



Global Leadership Conversation

Addressing Malnutrition

**Tuesday, January 19, 2016
12:30-4:00pm
Clinical Nutrition Week, Austin, TX**

Austin Convention Center, Room 18

Welcome! A.S.P.E.N. is excited to host the first Global Leadership Conversation here at Clinical Nutrition Week in Austin, TX. I cannot think of a better way to conclude what has been such a successful meeting than by all of us, leaders in our societies and in our field from around the world, coming together to discuss such an important topic. Hopefully the insights and dialogue today will set the stage for continued collaboration as we collectively strive to provide optimal nutrition care to all of our patients.

- Gordon S. Sacks, PharmD, BCNSP, FCCP
A.S.P.E.N. President, 2015-16

Agenda

12:30-1:30	Lunch
1:30-1:40	Words of welcome from the A.S.P.E.N. President
1:40-1:45	Introduction of the Global Leadership Conversation by Moderator
1:45-2:00	ESPEN Perspective
2:00-2:15	FELANPE Perspective
2:15-2:30	PENSA Perspective
2:30-2:45	A.S.P.E.N. Perspective
2:45-3:00	Break
3:00- 3:45	Q & A with Dialogue
3:45-4:00	Closing Remarks

Presentations will be made today by representatives from A.S.P.E.N., ESPEN, FELANPE, and PENSA. They will be addressing two questions:

- 1. What is your region's position on malnutrition screening, assessment, and diagnosis?**
- 2. What is your region's literature on malnutrition prevalence?**

Following is a presentation summary from each speaker. Additionally, a number of global societies shared their perspectives, and these have been included as well.

A.S.P.E.N. Response

Ainsley Malone, MS, RD, CNSC, FAND, FASPEN

A.S.P.E.N.'S Position On Malnutrition Screening, Assessment, And Diagnosis

A.S.P.E.N. and Malnutrition – Not a New Issue

Malnutrition was a key strategy for A.S.P.E.N. in the early 1980's. In 1983, the Board of Directors published a "statement", an early form of a position paper, publically noting that malnutrition occurs in hospitalized patients and that as an organization, A.S.P.E.N. will develop standards for nomenclature and procedural "matters" related to malnutrition.

Nutrition Assessment – The Beginning

The methodology of performing nutritional assessments included criteria/characteristics and methods that formed the foundation for diagnosing malnutrition as well as deciding who needed immediate nutrition intervention. The methods used included key parameters such as weight loss and calorie intake were known to be related to negative outcomes.

Nutrition Screening

Currently all hospitals must perform nutrition screening within 24 hours of patient admission. This standard was added to the Joint Commission for Accreditation of Hospitals standards in 1996, the culmination of efforts by multiple nutrition organizations including A.S.P.E.N. In 2012, A.S.P.E.N. conducted a nutrition screening and assessment survey to assess practices in adults, pediatrics and neonates. Of the 918 adult patient care respondents, 90% reported nutrition screening was completed within 24 hours of admission.

Malnutrition Redefined

Recognizing the need to standardize the criteria for diagnosing malnutrition, A.S.P.E.N. collaboratively participated with the Academy of Nutrition and Dietetics to develop and publish a consensus statement on recommended characteristics for the identification and documentation of both adult and pediatric malnutrition (2012/2015). This was a critical and very important step to address the lack of standardization in the definition of malnutrition.

Malnutrition Characteristics from the Consensus Documents

Adult

- Reduced food/caloric intake
- Unintended/non-volitional weight loss
- Loss of muscle
- Loss of subcutaneous fat
- Evidence of fluid accumulation
- Diminished hand grip strength

Any 2 or more characteristics should be used to identify Adult Malnutrition

Pediatric

With one available data

- Weight/height z score
- BMI z score
- Length/height age z score
- Mid-upper arm circumference z score, %

With two available data points

- Weight gain velocity (<2 years)
- Weight loss (2-20 years)
- Deceleration weight/length or weight/height z score
- Inadequate nutrient intake

Nutrition Care Process

A.S.P.E.N. has spent considerable effort to address the gaps that often occur in the care of malnourished patients or those at high risk of its development. In late 2015, revision of an adult and pediatric “nutrition care pathway” was finalized in an effort to promote best practice in malnutrition care.

Additionally, an important paper was published in the *Joint Commission Journal of Quality and Patient Safety* calling for a “national” goal for hospitals to address the issue of malnutrition.

Malnutrition Prevalence

Malnutrition prevalence has varied considerable over the decades with consistent prevalence ranging from 25% - 54%. The variability certainly can be attributed to a wide range of nutrition assessment methodologies utilized and populations surveyed. There is a clear need to utilize a consistent method for assessing malnutrition prevalence in the United States and globally.

Gaps in Prevalence

Despite what we believe is fairly accurate data with regards to malnutrition prevalence, in the United States, there is a significant gap in the documentation of malnutrition upon hospital discharge. While it appears malnutrition documentation is increasing (3.7% in 2010 to 4.8% in 2014) (<http://hcupnet.ahrq.gov/>), there remains a very large gap indicating hospitals are not receiving adequate resources to care for these complex patients who are much more likely to experience negative clinical outcomes.

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ESPEN Response

Tommy Cederholm, MS, PhD

ESPEN'S Position On Malnutrition Screening, Assessment, And Diagnosis

Screening

ESPEN advocates that screening for malnutrition should be performed in all subjects that come in contact with healthcare services. Depending on the care setting, screening should be performed within the first 24-48 hours after first contact and thereafter at regular intervals. There are several risk screening tools for malnutrition. ESPEN suggests the use of Nutrition Risk Screening-2002 (NRS-2002) and the Malnutrition Universal Screening Tool (MUST). For older persons ESPEN recommends the Mini Nutritional Assessment (MNA) either in its full or short form (MNA-SF). Other validated tools frequently used are Subjective Global Assessment (SGA) and SNAQ. These are all compiled of various combinations of registered or measured BMI, weight loss, food intake, disease severity and age. Local preferences are primarily guiding which instrument to use.

Assessment

Nutritional assessment is performed in all subjects identified as being at risk by nutritional risk screening.

- A *medical history* should be taken. Physical examinations and biochemical analyses should be performed, in order to decide the underlying disease or condition that may cause the potential state of malnutrition.
- *Social and psychological history* is taken to establish potential effects of living conditions, loneliness and depression on nutritional needs.
- A *nutrition history* should be taken and examinations and observations should be performed in order to decide the underlying nutritional causes, and to identify major nutritional obstacles and calculate nutritional needs.- Energy needs are determined by indirect calorimetry or calculated.
- Protein needs are established in the range from 0.8 g/kg/day (healthy adults) up to 1.5 g/kg/day according to age, disease and degree of protein depletion.
- Micronutrient needs should be determined according to prevailing recommendations.

Diagnosis

Basic diagnostic criteria for malnutrition have recently been suggested by an ESPEN Consensus Statement (Cederholm 2015). These are general criteria that are intended to be applied independent of clinical setting and aetiology.

Prior to diagnosis of malnutrition the criteria for being “at risk” of malnutrition according to any validated nutritional risk screening tool must be fulfilled. Then, two alternative sets of diagnostic criteria are given:

Option 1:

- BMI <18.5 kg/m²

Option 2:

- Weight loss (unintentional) >10% over any period, or >5% over the preceding 3 months combined with either:
- BMI <20 kg/m² if <70 years of age, or <22 kg/m² if ≥70 years of age; or
- FFMI <15 kg/m² in women, and 17 kg/m² in men.

Cut-off values for reduced BMI, weight loss and FFMI may be adapted or revised according to ethnicity or to new data.

Etiology based malnutrition diagnosis

Subordinate to the general diagnosis of malnutrition are the aetiology based types of malnutrition. These are disease-related malnutrition (DRM) and hunger-related malnutrition (HRM).

DRM is a specific type of malnutrition caused by a concomitant disease.

Inflammation is an important watershed for malnutrition aetiology. Thus, there are two distinct types of DRM: one triggered by a disease-specific inflammatory response; i.e. *Inflammation driven DRM*, and the other linked to diseases where non-inflammatory etiologic mechanisms predominate; i.e. *Non-inflammation driven DRM*.

Inflammation-driven DRM can either be elicited by an *acute disease or trauma* with a strong inflammatory response or by a *chronic disease* with a low inflammatory response.

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FELANPE Response

M. Isabel T. D. Correia, MD, PhD

FELANPE'S Position On Malnutrition Screening, Assessment, And Diagnosis

Malnutrition in Latin America

Malnutrition is widely prevalent worldwide (1-6) and, in Latin America, it's no different. Several studies have shown that rates as high as 70% can be found in hospitalized patients (7-12). In 2001, the Brazilian Society of Parenteral and Enteral Nutrition sponsored a multicenter study, which nutritionally assessed 4,000 patients admitted to public and private hospitals. Malnutrition was present in almost 50% of the hospitalized patients, with 12.6% being severely malnourished(12). In this study, it was shown that the longer the patient stays in the hospital the higher the prevalence of malnutrition is. Also, the presence of cancer and infection increased the number of malnourished patients and, medical patients were at higher risk of nutritional deficiencies. Later, another study showed that the malnourished patients had worse outcomes with increased complications and mortality, as well as length of hospital stay(13). This all impacted on hospital costs. This study aimed at reporting to the government the reality on nutritional care and services in the country and after such data, important laws on the relevance of nutrition therapy were developed and implemented in the country.

In other Latin American countries, a similar study was carried out in 2003, providing similar results to the Brazilians(14). Despite its high prevalence, malnutrition is seldom a key component of hospital practices and, in fact, the majority of the almost 10,000 assessed patients, less than 20% had any information in the medical records related to nutrition issues. It's noteworthy to point out that this information did not include any sophisticated assessment but rather, simple words such as "malnourished", "has lost weight", "is not eating adequately" etc. Therefore, we speculated that despite the high prevalence of malnutrition, medical awareness is low.

Almost 15 years later, another Brazilian study(15), now to assess pressure ulcer prevalence and its relation to the nutritional status, showed that the high prevalence of malnutrition is still a reality in the country, with more than 50% of the patients being malnourished. Malnutrition increased the risk of pressure ulcer by more than ten times.

Similar results have recently been reported by Mexican authors who showed that among 2,378 patients, malnutrition was present in almost 50% of the patients independently of the ward these individuals were admitted to. Also, in their report, authors have shown that malnutrition significantly increased mortality.

Thus, malnutrition is definitely a health care problem in Latin America where medical awareness related to the problem seems to be low. In Brazil, several laws have been implemented but they seem not to have impacted on the prevalence of such syndrome.

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PENSA Response

Ryoji Fukushima, MD, PhD

Nutritional Screening and Assessment in Asia

1. Nutrition screening and assessment tools.

Several tools are utilized in Asian countries such as MUST (malnutrition universal screening tool), CONUT (Controlling Nutritional Status), NRS 2002 (Nutritional Risk Screening, SGA (Subjective global assessment) and others. For elderly people, MNI (Mini nutritional assessment) and GNRI (Geriatric Nutritional Risk Index) are used. Asian language versions of MNIs are now available in Japanese, Chinese, Korean and Thai. For some surgical patients, PNI (Prognostic Nutritional Index) is used to assess the surgical risk of the patients. In Korea, SNUH-NSI (Seoul National University Hospital-Nutrition Screening Index) is developed for assessment tool.

In Japan, more than 20,000 doctors participated in TNT (total nutrition therapy) course in the past 15 years where SGA is included in the program. In recent years those who perform body composition analysis using BIA (Bioelectrical impedance analysis) or CT scan images are increasing.

According to the survey preformed to 1,019 Japanese doctors in 2005, 38% of them think that body weight loss is the most important parameter for nutrition assessment and 31% think serum albumin the most important.

2. BMI (body mass index) in Asians and Westerners.

It is known that average BMI is smaller in Asians than in Westerners. This is confirmed by the nutritionDay data in 2014 as shown below. We must take this difference into account when using BMI for nutrition assessment.

Country	CN	IN	JP	PH	SG	TH	US	AT	World
n	253	286	1313	174	607	127	2806	321	14603
BMI	22.7	24.3	22.1	24.7	23.5	23.9	28.9	25.6	25.7
age	52	56	71	53	71	67	62	68	67
With BW loss(%)	34	28	34	35	28	32	38	48	43

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Asociacion Argentina de Nutricion Enteral y Parenteral – Argentina

Submitted by: Romina Barritta de Defranchi

What is your region's position on malnutrition screening, assessment, and diagnosis?

Nutritional screening in Argentina is not mandatory. Few institutions have developed their own policies and procedures to perform nutritional screening in hospitalized and ambulatory patients. The Latin American Federation of Enteral and Parenteral Nutrition (FELANPE) states that all patients should be evaluated within the first 24 to 48 hours, with a validated screening method, to identify patients at nutritional risk (1).

At this time there is not a local validated nutritional screening tool in Argentina. The upcoming results of a study from the Argentinean Association of Enteral and Parenteral Nutrition (AANEP) known as “*AANEP 2014 Disease Related Malnutrition Prevalence in Hospitalized Patients in Argentina*” will determine which validated nutritional screening tool is more useful for our population and our resources. In the meantime, tools like Subjective Global Assessment (SGA), Nutrition Risk Screening (NRS 2002), Malnutrition Universal Screening Tool (MUST), Malnutrition Screening Tool (MST), Short Nutritional Assessment Questionnaire (SNAQ) and Mini Nutritional Assessment (MNA-SF) are used.

The Argentinean Association of Enteral and Parenteral Nutrition (AANEP) Clinical Practice Guidelines (in the setting of the National Minister of Health) will be updated once the results from our mentioned study are published, hoping that nutritional screening be required for all patients admitted to hospitals across the country. Formal nutrition assessment is performed in those patients identified at nutritional risk. Nutrition assessment and nutrition diagnosis is determined by the dietitian (*Licenciado en Nutrición*) in most cases. Anthropometric, dietary, biochemical, clinical and functional parameters are evaluated, but there is no consensus in the criteria used to diagnose and document malnutrition.

What is your region's literature on malnutrition prevalence?

Preliminary data of the multicenter study *AANEP 2014 Disease Related Malnutrition Prevalence in Hospitalized Patients in Argentina* shows a prevalence of malnutrition of 48.06% (37% moderate and 11% severe), determined by SGA. This study was conducted in 64 both public and private hospitals and included 1546 subjects. Prevalence of malnutrition in surgical patients was 40.21% and 52.7% in medical patients. As expected, the prevalence of malnutrition increased with age. Also,

length of hospital stay, infectious complications and mortality were significantly higher in malnourished subjects.

Our previous study, known as AANEP 99, found that the 47.3% of hospitalized patients had some degree of malnutrition, also defined by SGA (11.2% severe and 35.1% moderate) (2,3).

Similar prevalence of hospital malnutrition was observed in a comparable study conducted in Brazil (IBRANUTRI study) and another carried out in several countries of Latin America (ELAN study) (4,5).

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MALNUTRITION PREVALENCE, SCREENING AND ASSESSMENT IN AUSTRALASIA: A summary of the literature for ASPEN

Varsha Asrani RD Senior Clinical Dietitian, Auckland District Health Board and **Gil Hardy** PhD FRSC FASPEN, Professor of Clinical Nutrition, Massey University, New Zealand

NB: This report has not been reviewed or endorsed by AuSPEN (Australasian Society of Parenteral and Enteral Nutrition)

MALNUTRITION PREVALENCE

Internationally it is well established that at least **one third of all patients** admitted to hospital are either malnourished or at significant risk of disease-related malnutrition (DRM) **(1)** post hospital admission, with many remaining undiagnosed, leading to a rapid decline in their nutritional status **(2)**. Likewise **in Australasia, it is estimated that 30-40% hospital patients are malnourished (3)**.

A snapshot of current malnutrition prevalence in Australian (AUS) and New Zealand (NZ) hospitals, is the **2010 Australasian Nutrition Care Day Survey (ANCDs)(4,5)**. Hospital dietitians evaluated nutritional status using BMI and nutritional risk screening (NRS) tools in line with ICD-10-AM malnutrition definition, in 3122 adult patients from 42 hospitals in AUS (287 wards) and 14 hospitals in NZ (83 wards) representing 20% AUS and 38% NZ acute care hospitals with >60 beds:

- 46% of patients were screened on admission (53% in NZ) to 64% of wards
- 79% of the wards used MST. 16% used MUST. 5% used local tools
- **One in three patients (32%) were malnourished**
- **41% were at risk of malnutrition**
- Those identified as malnourished had: Double the 90 day-mortality, 5 days longer LOS and 6% higher remission rates
- More than half the wards referred screened patients at nutrition risk to dietitians and commenced a nutrition intervention protocol.

COST IMPLICATIONS FOR AUSTRALASIAN HEALTHCARE SYSTEM

Almost AUD 2 million per year in hospital reimbursement could be lost from undiagnosed or undocumented malnutrition.

- Under the case-mix funding system used in Australasia, hospitals are subsequently reimbursed, based on the Diagnosis Related Group (DRG).
- Malnutrition, when documented, can influence the DRG, often resulting in a higher classification which can attract greater level of reimbursement **(6)**
- In 1997 early nutritional intervention in USA, with frequent reviews was more cost effective than either early intervention alone or frequent reviews alone. Estimated saving to the hospital was **USD1064 per patient (7)**
- At the same time, a Brisbane hospital **(8)** estimated an **annual loss of AUD 1,677,235** due to undiagnosed or undocumented malnutrition.

- Ten years later, in a Melbourne hospital, malnourished patients had 4.5 days longer LOS with an **estimated annual deficit in hospital reimbursement of AUD 1,850,540** for undiagnosed or undocumented malnutrition. (9)

GUIDELINES

The principal professional guidelines in Australasia are the '**Evidence-based practice guidelines for the nutritional management of malnutrition in adult patients across the continuum of care**', published in 2009 by Dietitians Association of Australia (DAA) and endorsed by Dietitians New Zealand (DNZ). (10)

These guidelines provide a Grade B (Good) NHMRC recommendation that routine NRS should occur in the acute setting on admission, but only a Grade D (poor) recommendation for routine NRS in sub acute, residential aged care and community settings. Routine NRS for diagnosis and intervention, with monitoring and evaluation protocols are advocated as integral elements of patient care for early identification of risk to improve management support of malnourished adults (NHMRC Grade B). Unfortunately, implementation of these recommendations does not always translate into practice. Unlike some countries (11) **nutrition risk screening is not mandatory in Australia and New Zealand**, despite the fact that assessment of patient's physical, psychological and social needs is mandatory (12)

SCREENING AND ASSESSMENT TOOLS IN AUSTRALASIA

- In 2008 67% hospitals were using MST and 23% were using SGA/MNA
- Latterly, MUST has become more popular in NZ (13) but measuring weight and height to calculate BMI is a challenge for immobile patients and anthropometry can be skewed by e.g. fluid overload.
- A more reliable NRS tool is needed in these situations
- MUST is not validated for patients with renal impairment.

Biochemical Markers

- The visceral protein; Prealbumin (PAB) is a potential marker for quickly and effectively identifying individuals at risk of complications from DRM.
- Routine PAB screening in USA, (14) claims to have saved the hospital \$600,000 p.a. (\$500/d saving with LOS reduced by 2 days).

Summary of NZ Prealbumin (PAB) study (15):

- 27% (155/564) of admissions to 5 surgical/medical wards at NS hospital Auckland when screened with MUST and PAB had a low PAB (<0.2g/L)
- 30% of patients referred for dietitians assessment had a low PAB
- Including the PAB test did not improve recognition of malnutrition risk by HPs nor increased referral to dietitians (7.6% MUST+ PAB versus 7.9% MUST)

SCREENING PRACTICES IN AUSTRALASIA

Prior to the first AUS survey of NRS practices in 1995 (16), it was estimated that less than 5% of all AUS hospitals were screening. In the 1995 survey, the reported rate of screening was 23%, but only 17% used a formal screening tool.

- A 1 day audit of 2 Melbourne wards in 2006 reported screening rates of 17% (4/23) in General Medical and 61% (14/23) in Gastroenterology/Liver wards.

However, a 6 week retrospective survey of the 2 wards (n=212) showed a higher mean screening rate 23% than the 1 day audit (n=46) ($p<0.05$).

- The authors concluded that nurses have the best opportunity to screen patients so that dietitians can engage in more complex assessments. **(17)**

This recommendation appears to have borne fruit in a survey of DAA members a decade later, that compared current screening practices to those in 1995 **(18)**.

- **78% of hospitals were screening in 2008** vs 23% of hospitals in 1995.
- Screening was primarily carried out by nurses (62% v 24% in 1995) whereas screening by dietitians decreased from 62% in 1995 to 29% in 2008.
- In 2008 most patients were screened earlier (64% v 13% in 1995) but screening time decreased to approx 5min .
- **48% hospitals still had no documented screening policy.**

SCREENING IN VULNERABLE GROUPS

Hospitalised children in NZ

- NRS tools: **STRONGkids, STAMPS, PYMS**, were applied to all children (n=162) during the first 24h of hospital admission in Christchurch NZ **(19)**.
- Under-nutrition was higher in patients than controls **(9.9% vs. 3.7%; $p = 0.04$)**
- **Undernourished patients had longer hospital stay than well-nourished**
- **STRONGkids** proved to be the most reliable NRS tool.

Community living older adults in AUS

- Over 40% of older adults (65+yrs) receiving home nursing care (n=235) were either malnourished (8.1%) or at risk of malnutrition (34.5%) **(20)**
- Older people need routine NRS with targeted nutrition intervention.

OTHER CONSTRAINTS TO NRS IMPLEMENTATION

- Nurses have insufficient time for NRS, anthropometry, providing assistance with feeding and ordering extra blood tests.
- Nutrition support is still low priority with an over-reliance on PN
- Hospital food tastes and availability of high energy options are limited
- In the elective setting, patients are frequently NBM for scans/ rehab/ surgery
- NB: ERAS helps to prevent malnutrition in elective orthopaedic/ GI surgery.

CONCLUSIONS AND RECOMMENDATIONS:

- In the twenty years since nutrition screening began in Australasia the identification of patients at risk of malnutrition has improved, but small survey sample sizes means prevalence of NRS is likely still underestimated.
- Many acute care hospital wards in Australasia do not comply with evidence-based guidelines for nutritional management of malnourished patients
- More HP education is necessary to eliminate confusion between nutrition screening/assessment and who should be responsible for screening,

- Embedding NRS into nursing practices is key to improving screening rates
- Gaps in malnutrition documentation and/or subsequent coding could potentially result in significant loss of case mix-related revenue for hospitals
- Dietitians should lead the way in developing structured processes for malnutrition risk identification, documentation and coding.
- NRS tools have limitations. Research into universal PAB screening could improve detection rates if results automatically trigger dietitian referral.
- It is important to adopt a standard set of protocols in every institution to identify all patients at risk of malnutrition as per ESPEN guidelines **(21)**
- A clear nutrition care pathway should indicate action required from the NRS exercise with extra funding allocated for the increased workload for HPs.

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Canadian Nutrition Society – Canada

Canadian Malnutrition Task Force

What is your region's position on malnutrition screening, assessment, and diagnosis?

CMTF advocates for a systematic screening and assessment process. The Integrated Nutrition Pathway for Acute Care (INPAC) is an evidence based pathway developed and validated by the CMTF and is currently being tested in five Canadian hospitals. INPAC encompasses two simple screening questions (Canadian Nutrition Screening Tool) and the use of Subjective Global Assessment (SGA) for diagnosing malnutrition.

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What is your region's literature on malnutrition prevalence?

CMTF conducted a cohort study in 18 hospitals, in 8 provinces with a sample of 1022 patients. Using Subjective Global Assessment we identified prevalence of malnutrition to be 45% in medical and surgical patients.

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Asociacion Colombiana de Nutricion Clinica – Colombia

Adriana Amaya, RD and Patricia Savino, LL, MBA, RD, CNSD

What is your region's position on malnutrition screening, assessment, and diagnosis?

La Asociación Colombiana de Nutrición Clínica recommends using the tool NRS 2002 for nutritional screening. A dietitian in the clinical area performs the nutritional assessment, and the diagnostic is given according to the IMC.

What is your region's literature on malnutrition prevalence?

The hospital malnutrition prevalence in Colombia is 53%. From this, 13.8% had lost more than 8 kg of body weight before being admitted into the hospital, showing a high nutritional risk. This data was obtained from the last Nutrition Day.

The ACNC has been performing the Nutrition Day for 4 years in a row.

The outcome of the last report (2014) has given us the following information obtained from **53 units and 1,673 patients**.

Nutrition Support Teams: 34 (65%)

Patient Information

- Internal Medicine 53.8%
- Surgery 46.2%
- ICU 16.25%
- Post operator: 31.2%
- Pre operator: 10.9%

Comorbidities

- Diabetes 16.3%
- COPD 7.41%

After 30 days

- Discharged home: 70.7%
- Transferred to other hospital 5.33%
- Death 3.66%

General Information

- Males 53.7%
- Females 46.3%

- Weight 65.7 kg (+/- 14.1)
- Height 163.2 (+/- 9.1)
- BMI 24.7 (+/- 5.1)

Nutrition Information

- Weight loss: 53%
- More than 5 kg of weight loss 33%
- 1/4th or nothing eaten at lunch 29%
 - Loss of appetite 34%
- Couldn't walk without assistance 33%

Nutrition Support

- Enteral: 4.54%
- Parenteral: 2.21%
- Enteral + Parenteral: 0.54%
- Special Diet: 56.8%

Nutrition Support Access

- Nasogastric: 2.33%
- Other: 2.5%
- CVC: 7.02%

Others

- Other food not from hospital: 26%
 - Fruits 42%
 - Fruit juice 36%
 - Dairy Products 10%

Irish Society for Clinical Nutrition and Metabolism (IrSPEN) – Ireland

Submitted by: Carmel O'Hanlon

What is your region's position on malnutrition screening, assessment, and diagnosis?

Malnutrition screening/assessment

- Nutritional screening is widely recognized as critical to identifying individuals who are at risk nutritionally and require nutritional intervention, as appropriate to their needs. It is recommended by national bodies across Europe and the US, and in the UK is endorsed by Care Quality Commission (CQC), Department of Health (DoH) and NICE. Failure to implement screening leads to delayed diagnosis and management of malnutrition, which impacts on patient and clinical outcomes.
- Evidence based practice recommends that mandatory nutritional screening for all vulnerable groups should be built into national nutrition policies. Quality standards with audit and quality control measures should be included.
- Since 2009, the Department of Health in Ireland, has advocated the need for nutritional screening in all Irish hospitals (DH, 2009). HIQA (Health Information and Quality Authority) monitor compliance with nutritional screening in nursing homes in Ireland. However, patients who are at risk of malnutrition in Irish hospitals are often not being identified and therefore not being treated for this, due to lack of screening.

Gaps between current practice and evidence based practice

From Nutrition Screening Week 2010 (BAPEN, 2010):

- 54% of respondents from Irish hospitals screened only 0–25% of their patients.
- Overall, just 24% of the 29 participating Irish hospitals reported to have a nutritional screening policy in place, although the fact that a policy is in place does not mean it is being implemented.

Indeed, the results from Nutrition Screening Week conducted in 2011 (BAPEN, 2011) highlighted the fact that patients on all wards were routinely weighed in only 3 of the 26 participating Irish hospitals. Furthermore, results of an undergraduate survey on nutritional screening practices in Irish hospitals

(Berglund and Bååth, 2014) found that nine (31%) of the 29 dietitian manager respondents reported that **no screening tool** was used in their hospital setting.

Associated risk of variance from best practice

- If patients are not screened for nutritional risk, then they are not being identified and malnutrition prevention and treatment strategies cannot be implemented in a timely fashion.
- If left untreated, approximately 2/3 of these malnourished patients will experience a further decline in their nutrition status during their inpatient stay (Braunschweig et al 2000).
- A standardised approach to nutrition support provision is advocated (NICE, 2006). This should be done in a consistent streamlined, systematic manner using Nutrition Support Policies/Protocols.
- In addition, the annual healthcare costs of undernourished patients is more than three times that of non-malnourished patients (Elia, 2015 in press) due to increased use of healthcare resources.

Earlier this year, the National Institute for Clinical Effectiveness (NICE) in the UK ranked the implementation of its CG32 guidelines on use of nutrition support in adults as the third greatest potential means of achieving net cost savings for the NHS, having reviewed 400 of its clinical guidelines, technological assessments and quality standards, of which just 39 were cost saving. The potential for savings in the Irish healthcare system are equally substantial, with the added benefit of producing savings within very short timescales, relative to other technologies and interventions.

Local pilot data

Recently, in one Irish acute teaching hospital in Dublin, average length of stay (ALOS) was significantly reduced on two wards after introducing a validated nutrition screening tool, compared with the average reduction in ALOS hospital-wide over the same period (O'Hanlon, 2014). The National Institute for Health and Clinical Excellence (NICE) in the UK has estimated that implementation of screening programmes and nutritional care standards will produce net savings of 54.1 million euro per year to the NHS (NICE, 2006; NICE, 2013).

Importance of malnutrition diagnosis

Mortality risk

Undernutrition and weight loss have been consistently found to increase mortality risk, at all ages and across care settings. Malnutrition (risk score using the MUST) has been shown to double the risk of mortality in hospital patients and to triple mortality in older patients in hospital and after (Stratton et al., 2006). However, the findings from a large multicentre study in 12 countries (n=5051) showed that patients with malnutrition (using other tools) had a twelvefold increase in hospital mortality (Sorensen *et al.*, 2008), whereas a prospective cohort study of newly admitted adult patients (18–74 years of age) to an acute tertiary hospital (Lim et al, 2012) found that the mortality rate was higher in those assessed to be malnourished at 1 year (34.0% vs 4.1%), 2 years (42.6%

vs 6.7%) and 3 years (48.5% vs 9.9%, $p < 0.001$ for all). Malnutrition was a significant predictor of mortality (adjusted hazard ratio [HR] of 4.4 [95% CI 3.3–6.0], $p < 0.001$).

Morbidity risk

Results from a large, multicentre study (EuroOOPS, $n= 5051$, 12 countries, 26 hospitals) confirm the findings of other individual studies demonstrating that malnourished hospital patients (i.e. those at risk using a screening tool) experience vastly increased complication rates compared with well-nourished patients (30.6% vs 11.3%, $p<0.001$,) (Sorensen et al., 2008). This is consistent with the findings of studies to evaluate the impact of malnutrition on specific complications, such as pressure ulcers (Tappenden *et al.*, 2013). Similarly, the rate of hospital acquired infections have been consistently found to be more than three times greater among malnourished vs non malnourished patients (Schneider et al., 2004, Sorensen et al., 2008, Fry et al., 2010). Fry et al, found undernutrition to be an independent risk factor for nosocomial infections (odds ratio 3.0) in a retrospective analysis of over 900,000 patient records, alongside odds ratios for pressure ulcer, MRSA and catheter associated urinary tract infection of 3.8, 2.9 and 5.1 respectively. Older individuals with malnutrition are also more likely to experience poor quality of life (Rasheed and Woods, 2013; Kvamme *et al.*, 2011). Treatment effectiveness has also been shown to be adversely affected by undernutrition; studies have demonstrated that malnourished patients receiving chemotherapy have more pronounced treatment-related side effects and breaks from treatment to manage these, whilst undernutrition is also associated with poorer response to therapy, increased susceptibility to treatment-related adverse events and poor outcome).

Impact of inadequate / poor quality nutritional care on healthcare utilisation

In both prospective and large scale retrospective studies across a range of hospital inpatients in different countries, malnourished patients (with a variety of conditions) have been consistently found to use significantly more healthcare resources than well-nourished patients in terms of increases in length of hospital stay; increases in readmission rates and delays in returning home/need for institutional care (Pirlich et al, 2006, Melchior et al, 2012, Pernicka et al, 2010, Lim et al, 2012, Marco et al, 2011). This has very significant cost implications for the Irish healthcare system, with the total annual public healthcare costs associated with undernourished patients calculated at €1.42 billion (over 10% of total public healthcare budget), of which the vast majority is incurred in acute care (Rice and Normand, 2012). The excess bed days resulting from longer length of stay has been conservatively estimated at just over 250,000 bed days annually, and this figure is likely to grow as the population ages unless effective measures are taken to improve both the detection and treatment of those at risk.

Although nutrition support is safe, clinically and cost effective in the majority of patients unable to meet their requirements from food alone, the (incorrect) use of nutrition support is not without risk. In one major acute teaching hospital in Dublin, a high risk of refeeding syndrome (one of the known risks associated with malnutrition that all hospital staff involved in provision of nutrition support must be aware of), was demonstrated to

be present in 20-22% of consecutive non-elective admissions from the Hospital's Emergency Department, over two separate study periods (Boland *et al.*, 2013).

IrSPEN position on malnutrition screening, assessment and diagnosis:

See call to action booklet for outline of key recommendations. Progress has been made and is ongoing on all key recommendations.

What is your region's literature on malnutrition prevalence?

Whilst the majority of patients at risk of undernutrition are based in community, the concentration of patients likely to require nutrition support is greatest in acute care settings due to the close relationship between chronic and acute inflammatory disease and poor nutritional status and /or conditions that preclude normal eating. Nearly 1 in 3 patients entering Irish hospitals have been found to have clinically relevant signs of undernutrition that place them at increased risks of serious complications, longer length of hospital stay and greater risk of readmission after discharge. Prevalence is based on two major studies conducted in 27 Irish hospitals in winter and spring of 2010 and 2011 (Russell and Elia, 2010, 2011) in which just over 30% (32.8%, n=1601, 28.2%, n=1100 respectively) of patients screened using the Malnutrition Universal Screening Tool (MUST) had a positive risk score for malnutrition, ≥74% in the high risk category. Undernutrition was common in all age groups and diagnostic categories with no significant difference between men and women when adjusted for age. However, risk increased with age and prevalence was higher in those with gastrointestinal disease (48%), respiratory disease (38%) and neurological disease (32%). It was also higher in patients with cancer than those without (44 vs 34%) and in those admitted from nursing homes vs their own home (54% vs 30%, NSW 2010).

Since nutrition-risk patients spend between 25 and 75% longer in hospital compared with patients not at risk, they account for an estimated 36% of bed days each year, which would be the expected prevalence at ward level (Rice, Normand 2012).

In comparison with Europe, in which malnutrition is estimated to affect approximately 5% of the adult population at any point in time (point prevalence), (Ljungqvist and de Man, 2012), the total number of adults affected in the Republic of Ireland is estimated at around 3% of the total population (140000 adults, 52%

>65 years, Rice and Normand, 2012), the lower prevalence being due to demographic differences in the proportion of our population over 65 years of age and not to better management. Prevalence rates in Irish hospitals are in fact similar to other countries in Europe in which screening programmes are not routinely implemented, but higher than in countries such as the Netherlands which have achieved impressive reductions in malnutrition since introducing a national programme in 2007.

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**Mexican Association on Clinical Nutrition and Nutritional Therapy (AMAEE) –
Mexico**

Ignacio Diaz-Pizarro, MD

What is your region's position on malnutrition screening, assessment, and diagnosis?

It is not mandatory, each Hospital has different policies. The Health Secretariat recommends it and is one of the aspects suggested to obtain the Hospital's official Certification.

What is your region's literature on malnutrition prevalence?

As part of the ELAN study (Correia MITD, Campos ACL. Prevalence of Hospital Malnutrition in Latin America: The Multicenter ELAN Study. Nutrition 2003;19(10):823-5.
As part of the ENHOLA study (in editorial process)
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Sociedad Paraguaya de Nutrición – Paraguay

Any Ferreira Heyn, MD

What is your region's position on malnutrition screening, assessment, and diagnosis?

We have some studies about assessment in surgical patients comparing Subjective Global Assessment with NRS 2002, in patients with cancer using Scored Patient-Generated Subjective Global Assessment, and in Respiratory diseases Center with SGA. Some of them published, and others presented in Congresses.

What is your region's literature on malnutrition prevalence?

We participate like a country (Paraguay) in the ELAN study, published in Nutr, 2003;19;823-25, Malnutrition in patients with tuberculosis in Paraguay, published in Nutrición Hospitalaria v.21 supl.1 Mayo 2006, The impact of malnutrition on morbidity, mortality and length of hospital stay in trauma patients, published in Nutrición Hospitalaria, 2006; Impact of malnutrition in surgeries services of Paraguay, published in RNC, Abstracts presented in XII Argentina Congress and IV congress of South About nutritional Support, Junio 2005.

Global Leadership Conversation

Addressing Malnutrition

Clinical Nutrition Week 2016
Austin, TX

Global Leadership Conversation

Moderator

Gordon L. Jensen, MD, PhD

Global Leadership Conversation: Addressing Malnutrition

Gordon L Jensen, MD, PhD, FASPEN
Senior Associate Dean for Research
Professor of Medicine and Nutrition
University of Vermont College of Medicine



Evolving settings for malnutrition

- **Historic**
 - Famine / starvation were prevalent
- **Today**
 - Famine / starvation still occur
 - War and genocide, food deprivation as weapon
 - Malnutrition in setting of disease or injury now very prevalent



Limitations of historic definitions for malnutrition

- Diagnostic criteria lack full validity.
- Poor specificity, sensitivity, and inter-observer reliability.
- Overlapping definitions and misdiagnosis.
- Multiple definitions resulting in widespread confusion.
- Lack modern appreciation for role of inflammatory response.

Preliminary Thoughts

- Inflammation and malnutrition are intimate partners that impact upon lean mass.
- Prospects for nutritional modulation of inflammation appear promising.
- Laboratory, functional, food intake or body weight criteria in support of these diagnostic approaches will require further testing.
- Translation of these diagnostic approaches to routine clinical practice will require validation. New approaches to assessment and diagnosis are a work in progress.

Preliminary Thoughts

- Priority to establish strong evidence-based consensus approaches to malnutrition assessment and diagnosis.
- Develop and validate better indicators of nutritional status.
- Need for systematic approaches to outcome measurement with valid metrics.
- Recognize the challenges. We are confronted by complex outcomes of interest that are multivariable in nature. Nutrition is but one player and malnutrition keeps bad company.

Global Leadership Conversation: What do we hope to accomplish?

- How can we best work together to secure broad consensus and validation around approaches to assessment, diagnosis, and outcome measurement?
- In review of current diagnostic approaches it is evident that there are key common variables that have a strong evidence base:
 - Non-volitional weight loss, severe underweight status, and compromised dietary intake.
- Other key variables of interest include disease/inflammation, body composition, and function.
- What additional research do we need?
- Let's make this a global work in progress!



Global Leadership Conversation

Schedule

- 1:30-1:45 Words of Welcome/Introduction
- 1:45-2:00 ESPEN Perspective
- 2:00-2:15 FELANPE Perspective
- 2:15-2:30 PENSA Perspective
- 2:30-2:45 A.S.P.E.N. Perspective
- 2:45-3:00 Break
- 3:00- 3:45 Q & A with Dialogue
- 3:45-4:00 Closing Remarks



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NUTRITION AND
METABOLISM

ESPEN view on definition of malnutrition:

Basic (1) definition and etiology (2) based diagnoses

-

Tommy Cederholm MD, PhD

Executive Committee member of ESPEN

Professor of Clinical Nutrition

Senior consultant in Geriatric medicine

Board certificates in Internal Medicine and Geriatrics

**University of Uppsala, Uppsala University Hospital ,
Sweden**

Part 1: Diagnostic criteria for the basic definition – Objectives

- To **define diagnostic criteria and cut-offs**
 - for the general state of malnutrition independent of etiology and clinical setting.
 - that enables comparisons between countries, clinical settings, diseases etc.
 - to complement risk screening
 - provide basis for ICD updates

Working Group (10 physicians, 2 dietitians):

Tommy Cederholm, Ingvar Bosaeus, Rocco Barazzoni, Juergen Bauer, Andre Van Gossum, Stanislaw Klek, Maurizio Muscaritoli, Ibolya Nyulasi, Johann Ochenga, Stéphane Schneider, Marian de van der Schueren, Pierre Singer

Rationale: To complement the nutrition care process

- Screening/risk evaluation
- Assessment
 - **diagnosis**
- Treatment
- Monitoring

A true/clear diagnostic procedure has been missing



ESPEN Consensus process (part 1)

- **Project launched by ESPEN January 2013**
- **Delphi process (~1 year)**
 - E-mail, face-to-face meeting, questionnaires, ballots, Delphi polls
- **Consensus statement February 2014**
- **General ESPEN membership poll spring 2014**
- **Clinical Nutrition publication spring 2015**
 - Cederholm et al. Clin Nutr 2015;34:335-40.
- **Validation studies – on-going**



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Diagnostic criteria for malnutrition

Step 1. Risk screening by a validated instrument , e.g. NRS-2002, MUST, MNA(-SF), SNAQ, ...

i.e. BMI, Weight loss, Reduced food intake, Disease severity

Step 2. Diagnosis

- **BMI $<18.5 \text{ kg/m}^2$**

or

- **Weight loss $>10\%$ (indefinite time)/ $>5\%$ last 3 mo** combined with either
- **BMI <20 ($<70 \text{ y}$)/ <22 ($>70 \text{ y}$) or**
- **FFMI <15 and 17 kg/m^2 in women and men,** respect.

Cederholm et al. Clin Nutr 2015;34:335-40.

Rationale

- **Weight loss** gives the dynamic historic dimension and covers clinically relevant
 - Anorexia, teeth problems, dysphagia
 - Insufficient food intake
- **BMI** and/or **FFMI** gives structural measures that reflect the current energy and nutrient reserves
- *Functional* and *biochemical* indicators are not nutrition specific enough for the basic definition (consensus after extensive discussions)



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NUTRITION AND
METABOLISM

Validation studies (part 1)

Roger et al, Clin Nutr 2015:

a. Acutely ill (n=249, 58±18 y)

30 % were at risk for malnutrition (SNAQ)

14 % malnourished according to ESPEN Criteria (EC)

b. Outpatient geriatric subjects (n=135, 81±7y)

10 % were at risk

6 % malnourished according to EC

c. Healthy old (n=306, 74±3y)

0.5 % were at risk

0 % were malnourished (EC)

d. Healthy young (n=179, 23±3y);

0.5 % were at risk

0 % were malnourished (EC)

Amaral et al. ESPEN Poster 2015:

Hospitalized patients (n=632, age ~57 y)

72 % at risk (NRS-2002, 48% malnourished)

12 % malnourished according to EC

Sobestiansky et al. ESPEN Poster 2014:

Acutely ill geriatric multi-morbid patients

(n=71, 85±7 y)

93 % at risk according to MNA-SF

43 % malnourished according to EC

Rondel et al. ESPEN Poster 2015:

General hospital patients (n=335)

15%/19%/35% were malnourished or cachectic according to EC/Evans /Fearon.

3-months and 1-year mortality was well predicted only by EC



LEADING THE SCIENCE AND
PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

Part 2: Etiology based malnutrition diagnoses Objectives

- Put the **basic definition into etiology contexts**
- Part of a **Terminology Guideline project** to define nutritional concepts and procedures
- Delphi process according to ESPEN SOP - started June 2015 – on-going

Working group (physicians, dietitians, nutritionists, nurses, pharmacists):

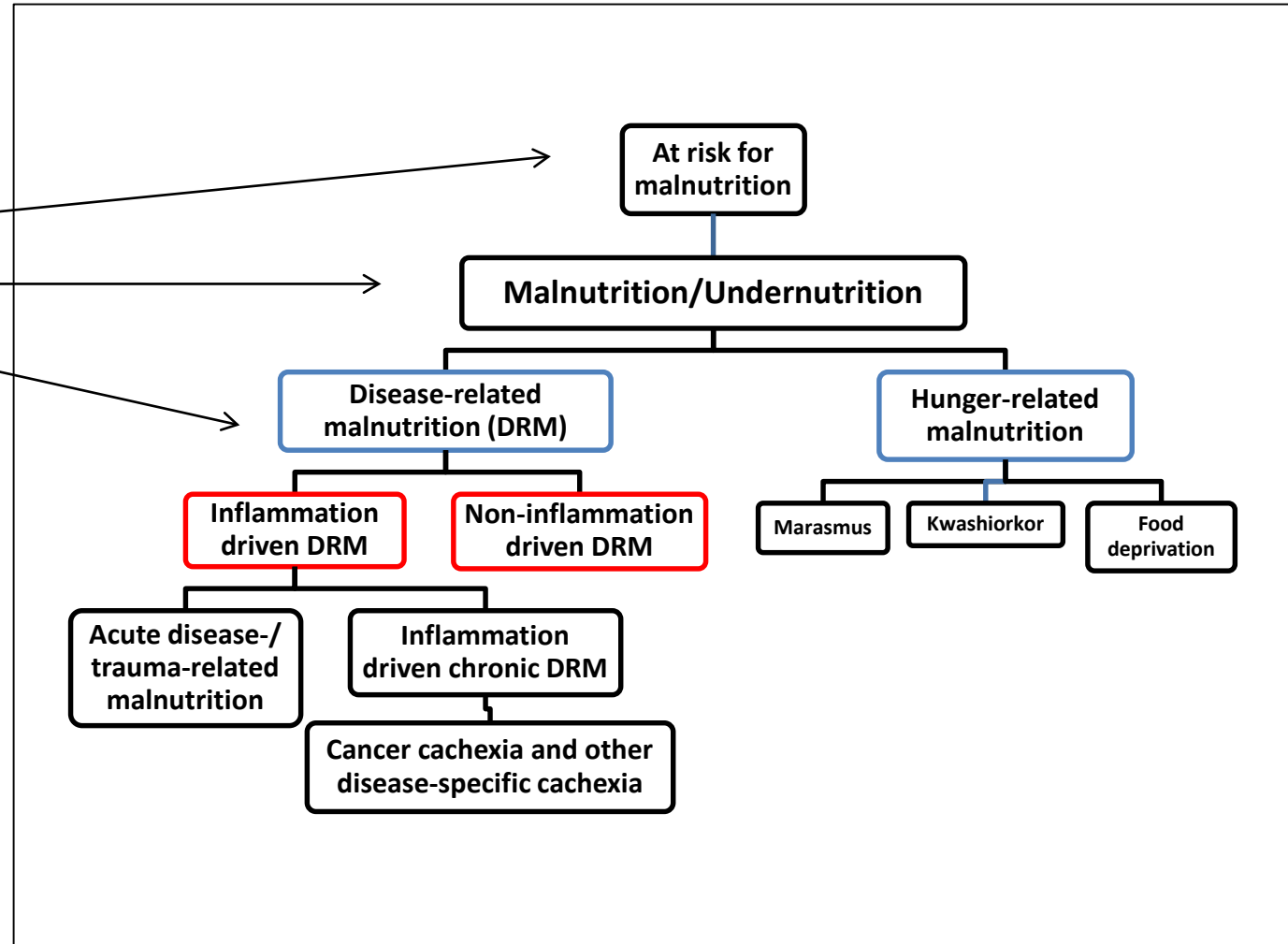
Tommy Cederholm, Peter Austin, Peter Ballmer, Rocco Barazzoni, Gianni Biolo, Stephan Bischoff, Mette Holst, Maurizio Muscaritoli, Matthias Pihlich, Elisabet Rothenberg, Karin Schindler, Marian de van der Schueren, Luzia Valentini, Andre Van Gossum, Pierre Singer.

Malnutrition diagnoses tree

Step 1: Risk screening

Step 2: Basic diagnosis

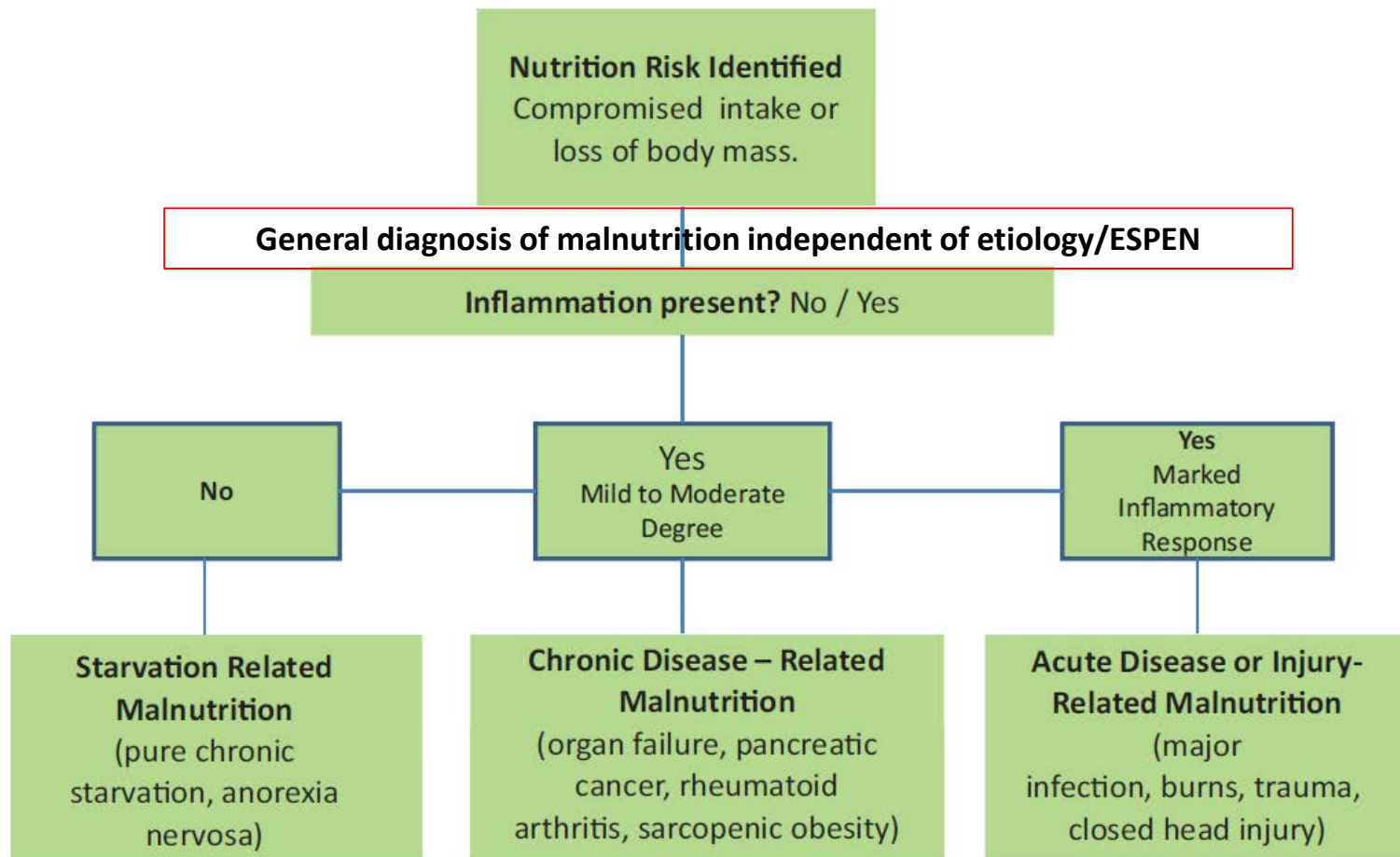
Step 3: Etiology based diagnosis



How to align with our American colleagues and friends?

ASPEN/AND consensus statement

Etiology-based definition



White et al JPEN 2012;36:275-83

Potential problems and issues raised

- Weight loss/malnutrition in obese patients?
FFMI↓
- Low access to BC measurement techniques?
Promotion of BC measurements, visionary statement
- Too restrictive cut-offs? *A diagnosis of malnutrition requires depleted energy and protein reserves (or?)*
- Lower prevalence figures → less reimbursement? *Risk status needs to be reimbursed*
- Ethnicity? *Of course*

Malnutrition in Latin America

FELANPE

- M. Isabel T. D. Correia, MD, PhD
 - Universidade Federal de Minas Gerais
 - Belo Horizonte, Brazil
- Dr. José Ignacio Dias Pizarro – México

Disclosures

- Abbott
- Baxter
- Fresenius
- Invictus
- Nestlé

Outline

- Malnutrition in Latin America
 - Brief history
 - Data
- Malnutrition vs outcome
- Impact on policies
- Current data
 - Brazil
 - Mexico

Hospital Malnutrition: The Brazilian National Survey (IBRANUTRI): A Study of 4000 Patients

Dan L. Waitzberg, MD, Waleska T. Caiaffa, MD, and M. Isabel T. D. Correia, MD

From the Department of Gastroenterology, University of São Paulo Medical School, São Paulo, Brazil; the Department of Social and Preventive Medicine, University Federal of Minas Gerais Medical School, Belo Horizonte, Brazil; and the Hospitals Semper and Luxemburgo, Belo Horizonte, Brazil

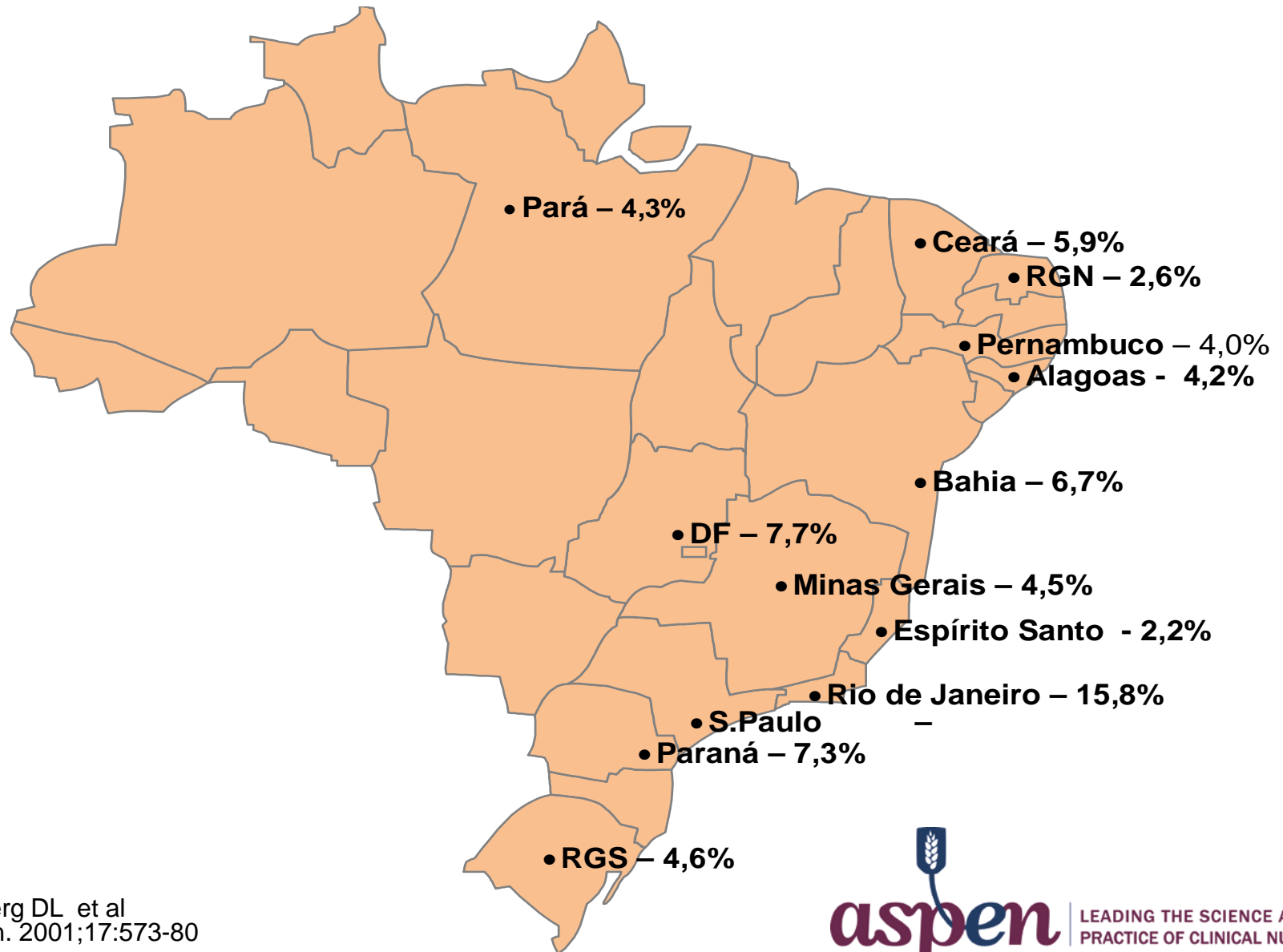
OBJECTIVE: We assessed nutrition status and prevalence of malnutrition in hospital patients as determined by the Subjective Global Assessment Form, awareness of patients' nutrition status by health teams, and the use of nutrition therapy.

METHODS: We enrolled 4000 hospital patients at least 18 y old who were covered by the Brazilian public health care system in a cross-sectional, multicenter epidemiologic study. We used Student's *t* and chi-square tests for univariate and multiple logistic regression analyses.

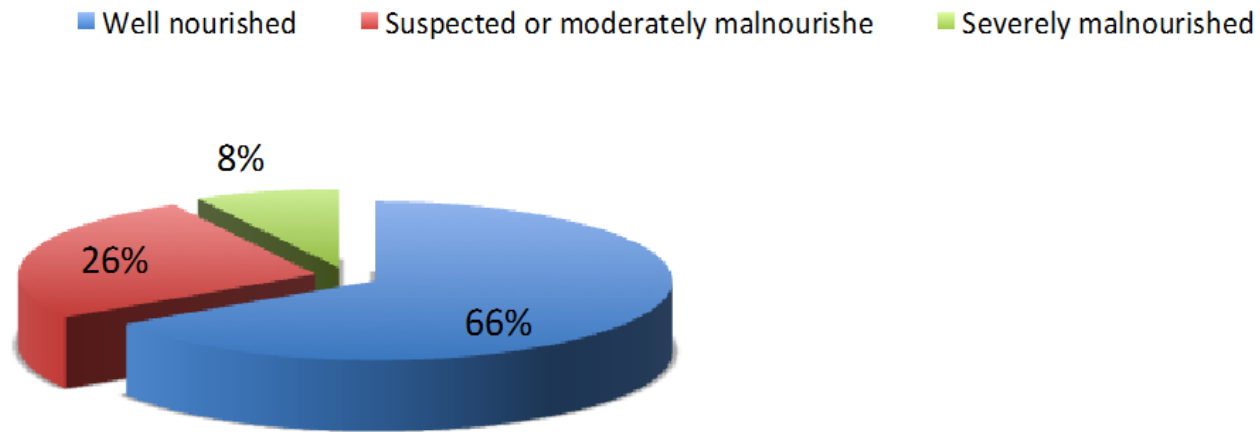
RESULTS: Malnutrition was present in 48.1% of patients and severe malnutrition was present in 12.5% of patients. The prevalence of malnutrition was higher in the northern and northeastern regions of Brazil, where per-capita income is lower. Malnutrition correlated with primary diagnosis at admission, age (60 y), presence of cancer or infection, and longer hospital stay ($P < 0.05$). Fewer than 18.8% of patients' records contained information on nutrition-related issues. Nutrition therapy was used in 7.3% of patients (6.1% enteral nutrition and 1.2% parenteral nutrition).

CONCLUSIONS: The prevalence of malnutrition in hospitalized patients in Brazil is high, physician awareness of malnutrition is low, and nutrition therapy is underprescribed. *Nutrition* 2001;17:573–580.

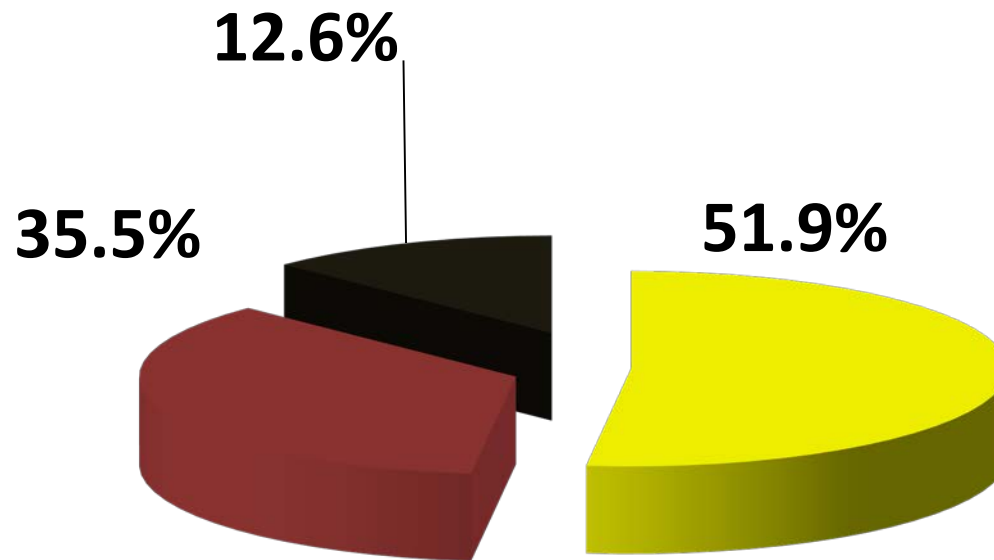
Ibranutri – BRAZIL – 4.000 patients



Ibranutri – nutritional status at hospital admission



Ibranutri – Nutritional status



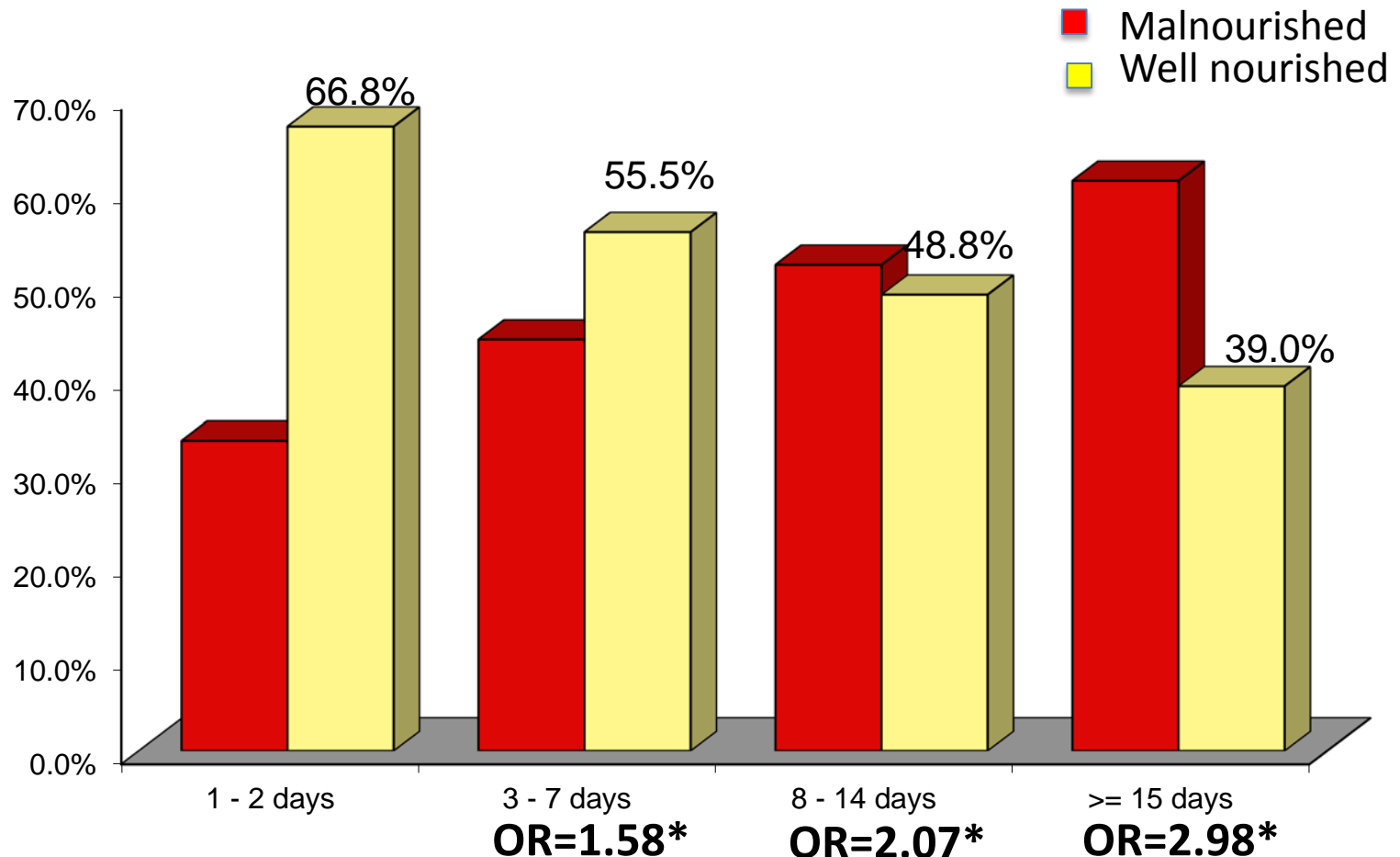
■ Malnourished

■ Moderately malnourished or suspected

■ Severely malnourished

Waitzberg DL et al
Nutrition. 2001;17:573-80

Ibranutri – Nutritional status



* $p < 0.05$

Waitzberg DL et al
Nutrition 2001;17:573-80

Prevalence of Hospital Malnutrition in Latin America: The Multicenter ELAN Study

M. Isabel T. D. Correia, MD, PhD, and Antonio Carlos L. Campos, MD, PhD, for the
ELAN Cooperative Study

From Belo Horizonte, Brazil

PATIENT DISTRIBUTION ACCORDING TO COUNTRY

Country	<i>n</i> patients
Argentina	1000
Brazil	4000
Chile	525
Costa Rica	199
Cuba	1361
Dominican Republic	132
Mexico	335
Panama	700
Paraguay	230
Puerto Rico	126
Peru	352
Venezuela	188
Uruguay	200

PREVALENCE OF MALNUTRITION ACCORDING TO COUNTRY

Country	Moderate/severe malnutrition (%)	Severe malnutrition (%)
Argentina	61.9*	12.4*
Brazil	48.1*	12.6*
Chile	37.0	4.6
Costa Rica	50.3*	18.1*
Cuba	39.0†	10.1*
Dominican Republic	60.3*	9.5*
Mexico	64.0*	13.0*
Panama	40.5†	5.5†
Paraguay	40.9†	10.0*
Puerto Rico	39.2*	12.8*
Peru	50.0*	17.0*
Venezuela	48.7*	16.6*
Uruguay	51.0*	17.0*

* $P < 0.05$.

† Not significant.

Risk Factors

VARIABLES CONSIDERED RISK FACTORS FOR MALNUTRITION (UNIVARIATE ANALYSIS)

Risk factor	Malnourished (%)	Well nourished (%)	Relative risk (CI)
Age > 60 y	53.0	47.0	1.55* (1.43–1.73)
Internal medicine	52.1	47.9	1.57* (1.43–1.73)
Infection	60.9	39.9	2.40* (2.16–2.60)
Cancer	65.6	34.4	2.68* (2.39–3.23)
LOS < 2 d	33.0	67.0	
LOS 2–7 d	42.7	53.7	1.51* (1.31–1.73)
LOS 7–14 d	49.1	50.9	1.95* (1.68–2.26)
LOS >14 d	59.7	40.3	3.00* (2.61–3.45)

* $P < 0.05$.

CI, confidence interval; LOS, length of hospital stay

ELAN - Problem recognition

- 23.1% - Information on nutritional status
- 28.5% - Normal weight
- 26.5% - Weight on admission
- 39.2% - Height record
- 74.9% - Availability of weighing scales

Outline

- Malnutrition in Latin America
 - Brief history
 - Data
- Malnutrition vs outcome
- Impact on policies
- Current data (México)

Complications

Malnourished



27.0%

Well nourished



16.8%

RR = 1.60 (CI = 1.20 - 2.14), p <0.01

Infectious complications

Malnourished



19.4%

Well nourished

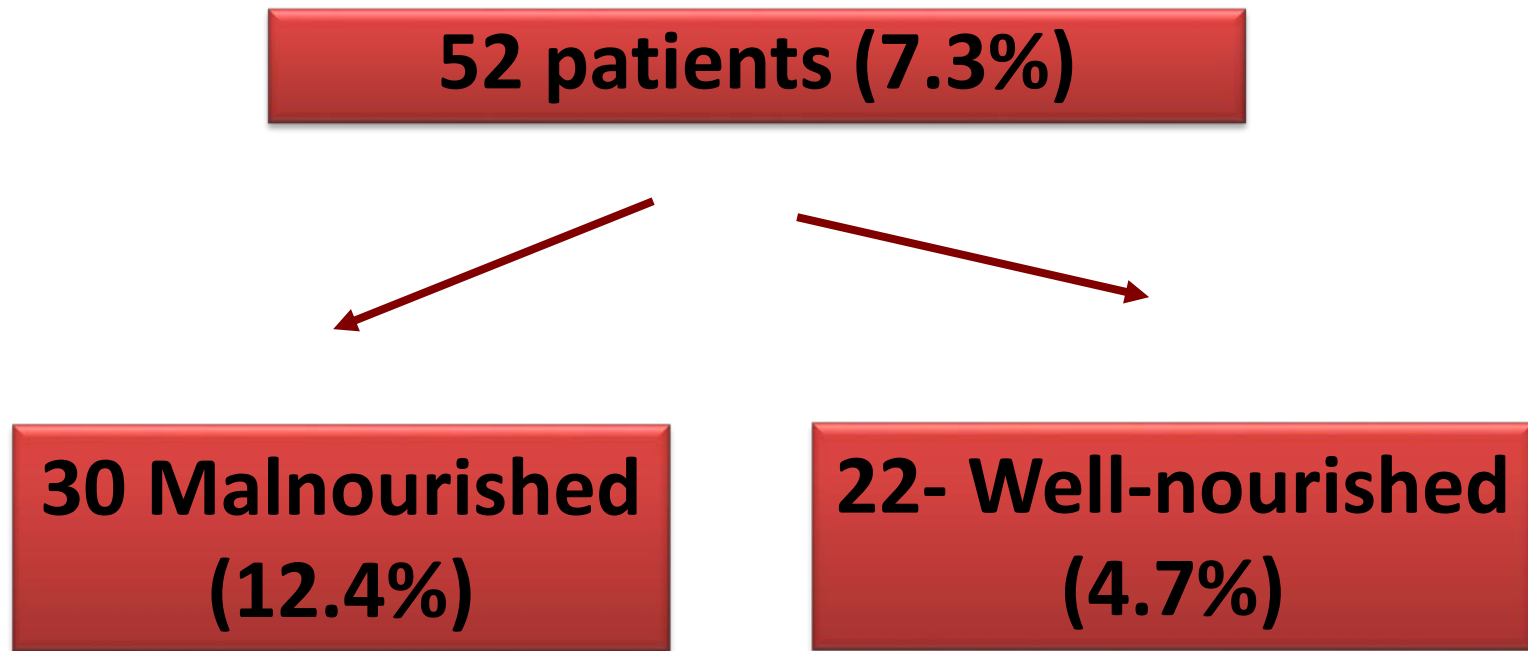


10.1%

RR = 1.93 (CI = 1.33 - 2.80), p <0.01

Pulmonary, urinary, (3.7% x 1.1%) *, abdominal abscess (2.1% x 0.4%)
*** * p <0.01**

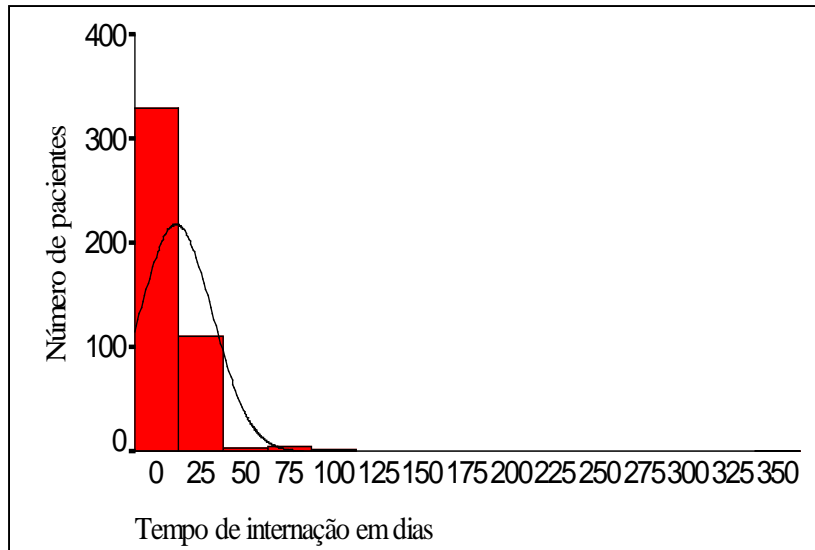
Mortality



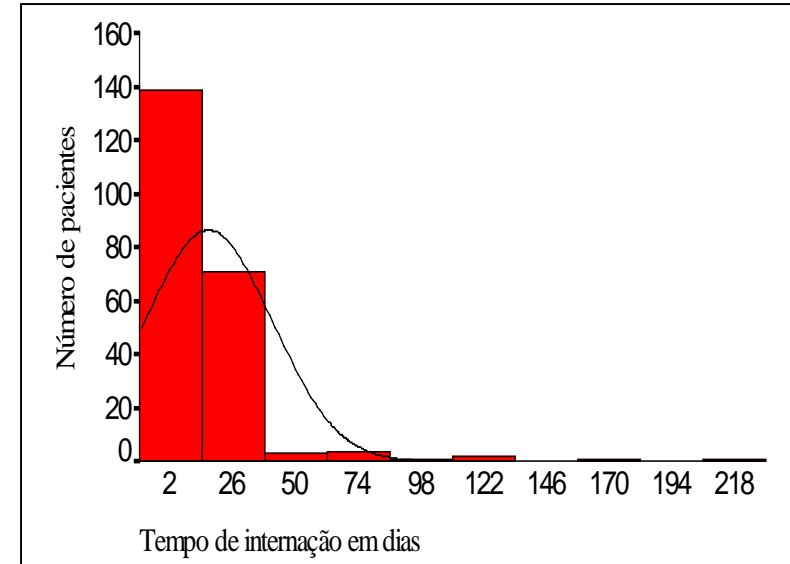
RR = 2.63 (CI = 1.55 - 5.27) p <0.01

Correia & Waitzberg
Clin Nutr. 2003; 22:235-9.

Hospital stay



10.1 + 11.7 days, median 6 days



16.7 + 24.5 days, median 9 days

Correia & Waitzberg
Clin Nutr. 2003; 22:235-9.

Costs

Well nourished patients - \$ 175

Malnourished patients - \$ 295

67% increase

Correia & Waitzberg
Clin Nutr. 2003; 22:235-9.

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The Brazilian reality

- Portarias da vigilância sanitária
 - A Portaria MS nº 272, de 08 de abril de 1998 - NP
 - RCD nº 63, de 6 de julho de 2000 – NE
- PORTARIA Nº 120, DE 14 DE ABRIL DE 2009
- “*Portaria Conjunta SE/SAS nº 38 de 29 de setembro de 1999**”



O Secretário Executivo e o Secretário de Assistência à Saúde, no uso de suas atribuições,

Considerando os estudos realizados pela Sociedade Brasileira de Nutrição Parenteral e Enteral, por meio do Inquérito Brasileiro de Avaliação Nutricional Hospitalar - IBRANUTRI sobre a avaliação da desnutrição no Brasil;

Considerando o alto índice de desnutrição em pacientes hospitalizados;
Considerando a necessidade de se diminuir o tempo de permanência hospitalar, os índices de morbidade e mortalidade e o custo associado à desnutrição, e
Considerando que os estudos do IBRANUTRI, em relação ao custo benefício da Terapia de Nutrição na Assistência Integral à Saúde, demonstram que para cada R\$ 1,00 (um real) investido em terapia nutricional gera R\$ 4,13 (quatro reais e treze centavos) de economia total, resolvem:.....”

Resolução da Diretoria Colegiada – RCD nº 63, de 6 de julho de 2000.

A Diretoria Colegiada da Agência Nacional de Vigilância Sanitária no uso da atribuição que lhe confere o art. 11 inciso IV do Regulamento da ANVISA aprovado pelo decreto 3.029, de 16 de abril de 1999, c/c o § 1º do Art. 95 do Regimento Interno aprovado pela Resolução nº 1, de 26 de abril de 1999, em reunião realizada em 29 de junho de 2000, adota a seguinte resolução de Diretoria Colegiada e eu, Diretor-Presidente, determino a sua publicação:

Art. 1º Aprovar o Regulamento Técnico para fixar os requisitos mínimos exigidos para a Terapia de Nutrição Enteral, constante do Anexo desta Portaria.

PORTARIA Nº 120, DE 14 DE ABRIL DE 2009

O Secretário de Atenção à Saúde, no uso de suas atribuições,

Considerando a Portaria GM/MS nº 343, de 07 de março de 2005, que institui mecanismos para a organização e implantação de Unidades de Assistência e Centros de Referência de Alta Complexidade em Terapia Nutricional, no âmbito do Sistema Único de Saúde - SUS;

Considerando a Portaria GM/MS nº 2529, de 19 de outubro de 2006, que regula a Internação Domiciliar no Sistema Único de Saúde;

Considerando a necessidade de conceituar as Unidades de Assistência de Alta Complexidade em Terapia Nutricional e os Centros de Referência de Alta Complexidade em Terapia Nutricional, bem como determinar seus papéis na atenção à saúde e as qualidades técnicas necessárias ao bom desempenho de suas funções;

Considerando a necessidade de atualizar o sistema de credenciamento/habilitação e adequá-lo à prestação dos procedimentos de Alta Complexidade em Terapia Nutricional;



Brazilian policies

- Hospitals must have nutritional therapy teams
- A team is constituted by:
 - Physician
 - Dietitian
 - Nurse
 - Pharmacist
 - Other professionals
- Screening is mandatory at hospital admission

Outline

- Malnutrition in Latin America
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 - Brazil
 - Mexico

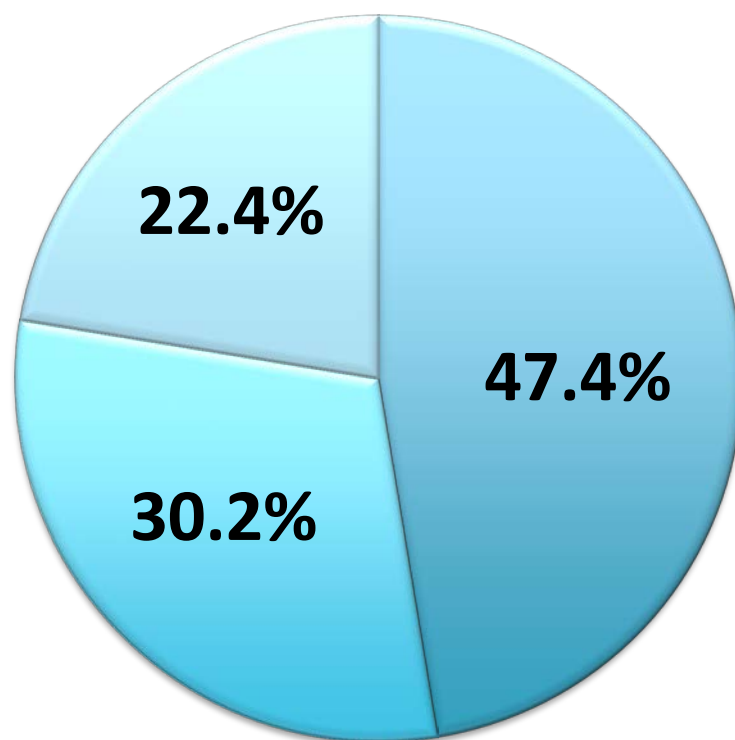


Applied nutritional investigation

Prevalence of pressure ulcers in hospitals in Brazil and association with nutritional status—A multicenter, cross-sectional study

Patrícia Alves Brito M.Sc.^a, Simone de Vasconcelos Generoso Ph.D.^{b,*},
Maria Isabel Toulson Davisson Correia M.D., Ph.D.^c

Malnutrition – 52.4%



- Noursihed
- Suspected or moderate malnourished
- Severe malnourished

Brito P et al
Nutrition. 2013.29:636-9.

ENHOLA

“**E**ncuesta de **N**utrición **H**Ospitalaria en **L**atino-
América”

(Latin-America Hospital Nutrition Survey)

Mexico Results

Dr. Anél Gómez García

Dr. Elisa Gómez Reyes

Dr. Juan Carlos Castillo Pineda

Dr. José Ignacio Díaz-Pizarro Graf



ENHOLA Mexico

- General data
- 12 hospitals
 - 8 public
 - 4 private
- 2,378 patients
- March – September 2012



Sample size (for Mexico)

$$n = \frac{N z_{1-\alpha}^2 p (1-p)}{d^2 (N-1) + z_{1-\alpha}^2 p (1-p)}$$

Where:

n= Sample size

N= Total population in Mexico (112,336,538; INEGI 2012)

$z_{1-\alpha}^2$ = z value for a 95% confidence level

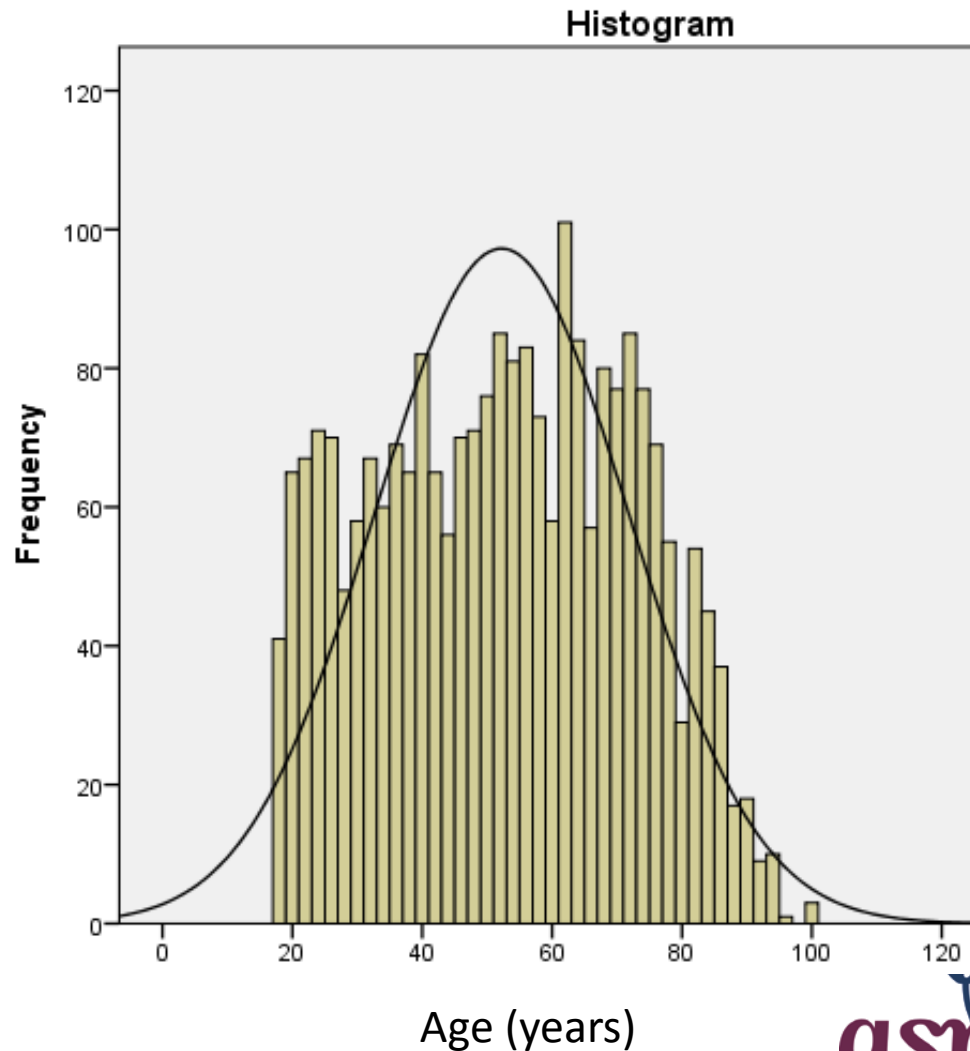
P = expected malnutrition proportion in population = 10%

d= estimated error = 2%

$$n = \frac{112,336,538 (1.96)^2 10 (100-10)}{(2)^2 (112,336,538 - 1) + (1.96)^2 [10 (100-10)]} = 864.35 \text{ patients}$$



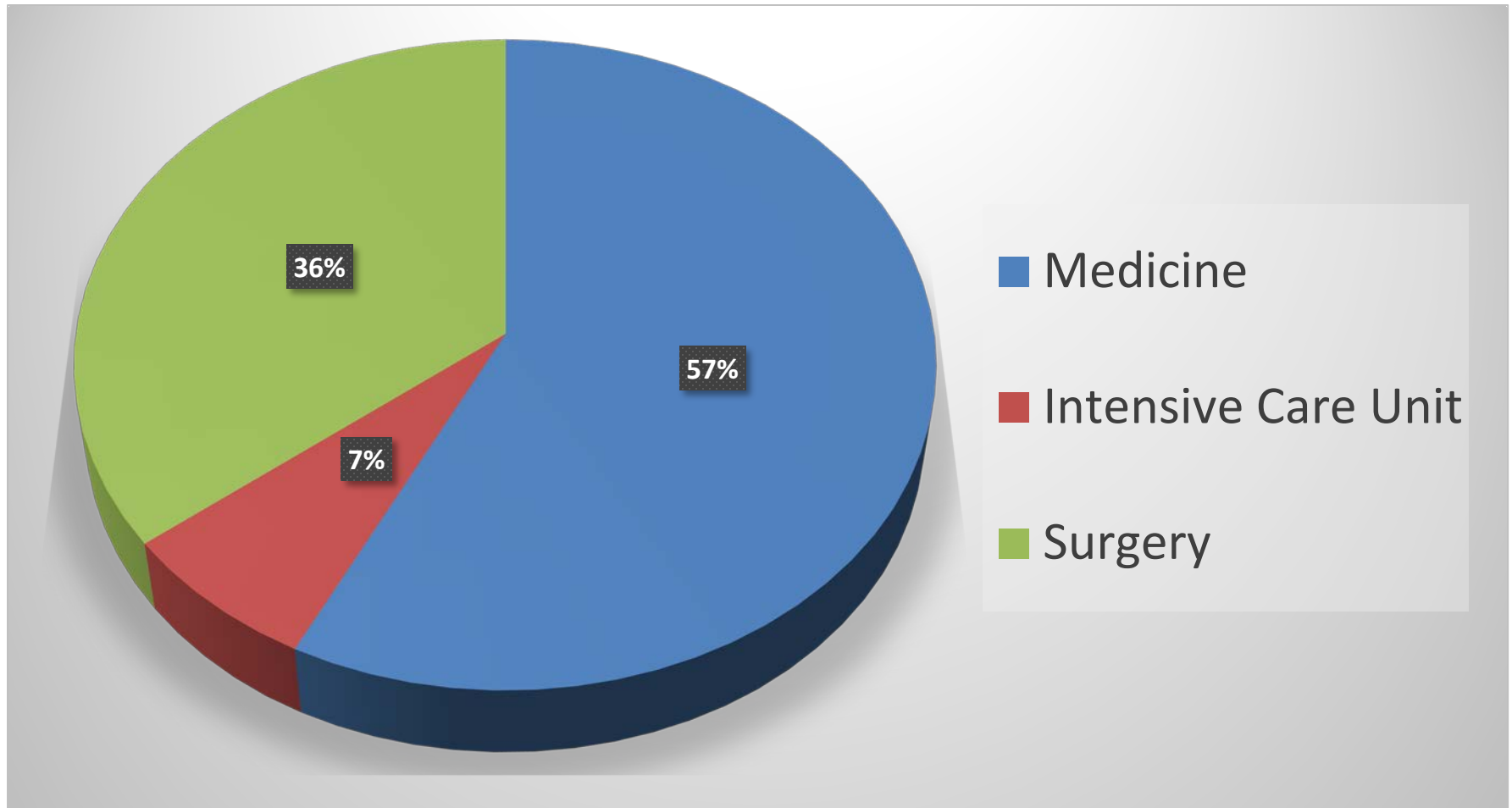
Age



n = 2,389
Mean: 52.22
Std. Dev.: 19.598



Distribution by hospital ward

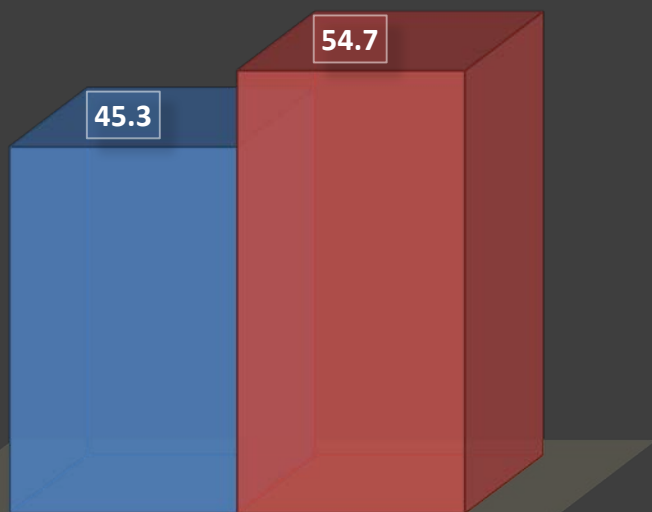




Nutritional Assessment (All wards)

NUTRITIONAL RISK SCREENING 2002

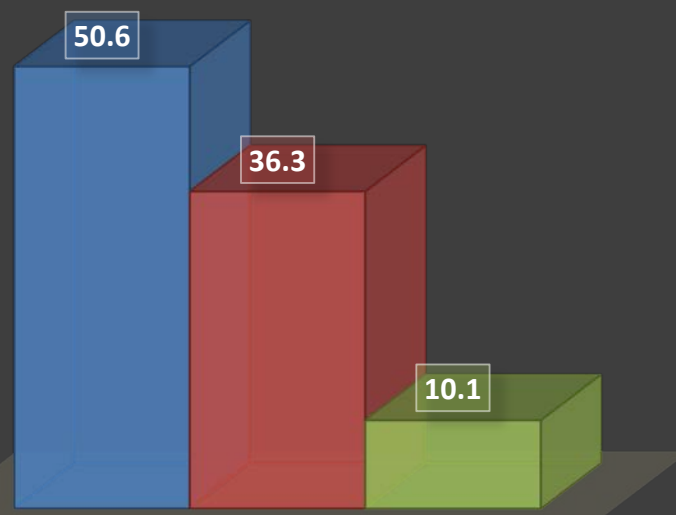
- With risk
- Without risk



General

SUBJECTIVE GLOBAL ASSESSMENT

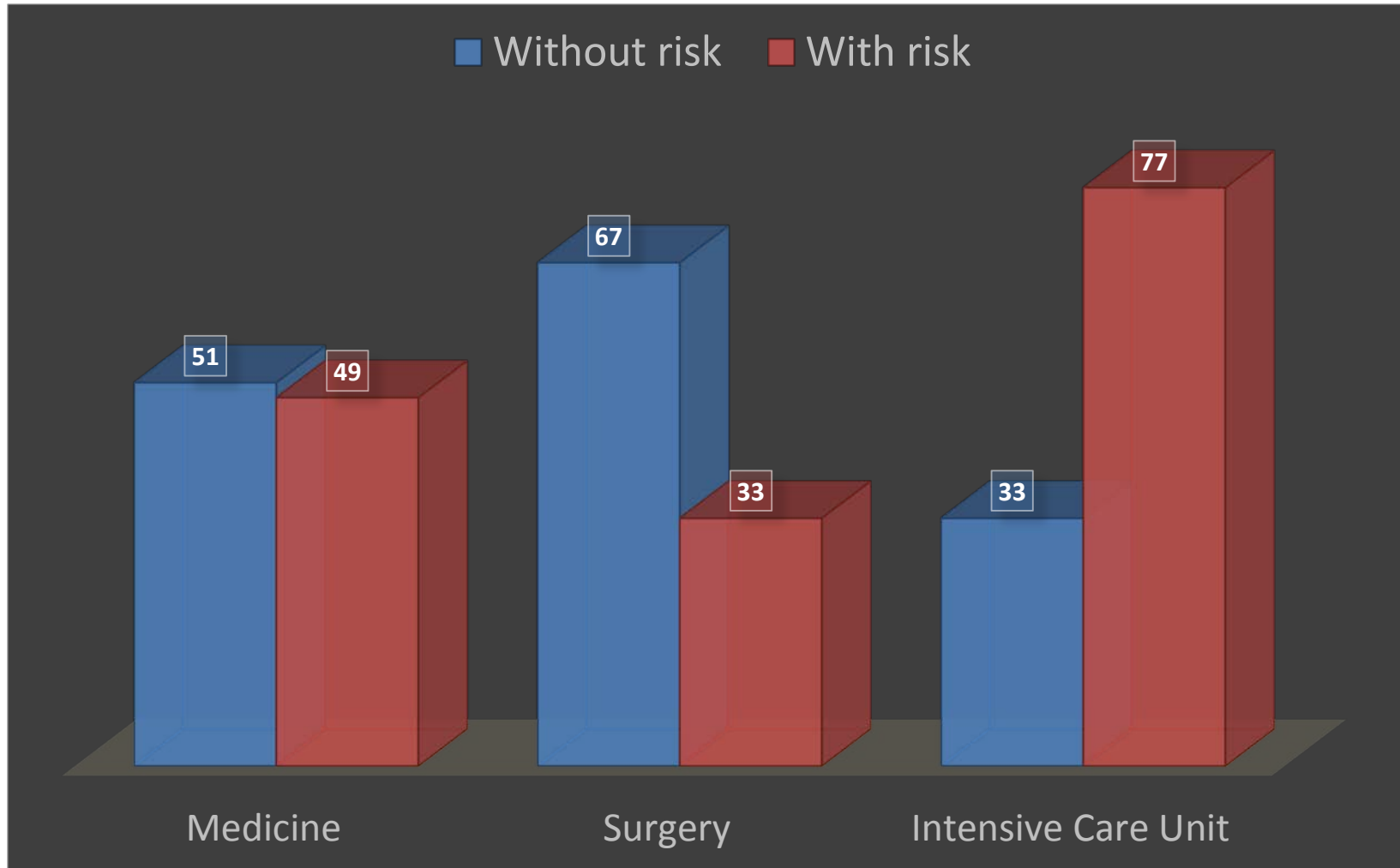
- Well nourished
- Moderate malnutrition
- Severe malnutrition



General

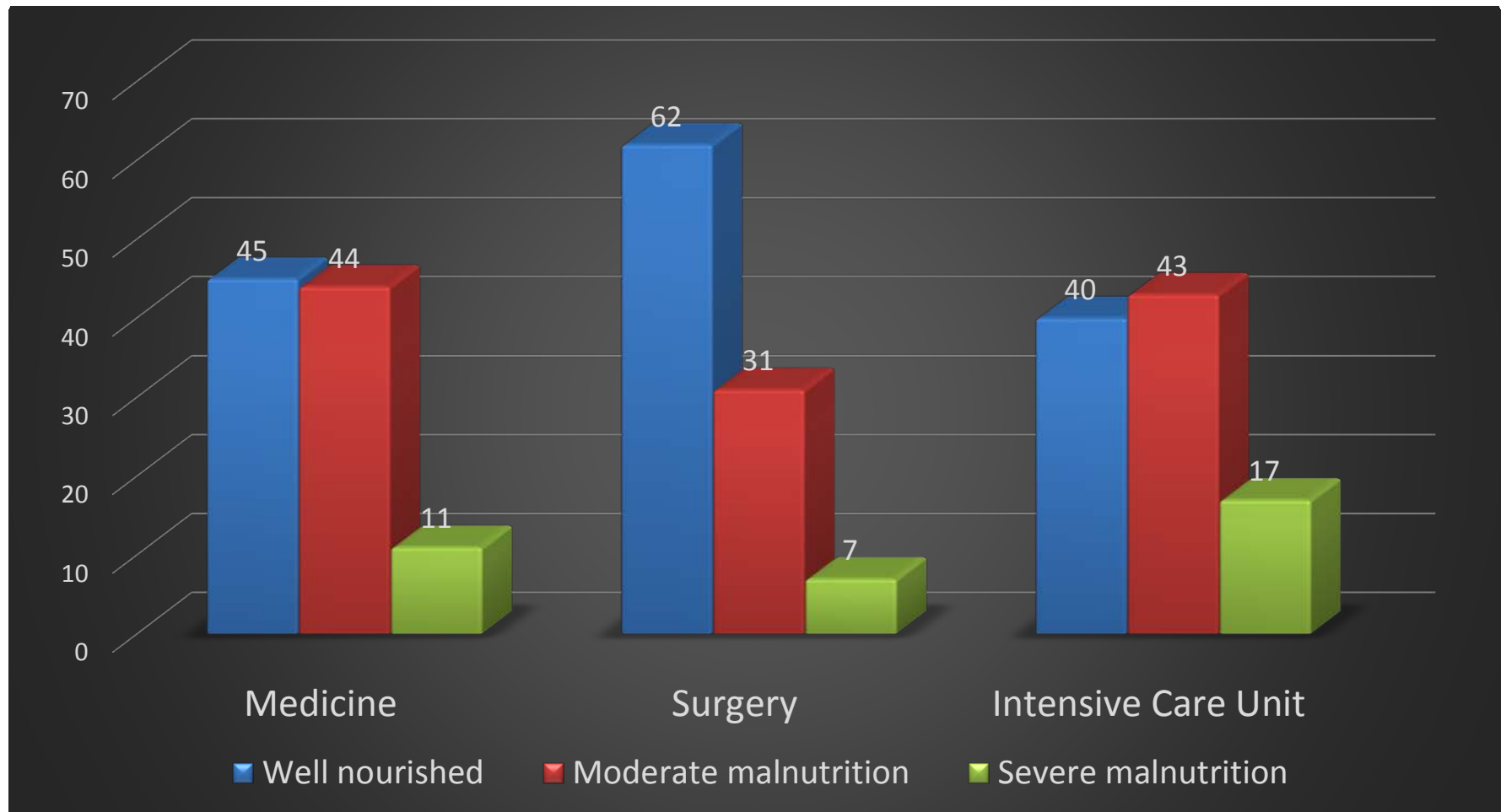


Nutritional risk by NRS-2002



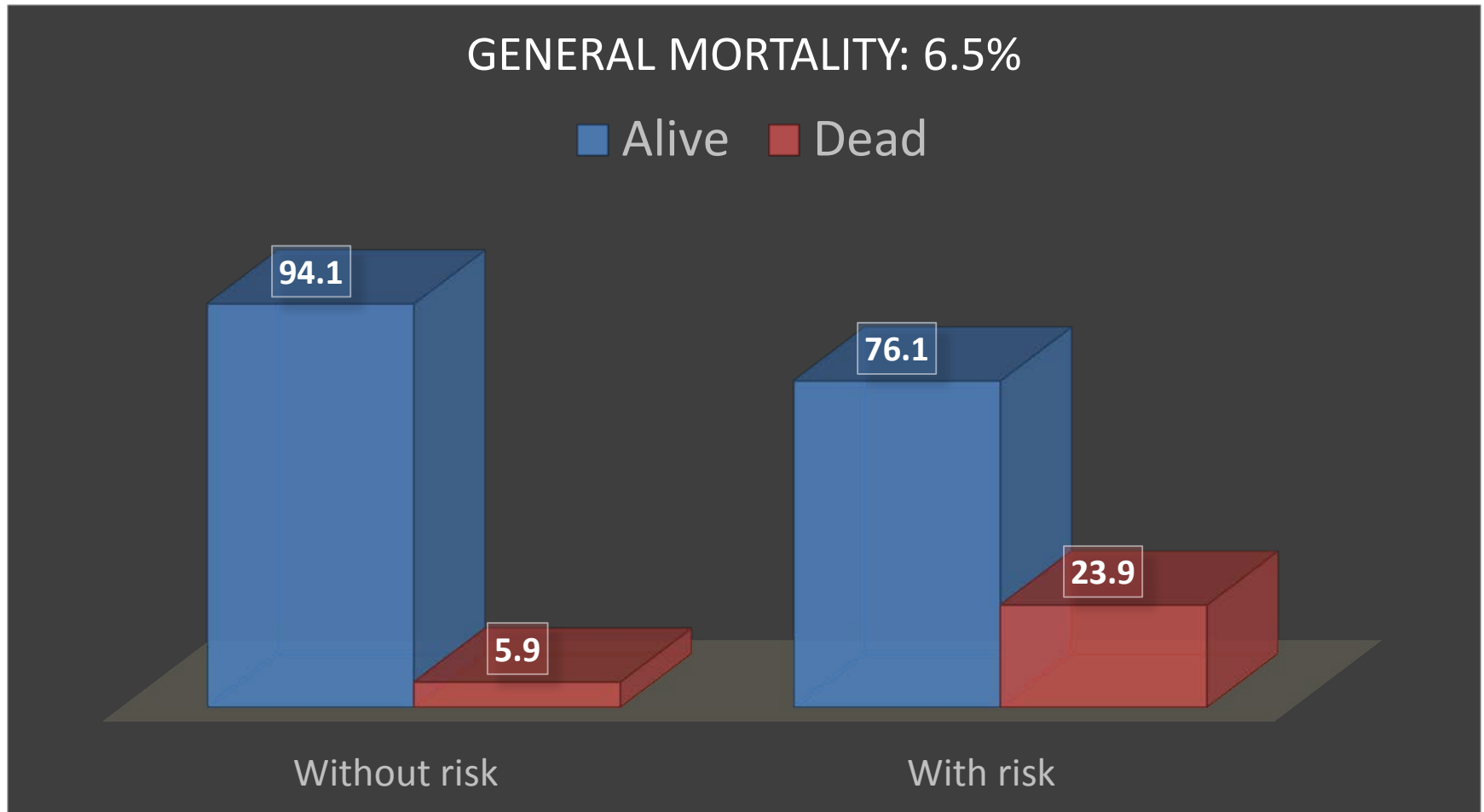


Malnutrition by SGA



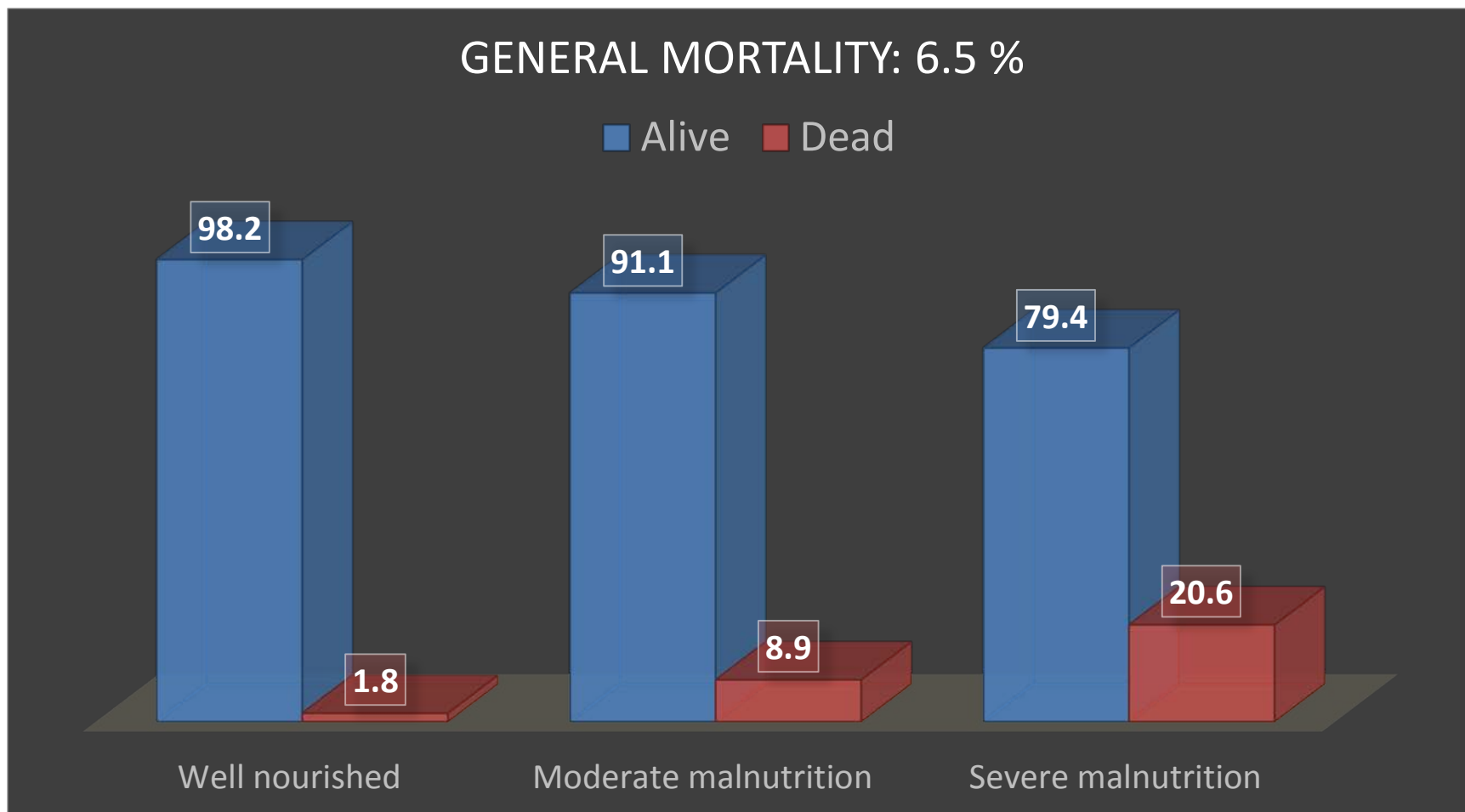


Mortality & NRS-2002





Mortality & SGA





ENHOLA Mexico

- Conclusions

- High prevalence of malnutrition in Mexican hospitals
- More evident in Medicine wards and ICU's
- High correlation of mortality with:
 - Nutritional risk (NRS-2002)
 - Nutritional assessment (SGA)

Conclusions

- Malnutrition is highly prevalent in LA
 - It is related to adverse outcomes
 - It impacts costs
- In Brazil, despite laws it is still a problem of awareness

Nutritional screening and assessment in Asia

- Ryoji Fukushima, MD, PhD
- Department of Surgery
- Teikyo University School of Medicine Tokyo Japan

Disclosures

- Non declared

Nutrition Screening and Assessment

Body mass index (BMI)

BW change

Blood tests

- Serum Albumin

- Serum Total protein

- RTP (rapid turnover protein): prealbumin, retinol binding protein etc.

- Other blood tests: Total cholesterol, cholinesterase, etc

- Lymphocyte count

Anthropometric measurements:

- Triceps skinfold (TSF)

- Arm muscle circumference (AMC)

- Mid upper arm circumference (MUAC)

Body composition analysis

- DEXA

- CT

- MRI

- US

- BIA

Assessment tools

MUST (malnutrition universal screening tool)

CONUT (malnutrition universal screening tool)

NRS 2002 (Nutritional Risk Screening)

SGA (Subjective global assessment)

MNA (Mini nutritional assessment)

For elderly

GNRI (Geriatric Nutritional Risk Index)

PNI (Prognostic nutritional index): Onodera

For surgical patients

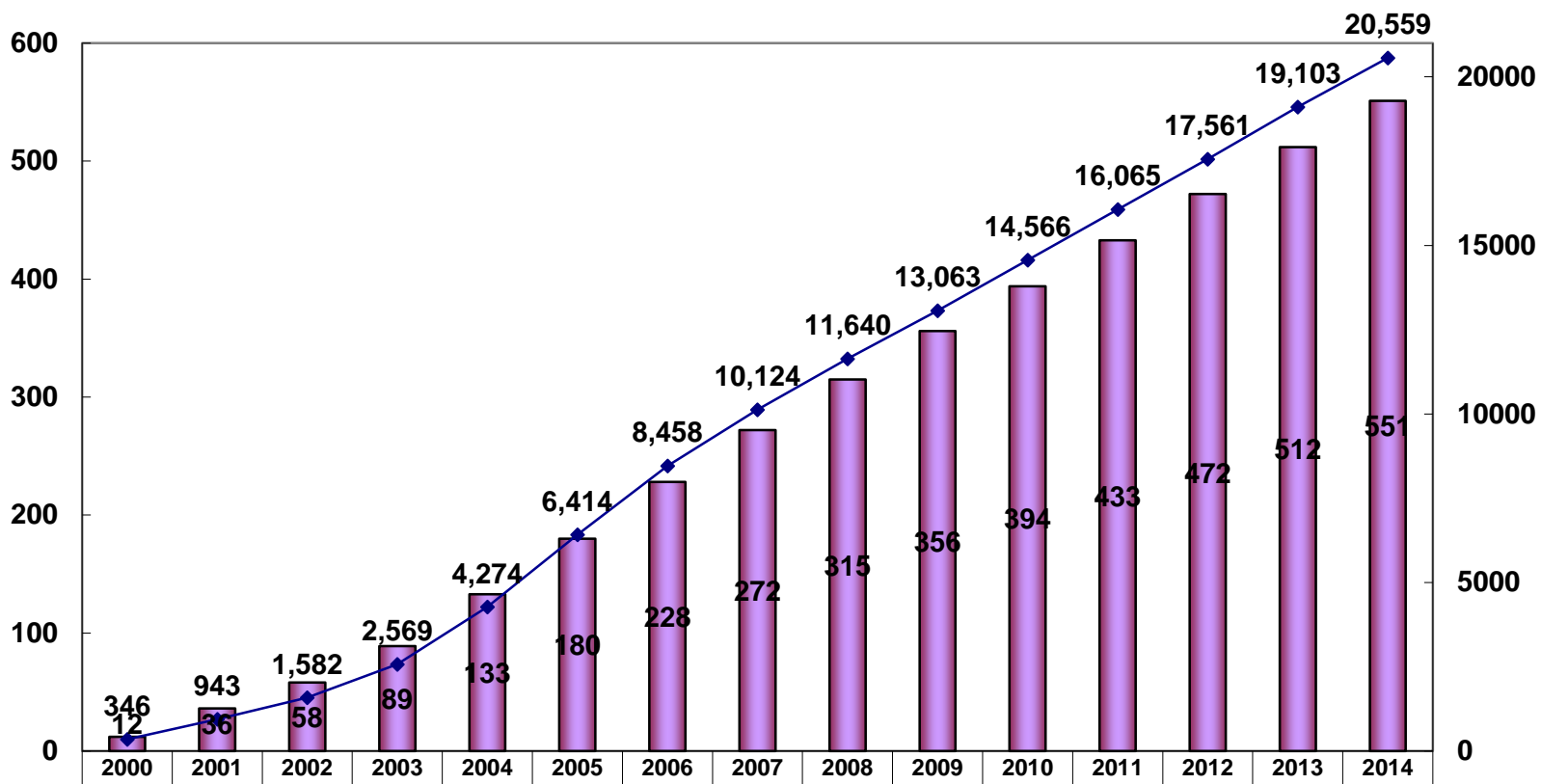
JAPN

SGA

Included in the TNT course



TNT in Japan



Cumulative No of courses

Cumulative No of doctors participated

PNI

For surgical patients

Onodera's PNI

$$\text{PNI} = (10 \times \text{Alb}) + (0.005 \times \text{TLC})$$

Prognostic nutritional index in gastrointestinal surgery of malnourished cancer patients.
Onodera T, Goseki N, Kosaki G.
Nihon Geka Gakkai Zasshi. 1984 Sep;85(9):1001-5. Japanese.

MNA

For elderly

The MNA[®] was developed nearly 20 years ago and is the most well validated nutrition screening tool for the elderly. Originally comprised of 18 questions, the current MNA[®] now consists of 6 questions and streamlines the screening process. The current MNA[®] retains the validity and accuracy of the original MNA[®] in identifying older adults who are malnourished or at risk of malnutrition. The revised MNA[®] Short Form makes the link to intervention easier and quicker and is now the preferred form of the MNA[®] for clinical use.

Asian language version is now available in **Japanese, Chinese, Korean and Thai** along with Dutch, English, Farsi, French, German, Greek, Italian, Norwegian, Portuguese, Polish, Romanian, Sinhala, Spanish, Turkish.

Mini Nutritional Assessment

MNA[®]

Nestlé
Nutrition Institute

Last name:		First name:		
Sex:	Age:	Weight, kg:	Height, cm:	Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening	
A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties? 0 = severe decrease in food intake 1 = moderate decrease in food intake 2 = no decrease in food intake	<input type="checkbox"/>
B Weight loss during the last 3 months 0 = weight loss greater than 3 kg (6.6 lbs) 1 = does not know 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs) 3 = no weight loss	<input type="checkbox"/>
C Mobility 0 = bed or chair bound 1 = able to get out of bed / chair but does not go out 2 = goes out	<input type="checkbox"/>
D Has suffered psychological stress or acute disease in the past 3 months? 0 = yes 2 = no	<input type="checkbox"/>
E Neuropsychological problems 0 = severe dementia or depression 1 = mild dementia 2 = no psychological problems	<input type="checkbox"/>
F1 Body Mass Index (BMI) (weight in kg) / (height in m) ² 0 = BMI less than 19 1 = BMI 19 to less than 21 2 = BMI 21 to less than 23 3 = BMI 23 or greater	<input type="checkbox"/>

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm 0 = CC less than 31 3 = CC 31 or greater	<input type="checkbox"/>
--	--------------------------

Screening score (max. 14 points)	<input type="checkbox"/> <input type="checkbox"/>
--	---

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

Ref: Velaz B, Villars H, Abellan G, et al. Overview of the MNA® - Its History and Challenges. J Nutr Health Aging 2006; 10:466-485.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Velaz B. Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). J Geront 2001;56A: M366-377.
Guigoz Y. The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us? J Nutr Health Aging 2006; 10:466-487.

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For more information: www.mna-elderly.com

Nestlé
Nutrition Institute

簡易栄養状態評価表
Mini Nutritional Assessment-Short Form
MNA[®]

氏名:				
性別:	年齢:	体重:	kg	身長:
		cm	調査日:	

下の口欄に適切な数値を記入し、それらを加算してスクリーニング値を算出する。

スクリーニング	
A 過去3ヶ月間で食欲不振、消化器系の問題、そしゃく・嚥下困難などで食事が減少しましたか? 0 = 著しい食事量の減少 1 = 中等度の食事量の減少 2 = 食事量の減少なし	<input type="checkbox"/>
B 過去3ヶ月間で体重の減少がありましたか? 0 = 3 kg 以上の減少 1 = わからない 2 = 1~3 kg の減少 3 = 体重減少なし	<input type="checkbox"/>
C 自力で歩けますか? 0 = 寝たきりまたは車椅子を常時使用 1 = ベッドや車椅子を離れられるが、歩いて外出はできない 2 = 自由に歩いて外出できる	<input type="checkbox"/>
D 過去3ヶ月間で精神的ストレスや急性疾患を経験しましたか? 0 = はい 2 = いいえ	<input type="checkbox"/>
E 神経・精神的問題の有無 0 = 強度認知症またはうつ状態 1 = 中度の認知症 2 = 精神的問題なし	<input type="checkbox"/>
F1 BMI (kg/m ²) : 体重(kg)÷身長(m) ² 0 = BMI が 19 未満 1 = BMI が 19 以上、21 未満 2 = BMI が 21 以上、23 未満 3 = BMI が 23 以上	<input type="checkbox"/>

BMI が測定できない方は、F1 の代わりに F2 に回答してください。
BMI が測定できる方は、F1 のみに回答し、F2 には記入しないでください。

F2 ふくらはぎの周囲長(cm) : CC 0 = 31cm未満 3 = 31cm以上	<input type="checkbox"/>
--	--------------------------

スクリーニング値 (最大: 14ポイント)	<input type="checkbox"/> <input type="checkbox"/>
---------------------------------	---

12-14 ポイント: 栄養状態良好
8-11 ポイント: 低栄養のおそれあり (At risk)
0-7 ポイント: 低栄養

Ref: Velaz B, Villars H, Abellan G, et al. Overview of the MNA® - Its History and Challenges. J Nutr Health Aging 2006; 10:466-485.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Velaz B. Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). J Geront 2001;56A: M366-377.
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さらに詳しい情報をお知りになりたい方は、www.mna-elderly.com にアクセスしてください。



Wan Gyoon Shin, Pharm.D.,
President Ph.d.

The Korean Society of Parenteral & Enteral
Nutrition (KSPEN)



Addressing Malnutrition in Korea

- **Screening tools**

- Nutritional Risk Screening 2002 (NRS 2002)
- Mini Nutritional Assessment (MNA)
- Seoul National University Hospital-Nutrition Screening Index (SNUH-NSI)

- **Assessment Instruments**

- Subjective Global Assessment (SGA)
- Patient Generated-Subjective Global Assessment (PG-SGA)

- **SNUH-NSI Criteria**

- Appetite
- Change in Weight
- Difficulty in digestion
- Diet type
- Serum Albumin (g/dℓ)
- Serum Cholesterol (mg/dℓ)
- Total Lymphocyte Count (cells/mm³)
- Hemoglobin (g/dℓ)
- CRP (mg/dℓ)
- Body Mass Index (kg/m²)
- Age (yr)

Data from Thailand



Veeradej Pisprasert, MD PhD

Division of Clinical Nutrition

Department of Medicine

Khon Kaen University

aspen LEADING THE SCIENCE AND
PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

screening and assessment tools in Thailand

Consensus of SPENT to implement
malnutrition screening tools (2015)

- NT (Nutrition Triage)
- NAF (Nutrition Alert Form)

การตรวจคัดกรองภาวะทุโภชนาการ

(Nutrition Triage : NT)

ชื่อ/นามสกุลผู้ป่วย อายุ ปี, HN AN

เพศ : ชาย ☐ , หญิง ☐ , หอผู้ป่วย OPD, การวินิจฉัยโรค.....

นน.ปกติ กก. □ ตาม □ ประมาณ □ ชั่ง, นน.ปัจจุบัน กก. □ ตาม □ ประมาณ □ ชั่ง, ส่วนสูง ซม. □ ตาม □ ประมาณ □ วัด

ผู้ประเมิน (ชื่อ) : แพทย์, พยาบาล....., อื่นๆ

คัดกรองเบื้องต้น (Nutrition Screening)

1. ได้รับอาหารหรือสารอาหารน้อยลง
ในระยะเวลา ≥ 7 วันที่ผ่านมา

2. น้ำหนักลดลงในช่วงเวลา 6 เดือนที่ผ่านมา

3. ดัชนีมวลกาย < 18.5 หรือ ≥ 25

4. มีภาวะวิกฤตหรือถึงวิกฤตร่วมด้วย

วันที่.....

☐ มี ☐ ไม่มี

☐ มี ☐ ไม่มี

☐ มี ☐ ไม่มี

☐ มี ☐ ไม่มี

ถ้าคำตอบ คือ ไม่มี

ทั้ง 4 ข้อ

กรุณา คัดกรองซ้ำ

อีก 1 สัปดาห์ถัดไป หรือ

ในระยะเวลาที่เหมาะสม

วันที่.....

☐ มี ☐ ไม่มี

☐ มี ☐ ไม่มี

☐ มี ☐ ไม่มี

☐ มี ☐ ไม่มี

หมายเหตุ ถ้าได้ผลว่า มี ≥ 1 ข้อ ให้ประเมินภาวะทุโภชนาการ (BNT 2013 : Nutrition Assessment)

A simplified nutrition screening form for Nurse

Name _____ ☐ Male ☐ Female Age _____ yr HN _____ D/M/Y admitted _____ Time _____

Diagnosis _____ Data from ☐ Patient ☐ Pt.'s relative ☐ from _____

Mark ☒ in ☐ by choosing only one choice in each big topic and small topic (except topics 6 and 8 which more choices are allowed) and fill scores in the box

Scores

1. 凡在本行开立存款账户的客户均可申请。
 2. 凡在本行开立存款账户的客户均可申请。
 3. 凡在本行开立存款账户的客户均可申请。
 4. 凡在本行开立存款账户的客户均可申请。
 5. 凡在本行开立存款账户的客户均可申请。

1. Height/Body's lenght/Arm span

☐ Height _____ CM

☐ Body's lenght..... cm

☐ Arm span _____ cm

☐ From Pt.'s relative cm

2. Weight and Body mass index [Body mass index (BMI) = Weight (kg)/Height (m)²]

2.1 Weight..... kg ☐ Lie down position (1) ☐ Stand position (0) ☐ Not feasible (0) ☐ From Pt's relative (0)

2.2 BMI.....kg/m² ☐ BMI < 17.0 kg/m² (2) ☐ BMI 17.0-18.0 kg/m² (1) ☐ BMI 18.1-29.9 kg/m² (0) ☐ BMI ≥ 30.0 kg/m² (1)

If weight is not available, use either Albumin or Total Lymphocyte Count (TLC) (TLC = Total WBC/mm³ X % Lymphocyte/100)

2.1 Albumin ☐ ≤ 2.5 g/dl (< 25 g/l) (3) ☐ 2.6-2.9 g/dl (26-29 g/l) (2) ☐ 3.0-3.5 g/dl (30-36 g/l) (1) ☐ > 3.5 g/dl (35 g/l) (0)

2.2 TLC ☐ $\leq 1,000$ cells/mm³ (3) ☐ 1,001-1,200 cells/mm³ (2) ☐ 1,201-1,500 cells/mm³ (1) ☐ $>1,500$ cells/mm³ (0)

3. Body build

☐ Too thin (2)

□ Thin (1)

☐ Obese (1)☐ Normal-Overweight (0)

4. Weight change in the past 4 wk. ☐ Decreased (2) ☐ Increased (1) ☐ Not available (0) ☐ Stable (0)

5. Dietary intake in the past 2 wk.

5.1 Type ☐ Clear liquid diet (2) ☐ Full liquid diet/BD/Medical food (2) ☐ Soft diet (1) ☐ Regular diet (0)

5.2 Quantity ☐ Too little (2) ☐ Little (1) ☐ Too much (0) ☐ Adequate (0)

6. Persistent gastrointestinal symptoms in the past 2 wk. (more than one choice is allowed)

- 6.1 Chewing / Swallowing problems ☐ Aspiration (2) ☐ Chewing difficulty/Dysphagia/Tube feeding (2) ☐ No (0)
- 6.2 Gastrointestinal problems ☐ Diarrhea (2) ☐ Abdominal pain (2) ☐ No (0)
- 6.3 Problems during intake ☐ Vomiting (2) ☐ Nausea (2) ☐ No (0)

7. Functional capacity ☐ Bed ridden (2) ☐ Needs assistance occasionally (1) ☐ Self dependence (0) ☐ Normal (0)

8. Pt.'s disease, please inform dietitian/nutritionist (more than one choice is allowed)

- | | | |
|--|---|---|
| <input type="checkbox"/> DM (3) | <input type="checkbox"/> CKD-ESRD (3) | <input type="checkbox"/> CLD/Cirrhosis/Hepatic encephalopathy (3) |
| <input type="checkbox"/> Solid cancer (3) | <input type="checkbox"/> Chronic heart failure (3) | <input type="checkbox"/> Severe head injury (3) |
| <input type="checkbox"/> Hip fracture (3) | <input type="checkbox"/> COPD (3) | <input type="checkbox"/> $\geq 2^\circ$ of burn (3) |
| <input type="checkbox"/> Stroke/CVA (6) | <input type="checkbox"/> Sepsis/septicemia (3) | <input type="checkbox"/> Severe pneumonia (6) |
| <input type="checkbox"/> Multiple fracture (6) | <input type="checkbox"/> Malignant hematologic disease/
Bone marrow transplant (6) | <input type="checkbox"/> Critically ill (6) |

Total Scores*

*Interpretation

- ☐ Scores of 0-5 (NAF = A : Normal-Mild malnutrition)

No risk of malnutrition, nurse should rescreen the patient again within 7 days.

- ☐ Scores of 6-10 (NAF = B : Moderate malnutrition) Please inform attending doctor and dietitian/nutritionist immediately.

Moderate risk of malnutrition. Patient should be assessed by dietitian/nutritionist and received nutrition therapy by attending doctor within 3 days.

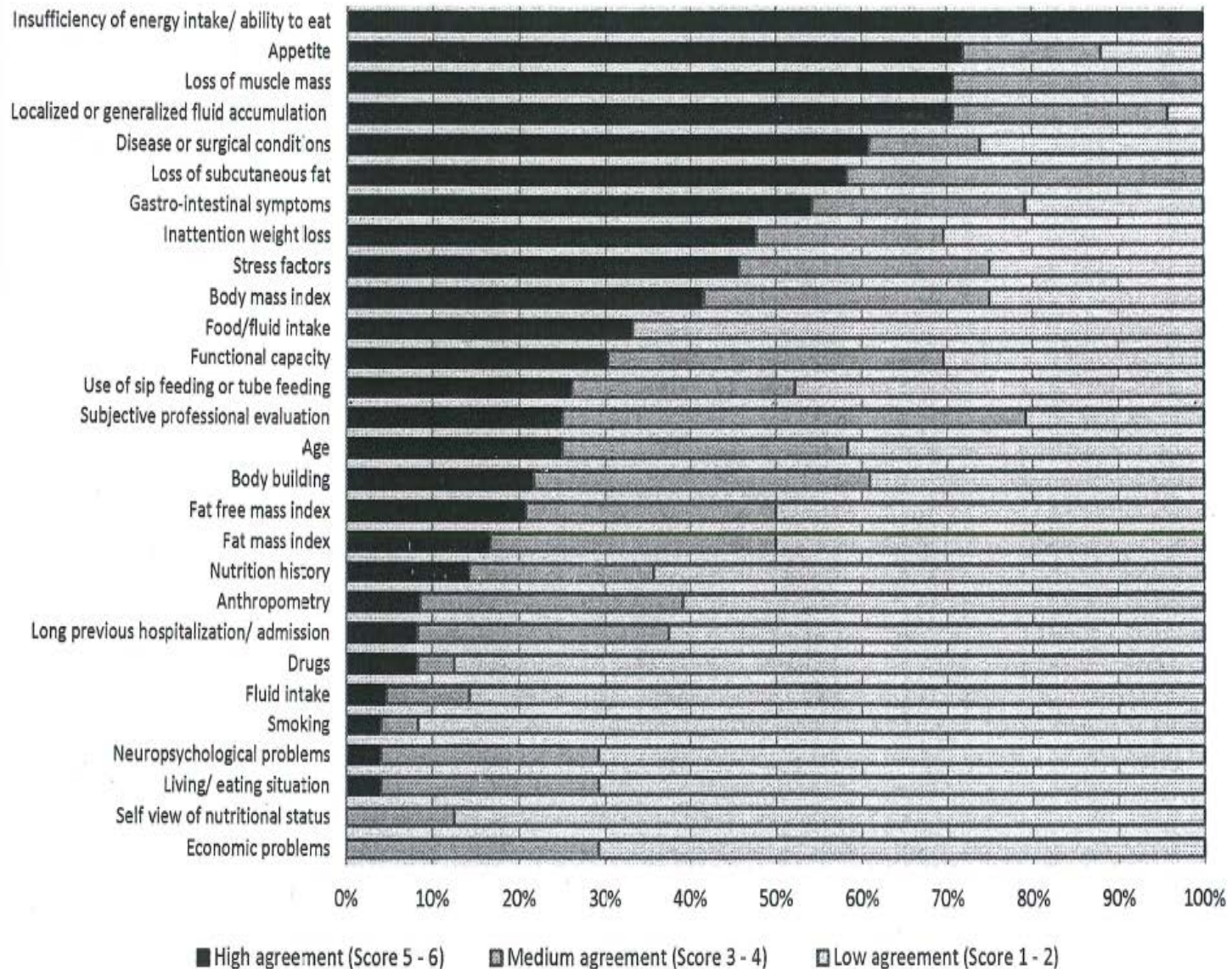
- ☐ Scores of 11 and more (NAF = C : Severe malnutrition) Please inform attending doctor and dietitian/nutritionist immediately.

Severe risk of malnutrition. Patient should be assessed by dietitian/nutritionist and received nutrition therapy by attending doctor within 24 hours.

Screened by.....D/M/Y.....Time.....

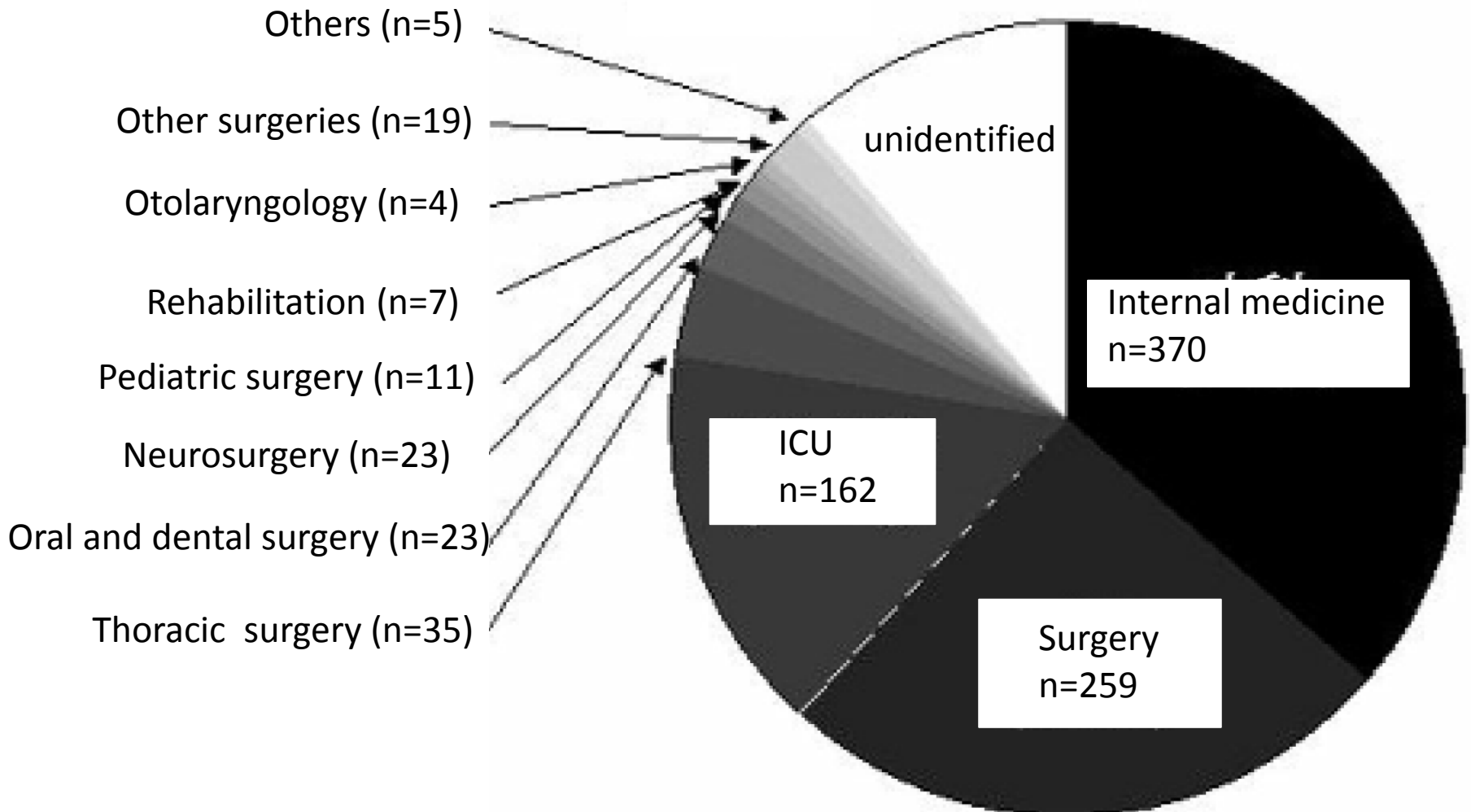
Thailand

Nutrition status indicator variables



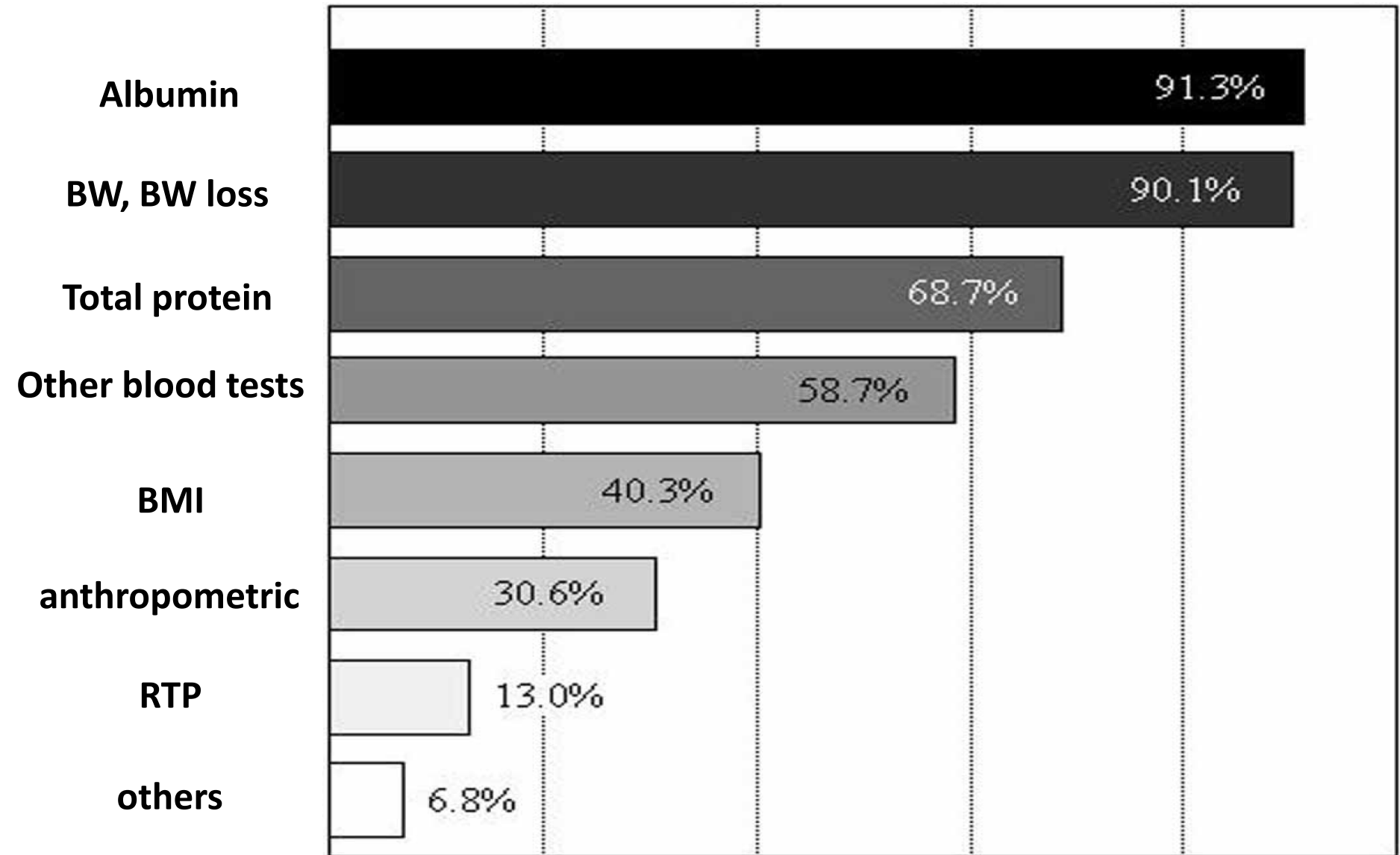
Asked 1019 doctors in Japan about nutrition care

Performed in 2005

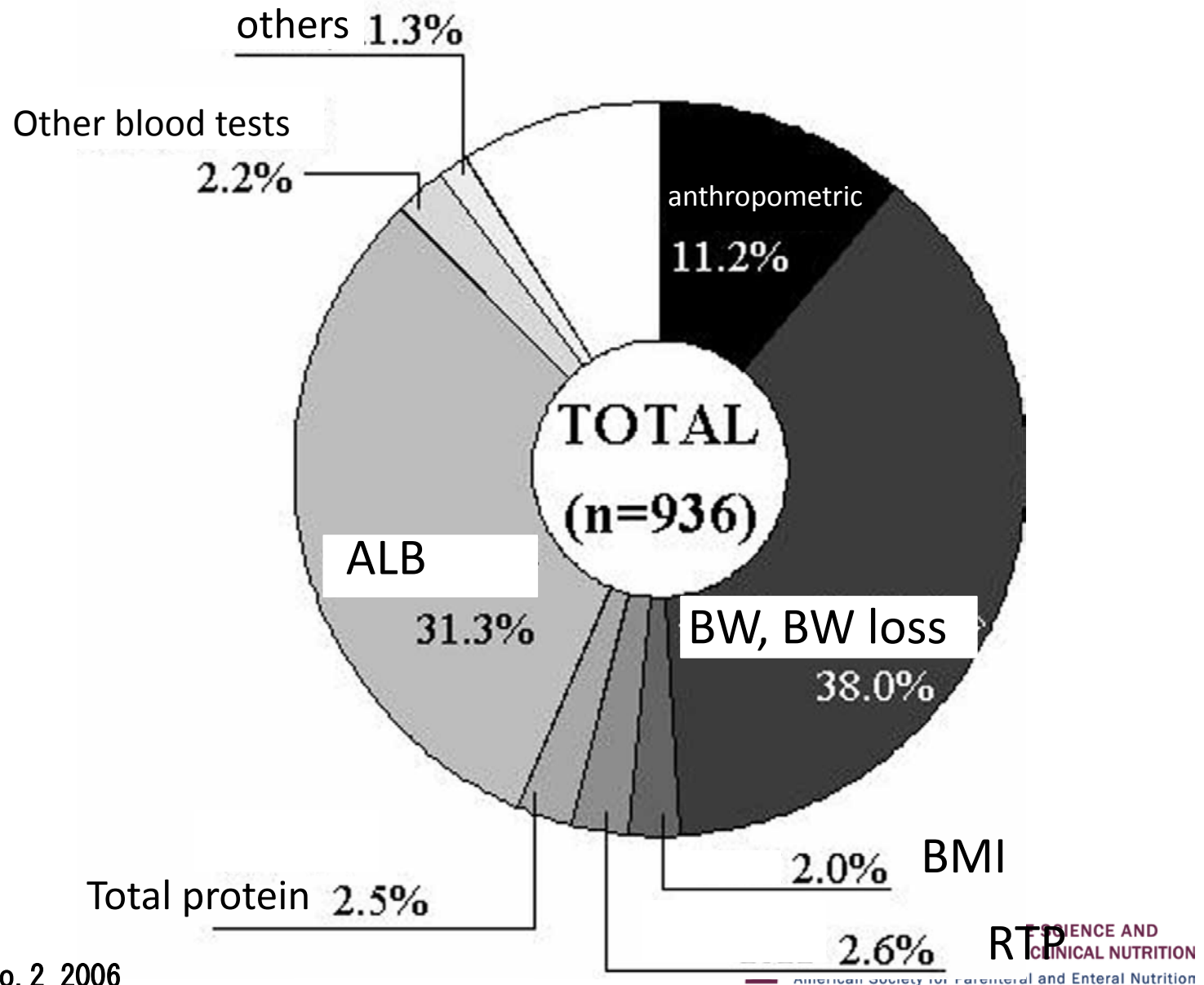


What do you measure for nutrition assessment

N=939 multiple answer



Which do you think is the most important for nutrition assessment



BMIs in different countries

BMI in Asian countries

nutritionDay Project 2014

	China	Japan	Philippine	Singapore	Thailand	USA	Austria	World
n	253	1313	174	607	127	2806	321	14603
BW	63.7 ± 13.3	55.3 ± 13.3	63.4 ± 12.6	59.5 ± 16.0	64.5 ± 15.2	82.5 ± 25.0	73.6 ± 14.3	70.1 ± 20.6
HT	166.8 ± 9.3	157.8 ± 10.7	160.4 ± 7.8	159.4 ± 12.6	164.4 ± 10.0	168.4 ± 11.8	169.3 ± 9.1	164.4 ± 12.9
BMI	22.7 ± 3.7	22.1 ± 4.3	24.7 ± 4.9	23.5 ± 6.5	23.9 ± 5.4	28.9 ± 8.0	25.6 ± 4.6	25.7 ± 6.4
age	52	71	53	71	67	62	68	67
BW loss(%)	34	34	35	28	32	38	48	43
0-4	6	18	18	15	21	14	17	19
5-8	6	6	4	4	2	7	8	8
>8	4	6	6	3	6	4	21	11

International nutrition survey

CERU Canada

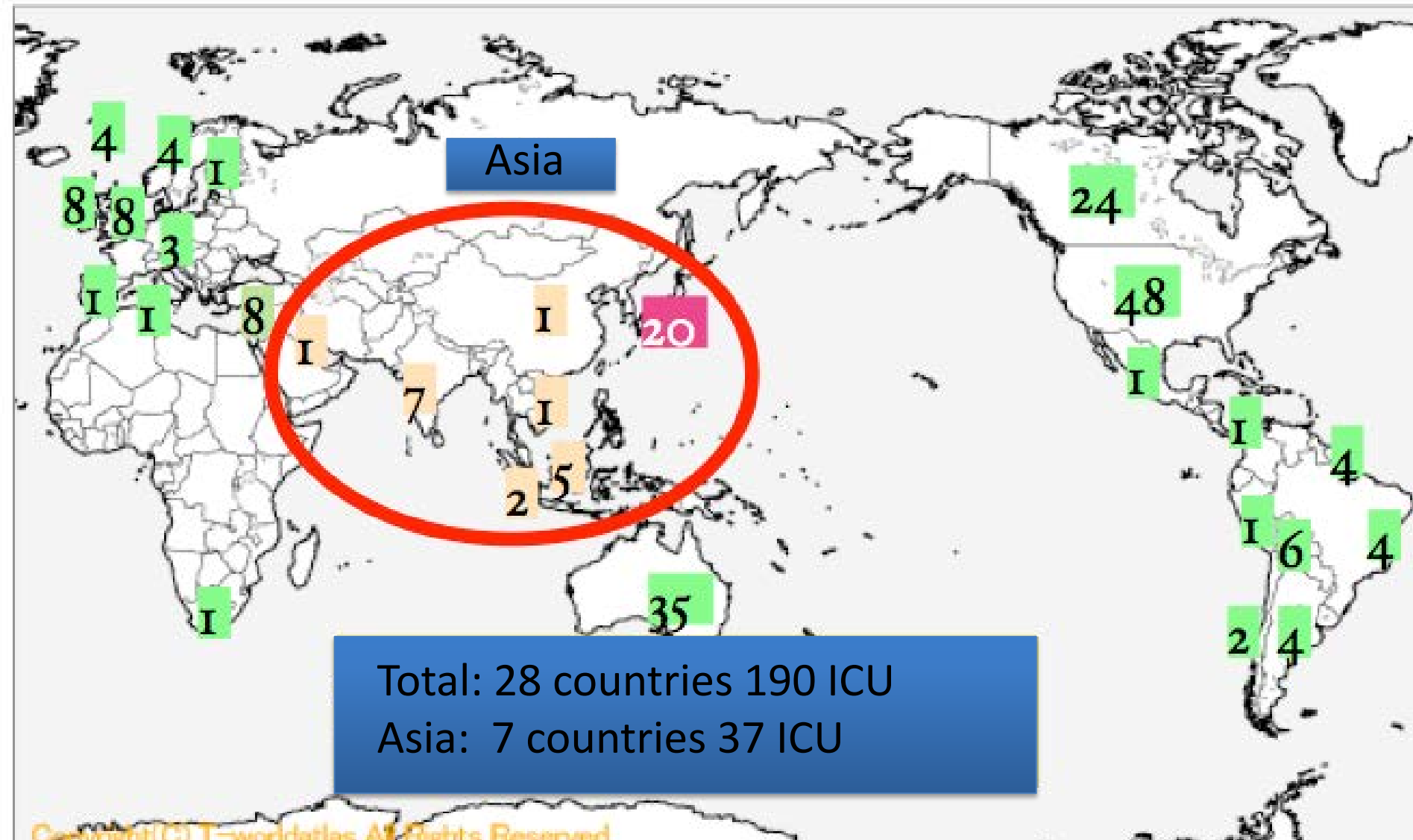
- Quality improvement initiative
- comparing nutrition practices in ICU within many countries
- Started in 2007, which had done in 2008, 2009 and 2011!
- >150 ICUs participating each year

Naoki Higashibeppu MD

Kobe city medical
center general
hospital Kobe Japan



2013

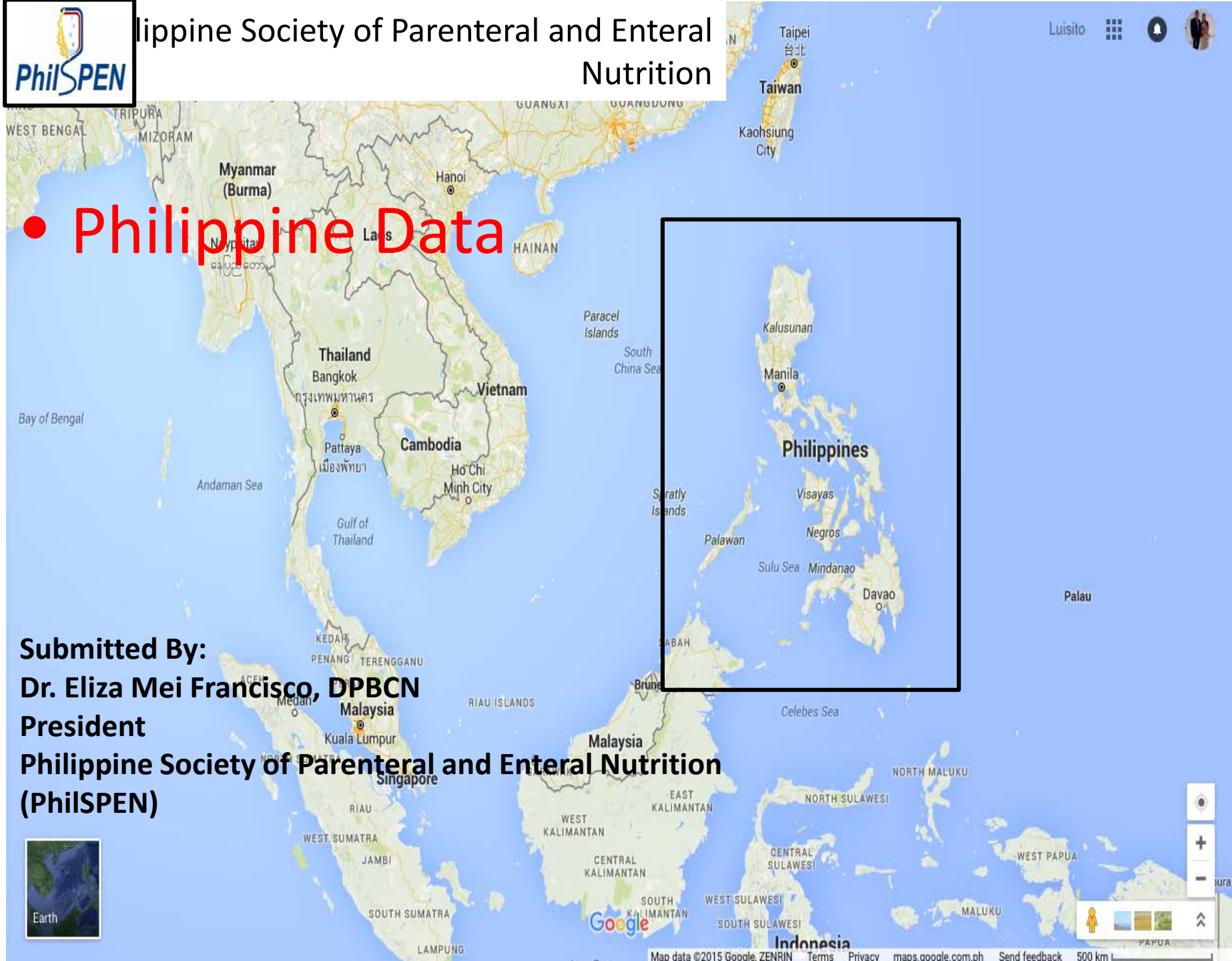


Baseline Data

	Japan	Asia	World
n	379	504	3661
Age(median)	67	64	63
Male/Female(%)	64/36	64/37	60/40
BW	58	62	75
BMI	23	23.3	26
Medical : Elective Surg : Emergent surg	201:54:124	364:17:133	2348:374:900
APACHE2(median)	23	24	22
Mechanical Vent	5.7	8.6	6.8
60day mortality	22.7%	27.4%	24.7%

• Philippine Data

Submitted By:
Dr. Eliza Mei Francisco, DPBCN
President
Philippine Society of Parenteral and Enteral Nutrition
(PhilSPEN)



BMI: WHO vs. Asian Criteria

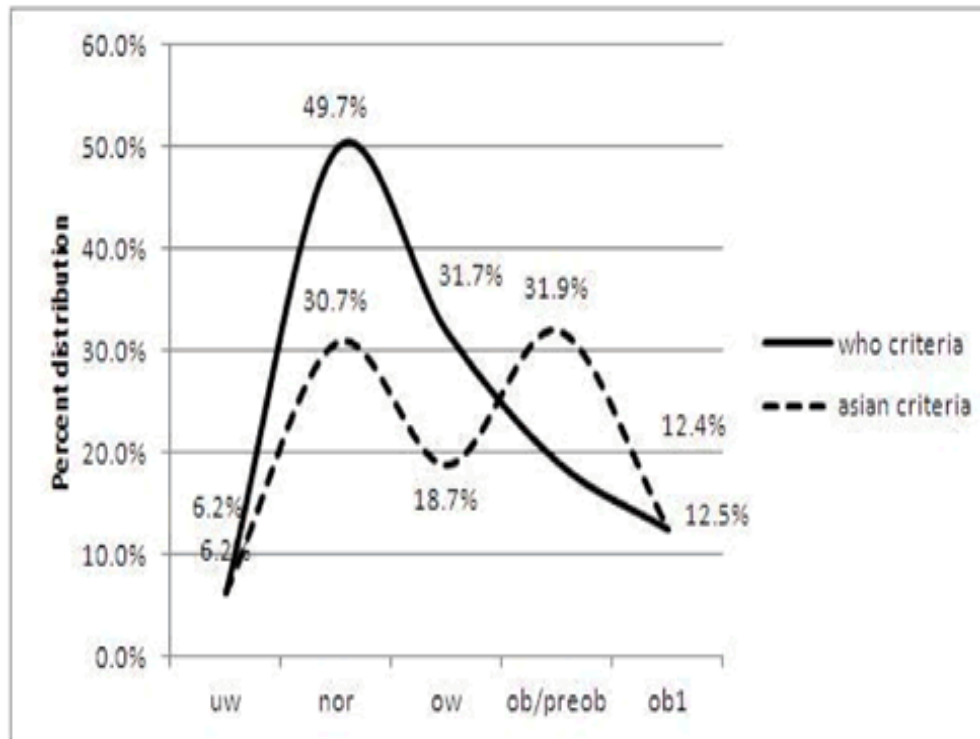


Figure 1: Data from St. Luke's Medical Center Nutrition Database (yr2000 to 2003; n=140,612); Legend: uw=underweight, nor=normal, ow=overweight, preob=pre-obese, ob=obese, ob1=obese type 1

WHO and "Asian" criteria values and data from years 2000 to 2003 (n=140, 612)

Source: PhilSPEN Online Journal of Parenteral and Enteral Nutrition. (Article 1 | POJ_0005.html)

Issue January 2010 - 2012: 1-8. Located at: http://www.dpsys120991.com/POJ_0005.html

Accessed December 12, 2015

BMI: WHO vs. Asian Criteria

Question: Which BMI criteria to use for nutrition screening?

Table 2: BMI based Nutritional Status, year 2000 to 2003				
Nutritional Status	WHO criteria	Number (%)	"Asian" criteria	Number (%)
Underweight	<18.5	8,999 (6.4)	<18.5	8,999 (6.4)
Normal	18.5 – 24.9	70,587 (50.2)	18.5 – 22.9	44,012 (31.3)
Overweight	25 – 29.9	44,574 (31.7)	23 – 24.9	26,294 (18.7)
Pre-Obese	-	-	25 – 29.9	44,855 (31.9)
Obese	≥30	16,452 (11.7)	≥30	16,452 (11.7)
Total		140,612		140,612

WHO and "Asian" criteria values and data from years 2000 to 2003 (n=140, 612)

Source: PhilSPEN Online Journal of Parenteral and Enteral Nutrition, (Article 1 | POJ_0005.html)

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BMI in Asian countries

nutritionDay Project 2014

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n	253	1313	174	607	127	2806	321	14603
BW	63.7 ± 13.3	55.3 ± 13.3	63.4 ± 12.6	59.5 ± 16.0	64.5 ± 15.2	82.5 ± 25.0	73.6 ± 14.3	70.1 ± 20.6
HT	166.8 ± 9.3	157.8 ± 10.7	160.4 ± 7.8	159.4 ± 12.6	164.4 ± 10.0	168.4 ± 11.8	169.3 ± 9.1	164.4 ± 12.9
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age	52	71	53	71	67	62	68	67
BW loss(%)	34	34	35	28	32	38	48	43
0-4	6	18	18	15	21	14	17	19
5-8	6	6	4	4	2	7	8	8
>8	4	6	6	3	6	4	21	11

Muscle mass is an important prognostic factor in many disease:

Liver transplantation

Cancer chemotherapy

Gastric cancer receiving adjuvant chemotherapy

Esophageal cancer patients with neoadjuvant chemo

Postoperative Respiratory Complications in
Patients with Esophageal Cancer

Body composition analysis

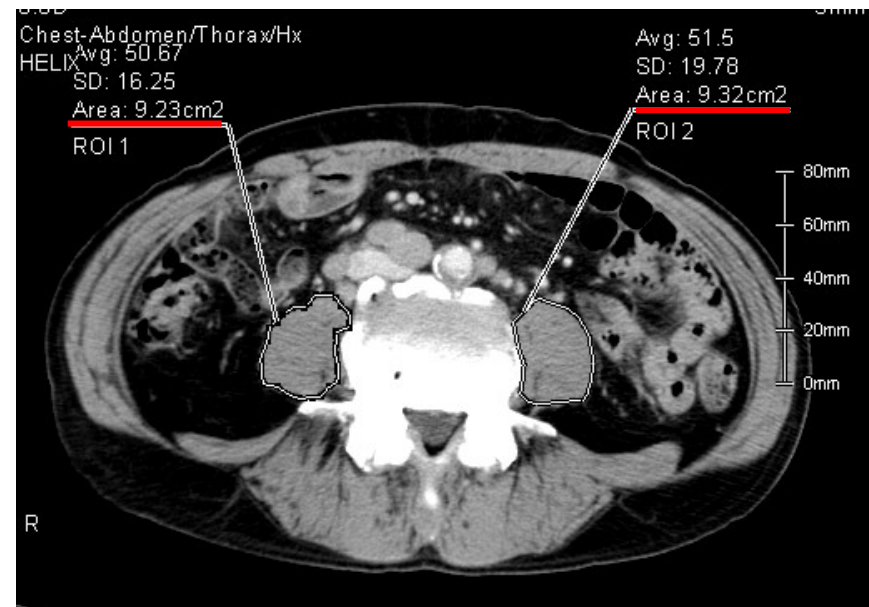
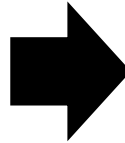
DEXA

CT

US

BIA

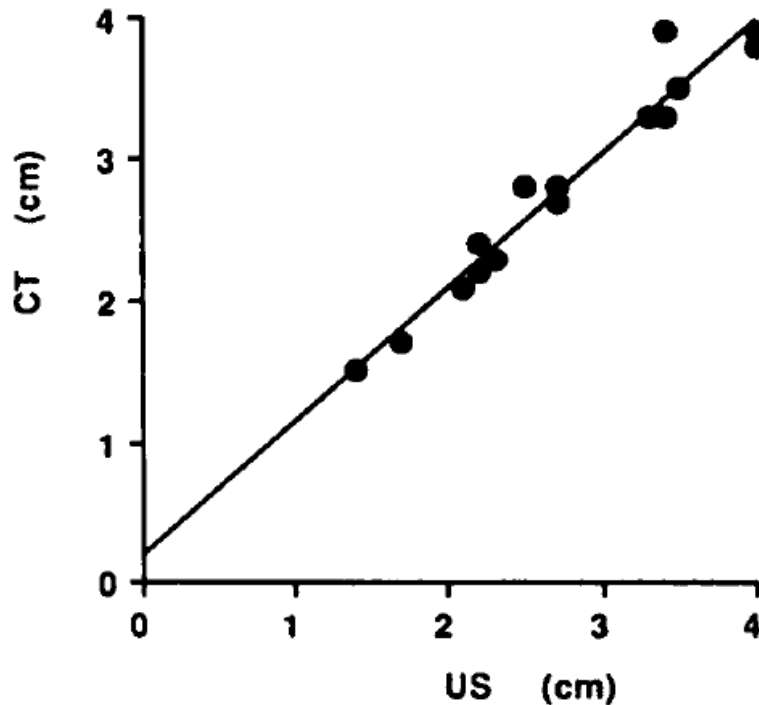
Area of psoas muscle



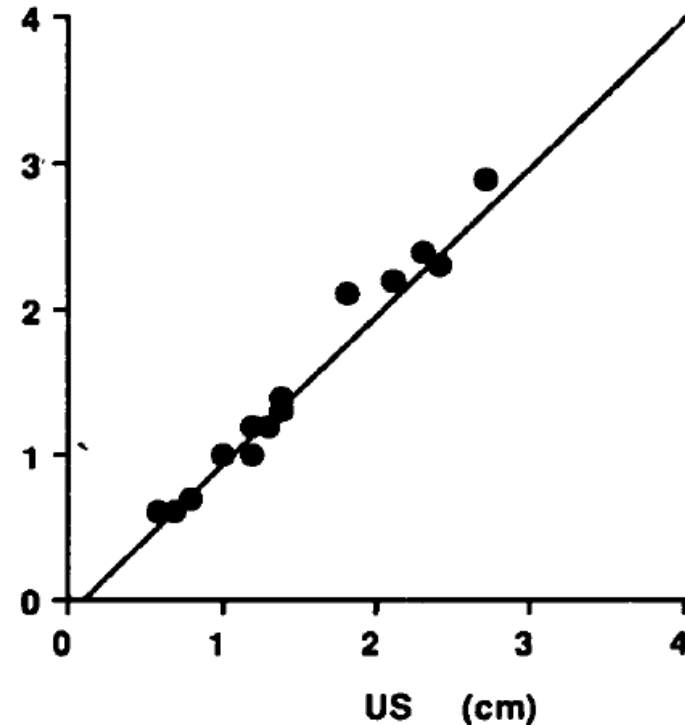
$$\text{Area} = 9.23 + 9.32 = 18.55 \text{ cm}^2$$

Good correlation between the measurements of muscle thickness obtained by US and CT

Femoral quadriceps



Brachial biceps



US

*Should work much harder
for nutrition research*

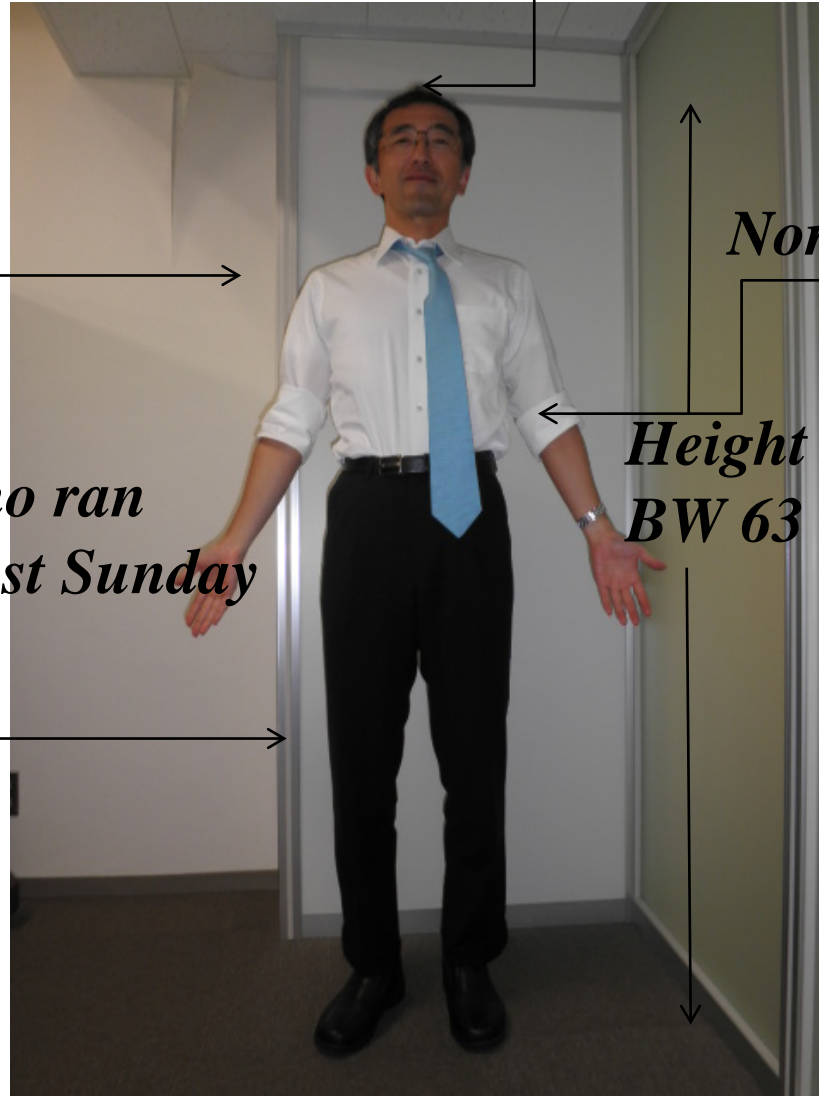
52 y.o, male

Normal diet ad libitum

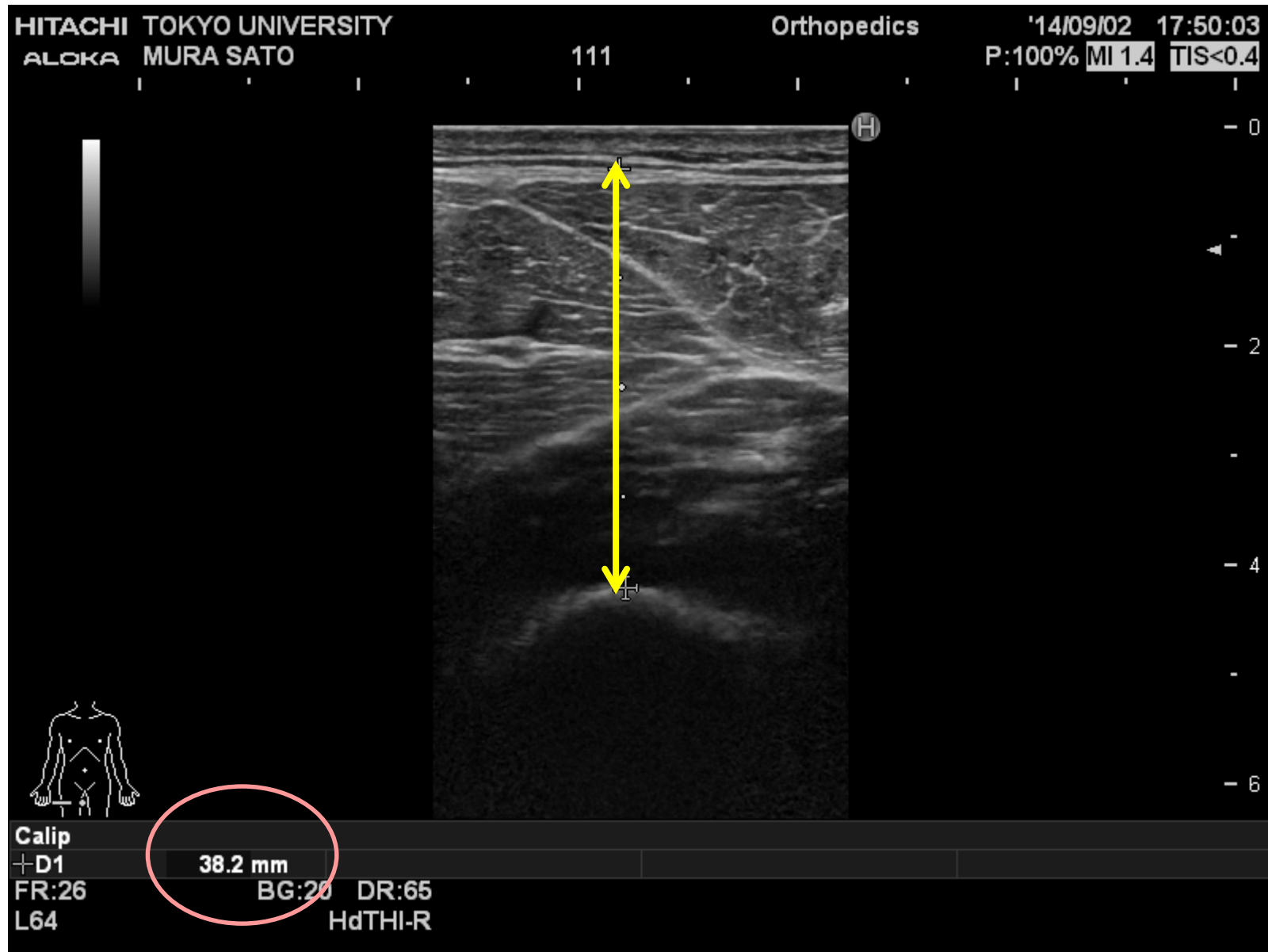
*Height 174 cm
BW 63 kg*

*A running freak who ran
full marathon on last Sunday*

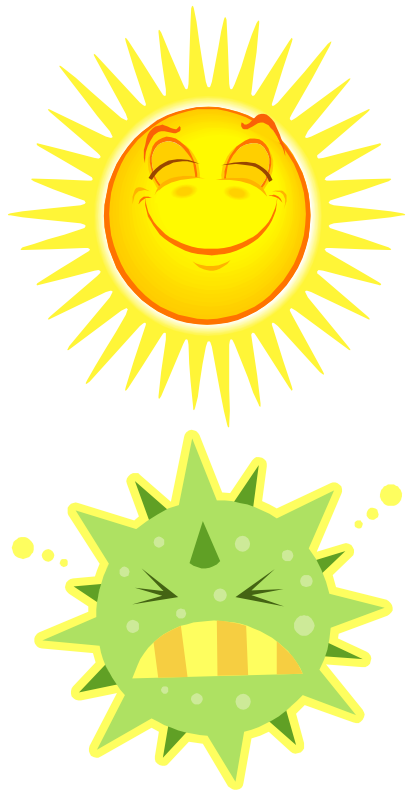
Dr. KF



Right quadriceps muscle



Advantages and Disadvantages of US



Real-time

Portable

Can be brought to a sick patient's bedside,

Low cost

No harmful ionizing radiation.

Difficulty imaging structures behind bone

Relative dependence on a skilled operator



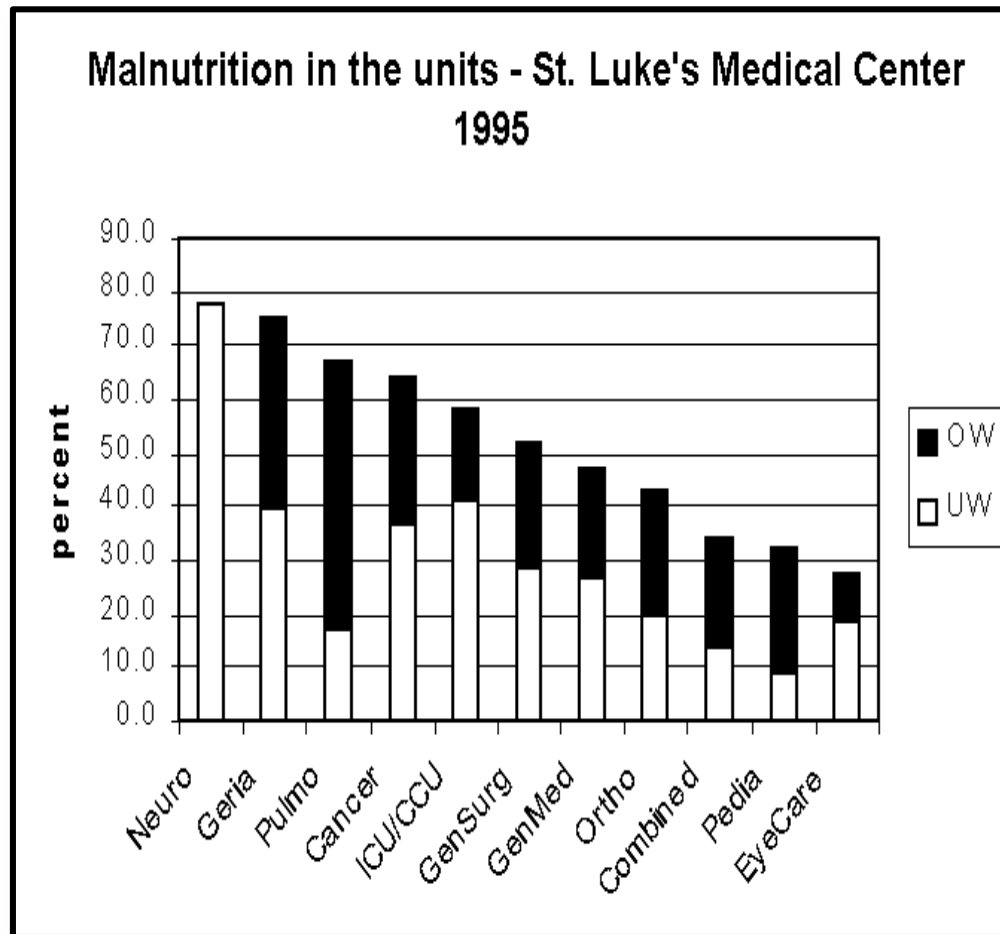
BIA

Simple

Summary

- Various screening and assessment tools are utilized in Asian countries
- Body weight loss seems to be the most simple and widely used screening method
- May have to consider the role of serum albumin in the assessment of nutritional status
- BMI is different among countries and regions
- Body composition analysis may be the next step

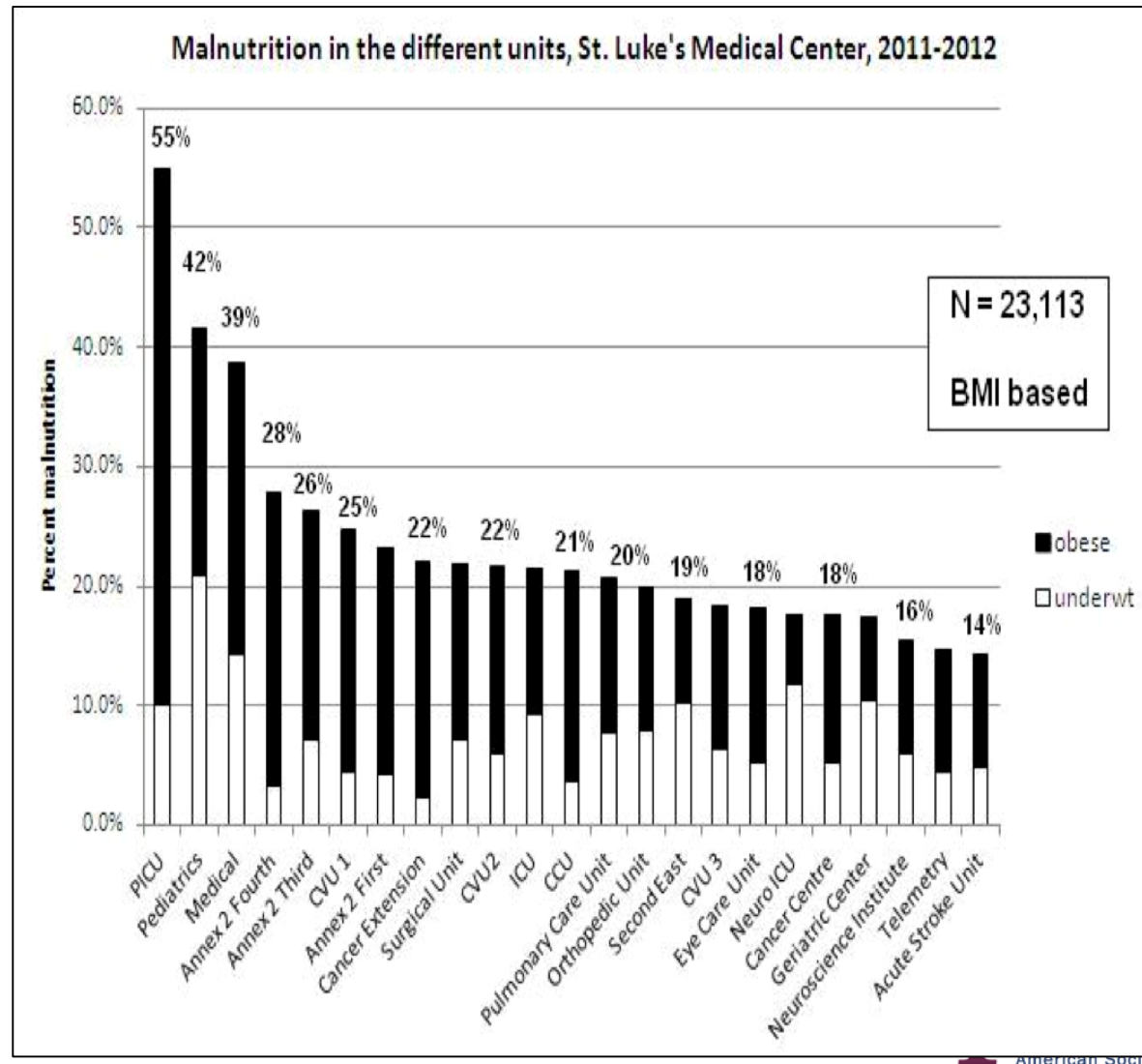
Change in patterns of BMI data in hospitalized patients from years 1995 to 2012



Source: Fernando R and Llido LO. Prevalence of malnutrition in a tertiary care hospital in Metro-Manila. St. Luke's Medical Journal 1996. Located at: http://www.dpsys120991.com/1_Fernando_Llido_et_al.pdf. Accessed December 12, 2015

aspen LEADING THE SCIENCE AND PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

Change in patterns of BMI data in hospitalized patients from years 1995 to 2012



A.S.P.E.N.

Ainsley Malone, MS, RD,LD, CNSC, FAND,
FASPEN

Pharmacy Dept.

Mt. Carmel West Hospital

Columbus, Ohio, USA

Clinical Practice Specialist

A.S.P.E.N.

Disclosures

- I have nothing to disclose

What Is A.S.P.E.N.'S Position On Malnutrition Screening, Assessment And Diagnosis?

A.S.P.E.N. and Malnutrition

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Special Communication

A Statement by the ASPEN Board of Directors

PREFACE

As the American Society for Parenteral and Enteral Nutrition gains stature in the field of medicine, and as the discipline of clinical nutrition continues its impact on the health of all patients, it is important that the Society develop standards by which the field can expand in a logical and productive manner. The following brief article represents a statement of the Society whereby we publicly note the fact that malnutrition does occur in hospitalized patients. It is the intent of the Society to build upon this initial position paper and develop a series of standards which will aid in the stabilization of not only nomenclature but procedural matters as well. Comments relative to this statement should be directed to the national office or any member of the Board of Directors of the Society.

WILLIAM P. STEFFEE, M.D., PH.D.
*Immediate Past President
Chairman, Board of Advisors*

MALNUTRITION IN HOSPITALIZED PATIENTS

Malnutrition was defined by the AMA Council on Foods and Nutrition as "A state of impaired functional ability, or deficient structural integrity or development, brought about by a discrepancy between the supply to the body tissues of essential nutrients and calories, and the specific biologic demand for them."¹

There are a number of general risk factors which are associated with a state of nutritional deficiency. These include poverty, lack of education, mental and physical

techniques to the hospitalized patient. Although there is not a single biochemical or physical measure that reflects the state of nutritional health, these data plus a review of a patient's medical and dietary history may suggest potential nutritional problems. The diagnostic criteria for malnutrition usually include the percent deviations of certain anthropometric measurements from median values for age.¹²⁻¹⁹ Other indices used have been the nonintentional weight loss, percentile values for weight and weight for height, serum protein measurements, and indices of cellular immunity.^{8, 13, 16} By evaluating all these factors, a good estimate of the nutritional status may be obtained.²⁰⁻²² Surveys of medical and surgical populations suggest the incidence of protein-calorie malnutrition may vary from 25% up to 65%.^{4, 5, 23} If subnormal serum levels in hospital patients for vitamins are also included, the incidence of nutritional deficiency rises further.²⁴⁻²⁶

Malnutrition in hospitalized patients may be acute or chronic.²⁷ Frequent causes of malnutrition are self-imposed food restriction, inability to eat or retain food, catabolic losses associated with infectious or malignant disease, malabsorption syndromes, prolonged intravenous feeding with nutrient-deficient solutions, cancer, and certain drugs.²⁸ Furthermore, a number of routine medical practices may contribute to poor patient nutritional health.²⁷

The state of malnutrition appears to affect patient morbidity and mortality rates. It is associated with an increased incidence of wound infection, fluid and electrolyte imbalances, depressed ventilatory response, decreased response to certain chemotherapy programs, de-

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American Society for Parenteral and Enteral Nutrition

LEADING THE SCIENCE AND
PRACTICE OF CLINICAL NUTRITION

American Society for Parenteral and Enteral Nutrition

Nutrition Assessment – The Beginning

Nutritional and metabolic assessment of the hospitalized patient

George L. Blackburn, M.D., Ph.D.
Bruce R. Bistrian, M.D., Ph.D.
Baltej S. Maini, M.D.
Haran T. Schlamm, B.A.
Michael F. Smith, M.D., F.R.C.S. Ed.

J Parent Ent Nutr 1977;1:11-

METHODS

The following parameters are included in the nutritional/metabolic profile:

1. Height in centimeters.
2. Weight in kilograms.
3. Basal energy expenditure in kilocalories per day.
4. Actual weight as a percentage of ideal weight.
5. Actual triceps skinfold thickness as a percentage of the standard value.
6. Actual mid-upper arm muscle circumference as a percentage of the standard value.
7. Creatinine/height index.
8. Serum albumin level.
9. Serum transferrin level or total iron-binding capacity.
10. Total lymphocyte count.
11. Measure of cell-mediated immunity (delayed hypersensitivity reaction).
12. Nitrogen balance.
13. Apparent net protein utilization.
14. Weight change as per cent of usual weight (with time).
15. Caloric intake as a multiple of basal energy expenditure.
16. Body surface area in square meters.

Nutrition Screening

- Standard for nutrition screening within 24 hours of admission
 - Added to the Joint Commission standards in 1996
- 2012 A.S.P.E.N. Nutrition Screening and Assessment survey
 - (n=918 adult)
 - 90% reported screening completed within 24 hrs of admission



Adult Malnutrition Redefined

Consensus Statement

Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics Recommended for the Identification and Documentation of Adult Malnutrition (Undernutrition)

Jane V. White, PhD, RD, FADA¹; Peggi Guenter, PhD, RN²;
Gordon Jensen, MD, PhD, FASPEN³; Ainsley Malone, MS, RD, CNSC⁴;
Marsha Schofield, MS, RD⁵; the Academy Malnutrition Work Group;
the A.S.P.E.N. Malnutrition Task Force; and the A.S.P.E.N. Board of Directors



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White J. JPEN 2012; 36:275-283



Adult Malnutrition Characteristics

- Reduced food/caloric intake
- Unintended/non-volitional weight loss
- Loss of muscle
- Loss of subcutaneous fat
- Evidence of fluid accumulation
- Diminished hand grip strength

Any 2 or more characteristics should be used to identify
Adult Malnutrition

Pediatric Malnutrition Redefined

Special Report



Consensus Statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: Indicators Recommended for the Identification and Documentation of Pediatric Malnutrition (Undernutrition)

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**Patricia Becker, MS, RD, CSP, LDN, CNSC¹; Liesje Nieman Carney, RD, CSP, LDN³;
Mark R. Corkins, MD, CNSC, FAAP²; Jessica Monczka, RD, LDN, CNSC⁴;
Elizabeth Smith, RD, LDN, CNSC³; Susan E. Smith, RD, CSP, LD⁵;
Bonnie A. Spear, PhD, RDN, LD⁶; Jane V. White, PhD, RD, LDN, FAND⁷; Academy of
Nutrition and Dietetics; and American Society for Parenteral and Enteral Nutrition**



Pediatric Malnutrition

Characteristics

- With one available data
 - Weight/height z score
 - BMI z score
 - Length/height age z score
 - Mid-upper arm circumference z score, %
- With two available data points
 - Weight gain velocity (<2 years)
 - Weight loss (2-20 years)
 - Deceleration weight/length or weight/height z score
 - Inadequate nutrient intake

Nutrition Care Process

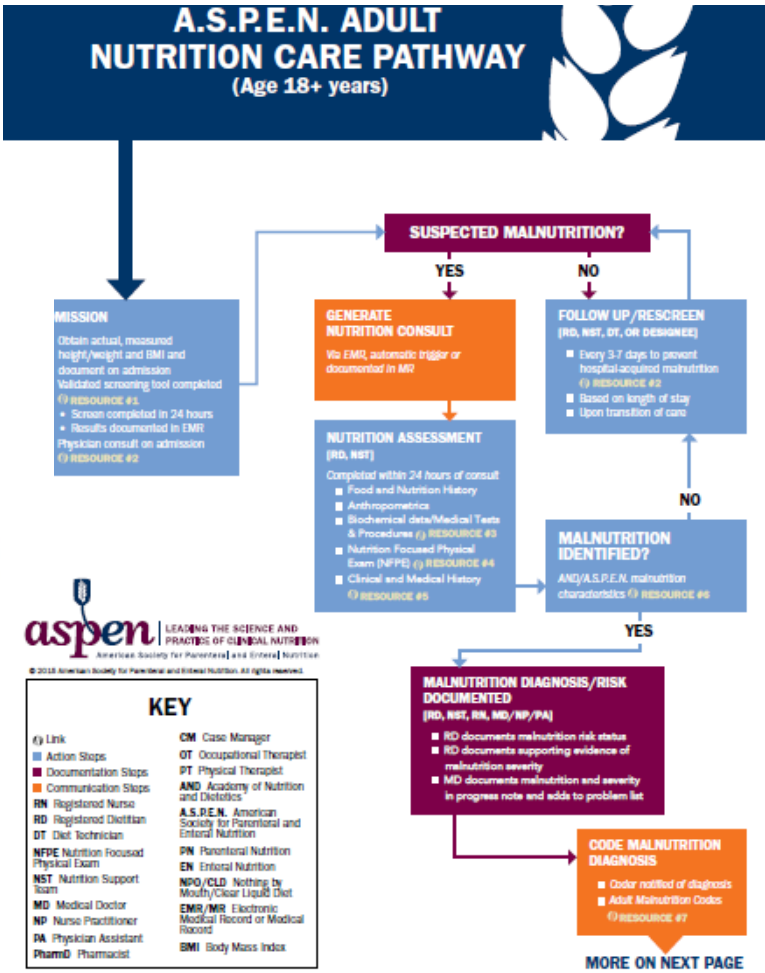
The Joint Commission Journal on Quality and Patient Safety

Forum

Addressing Disease-Related Malnutrition in Hospitalized Patients: A Call for a National Goal

Peggi Guenter, PhD, RN, FAAN; Gordon Jensen, MD, PhD, FASPEN; Vihes Patel MD, FACS, CNSC; Sarah Miller, PharmD, BCNSP; Kris M. Mogensen, MS, RD, LDN, CNSC; Ainsley Malone, MS, RD, CNSC, FAND; Mark Corkins, MD, SPR, CNSC, FAAP; Cindy Hamilton, MS, RD; Rose Ann DiMaria-Ghalili, PhD, RN, CNSC, FASPEN

Joint Comm J Qual Pat Safety 2015;41:469-473



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Malnutrition Prevalence

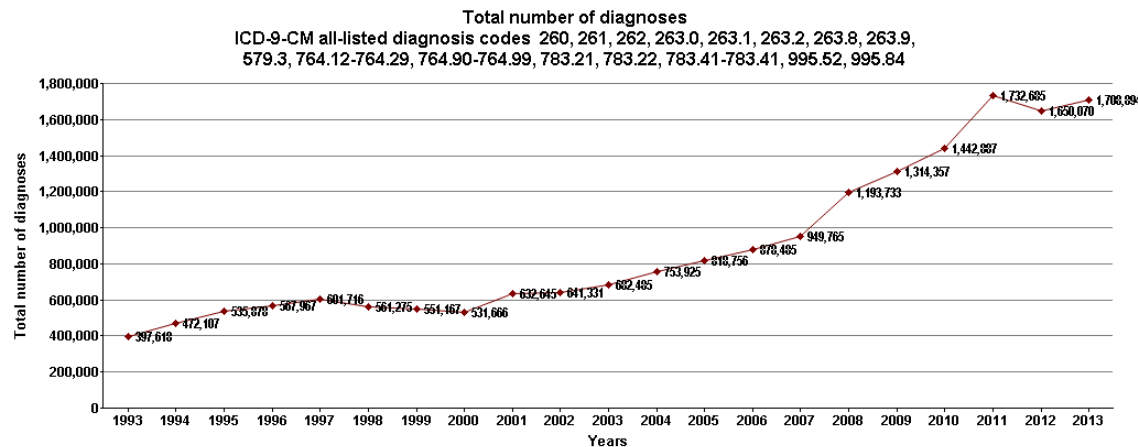
Year	Population	Definition	Prevalence		
			Severe	Moderate	Total
2013	Acute care hospital	A.S.P.E.N. Academy	19%	19.4%	38.4%
2015	Acute care hospital (pilot)	A.S.P.E.N. Academy	33%	15%	48%
2016 *	Ambulatory oncology	A.S.P.E.N. Academy	24%	4%	28%
2016*	Head and neck cancer	A.S.P.E.N. Academy	n/a	n/a	67%
2016*	Critically ill	A.S.P.E.N. Academy	n/a	n/a	20%
2016*	Pancreatic surgery	A.S.P.E.N. Academy	25.6%	30.2%	55.8%
2016*	Pediatric – acute care hospitals (pilot)	A.S.P.E.N. Academy	12%	12%-mod 17%-mild	41%

* CNW Abstract

Gaps in Prevalence

Agency for Healthcare Research and Quality (AHRQ)
National Inpatient Sample
Healthcare Cost Utilization Project (HCUP)

Year	Total hospital stays	# of stays with malnutrition code	% of hospital stays
2010	37,352,013	1,442,887	3.7%
2011	36,962,415	1,732,685	4.7%
2012	36,484,846	1,650,070	4.5%
2013	35,597,792	1,708,894	4.8%



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Global Leadership Conversation

Break

Global Leadership Conversation

Panel Q&A

Global Leadership Conversation

Summary



Global Leadership Conversation: Addressing Malnutrition

Tuesday, January 19, 2016

A.S.P.E.N. Clinical Nutrition Week, Austin, TX

Executive Summary:

Welcome: Gordon S. Sacks, PharmD, BCNSP, FCCP, A.S.P.E.N. President, 2015-16 welcomed the leaders of our societies and in our field from around the world to the first Global Leadership Conversation at Clinical Nutrition Week for the purpose of coming together to discuss such an important topic as malnutrition. The insights and dialogue will set the stage for continued collaboration as we collectively strive to provide optimal nutrition care to all of our patients.

Introduction: Gordon L. Jensen, MD, PhD, FASPEN, Senior Associate Dean for Research and Professor of Medicine and Nutrition, University of Vermont College of Medicine served as program moderator and presentations were made by representatives from A.S.P.E.N., ESPEN, FELANPE, and PENSA. They addressed two questions:

1. What is your region's position on malnutrition screening, assessment, and diagnosis?
2. What is your region's literature on malnutrition prevalence?

The audience was made up of representatives from 6 continents and 30 some countries. The primary focus of the Global Leadership Conversation was a panel with open audience discussion as to where do we go from here and how to work together in terms of assessment, diagnosis, and outcomes measures. The session was intended to be the start of a sustainable conversation.

Historically, famine and starvation were prevalent and they haven't gone away, but a growing concern is malnutrition in the setting of inflammation that is associated with injury and disease worldwide.

Limitations of historic definitions for malnutrition include, diagnostic criteria that lack full validity, poor specificity, sensitivity, and inter-observer reliability, overlapping definitions and misdiagnosis, multiple definitions resulting in widespread confusion, and lack modern appreciation for role of inflammatory response.

Preliminary thoughts for the discussion included:

- Inflammation and malnutrition are intimate partners that impact upon lean mass.
- Prospects for nutritional modulation of inflammation appear promising.

- Laboratory, functional, food intake or body weight criteria in support of new diagnostic approaches will require further testing.
- Translation of these diagnostic approaches to routine clinical practice will require validation.
- New approaches to assessment and diagnosis are a work in progress.
- Need to establish strong evidence-based consensus approaches to malnutrition assessment and diagnosis.
- Must develop and validate better indicators of nutritional status.
- Need for systematic approaches to outcome measurement with valid metrics.
- We must recognize the challenges. We are confronted by complex outcomes of interest that are multivariable in nature. Nutrition is but one player and malnutrition keeps bad company.

Global Leadership Conversation: What do we hope to accomplish? How can we best work together to secure broad consensus and validation around approaches to assessment, diagnosis, and outcome measurement?

- In review of current diagnostic approaches it is evident that there are key common variables that have a strong evidence base: Non-volitional weight loss, severe underweight status, and compromised dietary intake.
- Other key variables of interest include disease/inflammation, body composition, and function.
- What additional research do we need?
- Let's make this a global work in progress!

ESPEN'S Position on Malnutrition Screening, Assessment, and Diagnosis: Tommy Cederholm, MD, PhD

To provide a consensus-based minimum set of criteria for the diagnosis of malnutrition to be applied independent of clinical setting and etiology, and to unify international terminology, the European Society of Clinical Nutrition and Metabolism (ESPEN) appointed a group of clinical scientists to perform a modified Delphi process, encompassing e-mail communications, face-to-face meetings, and in group questionnaires and ballots, as well as a final ballot for the ESPEN membership. For individuals identified by screening as at risk of malnutrition, the diagnosis of malnutrition should be based on either a low BMI ($<18.5 \text{ kg/m}^2$), or on the combined finding of weight loss together with either reduced BMI (age-specific) or a low fat free mass index (FFMI) using sex-specific cut-offs. (Cederholm, *Clin Nutr*, 2015)

Screening

ESPEN advocates that screening for malnutrition should be performed in all subjects that come in contact with healthcare services. Depending on the care setting, screening should be performed within the first 24-48 hours after first contact and thereafter at regular intervals. There are several risk screening tools for malnutrition. ESPEN suggests the use of Nutrition Risk Screening-2002 (NRS-2002) and the Malnutrition Universal Screening Tool (MUST). For older persons ESPEN recommends the Mini

Nutritional Assessment (MNA) either in its full or short form (MNA-SF). Other validated tools frequently used are Subjective Global Assessment (SGA) and Short Nutritional Assessment Questionnaire (SNAQ). These are all compiled of various combinations of recorded or measured BMI, weight loss, food intake, disease severity and age. Local preferences are primarily guiding which instrument is used.

Assessment

Nutritional assessment is performed in all subjects identified as being at risk by nutritional risk screening.

- A *medical history* should be taken. Physical examinations and biochemical analyses should be performed, in order to decide the underlying disease or condition that may cause the potential state of malnutrition.
- *Social and psychological history* is taken to establish potential effects of living conditions, loneliness and depression on nutritional needs.
- A *nutrition history* should be taken and examinations and observations should be performed in order to decide the underlying nutritional causes, and to identify major nutritional obstacles and calculate nutritional needs.
- Energy needs may be determined by indirect calorimetry or calculated.
- Protein needs are established in the range from 0.8 g/kg/day (healthy adults) up to 1.5 g/kg/day according to age, disease and degree of protein depletion.
- Micronutrient needs should be determined according to prevailing recommendations.

Diagnosis

Basic diagnostic criteria for malnutrition have recently been suggested by an ESPEN Consensus Statement (Cederholm 2015). These are general criteria that are intended to be applied independent of clinical setting and etiology.

Prior to diagnosis of malnutrition the criteria for being “at risk” of malnutrition according to any validated nutritional risk screening tool must be fulfilled. Then, two alternative sets of diagnostic criteria are given:

Option 1:

- BMI $<18.5 \text{ kg/m}^2$

Option 2:

- Weight loss (unintentional) $>10\%$ over any period, or $>5\%$ over the preceding 3 months combined with either:
- BMI $<20 \text{ kg/m}^2$ if <70 years of age, or $<22 \text{ kg/m}^2$ if ≥ 70 years of age; or
- FFMI $<15 \text{ kg/m}^2$ in women, and $<17 \text{ kg/m}^2$ in men.

Cut-off values for reduced BMI, weight loss and FFMI may be adapted or revised according to ethnicity or to new data.

Etiology-based malnutrition diagnosis

Subordinate to the general diagnosis of malnutrition are the etiology based types of malnutrition. These are disease-related malnutrition (DRM) and hunger-related malnutrition (HRM).

DRM is a specific type of malnutrition caused by a concomitant disease. Inflammation is an important watershed for malnutrition etiology. Thus, there are two distinct types of

DRM: one triggered by a disease-specific inflammatory response; i.e. *Inflammation driven DRM*, and the other linked to diseases where non-inflammatory etiologic mechanisms predominate; i.e. *Non-inflammation driven DRM*. Inflammation-driven DRM can either be elicited by an *acute disease or trauma* with a strong inflammatory response or by a *chronic disease* with a low inflammatory response.

Controversies that have arisen from the ESPEN consensus effort include the issues of weight loss and malnutrition in obese patients and use of FFMI. We believe that improved body composition measures can help address these concerns. Some key questions include whether a definition of malnutrition should require depleted energy intake? Also whether using more strict malnutrition criteria have the potential to decrease reimbursement? We believe an “at risk” diagnosis is actually the most important to discern because it may not be recognized and may be amenable to intervention. Another key issue is that racial and ethnic variations need to be adequately addressed.

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FELANPE’S Position on Malnutrition Screening, Assessment, and Diagnosis: M. Isabel T. D. Correia, MD, PhD

Malnutrition is widely prevalent worldwide (1-6) and, in Latin America, it’s no different. Several studies have shown that rates as high as 70% can be found in hospitalized patients (7-12). In 2001, the Brazilian Society of Parenteral and Enteral Nutrition sponsored a multicenter study, which nutritionally assessed 4,000 patients admitted to public and private hospitals. Malnutrition was present in almost 50% of the hospitalized patients, with 12.6% being severely malnourished(12). In this study, it was shown that the longer the patient stays in the hospital the higher the prevalence of malnutrition is. Also, the presence of cancer and infection increased the number of malnourished patients and, medical patients were at higher risk of nutritional deficiencies. Later, another study showed that the malnourished patients had worse outcomes with increased complications and mortality, as well as length of hospital stay(13). This all impacted on hospital costs. This study aimed at reporting to the government the reality on nutritional care and services and after such data, important laws on the relevance of nutrition therapy were developed and implemented in Brazil.

In 2003 a similar study was carried out in other Latin American countries , providing results similar to those above(14). Despite its high prevalence, malnutrition is seldom a key component of hospital practices and, in fact, the majority of the almost 10,000 assessed patients, less than 20% had any information in the medical records related to nutrition issues. It’s noteworthy to point out that this information did not include any sophisticated assessment but rather, simple words such as “malnourished”,

“has lost weight”, “is not eating adequately” etc. Therefore, we speculated that despite the high prevalence of malnutrition, medical awareness is low.

Almost 15 years later, another Brazilian study(15), now to assess pressure ulcer prevalence and its relation to the nutritional status, showed that the high prevalence of malnutrition is still a reality in the country, with more than 50% of the patients being malnourished. Malnutrition increased the risk of pressure ulcer by more than ten times.

Similar results have recently been reported by Mexican authors who showed that among 2,378 patients, malnutrition was present in almost 50% of the patients, independent of the hospital ward to which these patients were admitted. This study also found that malnutrition significantly increased mortality risk (ENHOLA Mexico Results, Dr. Anél Gómez García,et al.).

Thus, malnutrition is definitely a healthcare problem in Latin America but medical awareness remains poor. In Brazil, several laws have been implemented but they seem not to have as yet impacted on the prevalence of malnutrition.

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PENSA Response: Nutritional Screening and Assessment in Asia: Ryoji Fukushima,
MD, PhD

1. Nutrition screening and assessment tools.

Several tools are utilized in Asian countries such as MUST (malnutrition universal screening tool), CONUT (Controlling Nutritional Status), NRS 2002 (Nutritional Risk Screening, SGA (Subjective global assessment) and others. For elderly people, MNI (Mini nutritional assessment) and GNRI (Geriatric Nutritional Risk Index) are used. Asian language versions of MNIs are now available in Japanese, Chinese, Korean and Thai. For some surgical patients, PNI (Prognostic Nutritional Index) is used to assess the surgical risk of the patients. In Korea, SNUH-NSI (Seoul National University Hospital-Nutrition Screening Index) is used as an assessment tool.

In Japan, more than 20,000 doctors have participated in the TNT (total nutrition therapy) course over the past 15 years. SGA is included in the course program. In recent years those who perform body composition analysis using BIA (Bioelectrical impedance analysis) or CT scan images has been increasing.

According to the survey administered to 1,019 Japanese doctors in 2005, 38% of them thought that body weight loss is the most important parameter for nutrition assessment and 31% thought that serum albumin is the most important.

2. BMI (body mass index) in Asians and Westerners.

It is well known that average BMI is smaller in Asians than in Westerners. This is confirmed by Nutrition Day data from 2014 as shown below. We must take this difference into account when using BMI for nutrition assessment.

Country	CN	IN	JP	PH	SG	TH	US	AT	World
n	253	286	1313	174	607	127	2806	321	14603
BMI	22.7	24.3	22.1	24.7	23.5	23.9	28.9	25.6	25.7
age	52	56	71	53	71	67	62	68	67
With BW loss(%)	34	28	34	35	28	32	38	48	43

CN=China, IN=Indonesia, JP=Japan, PH= Phillipines, SG=Singapore, TH=Thailand, US= United States of America, AT= Austria, World= all countries combined

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| A.S.P.E.N.'s Position on Malnutrition Screening, Assessment, and Diagnosis:
Ainsley Malone, MS, RD, CNSC, FAND, FASPEN

A.S.P.E.N. and Malnutrition – Not a New Issue

Malnutrition was a key strategy for A.S.P.E.N. in the early 1980's. In 1983, the Board of Directors published a "statement", an early form of a position paper, publically noting that malnutrition occurs in hospitalized patients and that as an organization, A.S.P.E.N. will develop standards for nomenclature and procedural "matters" related to malnutrition.

Nutrition Assessment – The Beginning

The methodology of performing nutritional assessments included criteria/characteristics and methods that formed the foundation for diagnosing malnutrition as well as deciding who needed immediate nutrition intervention. The methods used included key parameters such as weight loss and calorie intake that were known to be related to negative outcomes.

Nutrition Screening

Currently all hospitals must perform nutrition screening within 24 hours of patient admission. This standard was added to the Joint Commission for Accreditation of Hospitals standards in 1996, the culmination of efforts by multiple nutrition organizations including A.S.P.E.N. In 2012, A.S.P.E.N. conducted a nutrition screening and assessment survey to assess practices in adults, pediatrics and neonates. Of the 918 adult patient care respondents, 90% reported nutrition screening was completed within 24 hours of admission.

Malnutrition Redefined

Recognizing the need to standardize the criteria for diagnosing malnutrition, A.S.P.E.N. collaboratively participated with the Academy of Nutrition and Dietetics to develop and publish a consensus statement on recommended characteristics for the identification and documentation of both adult and pediatric malnutrition (2012/2015). This was a critical and very important step to address the lack of standardization in the definition of malnutrition.

Malnutrition Characteristics from the Consensus Documents

Adult

- Reduced food/caloric intake
- Unintended/non-volitional weight loss
- Loss of muscle
- Loss of subcutaneous fat
- Evidence of fluid accumulation
- Diminished hand grip strength

Any 2 or more characteristics should be used to identify Adult Malnutrition

Pediatric

With one available data

- Weight/height z score

- BMI z score
- Length/height age z score
- Mid-upper arm circumference z score, %

With two available data points

- Weight gain velocity (<2 years)
- Weight loss (2-20 years)
- Deceleration weight/length or weight/height z score
- Inadequate nutrient intake

Nutrition Care Process

A.S.P.E.N. has spent considerable effort to address the gaps that often occur in the care of malnourished patients or those at high risk of its development. In late 2015, revision of an adult and pediatric “nutrition care pathway” was finalized in an effort to promote best practice in malnutrition care.

Additionally, an important paper was published in the *Joint Commission Journal of Quality and Patient Safety* calling for a “national” goal for hospitals to address the issue of malnutrition.

Malnutrition Prevalence

Malnutrition prevalence has varied considerably over the decades with reports of prevalence ranging from 25% - 54%. The variability can likely be attributed to a wide range of nutrition assessment methodologies utilized and populations surveyed. There is a clear need to utilize a consistent method for assessing malnutrition prevalence in the United States and globally.

Gaps in Prevalence

Despite what we believe is fairly accurate data with regards to malnutrition prevalence, in the United States, there is a significant gap in the documentation of malnutrition upon hospital discharge. While it appears malnutrition documentation is increasing (3.7% in 2010 to 4.8% in 2014) (<http://hcupnet.ahrq.gov/>), there remains a very large gap indicating hospitals are not receiving adequate resources to care for these complex patients who are much more likely to experience negative clinical outcomes.

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Global Discussion Highlights with Panel and Attendees (Dr. Maria Cristina Gonzalez served as FELANPE discussant)

- How do we best go forward? Continue with ongoing international forums? Use of electronic conferencing? What are the information gaps and research priorities?
- Three consensus markers are in play, non-volitional weight loss, severe underweight status, and compromised dietary intake, but what else can be included?
- Which characteristics associate with negative outcomes and reflect malnutrition?
- What are the best variables to bring to consensus? Structural data – requires body composition. How can we practically measure lean mass?
- Practical body composition measures are not presently available so it will be a difficult task to relate lean mass to outcomes. Ultrasound might be the best for convenience, but it has limited validity in some settings.
- PENS countries are making some use of CT and BIA.
- Perhaps a 5% weight loss among Asians may actually be worse than a 10% weight loss among non-Asians. It will be important to discern which variables are best and then to modify cut-offs according to culture, regional, ethnic, racial groups.
- Weight loss is possibly the most important criterion, but interpretation needs to be based upon the etiology of loss. In the A.S.P.E.N.- AND criteria, thresholds of weight loss are different depending on etiology.
- Starvation and an inflammatory process can occur at same time or one may transition to the other.
- Nutrition Day project issues: Patients are often not weighed but this must become a standard of care. We need to develop a tool that everyone can use easily, like weights, and then follow up with body composition later when better approaches become available. We need a proxy body composition measure.

- Is it possible that clinical assessments like SGA could serve as proxy measures?
- Diseases such as COPD and cancer are often associated with malnutrition. Can disease and malnutrition diagnoses be linked such that interventions can be based on etiology?
- Issue of BMI and regional differences: Big data such as Nutrition Day or Dr. Heyland's critical care database might be analyzed. Can we look at BMI cut offs? Perhaps costly new prospective studies are not needed.
- We do need some type of functional testing such as chair stands, time gait, or other functional measures that can be widely applied. Can we add functional components to Nutrition Day?
- The Canadian Malnutrition Task Force is using SGA as a consensus with changes in eating, weight loss, asking patients functional questions, and physical assessment, so that one can detect changes in muscle mass. Training dietitians to look at muscle mass as assessment is a priority.
- The Philippines use NRS2002 and also use SGA plus some other components.
- Are there opportunities to access large cohort databases that are already available? Age is an important variable that has not been highlighted.
- Reaching strong consensus on the definition for malnutrition would be a tremendous achievement.
- We need to look at screening and assessment separately. We have to get patients screened and this is not getting done in many countries. A first step for this workgroup could be targeting the priority for screening.
- Where is the science and where are we going? How can we prioritize?
- We are not using same units- pounds vs. kg, kcal vs. kjoules; it would be ideal to express our findings in common units.

Next steps to consider: We need tools that accommodate all clinical settings. Ideally we need the simplest approaches that require the least resources.

1. First step is to schedule follow-up electronic conferencing and then meet at ESPEN in September 2016. We should aim to have face to face meetings at least twice a year. Each society / country can work within their own context, but we need to establish communication to share initiatives and progress.
2. One objective for a next meeting would be to hold an open session to inform society members and other stakeholders what is going on.

3. We need a small working group to begin to develop ideas to take back to their constituencies.
4. Ideally we can access useful information from existing large data sets. It would be most helpful to be able to access raw data in published or other formats.
5. A coordinator and administrative support will be required for the working group.
6. We need to collect and compare data with common variables so that studies can be rigorously compared.
7. What is the low hanging fruit? Height, weight, weight loss, BMI, and/or some measure of dietary intake? Will some combination of these or other variables bring added value?
8. Societies can potentially allocate funds for this type of work through their associated foundations.
9. We can use an online community such as that provided by A.S.P.E.N. to promote communication.