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Faculty Presenters:

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UMKC School of Medicine

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UICOMP
Medical Director, Healthy Kids U Program
Children’s Hospital of Illinois

The webinar will feature:
- Brief presentation on articles
- Discussion of research and clinical implications
- Open question and answer session

"A Review of Modifiable Risk Factors for Severe Obesity in Children Ages 5 and Younger". Childhood Obesity; October 2018; Volume 14, Number 7

"Characteristics of Children 2 to 5 Years of Age With Severe Obesity". Pediatrics originally published online February 27, 2018

"Application of the Medical Neighborhood to Children with Severe Obesity". Childhood Obesity; August/September 2018; Volume 14, Number 6

www.Ihcw.aap.org
Presentation is being recorded and will be posted online

To ensure audio quality:
- If possible, use the Webex “Call me” feature, or
- Please call in via land line
- All participant lines will be muted

Raise hand or type questions into the Chat box

Technical difficulties? Use the Chat box
Expert Exchange
WHO?

The Expert Exchange is comprised of representatives from tertiary obesity treatment programs at twenty different children’s hospitals across the United States. These representatives were selected from the clinical leaders formerly engaged in the FOCUS on a Fitter Future obesity improvement collaborative.

- Interdisciplinary
- Clinical experience and expertise
- Research expertise
WHAT?

The Expert Exchange focus

1. Explore characteristics of children younger than 5 years with severe obesity that may serve as a basis for clinical care while identifying gaps.

2. Identify potential framework to support care coordination and treatment of children with obesity in the context of a coordinated system of tertiary care, primary care practices and the community.
Expert Exchange workgroup: Publications


A Review of Modifiable Risk Factors for Severe Obesity in Children Ages 5 and Under

Renee M. Porter, RN, MS, DNP,1 Alexis Tindall, RD, LD,2 Bethany J. Gaffka, PhD,3 Shelley Kirk, PhD, RD, LD,4 Melissa Santos, PhD,5 Indira Abraham-Pratt, PhD,6 Jane Gray, PhD,7 David Heckler, PhD,7 Wendy L. Ward, PhD, ABPP,8 Jared M. Tucker, PhD,9 and Brooke Sweeney, MD,10
What the literature reports:

| Study Type                  | • Retrospective Chart review (5)  
|                            | • Longitudinal Study (1)           
|                            | • Cross-sectional (2)             
|                            | • Prospective Study (1)           |
| Comparison Groups          | • Compared SO, to OB, OW & Healthy Weight  
<p>|                            | • Descriptive (summarized behavior of young child with SO without comparison) |
| Ages                       | Birth-5 years; 1-4; 17-24 mo; 2-5; 3-5; 9 mo-Kindergarten |
| Study Size                 | N= 41-688 |
| Study Population           | HMO, Referral Clinic, Registry/Network, Intervention, Research Cohort (LS), NHANES |
| Study Years                | 1997-2016 |
| Publication Dates          | 2008-2017 |</p>
<table>
<thead>
<tr>
<th>Design/Years/Pub Date</th>
<th>SO Criteria</th>
<th>Study Population</th>
<th>AGE/ N</th>
</tr>
</thead>
</table>
| RCR: 2000-2006 2008  | % IBW ≥ 160% | Obesity Treatment Referral Clinic | Ages 1-4 y  
N=67 with SO  
12%: BMIz ≥5.0 |
| LS: 2001-2008 2013  | BMI ≥ 99th% | Early Childhood Birth Cohort | Ages: 9 mo- kindergarten (K)  
N=400 with SO  
5.7% in K |
| RCR: 2009-2011 2014 | BMI ≥ 99th% | Obesity Treatment Referral Clinic | Ages 2-5 y  
N=140 with SO  
11%: BMIz ≥5.0 |
| PS 2012              | Median BMI = 99th%  
Mean BMIz=2.36 | Family-Based Obesity Treatment Intervention Study | Ages 2-5 y  
N=41 |
N= 72 with SO |
| RCR: 2007-2010 2013 | BMI=1.2x95th% | Northern California Kaiser Clinic | Ages 3-5 y  
N=688 with SO  
N “biologically implausible BMI/Wt Values”=223 |
| CS: 2009-2016 2017  | WHO zBMI = >3  
CDC BMI = 1.2x95th% | TARGet Kids!  
Better Outcomes Registry & Network (BORN) Ontario | Ages: 17-24 months  
N = 4481 (1.1% WHO SO definition & 0.3% CDC SO def) |
| RCR: 2012-2013 2016 | 1.2x95th%  
Moderate OB: 1.0-1.19x95th% | Kaiser Permanente Northern California | Ages 3-5  
N=355 |
| CS: 1999-2012 2017  | BMI=1.2x95th% | NHANES | Ages: 2-5 years  
N= 157 (2.1%) with SO |
# Highlights from the Narrative Review

## Risk Factor Domain

<table>
<thead>
<tr>
<th>Specific Finding Predicting Severe Obesity (SO), More Associated with SO or Protective of SO</th>
<th>Odds Ratio, %, Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td><strong>BMI Early BMI Crossers:</strong>&lt;br&gt;• Crossing 85th% at 9 mo&lt;br&gt;• Crossing 85th% at 2 years</td>
</tr>
<tr>
<td><strong>Nutrition</strong></td>
<td><strong>• Drinking tea/coffee between meals or before bedtime at 2 yo</strong>&lt;br&gt;<strong>• Sugary Beverages at K 1x in past wk</strong>&lt;br&gt;<strong>• ≥2 Sugary Drinks/Day</strong>&lt;br&gt;<strong>• PROTECTIVE: Consumption of fruit at least weekly at K</strong></td>
</tr>
<tr>
<td><strong>Eating Behaviors</strong></td>
<td>**• <strong>Child Eating and Behavior Questionnaire (CBEQ): ages 2-12, SO vs OB</strong>&lt;br&gt;<strong>Lower “Satiety Responsiveness” P=0.006</strong>&lt;br&gt;<strong>Females were higher “enjoyment of food” (P=0.031) and lower on “Slowness of Eating” (P=0.047)</strong></td>
</tr>
<tr>
<td><strong>Sleep</strong></td>
<td><strong>• Inadequate sleep/night (&lt;8 hrs in 3-5 yo)</strong>&lt;br&gt;<strong>• Each hour of nocturnal sleep associated with 186 fewer calories consumed (posttreatment) &amp;</strong>&lt;br&gt;<strong>• BMlz decrease</strong></td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td><strong>60 minutes exercise (not PE) &lt;5 d/wk</strong>&lt;br&gt;40.7% Mod OB vs 53% with SO*</td>
</tr>
<tr>
<td><strong>Maternal health</strong></td>
<td><strong>• Maternal BMI/Pre-pregnancy BMI</strong>&lt;br&gt;<strong>• Maternal GDM</strong></td>
</tr>
</tbody>
</table>
Highlights from descriptive study

Single descriptive study (without control) in an obesity referral clinic described eating behaviors using clinical tool:
N=140, ages 2-5 y
11%: BMIz ≥5.0

- Problem eating patterns 68% (snacks too much, eats too fast, eats at wrong time of day, skips meals, eats at night)
- Mindless eating 51% (in front of TV/computer, eating when bored, food as reward)
- Self-control problems 76% (large portions, loves sweets, can’t stay away from food, eats ≥ 2 servings, not sure when full)
Gaps

- Stratification and comparison
- Social Determinants of Health
- Parental Influence
  - Household routines
  - Parent behaviors
- Child Behaviors
  - Eating
  - Behavioral health
- Early identification
- Early influences
- Protective Factors
Characteristics of Children 2 to 5 Years of Age With Severe Obesity


Background/Methods

- Need to better characterize young children with severe obesity
- NHANES datasets from 1999-2014 were utilized in order to have adequate power to detect differences between subgroups of healthy weight, overweight, obesity, and severe obesity (>120th% of 95th percentile)
  - N = 7028
  - Ages 2-5
- Evaluated demographic, social determinant, and modifiable factors known to be associated with obesity
Variables of interest

- Birthweight
- Maternal smoking during pregnancy
- Breastfeeding
- Child race/ethnicity
- Age
- Sex
- Marital status
- Parent educational attainment
- Maternal age
- Screen time
- Physical activity-but unable
- Diet quality and total calories
Results: Weight Status

- Healthy weight: 76.5
- Overweight: 13
- Obesity: 8.4
- Severe Obesity: 2.1

Weight classification
# Results: Increased Odds of Obesity/Severe Obesity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Healthy Weight</th>
<th>Overweight</th>
<th>Obesity</th>
<th>Severe Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>47.7 (ref)</td>
<td>47.5 (0.16)</td>
<td>49.6 (2.2)*</td>
<td>56.5 (9.2)*</td>
</tr>
<tr>
<td>Race and/or Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>1604 (ref)</td>
<td>264 (ref)</td>
<td>146 (ref)</td>
<td>31 (ref)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1782 (ref)</td>
<td>361 (1.3)*</td>
<td>304 (2.0)*</td>
<td>75 (2.3)*</td>
</tr>
<tr>
<td>Non-Hispanic African American</td>
<td>1843 (ref)</td>
<td>224 (1.0)</td>
<td>174 (1.5)*</td>
<td>44 (1.7)*</td>
</tr>
<tr>
<td>Household Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;300%</td>
<td>1109 (ref)</td>
<td>145 (ref)</td>
<td>90 (ref)</td>
<td>16 (ref)</td>
</tr>
<tr>
<td>200-299</td>
<td>623 (ref)</td>
<td>104 (1.2)</td>
<td>76 (1.3)*</td>
<td>16 (1.7)*</td>
</tr>
<tr>
<td>100-199</td>
<td>1330 (ref)</td>
<td>252 (1.4)*</td>
<td>181 (1.5)*</td>
<td>47 (2.2)*</td>
</tr>
<tr>
<td>&lt;100</td>
<td>1850 (ref)</td>
<td>340 (1.3)*</td>
<td>267 (1.6)*</td>
<td>64 (2.1)*</td>
</tr>
</tbody>
</table>
### Results: Increased Odd of Obesity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Healthy Weight</th>
<th>Overweight</th>
<th>Obesity</th>
<th>Severe Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Caregiver Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any college</td>
<td>2383 (ref)</td>
<td>349 (ref)</td>
<td>239 (ref)</td>
<td>49 (ref)</td>
</tr>
<tr>
<td>Less than HS or GED</td>
<td>2735 (ref)</td>
<td>544 (1.5)*</td>
<td>392 (1.5)*</td>
<td>107 (2.4)*</td>
</tr>
<tr>
<td><strong>Caregiver Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>3533 (ref)</td>
<td>594 (ref)</td>
<td>421 (ref)</td>
<td>85 (ref)</td>
</tr>
<tr>
<td>Single</td>
<td>1401 (ref)</td>
<td>269 (1.2)</td>
<td>202 (1.4)*</td>
<td>60 (2.0)*</td>
</tr>
<tr>
<td><strong>Birth Weight</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>561 (ref)</td>
<td>57 (0.6)*</td>
<td>45 (0.7)</td>
<td>15 (1.0)</td>
</tr>
<tr>
<td>Normal</td>
<td>4219 (ref)</td>
<td>746 (ref)</td>
<td>511 (ref)</td>
<td>122 (ref)</td>
</tr>
<tr>
<td>High</td>
<td>391 (ref)</td>
<td>98 (1.2)</td>
<td>100 (2.0)*</td>
<td>17 (1.1)</td>
</tr>
<tr>
<td>Mom smoked pregnancy</td>
<td>677 (ref)</td>
<td>126 (1.1)</td>
<td>103 (1.4)*</td>
<td>22 (1.6)</td>
</tr>
<tr>
<td>Never breastfed</td>
<td>1777 (ref)</td>
<td>328 (1.1)</td>
<td>255 (1.5)*</td>
<td>70 (1.9)*</td>
</tr>
</tbody>
</table>
Results: Odds of Screen Time Exceeding AAP recommendations
Conclusions

✓ Increased screen time associated with increased odds of obesity and severe obesity

✓ No significant differences found in terms of calories consumed or diet quality

✓ Significant health disparities seen
  ✓ Those from racial and ethnic minority groups, especially Latino
  ✓ Families with incomes below the federal poverty level
  ✓ Single parent households with low educational attainment
Clinical Implications

- Provide early, frequent education about breastfeeding
- Start counseling about screen time at infant WCCs
- Consider creative ways to reach families from racially and ethnically diverse cultures, especially at young ages to engage in treatment
- Role of possible low resting energy expenditure in children with severe obesity versus underreporting of calories
CANADIAN 24-HOUR MOVEMENT GUIDELINES FOR CHILDREN AND YOUTH
An Integration of Physical Activity, Sedentary Behaviour, and Sleep.

A HEALTHY 24 HOURS INCLUDES:

**SWEAT**
MODERATE TO VIGOROUS PHYSICAL ACTIVITY
An accumulation of at least 60 minutes per day of moderate-to-vigorous physical activity, comprising a variety of aerobic activities. Vigorous physical activities and moderate-to-vigorous strengthening activities should each be incorporated at least 3 days per week.

**STEP**
LIGHT PHYSICAL ACTIVITY
Several hours of mostly unstructured and unsupervised light physical activities.

**SLEEP**
Uninterrupted 8 to 11 hours of sleep per night for those aged 5 to 13 years and 9 to 10 hours per night for those aged 14 to 17 years, with consistent bedtimes and wake-up times.

**SIT**
SEDENTARY BEHAVIOUR
No more than 2 hours per day of noncontinuous screen time and limited sitting for extended periods.

**VISIT BUILDYOURBESTDAY.COM AND CREATE THE BEST DAY EVER!**

Presenting sufficient sleep, trading indoor time for outdoor time, and replacing sedentary behaviour and light physical activity with additional moderate to vigorous physical activity can provide greater health benefits.
Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years)

For healthy growth and development, infants, toddlers, and preschoolers should achieve the recommended balance of physical activity, high-quality sedentary behaviour, and sufficient sleep. A healthy 24 hours includes:

**MOVE**

**INFANTS (LESS THAN 1 YEAR)**

Being physically active several times in a variety of ways, particularly through interactive floor-based play—more is better. For those not yet mobile, this includes at least 30 minutes of tummy time spread throughout the day while awake.

**TODDLERS (1-2 YEARS)**

At least 180 minutes spent in a variety of physical activities at play indoors, including energetic play, spread throughout the day—more is better.

**PRESCHOOLERS (3-4 YEARS)**

At least 180 minutes spent in a variety of physical activities spread throughout the day, of which at least 60 minutes is energetic play—more is better.

**SLEEP**

**INFANTS (LESS THAN 1 YEAR)**

14 to 17 hours for those aged 0-3 months or 12 to 16 hours for those aged 4-11 months of good-quality sleep, including naps.

**TODDLERS (1-2 YEARS)**

11 to 14 hours of good-quality sleep, including naps, with consistent bedtime and wake-up times.

**PRESCHOOLERS (3-4 YEARS)**

15 to 17 hours of good-quality sleep, which may include a nap with consistent bedtime and wake-up times.

**SIT**

Not being restrained for more than 1 hour at a time, e.g., in a stroller or high chair. Screen time is not recommended. When sedentary, engaging in pursuits such as reading and interacting with a caregiver is encouraged.

Replacing time restrained or sedentary screen time with additional energetic play and outdoor time can yield greater health benefits.
CANADIAN 24-HOUR MOVEMENT GUIDELINES
FOR THE EARLY YEARS (0-4 YEARS)

INFANTS LESS THAN 1 YEAR
Being physically active several times in a variety of ways, particularly through interactive floor-based play—more is better. For those not yet mobile, this includes at least 30 minutes of tummy time spread throughout the day while awake.

TODDLERS 1-2 YEARS
At least 180 minutes spent in a variety of physical activities at any intensity, including energetic play, spread throughout the day—more is better.

INFANTS LESS THAN 1 YEAR
14 to 17 hours (for those aged 0-3 months) or 12 to 16 hours (for those aged 4-11 months) of good-quality sleep, including naps.

TODDLERS 1-2 YEARS
11 to 14 hours of good-quality sleep, including naps, with consistent bedtimes and wake-up times.

PRESCHOOLERS 3-4 YEARS
10 to 13 hours of good-quality sleep, which may include a nap, with consistent bedtimes and wake-up times.

PRESCHOOLERS 3-4 YEARS
Not being restrained for more than 1 hour at a time (e.g., in a stroller or high chair) or sitting for extended periods. For those younger than 6 years, sedentary screen time is not recommended.

PRETENDERS 1-2 YEARS
Not being restrained for more than 1 hour at a time (e.g., in a stroller or high chair) or sitting for extended periods. For those younger than 6 years, sedentary screen time is not recommended.

FOR MORE INFORMATION VISIT:
BUILDYOURBESTDAY.COM/EARLYYEARS
Application of the Medical Neighborhood to Children with Severe Obesity

Amy L. Christison, MD, Susma Vaidya, MD, Lydia Tinajero-Deck, MD, and Sarah E. Hampl MD
Featured relevant approaches to care coordination within a medical neighborhood model which could apply to severe obesity management

https://millenniumcc.org/building-up-patient-centered-medical-neighborhoods/
Chronic disease care coordination, access, and communication among healthcare providers

Pre-Consult
- Shared screening
- Primary care management algorithm
- Specialty availability

Formal Consult
- Uniform referral content
- Timely process

Management Roles
- Co-management or transfer of care for a time
- Transition back to primary

Coordinated PWM and primary care exchange
- Care Coordination Agreements
- Shared decision making with families and care plans
- Capacity building
  - Learning collaboratives
  - Clinical Decision Support
  - Training
  - Consultative availability
Care coordination in the community

- Community programs and resources are complimentary team care members
  - partnerships with YMCA, park districts, community centers
  - active endorsement, referral, and exchange of communication bidirectionally
  - care plans related to physical activity and optimal nutrition within the school
  - use of School Based Health Clinics to promote healthy habits, treat obesity,
- Use of community trusted integrator: sustain key relationships, infrastructure, and policy changes with the community ecosystem
Transition of care between pediatric and adult specialists

- Discussion early about transition developing shared expectations about when and what that would look like

- Older adolescents:
  - shared understanding of shorter term therapeutic relationship
  - not a replacement for their primary care provider

- Consider
  - use of transition coordinator
  - transition clinics: adolescent and young adult
  - co-locating adult and pediatric providers for PWM
Facilitators and barriers associated with effective care coordination

- Effective provider to provider communication
  - necessary information before the consultation, clear identification of referring provider and care team, timely receipt of specialty communication
  - specialist communication includes suggestions for future care, follow-up arrangement, plans for management or co-management
- EHR support for standard referral process, facilitate pre-consultative communication, track referrals, measure performance metrics
- Allocation of healthcare system resources for care coordination and CCAs
Promising approaches to coordinated care delivery

- Capacity building for prevention, identification of problematic weight gain and related co-morbidities, and management within the primary care
- Shared decision making with the family about 1) referral, 2) expectations of provider treatment roles, 3) care plans and 4) timing of transitions
- Uniform and timely process and communication exchanged among all care team members, family, and community partners
- Call for infrastructure support: 1) EMR facilitated communication, referral, outcomes tracking, 2) capacity building within primary care, 3) care coordinators, 4) community partnership building
Questions?
A Focus on Early Obesity Prevention

- A series of CME modules for pediatric clinicians
- A series of family resources to support adoption of healthy active living behaviors

Access the Portal

These materials and other resources are available at: www.aap.org/EarlyFeedingHALF
CME Modules

Online Modules for Pediatric Healthcare Providers

Introductory Module

Appropriate Nutrition (a series of 5 mini-modules)
- Breastfeeding
- Bottle feeding
- Food Introduction
- Healthy Snacks
- Healthy Beverages

Safe and Supportive Environment (a series of 5 mini-modules)
- Physical Activity
- Screen Time
- Sleep
- Adverse Childhood Experiences
- Food Insecurity

Stable and Responsive Relationships (a series of 4 mini-modules)
- Parenting & Feeding Styles
- Hunger & Satiety
- Role Modeling & Routines
- Healthy Family
Patient and Family Materials

Social Media Assets
A Tweet Bank and a set of social media graphics on critical feeding practices and early obesity prevention are also available for you to use! These tools are ideal for platforms you use to engage with families, especially a practice page on social media or an education tab on your website.

Engaging Families through Media
Pediatricians and other healthcare providers can utilize these brief and engaging videos to educate families about key healthy active living behaviors.

Healthy Habits for You and Your Baby: Responsive Feeding:

Healthy Habits for You and Your Baby: Introducing Solid Foods:

Healthy Habits for Your Children: Tips for Feeding Picky Eaters:
Infographic topics:

- Responsive Feeding
- First 2 years
- Breastfeeding
- Food Introduction
- Picky Eating
In *Change Talk*, users practice several MI skills and communication techniques, including shared agenda-setting, open-ended questions, reflective listening, elicit-provide-elicit, importance-and-confidence scales, affirmation, and summarizing.


Thank you!

lhcw.aap.org

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