

ESMO Preceptorship on Supportive and Palliative Care

ESMO PRECEPTORSHIP ON
SUPPORTIVE AND PALLIATIVE CARE

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Parenteral nutrition: indication, practice, ethics

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ESPEN Guideline

ESPEN guidelines on nutrition in cancer patients[☆]

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B3 – 3	Modes of nutrition: when to escalate
Strength of recommendation STRONG	<i>If a decision has been made to feed a patient, we recommend enteral nutrition if oral nutrition remains inadequate despite nutritional interventions (counselling, ONS), and parenteral nutrition if enteral nutrition is not sufficient or feasible.</i>
Level of evidence	Moderate
Questions for research	effect of EN or PN or combinations on clinical outcome in patients with inadequate food intake

Strong consensus

Surviving with a severe gastrointestinal defect

until 1960s

no chance of survival

1930s

safe amino acid solutions

1960s

safe fat solutions

1960s

safe central venous access

since 1970s

long-term parenteral nutrition

→ +/- PN = to live or not to live

To live or not to live?

Malignant tumors 3.500.000 new cases per year (EU)

60% incurable

just a few patients with GI defect

but: major fraction of HPN patients

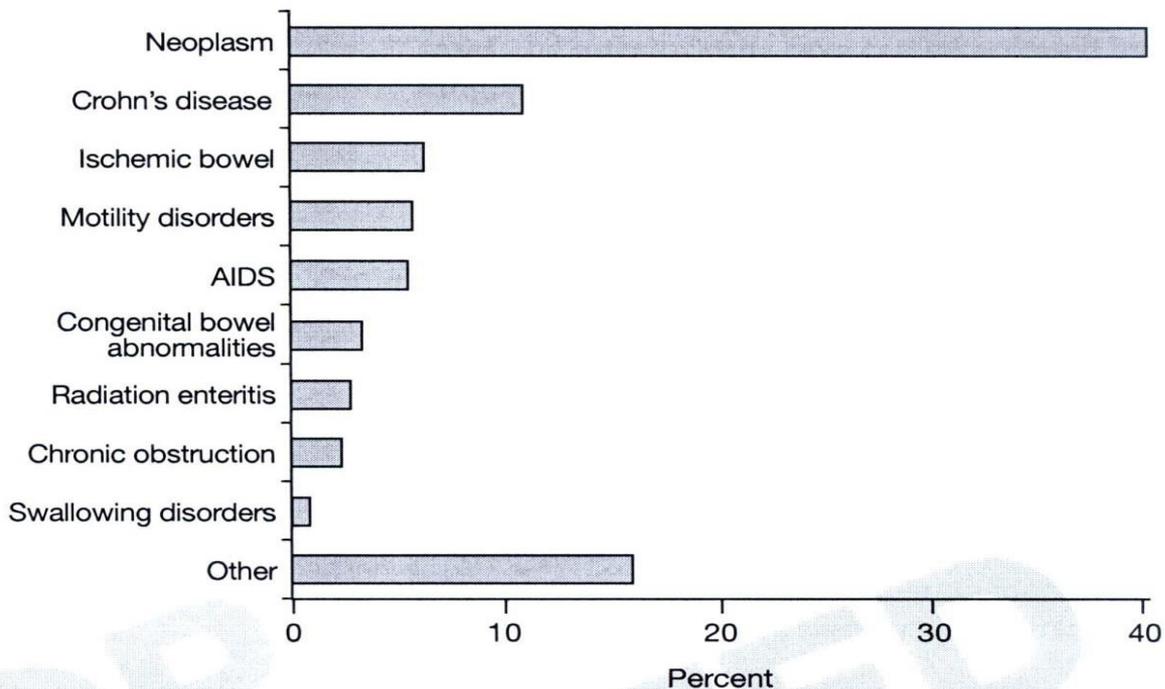
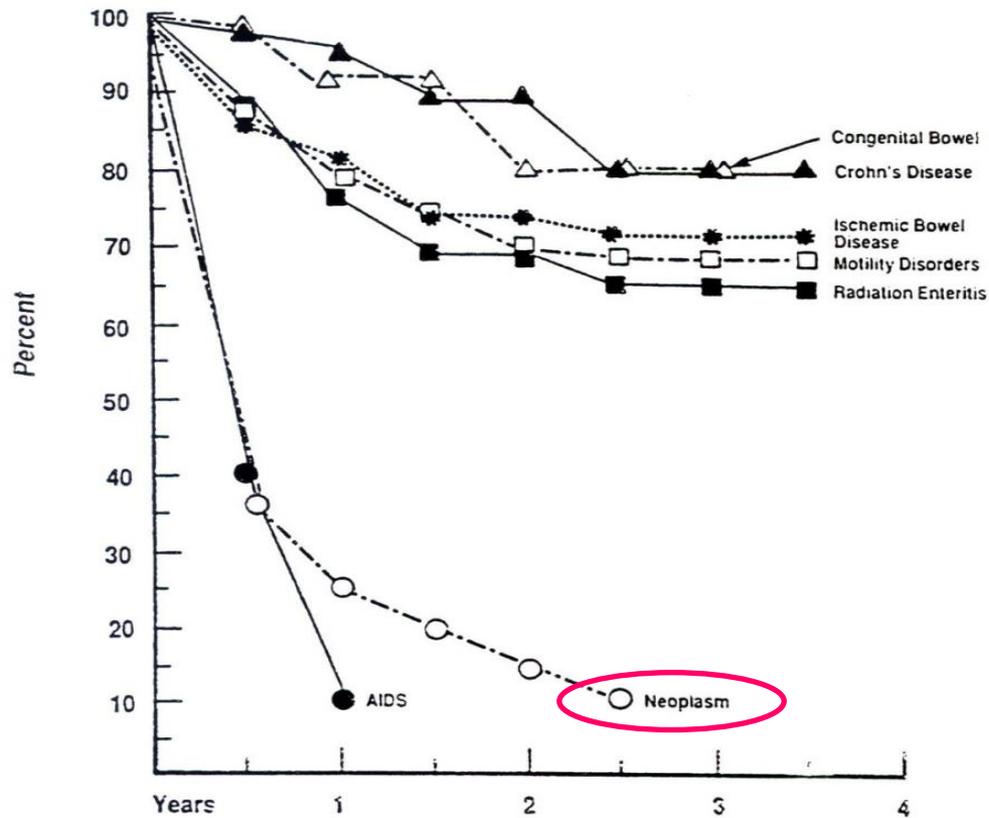


Figure 2 Distribution of diagnoses of the underlying disease in more than 5,000 home parenteral nutrition patients, reported to a voluntary registry between 1985 and 1992. Permission obtained from American Gastroenterological Association © Howard L and Ashley C (2003) *Gastroenterology* **124**: 1651–1661.

Diagnosis in HPN patients (%)

	Europe	GB	I	USA
Cancer	42	9	67	41
Crohn's	15	45	2	11
Vascular disease	13	11	10	7
Radiation enteritis	8	4	6	3
AIDS	4	3	1	5
other	18	28	14	33

Survival on HPN



benign diseases

FIG. 2. Survival curves of HPN patients in seven disease categories. (Congenital bowel, N = 67; Crohn's disease, N = 298; ischemic bowel, N = 142; motility disorders, N = 149; radiation enteritis, N = 106; AIDS, N = 56; Neoplasm, N = 777.)

Choosing the right patient

Guideline (ESPEN 2016)

Treat a nutritional deficit if the benefit outweighs the harm.

Contraindications for PN

adequate oral or enteral nutrition is possible

acute trauma, surgery, inflammation

shock of any cause

severe metabolic derangement (high lactate, hypoxia, acidosis)

ESPEN, ASPEN, AGA guidelines

... long-term PN should be offered,
if ... expected survival due to tumor progression
is longer than 2-3 months ...

***.. but: prognosis of survival is uncertain
 possible effect of PN on QoL ?
 nutrition is „basic support“***

Topic: Choosing PN = intake vs requirements

How to detect deficits?

Analog scale (intake as % of normal)

Nutrition diary: 1-7 days

Day to day variation!

assess fluid balance

assess protein intake

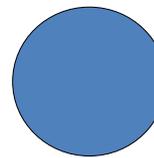
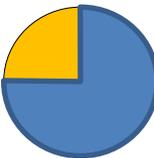
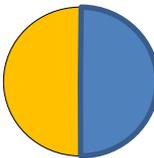
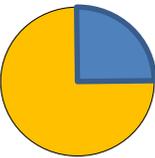
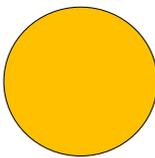
Confirm small bowel defect

Vomiting, pain, diarrhea, malabsorption, stenosis, dysmotility

How to detect / document inadequate nutritional intake?

▶Appetite: visuai/verbal analog scale

▶Food intake: visual/verbal analog scale
food diary



.....

Topic: Choosing PN = intake vs requirements

Energy requirements

Guidelines: 20-30 kcal/kg

Use standard equations: WHO, Harris-Benedict, etc.

Resting energy expenditure in cancer patients

Resting energy expenditure REE x 130%
n=85 patients - data from indirect calorimetry

60 kg

Total energy expenditure	25-30 kcal/kg	1650 kcal
Protein oxidation	1.0 g/kg	60 g
Carbohydrate oxidation	2.6 g/kg	156 g
Fat oxidation	1.3 g/kg	78 g

Topic: Choosing PN = intake vs requirements

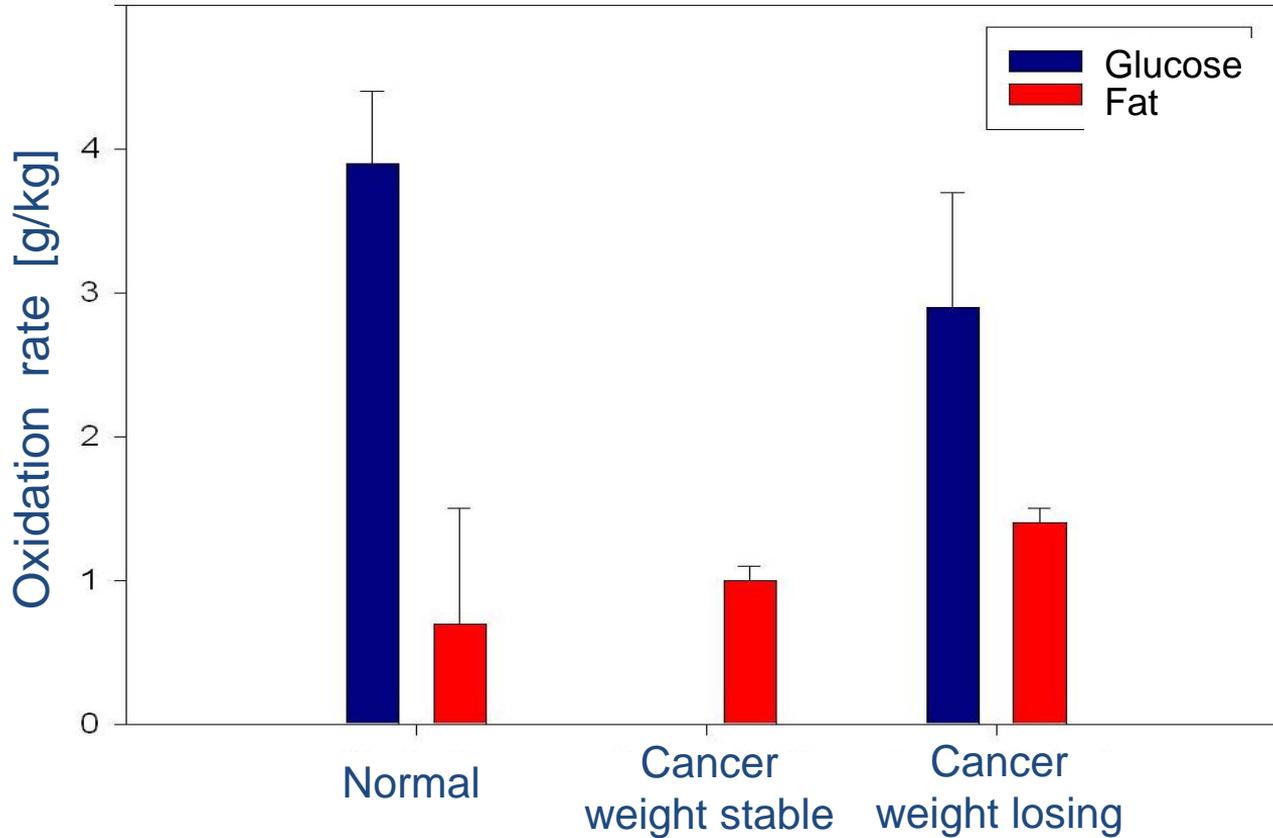
Water requirements

Guidelines: 30-35 kcal/kg

edema, ascites, pleural effusion

diarrhea, vomiting, fistulas, fever/sweating

Glucose and fat oxidation in cancer patients



Topic 2: Choosing PN = intake vs requirements

Amino acids

Guidelines: use 1.0-1.5 g/kg, possibly more

Evidence: very sparse

Specific AA: no recommendation

Consider: anabolic resistance

anabolic stimuli: leucine
muscle training
pharmacologic agents

Electrolytes: Recommendations of societies

Elektrolyte	ESPEN per kg BW per day	AKE per kg BW per day	FK (Hartig) per kg BW per day	DGEM per day
Sodium	1-1,5 mmol	0,5-1,5 mmol	2 mmol	60-150 mmol
Potassium	1-1,5 mmol	0,3-1 mmol	1 mmol	40-100 mmol
Calcium	0,1 – 0,15 mmol	0,3 – 0,5 mmol	0,1 – 0,2 mmol	4-12 mmol
Magnesium	0,1 – 0,2 mmol	0,1 – 0,3 mmol	0,1 – 0,2 mmol	2,5 – 7,5 mmol
Phosphate	0,3 – 0,5 mmol	0,7 - 1,0 mmol	0,2 – 0,5 mmol	10 - 30 mmol

Energy and substrate requirements

Volume = 30-40 ml/kg + losses

Energy = 25-30 kcal/kg

Protein
1.0 - 1.5 g

5 kcal/kg

↓
Urea/Crea
< 40

Glucose
3 - 4 g

14 kcal/kg

↓
BG < 150
urine neg.

Fat
1 - 1.5 g

10 kcal/kg

↓
TG
<250 (before)
<400 (after)

E'lytes
mMol

Na 100
K 100
Ca 10
Mg 10
PO₄ 20

Trace elements

Fe, Zn, Cu
Mn, Mo, Cr
Se, J, F

RDA

Vitamins

B, C, A, D, E, K

RDA



avoid...

„Christmas
tree“ Syndrome

Complications may sacrifice the intended benefit of PN!

catheter/port infections (0.3/year)

thrombosis, occlusion, mechanical defects (0.25/year)

correlation with expertise of PN team

Risks of PN

	per year	per 1000 d
Infections	0.3	1.0
Occlusions	0.1	0.3
Mechanical	0.1	0.3
CV thrombosis	0.03	0.1
Total	0.5-1.0	1.5-3.0

Topic: Chosing the right patient

Guideline (ESPEN 2016)

Treat a nutritional deficit if the benefit outweighs the harm.

Contraindications for PN

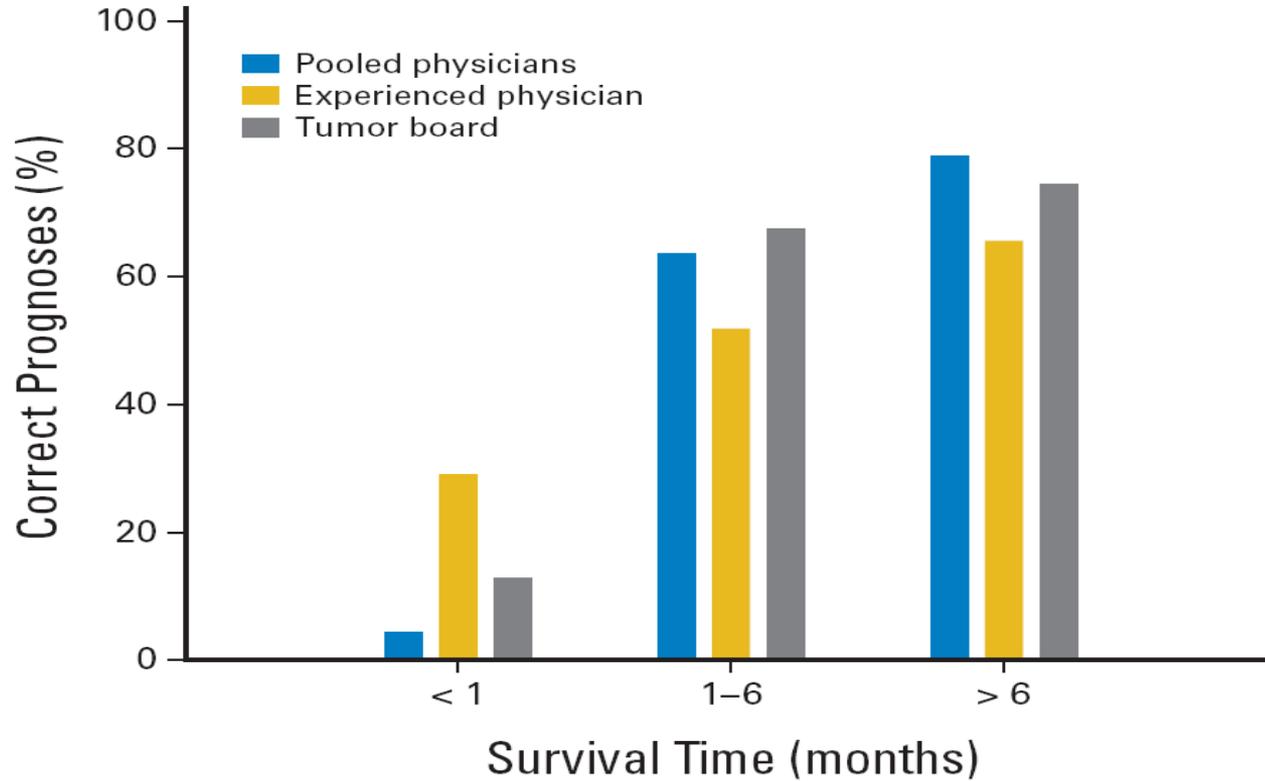
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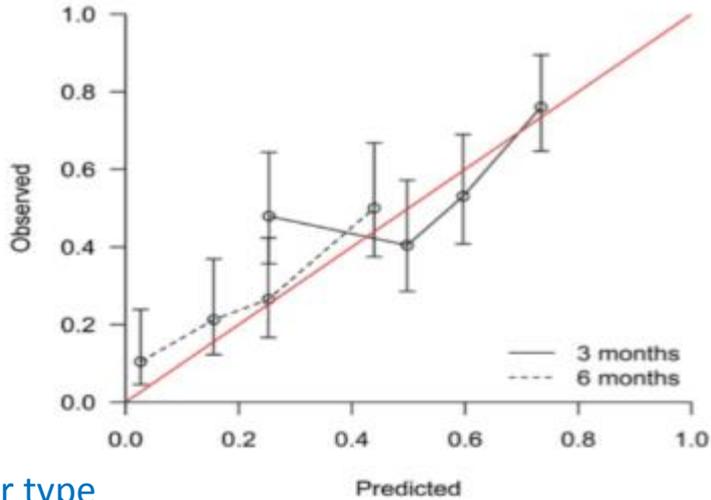
shock of any cause

severe metabolic derangement (high lactate, hypoxia, acidosis)

How often is survival time predicted correctly?

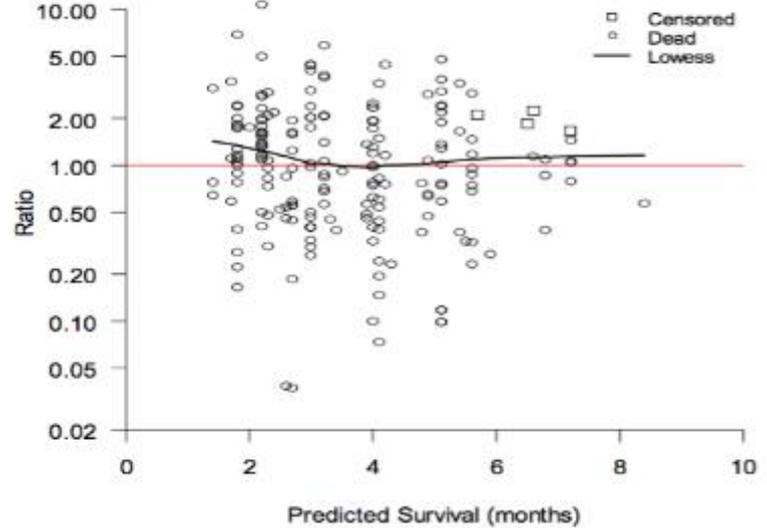


How to predict survival ?

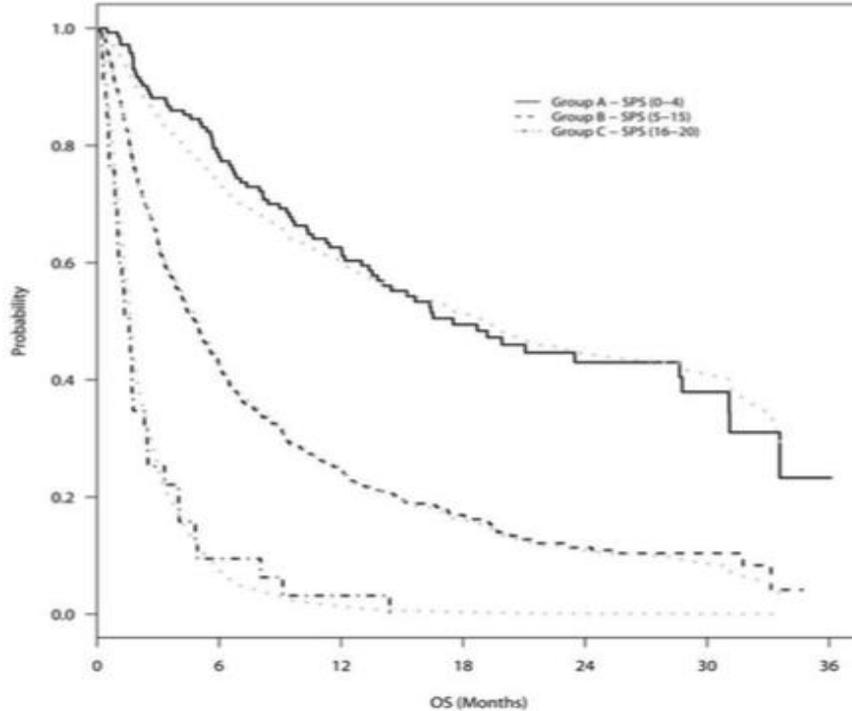


cancer type
cancer spread
Karnofsky
GPS

actual/expected



How to predict survival ?



cancer type

ECOG

age

prior pall. CHT

prior hospitaliz.

liver metast.

Median survival (95% CI)

A: 13.9-31.1 m

B: 4.3-5.6 m

C: 1.2-2.1 m

C6 – 2	Nutrition support in patients with advanced cancer
Strength of recommendation STRONG	<i>We recommend offering and implementing nutritional interventions in patients with advanced cancer only after considering together with the patient the prognosis of the malignant disease and both the expected benefit on quality of life and potentially survival as well as the burden associated with nutritional care.</i>
Level of evidence	Low
Questions for research	Effects of nutritional care on quality of life in patients with advanced cancer

Conclusions: when and how to supply PN

Indication: small bowel defect with insufficient nutrition tolerated

Contraindications: no benefit possible: emergency situation or limited life expectancy; no patient consent

Agreement on and thorough understanding of aims, burden and risks

Energy 20-30 kcal/d, protein 1.2-1.5 g/d, supply micronutrients

Teaching of team, patient and family; involve professional service

Evaluate situation repeatedly for change in or phasing out of regimen