END OF LIFE MATTERS – GENERAL SURGERY

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3 Key 'Matters' for the General Surgeon

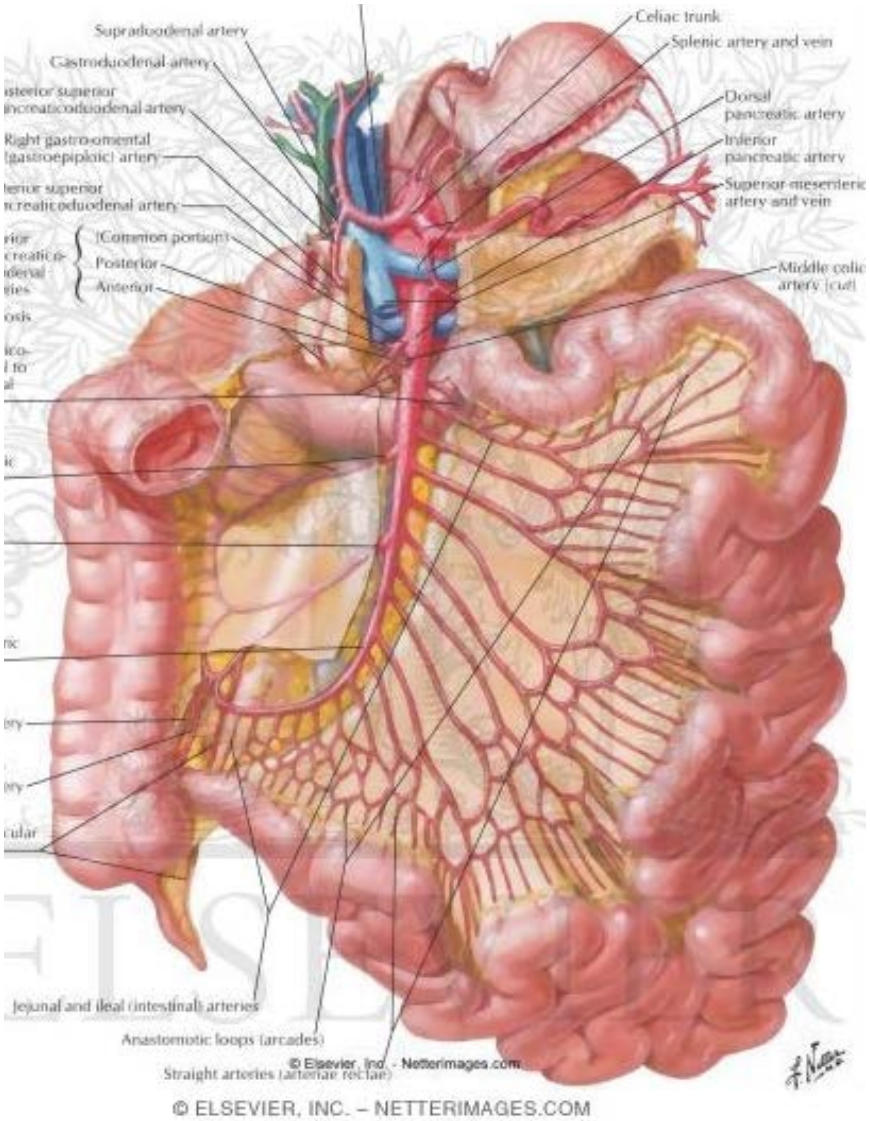
1. The frail patient with an acute surgical problem - operate or palliate?
2. Dead gut – resect or close?
3. Artificial nutrition in the palliative patient – yes or no?

I. DEAD GUT

Patient X

44 y.o man taken to theatre for an acute abdomen. Dead gut resected. He is left with 40cm jejunum, and an end jejunostomy.

Anatomy



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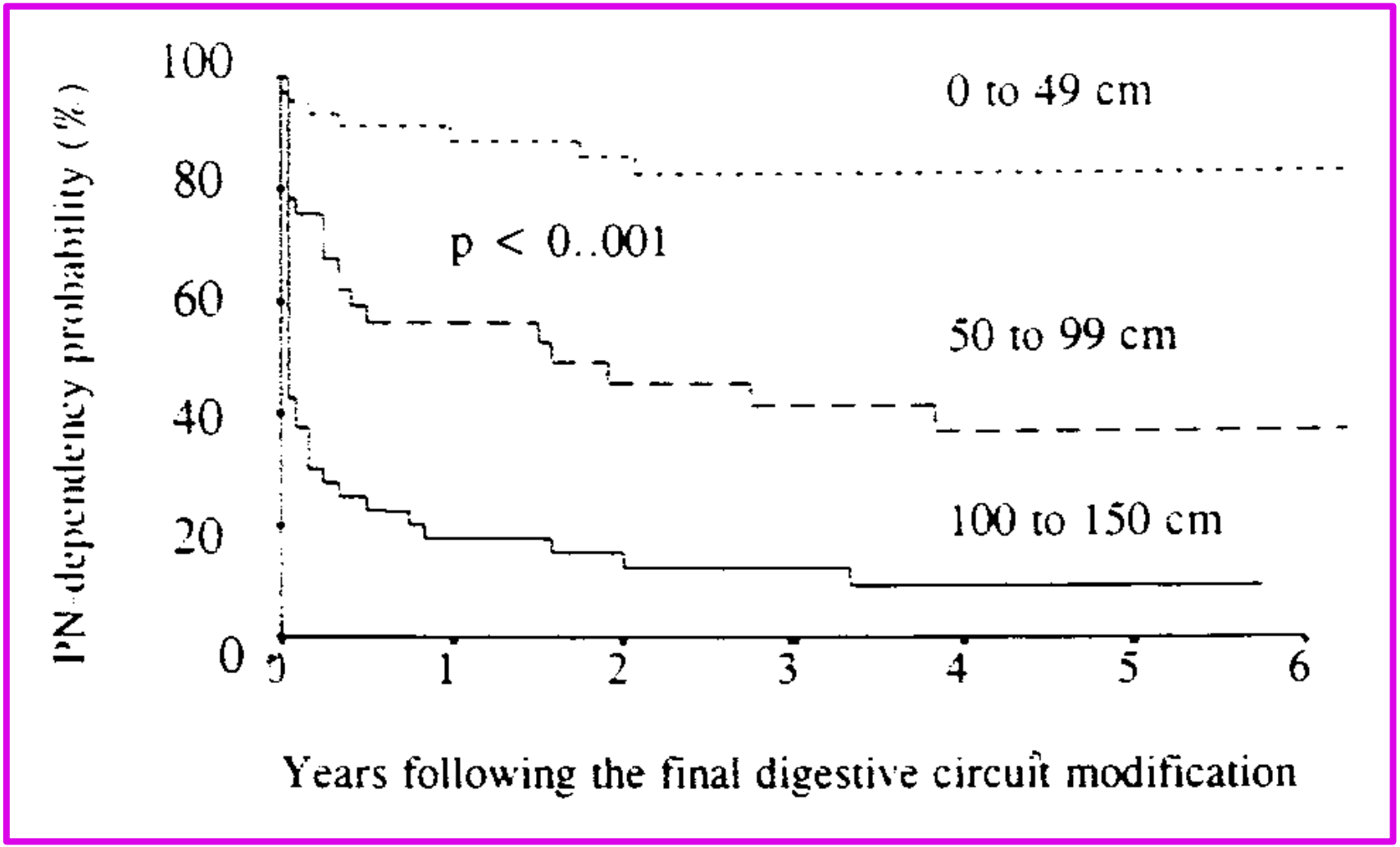
- Normal = 3-6 metres
- Short bowel < 150-200 cm
- How much is needed to avoid TPN dependence?

Short bowel syndrome

Table 2. Digestive Characteristics of 124 Adult Patients With Nonmalignant Short Bowel Syndrome

Characteristics	No. of patients (%)
Remnant small bowel length (*cm*)	
<50	43 (35)
50–99	39 (31)
100–150	42 (34)
Digestive circuit type of anastomosis	
End-enterostomy (type 1)	18 (14)
Jejunocolic anastomosis (type 2)	78 (63)
Jejunoileocolic anastomosis (type 3)	28 (23)
Radiographic abnormal pattern of remnant small bowel	
Present[a]	24 (19)
Absent	100 (81)
Other digestive features	
Left colostomy	12 (10)
Duodenopancreatectomy	3 (2)


100
80
60
40
20
0
PN-dependency probability (%)
0 to 49 cm
p < 0..001
50 to 99 cm
100 to 150 cm
0
1
2
3
4
5
6
Years following the final digestive circuit modification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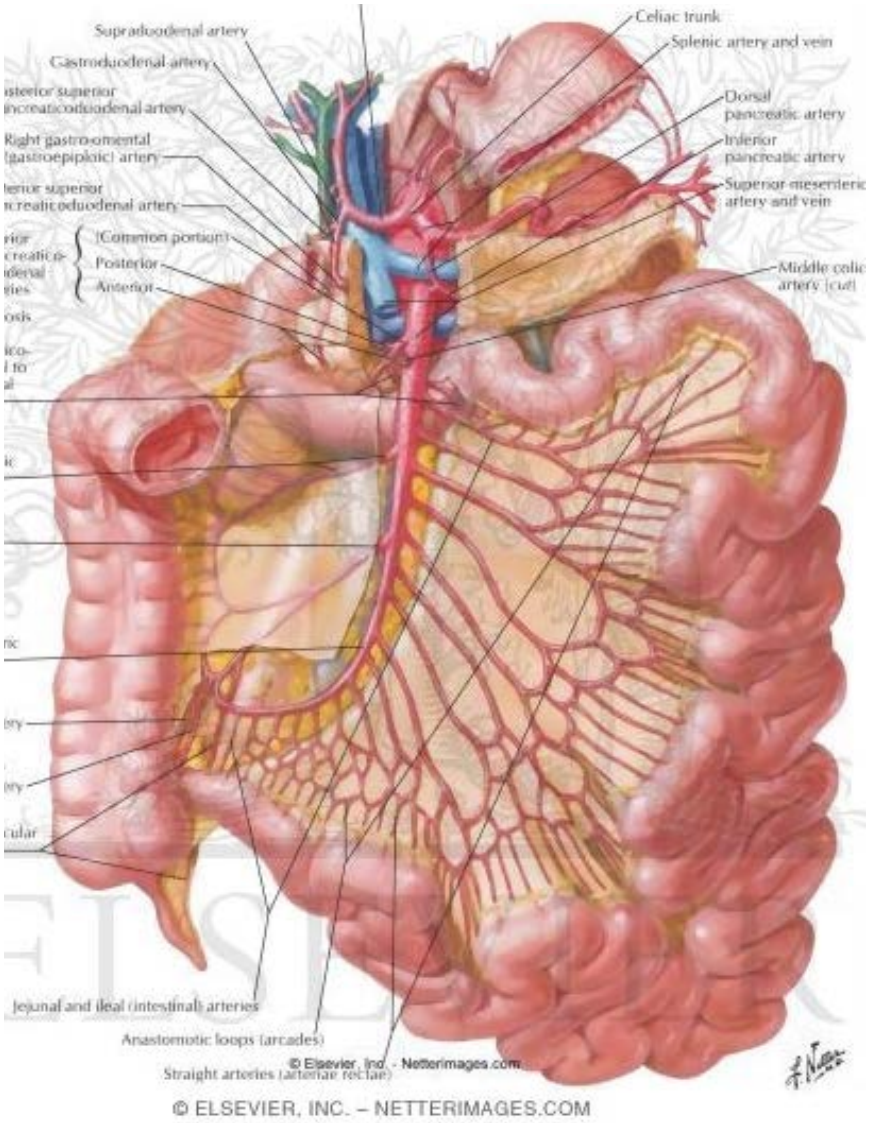
Acute mesenteric ischaemia



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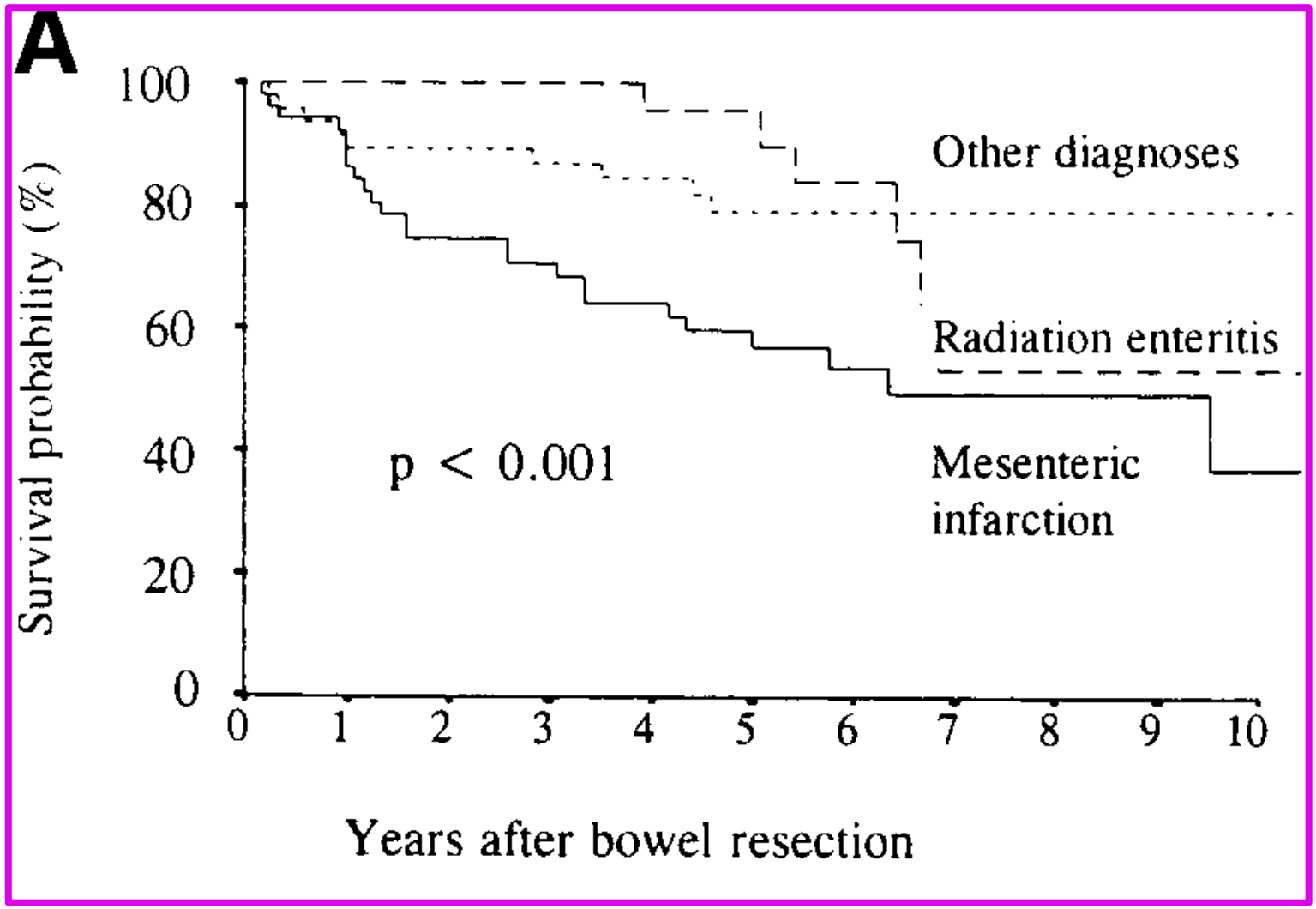
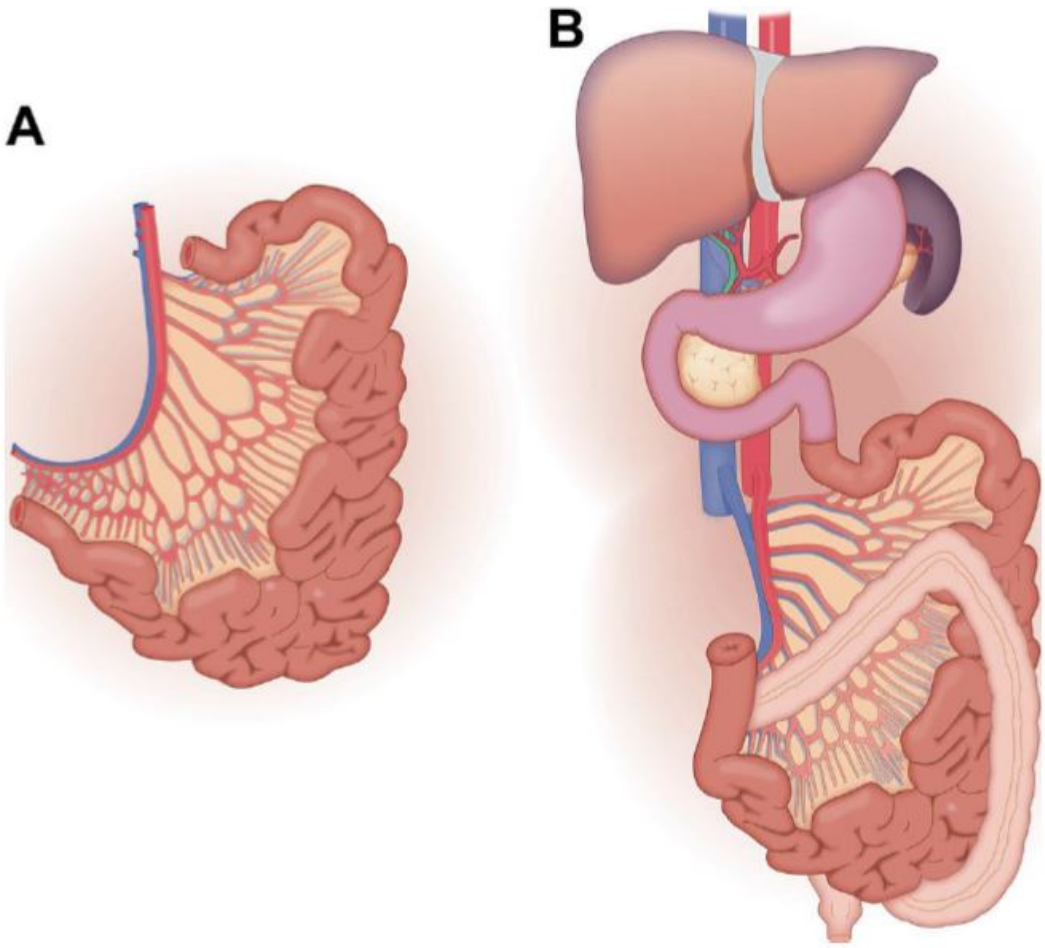
- To avoid TPN dependence:
  - Need **100 cm** jejunum
  - Or… **65 cm** jejunum + jejunocolic anastomosis
  - Or… **30 cm** jejunum + jejunoileocolic anastomosis


A
Survival probability (%)
100
80
60
40
20
0
0
1
2
3
4
5
6
7
8
9
10
Years after bowel resection
Other diagnoses
Radiation enteritis
Mesenteric infarction
p < 0.001

Intestinal transplant



Intestinal transplant in Australia

- Developed in 2009
- Austin Health & Royal Children's Hospital, Victoria
- Over 5 years, 3 transplants have been performed (2 in pediatric patients)
- 4 patients are wait-listed with wait-list times ranging from 385-1825 days

Patient X

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II. ARTIFICIAL NUTRITION IN THE PALLIATIVE PATIENT

Patient Y

68 y.o. man with gastric cancer and a leaking jejunostomy

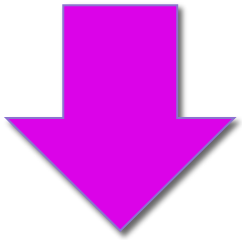
- 3 cycles chemotherapy
- Tumour un-resectable at laparotomy
- Feeding jejunostomy inserted
- “start of trauma” for patient

Due to start 4th cycle chemotherapy in 3 days

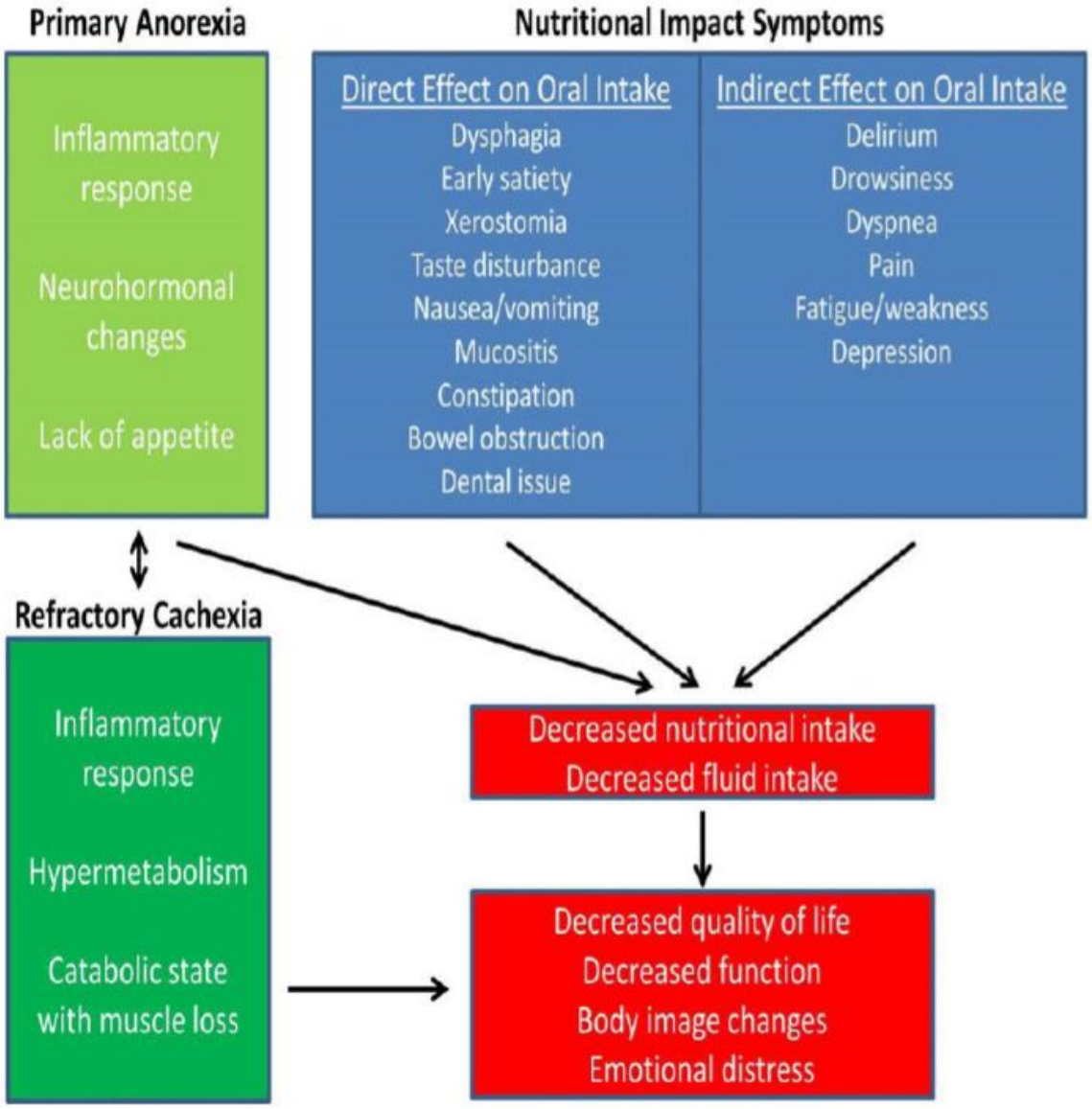

18FR
3.4cm
LOCK

2 major drivers of weight loss

1. Starvation
2. Refractory cachexia



Worsening symptom burden at the “end of life”


Primary Anorexia
Inflammatory response
Neurohormonal changes
Lack of appetite
Nutritional Impact Symptoms
Direct Effect on Oral Intake
Dysphagia
Early satiety
Xerostomia
Taste disturbance
Nausea/vomiting
Mucositis
Constipation
Bowel obstruction
Dental issue
Indirect Effect on Oral Intake
Delirium
Drowsiness
Dyspnea
Pain
Fatigue/weakness
Depression
Refractory Cachexia
Inflammatory response
Hypermetabolism
Catabolic state with muscle loss
Decreased nutritional intake
Decreased fluid intake
Decreased quality of life
Decreased function
Body image changes
Emotional distress

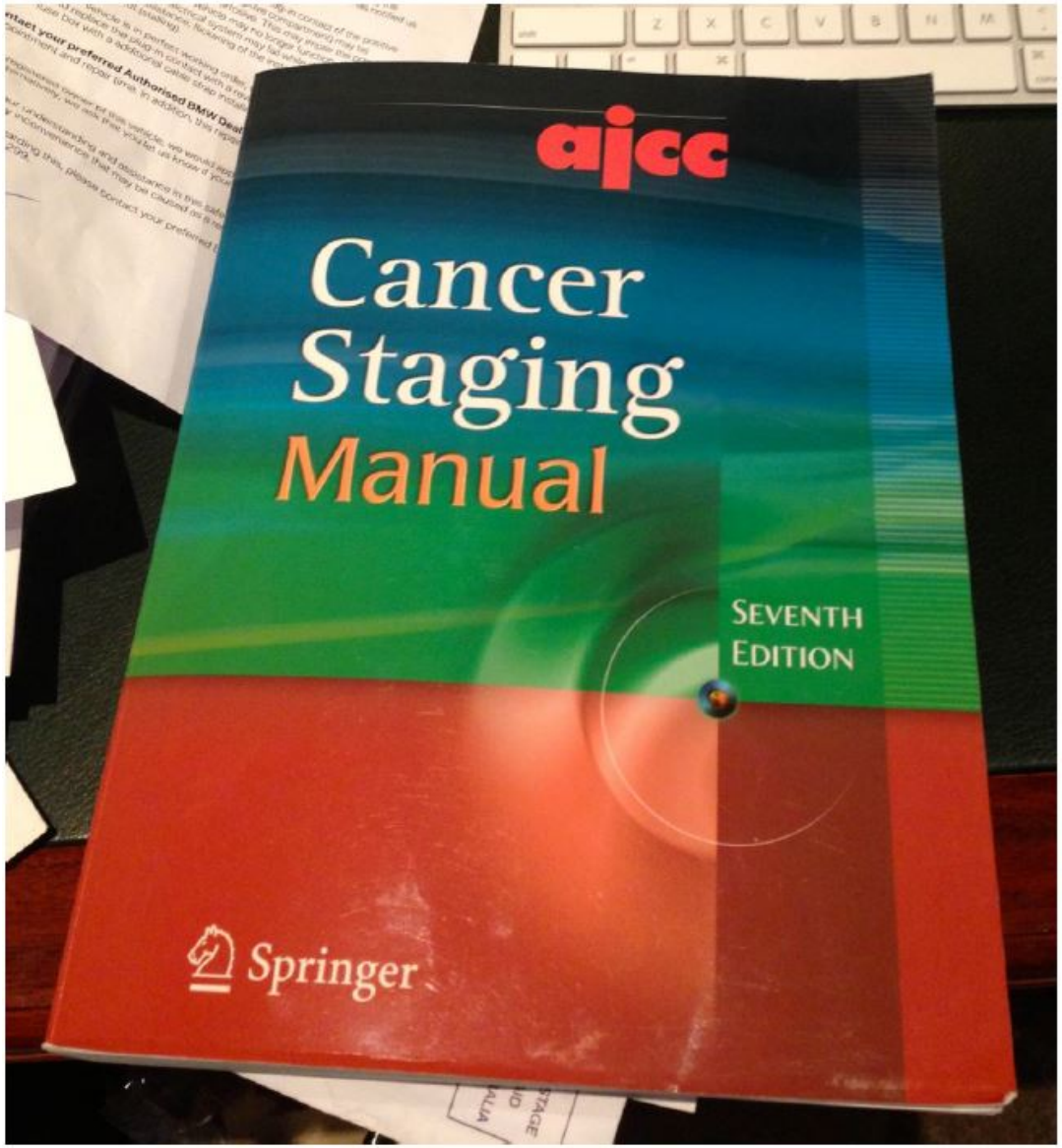
What is “end of life”?

- Ambiguous
- Range from few days to a few months
- Pragmatic cut-off = 3 months

How do we predict “end of life”?

- 343 physicians asked to estimate survival in 468 patients at time of hospice referral
- A total of 20% of predictions were accurate!

Models	Variables	Scoring	Survival Interpretation
Palliative Prognostic Score[57-60]	Clinician prediction of survival (0–8.5) Karnofsky performance scale ≥ 50% (2.5) Anorexia (1.5) Dyspnea (1) Leukocytosis (0–1.5) Lymphopenia (0–2.5)	Total score 0–17.5 points Higher score = worse survival	Risk group A (0–5.5 points): months of survival Risk group B (5.6–11 points): weeks of survival Risk group C (11.1–17.5 points): days of survival
Palliative Prognostic Index[80-86]	Palliative performance scale (0–4) Delirium (considered absent if caused by a single medication and potentially reversible) (4) Dyspnea at rest (3.5) Oral intake (0–2.5) Edema (1)	Total score 0–15 points Higher score = worse survival	Risk group A (0–4 points): months of survival Risk group B (4.1–6 points): weeks of survival Risk group C (6.1–15 points): days of survival
Glasgow Prognostic Score[52,61-65]	Albumin < 35 g/L (1) C-reactive protein > 10 mg/L (1)	Total score 0-2 Higher score = worse survival	Score = 0: months to years of survival Score = 1: months of survival Score = 2: weeks to months of survival


ajcc
Cancer
Staging
Manual
SEVENTH
EDITION
Springer

"The stage of cancer at the time of diagnosis is a key factor that defines prognosis and is a critical element in determining appropriate treatment…"

Why is it important to recognize “end of life”?

- Many symptoms/complications are irreversible
- Often takes weeks for weight to improve
- Anorexia-cachexia = shorter life expectancy
- BUT… intervention unlikely to change outcome due to the progressive cancer

What is the evidence?

Medically assisted nutrition for palliative care in adult patients (Review)

Good P, Cavenagh J, Mather M, Ravenscroft P

THE COCHRANE COLLABORATION®

5 Prospective Studies

- Insufficient evidence to support artificial nutrition
- Invasive medical intervention
- 2006 European Society for Clinical Nutrition and Metabolism (ESPEN) = No

Table 4

Prognosis-Based Decision Making Regarding Artificial Nutrition

Nutritional State	Life expectancy: months or longer (active cancer treatments considered; pre-cachexia/ cachexia state)	Life expectancy: days to weeks (progressive cancer with no standard treatment options; refractory cachexia)
Reduced oral intake and normal absorption	Continue with oral intake, consider nutritional supplements	Continue with oral intake, consider nutritional supplements
Significantly compromised oral intake (e.g. dysphagia, severe mucositis) and normal absorption	Consider enteral nutrition	Conservative measures Consider parenteral hydration Artificial nutrition not recommended
Significantly compromised absorption (e.g. bowel obstruction) or failure of enteral nutrition	Consider parenteral nutrition	Conservative measures Consider parenteral hydration Artificial nutrition not recommended

What is the goal of nutritional care at the “end of life”?

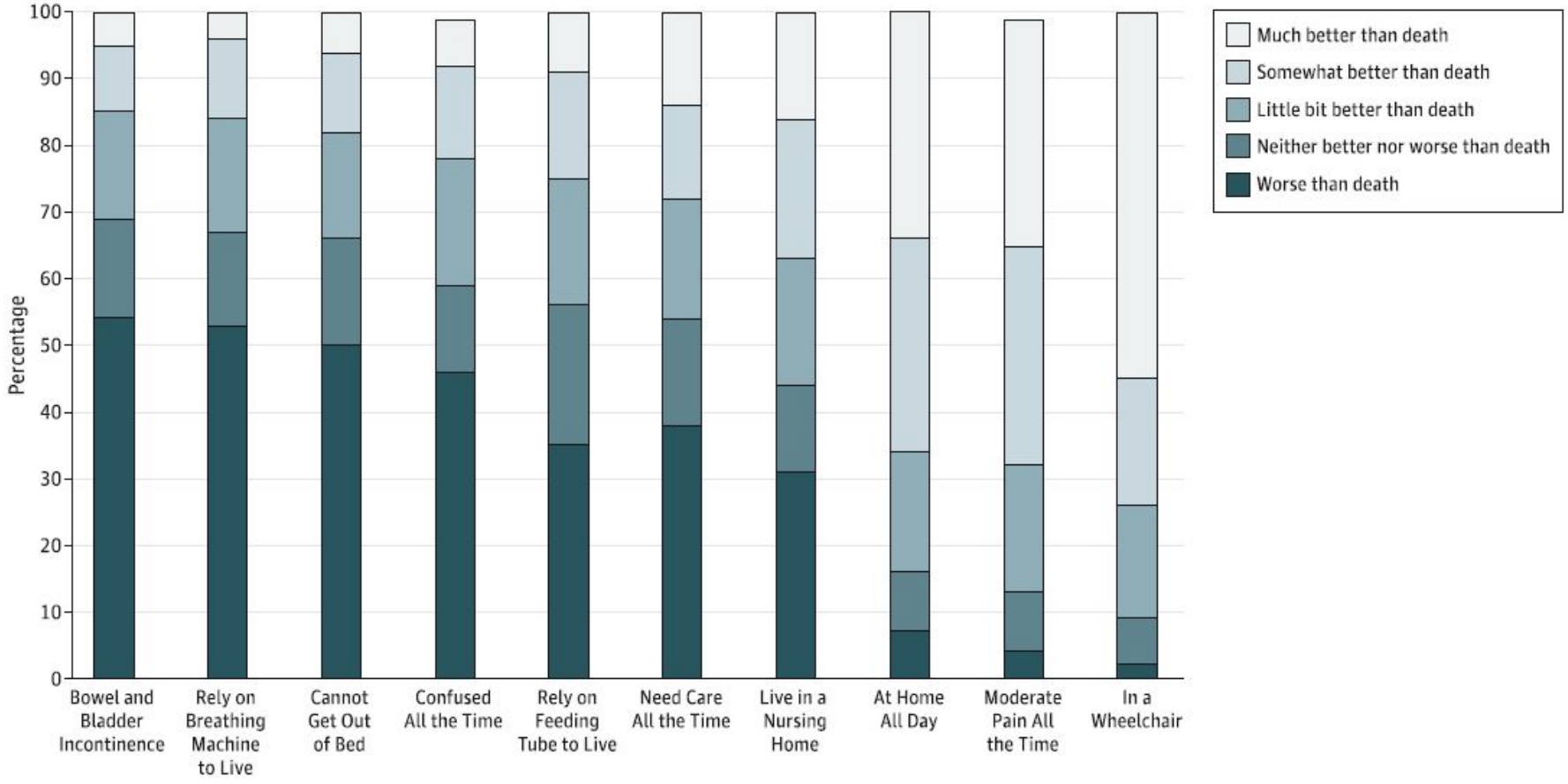
Summary

- Goal in most patients = maintenance of nutritional status/function
- Goal in the "end of life" patient = well-being and comfort
  - Stop weighing the patient
  - Stop measuring food intake
  - Stop restrictions around other medical conditions, i.e. diabetes

JAMA 2016

- Most studies use mortality as 1° or 2° outcome measure
- But do patients with acute illnesses requiring hospitalization view other conditions as "worse than death"?
- N = 180 patients
- All > 60 y.o. with advanced cancer, severe lung disease, or severe congestive heart failure

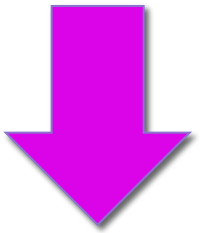
Figure. Ratings of States of Functional Debility Relative to Death by Hospitalized Patients With Serious Illnesses



Distribution of patient ratings of each queried health state on a 5-point Likert scale.

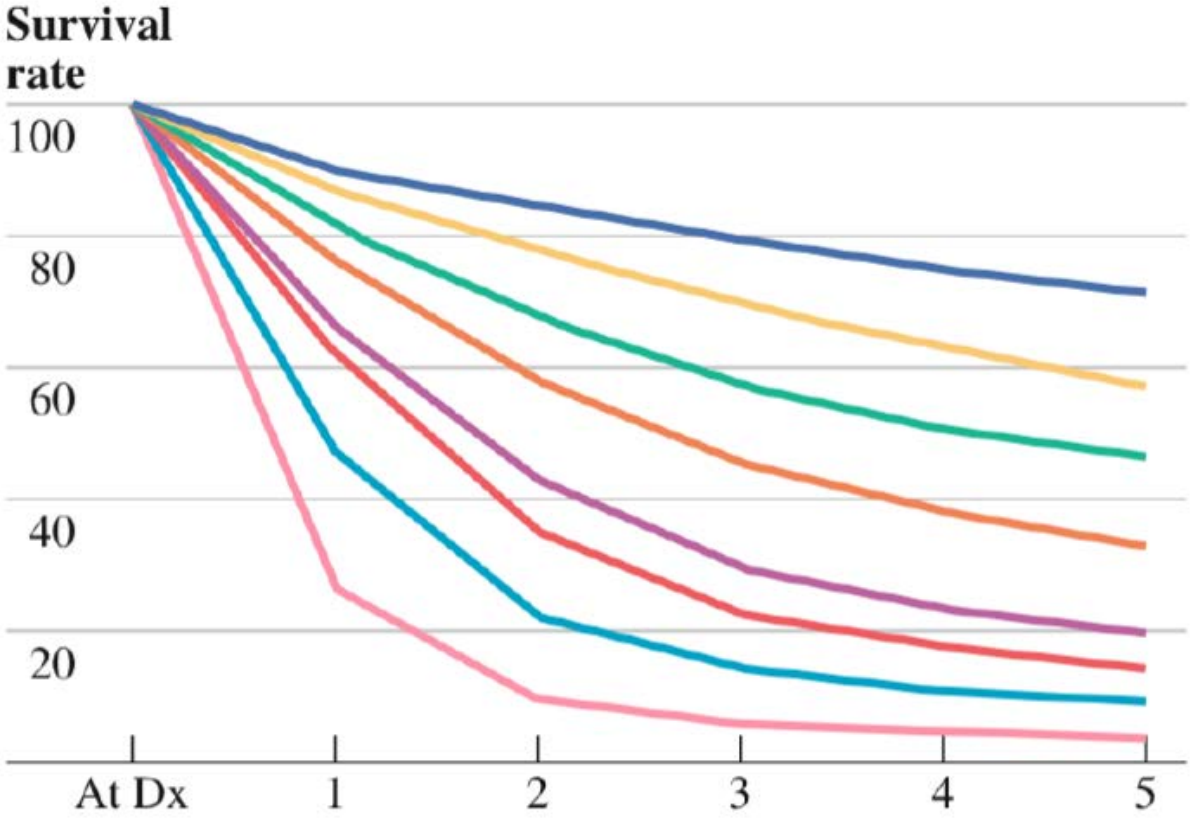
The Results

- Bowel/bladder incontinence 69%
- Breathing tube 67%
- Feeding tube 56%



Conditions the same or worse than death

Patient Y



	At Dx	1	2	3	4	5
IA	100.0	90.2	84.8	79.8	74.8	70.8
IB	100.0	87.4	77.9	69.9	62.7	57.4
IIA	100.0	82.1	67.4	57.2	50.2	45.5
IIB	100.0	76.8	58.3	46.0	38.4	32.8
IIIA	100.0	66.5	42.4	29.9	23.5	19.8
IIIB	100.0	61.6	35.4	22.9	17.8	14.0
IIIC	100.0	47.4	21.8	14.2	11.0	9.2
IV	100.0	27.0	10.0	5.6	4.5	4.0

Patient Y

III. CLOSING THOUGHTS

Dead Gut

1. Take careful measurements – how much bowel is left?

2. Is it possible to avoid TPN dependence?

3. If not, it may be more humane to refrain from resection.

Artificial Nutrition in the Palliative Patient

1. No evidence to support artificial nutrition in the "end of life" patient

2. A pragmatic cut-off is 3 months

3. 56% of seriously ill patients view reliance on a feeding tube to live as a condition the same or worse than death

Thank you