This chapter provides examples of International Nutrition and Dietetics Terminology (IDNT) terms appropriate for pediatric patients with a medical diagnosis of failure to thrive and also includes a case study. The IDNT terms and case study are intended for discussion and educational purposes in applying the Nutrition Care Process (NCP). They are not all-inclusive and are not meant to be considered best practice or guidelines to nutrition care. The information in the chapter should be used in conjunction with the International Dietetics & Nutrition Terminology (IDNT) Reference Manual: Standardized Language for the Nutrition Care Process, 4th edition (Chicago, IL: Academy of Nutrition and Dietetics; 2013), which provides much greater detail about IDNT terms and the overall NCP.

Nutrition Assessment

The following lists present possible nutrition assessment information to be obtained from the patient/family interview, observations and measurements, the medical record, and the referring health care provider for pediatric patients with a medical diagnosis of failure to thrive. Note that indicators marked with an asterisk are not included in IDNT. They are included here because they are often used in the assessment of patients with failure to thrive.

**Sample Client History Terms Related to Failure to Thrive**

- Personal data: Age (eg, gestational age vs actual age); Gender; Language
- Nutrition-oriented medical/health history: Gastrointestinal; Immune; Other (developmental milestones)
- Social history: Socioeconomic factors; Living/housing situation; Social and medical support
- Medical treatment

**Sample Food/Nutrition-Related History Terms Related to Failure to Thrive**

- Food intake: Amount of food, types of food/meals, meal/snack pattern, food variety
- Infant formula intake (including concentration and preparation)
- Breastmilk intake (including concentration and preparation)
- Fluid/beverage intake: Oral fluids; Liquid meal replacement or supplement
- Enteral nutrition intake: Formula/solution
Parenteral nutrition intake: Formula/solution
Vitamin intake (specify)
Mineral intake (specify)
Mealtime behavior: Meal duration; Percent of meal time spent eating; Refusal to eat/chew; Spitting food out; Willingness to try new foods; Limited number of accepted foods; Rigid sensory preferences

**Sample Anthropometric Measurement Terms Related to Failure to Thrive**
- Height/length
- Weight
- Body mass index (BMI)
- Growth pattern indices/percentile ranks (e.g., weight-for-length, z-scores, including head circumference for patients younger than 3 years of age)
- Weight change (specify time frame)
- Body compartment estimates (e.g., skinfold measurements, mid-arm circumference)

**Sample Biochemical Data, Medical Tests and Procedures Terms Related to Failure to Thrive**
- Protein profile: Albumin; Prealbumin
- Electrolyte and renal profile: Sodium; Chloride; Potassium; Magnesium; Calcium, serum; Phosphorus
- Vitamin profile: Vitamin A, serum; Vitamin C, serum; Vitamin D, 25-hydroxy; Vitamin E, plasma alpha-tocopherol
- Mineral profile: Copper, serum; Zinc, serum; Selenium, serum
- Gastrointestinal profile: Fecal fat; Stool culture; Swallow study; Endoscopy*; Abdominal films
- Nutritional anemia profile: Hemoglobin; Hematocrit; Mean corpuscular volume; B12, serum; Folate, serum; Iron, serum; Total iron-binding capacity
- Urine profile: Urine volume

**Sample Nutrition-Focused Physical Findings Terms Related to Failure to Thrive**
- Head and eyes (e.g., thin hair, sunken eyes)
- Extremities, muscles, and bones (e.g., bowed legs)
- Overall appearance (e.g., cachectic)
- Skin (e.g., eczema)
- Digestive system (e.g., poor dentition, ascites, vomiting, bowel movements)
Sample Comparative Standards Terms Related to Failure to Thrive

- Total energy estimated needs (including catch-up growth)
- Total protein estimated needs
- Total fluid estimated needs
- Estimated vitamin needs (specify)
- Estimated mineral needs (specify)
- Ideal/reference body weight (IBW)
- Desired growth pattern (linear, weight)

Nutrition Diagnosis

Using the data collected in the nutrition assessment, one or more nutrition diagnoses may be identified. Tables 2.1 through 2.9 provide sample nutrition diagnoses for pediatric patients with failure to thrive. Nutrition diagnoses should be documented as PES statements according to the following structure: Problem (P) “related to” etiology (E) “as evidenced by” signs and/or symptoms (S). Accordingly, in the tables each diagnosis (the “P” in the PES statement) is associated with at least one etiology. Then, signs and symptoms are identified for each etiology.

Table 2.1 Inadequate Energy Intake

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased oral intake</td>
<td>• Parent report of patient’s food refusal</td>
</tr>
<tr>
<td></td>
<td>• Weight loss or inadequate weight gain</td>
</tr>
<tr>
<td>Tiring with feeds</td>
<td>• Oral cyanosis</td>
</tr>
<tr>
<td></td>
<td>• Decreased oromotor function</td>
</tr>
<tr>
<td>Lack of access to sufficient foods</td>
<td>• Vitamin or mineral deficiencies</td>
</tr>
<tr>
<td></td>
<td>• Low socioeconomic status</td>
</tr>
</tbody>
</table>

Table 2.2 Increased Energy Expenditure

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound healing</td>
<td>• Low protein status</td>
</tr>
<tr>
<td></td>
<td>• Vitamin or mineral deficiencies</td>
</tr>
<tr>
<td></td>
<td>• Poor growth velocity</td>
</tr>
<tr>
<td>Altered absorption</td>
<td>• Growth failure</td>
</tr>
<tr>
<td></td>
<td>• Fecal or urine losses of nutrients</td>
</tr>
</tbody>
</table>
### Table 2.3 Malnutrition

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
</table>
| Lack of knowledge concerning adequate energy and protein intake | • Avoiding specific food groups that patient/parent believes to be unhealthful  
|                                                               | • Weight-for-height or BMI < 3rd percentile                                    |

### Table 2.4 Inadequate Protein-Energy Intake

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
</table>
| Decreased ability to consume adequate energy and/or protein   | • Inability to feed self                                                      
|                                                               | • Cardiac failure                                                             
|                                                               | • Decrease in growth percentiles                                              |
| Food-related knowledge deficit                                | • Inappropriate food selections                                                
|                                                               | • Growth failure                                                              |

### Table 2.5 Inadequate Oral Intake

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
</table>
| Dysphagia                                                     | • Inability to meet estimated needs with oral intake                          
|                                                               | • Swallow study showing aspiration                                             |
| Medications affecting appetite                               | • Decreased appetite or oral intake since starting new medication            
|                                                               | • Weight loss                                                                 |

### Table 2.6 Inadequate Enteral Nutrition Infusion

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
</table>
| Inability to reach goal enteral volume                        | • Report of need to stop feedings due to vomiting or diarrhea                  
|                                                               | • Physical signs of loss of subcutaneous fat                                   |
| Lack of access/malfunctioning enteral device                  | • Feeding tube malpositioned                                                   
|                                                               | • Growth failure                                                              |
| Intolerance to enteral formula                                | • Vomiting/diarrhea                                                           
|                                                               | • Lack of expected weight gain                                                 |
### Table 2.7 Limited Food Acceptance

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral feeding difficulties/oral aversions</td>
<td>• Weight loss or inadequate weight gain</td>
</tr>
<tr>
<td></td>
<td>• Parent report of patient’s food refusal/texture sensitivity</td>
</tr>
<tr>
<td></td>
<td>• Inadequate length/height growth</td>
</tr>
<tr>
<td>Multiple food allergies</td>
<td>• Weight loss or inadequate weight gain</td>
</tr>
<tr>
<td></td>
<td>• Inadequate length/height growth</td>
</tr>
<tr>
<td></td>
<td>• Insufficient intake of vitamins and minerals compared to requirements</td>
</tr>
<tr>
<td></td>
<td>• Parent/patient fear of allergen-containing foods</td>
</tr>
</tbody>
</table>

### Table 2.8 Altered GI Function

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alteration in gastrointestinal tract structure</td>
<td>• Report of vomiting, diarrhea, constipation, and/or bloody stools</td>
</tr>
<tr>
<td></td>
<td>• Stool studies reflecting malabsorption</td>
</tr>
<tr>
<td>Poor motility</td>
<td>• Vomiting, constipation, and/or bloody stools</td>
</tr>
<tr>
<td></td>
<td>• Abnormal gastric emptying study</td>
</tr>
</tbody>
</table>

### Table 2.9 Swallowing Difficulty

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor suck/swallow coordination</td>
<td>• Poor muscle tone or oral skills to safely swallow</td>
</tr>
<tr>
<td></td>
<td>• Abnormal swallow study</td>
</tr>
<tr>
<td></td>
<td>• Oral cyanosis associated with meals/feeds, prolonged suck, or chewing</td>
</tr>
</tbody>
</table>
Nutrition Intervention

Once the nutrition diagnoses are determined, the nutrition interventions will aim to resolve or improve the problems or to address the signs and symptoms. The following list includes sample nutrition interventions associated with failure to thrive:

• Composition of meals/snacks: Texture-modified diet; Schedule of food/fluids
• Enteral nutrition: Concentration; Volume; Rate; Route; Insert enteral feeding tube
• Parenteral nutrition: Composition; Schedule; Rate; Route; Site care
• Medical food supplement: Commercial beverage; Modified food
• Vitamin and mineral supplements: Multivitamin/mineral; Multi–trace elements
• Feeding assistance: Feeding position; Adaptive eating device; Other (feeding cues)
• Feeding environment: Meal service; Distractions
• Nutrition education—content: Recommended modifications; Priority modifications; Survival information
• Nutrition-related medication management: Prescription medications; OTC medications (eg, digestive enzymes, appetite stimulants)
• Nutrition education—application: Skill development; Result interpretation

Nutrition Monitoring and Evaluation

Nutrition monitoring and evaluation terms identify desired patient outcomes targeted to the nutrition diagnoses and interventions. The following are sample terms used to monitor and evaluate the effectiveness of the nutrition interventions for pediatric patients with failure to thrive and should include patient-specific goals for each term:

• Body composition/growth/weight history: Weight change; Height/length; Growth pattern indices/percentile ranks (eg, weight-for-length/height or BMI, growth velocity, z-scores, head circumference for children 3 years of age or younger)
• Protein profile: Albumin; Prealbumin
• Vitamin profile: Vitamin A, serum; Vitamin C, serum; Vitamin D, 25-hydroxy; Vitamin E, plasma alpha-tocopherol
• Mineral profile: Copper, serum; Zinc, serum
• Electrolyte profile: BUN; Creatinine; Sodium; Chloride; Potassium; Magnesium; Calcium, serum; Phosphorus
• Nutrition-focused physical findings: Digestive system (eg, improved bowel movements and decreased emesis/reflux)
NCP Case Study for Failure to Thrive

The following case study is an example of how to apply the NCP steps using IDNT for a pediatric patient with failure to thrive. It also illustrates one possible ADIME charting style.

**Step 1: Nutrition Assessment**

**Client History**
3-month-old male, full-term infant with Tetralogy of Fallot awaiting second repair. Lives at home with parents and two older healthy siblings, 3 and 7 years old. Admitted for cyanosis with feeds, resulting in decreased oral intake.

**Food/Nutrition-Related History**
Primarily breastfeeds, generally 10 to 15 minutes each side every 3 to 4 hours. Sleeps for 6 to 8 hours overnight and is not awakened to feed. Occasionally supplements with standard infant formula, generally 3 oz per feed.

**Anthropometric Measurements**
- Current weight: 5.1 kg; 3rd percentile (WHO growth chart); z-score: –1.30
- Current length: 60 cm; 25th–50th percentile (WHO growth chart); z-score: –0.39
- Weight/Length: < 3rd percentile; z-score: –2.17
- Head circumference: 42 cm; 50th–75th percentile (WHO growth chart); z-score: 0.48

**Biochemical Data, Medical Tests, and Procedures**
Sodium, 136 mmol/L; potassium, 4.8 mmol/L; chloride, 109 mmol/L; CO₂: 18 mmol/L (low); BUN: 6 mg/dL; creatinine, 0.2 mg/dL; glucose, 89 mg/dL; calcium, 9.2 mg/dL; albumin, 3.3 g/dL (low; suggests inadequate protein stores); vitamin D, 25-hydroxy, 18 ng/mL (low). Electrolytes are within normal limits with exception of low CO₂.

**Nutrition-Focused Physical Findings**
- Tiring and cyanosis with feeds
- Cachectic-appearing, sunken eyes and fontanelle

**Comparative Standards**
- Estimated energy needs: 130 kcal/kg/d (based on RDA + catch-up requirements)
- Estimated protein needs: 3 g/kg/d (based on increased needs for wound/surgical healing, compromised cardiac status, and low albumin)
- Estimated fluid needs: 100 mL/kg/d (based on maintenance fluid requirements)
Step 2: Nutrition Diagnosis

- Inadequate oral intake related to decreased ability to consume sufficient energy as evidenced by cyanosis and tiring with feeds.
- Increased energy expenditure related to cardiac disease as evidenced by growth failure with weight-for-length less than 3rd percentile.
- Inadequate vitamin D intake related to breastfeeding as evidenced by no supplemental vitamin D and low 25-hydroxyvitamin D.

Step 3: Nutrition Intervention

Nutrition Prescription

Nutrient needs + recommended diet/regimen: 130 kcal/kg; protein, 3 g/kg; fluid, 100 mL/kg; 24 kcal/oz breastmilk/formula: 90 mL by mouth, six times per day, plus overnight feeds of 35 mL/h × 8 hours via nasogastric tube.

Interventions

1. Enteral nutrition schedule:
   - Initiate overnight feeds of 35 mL/h × 8 hours via nasogastric tube.
   - Goal(s): Promote weight gain of 20–35 g/d and provide adequate protein to improve albumin to more than 3.5 g/dL.

2. Fluid-modified diet:
   - Increase energy density of formula to 24 kcal/oz. Goal(s): Meet 100% of estimated energy and protein needs with limited fluid intake.

3. Vitamin D supplement:
   - Provide 400 IU per day of vitamin D supplement. Goal(s): Correct vitamin D deficiency to 25-hydroxyvitamin D more than 30 ng/mL.

4. Nutrition education—content:
   - Provide recipe for breastmilk fortification and formula concentration. Goal(s): Parents will have adequate understanding of formula preparation so they can make formula when at home.
### Step 4: Nutrition Monitoring and Evaluation

Table 2.10 Nutrition Monitoring and Evaluation Indicators for Infant Boy with Failure to Thrive

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight change</td>
<td>• Weight increases 20–35 g/d</td>
</tr>
<tr>
<td>Vitamin profile: Vitamin D, 25-hydroxy</td>
<td>• Level &gt; 30 ng/mL when re-checked in 2 months</td>
</tr>
<tr>
<td>Protein profile: Albumin</td>
<td>• Albumin &gt; 3.5 g/dL when checked next month</td>
</tr>
</tbody>
</table>
Chapter 3

Behavioral/Feeding Disorders

Colleen Thomas, MS, RD, LDN,
and Colleen Yanni, MS, RD, LDN, CSP

This chapter provides examples of International Nutrition and Dietetics Terminology (IDNT) terms appropriate for pediatric patients with behavioral/feeding disorders and also includes a case study. The IDNT terms and case study are intended for discussion and educational purposes in applying the Nutrition Care Process (NCP). They are not all-inclusive and are not meant to be considered best practice or guidelines to nutrition care. The information in the chapter should be used in conjunction with the International Dietetics & Nutrition Terminology (IDNT) Reference Manual: Standardized Language for the Nutrition Care Process, 4th edition (Chicago, IL: Academy of Nutrition and Dietetics; 2013), which provides much greater detail about IDNT terms and the overall NCP.

Nutrition Assessment

The following lists present possible nutrition assessment information to be obtained from the patient/family interview, observations and measurements, the medical record, and the referring health care provider for pediatric patients with behavioral or feeding disorders.

Sample Client History Terms Related to Behavioral/Feeding Disorders

- Personal data: Age; Gender; Mobility
- Nutrition-oriented medical/health history: Cardiovascular (specify); Gastrointestinal (specify); Immune (eg, food allergies); Psychological (specify)
- Treatments/therapy: Medical treatment/therapy; Surgical treatment
- Social history: Socioeconomic factors

Sample Food/Nutrition-Related History Terms Related to Behavioral/Feeding Disorders

- Total energy intake
- Fluid/beverage intake: Oral fluids; Liquid meal replacement or supplement
- Breastmilk intake
- Infant formula intake