

# *Recognizing Malnutrition in our Hospitalized Patients – and doing something about it!*

Beth Taylor, DCN, RDN-AP, CNSC, FCCM  
Research Scientist/Dietitian  
Barnes-Jewish Hospital  
St. Louis, MO



# Conflict of Interest

- None to Declare
- Member of Malnutrition Validation Task Force for the Academy of Nutrition and Dietetics

# Objectives

- Become aware of the prevalence of malnutrition in the hospital
- Understand the impact of malnutrition on patient outcomes
- Identify moderate and severe malnutrition appropriate for medical diagnosis
- **Intervene/treat, monitor, prevent!**

# Florence Nightingale.....

*“Every careful observer of the sick will agree in this that thousands of patients are annually starved in the midst of plenty, from want of attention to the ways which alone make it possible for them to take food”*



# HOW MANY PATIENTS ARE WE TALKING ABOUT?

*Does it really make a difference in patient  
outcomes?*



# Prevalence.....sort of

- 51577 patients: BJH 2017 discharges (not mom and baby)
- **3885 patients**: had any form of malnutrition coded (RDs identified 4440) – **7%**
- **2484 patients**: had severe malnutrition – **4.8%**
- Looking only at medicare pts (known reimbursement) – **7% of severe maln only MCC (major complication/co-morbidity)**.
- $2484 \times 0.07 = 174 \times \$7171.77$  (Medicare base rate) = **\$1,247,027 potential reimbursement to BJH**

Based on discharge medical diagnosis of malnutrition (ICD-10 codes)

105 hospitals in Vizient database for 2014-2015: any malnutrition 4% (2.9 – 6.0); severe 0.9% (0.4-1.4)<sup>1</sup>

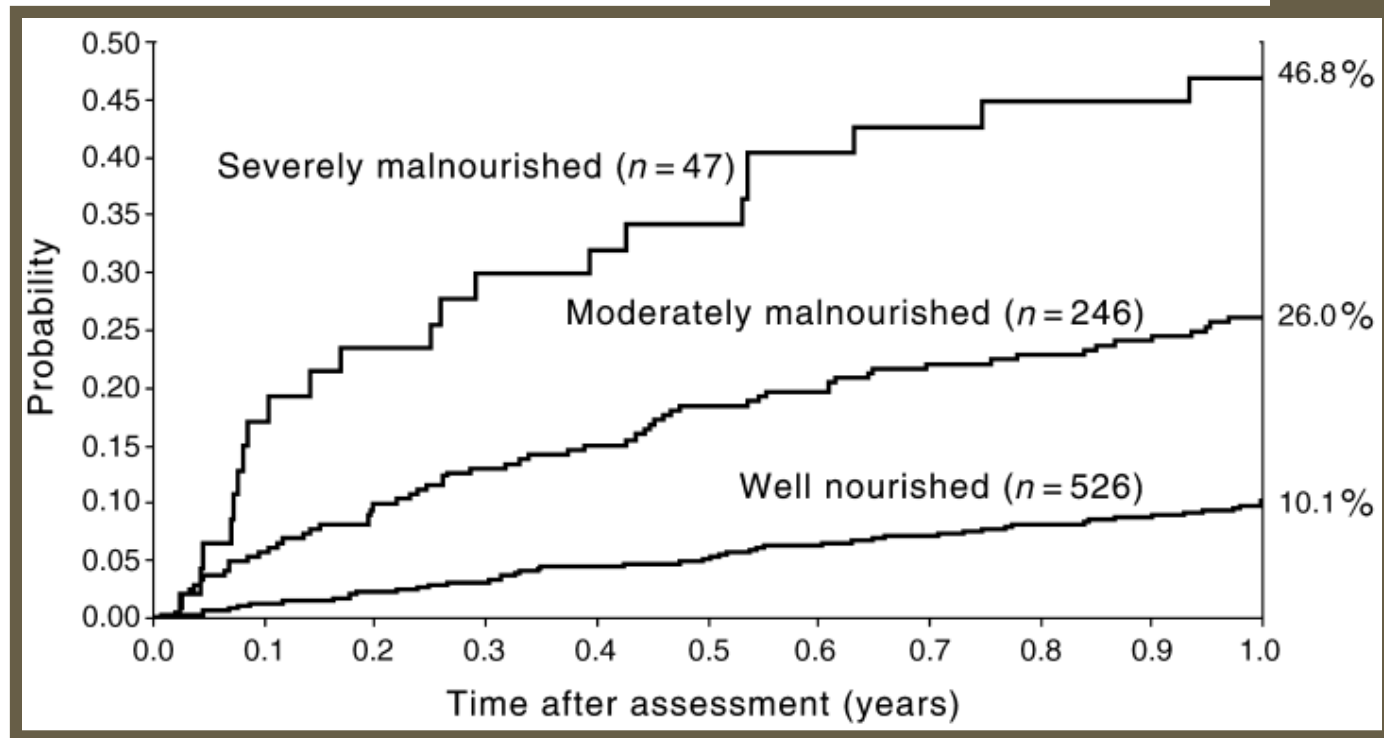
Research range (20 studies) **20 – 50%** prevalence<sup>2</sup>

**Only 3.2 – 7%** of these have the medical diagnosis documented<sup>3</sup>

**? Missed opportunities identifying and diagnosing**

# Malnutrition Matters!

- More nosocomial infection
- Longer stay
- Poor wound healing
- Muscle wasting
- Increased mortality



Incidence of mortality to 1 year. ( $P < 0.0005$ ) between 3 categories

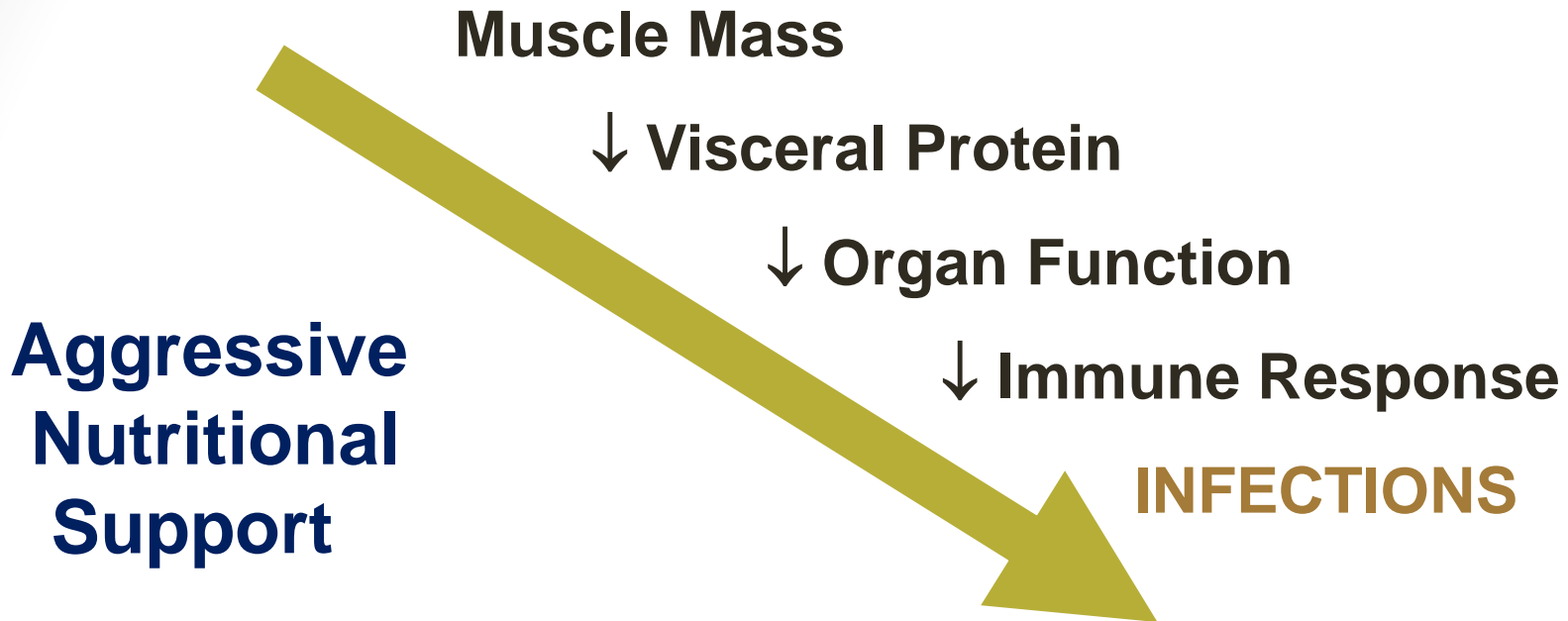
# Malnutrition in ICU Pts

Hospital	Specialty	# of Pts	% Maln Pts
Brazil <sup>1</sup>	ICU/mixed	375	29.7%
Chicago, IL <sup>2</sup>	ICU	57	50%
Chicago, IL <sup>3</sup>	ICU > 65 yrs	260	34%
Pennsylvania <sup>4</sup>	ICU/General	274	44%/32%

**Present in 12-25% of all patients at admission**

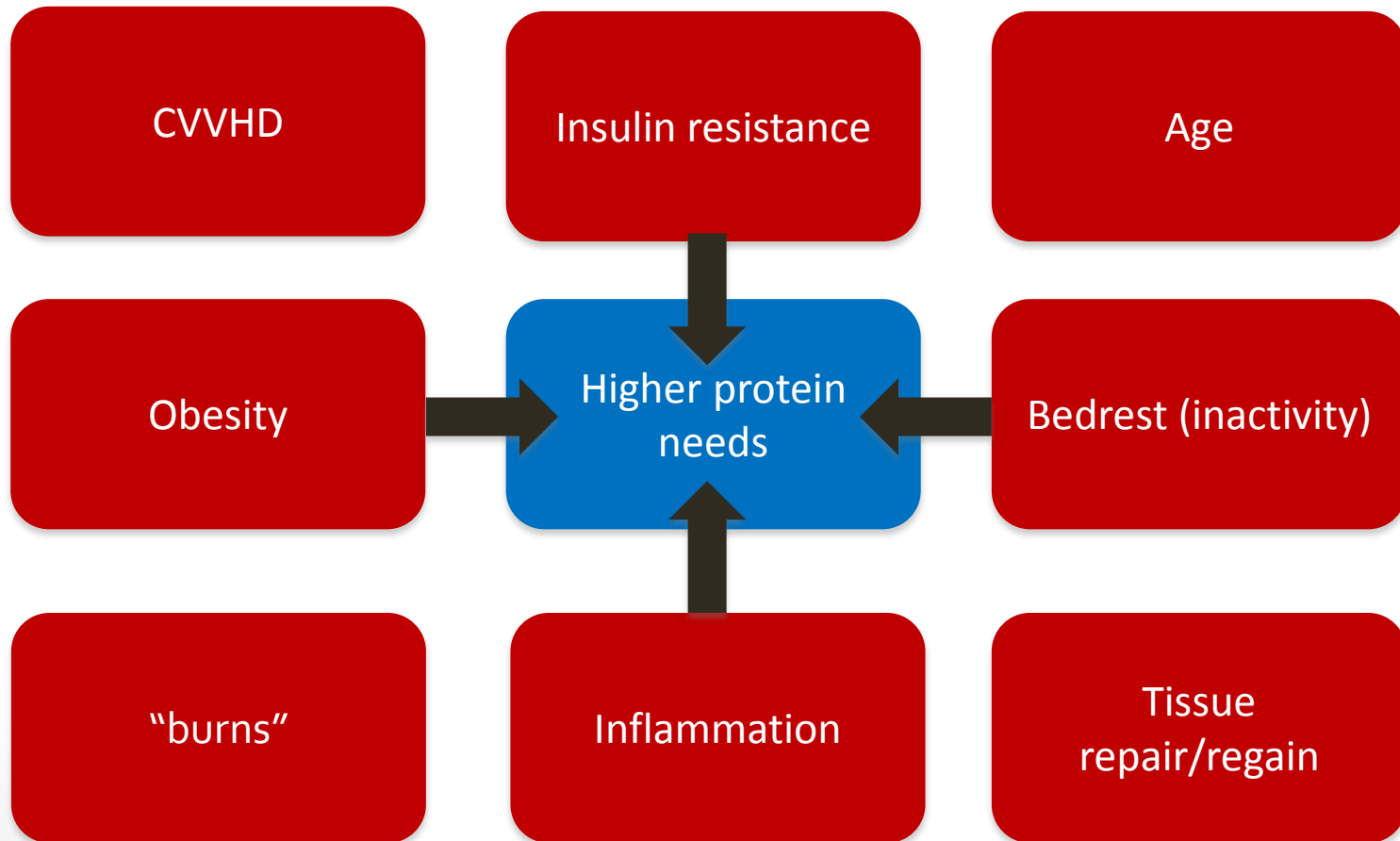


# ACUTE **PROTEIN** MALNUTRITION



Loss of lean body mass clinical consequences <sup>1,2</sup>  
10% impaired Immune function  
20% impaired wound and rehabilitation  
30% pneumonia and pressure ulcers  
40% Death (pneumonia)

# Increased protein demand = muscle loss



# Impact on Patient Never Events

- Patient Characteristics and the Occurrence of Never Events
- US epidemiologic analysis of 887,189 surgery cases from 1368 hospitals, using HCUP NIS data from 2002-2005
- **Malnutrition can dramatically increase the risk of severe events**
  - 4X more likely to develop pressure ulcers
  - 2X more likely to have SSI
  - 5X more likely to have CAUTI

# More Burden to Patients/Hosp

Up to **5x higher** likelihood of death compared to non-malnourished patients<sup>1,2</sup>

**54% higher** likelihood of 30 day-readmission, mostly due to septicemia.<sup>3</sup>

**Double** the avg hospital costs per initial stay<sup>1</sup>

**26-34% higher** readmission costs<sup>3</sup>



*Total annual cost of disease-associated malnutrition in the US is more than \$147 billion!*

<sup>1</sup>Barker LA et al. Int J Environ Res and Public Health 2011;8:514  
Ceniccola GD J Crit Care 2018;44:398

<sup>3</sup>Weiss AJ et al 2013 Agency for Healthcare Research and Quality Brief: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb210-Malnutrition-Hospital-Stays-2013.pdf>.

# Budget Impact of Intervention

- Budget impact of QI Program for Malnourished Patients – Hospital System, Patients identified with malnutrition
  - Basic QI (N=769)– 1 teaching, 1 community
  - Enhanced QI (N=500)– 1 teaching, 1 community
  - Validation Cohort – for comparison

## Basic QI Program

- Nurses screened at adm via EMR cued tool
- Oral nutrition supplement given w/in 24-48 hrs if score  $\geq$  2 (if not NPO)

## Enhanced QI Program

- Nurses screened at adm via EMR cued tool
- Oral nutrition supplement given w/in 24-48 hrs if score  $\geq$  2 (if not NPO)
- RD Inpatient nutr educ
- RD Post d/c instructions
- RD f/u phone call/coupons for product

# Results

Population based results

Took into account Direct and Indirect Costs

Cost of Readmission and Labor (based on 2010 \$)

**Cost of Readmission \$11,200 - \$18,478**

**Potential saving of nearly \$4000 per pt (LOS + Readmit)**

**Table 2**

## Cost-Savings with a Quality Improvement Program for Malnourished Hospitalized Patients: Comparing the Validation versus the Basic and Enhanced Cohorts

	Hospital readmission rates		
	Basic quality improvement program cohort, 16.4% (N = 769)	Enhanced quality improvement program cohort, 15.6% (N = 500)	Combined quality improvement program cohorts <sup>b</sup> (N = 1269)
Validation cohort readmission rate, <sup>a</sup> 22.1% (N = 1319)			
Avoided readmissions (observed/expected frequencies), N <sup>c</sup>	44	33	77
Total readmission cost-savings, \$ <sup>d</sup>	490,930	364,000	854,930
Patient net savings, \$	638	728	674
	Hospital length of stay		
	Basic quality improvement program, 5.4 ± 4.8 days	Enhanced quality improvement program, 5.3 ± 4.5 days	Quality improvement program cohorts <sup>b</sup> (N = 1269)
Validation cohort, length of stay 7.2 ± 8 days (N = 1319)			
Difference, days	1.8	1.9	1.8
Length-of-stay cost-savings, \$ <sup>e</sup>	2,450,034	1,681,500	4,131,534
Patient net savings, \$	3186	3363	3255
Readmission and length of stay			
Combined cost-savings, \$	2,940,964	2,045,500	4,986,464
Total quality improvement program cost (fixed and variable costs), \$	40,412	49,564	89,706
Total quality improvement program savings, \$	2,900,822	1,995,936	4,896,758
Patient net savings, \$	3772	3992	3858

<sup>a</sup>Patients admitted to the 4 Advocate quality improvement program hospitals a year before quality improvement program with malnutrition-related diagnoses (*International Classification of Diseases, Ninth Revision* codes 263.0-263.9) and oral nutritional supplementation orders.

<sup>b</sup>Weighted averages or totals are reported as applicable.

<sup>c</sup>Reflects rounded or exact numbers as applicable.

<sup>d</sup>Based on HCUP readmission cost of \$11,200.



OK MAKE A NOTE.....  
STOP MALNUTRITION?

SGA

MST

MUST

**ASPEN/Academy**

MNA

SNAQ

**HOW IS MALNUTRITION DEFINED?**

**DEPENDS ON WHO YOU ASK...**

**MALNUTRITION = UNDERNUTRITION**

**HOW TO IDENTIFY PATIENTS**

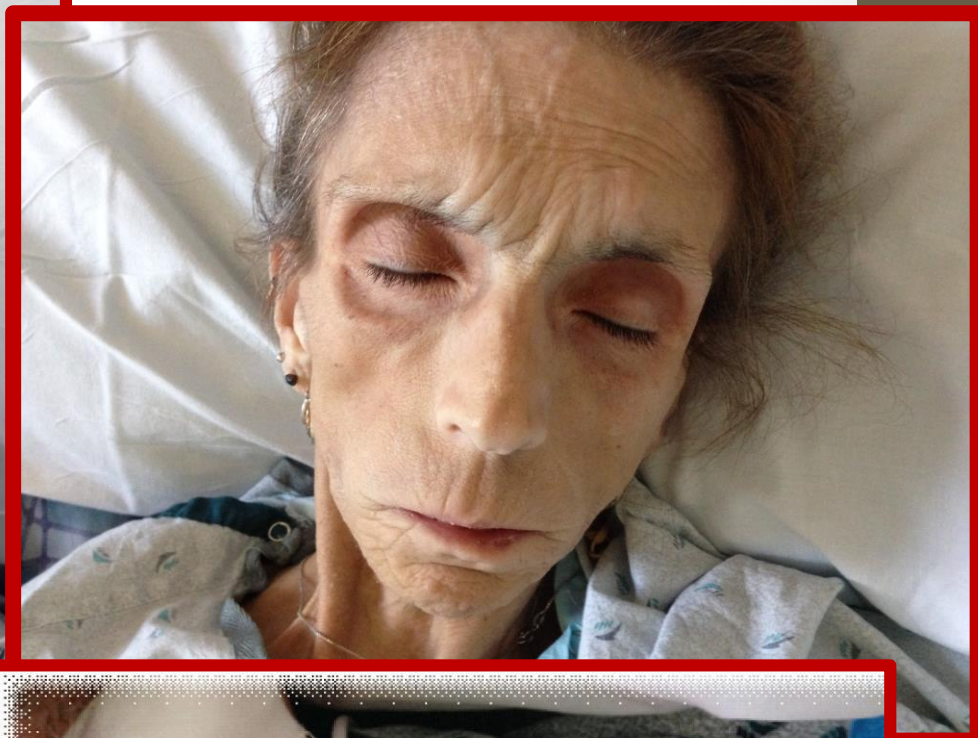


# Screening per Pt Profile



- BMI (based on admit height and weight)
- Appetite (Good, Fair, Poor)
- Decreased Appetite (Yes/No – how long)
- History of nausea/vomiting, diarrhea, dysphagia, TF/TPN
- Lost weight without trying (Yes/No)
  - Amount of wt in pounds
  - Timeframe of wt change

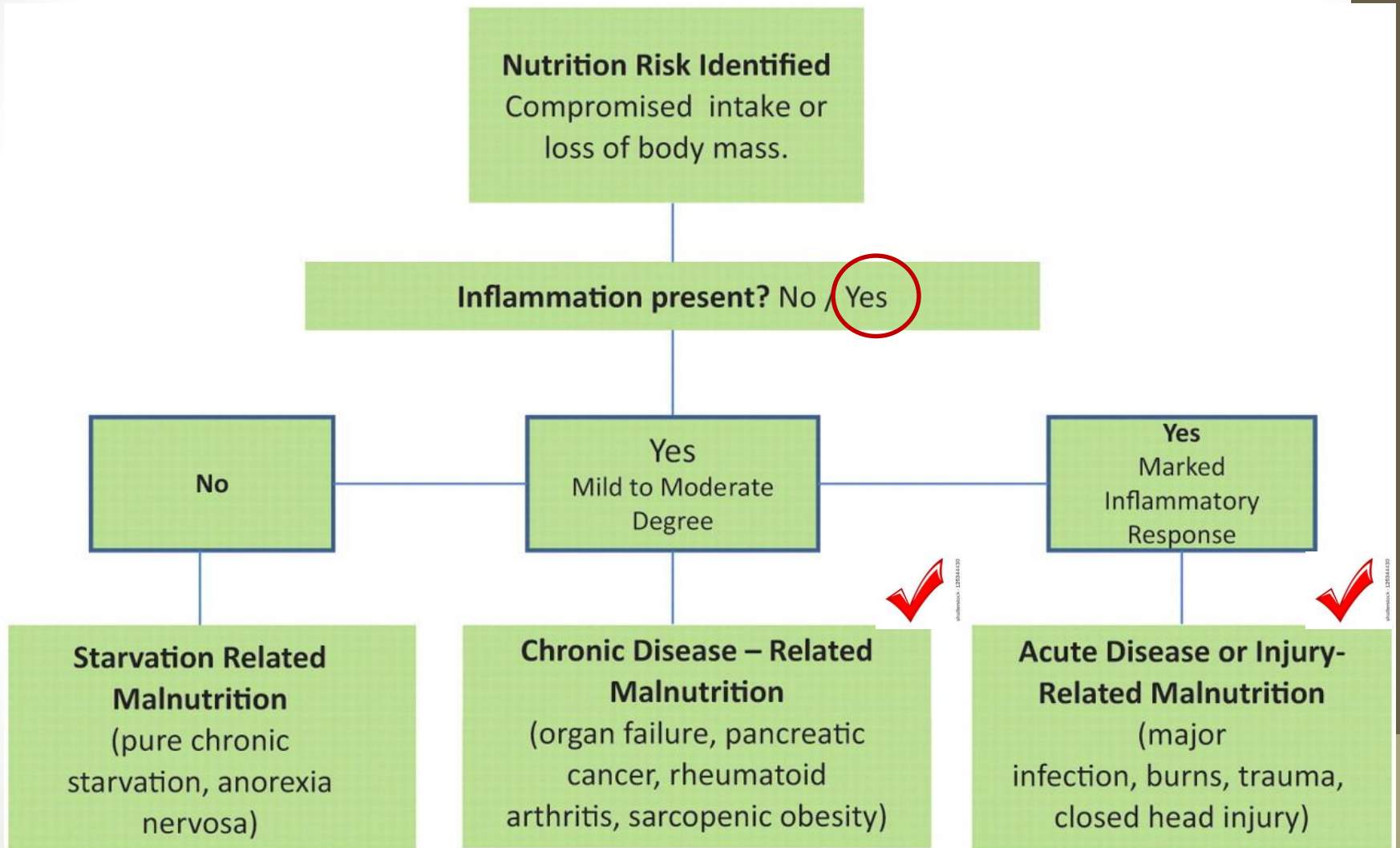
*Positive response triggers RD consult –  
within 48hrs...a long time to go without  
needed nourishment*



## Chronic/Acute malnutrition

“undernutrition” seen in  
cirrhotics (pre/post transplant),  
cancer patients, CF,  
malabsorption, etc

# ASPEN Malnutrition Definitions



# Malnutrition Diagnosis (Nutrition vs Medical)

- *Severe Malnutrition (2 or more)*
  - Significant muscle wasting or loss of subcutaneous fat
  - Intake <50% for 2 weeks or more
  - Bedridden, reduced functional capacity
  - Wt loss >2% in 1 week, 5% in 1 month or 7.5% in 3 months
- *Moderate Malnutrition (2 or more)*
  - Some muscle wasting or loss of subcutaneous fat
  - Intake <50% for 1 week
  - Reduced functional capacity
  - Wt loss 1-2% in 1 weeks, 5% in 1 month, 7.5% in 3 months
- *Mild Malnutrition*
  - Intake <50-70% of normal for past 1 week

# Traditional vs New

- *Traditional – chronic condition, prolonged deficiency*
  - Dx based on: physical factors, biomarkers, BMI
  - No particular finding required or definitive
  - Biomarkers “considered with caution” due to effects of other conditions “inflammatory states, acute illness and trauma”
  - Subjective data - decision by MD
- *New – Undernutrition*
  - Acute, Chronic and Social Environmental
  - Chronic and Social Environmental = traditional concept
  - “Acute” dx new territory
  - Subjective data – decision by MD, APRN, LIP, RD

*Variety of definitions and techniques being used at present to diagnose – no nationally recognized standard*

	ASPEN Severe	Traditional severe	ASPEN Non-severe	Traditional moderate
IBW	N/A	<70%	N/A	<80%
Unintended Weight loss	>2% in 1 wk >5% in 1 mo >7.5% in 3 mo	>5% in 1 mo >7.5% in 3 mo >10% in 6 mo	1-2% in 1 wk 5% in 1 mo 7.5% in 3 mo	< 85% of usual body wt
BMI	N/A	<16 kg/m <sup>2</sup>	N/A	<17 kg/m <sup>2</sup>
Alb/Pre-alb	N/A	<2.0g/dL or < 5 mg/dL		≤2.5 g/dL or <10 mg/dL
% intake	≤ 50% of need for ≥ 5 days	N/A	≤ 75% of need for ≥ 7 days	N/A
Physical Findings	Moderate ↓ Subcut Fat ↓ Muscle ↑ fluid/edema	MD states: Cachetic Emaciated Temporal wasting Failure to thrive	Mild ↓ Subcut Fat ↓ Muscle ↑ fluid/edema	
Hand Grip or Function test	↓ per industry standards	N/A	N/A	N/A
Risk Factors	N/A	Cancer, chemo, AIDS, Etoh abuse, end-stage organ fail, GI/Panc d/o, malabsorp, NH pt, debilitation	N/A	Same as Severe

# Albumin – Yay or Nay

- Use of low albumin or pre-albumin levels can still be used to **support a query of malnutrition**, however these are no longer considered acceptable as inclusion criteria for diagnosing malnutrition.

*“In critically ill patients, the serum prealbumin level did not respond sensitively to nutritional support. In addition, an increase in prealbumin level does not indicate a better prognosis for critically ill patients”*

# ICD-10 Codes Related to Malnutrition

ICD-10 Code/Language	Type of Comorbidity Code
E40 Kwashiorkor*	MCC
E41 Nutritional marasmus*	MCC
E43 Unspecified severe protein-calorie malnutrition	MCC
E44.0 Moderate protein-calorie malnutrition	CC
E44.1 Mild protein-calorie malnutrition	CC
E46 Unspecified protein-calorie malnutrition	CC

MCC=major complications/comorbidity, CC=complication/comorbidity  
\* Not typically seen in first-world countries



# Patient level Differences

## ICD-10-CM

E43 Unspecified severe PCM (MCC)  
E44.0 Mod PCM (CC)  
E44.1 Mild PCM (CC)  
E46 Unspecified PCM (CC)

*MCC = Major complications or comorbidities*

*CC = complications or comorbidities*

*Currently under CMS review for electronic clinical quality measure (CQM)*

- *Complete screen w/in 24 hrs of admit*
- *Complete nutr assess if at risk for maln within 24 hrs of screen*
- *Nutrition care plan documented*
- *Appropriate documentation of malnutrition diagnosis*



# Recognize Severe Malnutrition— the pennies add up!

Principle ICD-9 Dx/ Procedure	2 <sup>nd</sup> dx	Mortality Risk/ Severity of Illness	Estimated Reimburse	2 <sup>nd</sup> ICD-9 dx + / New Risk/Sev of Illness
1533/ Sigmoid ca 4582/ open TAC with EI	4011/benign essential HTN	1/1	\$12,363	5793/ ileus 1/2

Est. w/ ileus	2 <sup>nd</sup> dx + / New risk/ Sev of Ill	Estimated Reimbursement (Add' l with severe malnutrition)
<b>\$18,522</b> <i>(\$6,159 add' l)</i>	<b>262/ Severe PCM 2/3</b>	<b>\$35,996</b> <i>(\$23,633)</i>

*Goal is to identify “ALL” co-morbidities and the money will follow – it takes a team to get the job done.*



# Reimbursement and Responsibility

- ICD – 10 codes use 3 levels: mild, moderate or severe
- ASPEN criteria: severe, non-severe
- Medical dx of “severe” malnutrition – results in higher reimbursement.

*“A diagnosis that results in higher payment must be verifiable by independent professional audit using clinical criteria widely accepted by the medical community”*

*U.S. Dept. of Justice*

**Goal: Ensure Consistent identification, assessment and diagnosis of malnutrition while reducing/eliminating risk of insurance fraud while having the most beneficial impact on patient outcomes.**

# Tips to Avoid Abuse and Fraud

- Avoid documentation and coding of Kwashiorkor malnutrition at all costs --- very rare in the U.S. and not likely in hospitalized patients
- Refer to findings in dietitian assessment – ASPEN criteria
- Document risk factors, disease states, vitamin deficiencies
- For coding specialists – do not query just based on “underweight”



# The APRN is positioned to

- Assess, prevent and treat malnutrition
- Educate and collaborate with nursing and other disciplines
- Implement system-level interventions to ensure that at risk adult patients are screened, identified and treated for suboptimal nutritional states



*Does this come  
as a surprise?*

# Survey Says.....

## **NACNS nutritional knowledge survey (2015-2016)**

- ❖ 50% of members received nutrition education beyond undergrad
- ❖ 59% indicated basic or < basic knowledge of nutritional needs of hospitalized adults
- ❖ Surprisingly, *no survey respondents identified that advanced practice registered nurses (APRNs) have primary responsibility for initiating nutritional intervention* and **only 4.1 percent of respondents thought that APRNs have responsibility for maintaining nutritional interventions.**

# NACNS Recommendations



- *Utilize full scope of practice, including prescriptive authority, to identify and treat hospitalized adult patients at risk for and experiencing malnutrition*
- *Implement curriculum, based on master and doctoral level core competencies, which supports the nutritional assessment, treatment and prescription of nutritional supplements and interventions for the hospitalized adult patient*

# NACNS Recommendations



- *Advocate for the nutritional needs of the at-risk and malnourished hospitalized adult patient in national forums in order to raise awareness of this critical gap in healthcare delivery*
- *Champion for increased funding for nursing nutritional assessment, systems-level nursing and interprofessional nutritional support projects, and research to reduce the rate of malnutrition and its sequelae in the hospitalized adult patient*

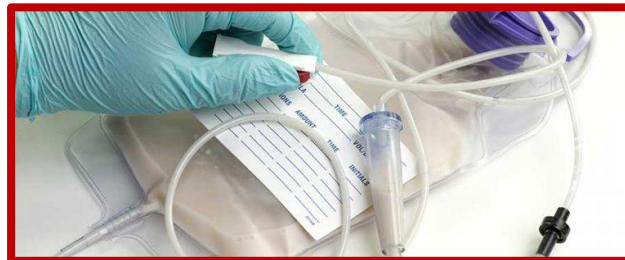




SCREEN, RECOGNIZE, AND DIAGNOSE  
TREAT, INTERVENE, MONITOR, PREVENT

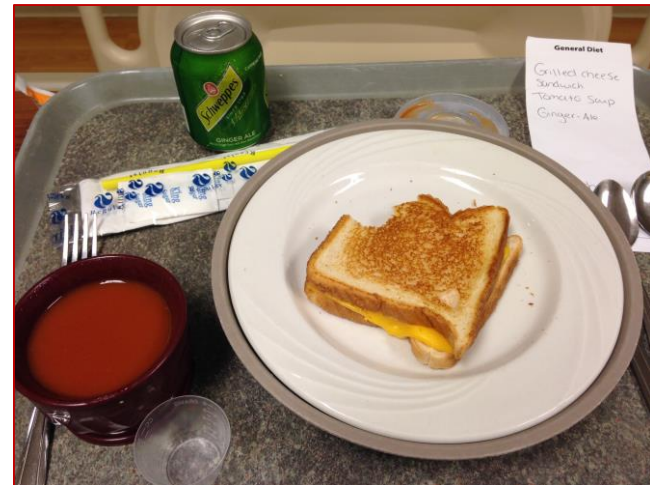
# Treat/Intervene

- Order Dietitian Consult
- Offer diet appropriate oral supplements – sample from pantry
- Discuss with medical team – *sooner rather than later! Does the pt need TF or TPN?*
- Discuss importance of adequate nutrition as part of the healing process with patient and family – get them in the ‘game’!
- Anti-nausea meds 30 min before meals



# Monitoring and Transition

- Amount eaten --- matters
- Acceptance of oral supplements
- Upon discharge –let other healthcare workers know upon transition, restate importance to families
- Teach tube feeding administration and trouble shooting – do you think they can do it?



*Nutrition stopped === potential readmission with worsening malnutrition and increased complications!*



# Prevention

- Mealtime - quiet time, pt to focus on eating
- Tube feeding – volume-based feeding make up for lost time
- Parenteral Nutrition – hang on time
- Oral supplements with med pass – even if well-nourished
- Offer between meal snacks/supplements if poor intake at meal.....not sure....ask your RD!
- Discuss prolonged NPO with MD



# Hospital Malnutrition in Acute Care

- Poor food intake ( $\leq 50\%$  of tray) in the first week of hospital stay occurs for  $\sim 35\%$  of pts (424 pts) (Allard et al., 2015)
- Poor food intake during admission predicts length of stay when adjusted for other covariates such as malnutrition at admission (Allard et al., 2015)
- Patients experience many barriers to intake (Keller et al., 2015)
  - 42% interrupted during meal (371/887 pts)
  - 69% if missed a meal, not provided food (251/363 pts)
  - 30% couldn't open food packages (261/867 pts)
  - 20% could not reach meal tray (171/867 pts)

# Implementing Measures in the MQii

## The Malnutrition eCQMs Help Providers Measure Progress Toward Standards of Care

### MQii eCQMs SPAN THE MALNUTRITION CARE WORKFLOW



<p><b>Screening</b></p> <p>Nutrition screening using a validated tool for all patients with a hospital admission (MUC16-294)</p>	<p><b>Assessment</b></p> <p>Nutrition assessment using a standardized tool for all patients identified as at-risk for malnutrition (MUC16-296)</p>	<p><b>Diagnosis</b></p> <p>Documentation of nutrition diagnosis for all patients identified as malnourished (MUC16-344)</p>	<p><b>Care Plan Development</b></p> <p>Establishment of a nutrition care plan for all patients identified as malnourished or at-risk for malnutrition (MUC16-372)</p>	<p><b>Intervention Implementation*</b></p> <p>Implementation of a nutrition care plan including treatment for all patients identified as malnourished or at-risk for malnutrition</p>	<p><b>Monitoring / Evaluation &amp; Discharge Planning*</b></p> <p>Implementation of processes, including discharge planning, that support ongoing monitoring and support the care of patients identified as malnourished or at-risk for malnutrition</p>
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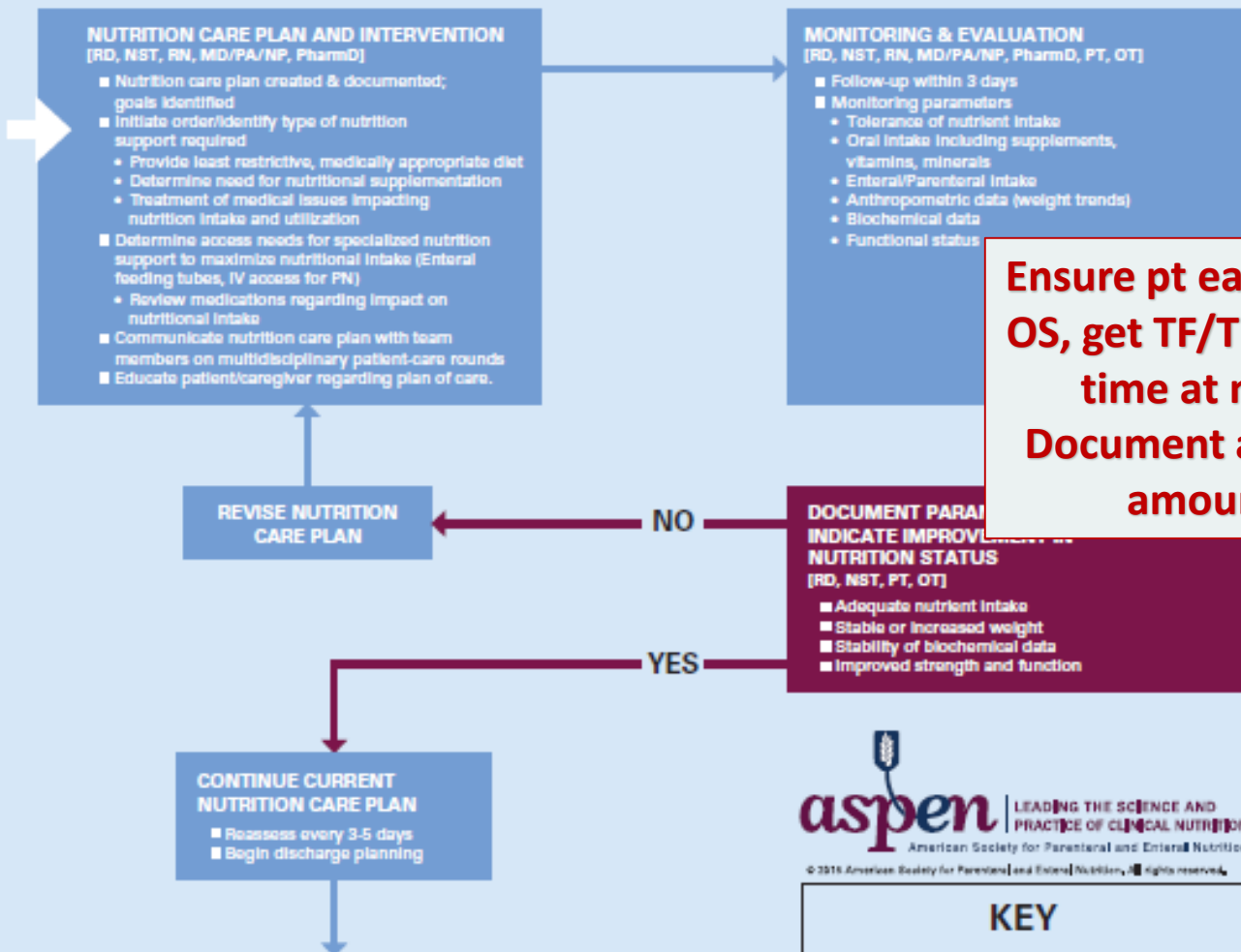
#### Clinician Typically Responsible for Each Step

<ul style="list-style-type: none"> <li>Nurse</li> </ul>	<ul style="list-style-type: none"> <li>Dietitian</li> </ul>	<ul style="list-style-type: none"> <li>Physician</li> <li>Dietitian</li> </ul>	<ul style="list-style-type: none"> <li>Physician</li> <li>Dietitian</li> <li>Nurse</li> </ul>	<ul style="list-style-type: none"> <li>Physician</li> <li>Dietitian</li> <li>Nurse</li> </ul>	<ul style="list-style-type: none"> <li>Physician</li> <li>Dietitian</li> <li>Nurse</li> </ul>
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= Measure developed to address this step in the malnutrition care workflow

\*Measures for monitoring and evaluation, and discharge planning were not technically feasible due to limitations in availability of measure data.





**NUTRITION CARE PLAN AND INTERVENTION**  
[RD, NST, RN, MD/PA/NP, PharmD]

- Nutrition care plan created & documented; goals identified
- Initiate order/identify type of nutrition support required
  - Provide least restrictive, medically appropriate diet
  - Determine need for nutritional supplementation
  - Treatment of medical issues impacting nutrition intake and utilization
- Determine access needs for specialized nutrition support to maximize nutritional intake (Enteral feeding tubes, IV access for PN)
  - Review medications regarding impact on nutritional intake
- Communicate nutrition care plan with team members on multidisciplinary patient-care rounds
- Educate patient/caregiver regarding plan of care.

**MONITORING & EVALUATION**  
[RD, NST, RN, MD/PA/NP, PharmD, PT, OT]

- Follow-up within 3 days
- Monitoring parameters
  - Tolerance of nutrient intake
  - Oral intake including supplements, vitamins, minerals
  - Enteral/Parenteral Intake
  - Anthropometric data (weight trends)
  - Biochemical data
  - Functional status

**REVISE NUTRITION CARE PLAN**

**DOCUMENT PARAMETERS INDICATE IMPROVEMENT IN NUTRITION STATUS**  
[RD, NST, PT, OT]

- Adequate nutrient intake
- Stable or increased weight
- Stability of biochemical data
- Improved strength and function

**CONTINUE CURRENT NUTRITION CARE PLAN**

- Reassess every 3-5 days
- Begin discharge planning

**DISCHARGE PLAN**  
[RD, RN, MD/PA/NP, PharmD, CM]

- Education / Counseling with patient and caregivers
- Communication of PN, EN, or Oral Nutrition Supplement prescription
- Case management for continuity of care
- Outpatient follow-up as appropriate

**Ensure pt eats, drinks OS, get TF/TPN, quite time at meals**  
**Document accurate amounts**

**Educate family/pt on importance of nutrition to recovery**



**KEY**

- CM Case Manager
- OT Occupational Therapist
- PT Physical Therapist
- AND Academy of Nutrition and Dietetics
- A.S.P.E.N. American Society for Parenteral and Enteral Nutrition
- PN Parenteral Nutrition
- EN Enteral Nutrition
- NPO/CLD Nothing by Mouth/Clear Liquid Diet
- EMR/MR Electronic Medical Record or Medical Record
- PA Physician Assistant
- PharmD Pharmacist
- BMI Body Mass Index



# Together we can stop the madness of malnutrition!



*Identify, treat/intervene, monitor, prevent...*

# Questions?

