No Disclosures**

**I’ve had 2 kids, 1 with colic and reflux and know/lived mega sleep deprivation
Objectives

- Discuss background of Home Enteral Feeding Transitions (HEFT) clinic
- Show results of our HEFT post-NICU clinic
- Present “what’s new” for area feeding clinics
- Field questions on infant feeding.
PCH’s hospital NICU population had ~ 1 in 3 patients discharged home on NG, GT, NJ feeds

O2 need at discharge & tracheostomy were both associated with increased tube use

LOS was greater in GT patients

Adverse events were low: 2% of tube patients were re-admitted for a tube event

GT morbidity was higher: 63% of tube-related ED visits and 82% of tube-related readmissions

1. Neonates have complex needs and comorbidities surrounding feeds\textsuperscript{1-4}
2. Earlier discharge NICU programs are becoming more common\textsuperscript{5, 6}
3. GT placement is becoming less common\textsuperscript{6,7}
HEFT Clinic Creation - 2016

MISSION

1. Provide streamlined outpatient support for patients/families for infants with fragile feeding needs
   - Provide “one-stop shop” for feeding oversight
   - “Tube Weaning” efforts
2. Reduce LOS and associated-costs and comorbidities in the NICU
3. New Program development based on patients’ needs
**HEFT Discharge
PCH NICU**

**Babies appropriate for HEFT clinic:**

1. Must have partial oral ability
2. NG/GT use or
3. Thickener use for feeds

- Parents agree to home tube
HEFT Discharge
PCH NICU

- Sept 2016 – Pilot program started
- May 2017 – 232 Infants enrolled in NICU;
  - 98 infants discharge on HEFT protocol
- May 2018 – 182 patients enrolled

- LOS improved in pilot group
  - 56.2 days in historical patients
  - 53.6 days in HEFT cohort

- Safety After Discharge
  - No differences in the pre-pilot cohort and post-intervention cohort

- Cost-Savings: $27,669/patient

HEFT Clinic 2020

- Drs Ermarth & O’Gorman
- Kristin Brinker, SLP & Nicki Barrett, SLP
  - NICU feeding specialists
- Moira Kryger, RD, IBCLC
- Hillary Torres, NP

- Incorporates medical, environmental, social, developmental considerations for feeding neonates and babies
A Visit to HEFT Clinic ~ **80 minutes**

- Weight and height to assess growth
- Medical and feeding history
- RD adjusts for adequate growth and nutrition
- SLP completes feeding assessment
- Feeding interventions and education
- Team rounds, plans discussed
- Exam & History by MD/NP
- Plan provided to family
- Collaboration with community providers
<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>HEFT cohort</th>
<th>Tube weaned group</th>
<th>Non-weaned group</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td>182</td>
<td>121 (67)</td>
<td>61 (34)</td>
<td>-</td>
</tr>
<tr>
<td>NGT, n (%)</td>
<td>110 (60)</td>
<td>106 (88)</td>
<td>4 (6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Male sex, n (%)</td>
<td>108 (59)</td>
<td>74 (61)</td>
<td>34 (56)</td>
<td>0.482</td>
</tr>
<tr>
<td>Birthweight, g (IQR)</td>
<td>2428 (1380, 3185)</td>
<td>2510 (1550, 3385)</td>
<td>2270 (1130, 2930)</td>
<td>0.035</td>
</tr>
<tr>
<td>LOS, days (IQR)</td>
<td>38 (19, 87)</td>
<td>33 (17, 67)</td>
<td>55 (24, 124)</td>
<td>0.003</td>
</tr>
<tr>
<td>PMA at discharge, wks (IQR)</td>
<td>43.6 (41, 46.9)</td>
<td>42.9 (40.6, 45.3)</td>
<td>45.6 (42.4, 52.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gestational age at birth, wks (IQR)</td>
<td>36 (30, 38)</td>
<td>36 (31, 38)</td>
<td>36 (27, 38)</td>
<td>0.443</td>
</tr>
<tr>
<td>PO at discharge, % (IQR)</td>
<td>20 (0, 43)</td>
<td>29 (11, 50)</td>
<td>0 (0, 10)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Weight at discharge, g</td>
<td>3765 (3160, 4540)</td>
<td>3700 (3180, 4355)</td>
<td>3975 (3085, 5315)</td>
<td>0.078</td>
</tr>
<tr>
<td>Follow-up weight-for-length*, z-score</td>
<td>-0.06 (-0.82, 0.88)</td>
<td>-0.28 (-0.88, 0.69)</td>
<td>0.16 (-0.63, 1.14)</td>
<td>0.082</td>
</tr>
</tbody>
</table>

* n=168

doi:10.1002/jpen.1717
HEFT Babies’ *Days to Feeding Tube Discharge by PO%*


N=121
Safety of Tube Weaning at Home (w/in 6 mo)

Emergency Room visits n=15 (13%)
- 8 GT complications
- 4 NG/NJ complications
- 2 Poor growth
- 1 parent uncomfortable with feeding equipment

Hospital Admissions n=9 (5%)
- 8 Poor growth*
- 1 Aspiration pneumonia

*All admissions <72 hrs

1.6 ER visits per 500 tube days
0.8 admissions per 500 tube days

25,710 tube days for all patients (n=182)
Novel Results from HEFT clinic cohort

- First to show “Time to Tube Discharge” in this large of cohort
  - Prospective manner
- First to show tube exposure days: adverse events
- Gave clinical characteristics upon discharge to help NICU/post-NICU practitioners
  - “10%” rule
- Babies can keep an NGT longer than previous recommendations
- Afterthought: saves healthcare dollars
HEFT Advantages

- Fully-integrated feeding & nutrition support
  - “NICU Potpourri”

- Customized and supported “Tube Weaning”
  - Alternatives: long-distance programs, expensive, controversial
  - Primary care collaboration

- Consistent and streamlined approach for therapies and interventions
  - Thickener management and standardization
  - Swallow study (MBS) management
HEFT Expansion 2016-2020

- Serves 3 NICUs
  - PCH, Univ Hospital, IMC
- Clinics
  - 1.5 days/week
- Typical wait time for 1st appointment 2-4 weeks post-discharge
"There are 1,000 ways to skin a feeding tube."

Try to match the family’s needs
- E.g. Multiples → Try to match siblings’ schedules
- Parental or caregiver shift work
- Babies with oxygen need
  - BPD/PHTN - some tolerate feeds better with increased oxygen flow

Positioning matters
- Side-lying, upright
NG-GT Tube Pearls

- Continuous overnight feeds are NOT a step backward
  - Useful for easy GER or vomiting babies
  - Useful for severe BPD or babies with post-NICU irritability
  - Helpful for parent sleep/recovery
  - No data to show increased risk of tube displacement or aspiration risk

- GT relative indications*
  - Worsening or stagnation of lung disease +/- aspiration;
  - Poor growth;
  - Poor social functioning;
  - Parental preference or discomfort w/ NGT
  - Dermatitis

Future Endeavors

- "Healthy Infant" Feeding clinic
  - For the term, non-NICU patient who has feeding dysfunction.

- Pediatric Nutrition Clinic
  - Still the spot for malnourished patients

- Expansion of HEFT
  - Currently only UofU, PCH, IMC
  - Difficult to clone providers

- Future Studies
  - The BPD patient, the Neurologic patient, GT vs. NGT, Thickener safety and utilization
Thank you!  Questions?
References


