Managing critical care - Can we afford not to get it right?

Mike Wallace

Market Access Director, Nutricia Advanced Medical Nutrition

Colours of Sepsis, Ostrava.
8Feb2016

The Intensive Care Unit

Accounts for less than 10% of hospital beds

But accounts for more than 20% of hospital costs

Costs can be managed more efficiently by reducing the length of stay in the ICU

Key Question

If we could apply **guideline based care**, what impact could we have on the **economics of critical care**?

Critical Care guidelines compared

Table 2
Standardised scores across CPGs per domain (AGREE II).

Guideline and year	Scope and purpose,%	Stakeholder involvement,%	Rigour of development,%	Clarity of presentation,%	Applicability,%	Editorial independence,%	Overall recommendation
Evidence-Based Guidelines for Nutritional Support of the Critically Ill: Results of a Bi-National Guideline Development Conference, 2005 [33]	69	13	51	70	33	22	Recommended with modifications
ESPEN Guidelines on Enteral Nutrition:Intensive care, 2006 [34]	89	54	70	87	8	78	Recommended
ESPEN Guidelines on Parenteral Nutrition: Intensive care, 2009 [35]	80	44	58	85	13	42	Recommended with modifications
Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.), 2016 [27]	100	72	84	89	22	78	Recommended
Guidelines for Nutritional Support in Critically Ill Patient (SEMICYUC-SENPE), 2011 [30]	85	46	54	80	13	56	Recommended with modifications
Critical Illness. Evidence-Based Nutrition Practice Guideline, 2012 [29]	87	72	85	91	78	64	Recommended
Clinical Practice Guideline Manual. Initiation of Nutrition in the SICU, 2013 [28]	54	6	4	43	15	0	Not recommended
Nutrition artificielle en réanimation.Guidelines for nutrition support in critically ill patient, 2014 [31]	44	37	41	56	7	0	Not recommended
Canadian Critical Care Nutrition. Clinical Practice Guidelines, 2015 [32]	78	41	74	91	82	39	Recommended

Nutrition in critically ill adults: A systematic quality assessment of clinical practice guidelines. Padilla P.F et al. Clinical Nutrition 35 (2016) 1219-1225

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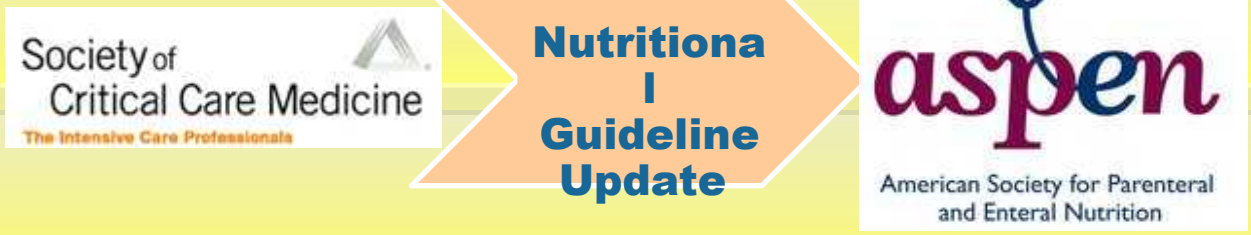
Key Question

If we could apply **guideline based care**, what impact could we have on the **economics of critical care**?



SURVIVAL

COMPLICATIONS

LENGTH OF STAY

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Health Economics

The demand for healthcare exceeds every countries healthcare system capacity

We are forced to make choices on which healthcare should be pubically funded

The objective is to maximise health within available budget

Being guided by cost effectiveness and social value judgements

Considering the most effective package of integrated care

Cost Impact

HEALTHCARE INTERVENTIONS

- Pharmaceuticals, medical devices, diagnostics, consumables, medical nutrition

HOSPITAL CARE

- A&E, ICU, Wards, Surgeons, Specialists, Nurses, Dieticians.....

REHABILITATION / CARE CENTRES

PRIMARY CARE – GPs, nurses, dieticians

SOCIAL IMPACT – Social care, time off work, family and carers.

What is relevant to the specific decision maker?

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We know about the costs of the ICU in Europe

Intensive care = Expensive care

<10% of hosp beds….>20% of hospital costs

SPECIALISED HCPs

Labour	61%	(ICU specialists /nurses + consulted specialists)
Consumables	22%	(drugs, fluids, disposables)
Diagnostics	14%	(imaging, labs)
Hotel & Nutrition	4%	

€1400 Average daily cost across 7 German, UK, Italian and Dutch ICUs

Direct cost analysis of Intensive Care unit stay in Four European countries: Applying a standardixed costing methodology. Swan Tan s et al. Value in Health 15 (2012)81-86.

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Effectiveness – The patient impact

Whatever outcome is relevant

Weight gain / Muscle gain / reaching nutritional targets

Number of complications avoided

Speed of recovery / time in hospital

Hospital discharge destination / readmissions

Impact on ability to perform normal activities

Lives saved / life years gained

Quality of Life – general / disease specific

Quality adjusted life years → ,quality adjusted life years gained

What is relevant to the patient and the decision maker?

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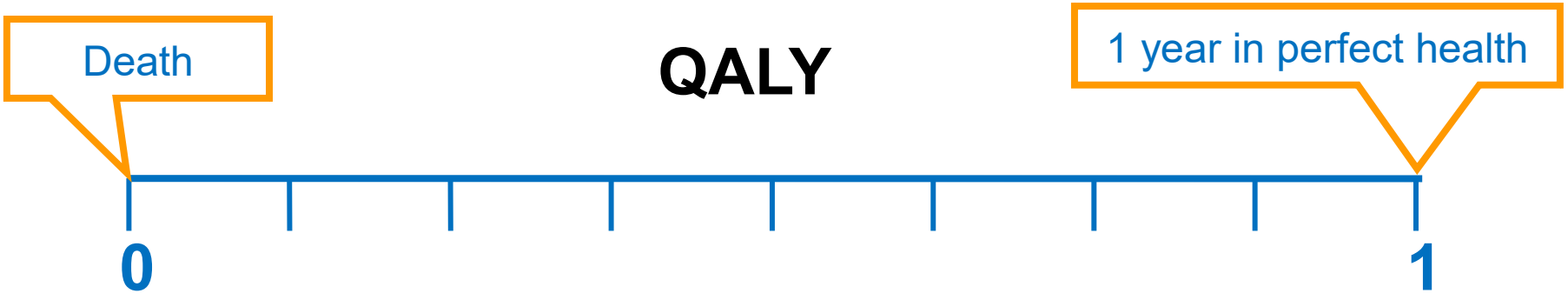
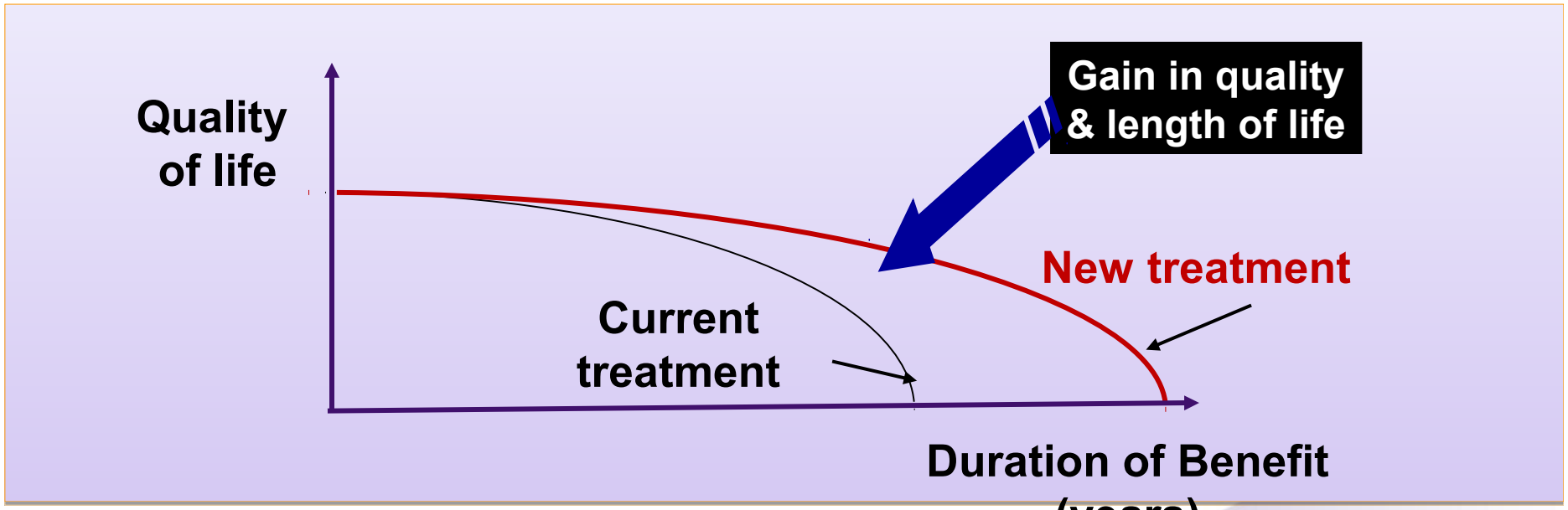
The Health Economist prefers the QALY

Quality Adjusted Life Years

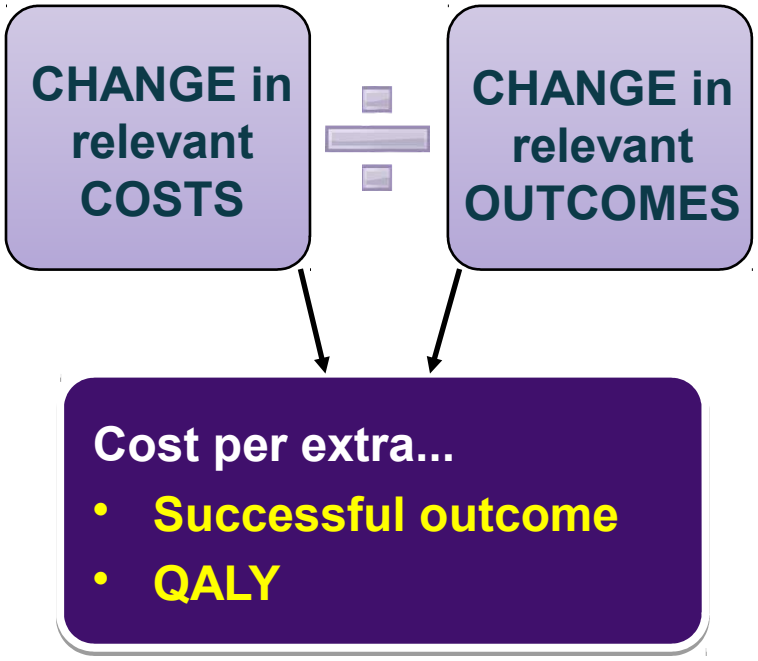
QALY = a measure of health status between 0 and 1

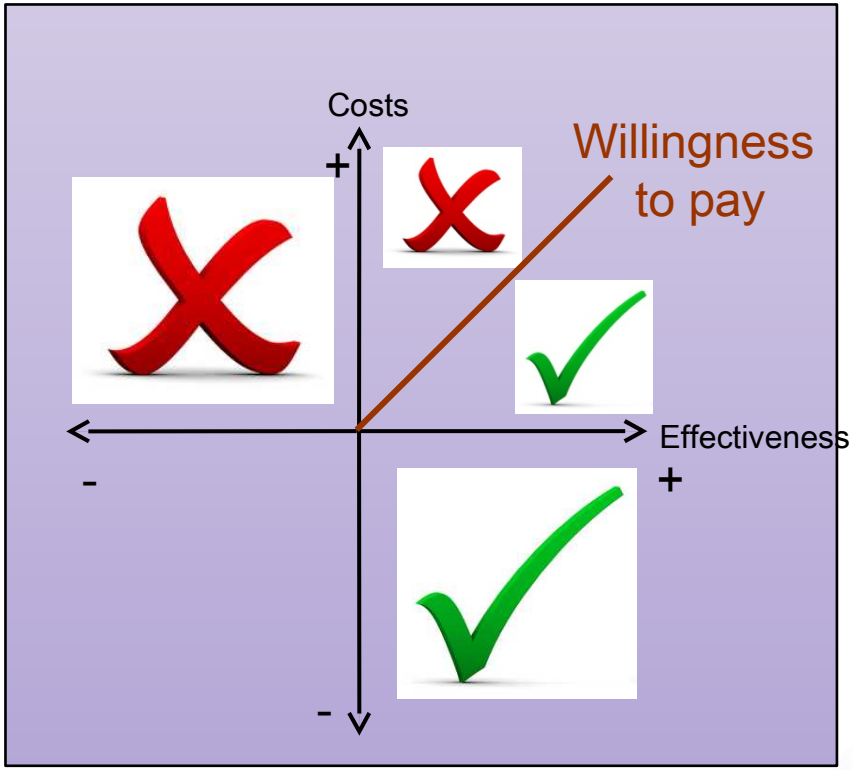


Comparable between treatments



Cost Effectiveness
Informing the decision





Helps inform the ***'Why?'*** question

Our focus is medical nutrition….

Pharmaceuticals ⟷ **Food**

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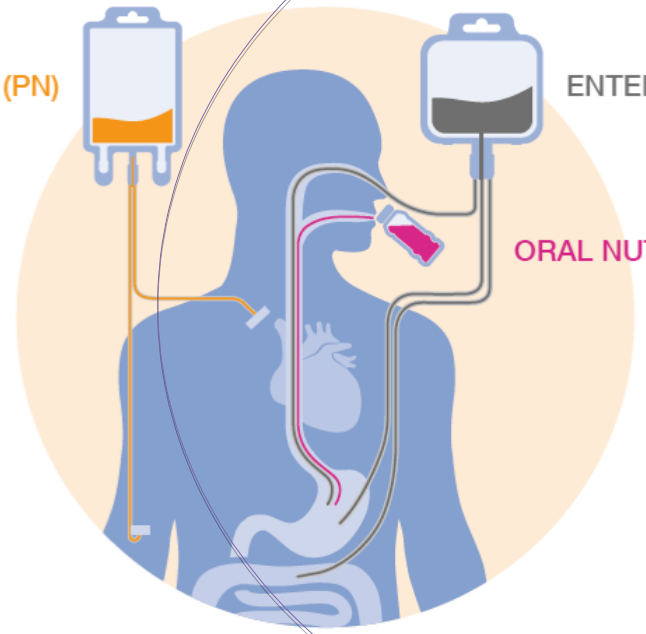
Pioneering nutritional discoveries that help people live longer, healthier lives

….specifically oral/enteral medical nutrition

Regulated in Europe as Foods for Special Medical Purposes (FSMPs)



PARENTERAL NUTRITION (PN)

ENTERAL NUTRITION (EN)

ORAL NUTRITIONAL SUPPLEMENTS (ONS)

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Providing benefits across the lifespan

	Early development	Adult	Older people
Improve overall intake	 Cerebral palsy Congenital heart disease	 Critical care Oncology	  Stroke Neurology Multi-morbidity 
Avoid specific nutrients	Cow's milk allergy Inherited metabolic disorders  		
Provide specific nutrients	Epilepsy 		 Alzheimer's disease

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Our ambition

To establish advanced medical nutrition as an integral part of healthcare

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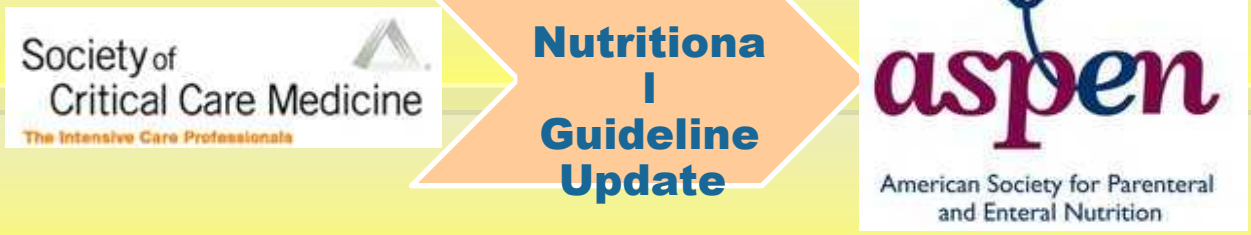
Key Question

If we could apply **guideline based care**, what impact could we have on the **economics of critical care**?



SURVIVAL

COMPLICATIONS

LENGTH OF STAY

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Nutritional Guideline Update

Provision and assessment of Nutritional support therapy in the Adult Critically Ill Patient

SCCM / ASPEN – GUIDELINES - Feb2016

Clinical Guidelines

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

Journal of Parenteral and Enteral Nutrition
Volume 40 Number 2
February 2016 159–211

DOI: 10.1177/0148607115621863
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Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)

Stephen A. McClave, MD[1*]; Beth E. Taylor, RD, DCN[2*]; Robert G. Martindale, MD, PhD[3]; Malissa M. Warren, RD[4]; Debbie R. Johnson, RN, MS[5]; Carol Braunschweig, RD, PhD[6]; Mary S. McCarthy, RN, PhD[7]; Evangelia Davanos, PharmD[8]; Todd W. Rice, MD, MSc[9]; Gail A. Cresci, RD, PhD[10]; Jane M. Gervasio, PharmD[11]; Gordon S. Sacks, PharmD[12]; Pamela R. Roberts, MD[13]; Charlene Compher, RD, PhD[14]; and the Society of Critical Care Medicine[†] and the American Society for Parenteral and Enteral Nutrition[†]

Keywords
nutrition; critical care; intensive care unit; enteral; parenteral; evidence-based medicine; Grading of Recommendations, Assessment, Development, and Evaluation criteria; guidelines

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Nutritiona
l
Guideline
Update

Introductory comments:

The changing role of Nutrition in intensive care

The target of these guidelines is intended to be the adult (≥18 years) critically ill patient expected to require a length of stay (LOS) greater than 2 or 3 days in a medical ICU (MICU) or surgical ICU (SICU)

Traditionally, *nutrition support* in the critically ill population was regarded as adjunctive care designed to provide exogenous fuels to preserve lean body mass and support the patient throughout the stress response.

Recently, this strategy has evolved to represent ***nutrition therapy***, in which the feeding is thought to help attenuate the metabolic response to stress, prevent oxidative cellular injury, and favorably modulate immune responses. **Improvement in the clinical course of critical illness may be achieved by early EN**, appropriate macro- and micronutrient delivery, and meticulous glycemic control.

Delivering early nutrition support therapy, primarily by the enteral route, is seen as a proactive therapeutic strategy that may reduce disease severity, diminish complications, decrease LOS in the ICU, and favorably impact p

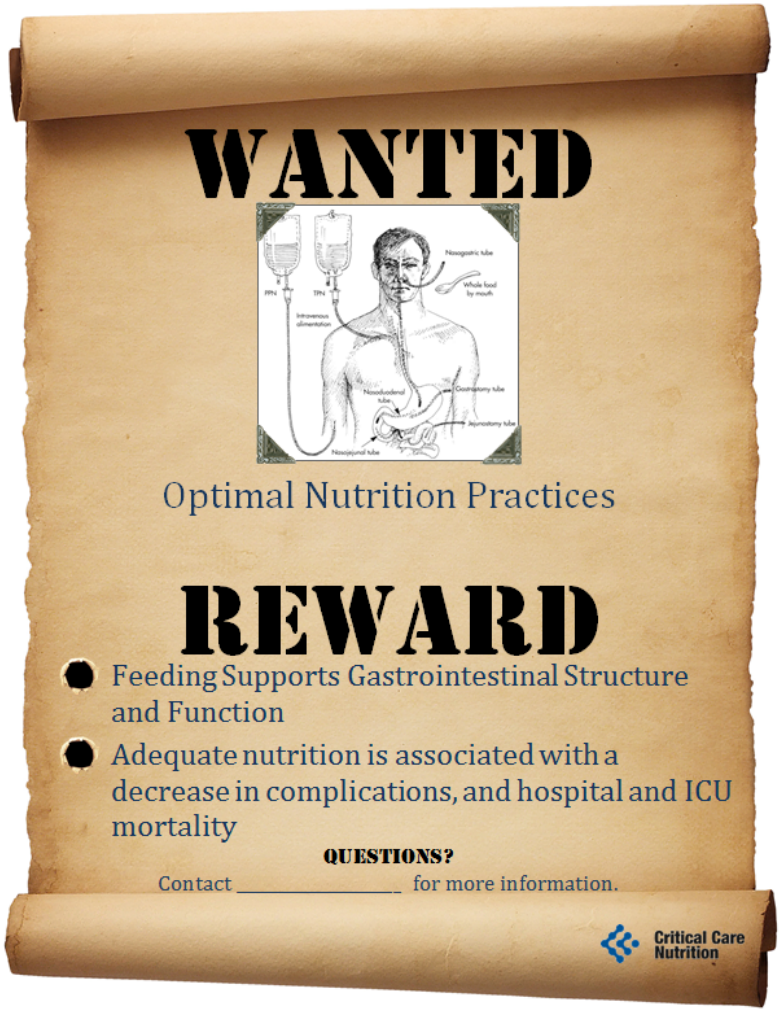
Key Recommendations with Health Economic implications

A1: [Nutritional Assessment]

Based on expert consensus, we suggest a determination of nutrition risk (eg, nutritional risk screening [NRS 2002], NUTRIC score) be performed on all patients admitted to the ICU for whom volitionalintake is anticipated to be insufficient. High nutrition risk identifies those patients most likely to benefit from early EN therapy.

IMPORTANCE OF NUTRITIONAL ASSESSMENT

How to assess Nutritional status and Nutritional needs



Weight loss and BMI

- May be difficult to obtain given critical condition
- May reflect fluid loss

Risk measures

NUTRIC scoring system

quantifies risk of adverse events that can be modified by aggressive nutritional therapy.

- Age APACHE II, SOFA, NO. Comorbidities, admission to ICU from hospital
- Interleukin 6 (optional)

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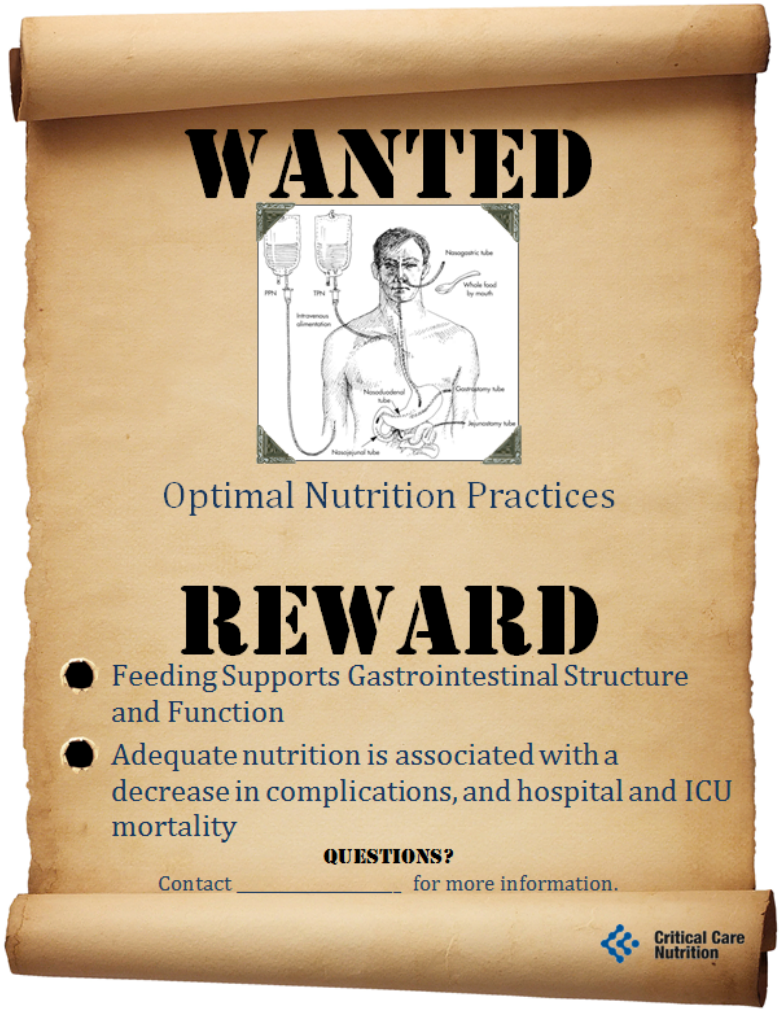
IMPORTANCE OF NUTRITIONAL ASSESSMENT

How to assess Nutritional status and needs



Weight loss and BMI

- May be difficult to obtain given critical condition
- May reflect fluid loss

Risk measures

Subjective Global Assessment

Doesn't require patient interaction, however relies on detailed patient history

- Weight, dietary intake, GI symptoms, functional capacity, metabolic stress, physical state.

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IMPORTANCE OF NUTRITIONAL ASSESSMENT

Why is it important to assess nutritional status and needs

Which tool predicts the greatest hospital costs?

CHICAGO, USA 302 patients admitted to the medical, surgical and neuroscience ICUs
Screened within 24 hours of admission

Table 4-1. Hospital and ICU LOS and Hospital Disposition Using Routine Screening, Subjective Global Assessment (SGA), and NUTRIC.

	Risk With Routine Screening (n = 89)	Risk With SGA (n = 114)	Risk With NUTRIC Score (n = 38)
Age, mean years ± SD	61.0 ± 15.4	61.7 ± 15	69.7 ± 12.1
BMI, mean kg/m^2 ± SD	26.5 ± 7.7	27.0 ± 8.1	26.8 ± 8.1
Hospital LOS, mean days ± SD	10.6 ± 8.9	9.8 ± 8.5	11.9 ± 10.5
ICU LOS, mean days ± SD	4.5 ± 4.2	5.4 ± 5.3	6.4 ± 7.1
Expired, n (%)	10 (11%)	14 (12%)	5 (13%)
Discharged to rehab, n (%)	14 (15%)	19 (17%)	6 (16%)

Routine Screening:
Significant weight loss, BMI 18.,18.5 or >40, dyshagia, EN/PN use prior to admission

Use of three nutritional screening tools to assess nutrition risk in the ICU. Coltman A et al. Journal of Parenteral and Enteral nutrition, Vol 38 No. 1, Jan2014, 124-129.

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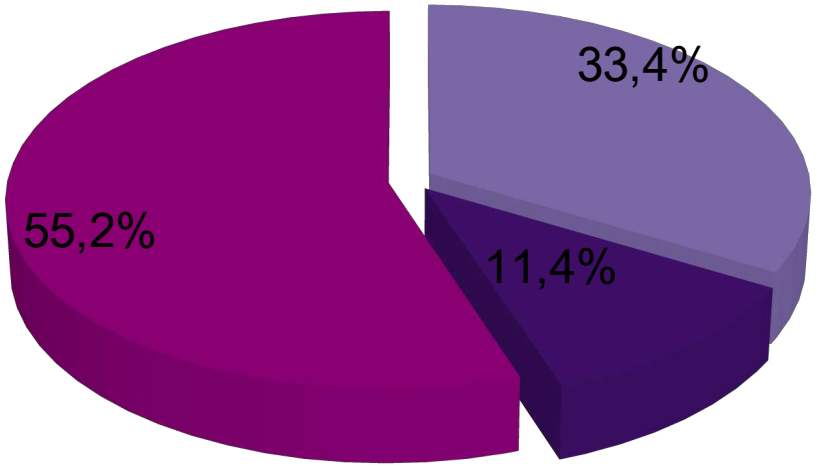
IMPORTANCE OF NUTRITIONAL ASSESSMENT

Why is it important to assess nutritional status and needs

BOSTON, USA Review of 6823 critical care patients alive at hospital discharge
Malnutrition as assessed by a registered dietician



Mortality in 30 days post discharge – Adjusted Odds ratio relative to patients without malnutrition*

2.68 (95% CI 1.99-3.59; P<.001)

1.60 (95% CI 1.27-2.02; P<.001)

Malnutrition and post hospital discharge mortality in ICU survoivors Mogensen, KM, et al. Journal of Parenteral and Enteral nutrition, Vol 38 No. 1, Jan2014, 124-129.

**Mortality data adjusted to account for: Age, race, gender, charlson index, sepsis, med v sugical, organ failure*

''Malnutrition may be a prognostic and potentially modifiable for patients who are at a high risk of post hospital discharge mortality."

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Key Recommendations with Health Economic implications

A1: [Nutritional Assessment]

Based on expert consensus, we suggest a determination of nutrition risk (eg, nutritional risk screening [NRS 2002], NUTRIC score) be performed on all patients admitted to the ICU for whom volitionalintake is anticipated to be insufficient. High nutrition risk identifies those patients most likely to benefit from early EN therapy.

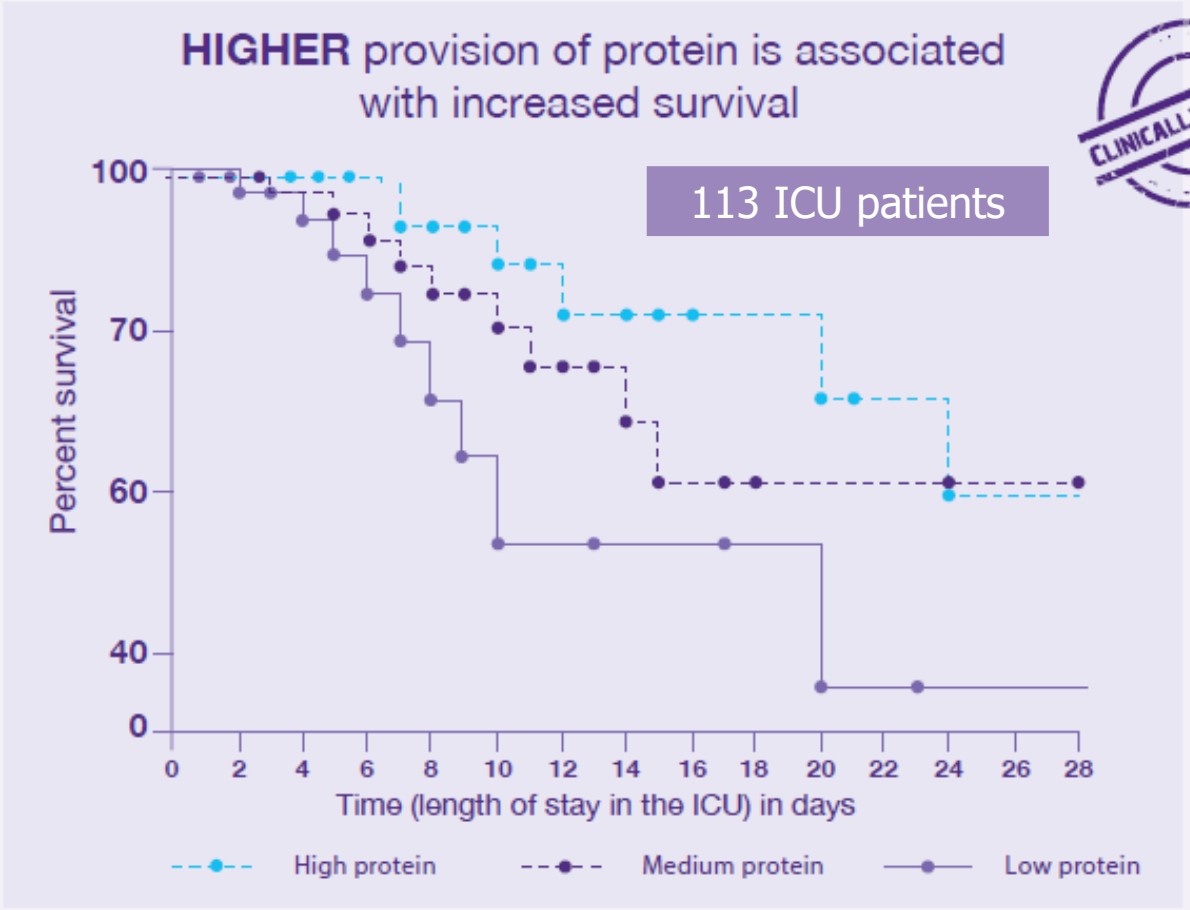
A4: [Nutritional Assessment]

A4. Based on expert consensus, we suggest an ongoing evaluation of adequacy of protein provision be performed.

The RIGHT NUTRITION strategy

Provision of higher protein saves lives

Optimal Nutritional Therapy Improves survival



Allingstrup M, et al. Clinical Nutrition2012;(31):462-468.

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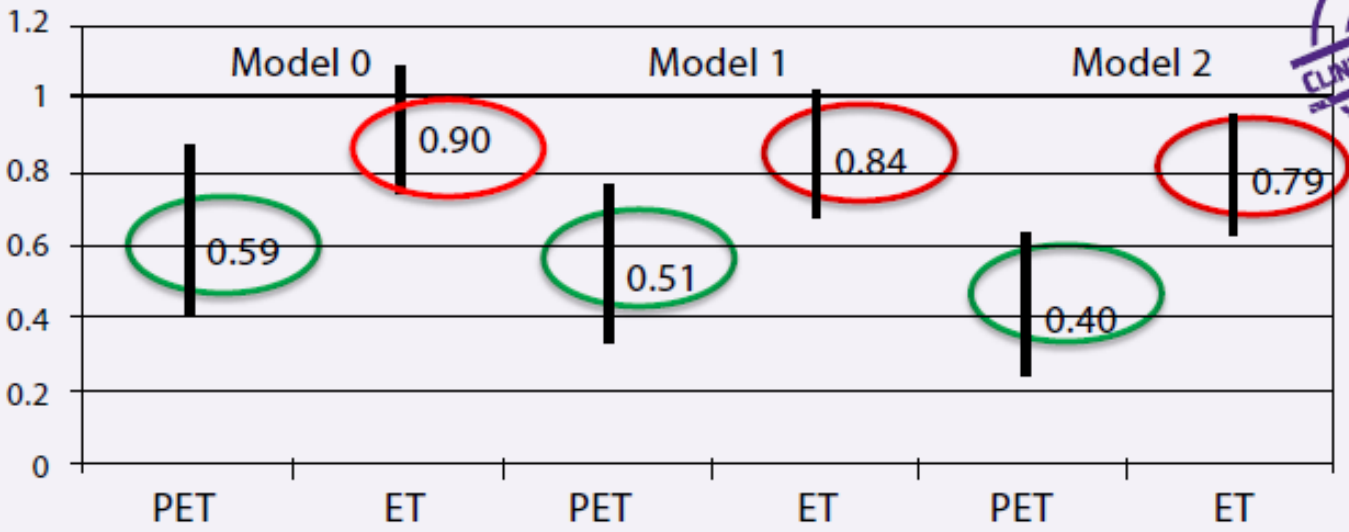
The RIGHT NUTRITION strategy

Provision of higher protein saves lives

Optimal Provision of both Protein & Energy Decreases 28-day mortality in critically ill patients

886 Mechanically ventilated Medical/surgical ICU patients



28-day mortality hazard ratio with 95% confidence interval for protein and energy target (PET) group and energy target (ET) group. Model 0 is unadjusted. Model 1 adjusted for sex, age, BMI, diagnosis, hyperglycemic index and Acute Physiology and Chronic Health Evaluation II score. Model 2 additionally adjusted for time to energy target and use of parenteral nutrition.

Weijs PJ et al., JPEN J Parenter Enter Nutr 2012;36:60–68.

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The RIGHT PROTEIN strategy

Provision of higher protein saves lives

Optimal Nutritional Therapy Improves survival

Optimal Protein and Energy provision is associated with a

50%

decrease in **28-day mortality**

Weijs PJ et al., JPEN J Parenter Enter Nutr 2012;36:60–68.

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Nutritional Guideline Update

Key Recommendations with Health Economic implications

A1: [Nutritional Assessment]
Based on expert consensus, we suggest a determination of nutrition risk (eg, nutritional risk screening [NRS 2002], NUTRIC score) be performed on all patients admitted to the ICU for whom volitionalintake is anticipated to be insufficient. High nutrition risk identifies those patients most likely to benefit from early EN therapy.

A4: [Nutritional Assessment]
Based on expert consensus, we suggest an ongoing evaluation of adequacy of protein provision be performed.

B1: [Initiate EN]
We recommend that nutrition support therapy in the form of early EN be initiated within 24–48 hours in the critically ill patient who is unable to maintain volitional intake.

The RIGHT nutrition strategy

The RIGHT time – Early Enteral nutrition

Limit the consequences of poor nutritional status

Reduced GI tolerance	Ventilator dependence
Immune dysfunction	Reflux, Esophagitis, pulmonary aspiration
Weakened respiratory muscles	Sepsis, Multi-organ failure, death
Lower ventilation	Delayed recovery

When should you start…

Hemodynamically stable ✓

Functioning GI tract ✓

Early Enternal nutrition within 24-48 hours of the ICU

Hegazi, RA, Wischmeyer PE, Critical review: optimising enteral nutrition for critically ill patients – a simple data-driven formula. Critical Care, 2011, 15;234

The RIGHT nutrition strategy

Why 24-48 hours?

Observational (US) data - nonsurgical ICU patients receiving mechanical ventilation (MV)and whose hemodynamic condition was unstable at the time MV was started

arly = within 48hrs of start of MV

Comparison of clinical outcomes in early and late enteral nutrition groups after matching for propensity score

Characteristic	Enteral nutrition group: Early (n=357)	Enteral nutrition group: Late (n=357)	P
Intensive care unit mortality, No. (%) of patients	77 (21.6)	95 (26.6)	.12
Hospital mortality, No. (%) of patients	121 (33.9)	152 (42.6)	.01
Ventilator-associated pneumonia, No. (%) of patients	39 (10.9)	35 (9.8)	.63
Days in intensive care unit, mean (SD)	12.4 (8.6)	11.1 (7.7)	.39
Ventilator-free days,[a] mean (SD)	16.0 (9.2)	15.2 (10.3)	.29

[a] Ventilator-free days are the number of days (among the first 28 days after intubation) that the patient spends breathing independently of the ventilator.

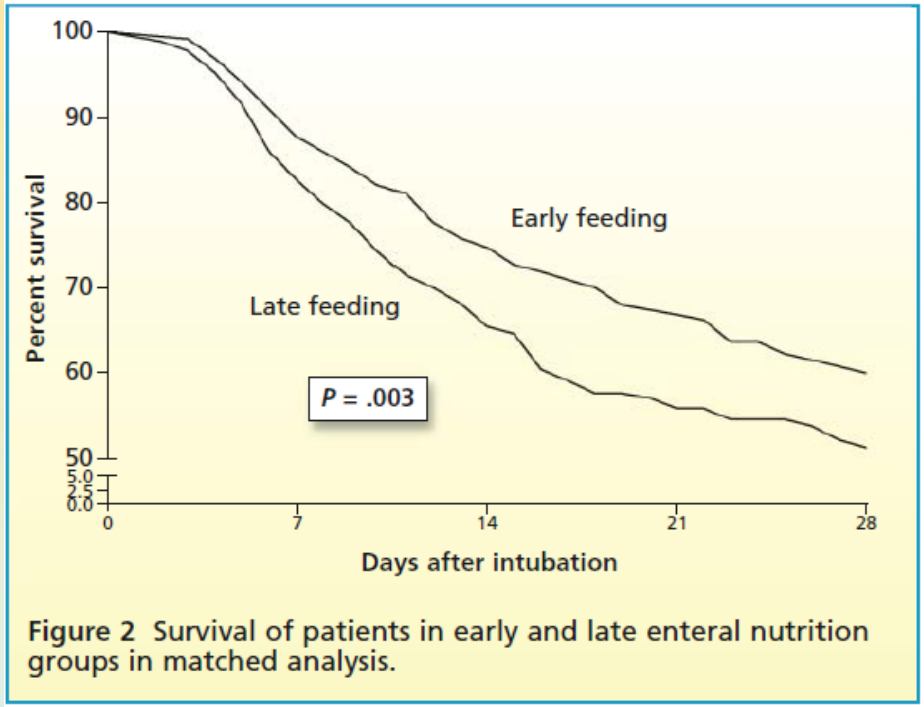


Figure 2 Survival of patients in early and late enteral nutrition groups in matched analysis.

Khalid I et al, Early Enteral nutrition and outcomes of critically ill patients treated with vasopressors and mechanical ventilation. American Journal of Critical Care, May2010, Vol. 19, no. 3 261-268;

Early EN associated with reduced mortality

Study or Subgroup	Early EN Events	Early EN Total	Delayed/None Events	Delayed/None Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
Sagar 1979	0	15	0	15		Not estimable	1979
Moore 1986	1	32	2	31	2.3%	0.48 [0.05, 5.07]	1986
Chiarelli 1990	0	10	0	10		Not estimable	1990
Schroeder 1991	0	16	0	16		Not estimable	1991
Eyer 1993	2	19	2	19	3.7%	1.00 [0.16, 6.38]	1993
Beier-Holgersen 1996	2	30	4	30	4.9%	0.50 [0.10, 2.53]	1996
Carr 1996	0	14	1	14	1.3%	0.33 [0.01, 7.55]	1996
Chuntrasakul 1996	1	21	3	17	2.7%	0.27 [0.03, 2.37]	1996
Watters 1997	0	14	0	14		Not estimable	1997
Singh 1998	4	21	4	22	8.2%	1.05 [0.30, 3.66]	1998
Kompan 1999	0	14	1	14	1.3%	0.33 [0.01, 7.55]	1999
Minard 2000	1	12	4	15	3.0%	0.31 [0.04, 2.44]	2000
Pupelis 2000	1	11	5	18	3.2%	0.33 [0.04, 2.45]	2000
Pupelis 2001	1	30	7	30	3.1%	0.14 [0.02, 1.09]	2001
Dvorak 2004	0	7	0	10		Not estimable	2004
Kompan 2004	0	27	1	25	1.3%	0.31 [0.01, 7.26]	2004
Peck 2004	4	14	5	13	11.0%	0.74 [0.25, 2.18]	2004
Malhotra 2004	12	100	16	100	26.5%	0.75 [0.37, 1.50]	2004
Nguyen 2008	6	14	6	14	17.5%	1.00 [0.43, 2.35]	2008
Moses 2009	3	29	3	30	5.6%	1.03 [0.23, 4.71]	2009
Chourdakis 2012	3	34	2	25	4.4%	1.10 [0.20, 6.12]	2012
Total (95% CI)		**469**		**467**	**100.0%**	**0.70 [0.49, 1.00]**	
Total events	41		66				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 7.23$, $df = 15$ ($P = 0.95$); $I^2 = 0\%$

Test for overall effect: $Z = 1.97$ ($P = 0.05$)

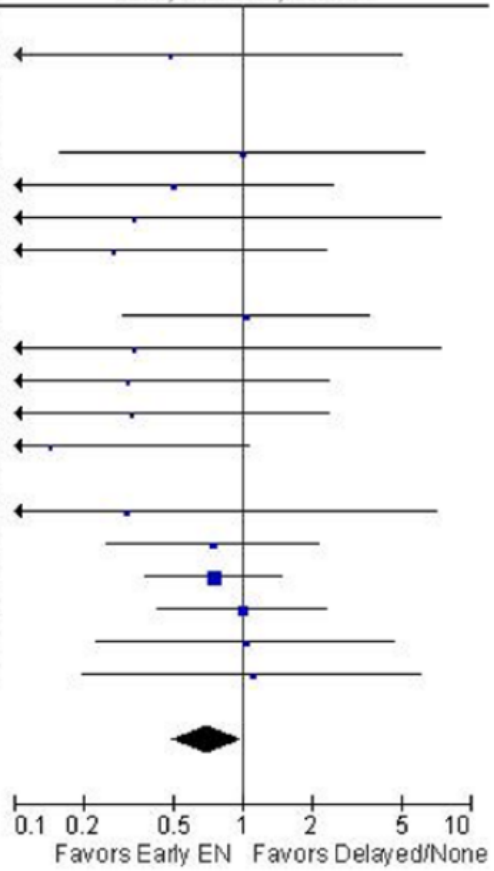


Figure 1. Early enteral nutrition (EN) vs delayed EN, mortality.

Early EN vs withholding early EN (delayed EN or STD) was associated with a **significant reduction in**

a) **mortality (RR = 0.70**; 95% CI, 0.49–1.00; *P* = .05) and

Society of Critical Care Medicine — The Intensive Care Professionals

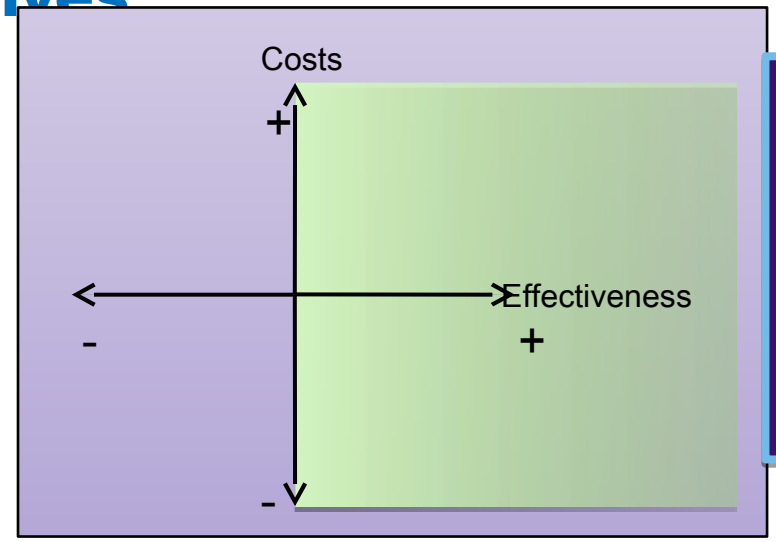
Nutritional Guideline Update

aspen — American Society for Parenteral and Enteral Nutrition

Improved survival in critical care patients delivers more QALYs

- **Nutritional status** influences survival
- **Protein** intake influences survival
- **Timing** of feeding influences survival

The right nutritional management can save lives



EFFECTIVE - √

COSTS - ?

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Early EN associated with decreased infection risk

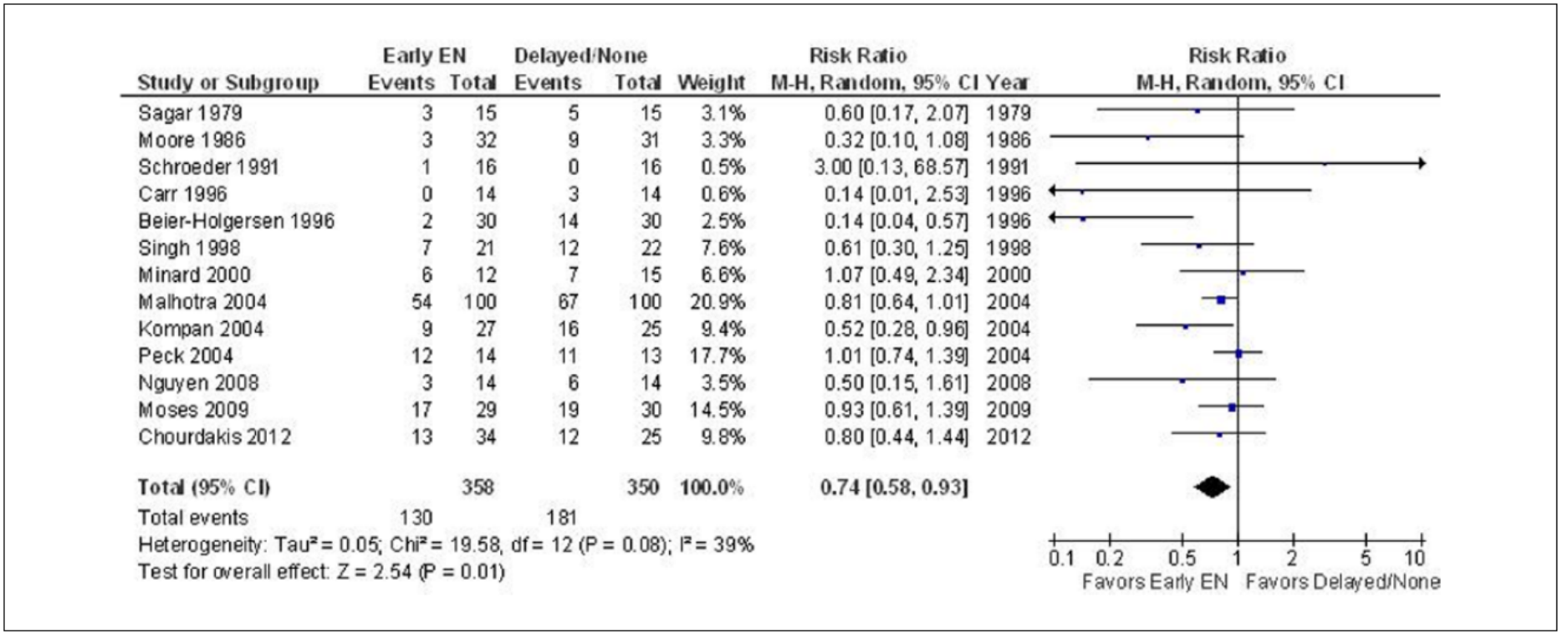

Figure 2. Early enteral nutrition (EN) vs delayed EN, infectious complications.

Early EN vs withholding early EN (delayed EN or STD) was associated with a **significant reduction in**

a) **mortality (RR = 0.70**; 95% CI, 0.49–1.00; *P* = .05) and

b) **infectious morbidity (RR =0.74**; 95% CI, 0.58–0.93; *P* = .01

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Nutritional Guideline Update

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Nutritional Guideline Update

Key Recommendations with Health Economic implications

A1: [Nutritional Assessment]
Based on expert consensus, we suggest a determination of nutrition risk (eg, nutritional risk screening [NRS 2002], NUTRIC score) be performed on all patients admitted to the ICU for whom volitionalintake is anticipated to be insufficient. High nutrition risk identifies those patients most likely to benefit from early EN therapy.

A4: [Nutritional Assessment]
Based on expert consensus, we suggest an ongoing evaluation of adequacy of protein provision be performed.

B1: [Initiate EN]
We recommend that nutrition support therapy in the form of early EN be initiated within 24–48 hours in the critically ill patient who is unable to maintain volitional intake.

B1: [Initiate EN]
B2. We suggest the use of EN over PN in critically ill patients who require nutrition support therapy.

The RIGHT nutrition strategy

RIGHT content and dose

EU, US and Canadian guidelines **endorse enteral feeding** for patients who are critically ill and hemodynamically stable

Enteral preferred over parenteral nutrition where theres a functioning GI tract.

Maintain gut barrier function and support immune

ICU IMPACT = ECONOMIC IMPACT

What are the health economic implications?

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Fewer infections with EN vs PN, shorter ICU stays

12 studies included in review by the SCCM / ASPEN review committee (618 patients)

In the 9 studies reporting on infection..

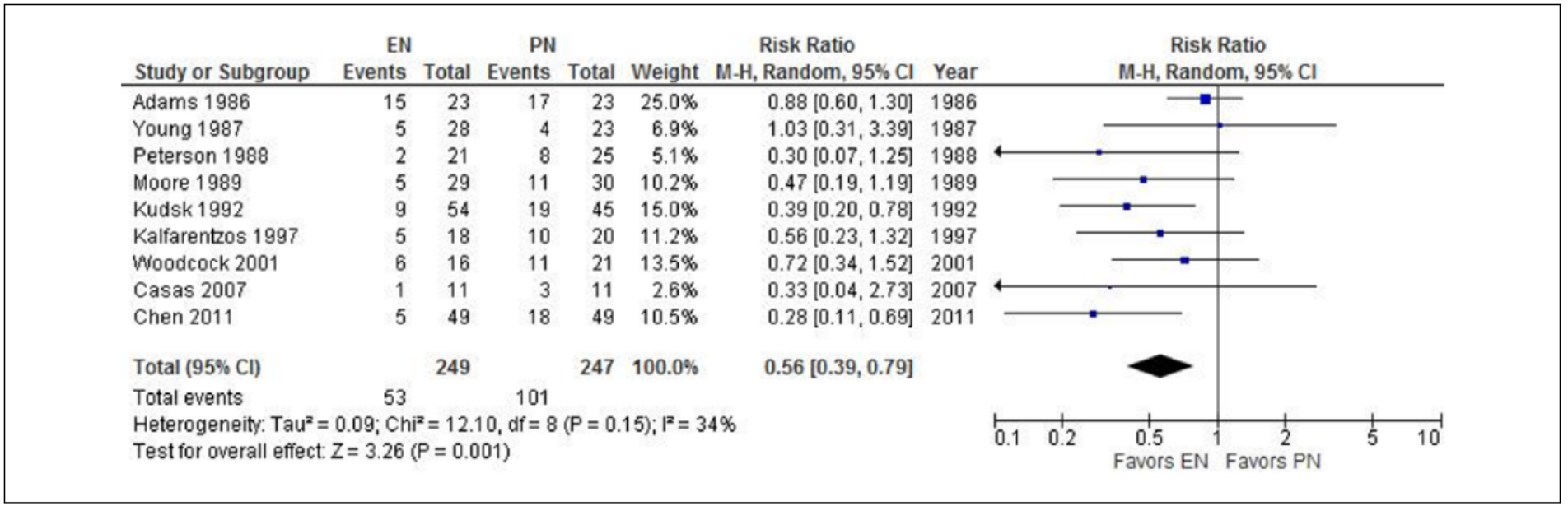

Figure 3. Enteral nutrition (EN) vs parenteral nutrition (PN), infectious complications.

EN vs PN was associated with a **significant reduction (favouring EN) in**

a) **Infections (RR = 0.56**; 95% CI, 0.39–0.79; *P* <.00001)

b) **ICU Length of stay (LOS -0.82 days**; 95% CI, -1.29 to -0.34; *P* = .0007),

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1 EXTRA ENTERAL APPROACH PER MONTH

Yearly Impact

Saved days in ICU	12	€16,800
Cost per day	€1400	

Change in costs of nutrition	€1200

Assuming €100 more expensive per patient (EN vs PN)

Yearly cost saving	€18,000

Conservative assessment
– excludes managing infectious complications

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Cost savings with enteral versus parenteral nutrition

Cost savings attributable to enteral tube feeding compared with parenteral nutrition (RCT evidence)

Study	Year	Country	Patient group	Reduction in cost	p-value
McClave	1997	USA	Pancreatitis	76.9%	0.001
Sand	1997	Finland	GI surgery (cancer)	76.5%	N/R
Bower	1986	USA	GI surgery	73.6%	0.001
Braga	2001	Italy	GI surgery (cancer)	72.5%	N/R
Adams	1986	USA	Laparotomy (trauma)	63.9%	N/R
Trice	1997	USA	Surgery (trauma)	62.9%	N/R
Hamaoui	1990	USA	Abdominal surgery	56.9%	0.001
Bauer	2000	France	ICU (not surgery)	48.0%	0.0001
Barzotti	1994	USA	Head injury	46.4%	N/R
Abou-Assi	2002	USA	Pancreatitis	23.4%	0.0004
Zhu	2003	China	GI surgery (cancer)	11.8%	<0.05

N/R=not reported

Stroud M et al; The National Institute for Clinical Excellence. Nutrition support for adults oral nutrition support, enteral tube feeding and parenteral nutrition. Methods, evidence & guidance. NICE, 2006; 1-176.

Simple savings calculator *(ICU LOS only)*

Example using daily ICU costs as 300, and difference between PN and EN of 50

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EN vs PN the benefits

Why is this important
ICUs are costly
Critical care
Specialised staff
Expensive daily costs

Why is this important to your patients
Guideline based care
Better recovery chances
Reduction in infections

Why is this important to your ICU
Saves Costs
Saves Time
Best Practise

Other considerations with economic implications

Reaching nutritional targets

Energy/protein goals

SPN

Closer to target

Fewer infections

What stays in

Improving GI tolerance

Reducing the frequency of Diarrhoea

- A focus on Fibre….

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The importance of reaching the nutritional target

What about that struggle to meet energy goals?

Swiss study N = 305
Inclusion : Failing to meet 60% of calorie target with EN
Strategy : supplemental parenteral nutritiondays 4-8

Result : add 2320 cals over 4 days
(SPN = 1500 CKZ per day)

Impact: 5% absolute reduction in nosocomial infections

+1000kCals = -10% relative risk of nosocomial infection

Nosocomial infection + 7,7days ICU, + 11.9 days in hosp

Other considerations with economic implications

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- A focus on Fibre….

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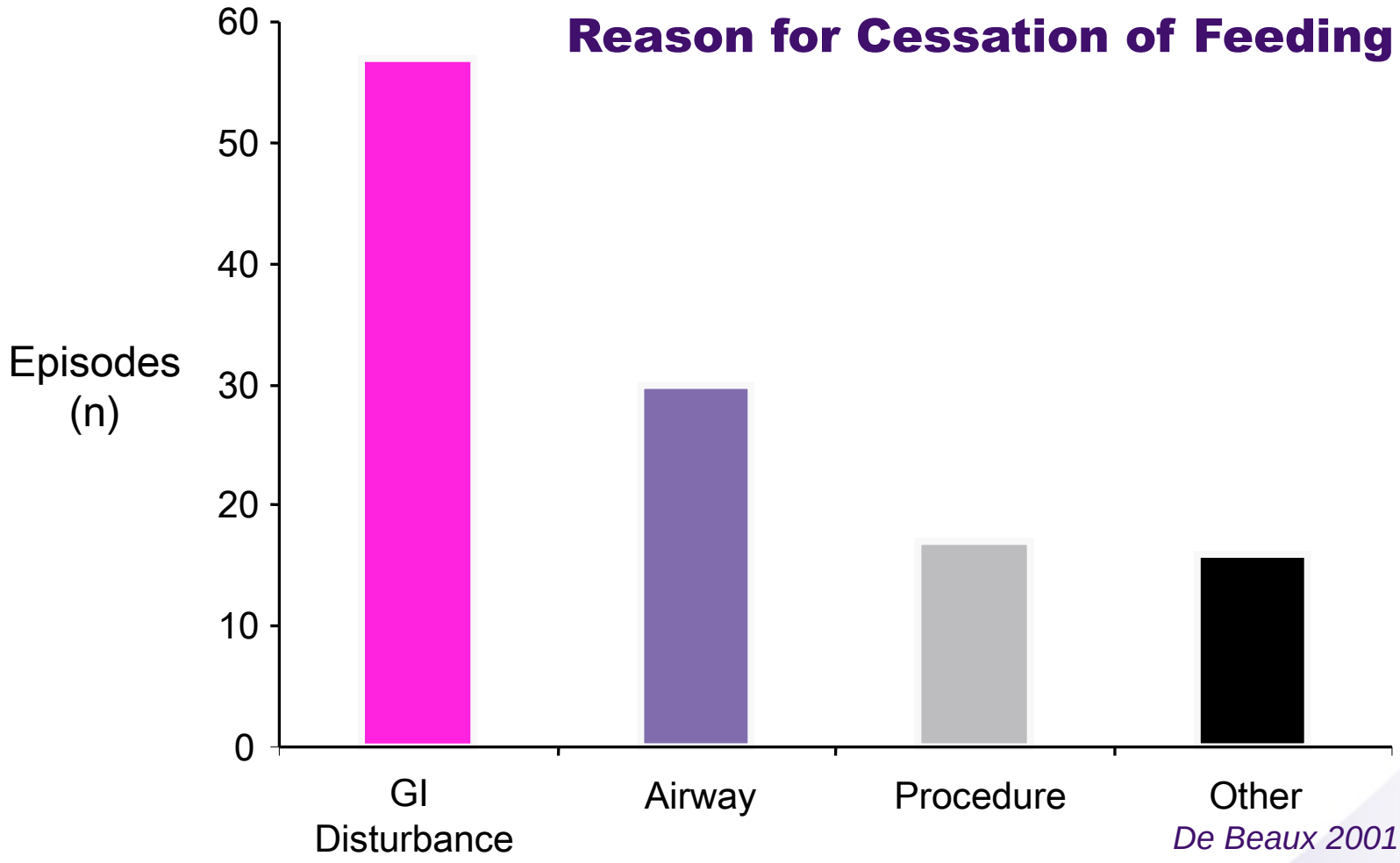
The RIGHT nutrition strategy

Reaching feeding targets - the impact of tolerance



De Beaux 2001

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The RIGHT nutrition strategy

The burden of diarrhoea

How frequent?

- 14% diarrhoea incidence in ICU patients
- Diarrhea risk factors – Relative risks
  - Antibiotics – RR = 3.64 (1.26 to 10.51)
  - Antifungals - = 2.79 (1.16 to 6.70)
  - EN covering >60% target energy = 1.75 (1.02 to 3.01)),

278 Medical/surgical tertiary ICU patients (Switzerland)

Costs of managing Diarrhoea

- Nurse time = 17mins 33 secs
- Cost of Nurse time = ~€25 (26.6 CHF)

Publiction pending* Graf et al
C Pichard, ISICEM 2015

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Describing Diarrhoea .....

Frequency	Consistency	Nutritional Risk
• Intensive nursing	• Spread risk of infection	• Reduced nutritional intake
-Time - Lab analysis - Laundry - Cleaning	**- Clostridium Difficile infections - Antibiotics - Sterilisation**	**- Reaching protein & energy goals - Longer hospital stay - Recovery**

Where's the evidence?

Alimentary Pharmacology & Therapeutics

Systematic review and meta-analysis: the clinical and physiological effects of fibre-containing enteral formulae

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SUMMARY

Background
Enteral nutrition can be associated with gastrointestinal side effects and fibre supplementation has been proposed as a means to normalize bowel function.

Aim
To evaluate systematically the effects of fibre supplementation of enteral feeds in healthy volunteers and patients both in the hospital and community settings.

Methods
Electronic and manual bibliographic searches were conducted. Controlled studies in adults or children, comparing fibre-supplemented vs. fibre-free formulae given as the sole source of nutrition for at least 3 days, were included.

Results
sion criteria. Fibre supplementation was generally well tolerated. In the hospital setting, the incidence of diarrhoea was reduced as a result of fibre administration (OR 0.68, 95% CI: 0.48–0.96; 13 randomized-controlled trials). Meta-regression showed a more pronounced effect when the baseline incidence of diarrhoea was high. In both patients and a significant moderating effect of fibre.

Conclusions
The review indicates that the fibre-supplemented enteral formulae have important physiological effects and clinical benefits. There is a need to use a consistent approach to undertake more studies on this issue in the community setting.

Aliment Pharmacol Ther **27**, 120–145

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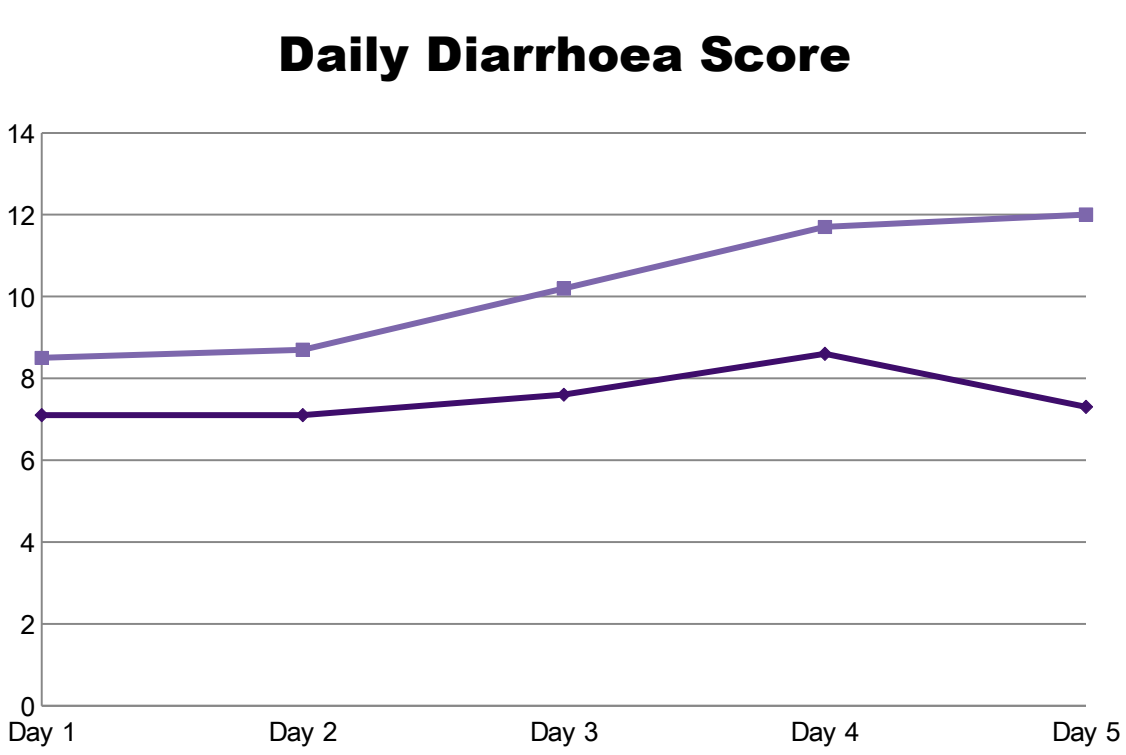
New research isolating the impact of a multifibre mix

120 Turkish ICU patients who required mechanical ventilation and enteral nutrition with a nasogastric tube were studied

The control group received the fibre-free nutrition solution (Nutrison). The study group, received the fibre enriched nutrition solution (Nutrison Multifibre)



39% reduction – at least **1 GI complaint**

42% reduction – at least 1 episode of **diarrhoea**

10% more of prescribed feed delivered on day 5

Yagmurdur et al. Enteral Nutrition Preference in Critical Care: fibre enriched or fibre free? *Asia Pac J Clin Nutr 2016;25(4):740-746*

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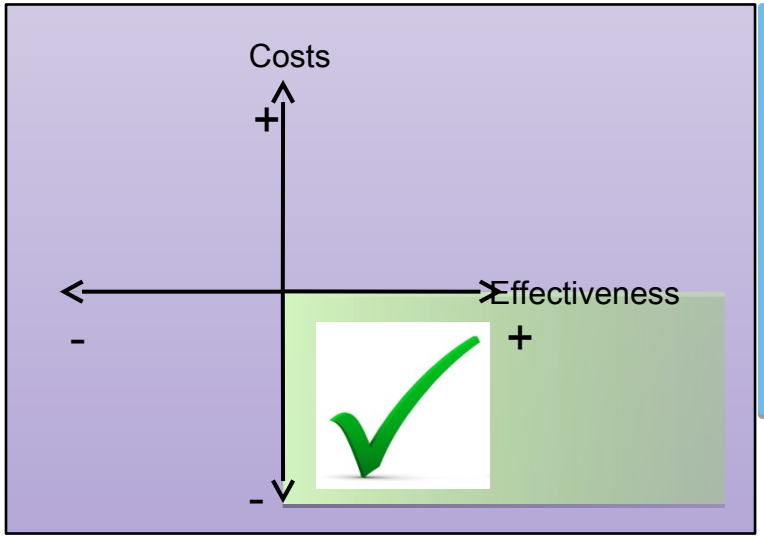
Improved management of critical care patients can save costs

- **EN when used approriately** reduces infection risk and ICU length of stay
- **Reaching nutritional targets** supports recovery
- **Multifibre EN** can reduce the burden of Diahhroea

The right nutritional strategy can save costs



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What are the other key ways in which integrating medical nutrition brings health economic benefits to the hospital....

1. Enhanced Recovery After Surgery (ERAS) ERAS® Society

2. Screening on admission and managing disease related malnutrition with Oral Nutritional Supplements

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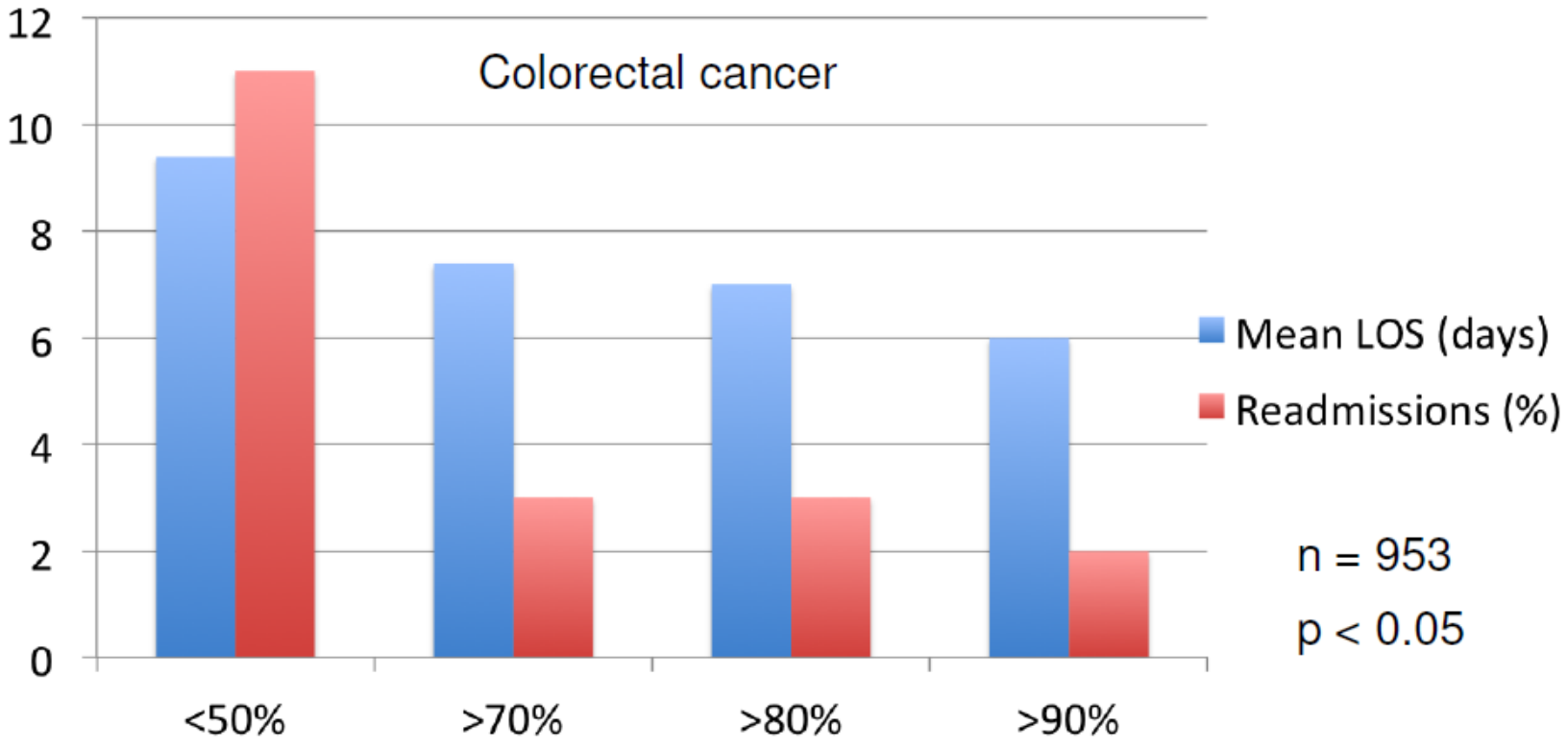
ERAS compliance: Length of stay & Readmissions



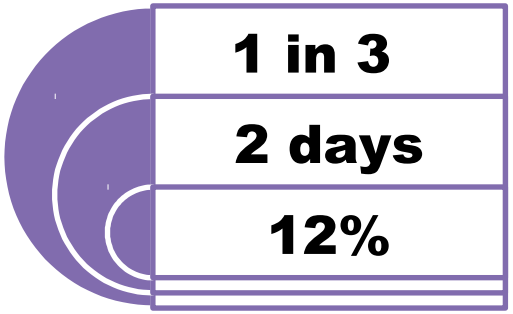
Compliance with ERAS protocol elements
Single center study consecutive patients

ERAS® Society

Gustafsson et al, Arch Surg 2011

The benefit of FSMPs – supporting effective and efficient health outcomes

A recent (2016) comprehensive systematic review with meta analysis of all **cost effectiveness research on oral nutritional supplements** in the **hospital** setting.



35% reduction in deaths & complications (p<0.05)

Shorter hospital Length of Stay (13% reduction)

Net hospital cost reduction (£750 ~ €1000 saving)*

neta-analysis of 5 studies in **abdominal surgical patients showed a mean t saving of £746 (or 13.5% of total care costs) with ONS versus standard**

ed on 2003 prices – translates to £1,014 2015 prices

owing adjustment for inflation, using specific healthcare inflation rates)

Elia M, et al., A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting. Clinical Nutrition, April 2016, Volume 35, Issue 2, Pages 370–380

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The Health Economists' Conclusion

We are forced to make choices on which healthcare should be pubically funded. We search for value

Applying guideline based care delivers significant health economic benefits to critical care.

Better for the health of the patient

etter outcomes from the hard work of HCI

Better for the hospital / health budget

Integrated Nutritional Care
A value we can't afford to

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Thank You

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