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
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

- 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

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remnant small bowel length (cm)</td>
<td></td>
</tr>
<tr>
<td>&lt;50</td>
<td>43 (35)</td>
</tr>
<tr>
<td>50–99</td>
<td>39 (31)</td>
</tr>
<tr>
<td>100–150</td>
<td>42 (34)</td>
</tr>
<tr>
<td>Digestive circuit type of anastomosis</td>
<td></td>
</tr>
<tr>
<td>End-enterostomy (type 1)</td>
<td>18 (14)</td>
</tr>
<tr>
<td>Jejunocolic anastomosis (type 2)</td>
<td>78 (63)</td>
</tr>
<tr>
<td>Jejunoileocolic anastomosis (type 3)</td>
<td>28 (23)</td>
</tr>
<tr>
<td>Radiographic abnormal pattern of remnant small bowel</td>
<td></td>
</tr>
<tr>
<td>Present(^a)</td>
<td>24 (19)</td>
</tr>
<tr>
<td>Absent</td>
<td>100 (81)</td>
</tr>
<tr>
<td>Other digestive features</td>
<td></td>
</tr>
<tr>
<td>Left colostomy</td>
<td>12 (10)</td>
</tr>
<tr>
<td>Duodenopancreatectomy</td>
<td>3 (2)</td>
</tr>
</tbody>
</table>
Years following the final digestive circuit modification

PN dependence probability (%)

0 to 49 cm

50 to 99 cm

100 to 150 cm

p < 0.001
Acute mesenteric ischaemia

- To avoid TPN dependence:
  - Need 100 cm jejunum
  - Or... 65 cm jejunum + jejunocolic anastomosis
  - Or... 30 cm jejunum + jejunointestinal anastomosis
A

Survival probability (%)

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

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

1. Starvation
2. Refractory cachexia

Worsening symptom burden at the “end of life”
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!
<table>
<thead>
<tr>
<th>Models</th>
<th>Variables</th>
<th>Scoring</th>
<th>Survival Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palliative Prognostic Score&lt;sup&gt;57-60&lt;/sup&gt;</td>
<td>Clinician prediction of survival (0–8.5)</td>
<td>Total score 0–17.5 points Higher score = worse survival</td>
<td>Risk group A (0–5.5 points): months of survival</td>
</tr>
<tr>
<td></td>
<td>Karnofsky performance scale ≥ 50% (2.5)</td>
<td></td>
<td>Risk group B (5.6–11 points): weeks of survival</td>
</tr>
<tr>
<td></td>
<td>Anorexia (1.5)</td>
<td></td>
<td>Risk group C (11.1–17.5 points): days of survival</td>
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<tr>
<td></td>
<td>Dyspnea (1)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Leukocytosis (0–1.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lymphopenia (0–2.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palliative Prognostic Index&lt;sup&gt;80-86&lt;/sup&gt;</td>
<td>Palliative performance scale (0–4)</td>
<td>Total score 0–15 points Higher score = worse survival</td>
<td>Risk group A (0–4 points): months of survival</td>
</tr>
<tr>
<td></td>
<td>Delirium (considered absent if caused by a single medication and potentially reversible) (4)</td>
<td></td>
<td>Risk group B (4.1–6 points): weeks of survival</td>
</tr>
<tr>
<td></td>
<td>Dyspnea at rest (3.5)</td>
<td></td>
<td>Risk group C (6.1–15 points): days of survival</td>
</tr>
<tr>
<td></td>
<td>Oral intake (0–2.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Edema (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glasgow Prognostic Score&lt;sup&gt;52,61-65&lt;/sup&gt;</td>
<td>Albumin &lt; 35 g/L (1)</td>
<td>Total score 0–2 Higher score = worse survival</td>
<td>Score = 0: months to years of survival</td>
</tr>
<tr>
<td></td>
<td>C-reactive protein &gt; 10 mg/L (1)</td>
<td></td>
<td>Score = 1: months of survival</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Score = 2: weeks to months of survival</td>
</tr>
</tbody>
</table>
“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
5 Prospective Studies

- Insufficient evidence to support artificial nutrition
- Invasive medical intervention
- 2006 European Society for Clinical Nutrition and Metabolism (ESPEN) = No
<table>
<thead>
<tr>
<th>Nutritional State</th>
<th>Life expectancy: months or longer (active cancer treatments considered; pre-cachexia/cachexia state)</th>
<th>Life expectancy: days to weeks (progressive cancer with no standard treatment options; refractory cachexia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced oral intake and normal absorption</td>
<td>Continue with oral intake, consider nutritional supplements</td>
<td>Continue with oral intake, consider nutritional supplements</td>
</tr>
<tr>
<td>Significantly compromised oral intake (e.g. dysphagia, severe mucositis) and normal absorption</td>
<td>Consider enteral nutrition</td>
<td>Conservative measures Consider parenteral hydration Artificial nutrition not recommended</td>
</tr>
<tr>
<td>Significantly compromised absorption (e.g. bowel obstruction) or failure of enteral nutrition</td>
<td>Consider parenteral nutrition</td>
<td>Conservative measures Consider parenteral hydration Artificial nutrition not recommended</td>
</tr>
</tbody>
</table>
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
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
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