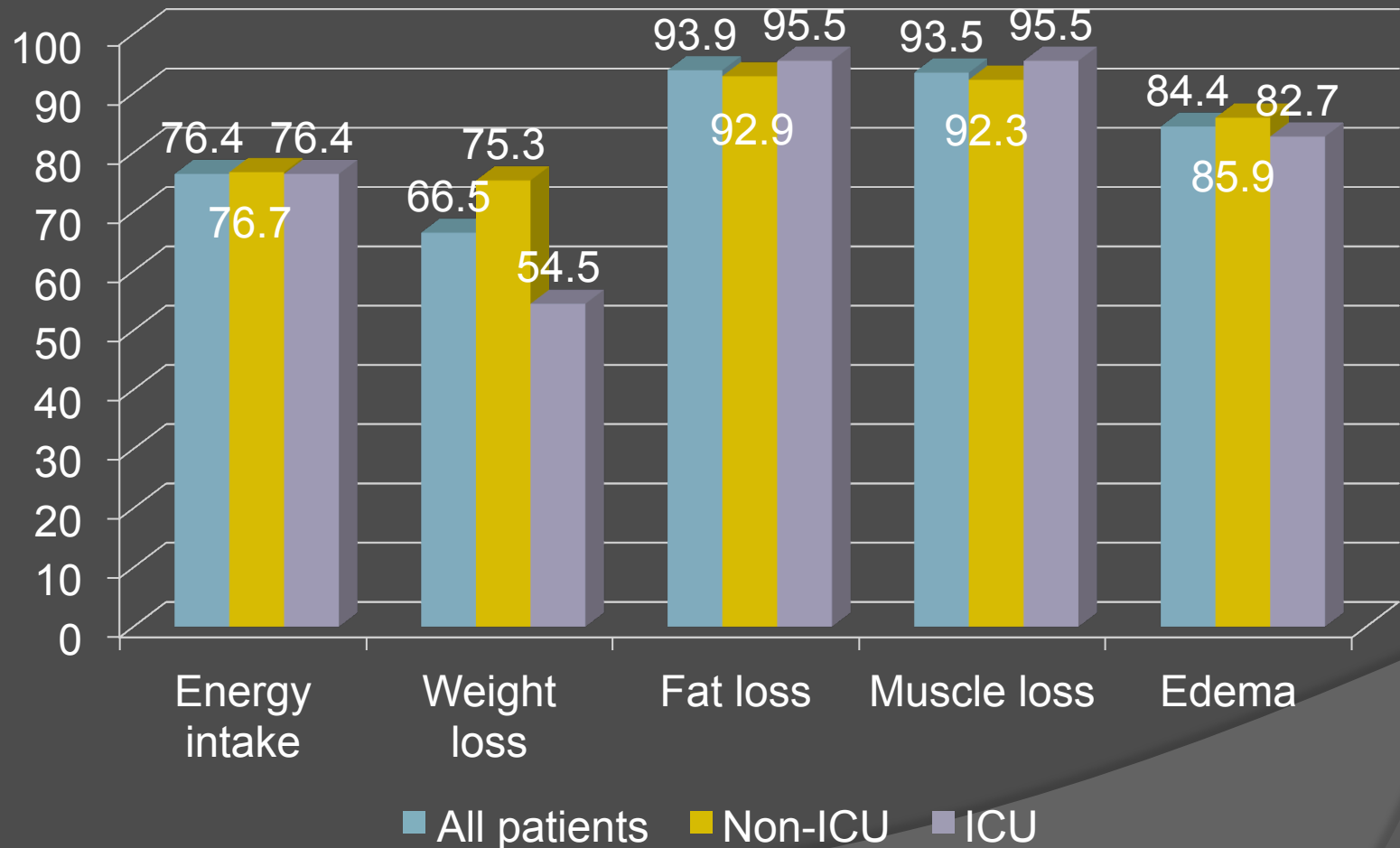
- ⦿ Personal communication with Mary Marian, MS,RDN,CSO,FAND
- ⦿ Among participants ≥ 18 years of age prior to beginning chemotherapy for lung, gastrointestinal, and gynecological cancers at Arizona Oncology Associates in Tucson, AZ, what is the diagnostic ability of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition malnutrition diagnostic framework for detecting malnutrition in comparison with the Patient-Generated Subjective Global Assessment (PG-SGA) tool?

Feasibility of Accessing Data in Hospitalized Patients to Support Diagnosis of Malnutrition

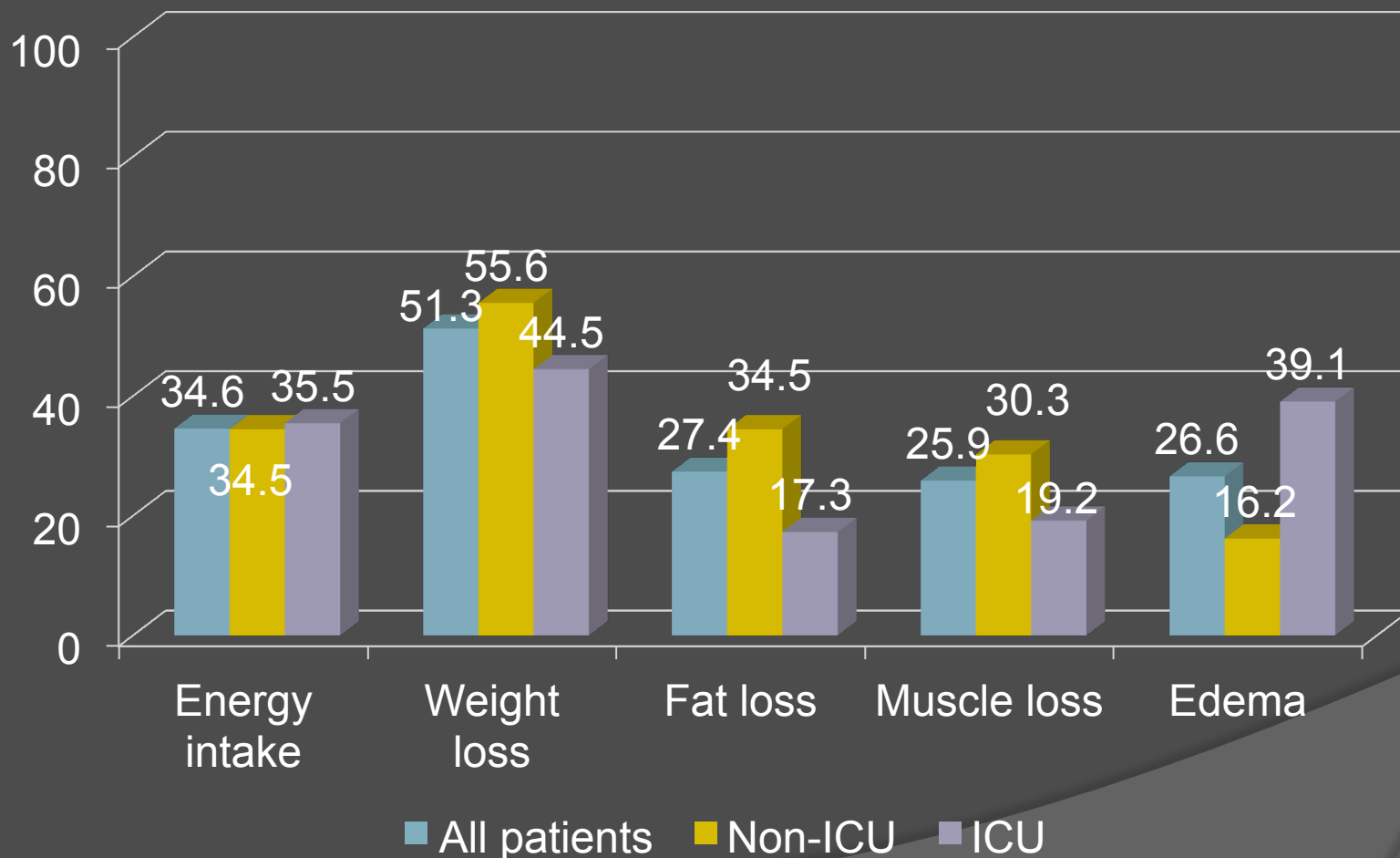
- Cross-sectional survey at 2 different tertiary teaching hospitals; included 262 adults
- Determined availability of data to support the proposed AND/ASPEN malnutrition characteristics



Comparison of all patients, non-ICU patients and ICU patients



Use of criteria to define malnutrition for all patients, non-ICU patients and ICU patients



Insufficient energy intake

Type of malnutrition	Acute illness or injury-related	Chronic disease-related	Social or environmental cause
Moderate	<75% of est. energy requirement for >7 days	<75% of est. energy requirement for ≥ 1 month	<75% of est. energy requirement for ≥ 3 months
Severe	$\leq 50\%$ of est. energy requirement for ≥ 5 days	$\leq 75\%$ of est. energy requirement for ≥ 1 month	$\leq 50\%$ of est. energy requirement for ≥ 1 month

Weight loss

Type of malnutrition	Acute illness or injury-related		Chronic-disease related		Social or environmental cause	
	%	Time	%	Time	%	Time
Moderate	1-2	1 week	5	1 month	5	1 month
	5	1 month	7.5	3 months	7.5	3 months
	7.5	3 months	10	6 months	10	6 months
			20	1 year	20	1 year
Severe	>2	1 week	>5	1 month	>5	1 month
	>5	1 month	>7.5	3 months	>7.5	3 months
	>7.5	3 months	>10	6 months	>10	6 months
			>20	1 year	>20	1 year

Physical assessment

- Muscle wasting
- Fat wasting
- Fluid accumulation



Techniques of the Physical Exam

● Inspection

- Broad observation
- Critical evaluation
- Symmetry

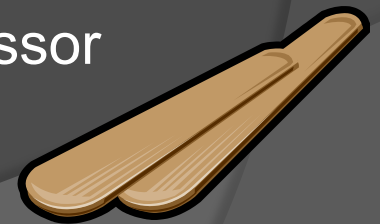


● Palpation

- Examining body structures
– touch

● Useful Tools

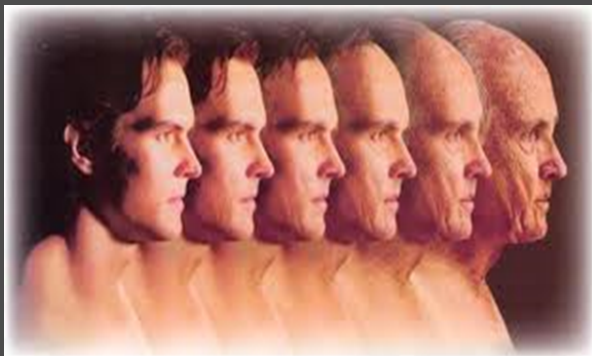
- Stethoscope
- Pen light
- Tongue depressor
- Gloves



Assessment of muscle wasting

Type of malnutrition	Acute illness or injury-related	Chronic disease-related	Social or environmental
Moderate	Mild loss	Mild loss	Mild loss
Severe	Moderate loss	Severe loss	Severe loss

- Consider potential reasons for muscle wasting
- Atrophied muscle is smaller, has decreased strength and leads to decreased mobility



Multiple Potential Causes of Muscle Atrophy

- Amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease)
- Polio
- Guillain-Barre syndrome
- Motor neuropathy (such as diabetic neuropathy)
- Injury
- Burns
- Long-term corticosteroid therapy
- Muscular dystrophy
- Not moving (immobilization)
- Osteoarthritis
- Dermatomyositis and polymyositis
- Rheumatoid arthritis
- Spinal cord injury
- Stroke
- **Malnutrition**

Assessing for muscle loss

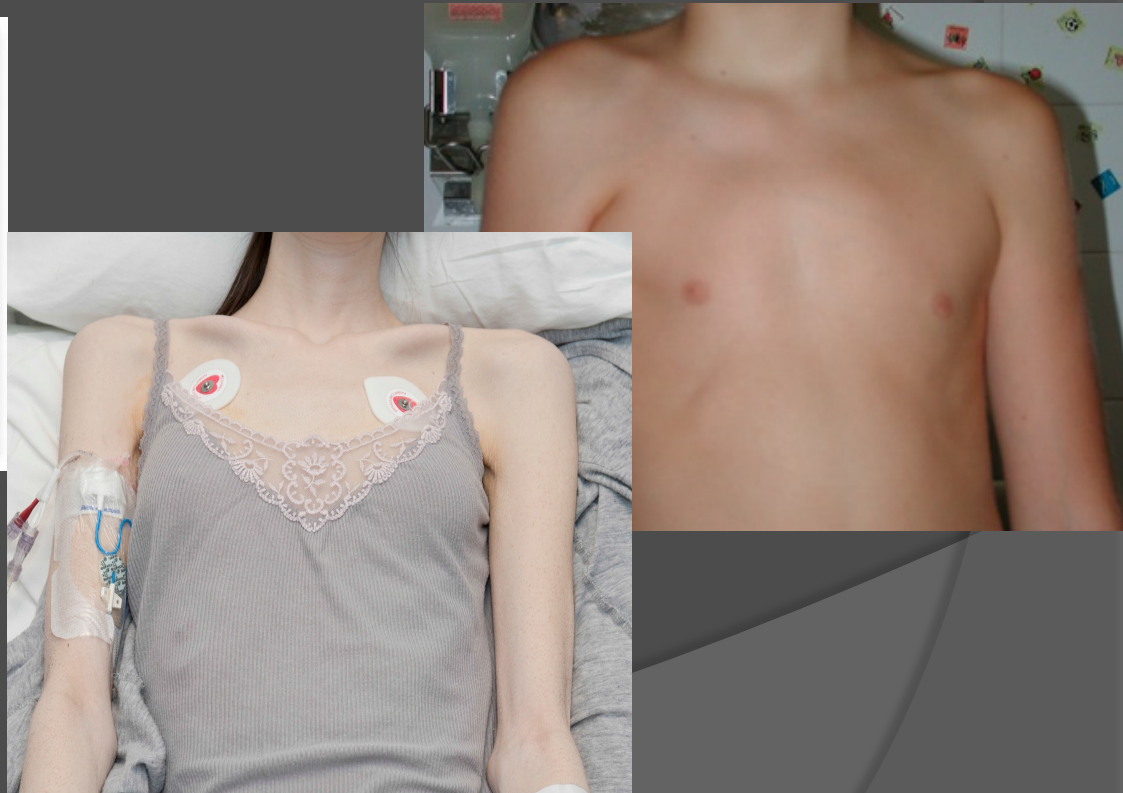
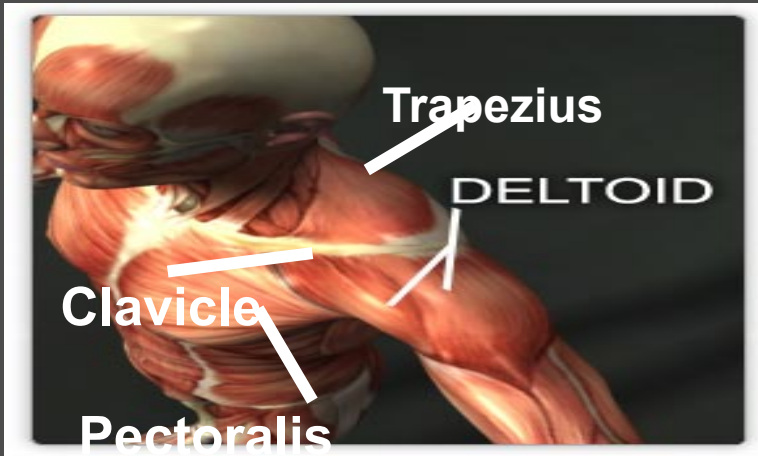
Exam area	Tips	Severe malnutrition	Mild – moderate malnutrition	Well-nourished
Temple region – Temporalis muscle	View patient when standing directly in front of them, ask them to turn head side to side	Hollowing, scooping, depression	Slight depression	Can see/feel well-defined muscle
Clavicle bone region – Pectoralis major, deltoid, trapezius muscles	Look for prominent bone. Make sure patient is not hunched forward	Protruding, prominent bone	Visible in male, some protrusion in female	Not visible in male, visible but not prominent in female
Clavicle & Acromion bone region – Deltoid muscle	Patient arms at side; observe shape	Shoulder to arm joint shape looks square. Acromion protrusion very prominent	Acromion process may slightly protrude	Rounded, curves at arm, shoulder, neck
Scapular bone region – Trapezius, supraspinus, infraspinus muscles	Ask patient to extend hands straight out, push against solid object	Prominent, visible bones, depressions between ribs/scapula or shoulder/spine	Mild depression or bone may show slightly	Bones not prominent, no significant depressions
Dorsal hand – Interosseous muscle	Look at thumb side of hand; look at pads of thumb when tip of forefinger touching tip of thumb	Depressed area between thumb and forefinger	Slightly depressed	Muscle bulges, could be flat in some well-nourished individuals

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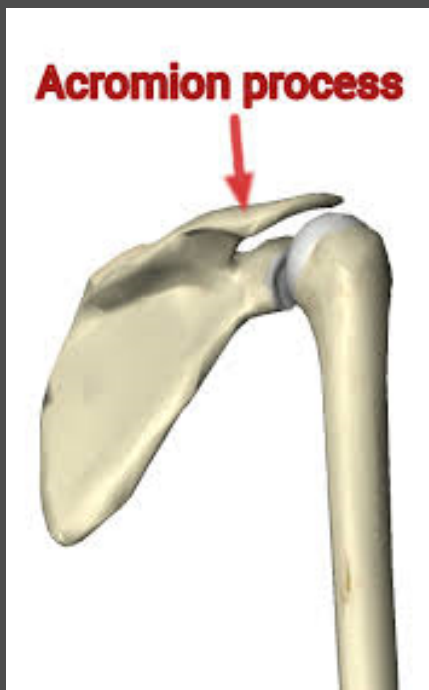
Picture courtesy of Cindy Hamilton @ CCF

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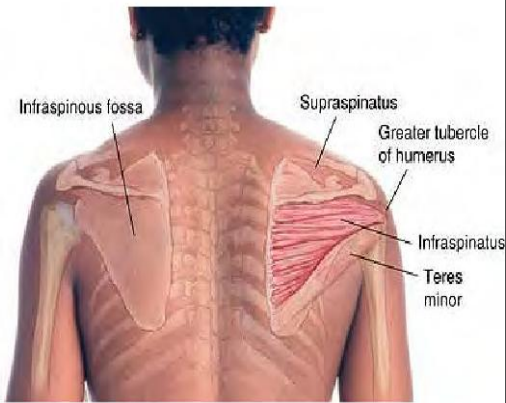


Pictures courtesy of Cindy Hamilton @ CCF

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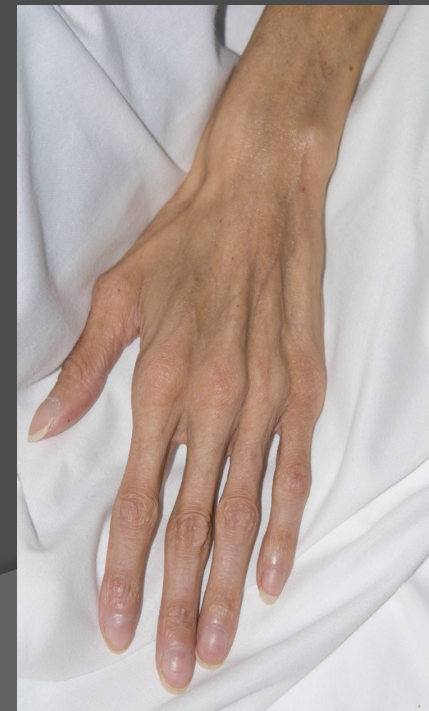


Severe muscle loss



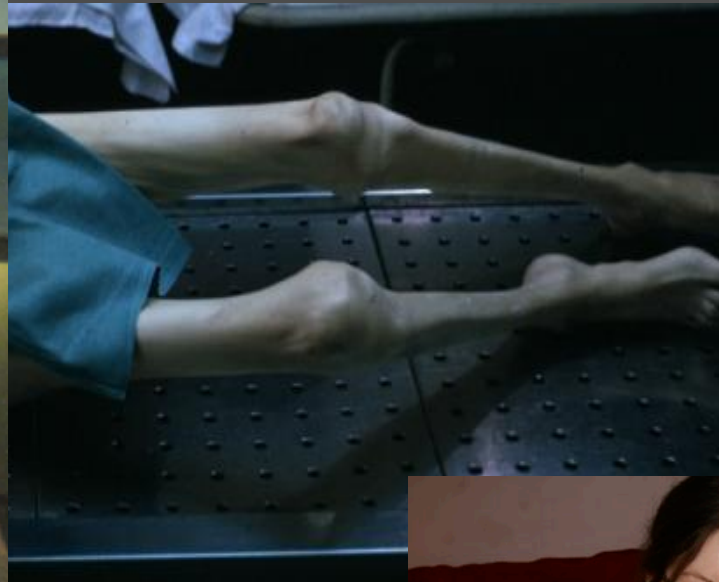
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Assessing for muscle loss in lower body – less sensitive to change

Exam area	Tips	Severe malnutrition	Mild – moderate malnutrition	Well-nourished
Patellar region – Quadricep muscle	Ask patient to sit with leg propped up, bent at knee	Bones prominent, little sign of muscle around knee	Knee cap less prominent, more rounded	Muscles protrude, bones not prominent
Anterior thigh region – Quadriceps muscle	Ask patient to sit, prop up leg on low furniture. Grasp quads to differentiate amount of muscle tissue from fat tissue	Depression/line on thigh, obviously thin	Mild depression on inner thigh	Well rounded, well developed
Posterior calf region – Gastrocnemius muscle	Grasp the calf muscle to determine amount of tissue	Thin, minimal to no muscle definition	Not well developed	Well developed bulb of muscle



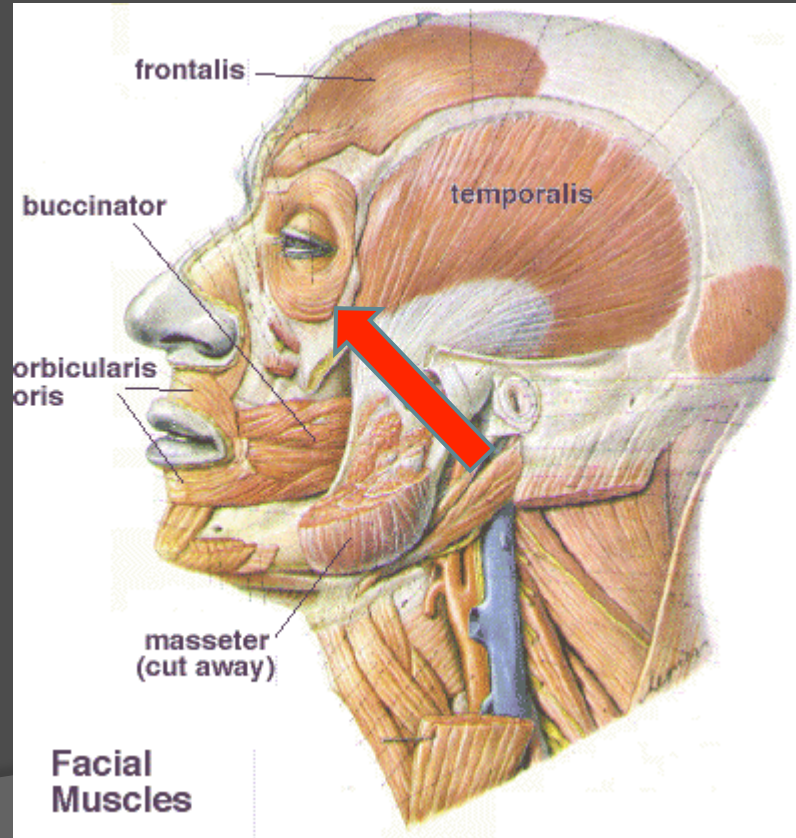
Assessment of loss of subcutaneous fat stores

Type of malnutrition	Acute illness or injury-related	Chronic disease-related	Social or environmental
Moderate	Mild loss	Mild loss	Mild loss
Severe	Moderate loss	Severe loss	Severe loss

Assessment of loss of fat mass

Exam area	Tips	Severe malnutrition	Mild – moderate malnutrition	Well-nourished
Orbital region – surrounding the eye	View patient when standing directly in front of them, touch above cheekbone	Hollow look, depressions, dark circles, loose skin	Slightly dark circles, somewhat hollow look	Slightly bulged fat pads. Fluid retention may mask loss
Upper arm region – triceps/biceps	Arm bent, roll skin between fingers, do not include muscle in pinch	Very little space between folds, fingers touch	Some depth pinch, but not ample	Ample fat tissue obvious between folds of skin
Thoracic and lumbar region – ribs, lower back, midaxillary line	Have patient press hands hard against a solid object	Depression between the ribs very apparent. Iliac crest prominent	Ribs apparent, depressions between them less pronounced. Iliac crest somewhat prominent	Chest is full, ribs do not show. Slight to no protrusion of the iliac crest

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Assessing fluid accumulation

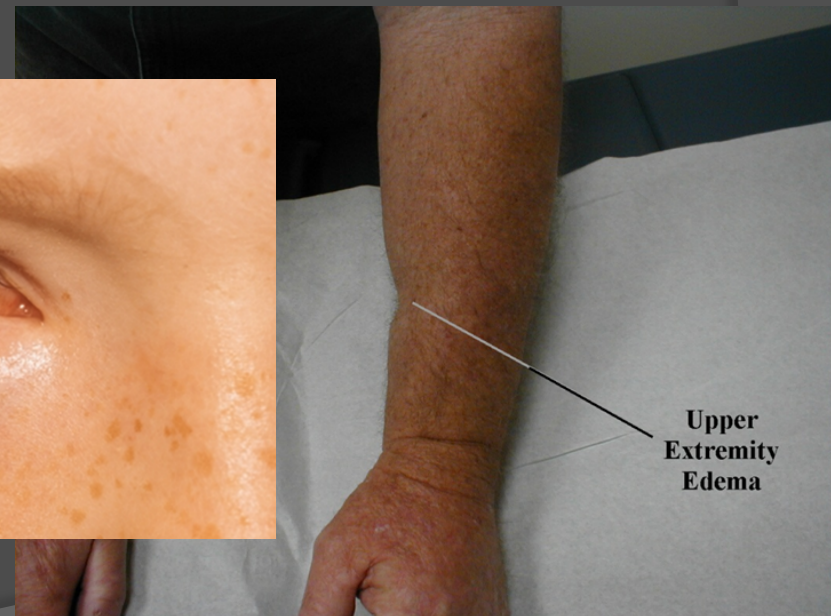
- Edema is the abnormal retention of fluid in interstitial spaces and cavities (e.g., peritoneal/abdominal cavity)
- Primarily found in dependent areas such as the sacrum, ankles, feet, scrotum, vulva
- Conditions associated with fluid accumulation
 - Heart failure
 - Renal & liver disease
 - Lymphatic obstruction
 - Critical illness
- Vital signs, intake and output, weight, history, imaging studies

Fluid accumulation

- The clinician may evaluate generalized or localized fluid accumulation during a physical exam
- Fluid accumulation is typically seen in the extremities, abdomen (ascites), and/or vulva/scrotal area
- Generalized edema can also occur, and when severe, is referred to as anasarca
- Weight loss is frequently masked by fluid retention and weight gain may be present

Assessing fluid accumulation

Type of malnutrition	Acute illness or injury-related	Chronic disease-related	Social or environmental
Moderate	Mild	Mild	Mild
Severe	Moderate to severe	Severe	Severe



Pictures courtesy of Cindy Hamilton @ CCF

Assessing fluid accumulation

Edema	Tips	Severe malnutrition	Mild to moderate malnutrition	Well Nourished
Rule out other causes of edema, patient at dry weight	View scrotum or vulva in activity restricted patient; ankles in mobile patient	Deep to very deep pitting, depression lasts a short to moderate time (31 to 60 seconds), extremity looks swollen (3+ to 4+ edema)	Mild to moderate pitting, slight swelling of the extremity, indention subsides quickly (0 to 30 seconds) (1+ to 2+ edema)	No sign of fluid accumulation

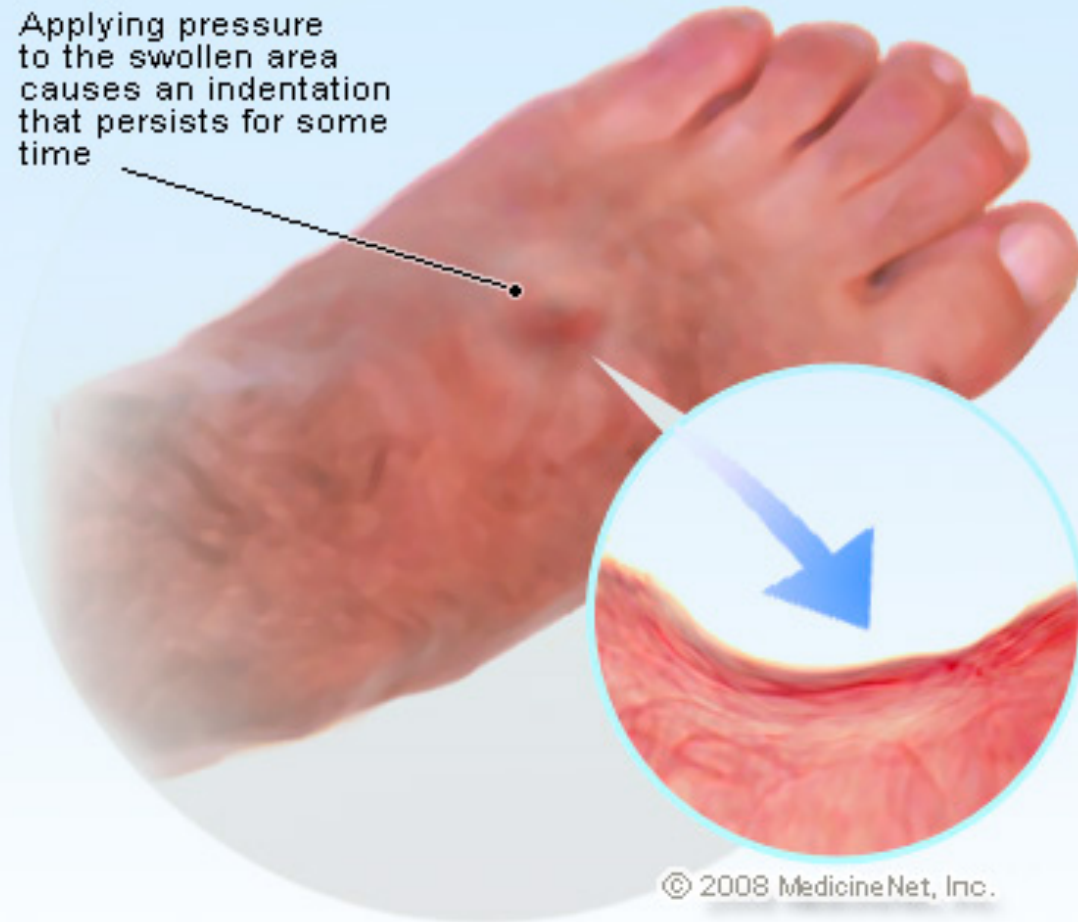
Edema in activity restricted patient

Edema: scrotum/vulva



Pitting Edema

Applying pressure to the swollen area causes an indentation that persists for some time



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Assessing the severity of edema

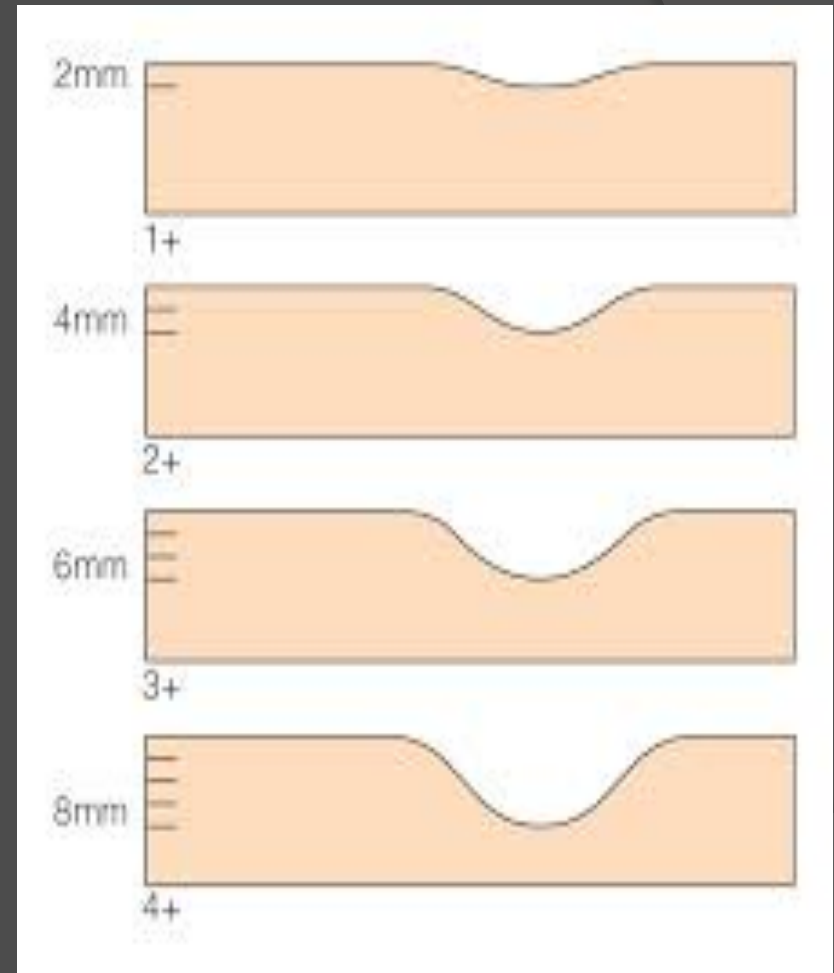
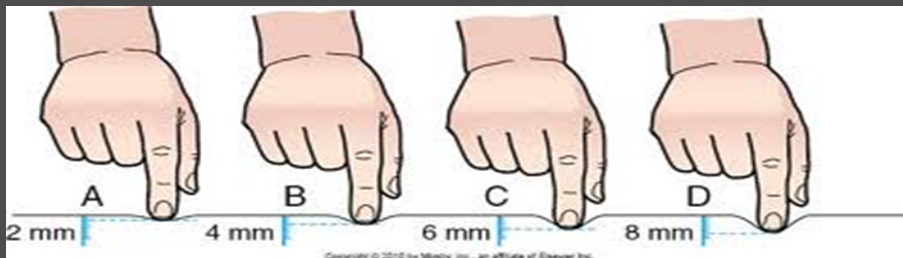
Method	O'Sullivan	Hogan
+1	Barely detectable impression when finger is pressed into skin	2 mm depression, barely detected, immediate rebound
+2	Slight indentation – 15 seconds to rebound	4 mm deep pit, a few seconds to rebound
+3	Deeper indentation – 30 seconds to rebound	6 mm deep pit, 10 – 12 seconds to rebound
+4	> 30 seconds to rebound	8 mm very deep pit, > 20 seconds to rebound

O'Sullivan, S.B. and Schmitz T.J. (Eds.). (2007). Physical rehabilitation: assessment and treatment (5th ed.). Philadelphia: F. A. Davis Company. p.659.

Hogan, M (2007) Medical-Surgical Nursing (2nd ed.). Salt Lake City: Prentice Hall

Assessing edema

- Press firmly but gently with your thumbs for at least 5 seconds over
 - The dorsum of the foot
 - Behind each malleolus
 - Over the shins
- Severity of edema is rated on a scale from +1 to +4



Assessing fluid accumulation

- Many patients have fluid accumulation but not all are malnourished
- Fluid accumulation combined with other characteristics (e.g., poor intake + weight gain or stable weight) can be helpful in identifying malnutrition as fluid accumulation can mask weight and muscle mass /SQ fat losses
- Nutritional and medical history as well as the current medical picture must be considered before determining whether fluid accumulation is a relevant characteristic to use in identifying malnutrition
- Continue to partner with nurses, physicians and other health care team members to enhance assessment of fluid status

Hand grip strength (HGS)

- ⦿ Simple, non-invasive marker of muscle strength of the upper extremities
- ⦿ Impaired HGS
 - ↑ post-operative complications
 - ↑ length of stay
 - ↑ readmission rate
- ⦿ In cancer patients, decreased HGS associated with
 - Shorter survival
 - Sarcopenia
 - Lower quality of life
 - Lower fat and lean body mass

Hand grip dynamometer



Assessing hand grip strength

Type of malnutrition	All malnutrition etiologies
Moderate	Not applicable
Severe	Measurably reduced

- Consult normative standards supplied by the manufacturer of the HGS device utilized

Malnutrition Diagnosis – Coding and Financial Impact

- ⦿ Adopt the AND/ASPEN malnutrition criteria
- ⦿ Work with coders, DRG specialists, and physicians to ensure appropriate documentation and coding of malnutrition diagnoses
- ⦿ Can impact reimbursement, severity of illness and risk of mortality scores

Malnutrition Diagnosis at Baylor

- ◎ 50 patients who were identified by the RD as having severe or moderate malnutrition
 - 28 severe, 22 moderate
- ◎ 98% (49/50) were coded for malnutrition
- ◎ 22% (11/50) contributed to reimbursement
 - 5 of 11 (45%) were oncology patients
 - 10 severe, 1 moderate
- ◎ Reimbursement impact: ~\$90,000

Nutrition-focused dysphagia screen

- ⦿ What is dysphagia, who is at risk, and why is it important to identify early?
- ⦿ Definition: Difficulty or inability to swallow
- ⦿ What diagnoses/conditions are associated with dysphagia?
 - Stroke
 - Traumatic brain injury
 - Progressive neurologic disorders
 - Neuromuscular diseases
 - Dementia
 - Cancer (especially brain and head/neck cancers)
 - Spinal cord injury
 - Aging
- ⦿ Importance of early identification to prevent
 - Aspiration pneumonia
 - Malnutrition and related consequences

Questions/observation of alert patients/medical record review

- History of dysphagia or aspiration pneumonia?
- Difficulty swallowing?
- Requirement for a modified texture or thick liquid diet?
- Coughing/choking before, during, or after swallowing food, liquids, or medications?
- High risk diagnosis?
- Tracheostomy?
- Cranial nerve dysfunction?

Clinical Characteristics of Dysphagia

- ⦿ Decreased consciousness (altered mental status)
- ⦿ Decreased ability to handle own secretions (coughing, drooling)
- ⦿ Prolonged eating time
- ⦿ Pocketing food or medications
- ⦿ New presentation or worsening of
 - Slurred speech (dysarthria)
 - Change in voice quality (dysphonia)
 - Mute or no voice (aphonia)
 - Trouble speaking or understanding words (aphasia)
 - Facial weakness
 - Weak or absent cough

Hydration - dehydration

- Common causes of dehydration include exposure to heat, fever, insufficient fluid intake & physical activity
- Dehydration is a common complication in oncology patients
- Water is lost from the body through several organs, including the kidneys, skin, respiratory/lungs and the GI tract



Assessing hydration status

- Body weight and I/Os
- Laboratory values
 - Hemoglobin/hematocrit
 - BUN/Creatinine
 - Plasma osmolality & sodium concentration
- Urine color
- Skin turgor
- Oral mucosa
- Blood pressure & heart rate

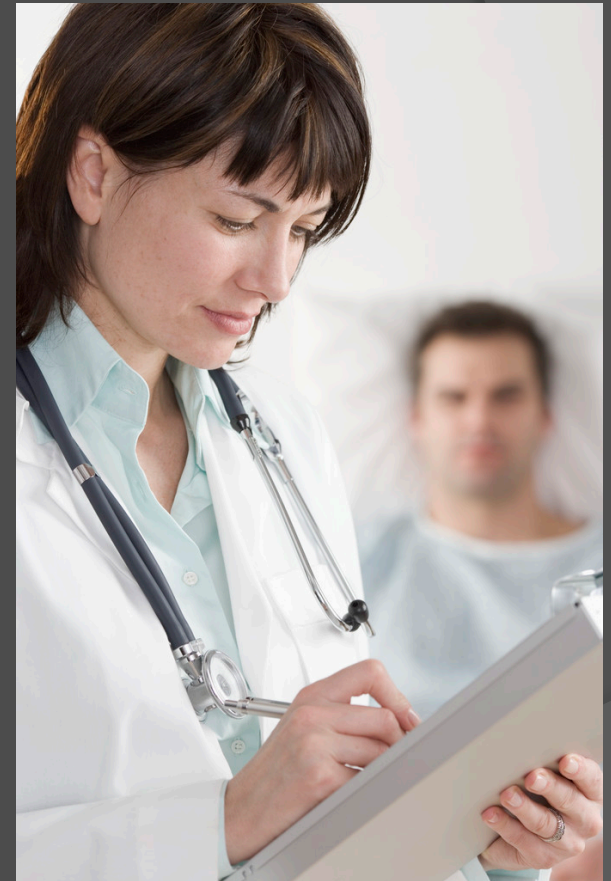


Abdominal assessment

- ⦿ What an abdominal assessment tells you:
 - Patient's ability to consume, digest and absorb nutrients
 - Need for nutrition support
 - Route of nutrition support
- ⦿ Tips for an abdominal examination
 - Review medical record, talk with team, focus exam & ?s
 - Explain and ask permission
 - Maintain privacy
 - Control exposure
 - Make sure the patient has an empty bladder
 - Distract the patient with conversation

Make the Patient Comfortable

- Supine position
- Bend knees for comfort
- Arms at side or folded across chest
- Warm hands and stethoscope
- Short fingernails
- Perform exam slowly
- Avoid unexpected movement



Before Starting Examination

- Ask patient about their pain, bowel habits, GI symptoms, & eating habits
- Ask them to point to areas where they are experiencing abdominal pain
- Examine those areas last if necessary
- Monitor patient's face for signs of discomfort
- Mentally visualize each organ as you examine

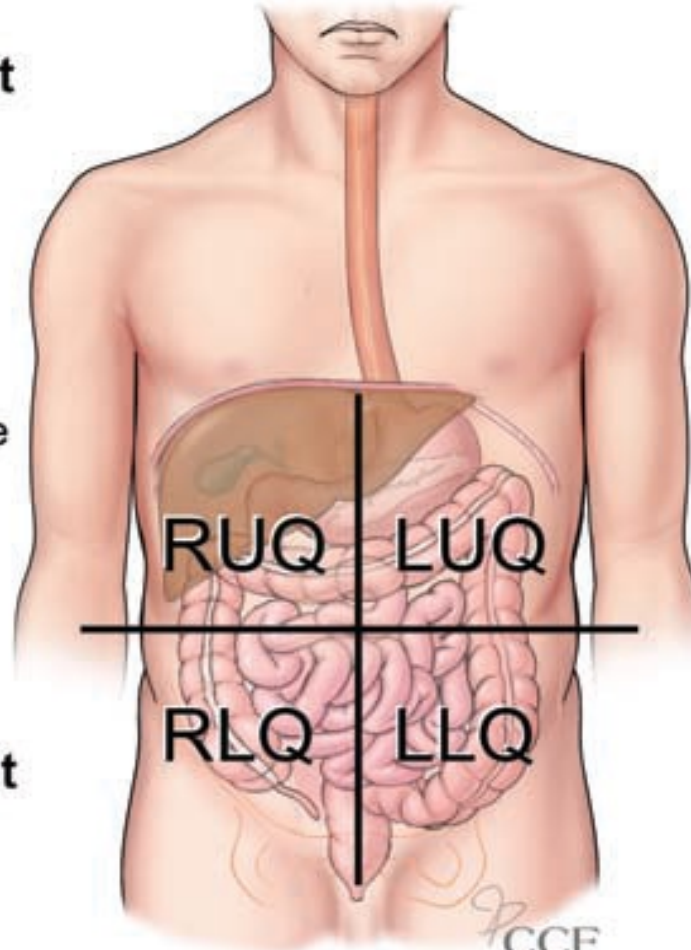
Abdominal Assessment

Right Upper Quadrant

Right lobe of liver
Gallbladder
Pylorus
First three parts of duodenum
Head of pancreas
Right colic (hepatic) flexure
Superior ascending colon
Right transverse colon

Right Lower Quadrant

Cecum
Appendix
Most of ileum
Inferior ascending colon



Left Upper Quadrant

Left lobe of liver
Spleen
Most of stomach, jejunum, and proximal ileum
Body and tail of pancreas
Left colic (splenic) flexure
Superior descending colon
Left transverse colon

Left Lower Quadrant

Sigmoid colon
Inferior descending colon

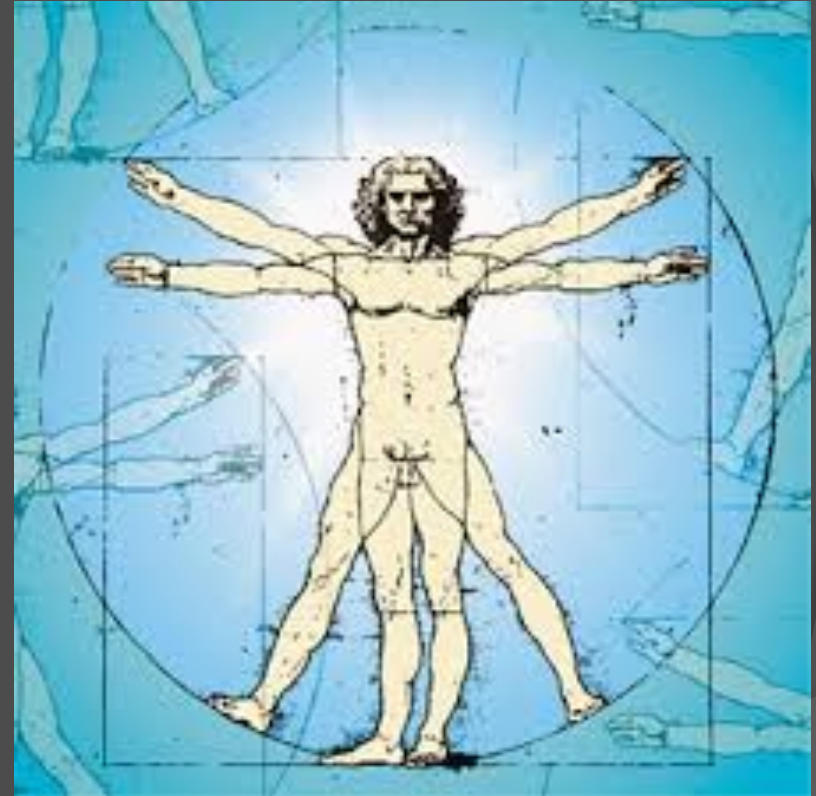
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Abdominal Exam

Technique		Possible causes of abnormal findings
Inspection	Observe: look for symmetry, surgical scars, contour, movement, color	<ul style="list-style-type: none">• Distended abdomen: paralytic ileus, bowel obstruction, ascites• Scaphoid abdomen or non-healing wound: malnutrition
Auscultation	Listen with a stethoscope Start in the RL quadrant Normal: 5 to 35/min Hypoactive: 3 to 4/min	<ul style="list-style-type: none">• Absence of bowel sounds: paralytic ileus• Hyperactive bowel sounds: bowel obstruction
Percussion	Use fingertips to tap lightly against body structures to assess location & density of underlying masses or organs	<ul style="list-style-type: none">• Dullness: solid organ or fluid• Shifting dullness: ascites• Distended tympanic abdomen: bowel obstruction
Palpation	Use touch to evaluate location, texture, size, temperature & tenderness	<ul style="list-style-type: none">• Firmness: paralytic ileus, bowel obstruction or ascites• Rebound tenderness: peritonitis• Guarding: peritonitis, inflammation

Other body systems & nutrient status

- Skin
- Nails
- Hair
- Eyes
- Oral cavity & lips
- Heart & lungs
- Neurologic



Resources

- Other clinicians at your hospital or clinic; practice on friends and family
- www.malnutrition.com
- Patient Simulation: Putting Malnutrition Screening, Assessment, Diagnosis, and Intervention into Practice at <http://anhi.org/courses/7D801AEE7DCE45FAB9C49857D88B0FAF>
- 2013 DNS Symposium presentation by Cindy Hamilton - <https://www.intelliquestmedia.com/library/dns2013>
- Support Line – April 2011 issue
- Abdominal examination: <http://meded.ucsd.edu/clinicalmed/abdomen.htm>
- Physical Examination Videos: <http://www.learnerstv.com/Free-Medical-video-lecture-courses.htm>
- YouTube Videos: http://www.youtube.com/results?search_query=physical%20examination%20head%20to%20toe&sm=1

Summary

- Identification of and timely, effective interventions for malnutrition are important due to the adverse outcomes associated with malnutrition
- Nutrition-focused physical exam is an essential component of a nutrition assessment and assists with identifying malnutrition and other nutritional problems