

Date: June 28, 2011

Parent-Infant Interaction and Non-Organic Failure to Thrive

Topic and/or question as originally asked

How do parent-child interactions in the context of feeding support or inhibit child acceptance of oral intake? Is there a way to reliably evaluate parent-child interactions during feeding and provide strategies for improving interaction that may facilitate improved growth?

Clinical Question

P (population/problem)	Among formula-fed infants admitted for inpatient hospitalization with non-organic failure to thrive and their primary caregivers
I (intervention)	does focused parent-child interaction education in addition to standard care
C (comparison)	compared with standard care
O(outcome)	improve weight gain
T (time)	within 4-8 weeks

Target Population

Formula-fed infants (birth to 1 year) with non-organic failure to thrive and their primary caregivers.

Definitions:

Focused Parent-Child Interaction: a plan of treatment with specific activities that are based on concepts that are known to be supportive of feeding, bonding/attachment, and overall development including understanding and use of appropriate positioning and feeding strategies, caregiver recognition and response to child cues, and use of a consistent feeding routine to reinforce the feeding process.

Recommendations (See Table of Recommendation Strength following references)

1. It is recommended that caregiver-child attachment/bonding be evaluated to determine if there are concerns that are impacting the feeding and developmental interaction (*Coolbear, 1999 [3a]; Ward, 2000 [3a]; Benoit, 1997 [4a]*).

Note: There are distinct differences in attachment/bonding between mothers and children with failure to thrive (*Coolbear, 1999 [3a]; Ward, 2000 [3a]; Benoit, 1997 [4a]*) and these differences in attachment were related to their child's nutritional status (*Ward, 2000 [3a]*).

Level of evidence for attachment: moderate.

2. It is recommended that caregiver-infant interaction be evaluated in infants and children admitted with non-organic failure to thrive. The findings from this additional evaluation will serve to guide additional supports the caregiver-child dyad might benefit from to support overall feeding interactions (*Coolbear, 1999 [3a]; Leitch, 1999 [3a]; Lindberg, 1996 [3a]; Wolke, 1990 [3a]; Ammaniti, 2004 [4a]; Feldman, 2004 [4a]; Hagekull, 1997 [4a]; Reilly, 1999 [4a]; Jung, 2006 [4a]; Drotar, 1990 [4a]*).

Note: There were significant differences found in maternal-child interactions in groups with children with failure to thrive and feeding disorders (*Coolbear, 1999 [3a]; Leitch, 1999 [3a]; Lindberg, 1996 [3a]; Wolke, 1990 [3a]; Ammaniti, 2004 [4a]; Feldman, 2004 [4a]; Hagekull, 1997 [4a]; Reilly, 1999 [4a]; Jung, 2006*

[4a]; Drotar, 1990 [4a]). These differences were associated with reduced social-emotional and cognitive growth fostering behaviors and were also associated with differences in feeding.

Level of evidence for caregiver-child interaction: moderate.

3. It is recommended that oral-motor/feeding skills and caregiver-infant behaviors during feeding interaction be evaluated (Ramsay, 2002 [3a]; Wright, 2006 [4a]; Ammaniti, 2004 [4a]; Wright, 2000 [4a]; Ramsay, 1993 [4a]; Mathisen, 1989 [4a]; Raynor and Rudolf, 1996 [4b]).

Note: There are differences in feeding behaviors in children with failure to thrive and maternal response to feeding behaviors that may perpetuate difficulties with weight gain and caregiver-child interaction (Ramsay, 2002 [3a]; Wright, 2006 [4a]; Ammaniti, 2004 [4a]; Wright, 2000 [4a]; Ramsay, 1993 [4a]; Mathisen, 1989 [4a]; Raynor and Rudolf, 1996 [4b]).

Level of evidence for feeding behaviors: moderate.

4. It is recommended that caregiver education regarding child cues, behavioral states, state modulation, and feeding be incorporated into plan of care with infants admitted with non-organic failure to thrive (Leitch, 1999 [3a]; Jung, 2006 [4a]).

Note: Specific education regarding child cues, behavioral states, state modulation, and feeding results in increased sensitivity to cues and overall feeding and interaction (Leitch, 1999 [3a]; Jung, 2006 [4a]).

Level of evidence for caregiver education: moderate.

Discussion/summary of evidence

Upon review of the literature pertaining to parent-child interactions, feeding, and attachment/bonding, several references related to differences in affective state of the mother (specifically anxiety and depression) and correlations with inappropriate feeding practices, weight gain, overall emotional and cognitive growth fostering behaviors that deserve consideration with the non-organic failure to thrive population (Ramsay, 2002 [3a]; Wright, 2006 [4a]; Ammaniti, 2004 [4a]; Feldman, 2004 [4a]). A summary of this evidence will be included in the following discussion.

For Attachment/Bonding:

Attachment is a bond/connection between people. In the context of a caregiver-child relationship, attachment serves as a basis for interaction and development. Based on attachment theory by John Bowlby and Mary Ainsworth, a secure attachment occurs when a caregiver is reliable and responsive to their child's needs. When there is a disruption to the caregiver-child connection, a less secure attachment can form and can greatly impact overall development.

A review of the literature revealed significant differences in attachment/bonding in infants with non-organic failure to thrive and their caregivers. Of note, attachment classification (secure versus insecure) was highly associated with failure to thrive status ($p < .001$) (Ward, 2000 [3a]). Infants with failure to thrive were significantly less likely to show secure attachment and more likely to show anxious, disorganized attachments when compared with a control group that included children with normal growth profiles ($p < .001$) (Ward, 2000 [3a]) and ($p < .05$) (Coolbear, 1999 [3a]).

Mothers of children with non-organic failure to thrive demonstrated higher rates of insecure attachment ($p < .001$) (Coolbear, 1999 [3a]) and were more emotionally distant and demonstrated less sensitivity during interactions with their infants (Lindberg, 1996 [3a] ($p < .10$) and Benoit, 1997 [4a] ($p < .05$). Maternal attachment differences were associated with reduced bonding cues with their infants (Fosson and Wilson, 1987 [4a]), were significantly related to their child's nutritional status (Ward, 2000 [3a] ($p < .001$), and when combined with another variable (working model of the child interview, WMCI) was able to predict who would be in a failure to thrive group (Coolbear, 1999 [3a] ($p < .01$).

For Caregiver-Child Interaction:

Feeding in infants requires mutual interaction between a child signaling a need/desire to feed (giving clear cues) and a responsive caregiver who is able to read their child's cues and respond fittingly and consistently. This consistent cue followed by an appropriate response strengthens the bond between caregiver and child and reinforces feeding as a nourishing and social interaction. If there are any characteristics within the caregiver, child, or the interaction between them that reduces cues, response to cues, or interactions, difficulties with feeding may occur.

Several studies revealed several differences in interaction between caregiver-child dyads with non-organic failure to thrive compared to controls. Differences included reduced caregiver-child proximity ($p < 0.05$), touch ($p < 0.05$) and gaze pattern ($p < 0.05$) (Feldman, 2004 [4a]) as well as dyadic reciprocity ($p < 0.05$) including eye contact and positive affect exchange (Coolbear, 1999 [3a]), maternal sensitivity and infant regularity ($p < .05$) (Benoit, 1997 [4a]); Hagekull, 1997 [4a] ($p < .01$), and (Drotar, 1990 [4a] ($p < .01$), communicative responsiveness of mother's with their infants during mealtime interactions (Reilly, 1999 [4a]), ability of mother and child to give cues during mealtime, and maternal responsiveness to child cues (Leitch, 1999 [3a] ($p < .001$) and (Lindberg, 1996 [3a] ($p < .001$). The impact of these difficulties were associated with overall negative interactions (Wolke, 1990 [3a] ($p < .05$), aversive feeding behaviors, and arbitrary termination of feeding (Drotar, 1990 [4a] ($p < .05$).

For Feeding Behaviors:

Based on several studies, infants with non-organic failure to thrive demonstrate distinct differences with feeding and oral-motor skills compared with children with normal growth. These differences have potential to impact weight gain and, as a result, require assessment. Specific difficulties reported include reduced oral-motor skills ($p < 0.01$) (Wright, 2006 [4a]) with increased duration of feeding and reduced intake (Ramsay, 2002 [3a]; Mathisen, 1989 [4a] ($p < .05$), oral hypersensitivity (Mathisen, 1989 [4a] ($p < .05$), delayed acceptance of more advanced textures (Ramsay, 1993 [4a], and increased avoidant reaction to feeding (Wright, 2006 [4a]; (Raynor, 1996 [4b]) that included gagging, vomiting, turning away from feeding, and food refusal (Raynor, 1996 [4b]). In children demonstrating reduced oral-motor skills and reduced intake with feeding, there was an increase in maternal use of aversive compensatory feeding (Ramsay, 2002 [3a] ($p < .001$); (Raynor, 1996 [4b]). Feeding difficulties reportedly began early, became chronic (Ramsay, 1993 [4a]; (Raynor, 1996 [4b]) and preceded or coincided with deceleration of weight gain and diagnosis of failure to thrive (Wright, 2000 [3a] ($p < .02$); Ramsay, 1993 [4a]; Raynor, 1996 [4b].

For Caregiver Education:

Recent evidence indicates that caregiver education regarding understanding of their infant's cues, behaviors, state modulation and feeding increased interactions during feeding (Jung, 2006[4a]). There have also been significant differences in maternal sensitivity to cues and social-emotional growth fostering behaviors in mothers who received education regarding infant communication through the Nursing Child Assessment Satellite Training (NCAST) (Leitch, 1999 [3a] ($p < .05$).

For Caregiver anxiety/depression:

Upon review of the literature pertaining to parent-child interaction, attachment and feeding, there were inconsistent results regarding rates of anxiety and depression among mothers of children with non-organic failure to thrive. The presence of maternal anxiety and depression may impact bonding/attachment, cognitive growth fostering and social-emotional growth fostering behavior (Ramsay, 2002 [3a]). Although one study did not find a correlation between reduced/negative maternal affective and interactive behaviors between mothers of children with non-organic failure to thrive (Ramsay, 1993 [4a]), a more recent study revealed increased incidence of weight faltering in children with non-organic failure to thrive whose

mothers exhibited maternal anxiety or depression (Wright, 2006 [4a]). This fact may be due to a reduced ability to sustain appropriate interaction even for important caregiving tasks including feeding in the presence of maternal anxiety and depression. Anxiety and depression among caregivers of children with non-organic failure to thrive has been associated with parent withdrawal, increased arbitrary termination of feedings (Drotar, 1990 [4a]), increased control in feeding and interactions (Lindberg, 1996 [3a]), increased child aversive response to food resulting from increased caregiver feeding compensation (Raynor and Rudolf, 1996 [4b]), reduced maternal sensitivity (Benoit, 1997 [4a]) and increased report of difficult child temperament and child management (Feldman, 2004 [4]; Ammaniti, 2004 [4a]; Hagekull, 1997 [4a]).

Health Benefits, Side Effects and Risks

Admission to an inpatient unit is costly. Incorporating caregiver education to increase feeding interaction may improve caregiver-infant interaction and overall weight gain. In addition, there may be a long term benefit to this education including increased attachment behaviors that support appropriate development. There are no side effects or risks of education.

References (evidence grade in []; see Table of Evidence Levels following references)

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Note: Full tables of evidence grading system available in separate document:

- [Table of Evidence Levels of Individual Studies by Domain, Study Design, & Quality](#) (abbreviated table below)
- [Grading a Body of Evidence to Answer a Clinical Question](#)
- [Judging the Strength of a Recommendation](#) (abbreviated table below)

Table of Evidence Levels (see note above)

<i>Quality level</i>	<i>Definition</i>
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5 or 5a or 5b	Other: General review, expert opinion, case report, consensus report, or guideline

†a = good quality study; b = lesser quality study

Table of Recommendation Strength (see note above)

Strength	Definition
“Strongly recommended”	There is consensus that benefits clearly outweigh risks and burdens (or visa-versa for negative recommendations).
“Recommended”	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation made	There is lack of consensus to direct development of a recommendation.
Dimensions: In determining the strength of a recommendation, the development group makes a considered judgment in a consensus process that incorporates critically appraised evidence, clinical experience, and other dimensions as listed below.	
<ol style="list-style-type: none"> 1. Grade of the Body of Evidence (see note above) 2. Safety / Harm 3. Health benefit to patient (<i>direct benefit</i>) 4. Burden to patient of adherence to recommendation (<i>cost, hassle, discomfort, pain, motivation, ability to adhere, time</i>) 5. Cost-effectiveness to healthcare system (<i>balance of cost / savings of resources, staff time, and supplies based on published studies or onsite analysis</i>) 6. Directness (<i>the extent to which the body of evidence directly answers the clinical question [population/problem, intervention, comparison, outcome]</i>) 7. Impact on morbidity/mortality or quality of life 	

Introductory/background information

Non-organic failure to thrive is a diagnosis of impaired growth, particularly related to weight gain in young children without any underlying medical cause. It is a complex condition that requires a multidisciplinary approach for evaluation and management. Team members may include physicians, bedside nurses, speech pathologists, occupational therapists, social workers, and nutritionists.

The incidence of failure to thrive is between 1-5% of tertiary hospital admissions in children under 1 year of age. It is estimated that up to 10% of children in a primary care setting show symptoms of failure to thrive. Non-organic failure to thrive is higher proportionately in the United States of industrialized nations (Rabinowitz, S et al., 2010). Non-organic failure to thrive has nutritional, medical, developmental, social, and legal implications for the child and their family.

Infants with non-organic failure to thrive may undergo an inpatient admission for medical assessment and intensive feeding intervention and caregiver education. During such an admission, speech pathologists and occupational therapists typically provide consultative services to evaluate oral feeding skills, establish a feeding plan to support efficient oral feeding, and provide support to the child and their family with feeding and development during their inpatient stay. Therapists frequently observe that the feeding environment, interaction between caregiver and child, child feeding cues, and parent response to child feeding cues may not be optimal. A mismatch between child and caregiver interactions during mealtime can be frustrating experiences for both parents and infants which may in result in maladaptive feeding behaviors that may have long-term negative consequences.

Non-organic failure to thrive has nutritional, medical, developmental, social and legal implications for the child and their family.

Group/team members

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Search strategy

- **Keywords:** Parent-infant interaction, Infant feeding, parent education, failure to thrive, non-organic failure to thrive, feeding strategy, feeding practices, feeding technique, management of failure to thrive
- **Databases:** Medline, Cinahl, Pub Med, Cochrane, Google Scholar,
 - limits: English language
 - Search date: August, 2010 through February 15, 2011.
- National Association of Children's Hospitals and Related Institutions (NACRHI) electronic mailing list.

Applicability issues

There are potential applicability issues with implementation of assessment and activities to increase parent-infant interaction including:

- Access to caregivers during inpatient stay may be limited when families are not able to be present during their child's admission due to family or work obligations. This may present challenges with completing assessment and intervention activities.
 - Caregivers may have limited time and the impact of external pressures may be reflected in atypical infant-caregiver interactions.
- Behavior may not truly be reflective of an infant's typical performance due to the unfamiliar environment and with frequent/multiple interactions with strangers.
 - There may be some benefit to having primary nurses and therapists following these patients for the duration of their inpatient stay. This will allow increased ability to build rapport and ultimately allow more confidence with observations of true capabilities with interactions.
- Use of a valid and reliable tool that specifically evaluates parent-infant interaction is needed. While there are tools available, they require training and assessment/certification of evaluator reliability prior to their use.
- Infants are admitted with non-organic failure to thrive to multiple inpatient units. Practice variation between units is a barrier to implementation of this practice change. Expanded education to include all units who serve infants with non-organic failure to thrive will be necessary.

Copies of this Best Evidence Statement (BEST) are available online and may be distributed by any organization for the global purpose of improving child health outcomes. Website address: <http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/ev-based/default.htm>

Examples of approved uses of the BEST include the following:

- copies may be provided to anyone involved in the organization's process for developing and implementing evidence based care;
- hyperlinks to the CCHMC website may be placed on the organization's website;
- the BEST may be adopted or adapted for use within the organization, provided that CCHMC receives appropriate attribution on all written or electronic documents; and
- copies may be provided to patients and the clinicians who manage their care.

Notification of CCHMC at HPCEInfo@cchmc.org for any BEST adopted, adapted, implemented or hyperlinked by the organization is appreciated.

For more information about CCHMC Best Evidence Statements and the development process, contact Center for Professional Excellence/Research and Evidence-based Practice office at CPE-EBP-Group@cchmc.org for the contact information.

Note

This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

Reviewed against quality criteria by 2 independent reviewers.