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Evidence-based resources for connection and well-being

The Evidence on Artificial Nutrition & Hydration

A Clinical Summary

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Terminal Anorexia-Cachexia Syndrome

Terminal anorexia-cachexia syndrome (TACS) is a multifactorial metabolic syndrome characterized by progressive weight loss, muscle wasting, and anorexia that cannot be reversed by conventional nutritional support. It is distinct from simple starvation and is driven by the underlying disease process rather than inadequate caloric intake.

Pathophysiology

The syndrome is mediated by pro-inflammatory cytokines released by the tumor or the host immune response:

- **IL-1 (Interleukin-1):** Suppresses appetite through direct action on the hypothalamic satiety center. Induces fever and increases resting energy expenditure.
- **IL-6 (Interleukin-6):** Drives hepatic acute-phase protein synthesis, diverts amino acids from muscle to liver, and accelerates muscle proteolysis.
- **TNF-alpha (Tumor Necrosis Factor-alpha):** Formerly called "cachectin." Directly stimulates lipolysis and muscle catabolism. Suppresses lipoprotein lipase activity.

These cytokines produce hypothalamic suppression of appetite that is distinct from the hunger experienced by a healthy person who is not eating. The patient genuinely does not experience hunger, and providing calories does not reverse the metabolic derangement — the wasting continues regardless of intake.1

Key Metabolic Features

- Increased resting energy expenditure (unlike simple starvation, where metabolism decreases).
- Preferential loss of skeletal muscle with relative preservation of visceral protein (early).
- Insulin resistance and altered glucose metabolism.
- Shift to ketone body utilization with associated reduction in hunger and mild euphoria.
- Elevated C-reactive protein and hypoalbuminemia reflecting systemic inflammation, not malnutrition.

The Evidence on Artificial Hydration

Bruera et al., 2013 — Randomized Controlled Trial

The definitive RCT on parenteral hydration in advanced cancer was conducted by Bruera and colleagues and published in the Journal of Clinical Oncology in 2013.2

Bruera et al. (JCO 2013) — Key Findings

- Design: Double-blind, placebo-controlled RCT at 7 hospice sites.
- Intervention: 1 liter/day of normal saline subcutaneously vs. 100 mL/day placebo.
- Outcome: NO significant difference in dehydration symptoms, quality of life, or survival.
- Hydration did NOT improve thirst, dry mouth, fatigue, myoclonus, or sedation.
- No difference in overall survival between groups.
- Conclusion: Routine parenteral hydration at 1L/day provides no benefit over placebo in advanced cancer patients receiving hospice care.

Morita et al., 2006 — Hydration and Symptom Outcomes

Moritaand colleagues studiedtheassociationbetweenartificialhydration volume and clinical outcomes in terminally ill cancer patients.3 Their findings demonstrated that:

- Artificial hydration was associated with worsening hypoalbuminemia, not improvement.
- Higher volumes of hydration did NOT improve electrolyte balance.
- Hydration volumes above 1L/day were associated with increased peripheral edema, pleural effusions, and ascites.
- There was no association between hydration volume and improved symptom scores.

McCann et al., 1994 — Comfort Care Outcomes

ThelandmarkobservationalstudybyMcCannandcolleagues at a comfort care unit found that among 32 terminally ill patients:4

- 63% never experienced hunger throughout their terminal illness.
- 62% never experienced thirst.
- Among those who did experience hunger or thirst, small amounts of food, sips of liquid, or mouth care completely relieved symptoms in every case.
- No patient required IV fluids or tube feeding for symptom management.

Dementia and Feeding Tubes

Finucane et al., 1999 — Systematic Review

Finucane, Christmas, andTravispublisheda landmark systematic review in JAMA examining the evidence for percutaneous endoscopic gastrostomy (PEG) tube feeding in patients with advanced dementia.5 Their conclusions were unequivocal:

Finucane et al. (JAMA 1999) — Key Findings

- No evidence that tube feeding prevents aspiration pneumonia in dementia patients.
- No evidence that tube feeding improves survival in advanced dementia.
- No evidence that tube feeding reduces the incidence of pressure injuries.
- No evidence that tube feeding improves nutritional parameters in a clinically meaningful way.
- Tube feeding was associated with significant complications: aspiration of tube feeds, tube site infections, agitation requiring restraints, and diarrhea.

AGS Position Statement, 2014

TheAmerican GeriatricsSociety (AGS) published a position statement in 2014 recommending against the use of feeding tubes in patients with advanced dementia:6

- "Feeding tubes are not recommended for older adults with advanced dementia. Careful hand feeding should be offered instead."
- This position is consistent with the Choosing Wisely campaign and is endorsed by major geriatric and palliative care organizations.
- The statement emphasizes that hand feeding — even small tastes — preserves human connection, dignity, and the pleasure of oral sensation.

Palecek et al., 2010 — Comfort Feeding Only

Palecekand colleaguesproposedthe "comfort feeding only" (CFO) framework as an alternative to the binary choice between feeding tube and "no feeding."7 Key elements:

- Small amounts of food and liquid are offered for comfort, pleasure, and human connection — not to meet caloric goals.
- Feeding stops when the patient shows signs of distress: coughing, grimacing, turning away, holding food in the mouth.
- The focus is on the patient's experience, not the volume consumed.
- The term "comfort feeding only" was deliberately chosen to replace "no tube feeding" — reframing the conversation from what is being withheld to what is being provided.

Medications and Appetite: Clinical Considerations

Severalmedications affectappetiteinthe terminalsetting. Cliniciansshould be aware of both appetite-suppressing effects of necessary medications and the limited role of appetite stimulants.

Medication	Effect on Appetite	Clinical Notes
Opioids (morphine, oxycodone, hydromorphone)	Suppress appetite; nausea common at initiation	Nausea typically resolves in 3-5 days. Antiemetics may be needed during titration.
Dexamethasone (corticosteroid)	Short-term appetite stimulation (days to weeks)	Effect is temporary. Useful for specific goals (e.g., family visit). Side effects increase with duration.
Antiemetics (ondansetron, metoclopramide)	May improve intake by reducing nausea	Metoclopramide also has prokinetic effects. Avoid in bowel obstruction.
Megestrol acetate (Megace)	Appetite stimulant; modest effect on weight	Weight gain is primarily fluid and fat, not lean muscle. Increased thromboembolic risk. Not recommended in most end-of-life settings.
Dronabinol (Marinol)	Mild appetite stimulation	Mixed evidence. May cause confusion or sedation in elderly patients.

Ethical and Legal Framework

Theethics offorgoingartificialnutritionandhydration (ANH) are well-established in medical ethics, law, and professional position statements.

Key Ethical Positions

- **American Nurses Association (ANA), 2017:** "The provision or forgoing of nutrition and hydration... should be guided by the goals of care, the patient's wishes and values, and the best available evidence." Forgoing ANH is ethically permissible when it no longer benefits the patient.8
- **American Medical Association (AMA):** ANH is considered a medical treatment, not basic care. Like any medical treatment, it can be withheld or withdrawn when it no longer serves the patient's goals.
- **Principle of non-maleficence:** When ANH causes suffering (aspiration, edema, secretions) without providing benefit, continuing it violates the fundamental ethical principle of "do no harm."

- **Legal precedent:** The right to refuse medical treatment, including ANH, is well-established in U.S. law (Cruzan v. Director, Missouri Department of Health, 1990).

Critical Ethical Distinction

- Forgoing artificial nutrition and hydration is ethically distinct from causing death.
- The patient dies from the underlying disease, not from the withdrawal of ANH.
- The intent is to relieve suffering, not to hasten death.
- This is consistent with all major medical ethics frameworks and is legally protected.

Clinical Assessment Checklist

Use this checklist when assessing the role of nutrition and hydration in a terminally ill patient:

1. Assess current oral intake and trend over the past 1-2 weeks.

2. Evaluate for reversible causes of decreased intake: untreated nausea, oral thrush, pain, constipation, depression, medication side effects.

3. Review prognosis: Is the patient in the last weeks to days of life? If yes, TACS is likely and ANH is unlikely to provide benefit.

4. Assess for symptoms of dehydration vs. symptoms of overhydration. Determine which is more likely causing distress.

5. Elicit patient's wishes (advance directive, previously expressed preferences, POLST/MOLST).

6. Explore family understanding and cultural/religious considerations.

7. If ANH is in place, assess for complications: edema, increased secretions, aspiration, nausea, site infection.

8. Document the clinical rationale for initiating, continuing, or forgoing ANH.

9. Provide education to family using evidence-based resources.

10. Schedule follow-up to reassess goals and symptom management.

Documentation Requirements

When forgoing or withdrawing ANH, document the following:

- Clinical rationale: prognosis, TACS diagnosis, risk-benefit analysis.
- Patient wishes: advance directive content, previously expressed preferences, surrogate decision-maker identification.
- Family meeting summary: who was present, what was discussed, level of understanding and agreement.
- Cultural/spiritual considerations and accommodations.
- Comfort care plan: mouth care protocol, symptom management, monitoring plan.
- Ethics consultation (if obtained).

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