Introduction

Premature infants in the NICU often experience feeding difficulties that prolong their hospital stay. In the past, health care professionals have relied on scheduled feeding techniques to facilitate weight gain and improve the health status of infants in the NICU. Transition to full oral feeding is often the last benchmark in determining readiness for hospital discharge (Wellington, 2015). Cue-based feeding, also known as demand-driven feeding, has gained support as a strategy that responds more appropriately to an individual infant’s needs (Shaker, 2010). Instead of following a schedule of when and how much to feed an infant, cue-based feeding is guided by the behavioral cues of the infant to encourage acquisition of safe feeding behaviors. Infants can self-direct their feeding in a developmentally appropriate way, allowing for a more efficient transition to full oral feeding. Although some studies have indicated the effectiveness of cue-based feeding, the long-standing traditions of NICU culture mean that infant-driven programs have not been widely implemented.

Methods

- **Research Question:** For premature infants in the NICU, does cue-based feeding result in an earlier transition to oral feeding than scheduled feeding techniques?
- **Databases:** PubMed, CINHAL, Web of Science
- **Time Limiting:** None
- **Study Designs:** randomized control trials, systematic reviews (no case studies)
- **Search Terms:** (premature infant* OR NICU OR neonatal intensive care unit OR low birth weight) AND (cue-based feeding OR infant-driven feeding OR scheduled feeding)

### Study Characteristics

- **Three RCTs and two systematic reviews were selected for inclusion**
- **Study publication dates ranged from 1982-2015**

### Results

#### Summary of Study Characteristics

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<thead>
<tr>
<th>Article Information</th>
<th>Results Reported</th>
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<tbody>
<tr>
<td><strong>Primary Author</strong></td>
<td><strong>Date of Publication</strong></td>
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<tr>
<td>Collinge, J. M.</td>
<td>1982</td>
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<td>McCain, G. C.</td>
<td>2001</td>
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<td>McCormick, F. M.</td>
<td>2010</td>
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<td>Puckett, B.</td>
<td>2008</td>
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<td>Watson, J.</td>
<td>2015</td>
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* indicates statistical significance

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<th>Primary Author</th>
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#### Study Quality

- The included five studies were of moderate-to-good quality
- Some RCTs did not perform appropriate randomization, determine ideal sample size, account for confounding factors, report ethical approval, or account for all participants
- Systematic reviews varied in quality of included studies as well as reported statistical and clinical significance of results

#### Study Results

- Each article included contained slightly different outcome measures. Days to oral feeding, weight gain, and length of hospital stay were determined to be most aligned to the researchers’ objective
- Overall, studies revealed that cue-based feeding resulted in fewer days to oral feeding, shorter length of hospital stay, and negligible effects on weight gain
- The included systematic reviews found inconclusive results

- McCormick (2001) found that cue-based feeding resulted in a shorter duration of hospital stay (2-4 days), though the authors caution that these results may not be valid, since the included studies contained several methodological weaknesses
- Watson (2015) found that cue-based feeding can result in slower weight gain and shorter transition to oral feeding, but does not attribute clinical importance to these findings because of small sample size and methodological flaws

Conclusions

Key Findings

Though the included studies varied somewhat in quality, the results of the included studies agree that cue-based feeding is generally more effective than scheduled feeding for premature infants in the NICU at reducing length of time to oral feeding. Collinge (1982) reported that the length of hospital stay was shortened by 6.2 days for the intervention group; Puckett reported that the intervention group was discharged 4.5 days earlier than the control group. McCain (2001) found that the intervention group achieved oral feeding 5 days sooner than the control group. The systematic review by McCormick (2010) reported that infants who received cue-based feeding were discharged from the hospital about 2-4 days earlier than those who did not.

None of the included studies followed-up on study participants, so no conclusions can be drawn regarding long-term health benefits to the patients. However, studies do indicate that cue-based feeding can be effective clinically by reducing the number of days until achievement of oral feeding, which therefore reduces the average length of hospital stay. A reduced hospital stay in the NICU can have significant savings in terms of time and cost.

One study (Collinge, 1982) reported on economic considerations, estimating that using cue-based feeding instead of a feeding schedule in the NICU saved about $2,419 per infant. Collinge et al. found that cue-based feeding saved an estimated $47 gavage feeding sets per patient and reduced the length of hospitalization by 6.2 days, leading to an estimation of money saved per patient. Given rates of inflation and the increasing cost of medical care, the estimated amount of money saved per patient would be much higher today.

Future Research

Further research is needed to draw reliable conclusions about the effects of cue-based feeding on time to full oral feeding, weight gain, and length of hospital stay. Larger, more consistently randomized studies are necessary to determine clinical significance and cost effectiveness of cue-based feeding in NICU settings.

References