Promoting Food to Decrease the Tube

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Disclosure Information

GOLDIE AND VALERIE HAVE NO FINANCIAL INTEREST OR POTENTIAL CONFLICTS OF INTERESTS
Objectives

• Assess for readiness to begin the tube feeding weaning process as well as identify what can be done to prepare for the weaning process
• Discuss the type of medical/behavioral approach for the more complex patients
• Described process to foster ongoing dialogue with the families about the process

Definition of Tube Dependence

“A tube-dependent child remains tube fed although his/her medical condition and developmental potential would allow the transition to oral nutrition.”


Prevalence of G-tube Placement

• G-tubes were placed during 64,412 admissions
• Surgical gastrostomy rates increased by 19%
• The highest increase among children <1 year: 32%
• PEG rates did not increase
• Lifeline for babies

Approach to Tube Weaning

1. Start transition at time of G-tube placement!
2. Assess child/caregiver readiness cues for weaning
3. Optimize medical and nutritional management
4. Optimize hunger
5. Consider referral for a behavioral team approach

To Wean or Not to Wean

- Neurological impairment, unable to swallow
- Dysphagia, aspiration on all thickness of fluid
- Uncontrolled medical symptoms (asthma, seizures)
- Weight loss with decreasing z-scores (moderate & severe malnutrition)
- Unable to meet fluid and nutritional needs without enteral feeding
- Feeding intolerance and sensitivity to changes

Begin transition with G-tube Placement

- Offer non-nutritive opportunities
- Provide tube feeding while seated in high chair
- Offer oral feeds around bolus feeds
- Offer blended formula (i.e. Real Foods Formula) for older children
- Identify readiness cues and begin weaning process early
Assess Readiness Cues

- Able to wean
  - Child Factors
    - Swallowing safety
  - Caregiver factors
    - Interest/Ability to feed orally
    - Desire for wean tube
    - Ability to follow through

Readiness Cues: Child

- Tolerating tube feeding
- Is "safe" to initiate and/or resume oral feeding
- Skills to eat (normal swallow, ability to chew)
- Hunger cues (shows interest in eating, watches others)
- Developmentally appropriate (able to understand simple commands, able to sit in a chair)
- Underlying medical/comorbid conditions managed

Readiness Cues: Caregiver

- Able to identify hunger cues in the child
- Able to tolerate child not gaining weight
- Agree to reduce feeds sufficiently to stimulate hunger
- Motivated to wean child from tube feeding
Optimize Medical Management

**Constipation**
- Identify etiology: common
  - Diet
  - Liquid intake
  - Slow emptying

**Manage:**
- Fiber supplement
- Laxative/stool softener
- Stimulant
- Behavior

**Vomiting**
- Identify etiology: common
  - GERD
  - Feeding intolerance
  - Gastroparesis

**Manage:**
- Reflux medications
- Change in formula

Optimize Nutritional Management

**Appropriate method for measuring**
- Weight for height (<24 months) WHO Growth Chart
- BMI (>24 months) CDC Growth Chart

**Weight gain is adequate based on z-score trend**
- Age-appropriate
- Catch-up weight gain

Optimize Nutritional Management

- Wean from J-tube to G-tube: note location of tube
- Tolerates higher calorie formula: note concentration
  - Formula (Pediasure, Pediasure 1.5, Nutren Jr, Peptamen Jr)
  - Blended tube feeding
- Tube feeding schedule: note tolerance and sensitivity with changes
  - Accepts tastes or input around mouth
  - Tolerance with oral feeds and tube feeds
Optimize Hunger

Hunger-Satiety Cycle is mediator for:
- Acquisition of feeding skills
- Self-regulation
  - Hunger (I want to eat) – start eating
  - Satiety (I am full) – stop eating
  - Satiation (I am satisfied) – interval

Citation Presenting Problem Outcome
- Chinuk, R. (2014) Cystic Fibrosis Improved weight
- Sant’Anna, A. (2014) Feeding Disorder Improved appetite
- Merhar, S. (2016) Feeding Intolerance Improved symptoms

Cyproheptadine

- First generation H1- antihistamine
- Lipophilic: crosses blood-brain barrier into CNS
- Side effects: increased appetite, sedation, irritability, abd. pain
- Works by improving with gastric accommodation
- Dosing: 0.25 mg/kg/day divided BID or TID
- Recommend cycling
- Evidence: Strong
### Use of Cyproheptadine in Young Children With Feeding Difficulties and Poor Growth in a Pediatric Feeding Program

Retrospective chart review, 2007 - 2011

Patients in behavioral-based feeding program with poor weight gain received CY

N=127  comparison =82

Not receiving Tube Feeds

Dose 0.25 mg/kg/day divided

96% of parents report positive change in mealtime & feeding behavior

Improvement in mean Wt Z after starting CY compared with wt Z before

### Megastrol Acetate (Megace)

- Synthetic progesterone derivative
- Dose: 10 mg/kg/day
- Central hypothalamic effect and may lead to adrenal suppression

19 children with malignant cancer were retrospectively reviewed

Positive weight gain median of 1kg (z-score of 0.36) after 3 to 6 weeks; decrease in cortisol levels after taking MA for median of 42 days. Had 1 death; Orme, L (2003)

- Evidence: Mixed

### Prokinetics

  - Enteral intolerance
  - Dysmotility (delayed gastric emptying)
  - Anecdotally shown to improve symptoms
- Drug: Erythromycin
- Dose:
- Evidence: Lack of studies
Gabapentin

Gabapentin Improves Oral Feeding in Neurologically Intact Infants with Abdominal Disorders (2018)

- Mechanism: visceral hyperalgesia increases pain receptors
- At risk: abdominal wall disorders or surgery, G-tube/Nissen
- Gabapentin may improve enteral and oral feeding tolerance
- Clinical Vignette: full oral feeds obtained in 3 patients within 3 to 4 months of starting gabapentin
- Evidence: Not strong; small sample size, case studies

Davis, (2015)

Tube Feeding Manipulation

- Goal: weight maintenance
  - Start with 10% decrease
  - Stop >10% weight loss
- Systematic adjustment of tube feeds:
  - Bolus feeds
  - Overnight feeds
  - Increase rate
  - Decrease caloric density of formula (i.e. 30 to 24 calories)

Behavioral Team Approach

- Outpatient Program
  - Length varies: up to 18 months
- Day Treatment Program
  - Length: 4 to 6 weeks
- Inpatient Treatment Program
  - Length: 2 to 3 weeks
- Online: Notube®
  - Length: 90 days “coaching”
### Behavioral Intervention: Evidence

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Sample</th>
<th>Methodology</th>
<th>Length</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shalem, T., et al.</td>
<td>Israel</td>
<td>N=34 ;28 GT depend. Mean age 3.4 yr</td>
<td>Retrospective Chart Review</td>
<td>Average 3 weeks</td>
<td>85% achieved target goal</td>
</tr>
<tr>
<td>Hartdoff, C., et al</td>
<td>Netherlands</td>
<td>N=22 Ages 9 – 24 mos.</td>
<td>Prospective, cross-over design (Paired random placebo/dropper activated)</td>
<td>Both</td>
<td>Half of 11 weaned in the study group</td>
</tr>
<tr>
<td>Brown, J., et al</td>
<td>USA</td>
<td>N=30 Mean 3.9 yr</td>
<td>Retrospective Chart Review</td>
<td>Average 2 weeks</td>
<td>Before 60% gagged from GT After 80% GT</td>
</tr>
<tr>
<td>Wilken, M., et al.</td>
<td>Germany</td>
<td>N=39 Mean age 16 months</td>
<td>Prospective</td>
<td>Oral feeding, 4 – 10 day</td>
<td>Orally feeding in 89.7%</td>
</tr>
<tr>
<td>Silverman, A., et al.</td>
<td>USA: Wisconsin</td>
<td>N=17 Mean age 4.5 years</td>
<td>Retrospective Chart Review</td>
<td>Average 2 weeks</td>
<td>BMI z-score remained constant</td>
</tr>
<tr>
<td>Wright, C., et al</td>
<td>England</td>
<td>N=41</td>
<td>Retrospective Chart Review</td>
<td>Oral diet</td>
<td>70% achieved normal diet 17% remained EN 8% reliant oral supplement</td>
</tr>
</tbody>
</table>

### Measure of Child Success

- Increase variety of food
- Wean to high calorie nutritious beverages
- Developmentally appropriate mealtime behavior
- Reduction in gagging, retching, vomiting
- Overall reduction calories
- Weight maintenance
- Growth and development appropriate

### Influence of Parenting Style

Parent Success

- Achieve positive caregiver-child interaction
- Feed majority of meals to child
- Problem-solve around challenging meals
- Feel reassured that the child can/will maintain and gain weight without supplemental tube feeds
- Less family stress
- Reduction in caregiver stress

Take Home Points: 5 Steps

1. Start with placement of tube feeding
   - Identify who and when to wean
2. Assess readiness cues
   - Child
   - Caregiver
3. Ensure child is medically and nutritionally stable
4. Optimize hunger
   - Nutrition (enteral feeding cals)
   - Pharmacological
5. Consult with experts
   - Community therapists
   - Interdisciplinary Feeding Teams

Thank you!
Questions?
References


References


