Is Enteral Tube Feeding More Effective than Oral Nutrition in Promoting Better Growth and Development, Nutrition & Quality of Life in Children Living with Cystic Fibrosis?—a Systematic Review

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Problem:
About 1000 new cases of cystic fibrosis (CF) are diagnosed yearly in the United States, mostly in children less than 2 years old. Pediatric nursing interventions to support nutrition are critical to assist children living with CF to reach adulthood. The relatively low incidence of CF creates difficulty in acquiring meaningful, evidence based data to guide advanced nursing management of the nutritional challenges of the disorder.

Purpose:
The objectives of this inquiry was to evaluate the current evidence in the literature on the effects of enteral and oral nutrition in promoting growth and development, nutrition, and quality of life in children living with cystic fibrosis, and to assess the direction for additional nursing research.

Search Strategy:
- Databases searched included: CINAHL Plus, Nursing Consult Evidence Monographs, Nursing Consult Practice Guidelines, Cochrane Database of Systematic Reviews, Dynamed, ACP Pier, Clinical Evidence, Up to Date, National Guideline Clearinghouse, and PubMed data bases.
- The search terms included the MeSH Major Topics of cystic fibrosis, child nutrition sciences, enteral nutrition, oral nutrition, growth and development, nutritional status, and quality of life.
- The search was limited to research studies or research reviews of children with CF that were published in English from 2005 to September, 2013.
- Titles of articles retrieved in the searches were reviewed to eliminate duplicates, then abstracts read for inclusion criteria.

Results:
Searches resulted in 43 hits, which after review, decreased to 13 articles screened and 9 articles reviewed. Data abstraction, determination of level of evidence and study quality followed the Johns Hopkins Nursing Evidence Based Practice Guidelines for Research Evidence.

<table>
<thead>
<tr>
<th>JHNEBP Evidence Level</th>
<th>Number of sources</th>
<th>Overall Quality</th>
<th>Key Findings</th>
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</table>
| I: RCTs or Systematic Reviews of RCTs | 3 | Good | • Review of 31 experimental studies; need high quality RCTs re: supplemental enteral feedings effect on outcomes
• Insufficient evidence that enteral feeding is effective
• Growth hormone supplements through enteral feeding increases growth and clinical status. |
| II: Quasi-Exp. or Sys. Rev | 0 |  | |
| III: Descriptive study or Sys. Rev. | 2 | Good | • Children with CF and growth failure need oral or enteral nutritional supplements to improve rate of weight gain.
• Oral dietary supplements have no additional benefits over nutritional counseling. |
| IV: Consensus Statement; EBP guidelines | 3 | Good | • Patients with growth failure need supplemental enteral nutrition preferably through G-tube. Need for further RCT’s.
• Calorie supplements are beneficial but no evidence that enteral feeding is superior to oral.
• Behavioral intervention with nutritional counseling can promote weight gain. |
| V: Expert Opinion | 1 | Good | Enteral supplements promote better weight gain and growth but insufficient evidence on improved lung function. |

Synthesis of Evidence:
- Evidence suggests that supplemental nutrition improves outcomes in children with CF, but is insufficient
- There is a need for systematic reviews and randomized controlled trials comparing enteral tube feeding and oral nutrition in children with cystic fibrosis.

Conclusions:
- Evidence based data that support the efficacy of enteral tube feeding over oral nutrition in promoting normal growth and development, improved nutrition, or improved quality of life in children with cystic fibrosis was not identified.
- Future research involving large, multicenter trials is needed to address optimum advanced nursing nutrition intervention modalities for these children.