Nutrition for children with special care needs

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Rundown

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Introduction
Introduction

- Nutritional and growth problems are common in children with severe developmental disabilities. (Stallings et al., 1993; Sullivan et al., 2000; Schwarz, 2003; Cass, 2005; Ibrahim & Hawamdeh, 2007)

- Most of the children with developmental disabilities or neurological impairment had deprived growth (Amundson et al., 1994; Corwin 1996; Holden et al., 1997)

- Growth retardation was usually associated with inadequate intake as a result of self-feeding impairment and oromotor dysfunction (Corwin et al., 1996, Fung et al., 2002; Schwarz, 2003; Sullivan et al., 2000, 2002 & 2005; Ibrahim & Hawamdeh, 2007)
Introduction

• Children with neurological disorders may have difficulty in the coordination of muscles involved in swallowing leading to
  o Cannot form bolus properly
  o Cannot propel the bolus to the oesophagus effectively
  o Cannot protect the airway during swallowing
    (Couriel, et.al., 1993)

• Mealtime should be pleasurable and non-stressful. If it is longer than 30min on regular basis may suggest feeding and swallowing problem
  (Arvedson, 2013)
Factors causing inadequate intake:

- Poor oral motor function due to neurological impairment → risk of aspiration
- Structural problem
- Behavioural problem

Inadequate intake → chronic under-nutrition
Adverse effects of prolonged inadequate nutrition:

- poor growth and development,
- prolonged tissue repair
- deprived immune function
  (Holden et al., 1997; Sullivan et al., 2000)
- decrease muscle strength → ineffectiveness of cough → predisposition to aspiration
  (Sullivan et al., 2000; Craig et al., 2006; Ibrahim & Hawamdeh, 2007)
Adverse effects of prolonged inadequate nutrition:

- development of pressure sores and delayed wound healing. (Sullivan et al., 2000; Schwarz, 2003)
- increased irritability and decreased motivation, energy and attention span for rehabilitation (Stallings et al., 1993; Trier & Thomas, 1998; Cook, 2005)
- bone demineralization and fracture (Trier & Thomas, 1998; Schwarz, 2003)
Common manifestations of oromotor dysfunction:

- excessive drooling
- prolonged meal time
- coughing or gagging during meals
- recurrent chest infections
- malnutrition or growth failure (Schwarz, 2003; Petersen et al., 2006)
Nutritional Assessment
Feeding history

• Does the child eat and drink sufficiently and safely?
• Any modification of food texture required?
• What are the child’s preferred foods?
• Is fluid intake adequate and how does urine output?
• What is the position of the child during feeding?
• How frequent does the child eat?
• How does the illness affect the child’s feeding?
• Does the child require any dietary supplement?

(Fong & Bell, 2013)
Medical history

- Level of functioning / Activity level
- Degree of tone
- Any involuntary movement?
- Respiratory conditions (any signs of aspiration?)
- GI conditions (any vomiting / constipation / diarrhoea?)
- Any medications that might affect nutritional status? (e.g. anti-epileptic drugs)
- Any other conditions that reflect nutritional compromise (e.g. poor wound healing, abnormal hair and nails, fracture)

(Fong & Bell, 2013)
Anthropometric measurement

- Weight & height / body length
- Use ulnar length to calculate the height by age, gender and diagnostic specific equation for children with contractures, scoliosis or hypertone
- Compare weight-for-height with published age/gender normative data
- Measurement of skinfolds

(Fong & Bell, 2013)
Management
Facilitation of oral feeding in children with neurodisabilities (multidisciplinary team approach)

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Responsible for</th>
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<tbody>
<tr>
<td>Physician</td>
<td>Assess medical condition and suggest the most appropriate mode of feeding based on the clinical data &amp; physical assessment, and discuss with parents</td>
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<tr>
<td>Surgeon</td>
<td>Perform gastrostomy as an alternative mode of feeding</td>
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<tr>
<td>Dietitian</td>
<td>Assess nutritional needs and suggest appropriate diet</td>
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<tr>
<td>Speech therapist</td>
<td>Assess oromotor function to ensure safe oral feeding and suggest appropriate texture</td>
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<tr>
<td>Occupational therapist</td>
<td>Assess body posture and provide appropriate seating and other adaptive devices to facilitate oral feeding</td>
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<td>Physio-therapist</td>
<td>Maintain optimal physical condition of the child and monitor chest condition</td>
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<tr>
<td>Nurse</td>
<td>Train carer on the appropriate feeding technique and monitor patient’s growth</td>
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NGT feeding

- Short term alternative mean of nutritional support during acute illness

- Problems
  - Affect appearance
  - Discomfort
  - Regular changing of NGT causing trauma
  - Increase risk of Gastro-Oesophagaeal Reflux/vomiting/Gastro-Intestinal Bleeding
  - Easy tube displacement
Gastrostomy feeding

- Gastrostomy is a surgical opening through the abdominal wall to the stomach so that a tube or button is being kept at the stoma (Holden, 1997)
Comparison of GT & NGT feeding

• A local retrospective study was carried out in 2006 to compare the growth and other problems such as vomiting and episodes of chest infection between 2 groups of children on gastrostomy feeding (GT) (n=30) and nasogastric tube feeding (NGT) (n=32).
Result showed **significant growth** by increased Z-score of weight-for-height in the GT group, whereas no significant improvement was noted in the NGT group.
Changes of frequency of vomiting after gastrostomy of the GT & NGT groups

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<thead>
<tr>
<th></th>
<th>Mean rank</th>
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<tbody>
<tr>
<td></td>
<td>Before</td>
<td>after</td>
<td>Z</td>
<td>p</td>
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<tr>
<td><strong>Gastrostomy</strong> (n=30)</td>
<td>41.38</td>
<td>33.74</td>
<td>-3.781</td>
<td>0.000*</td>
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</tr>
<tr>
<td><strong>Nasogastric tube</strong> (n=32)</td>
<td>22.23</td>
<td>30.31</td>
<td>-0.229</td>
<td>0.819</td>
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Differences of frequency of vomiting between GT with and without fundoplication

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<tr>
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<td>Before</td>
<td>after</td>
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<tr>
<td><strong>Gastrostomy with fundoplication (n=18)</strong></td>
<td>18.64</td>
<td>14.69</td>
<td>-3.724</td>
</tr>
<tr>
<td><strong>Gastrostomy without fundoplication (n=12)</strong></td>
<td>10.79</td>
<td>17.81</td>
<td>-0.666</td>
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Changes of frequency of chest infection after gastrostomy of the GT & NGT groups

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<tr>
<td></td>
<td>Before</td>
<td>after</td>
<td>Z</td>
<td>p</td>
</tr>
<tr>
<td>Gastrostomy (n=30)</td>
<td>38.02</td>
<td>34.74</td>
<td>-3.482</td>
<td>0.000*</td>
</tr>
<tr>
<td>Nasogastric tube (n=32)</td>
<td>25.39</td>
<td>39.34</td>
<td>-0.663</td>
<td>0.507</td>
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</table>
• Frequency of vomiting and episodes of chest infection were significantly reduced in the GT group, especially for those who had anti-reflux surgery (fundoplication) done, but no significant difference was noted in the NGT group.

• Common complications identified included granuloma, infection, ulceration, leakage and accidental removal of tube.
Conclusion of the study:

• The results of the study demonstrate gastrostomy feeding can effectively improve both growth and health status by reducing undesirable symptoms in children with severe development disabilities.

• Although there are several minor complications noted, it still serves as an alternative mean of providing nutrition to patients who have feeding difficulties.

• The result may encourage parent to have prompt decision for gastrostomy for early nutritional intervention which can promote growth and development.
Feeding pattern in DDU (2015)

- Gastrostomy feeding: 76.71%
- Oral feeding: 16.44%
- NGT feeding: 6.85%
Contra-indications for PEG

- Failure to pass endoscope
- Failed trans-illumination
  - Significant ascitis
  - Morbid obesity
  - Large hiatus hernia
- Others
  - Subtotal gastrectomy
  - Gastric varices, etc
Antireflux surgery
(fundoplication)

• Few studies showed PEG would precipitate gastroesophageal reflux in some cases
• Due to the higher rate of complications in PEG concomitant with anti-reflux surgery, routine fundoplication is not recommended (Khattak et al., 1998; Puntis et al., 2000)
Antireflux surgery (fundoplication)

- Other studies demonstrated PEG would not precipitate gastroesophageal reflux (Launay et al., 1996)
- PEG alone can control vomiting and rarely lead to vomiting (Hament et al., 2001)
Antireflux surgery (fundoplication)
Type of devices Commonly Used

- Tube
  - PEG tube
  - Replacement tube
- Low profile device (button)
  - Mushroom type
  - Balloon type
PEG Tube
Balloon type Gastrostomy Replacement Tube
Mushroom type Button: BARD

Shaft → Decompression Tube

Anti-Reflux Valve
Mushroom type Button: Passport
Balloon type Button: MIC-KEY
Balloon type Button: CuBBBy
Daily Care

• Clean peristomal skin with soap and warm water during daily shower and **dry properly**.
• Use wet gauze to clean the **bottom part** of bolster or button to remove milk curd or discharge.
• Keep surrounding skin **clean and dry**.
• Observe for any peristomal skin problem and treat promptly.
Special Considerations
Special Considerations (1)

- Avoid using rubber band to tie up PEG tube as this may cause rupture of the tube.

- Mark and check the tube at the level of skin surface and secure the tube in position with bolster.
Bolster should be 0.5 cm apart from skin surface (Including measurement in sitting up position) to prevent excessive tube movement which may stimulate growth of granuloma or causing leakage.

Mark the tube above the level of the bolster.
Special Considerations (2)

• Inject appropriate amount of sterile water into the balloon of the gastrostomy tube (Too large volume of water may cause early rupture of balloon).

• For balloon type button, inject 5 ml sterile water into the balloon. If leakage around button occur, inject 1-2 ml more water into the balloon but **never exceed 10 ml**.
Special Considerations (3)

• Check the water volume inside the balloon monthly. (Silicon material leaks water).

• Infected stoma or problem stoma should be reported to Stoma nurse or MO promptly.
Special Considerations (4)

- Maintain good oral hygiene especially for children with non-oral feeding
- Oro-motor stimulation ± exercise
  - Reinforce oromotor exercise as taught by speech therapist/occupational therapist
  - Provide stimulation with different taste sensations: sweet, salty, sour, bitter... etc
- Join mealtime together with family members
- Continuous monitoring of growth and development as many children grow rapidly after gastrostomy placement
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Thank You