

## Module 2: Pediatric Growth Assessment

### Part Two – Ends of the Spectrum

**Slide 1:** A Preschool Nutrition Primer for Dietitians  
Module 2: Pediatric Growth Assessment – Part Two: Ends of the Spectrum

The Nutrition Resource Centre and NutriSTEP® present *Pediatric Growth Assessment – Part Two: Ends of the Spectrum*. This training module is one of five topics to increase the knowledge, skills and competence of Registered Dietitians who work in a variety of care settings. The goal of these evidence-informed Primers is to increase your comfort level to provide quality nutrition services to your clientele and support team-based care of young children.

**Slide 2:** Learning Objectives for this presentation are to:

- Understand the complex and influencing factors in childhood overweight and obesity.
- Know how to assess childhood overweight and obesity and the appropriate nutritional interventions in a primary care setting.
- Understand the types of Failure to Thrive and the risk factors and
- Know how to assess failure to thrive and the appropriate nutritional interventions in a primary care setting.

**Slide 3:** Presentation Outline will include the following topics:

For Overweight and Obesity:

- Population and individual level influences and actions
- Risk factors and potential causes
- Assessing obesity and healthy weights in children
- Recommended treatment strategies
- Nutritional assessment and interventions and
- Take home messages

For Failure to Thrive:

- Definitions
- Classifications
- Risk Factors
- Clinical Presentation

- Treatment Team and Dietitian Role
- Feeding Observation and Diet Instruction or Education

#### **Slide 4: Factors Impacting Child Growth & Preventing Obesity**

This diagram illustrates factors Impacting Child Growth & Preventing Obesity ranging from upstream to midstream, and then downstream.

Examples of:

- upstream include: policy changes to the food supply
- midstream include: public health education
- downstream include: nutrition or behaviour counselling programs

#### **Slide 5: Action on Obesity – The Three Different Paradigms**

- Public Health's work is Primary Prevention. In primary care, this work has focused on educating individuals to develop personal skills to adopt a healthy lifestyle. This is illustrated in green/right side, the downstream approach
- As the red/left side illustrates, we realize now that our efforts need to be more "Upstream", that is, we must also work at developing supportive environments and policy approaches to help individuals attain and maintain healthy weights.

#### **Slide 6: What Can We Do**

There are 6 different levels of changes that can occur from an individual level to a policy level. We need to work on all of these levels in whatever practice setting we are in.

- Level 1: Strengthening individual knowledge and skills
- Level 2: Promoting community education
- Level 3: Educating service providers
- Level 4: Fostering coalitions
- Level 5: Changing organizational practice and
- Level 6: Influencing policy and legislation

#### **Slide 7: Obesity**

Almost all cases of childhood obesity are caused when caloric intake exceeds caloric needs. Keep in mind that calorie needs are individual and are affected by the amount of physical activity a child gets.

**Slide 8: The Great Obesity Debate**

There are many factors that can affect childhood obesity, including:

- Energy balance
- Physical inactivity
- Food choices
- Eating behaviours
- Meals away from home
- Genetics
- Community design
- Automobile culture
- Parenting
- Individual foods/drinks
- TV/computer
- The food industry
- Agriculture policy
- Cost of food
- School lunches
- Vending machines
- Environment
- Individual responsibility and
- Fast food

**Slide 9: Medical Conditions Associated with Pediatric Obesity can include:**

- Genetics:
  - Monogenic disorders (such as melanocortin-4 receptor mutation, leptin deficiency, proopiomelanocortin deficiency)
  - And syndromes (such as Prader-Willi, Bardet-Biedl, Cohen, Alstrom, and Frohlich)
- Neurological Conditions such as:
  - Brain injury, brain tumor, cranial irradiation, and hypothalamic obesity
- Endocrine such as:
  - Hypothyroidism, Cushing syndrome, growth hormone deficiency, and pseudohypoparathyroidism
- Psychological such as:
  - Depression and eating disorders
- And Drug-Induced such as:
  - Tricyclic antidepressants, oral contraceptives, antipsychotics, sulfonylureas, and glucocorticoids

**Slide 10: Medical Co-Morbidities Associated with Childhood Obesity are:**

- Metabolic conditions such as: Type 2 diabetes and metabolic syndromes
- Orthopedic such as: femoral epiphysis and Blount's disease
- Cardiovascular such as dyslipidemia, hypertension, left ventricular hypertrophy, and atherosclerosis
- Psychological such as depression and poor quality of life
- Neurological such as pseudotumor cerebri
- Hepatic such as Non-alcoholic fatty liver disease or steatohepatitis
- Pulmonary such as sleep apnea and asthma
- And Renal such as proteinuria

**Slide 11: Other Factors**

Associated with childhood obesity are related to a child's environment, such as

- School environment
- Community environment and
- Family or Parent environment

Family or parent environment is the area most easily changed by clinical counselling. Other environments are more effected by a public health approach. Most often in the clinical setting we are dealing with the family/parent environment

**Slide 12: Assessing Obesity**

- Treatments for overweight/obese children are rarely implemented under 2 years of age
- Thorough nutritional assessments are needed to guide and plan interventions as obesity has many contributing factors

In children, a body mass index of greater than the 97<sup>th</sup> percentile is considered obese according to Canadian guidelines using the CDC growth charts. However, we will need to consider that these charts will be replaced by the WHO charts eventually. Therefore the 97<sup>th</sup> percentile may not apply. Also, remember to consider all various factors that come into play, and not just the body mass index. Think about past medical history, past or current medications, environment, feeding behaviours, and etc.

**Slide 13: Weight Goals to Achieve a Healthy Weight**

This diagram illustrates classification of overweight and obesity based on percentiles from the CDC growth charts, with recommendations for weight maintenance or weight loss.

Note these recommendations are based on CDC growth charts. Percentiles are not available in the WHO charts. These guidelines will change if the WHO charts were implemented.

Weight maintenance is usually for younger children and allowing them to 'catch up' through their height growth while some weight loss for adolescence may be in order.

To emphasize overweight and obese and energy requirements, assess how overall diet is. It may require minor adjustments, but to emphasize that the child should NOT be on a 'diet' of any sort, but emphasize "healthy eating" and "healthy options" when possible coupled with physical activity. With children, energy requirements are different because we need to consider GROWTH for children, so we need to provide enough for the child to grow.

**Slide 14: Current Recommendations for Obesity (The Gold Standard)**

- Little is known regarding the strategies and effectiveness with the preschool population
- For school age and adolescents, we use multi-component family based programs such as
  - Behavioural counselling
  - Increased physical activity
  - Parent training/modeling and
  - Dietary/nutrition education
- Interdisciplinary and comprehensive programs with
  - Ongoing follow-up for at least 3 months

**Slide 15: Nutritional Assessment consists of:**

- Subjective and objective data
- Detailed food frequency and diet recall
- Questions about meals/snacks, beverages, cooking methods, restaurant/take-out meals, friends, school theme days etc
- Questions about physical activity and screen time

- Nutrient analysis and estimated needs
- Readiness/barriers to change and
- Establishing a care plan and goals

**Slide 16: Motivational Techniques ...**

- Focusing on health benefits such as:
  - Self-worth and should not rely on appearance
- And stages of change include:
  - Pre-contemplation, contemplation, preparation, action, and maintenance.
- Help to understand your client's perspective. Target the interview toward the client's concerns, Avoid antagonism and keep the relationship open

**Slide 17: Motivational Techniques involve:**

- Motivational Interviewing includes:
  - Non-directive questions
  - Reflective listening
  - Compare values and current health practices and
  - Use importance or confidence rulers
- Non-judgemental approach evokes motivation rather than imposing it
- Encourage goal setting, monitor behaviours targeted for change, and use positive reinforcement

Examples of motivational interviewing are:

- What concerns do you have about your child's weight?
- Your child watches four hours of television on school days. What do you think about that?
- You are doing well with avoiding sugared drinks. You have been able to decrease this without too much stress.
- You are concerned about the possibility of developing diabetes. How does that feel?

**Slide 18: How Could Nutrition Care be Optimized?**

- Earlier referral?
- Increased frequency of visits, however, distance may be a factor
- Multi-disciplinary team approach such as an exercise specialist and behaviour expert
- Positive reinforcement for behaviour goals

- Caregiver continuity such as having a consistent dietitian
- Behaviour modeling from parents' lifestyle, siblings, or others

#### **Slide 19: Key Concepts in Nutrition Interventions**

- Adapted from Ellyn Satter's Division of Responsibility in Feeding handout page 3.
- Parents' jobs are to choose and prepare the food, provide regular meals and snacks, make eating time pleasant, teach children about food and mealtime behaviour, and do not let children graze.
- Children's jobs are to decide the amount they need, learn to eat their parents' foods, grow predictability and learn to behave well at the table.
- Children especially as they get older need to buy into the idea of healthy eating and willingness to change.
- Older children increasingly take on more responsibility for their food choices and so focus with them on making changes. While younger children are still more influenced by parent and caregiver decisions around food choices, eating times, and etc. See the DC Healthy Start for Life for more detail on this concept.

#### **Slide 20: Focus on Healthy Eating**

- Increase vegetables and fruit by aiming for 5 servings a day, and start with small steps. If they eat none, try starting with 1 serving.
- Increase fibre by choosing whole grains, whole fruits & veggies, and beans or legumes.
- Make healthy choices more often such as low fat dairy, lean meats/protein, and limit added fats.

#### **Slide 21: Focus on Healthy Eating (continued)**

- Limit sweet drinks by rethinking your drink choices. Watch out for fruit flavoured drinks, soft drinks, and sports and energy drinks consumption.
- Limit energy-dense, and not nutrient-dense snack foods and
- Limit meals and snacks eaten away from home.

#### **Slide 22: Focus on Healthy Eating (continued)**

What is a snack? What is a meal? Consider, with the parents:

- Portions, nutritional quality, healthy choices, and variety.
- Meal and snack schedules/timing.
- Eating cues such as: Eating for hunger and stopping when full.

- Family meals and family views of food (such as food for enjoyment versus nourishment).
- And foods eaten away from home such as at Grandma's, multiple caregivers, daycare, school, and restaurants.

See the Eat Right Be Active booklet or How To Build a Healthy Preschooler resource on the Nutrition Resource Centre's website for more information and ideas for parents. Another good source of information is the DC Healthy Start for Life on the Dietitians of Canada website.

### **Slide 23: Physical Activity**

- Assess level of activity individually
- Stress that activity is a major component of healthy weights
- Limit screen time to 1-2 hours a day and increase active play/physical activity
- Recommend community resources and programs for individuals with low incomes such as sponsored YMCA programs, sports tax credits, and free community events
- Suggest physical activity with neighbours (if safe and feasible) and/or friends with supervision
- See the DC Healthy Start for Life for more physical activity guidelines and suggestions for the preschool population.

### **Slide 24: Take Home Message**

- Factors are complex and rooted in many sectors
- Begins in early childhood: focus on children (via families, schools, community) is critical
- Education along with environmental and policy approaches
- Start with educating yourself and others about healthy weights approach and
- Advocate for model programming

### **Slide 25: Failure to Thrive**

- There is no consistent method of identifying or defining failure to thrive.
- It is generally accepted as growth that deviates from the norm; and assessing the progression of growth longitudinally is necessary, as a single growth measurement does not provide information or deviation of a growth pattern.

- It may be a symptom rather than a diagnosis.
- Failure to thrive may be defined as any of the following:
  - Weight for age less than the 5th percentile without a constitutional delay
  - Weight for height (or body mass index) less than the 5th percentile or
  - Decreased growth velocity with weight dropping greater than 2 major percentiles over 3-6 months

**Slide 26: Classifications of Failure to Thrive are:**

- Organic where it is due to an underlying medical condition. This can cause decreased oral intake, decreased absorption and decreased utilization of nutrients.
- Non-Organic where it involves Social or behavioural dysfunction, causing decreased oral intake.
- Or it can be organic and/or non-organic.

**Slide 27: The Risk Factors of Failure to Thrive are:**

Organic:

- The inability to consume adequate energy (such as dysphasia and cerebral palsy)
- The inability to retain nutrients (such as gastroesophageal reflux disease, and malabsorption)
- Increased energy needs (such as congenital heart disease and bronchopulmonary dysplasia) and
- Altered growth potential (such as prematurity, intrauterine growth retardation, and chromosomal anomalies)

**Slide 28: Risk Factors of Failure to Thrive (continued)**

Non-Organic:

- Psychosocial issues including:
  - Poverty
  - Disordered feeding environment
  - Dysfunctional parent and child interaction
  - Neglect
  - Sick or difficult child
  - Parental stress (such as depression, drug abuse, and isolation)
- Lack of Knowledge or Misinformation including:

- Intellectual impairment
- Decreased breast milk production and errors in formula preparation
- Increased juice consumption
- Misperceptions about normal infant and child diet and
- Unusual health and cultural beliefs

**Slide 29: Clinical Presentation of Failure to Thrive includes:**

- Weight loss or decreased growth velocity
- It may be classified as organic or non-organic, or not classified yet
- There is often a history of poor feeding and/or food aversions and
- Anemia (in up to 50% of failure to thrive cases)

**Slide 30: Birth to 36 months girls' chart**

This is a sample of failure to thrive where this child's birth weight and weight at 3 and 6 months were on the 95th percentile and then dropped to the 75-90th percentile at 8 1/2 months, to the 50th percentile at 12 months and 25th percentile at 15 months. Yet the child's linear growth remains unchanged/unaffected.

Repeat growth measurements for this assessment and use the same equipment for follow-up visits to determine the effectiveness of the nutritional care plan. Get a complete medical and nutritional history as it appears changes in health and/or nutritional intake occurred at about 9 months of age and appear to be continuing at 15 months as weight velocity has plateaued over the past three months (meaning no weight gain). Consider changes in the family setting, child care setting, feeding patterns, and child's health status to explain failure to thrive. Assess current caloric intake to determine adequacy and sufficient intake for catch up growth.

**Slide 31: Birth to 36 months girls' chart number 2**

This sample growth curve illustrates potential Failure to Thrive.

See the child's weight at 2 weeks of age, it is on the 5th percentile and then next weight measurement is at 6 months (note this is insufficient monitoring as there should be measurements at 1, 2 and 4 months of age,

see the collaborative paper for monitoring schedule). This child's weight continues below the 5th percentile following the same growth velocity as most children and appears to actually be gaining a little faster from 15-23 months (compare the angle of the child's curve to the reference curve-it is slightly steeper, meaning the child is gaining faster). The child's linear growth continues along the 5-10<sup>th</sup> percentile and there seems to be a length measurement at 3 months but no weight. There seems to be no effect on linear growth but note this is a difficult measure to do, therefore emphasize the importance of accuracy and frequent measures when possible (especially during infancy and growth spurts). Also height growth is not first affected by failure to thrive. It is first weight, then height, then head circumference.

You will need a complete medical and nutritional history to determine if there were significant illnesses or changes in intake to lead to weight drop in the first six months. It seems that the failure to thrive may have resolved and the child is catching up now. You would repeat growth measurements to confirm actual measurements using equipment that you can use at each follow-up visit to assess effectiveness of your nutritional care plan. Do a diet history and determining caloric intake and whether it is sufficient for catch-up growth.

#### **Slide 32: Treatment Team involves the:**

- Pediatrician
- Dietitian
- Social Worker
- Registered Nurse
- Child Psychologist/Psychiatrist or Behaviourist and
- Community Agencies (such as Health Units (HBHC program), Children's Treatment Centre, and children's aid society)

#### **Slide 33: The Role of the Dietitian and Completing a Nutritional Assessment**

- Get accurate anthropometrics
- Growth history from birth (call the Family Doctor)
- Lab values (complete blood count, ferritin, and sweat chloride to rule out cystic fibrosis)
- Detailed diet history from birth

- Outputs such as urine and stools
- Emesis
- Sleep patterns
- Social history (caregivers and home environment)
- Estimate energy intake & requirements for catch-up growth and
- Observe feeding

#### **Slide 34: Feeding Observation (The Caregiver and Child)**

Look for:

- Eye contact
- Physical contact
- Attentiveness to child's cues
- Use of distractions
- Role modeling/eating with child
- Caregiver's tolerance level and expectations
- Caregiver's reaction to child not eating
- Reactions in a stressed environment from both the caregiver and child and
- Division of Responsibility (Resource by Ellyn Satter)

#### **Slide 35: Diet Instruction and Education**

- Infants may require a Hypercaloric formula or expressed breast milk with formula concentrated to 24-30+ calories per ounce, in addition to high energy foods and boosters
- Toddlers and older children may require Hypercaloric milk or beverages with high energy foods and boosters (such as Pediasure, Instant Breakfast drinks, Resource just for kids, and etc.)
- *Some may even require tube feeding*

#### **Slide 36: Considerations for Tube Feeding**

- If it is long term versus short term use (consider a G-Tube versus an NG-Tube)
- Overall diet (over a long period of time), and whether the child may be able to meet his/her nutritional requirements by mouth
- The Formula type and concentration
- Qualification for formula coverage from the government
- Support and ability from family to carry out the responsibilities

- Support for family (such as professional assistance and training for the pump machine, if necessary) and
- Consultation and discussion with the child's multi-disciplinary team

### **Slide 37: Nutrition Care Plan and Education**

- Review normal diet for age (and boosters)
- Avoid grazing
- Limit juice (to less than 8 ounces per day)
- Limit milk consumption (to 2 cups per day for preschoolers)
- Assist with feeding techniques, such as utensils, approach, removal of distractions, feeding team support if necessary (such as an occupational therapist, speech pathologist, and dietitian)
- Assist with establishing a schedule of 3 meals/day with 2-3 snacks, and spaced out greater than 2 hours apart, and
- Division of responsibility between the parent and child:
  - For Parents, decision of what, when, and where to eat
  - For the Child, decision of how much and whether to eat or not

### **Slide 38: Calorie Boosters**

Examples of calorie boosters include using homogenized milk or whipping cream instead of milk in cream soups, puddings, and etc. Use peanut butter and extra butter or margarine in everything warm (where it can melt), and mini-go yogurts.

Encourage a high fat, high calorie diet for failure to thrive, and will usually need to keep the volume down and so boost calories through nutrient dense, high fat foods that won't be larger serving sizes.

### **Slide 39**

This is the end of the presentation. There are practice questions that can be completed on your own time, and are not part of the audio presentation. The questions and correct answers are located in the separate link titled [Modules 1-5: Case Study Questions and Answers](#).