Management of Type 1 Diabetes Mellitus in pre-adolescent children: Nutrition Considerations

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Key Questions

1. What unique nutrition needs of young children and growth considerations impact glucose management in young children?
2. How does a child's developmental progress-cognitive, social/emotional and fine/gross motor-guide diabetes self-management?
3. How do we address feeding challenges in young children that complicate diabetes management?
4. What strategies support healthy food choices and positive eating behaviors for young children and their families while managing diabetes?

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Type 1 Diabetes Epidemiology

- World Incidence-15/100,000-Prevalence 5.9/100,000 (T1DM represents 5-15 of all cases)
- USA Incidence-20/100,000-Prevalence 3.9/100,000
- Peak incidence age 12-14 years (increase worldwide for <age 5 years)
- Peak for girls precedes boys (puberty)
- After age 20 years males 2x females

- Mobasseri et al, Health Promotion Perspectives, 2020
- *Katsarou et al., Nature Reviews,2017*

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Barriers and Facilitators for Self-management

- Reliance on parents
  - Math
    - CHO counting and insulin calculations
  - Placement of cannula or injection sites
- Taking on new tasks
  - Participate independently with peers
  - Minimize pain
  - Alleviate burden on parents

- Rankin et al. BMC Endocrine Disorders, 2018

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Building Self-Efficacy

- Overcome disease denial
- Handle feelings triggered by needs for life changes
- Receive support from family
- Receive support from social networks
- Develop self-awareness and self-perception needed to feel confident in DM management
  - Collett et al. Rev Esc Enferm USP, 2018

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ADA 2018 Position Paper (last update)

- Structure management to evolving development
- Adapt care to child's needs and circumstances
- Transition planning for life course
- Incorporate intensive therapy
  - Multiple daily injections (prandial and basal)
  - $\leq$ 7.5% A1C (check 4x/year)
    - Flexibility required

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AND T1DM Evidence Analysis Center

- Literature search and review included 36/5192 articles
- The bulk of articles focused on CHO counting and diet patterns/quality
- Authors noted that approaches to diabetes management failed to tailor education/counseling to meet the needs of young children/family's

individual needs

- MNT offers an individualized approach
  - Handu and Piotowski, JAND, 2022

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❖"Observations upon growth and development are of the utmost importance during infancy and childhood. Only by this means are very many diseases detected in their incipiency". Holt, L. E. in Feld, L., & Hyams, J. (2004) Growth Assessment and Growth Failure. *Consensus in Pediatrics*. 5:1.

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The ABCs…

A. Anthropometrics
B. Biochemical
C. Clinical
D. Dietary
E. Environment
F. Feeding skills/development
G. Growth pattern

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Variations in Growth Patterns of Young Children (ages 2-10)

- The child is her own control
- The key word is "pattern"
- Reference and standard charts exist and are intended to be used in the context of the individual child and that child's development

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A: anthropometrics

- Measure accurately
  - What strategies exist for accurate measurement?
- Plot measurements on appropriate growth charts
  - Recumbent vs. standing height
  - Specialty growth charts
- Calculate BMI
  - Plot to obtain z-scores or percentiles
- Head circumference
- Skinfold and arm circumference

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G: growth pattern

- Compare to expected rate of growth for age and development
- Examine the trend depicted by growth charts
  - CDC charts
  - WHO charts
  - Specialty growth charts

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How does the feeding and eating environment impact overall health of a child (and the child's family)?

How might nutrition education provided in the context of the home environment impact diabetes management and health literacy?

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Health Literacy and Diabetes Management

- The capacity to understand and use health information to meet individual and family needs.
- Health Literacy includes:
  - Access to the healthcare system
  - Access to health information
  - Communication with healthcare providers
  - Navigating the healthcare system

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- Limited health literacy when viewed from the standpoint of point of service communication contributes to health disparities and poor health outcomes (Williams et al, 2002)
  - Lack of understanding with medical vocabulary
  - Lack of understanding of on-line information
  - Lack of informed consent
  - Poor compliance with medication and recognition of actionable side-effects
  - Validity of the medical history
  - Validity of tests that have components not adjusted for level literacy

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Developmental Perspectives

- Jean Piaget explained how knowledge evolves as children grow
  - Using the four stages of cognitive development, approaches to facilitate functional health literacy can be designed for children and families
    - Use language and visual representations
    - Use the child's descriptions and language
    - Partner with adults in the child's life to develop health literacy within the social and cultural norms of her community
      - Support learning where children and adults are

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Developmental Perspectives-continued

- Social, emotional, and cognitive developmental theories provide guidance on how to foster health literacy in children (Borzekowski, 2009)
  - Paulo Freire
    - Literacy includes reading the word and the world along with the developed ability to recognize situations that present barriers and apply learned strategies to overcome barriers
      - May foster ownership and empowerment and improve individual and population outcomes
      - Partnerships between children and adults in the home and community fosters understanding and adoption of health behaviors and informed decision-making

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Developmental Perspectives continued…

- Lev Vygotsky characterized cognitive and social development as most successful in social and cooperative settings (family and community)
  - What is the child's health literacy within the context of the family (dynamic assessment)
    - Child's ability to self-manage with help and the parent/caregiver ability to support self-management early and slowly remove supports as the child's skills develop (scaffolding)

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Feeding Concerns

- Concerns about feeding/eating behavior tend to be classified as existing solely within the child
- Children are part of a family and community and feeding disturbances for the most part are related to physical and psychosocial development in the context of the characteristics of the family
  - Chao & Chang, 2017

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Parental Interactions: Examples that may signal need for intervention beyond the primary care setting (Davies et al.)

- Parents are overly rigid and have agendas for the child's eating and growth, and therefore tend to undermine the child's ability to regulate food intake as well as impair the child's psychosocial development
- Parents are chaotic and therefore fail to provide the child with appropriate food or appropriate support, structure, and opportunities for learning to like a variety of food as well as master social patterns around eating.

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Parental Interactions – continued

- The social context for feeding is inappropriate: too controlling or lacking in adequate support
- Parents' limitations in cognitive abilities, eating attitudes, and/or behavior, which contribute to errors in management of food selection, food availability, or support for the child's intrinsic food regulation capabilities

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Characteristics of the child that complicate the feeding relationship

- Medical, neuropsychiatric, or neuromuscular issues that heighten parental concern, increase the difficulty of feeding the child, and likely distort feeding dynamics
- Temperamental characteristics that complicate feeding and overwhelm parent's ability to cope

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The Feeding Relationship

- The parent or caregiver is to provide appropriate food at appropriate times in appropriate quantities
- The child decides if she will eat and how much
  - Satter E, Child of Mine Feeding with Love and Good Sense. Bull Publishing, 1986

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Specific approaches for nutrition education

- Assess parent/caregiver confidence, investment, and authority in the feeding/eating relationship
  - Will have to work in that space
- Include the child as much as possible and support the caregivers in allowing the child to make feeding and eating choices
- Help families and children connect nutrition messages to life course health

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Nutrition Education for Parents

- Families need up-to-date, accessible information on how to keep kids healthy
- Messages adapted to age of children and educational background of the parents
- Provide alternative routes for learning (community programs, online resources etc.)
- Engage parent in construction of their personal health literacy
- Adapt messaging to fit with parenting and communication styles

Nutrition Education for Children

- Age/development appropriate
- Visual
- Interactive
- Contextual (family, school, community)
- Facilitate development of health as part of personal identity
- Modeled by adult caregivers

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Strategies

(DeCosta et al. 2017; Satter 2000)

- Strengthening the feeding relationship
  - Define roles of parent and child
- Be creative with food choices
  - Where can we get the nutrients of concern within the child and parents' comfort zone?
- Stop the food fights
  - Empower parents/caregivers to adhere to their role
    - Timing of meals and snacks (3 meals/3 snacks)
    - Meals and snacks in prearranged locations
      - Decreased distraction
    - Offer healthy, nutrient-dense foods
      - "gate keeper" approach
- Educate on appropriate expectations for intake
  - Quantity
  - Self-feeding
  - Communication of hunger/thirst
  - Teaching kids to taste (hierarchy of food acceptance)

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Strategies - continued

- Nutrient quality
  - Offer 3-4 healthy food items at meals and 2-3 at snacks
  - Portions should be child-sized
    - Allow children to serve themselves if possible.
    - Rule of thumb: 1 Tablespoon of each food for each year of age
    - Hand size: 1 serving is what will fit into the palm of the hand (as we get older our portion sizes increase – to a point!)
    - Milk/dairy servings are 2-8 oz. depending on the age of the child
  - Incorporate variety
  - Involve the child in food preparation and meal readiness

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Taste: Ask about favorite foods

- Get an idea of the core of foods a child likes
- Get an idea of how much the child likes these foods (magnitude)
- These pieces of information may offer clues about how to introduce new foods that have a higher probability of being accepted
- Offer foods the child does like with the new foods being presented
  - Offer the new food 10-15 times
  - Model eating the new food
- Be sensitive to temperature, smell and texture

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Allow self-feeding

- Offer developmentally appropriate finger foods
- Allow the child to hold a spoon while being fed and try to feed herself
- Get Messy!
  - Learning to eat neatly is a life-long quest
    - Bibs, old shirts, "disaster mats" under chairs
- Some children eat better when they feed themselves
  - Use other feeding tools are available
    - other foods, toys, etc.

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Attention Span for Mealtimes

- Mealtimes for young children may be short – 10 minutes or so
  - Have the food ready before calling everyone to dinner
  - Restaurant meals can be frustrating for families
- Allow the child to be excused when he or she is done

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Glucose Control

- Explore creative ways to administer insulin to optimize glucose control without increasing risk of hypoglycemia
  - Consider feeding/eating behaviors
  - Age of the child
  - Physical activity
  - Activity patterns

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Overview

- Assess the growth and development of the child
  - Children who are meeting expectations are likely doing well with basic needs
- Determine if the feeding concern is a "Problem" or "Developmental Variation"
- Assess the "Feeding Relationship"
- Refer if necessary (feeding team)

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Family Focused Treatment

Responsibility sharing	Screen
• Outline at the end of each visit • Responsibilities change for the child as they mature • Manage conflict	• Behavioral health • Eating disorders

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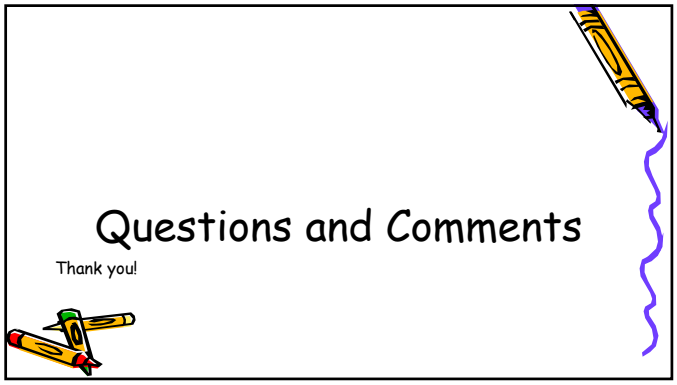

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