



## Fast Facts Core Curriculum

### Nutrition Hydration

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## FAST FACTS AND CONCEPTS #10 TUBE FEED OR NOT TUBE FEED?

James Hallenbeck MD

**Background** Tube feeding is frequently used in chronically ill and dying patients. The evidence for much of this use is weak at best. The Fast Fact reviews data on the use of tube feeding in advanced illness.

### For prevention of aspiration pneumonia

- Numerous observational studies have demonstrated a high incidence of aspiration pneumonia in those who have been tube fed. Reduction in the chance of pneumonia has been suggested for non-bed-ridden post-stroke patients in one prospective, non-randomized study. For bedridden post-stroke patients, no reduction was observed.
- Three retrospective cohort studies comparing patients with and without tube feeding demonstrated no advantage to tube feeding for this purpose.
- Swallowing studies, such as videofluoroscopy, lack both sensitivity and specificity in predicting who will develop aspiration pneumonia. Croghan's (1994) study of 22 patients undergoing videofluoroscopy demonstrated a sensitivity of 65% and specificity of 67% in predicting who would develop aspiration pneumonia within one year. In this study no reduction in the incidence of pneumonia was demonstrated in those tube fed.
- Swallowing studies may be helpful in providing guidance regarding swallowing techniques and optimal food consistencies for populations amenable to instruction. See *Fast Fact #128* for discussion of the role of swallowing studies.

### For life prolongation via caloric support

- Data is strongest for patients with reversible illness in a catabolic state (such as acute sepsis).
- Data is weakest in advanced cancer. No improvement in survival has been found (see exceptions noted below).
- Individual patients may have weight stabilization or gain with tube feeding. However, when cohorts of patients have been studied in non-randomized retrospective or prospective studies, no survival advantage between tube fed and hand fed cohorts has been demonstrated.
- Tube feeding may be life-prolonging in select circumstances:
  - Patients with good functional status and proximal GI obstruction due to cancer
  - Patients receiving chemotherapy/XRT involving the proximal GI tract.
  - Selected HIV patients
  - Patients with Amyotrophic Lateral Sclerosis

### For enhancing quality of life

- Where true hunger and thirst exist, quality of life may be enhanced (such as in very proximal GI obstruction).
- Most actively dying patients (see *Fast Fact #3*) do not experience hunger or thirst. Although dry mouth is a common problem, there is no relation to hydration status and the symptom of dry mouth – see *Fast Fact #133*.
- A recent literature review using *palliative care* and *enteral nutrition* as search terms found no studies demonstrating improved quality of life through tube feeding (results were limited to a few observational studies).
- Tube feeding may adversely affect quality of life if patients are denied the pleasure of eating.

## Summary

Although commonly used, current data does not provide much support for the use of artificial enteral nutrition in advanced dementia, or in patients on a dying trajectory from a chronic illness. A recommendation to use, or not use, tube feeding should be made only after first establishing the overall *Goals of Care* (see *Fast Fact #16*). Recommendations for how to discuss the issue tube feeding with patients/families can be found in *Fast Fact #84*.

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**FAST FACTS AND CONCEPTS #84**  
**SWALLOW STUDIES, TUBE FEEDING, AND THE DEATH SPIRAL****David E Weissman MD**

**Introduction** The reflex by families and doctors to provide nutrition for the patient who cannot swallow is overwhelming. It is now common practice for such patients to undergo a swallowing evaluation and if there is significant impairment to move forward with feeding tube placement (either nasogastric or gastrostomy) – see *Fast Fact #128*. Data suggest that in-hospital mortality for hospitalizations in which a feeding tube is placed is 15-25%, and one year mortality after feeding tube placement is 60%. Predictors of early mortality include: advanced age, CNS pathology (stroke, dementia), cancer (except early stage head/neck cancer), disorientation, and low serum albumin.

**The Tube Feeding Death Spiral** The clinical scenario, the *tube feeding death spiral*, typically goes like this:

1. Hospital admission for complication of “brain failure” or other predictable end organ failure due to primary illnesses (e.g. urosepsis in setting of advanced dementia).
2. Inability to swallow and/or direct evidence of aspiration and/or weight loss with little oral intake.
3. Swallowing evaluation followed by a recommendation for non-oral feeding either due to aspiration or inadequate intake.
4. Feeding tube placed leading to increasing “agitation” leading to patient-removal or dislodgement of feeding tube.
5. Re-insertion of feeding tube; hand and/or chest restraints placed.
6. Aspiration pneumonia.
7. Intravenous antibiotics and pulse oximetry.
8. Repeat 4 – 6 one or more times.
9. Family conference.
10. Death.

Note: at my institution, the finding of a dying patient with a feeding tube, restraints, and pulse oximetry is known as *Weissman’s triad*.

**Suggestions**

- Recognize that the inability to maintain nutrition through the oral route, in the setting of a chronic life-limiting illness and declining function, is usually a *marker of the dying process*. Discuss this with families as a means to a larger discussion of overall end of life goals.
- Ensure that your colleagues are aware of the key data and recommendations on tube feedings (see *Fast Fact #10*).
- Ensure there is true informed consent prior to feeding tube insertion—families *must* be given alternatives (e.g. hand feeding, comfort measures) along with discussion of goals and prognosis.
- Assist families by providing information and a clear recommendation for or against the use of a feeding tube. Families who decide against feeding tube placement can be expected to second guess their decision and will need continued team support.
- If a feeding tube is placed establish clear goals (e.g. improved function) and establish a timeline for re-evaluation to determine if goals are being met (typically 2-4 weeks).

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## **FAST FACTS AND CONCEPTS #128**

### **THE SPEECH PATHOLOGIST AND SWALLOWING STUDIES**

**Carol Monteleoni MS, CCC-SLP**

**Background** Speech pathologists can facilitate communication among members of the medical team, and between the team and the patient/family, to make treatment decisions that honor patient wishes. Speech pathology services for symptom control to enable the individual to maintain activities of daily living and basic functional skills are reimbursable under the Medicare Hospice Benefit (see *Fast Facts* #82, 87, 90). Swallowing studies are used to evaluate a patient's ability to safely ingest oral food and oral secretions, yet the role of swallowing studies to facilitate optimal care near the end of life is not clear. This *Fast Fact* will review the indications and contraindications for a swallowing study and the role of the speech pathologist.

#### **Potential Indications for a swallowing evaluation (Bedside or Instrumental)**

- Acute stroke or other neurological condition affecting oral motor function (see *Fast Facts* #201, 300).
- Tracheostomy or recent endotracheal extubation.
- Changes to oropharyngeal anatomy secondary to tumor, surgery, trauma, etc.
- Observed difficulty swallowing food or liquid.
- Recurrent upper respiratory infections or pneumonias.
- Reduced oral food intake; unexplained weight loss or fever.

#### **Contra-indications for swallowing evaluation (Instrumental only)**

- Imminent death—death expected within 2 weeks (See *Fast Fact* #3).
- Death expected within weeks from any progressive terminal illness.
- Reduced level of arousal (e.g. coma/obtundation).

#### **Types of swallowing studies**

- **Bedside dysphagia evaluation** involves an in-depth feeding/swallowing history, oral peripheral examination, and trial swallows of various food consistencies. Bedside evaluation cannot rule out silent aspiration.
- **Instrumental swallowing evaluation** is performed via modified barium swallow (videofluoroscopy), fiber-endoscopic evaluation of swallowing (FEES), or fiber-endoscopic evaluation of swallowing with sensory testing (FEEST). All of these instrumental assessments require the patient to be alert, cooperative, and able to follow simple commands.

**Speech Pathologist Role** The decision to perform a swallowing evaluation should be made based on the overall *goals of care* and expected prognosis. Consultation with your speech pathologist **prior** to ordering an evaluation can help clarify how you will use any new information to improve patient comfort and satisfaction. If performed, the speech pathologist will evaluate the patient's swallowing and recommend feeding strategies which may include:

- Appropriate food consistencies.
- Positioning of the head and neck.
- Timing of meals
- Promoting family involvement.

**Using the Speech Pathologist's Assessment** Decisions regarding feeding management *should not* be made based solely upon the speech pathologist's assessment of swallowing dysfunction, which may be a sign of the final stage of life in many terminal conditions. In addition, feeding tube placement decisions in this population *should not* be based on the likelihood of aspiration. In patients with advanced dementia and other terminal conditions, feeding tubes have not been found to reduce the incidence of aspiration and can significantly impair the dying patient's quality of life (see *Fast Facts* #10, 84).

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FAST FACTS AND CONCEPTS #133  
**NON-ORAL HYDRATION IN PALLIATIVE CARE**

**Robin Fainsinger MD**

**Background** At the center of the debate with regard to hydration in terminally ill patients is the desire to maintain comfort and avoid unnecessary/distressing procedures. There is no controversy that terminally ill patients should be encouraged to maintain adequate oral hydration for as long as possible. However there is debate and controversy around the use of parenteral hydration. This *Fast Fact* discusses medical decision-making about non-oral hydration in palliative care settings; *Fast Fact* #134 discusses techniques of hydration.

**Arguments Against Hydration**

- Comatose patients do not experience symptom distress.
- Parenteral fluids may prolong dying.
- With less urine there is less need to void and use catheters.
- With less gastrointestinal fluid there can be less nausea and vomiting.
- With less respiratory tract secretions there can be less cough and pulmonary edema.
- Dehydration can help reduce distressing edema or ascites.
- Dehydration may be a “natural” anesthetic to ease the dying process.
- Parenteral hydration can be uncomfortable (e.g. needles/catheters) and limit patient mobility.

**Arguments For Hydration**

- Dehydration can lead to pre-renal azotemia, which in turn can lead to accumulation of drug metabolites (notably opioids), leading to delirium, myoclonus and seizures. Hydration can reverse these symptoms in some patients leading to improved comfort.
- There is no evidence that fluids prolong the dying process.
- Providing hydration can maintain the appearance of “doing something,” even though there may be no medical value, and thus ease family anxiety around the time of death.

**Ethical/Legal Issues** In the United States, the following ethical/legal standards exist:

- Competent patients or their surrogates can accept or refuse hydration based on relevant information.
- Non-oral hydration is considered a *medical intervention*, not *ordinary care*. As such, there is no legal or ethical imperative to provide it unless the benefits outweigh the burdens.

**Recommendation** There is published medical literature to support both the use of, and the withholding of, non-oral hydration in patients near death; thus, there is no consensus on the single best approach to care. A Cochrane review of 6 relevant studies showed that sedation and myoclonus were improved with hydration in adult palliative care patients; however, discomfort from fluid retention was significantly higher in the hydration group and survival seemed to be the same between the groups. Key issues to be considered when determining the role of non-oral hydration include the following:

- Expressed wishes of the patient or surrogate decision-maker regarding use of hydration.
- Patient-defined goals; the presence of a specific goal may direct the clinician to use hydration as a means to improve delirium and potentially delay death.
- Symptom burden: symptoms related to total body water excess may improve by withholding hydration, while delirium may lessen with hydration.
- Burden to the patient and caregivers of maintaining the non-oral route of hydration.
- Family distress concerning withholding hydration/nutrition.
- When in doubt, a time limited hydration trial is an appropriate recommendation.



**Clinician Self-Reflection** Finally, it is important to recognize that health care providers often have biases for or against non-oral hydration near the end-of- life. Self-reflection upon these biases is crucial to help patients and families make decisions that are based on the best interests and goals of the patient/family unit.

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FAST FACTS AND CONCEPTS #134  
**NON-ORAL HYDRATION TECHNIQUES IN PALLIATIVE CARE**

**Robin Fainsinger MD**

**Background** The decision to use or withhold non-oral hydration near the end-of-life is complex (see [Fast Fact #133](#)). This Fast Fact reviews the technical aspects of providing non-oral hydration. [Fast Fact #190](#) discusses the related issue of parenteral nutrition in advanced cancer patients.

**Nasogastric and Gastrostomy Tubes** The use of enteral feeding tubes to provide nutrition is beyond the scope of this *Fast Fact* (see [Fast Facts #10, 84](#)). If already in place, enteral feeding tubes provide easy access for supplemental hydration. Placement of enteral tubes solely for hydration management in the last few weeks of life is generally not indicated, as other less burdensome methods of hydration can be provided (see below).

**Intravenous Hydration** This method includes hydration via peripheral or central catheters. For short-term use, especially as a time-limited trial, intravenous hydration is a reasonable step. However, both peripheral and central catheters are plagued with problems of site selection, placement, and maintenance; clot formation; local skin irritation; and local or systemic bacterial infections.

**Hypodermoclysis (subcutaneous infusions)** Hypodermoclysis offers a number of advantages compared to the intravenous route due to greater ease of site access, the possibility of temporary disconnection to facilitate patient mobility, and ease and suitability for home administration. Thrombocytopenia may be a relative contraindication. Solutions with electrolytes should be used (e.g. 0.9% sodium chloride), as non-electrolyte solutions (e.g. 5% dextrose) can draw fluid into the interstitial space. Continuous infusion rates up to 120 ml/hr have been reported; patients can tolerate boluses of up to 500 ml/hr two to three times per day. Traditionally the use of hyaluronidase to promote absorption was recommended. More recent experience has demonstrated that most patients will achieve good absorption of subcutaneous fluids without hyaluronidase. Winged infusion sets with 25 – 27 gauge needles are recommended.

The upper chest is the commonly used site for hypodermoclysis. Utilization of the lower abdomen and upper thigh as sites for hypodermoclysis can be associated with scrotal edema in males. Most experts recommend avoiding the upper arm as a site for hypodermoclysis. Check the site frequently for redness, irritation, excessive edema, or a dislodged needle. If there is a problem with absorption it is recommended to a) slow the infusion rate and consider using an infusion pump, or b) consider dividing the total volume into two separate subcutaneous sites.

**Rectal Hydration (proctoclysis)** Rectal hydration is an alternative only when other resources are not available. A 22 French nasogastric catheter can be inserted approximately 40 cm into the rectum. The patient can be positioned as for any rectal procedure. Tap water can be used, and the rectal infusion increased from 100 ml to a maximum of 400 ml per hour, unless fluid leakage occurs before the maximum volume is achieved. The majority of patients can successfully tolerate this approach at a volume of 100 to 200 ml per hour.

**Fluid Volumes** For all routes, a reasonable goal is 1-1.5 L/day in fluid volume.

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**FAST FACTS AND CONCEPTS #190  
PARENTERAL NUTRITION IN ADVANCED CANCER PATIENTS**

**Mehrnoush Mirhosseini MD and Robin Fainsinger MD**

**Background** Concerns about anorexia and weight loss are commonly expressed by advanced cancer patients and their families. Parenteral nutrition is a controversial and expensive treatment that is sometimes considered to assist with nutrition in advanced cancer patients. PN involves the intravenous delivery of a mixture of lipids, carbohydrates, amino acids, vitamins, and minerals. This *Fast Fact* reviews the role of PN in advanced cancer patients.

**The Problem** Weight loss in advanced cancer is frequently due to insufficient caloric intake as well as cancer-mediated hypermetabolism and hypercatabolism. These latter problems are caused by catabolic proinflammatory cytokines and eicosanoids and are responsible for much of the accelerated muscle wasting (cachexia) seen in advanced cancer. Patients and families frequently worry about malnutrition and starvation and request help from physicians to ameliorate these.

**The Role of PN** PN is usually considered outside the standard of care for most patients with advanced cancer. This is based on clinical research findings and other observations:

1. With a few specific exceptions (such as head and neck cancer patients undergoing radiation therapy), caloric supplementation of any kind has not been shown to benefit advanced cancer patients, and – if indicated – can almost always be achieved enterally.
2. There is no physiologic basis to assume that PN would affect the inflammatory and catabolic aspects of cachexia.
3. PN brings potential risks and burdens: laboratory testing, indwelling intravenous lines, infections, metabolic derangements, liver and pancreatic dysfunction.

Patients with progressive weight loss should have careful clinical assessments for potentially reversible causes (such as inadequate caloric intake or depression). Education and emotional and family support are the cornerstones of treatment otherwise. Drug interventions are an active focus of research although their efficacy remains controversial (see *Fast Facts* #93, 100).

**PN guidelines** There does remain however a small subset of advanced cancer patients for whom PN may be an appropriate therapy to improve quality and/or length of life. The following guidelines have been suggested to identify patients appropriate for PN:

- Enteral nutrition (including tube feeding) is not an option or there is a specific benefit expected from parenteral nutrition (e.g. inoperable malignant bowel obstruction, short bowel syndrome, and malabsorption). These are patients for whom a non-functional GI tract, and not cachexia itself, is the major problem.
- Death is probable from starvation or malnutrition earlier than anticipated from disease progression alone.
- The patient has a life expectancy of at least several months to allow a proper trial of PN (Karnofsky Performance Scale Score >50 or ECOG performance status ≤2).
- The patient has a good self-assessed quality of life; life-prolongation is consistent with their goals of care and the potential risks of PN are acceptable to the patient.
- The patient or caregiver can safely accommodate PN if at home: the home environment is safe and clean; someone is able to set-up and administer the PN; and the patient can be clinically monitored, including laboratory investigation.
- Typically close monitoring of electrolytes, liver and renal function, and triglycerides is required. In addition, careful assessments of the patient's response to treatment and global clinical course are needed to ensure PN remains an appropriate intervention.

**Summary**

PN can be an important palliative treatment, but for only a small group of cancer patients. Careful patient selection and monitoring is important to ensure that PN is meeting patient-defined goals of care.

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**FAST FACTS AND CONCEPTS #220  
HYPODERMOCLYSIS****Arif H Kamal MD and Eduardo Bruera MD**

**Background** This *Fast Fact* discusses subcutaneous fluid infusions, also known as hypodermoclysis (HDC). The use of parenteral hydration in dying patients is controversial and is discussed in *Fast Fact* #133. While this *Fast Fact* discusses subcutaneous fluid infusions for purposes of hydration, similar techniques can also be used to deliver medications (see *Fast Fact* #28).

**Historical and Current Practice** Hypodermoclysis was a widely accepted route for parenteral hydration in the 1940s and 1950s before falling out of favor after several reports of adverse reactions, likely related to the use of hypertonic and electrolyte-free solutions. Due to its ease of use, and subsequent research demonstrating its safety and efficacy, HDC has become more widely used. In the US, HDC is mostly used in geriatric and palliative care settings, although it is used more widely elsewhere in the world.

**HDC vs. Intravenous Hydration** Decisions for parenteral hydration in dying patients are complex and individual decision making is paramount. When parenteral hydration is indicated, clinicians are generally faced with a decision to use HDC or intravenous (IV) hydration (see *Fast Fact* #134).

- **Advantages of HDC over IV:** Starting and maintaining a subcutaneous infusion catheter is relatively pain-free. It can be done by trained patients or family caregivers, preventing the need for frequent skilled nursing visits or trips to medical centers to maintain a working IV. HDC provides greater potential sites for needle placement (arm, back, abdomen, thighs), and equipment costs are generally lower than with IVs. Subcutaneous catheters can be easily disconnected from IV tubing and re-used later, allowing a patient to receive intermittent fluid treatments. Portable infusion devices are not needed with HDC. HDC infusions may also cause less agitation in patients with dementia versus IV (1).
- **Disadvantages:** HDC is limited by a continuous infusion rate of 1-2 ml/min or 1.5-3 L/day (2). This is adequate for most clinical situations, and additional catheters can be added if needed. Bolus infusions (up to 500 ml/hour) are possible with HDC, but often require hyaluronidase (see below). Both HDC and IV infusions have similar rates of local adverse events (e.g. erythema, cellulitis) and lifespan of infusion site (3). HDC can be technically difficult in patients with substantial peripheral edema, as well as in cachectic patients with little subcutaneous tissue. Patients and families may have pre-conceived attitudes about greater benefits with IV routes even while acknowledging increased burden (4).

**Technique**

- **Equipment needed:** Small butterfly needle (usually 22 gauge) or angiocatheter, skin preparation (alcohol or iodine), sterile occlusive dressing, solution bag (saline or saline-dextrose combination), tubing with drip chamber. The use of an electrolyte free solution like 5% dextrose is discouraged due to third-spacing risks which can cause tissue sloughing or rarely circulatory collapse.
- **Procedure:** After cleaning the local site, insert the needle bevel up into the subcutaneous tissue. Attach to fluid and tubing and cover with occlusive dressing. Select an infusion fluid and set drip rate or fluid bolus. Normal saline (NS) is typically used although half-normal saline or 2/3 D5W in 1/3 NS have been used in clinical practice. Drip rates can be set to 20-125 ml/hour with gravity (no pump required) or 1-2 ml/minute. Some patients may prefer drips set to gravity 24 hours per day at a low rate (e.g. 50 ml/hour), overnight hydration (e.g. 100 ml/hour), or intermittent fluid boluses (e.g. 500 ml). The volume of infusion needed to keep acceptable levels of hydration in many palliative care patients is lower than healthy patients and postulated to be ~1 L/day (5). No evidence exists for the



frequency of site change. Some change only when there are symptoms or needle displacement while others choose a fixed time (e.g. every 3 or 7 days) or fluid volume (e.g. every 1.5 L). Teflon cannulas, although expensive, can be used for a week and are helpful for patients who have trouble maintaining a catheter site (6). Local anesthetic creams may be helpful during catheter placement to reduce discomfort, especially in children.

- **Recombinant human hyaluronidase:** RHH is an enzyme that temporarily lyses the subcutaneous interstitial space to promote diffusion of fluid. It can be used for site discomfort or if a faster rate of absorption is desired. Previous preparations were of bovine origin and were associated with local allergic reactions, anaphylaxis, and pain, making its role controversial. RHH has shown no human allergenicity (7). Recent studies have investigated RHH versus placebo in a randomized trial with gravity-driven infusion. The RHH group showed higher obtainable fluid rates, decreased discomfort, and similar local reactions. Doses of 150 U to 750 U given as steady push prior to the infusion can yield fluid rates of 380 to 520 ml/hour (8).

**Cautions** Uncommon local reactions include edema, local pain, or erythema. Interventions include slowing the rate, changing the site, or using RHH. Rare complications include cellulitis and vascular puncture. Systemic complications such as pulmonary edema can occur with all types of artificial hydration.

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## FAST FACTS AND CONCEPTS # 318 PROPHYLACTIC FEEDING TUBES IN HEAD AND NECK CANCERS

Samuel Hardy MD, Krista Haas APN, Vincent J. Vanston MD, Mark Angelo MD

**Clinical Background** Patients with head and neck cancer are at risk for reduced oral intake resulting from swallowing difficulties caused by their cancer treatment or obstructive tumors (1,2). International guidelines recommend feeding tube placement for these patients when such swallowing difficulties lead to malnutrition or hunger (3). This indication for feeding tube placement is distinct from feeding tube placement for anorexia and cachexia from progressive cancer, which has been generally discouraged by most experts and clinical guidelines (4) -- see *Fast Fact #10*. Many clinicians now recommend prophylactic feeding tube placement, or feeding tube placement prior to the onset of cancer treatment or the onset of swallowing difficulties, in the hopes of preventing malnutrition especially among head and neck cancer patients with curative goals of care (5).

Unfortunately, there is a paucity of robust clinical trials comparing the use of prophylactic feeding tube placement in head and neck cancer versus a “watch and wait” approach in which feeding tube placement is considered only when swallowing difficulties and/or malnutrition arise. Therefore, patient values and clinician preference may end up being stronger factors in clinical decision-making than the current body of medical evidence. As such, palliative care clinicians may get involved in this clinical-decision making process to foster optimal patient centered care. This *Fast Fact* will review some of the benefits and burdens of prophylactic feeding tube placement in head and neck cancer patients.

**Head and Neck Cancer Patients Who May Need Feeding Tubes** A single-institution retrospective review suggested that the following factors may be independently associated with the eventual need for feeding tube placement in head and neck cancer patients (6):

- Body mass index < 25 (at baseline)
- A tumor T classification (which relates to the original size and/or location of the primary tumor)  $\geq 3$
- A cumulative cisplatin dose of 200 mg/m<sup>2</sup>

### Potential Risks of Feeding Tube Placement in Head and Neck Cancer

- *Procedure-related morbidity*: A retrospective review of percutaneous endoscopy gastrostomy (PEG) tube placement in head and neck cancer (included both prophylactic feeding tube placement and other) showed a procedure-related morbidity rate of 7.4% (7). Post-procedure complications include tube dislodgement and cellulitis.
- *Hospitalizations*: The hospitalization rate for PEG-related complications in that review was 7.8% (7).
- *Dysphagia leading to gastrostomy tube dependence*: PEG feeding is associated with paryngo-esophageal and upper esophageal stricture attributable to muscle disuse and atrophy from reduced swallowing. While, there is a clinical concern prophylactic PEG feedings can increase the risk for long term dysphagia, a prospective study of head and neck cancer patients receiving prophylactic PEG tubes showed that 86% were able to have the PEG tubes removed within 1 year (8).
- *Metastasis*: Although rare, metastasis of primary tumor to the gastrostomy site has been reported (9).

**Comparative Evidence** Although the comparative evidence is not robust, retrospective and prospective studies have compared prophylactic versus as needed feeding tube placement in head and neck cancer patients receiving chemoradiotherapy.

- *Nutritional outcomes*: One clinical trial showed modest improvement in malnutrition in the prophylactic group (10). Among other lower quality studies, no consistent difference in BMI at

6 months post-treatment or amount of weight loss during and at the end of treatment have been identified (11-17).

- *Unplanned interruptions of chemoradiotherapy*: Only one of five studies found that prophylactic feeding tube placement prevented unplanned interruptions of chemotherapy or radiotherapy (11-15).
- *Disease-free survival*: appears to be similar in both approaches (10, 13-17).
- *Quality of life*: Feeding tubes can be associated with psychological suffering from interference with family life, intimate relationships, and social activities (18). However, two non-blinded, prospective, randomized trials suggested that, following an initial decline, prophylactic gastrostomy placement *may* improve quality of life at 6 months for patients with unresectable squamous cell cancers treated with radiation and chemotherapy (10,14).

**Recommendations** To best assist head and neck cancer patients with this challenging clinical dilemma, clinicians should first identify the intent of therapy and prognosis. In cases in which it is clear that the patient is experiencing refractory cachexia from an untreatable terminal cancer, feeding tube placement should be avoided. In other cases, clinicians may wish to frame the issue around trade-offs – “*What are the trade-offs you are and are not willing to make at this point in your medical care?*” For patients who prioritize the pleasure from oral feeding or would find the potential interruptions to their family or social life from tube feeding placement (e.g. PEG-related hospitalizations) particularly objectionable, a “watch and wait” approach should be supported by treating clinicians. In other patients who prioritize maximizing nutritional status as they undergo an often grueling cancer treatment, prophylactic feeding tube placement may be prudent, especially if known risk factors are present.

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