



**PEG**

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### Prolonging life for sick elderly

**Peter Singer**



Princeton, Penn. — ...used to be called "the old man's friend" because it often brought a frailty with and purchase and to a life that was already of poor quality and would otherwise have continued to decline. Now a study of severely demented patients in Boston-area nursing homes shows that the "friend" is often being fought with antibiotics. Such practices raise the obvious question, are we, routinely treating illnesses because we can, rather than because we ought to?

The study, carried out by Erika D'Agata and Susan Mitchell and recently published in the Archives of Internal Medicine, showed that over 18 months, two-thirds of 214 severely demented patients were treated with antibiotics. The mean age of these patients was 85. On the test for severe impairment, where scores range from zero to 24, three-quarters of these patients scored zero. Their ability to communicate verbally ranged from non-existent to minimal. It isn't clear that using antibiotics in these circumstances prolongs life, but even if it did, one would have to ask: "What is the point? How many people want their lives to be prolonged in this way, and how many people are unwilling to accept the consequences of a life that is not their own?"

Princeton also has not been able to give its family role 94-year-old Susana Golobchuk, of Winnipeg, Canada, who for years has had limited physical and mental capacities as a result of a brain injury. Golobchuk's doctor thought it best not to prolong his life, but his children, anxious to discontinue life-support would violate their Orthodox Jewish beliefs, obtained a court order compelling the doctor to keep their father alive.

So, for the past three months, Golobchuk has had a tube down his throat, in his lungs, in his stomach, and another in his stomach. He does not speak and has not been able to get out of bed. How much awareness he has is in dispute. The case will now go to trial, and how long that will take is unclear.

Normally, when patients are unable to make decisions about their treatment, the family wishes should be given great weight. But a family's wishes should not override doctor ethical responsibility to act in the best interests of their patients.

Golobchuk's children argue that he interacts with them. But establishing their father's awareness could be a difficult

task, since it could also mean that keeping him alive is pointless torture, and it is in his best interests to be allowed to die peacefully.

The other important issue raised by Golobchuk's case is how far a publicly funded healthcare system such as Canada's has to go to satisfy the family's wishes. When a family seeks treatment that, in the professional judgment of the physician, is not in the patient's best interests, the answer should be, not for all.

If Golobchuk's children can convince the court that their father is not suffering, the court might reasonably order the hospital to grant them custody of their father. They can then decide for themselves, at their own expense, how much further treatment he should have. What the court should not do is order the hospital to maintain care for Golobchuk, against the better judgment of its healthcare professionals. Canada's taxpayers are not required to support the religious beliefs held by their fellow citizens.

Peter Singer is a professor of bioethics at Princeton University. He is the author of among other books, "Animal Rights, Human Obligations," "The Ethics of What We Eat," and "The Ethics of What We Do." — Ed.

### ESPEN guidelines on enteral nutrition: intensive care

- Use EN in patients who can be fed via the enteral route.
- There is no significant difference in the efficacy of jejunal versus gastric feeding in critically ill patients.
- Avoid additional parenteral nutrition in patients who tolerate EN and can be fed approximately to the target values.
- Use supplemental parenteral nutrition in patients who cannot be fed sufficiently via the enteral route.
- Consider careful parenteral nutrition in patients intolerant to EN at a level equal to but not exceeding the nutritional needs of the patient.

Kreymann. Clinical Nutrition 2006;25:210-223

### Canadian guidelines for nutrition support in mechanically ventilated, critically ill patients

1. Does EN compared with PN result in better outcomes in the critically ill adult patient? According to 1 level 1 and 12 level 2 studies, when considering nutrition support for critically ill patients, we strongly recommend the use of EN over PN.
2. Does early EN compared with delayed nutrient intake result in better outcomes in the critically ill adult patient? According to 8 level 2 studies, we recommend early EN (within 24-48 hours after admission to ICU) in critically ill patients.
3. Does achieving target dose of EN result in better outcomes in the critically ill adult patient? According to 1 level 2 study, when initiating EN in head-injured patients, strategies to optimize delivery of nutrients (starting at target rate, higher threshold of gastric residual volumes and use of small bowel feedings) should be considered. In other critically ill patients, there are insufficient data to make a recommendation.

Heyland. JPEN 2003;27:355-373

### Canadian guidelines for nutrition support in mechanically ventilated, critically ill patients

4. Compared with standard enteral feeds, do diets supplemented with arginine and other nutrients result in improved clinical outcomes in critically ill patients? According to 2 level 1 studies and 12 level 2 studies, we recommend that diets supplemented with arginine and other select nutrients not be used for critically ill patients.
5. Does the use of enteral formula with fish oils result in improved clinical outcomes in the critically ill adult patient? According to 1 level 1 study, the use of products with fish oils, borage oils, and antioxidants should be considered in patients with ARDS.
6. Compared with standard care, does glutamine-supplemented EN result in improved clinical outcomes in critically ill patients? According to 4 level 2 studies and 1 level 1 study, enteral glutamine should be considered in burn and trauma patients. There are insufficient data to support the routine use of enteral glutamine in other critically ill patients.
7. Does the use of peptide-based enteral formula, compared with a whole-protein formula, result in better outcomes in the critically ill adult patient? According to 4 level 2 studies, when initiating enteral feeds, we recommend the use of whole-protein formulas (polymeric).

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### Canadian guidelines for nutrition support in mechanically ventilated, critically ill patients

8. Does the use of a feeding protocol result in better outcomes in the critically ill adult patient? There are insufficient data from randomized trials to recommend the use of a feeding protocol in critically ill patients. If a feeding protocol is to be used, according to 1 level 2 study, a protocol that incorporates prokinetics (metoclopramide) at initiation and tolerates a higher gastric residual volume (250 mL) should be considered as a strategy to optimize delivery of EN in critically ill adult patients.
9. Compared with standard practice (placebo), does the routine use of motility agents result in better clinical outcomes in critically ill patients? According to a systematic review of the literature, in critically ill patients who experience feed intolerance (high gastric residuals, emesis), the use of metoclopramide as a motility agent should be considered.
10. Does enteral feeding via the small bowel compared with gastric feeding result in better outcomes in the critically ill adult patient? According to 11 level 2 studies, small bowel feeding compared with gastric feeding may be associated with a reduction in pneumonia in critically ill patients. In units where obtaining small bowel access is feasible, we recommend the routine use of small bowel feedings. In units where obtaining access involves more logistical difficulties, small bowel feedings should be considered for patients at high risk for intolerance to EN (on intubation, continuous infusion of sedatives, or paralytic agents, or patients with high nasogastric drainage) or at high risk for regurgitation and aspiration (cared for in the supine position). Finally, in units where obtaining small bowel access is not feasible (no access to fluoroscopy or endoscopy and blind techniques not reliable), small bowel feedings should be considered for those select patients who repeatedly demonstrate high gastric residual volumes and are not tolerating adequate amounts of EN delivered into the stomach.

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### Canadian guidelines for nutrition support in mechanically ventilated, critically ill patients

11. Do alterations in body position result in better outcomes in the critically ill adult patient receiving EN? According to 1 level 2 study, we recommend that critically ill patients receiving EN have the head of the bed elevated to 45 degrees. Where this is not possible, attempts to raise the head of the bed as much as possible should be considered.
12. Does the use of PN in combination with EN result in better outcomes in the critically ill adult patient? According to 5 level 2 studies, for critically ill patients starting on EN, we recommend that PN not be started at the same time as EN. In the patient who is not tolerating adequate EN, there are insufficient data to put forward a recommendation about when PN should be initiated. Practitioners will have to weigh the safety and benefits of initiating PN in patients not tolerating EN on an individual case-by-case basis. We recommend that PN not be started in critically ill patients until all strategies to maximize EN delivery (such as the use of small bowel feeding tubes and motility agents) have been attempted.
13. Compared with standard care (IV fluids, oral diet, etc), does PN result in better outcomes in critically ill patients who have an intact GI tract? In critically ill patients with an intact GI tract, we recommend that PN not be used routinely.
14. Compared with standard PN, does glutamine-supplemented PN result in better outcomes in critically ill patients? According to 2 level 1 studies and 3 level 2 studies, when PN is prescribed to critically ill patients, parenteral supplementation with glutamine, where available, is recommended. There are insufficient data to generate recommendations for IV glutamine in critically ill patients receiving EN.

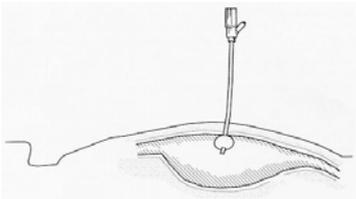
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### Canadian guidelines for nutrition support in mechanically ventilated, critically ill patients

15. Does hypocaloric PN influence the outcome of critically ill patients? According to 2 level 2 studies, in critically ill patients who are not malnourished, are tolerating some EN, or when PN is indicated for short-term use (<10 days), hypocaloric PN should be considered. There are insufficient data to make recommendations about the use of hypocaloric PN in the following patients: those requiring PN for long term (>10 days), obese critically ill patients, and malnourished critically ill patients. Practitioners will have to weigh the safety and benefits of hypocaloric PN on an individual case-by-case basis in these latter patient populations.
16. Does the presence of lipids in PN influence outcomes in the critically ill adult patient? According to 2 level 2 studies, in critically ill patients who are not malnourished and are tolerating some EN, or when PN is indicated for short-term use (<10 days), withholding lipids should be considered. There are insufficient data to make a recommendation about withholding lipids in critically ill patients who are malnourished or those requiring PN for long term (>10 days). Practitioners will have to weigh the safety and benefits of withholding lipids on an individual case-by-case basis in these latter patient populations.
17. Does tight blood glucose control result in better outcomes in the critically ill adult patient receiving nutritional support? According to 1 level 2 study, in surgical critically ill patients receiving nutrition support, intensive insulin therapy to tightly control blood glucose levels between 4.4 and 6.1 mmol/L should be considered. There are insufficient data to make a recommendation regarding intensive insulin therapy in other critically ill patients.

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### Percutaneous Endoscopic Gastrostomy (PEG)



### Objectives

- Indications and contraindications of PEG
- Upper flexible fiberoptic gastroscopy
  - Principles
  - Procedures
- Monitoring, sedation
- Surgical procedure

### PEG: Indications

- Long-term feeding
- Mechanical Dysfunction
  - Esophageal obstruction
  - Swallowing disorder
  - Facial fractures
- Neurologic impairment
  - Stroke
  - Closed head injury

### PEG: Indications

- Replace nasogastric feeding tube
  - Reduce risk of aspiration, sinusitis
  - Facilitates tube replacement for mechanical problems
- Permit transfer to long term facility

### Additional Indications

- Decompressive tube for palliation (carcinomatosis, gastric obstruction, severe diabetic gastroparesis)
- Access for repeated endoscopic or surgical instrumentation (e.g. bougie)
- Recirculation of bile
  - Fistula, biliary drain
- Gastric volvulus

### Contraindications

- Terminal illness
- Poorly selected populations have 30 day mortality of up to 50% after PEG
- Exception: palliative, for decompression

### Contraindications

- Inability to perform upper endoscopy
  - Obstructing esophageal tumor
  - Stricture
- Ascites
- Inability to appose gastrotomy to anterior abdominal wall
  - Previous subtotal gastric resection
  - Hepatomegaly, esp left lobe

### Relative Contraindications

- Coagulopathy
- Portal hypertension
- Peritoneal dialysis
- Large hiatal hernia

### PEG: Alternatives

- Open gastrotomy
  - Additional risks of incision
    - Wound infection
    - Dehiscence
- Laparoscopic gastrotomy
  - Cost
  - Use of OR Resources

### PEG Techniques

- Pull vs push technique
- No outcome difference
- Pull
  - Popular approach
  - Featured in this program
- Push
  - Popular for radiologic approach
  - Similar to laparoscopic insertion technique

### Complications of PEG

- Direct, major complications: 4%
- Mortality from complications: 25%
- High mortality attributed to patient population
  - Debilitated
  - Cannot tolerate additional insult

### PEG removal due to wound infection



### Necrotizing Fasciitis



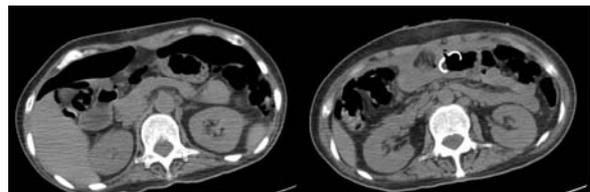
### Peristomal Wound Infection

- 5-30% of cases
- Prophylactic Antibiotics
  - Single dose 30 minutes before procedure
  - Narrow spectrum (e.g. cefazolin)
- Skin incision
  - Large enough to *easily* admit tube
  - Smaller incision allows entrapment of bacteria
    - ⇒ postop infection

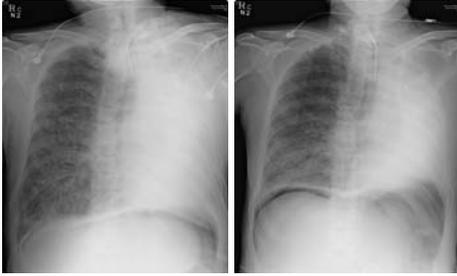
### Necrotizing Fasciitis

- Rare, devastating complication
- 43% mortality
- Initial presentation with cellulitis
- Source control essential
  - May mandate surgical closure of PEG site

### Pneumoperitoneum after PEG



### Pneumoperitoneum after PEG



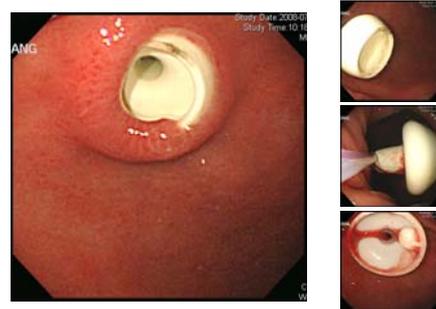
### Pneumoperitoneum after PEG

- Expected event
  - Up to 36%
- Contributing factors
  - Excessive air insufflation
  - Prolonged procedure time
  - Multiple percutaneous needle punctures of the stomach
- Peritonitis
  - <1% of PEGs
  - ~30% mortality

### Pneumoperitoneum after PEG

- No additional studies warranted unless signs of inflammation, peritonitis
- Contrast study
  - May detect gross extravasation
- CT Scan Abdomen
  - Extravasation
  - Lack of apposition with abdominal wall
  - Free fluid, suggestive of visceral perforation, hemorrhage

### Partial buried bumper syndrome



### Buried Bumper Syndrome

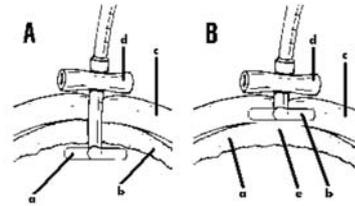
- Excessive traction on PEG tube
- Overtightening of skin disk
  - Ischemic necrosis of the gastric mucosa
  - Migration of the internal bolster into the gastric or abdominal wall
- Prevention
  - Confirm some laxity at initial insertion

### Buried Bumper Syndrome

- Findings
  - Resistance to flow
  - PEG tube fixed, with surround subcutaneous erythema
- Endoscopy
  - Ulceration, mucosal dimpling
  - Nonvisualization internal bumper

## Buried Bumper Syndrome

- Treatment
  - Dissection of the buried appliance from the abdominal wall
  - Replace with new gastrostomy tube
  - Large gastrocutaneous fistula may warrant laparotomy/resection



**Fig.1** Schematic representation of the buried bumper. (A) Tissue configuration immediately after PEG placement; (B) Tissue configuration following the application of excessive tension on the internal bumper. Such undue tension causes local gastric necrosis around the bumper, followed by gradual migration of the bumper from the gastric lumen into the gastric mucosa and wall, and then into the abdominal wall. Finally, the gastric mucosa regrows and 'seals over' the original PEG opening, resulting in loss of the connection between the PEG tube and the gastric lumen. Legend: (a) internal bumper; (b) gastric mucosa/wall; (c) abdominal wall; (d) external bolster; (e) potential space between the 'sealed off' stomach and the 'buried' internal bumper.

## Dislodgement of PEG Tube

- Concern when occurs prior to maturation of gastrocutaneous tract
- Initial Rx
  - Nasogastric suction
  - Broad spectrum antibiotics
- Surgery
  - Failure to improve
  - Overt peritonitis, sepsis

## Gastrocolocutaneous Fistula

- Early presentation
  - Drainage of feculant material at PEG site
- Late
  - Detected after tube replacement: diarrhea
- Colonic interposition during placement
  - Dx: gastrograffin study, CT scan

## Hemorrhage

- 2.5% of cases
- Repeat endoscopy indicated for Dx, possible Rx
- Often related to gastric ulceration under internal bumper
  - Pressure necrosis
  - Friction
- Caution in patients with coagulopathy

## Aspiration

- Clinically evident aspiration rare
- 50-60% mortality rate
- Related to
  - Initial illness
  - Positioning and sedation during procedure
- Monitor residuals, appropriate interventions if increased

## Tube Migration

- Inadequate stabilization
- Proximal migration
  - Vomiting, aspiration
- Migration into distal stomach
  - Gastric outlet obstruction
  - Distention, vomiting
- Distal migration (small bowel)
  - Dumping syndrome

## Balloon형 PEG change tube의 어려움

- 설명서의 ballooning water 교환 방법

- Check balloon volume every 7 to 10 days for correct inflation volume using the following steps;
- Discontinue feeding
- Use a luer-tip syringe to completely evacuate water from balloon
- Discard evacuated water
- Reinflate balloon with appropriate amount of water (20 ml).

## Balloon형 PEG change tube의 어려움

- 과거의 제품과 달리 balloon형이므로 교환은 쉽지만 tube가 빠질 위험이 높음을 설명하였음. 보호자가 10일마다 distilled water를 이용하여 아래 설명서에 언급된 바와 같이 ballooning water를 갈아주어야 함을 설명해 주시기 바랍니다. Distilled water와 syringe는 의요기 상사에서 개별구입하도록 할 수 밖에 없는 실정임을 설명해 주시기 바랍니다.
- 본 tube의 유효기간은 과거의 tube보다 짧고 설명서에는 30일마다 바꾸라고 되어 있으나 이런 짧은 교환주기를 유지하기는 현실적으로 어려우므로 사용가능한 오래 써 보고 막히거나 심하게 변색되었을 때 바꿀 수 밖에 없음.
- 단 이처럼 정해진 기간보다 오래 사용하는 경우 balloon의 누수로 인하여 tube가 빠지는 위험이 높을 수 밖에 없음. 현실적인 점을 고려하여 두 달에 한번 외래 내시경실에서 입원하지 않고 교환할 것을 추천함.