

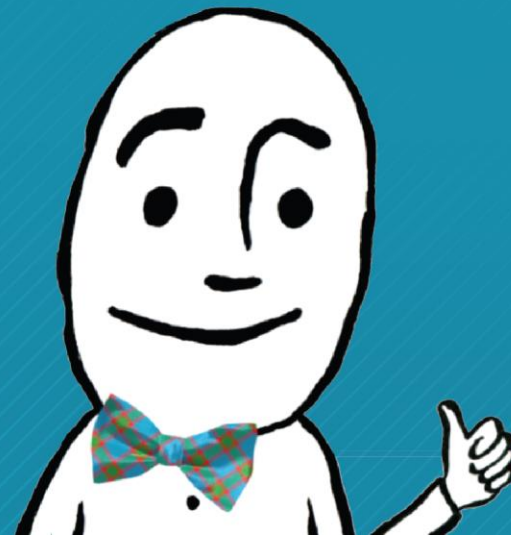
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& EXPLORE**



1. Spotlight: Introducing: A Guide to Methods for Assessing Childhood Obesity
2. One on One
 - Dympna Gallagher, Columbia University
 - Voula Osganian, NIH
 - Brook Belay, CDC
3. NCCOR Announcements

TODAY'S PROGRAM



Today's Conversation



**Dympna Gallagher,
EdD**
Columbia University



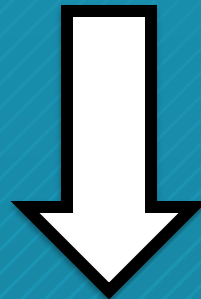
**Voula Osganian,
MD, ScD, MPH**
National Institutes of
Health



**Brook Belay,
MD, MPH**
Centers for Disease
Control and Prevention

Need technical assistance? Have a question for our speakers?

Type your question(s) by clicking the
Q&A icon located below and
representative will respond shortly.



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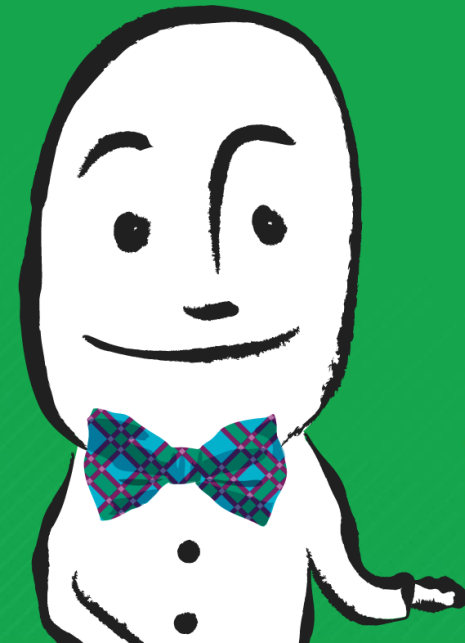
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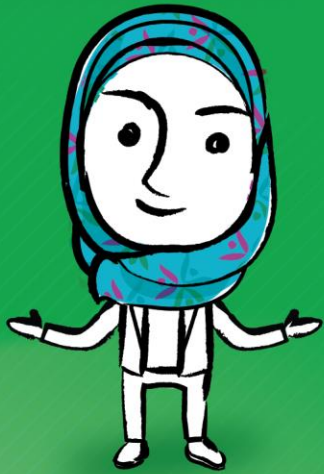
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INTERACTIVE POLL



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SPOTLIGHT



Standard measures are needed for:



Research and evaluation related to the causes of childhood obesity



Interventions to prevent and treat obesity in children



Programs and policies concerning individual and environmental determinants of childhood obesity



Progress towards identification and implementation of evidence-based interventions, programs, and policies

Why Develop This User Guide?

- Difficult for users to choose the most appropriate methods to assess adiposity, or the amount of body fat, in children.
 - Multiple methods exist
 - Existing information on methods is often lengthy and difficult to read
- Users want information that is easy to understand and that provides examples relevant to their work.

Why Do We Need to Measure Childhood Adiposity?

1 PSYCHOSOCIAL

Poor self-esteem
Depression
Eating disorders

2 PULMONARY

Irregular breathing during sleep
Asthma
Exercise intolerance

3 GASTROINTESTINAL

Gallstones
Fatty liver disease

4 RENAL

Kidney Disease

5 MUSKULOSKELETAL

Upper thigh bone shift
Abnormal growth of lower leg bones
Forearm fracture
Flat feet

6 NEUROLOGICAL

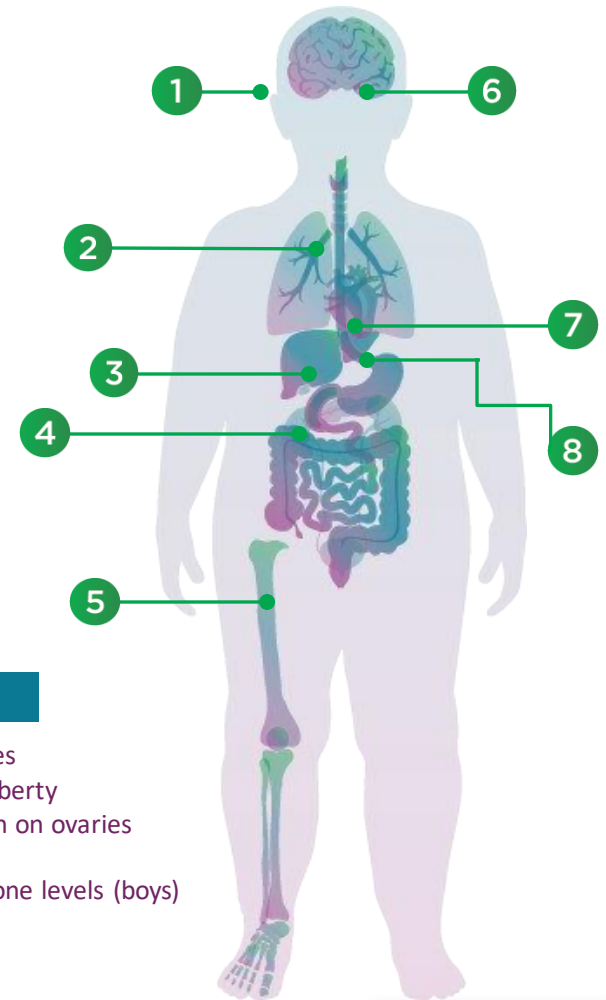
High brain fluid pressure

7 CARDIOVASCULAR

Abnormal blood lipid levels
High blood pressure
Blood clotting impairment
Long-term inflammation
Blood vessel dysfunction

8 ENDOCRINE

Type 2 diabetes
Early onset puberty
Fluid collection on ovaries (girls)
Low testosterone levels (boys)





Just released



A Guide to Methods for Assessing Childhood Obesity

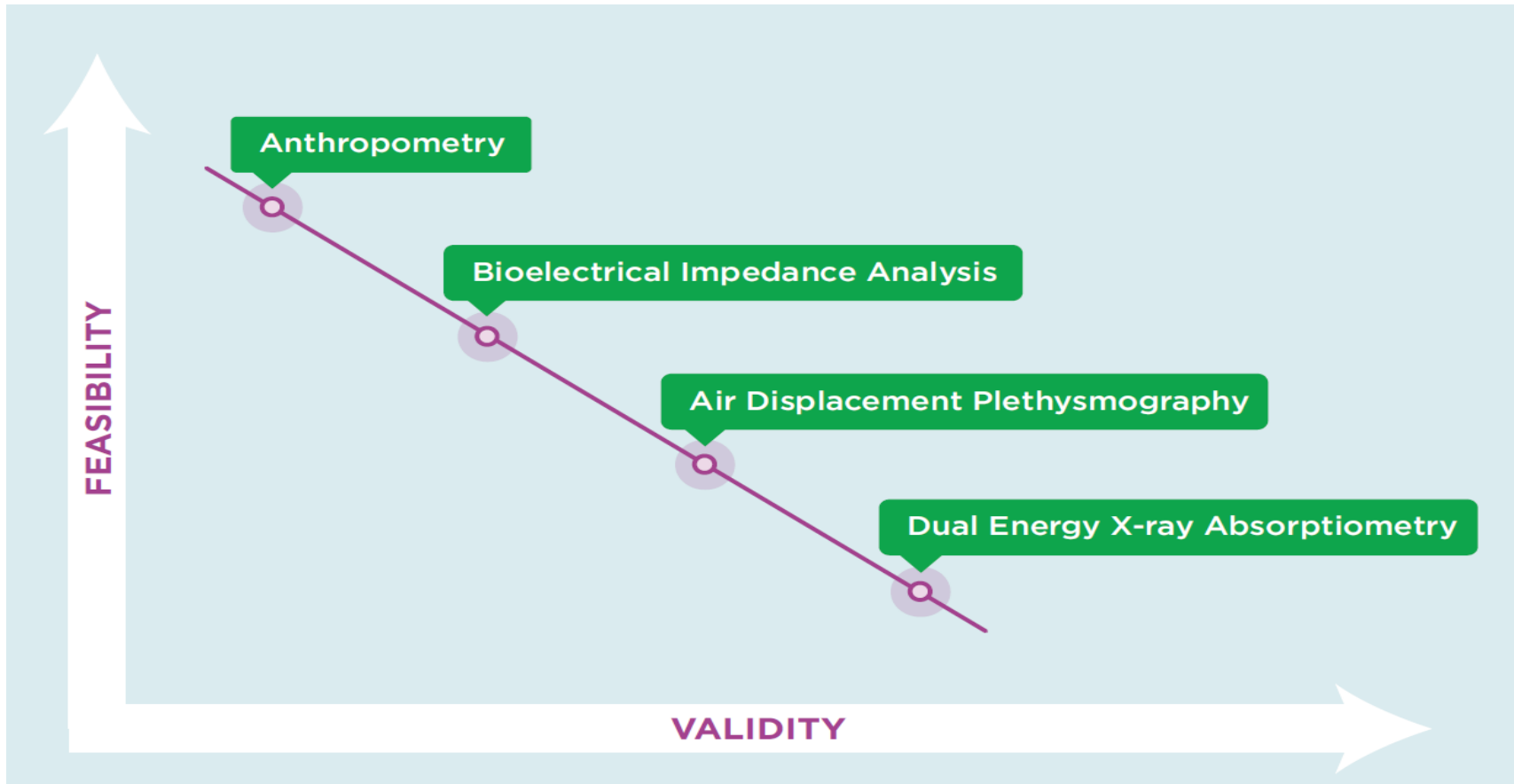
nccor.org/tools-assessingobesity

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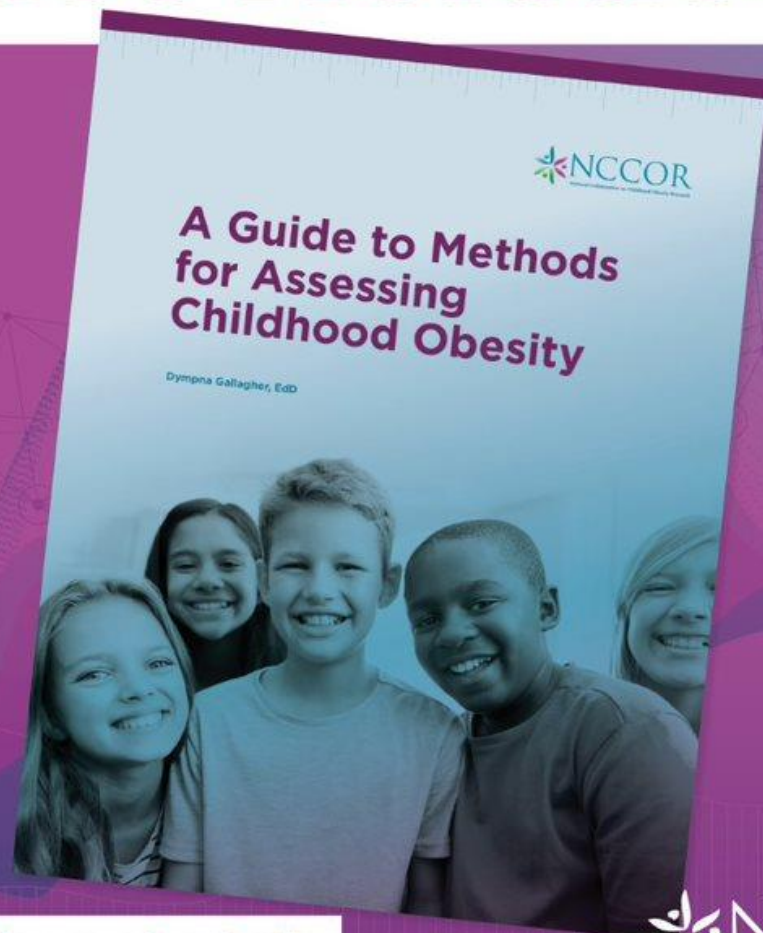
What Does the Guide Include?

- Overview of Body Composition and Measuring Adiposity
- Key Factors Influencing Body Composition and Its Distribution
- Clinical Utility of Assessing Adiposity in Children
- Assessing Adiposity
- Using Secondary Data to Assess Obesity
- Case Studies
- Resources

What Methods Are Included in the Guide?



Just Released



nccor.org/tools-assessingobesity

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National Collaborative on Childhood Obesity Research

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What is Body Composition?

Body composition is the relative proportion of fat mass (FM) and fat-free mass (FFM) in the body.

$$\text{Body weight} = \text{FM} + \text{FFM}$$

FM consists of adipocytes in adipose tissue as well as fat deposits found in other cells and organs.

FFM consists of muscle, bone, internal organs, and body water.

How to Measure Body Composition?

Available methods estimate body FM using indirect or surrogate measures.

Simple, accessible, and accurate methods for measuring body FM directly are not available because of safety concerns.

What Influences Body Composition?

- As children grow and mature, body composition changes due to factors such as
 - Hormones
 - Environments
 - Disease
- Growth is associated with increases in FFM and FM.
- Changes in the relative proportions of FFM and FM have implications for accurate measurement of body composition.

What Should I Know When Assessing Adiposity?

- Adiposity measurement methods vary in
 - Reliability
 - Validity
 - Participant acceptability
 - Cost
 - Technical complexity
- Each method has advantages and disadvantages.
- Each method has some degree of error.

What Matters When Choosing a Body Composition Measurement Method?

- Choosing a body composition measurement method depends on the following:
 - Goal of the study or evaluation
 - Type of tissue to be assessed
 - Study population
 - The setting and resources available

What Should I Consider When Assessing Adiposity?

- Specific factors to consider when selecting a method include
 - Validity
 - Reliability
 - Sensitivity to change over time or with interventions
 - Ability to predict health risks or outcomes
 - Availability of reference ranges or norms for the study population
 - Accessibility of the tools and/or equipment and staff in terms of training and level of skill needed
 - Cost
 - Degree of burden and/or risk and acceptability to the participant

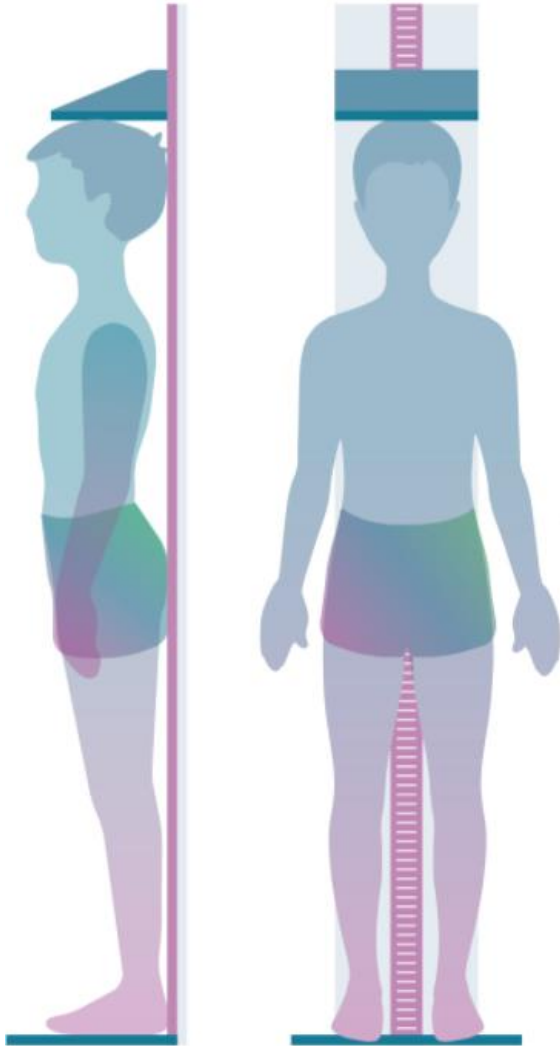
What is the Ideal Method?

- The ideal method has
 - High validity
 - High reliability
 - Low cost
 - Low participant risk and
 - Low burden
- But methods that have high validity often lack feasibility and vice versa in population-based studies.

Anthropometry

- Anthropometry is the study of human body measurements.
- Anthropometry is composed of physical measurements that include
 - Recumbent length (lying down length)
 - Stature (standing height)
 - Weight
 - Circumference measurements
 - Skinfold thicknesses

Length/Stature and Weight



Recumbent length/stature and weight are the most common measurements used to assess weight status and monitor growth.

They are used to calculate indices that can be used to define obesity across all ages, from infancy through adulthood.

Body Mass Index (BMI)

- BMI is calculated from weight and height.
- It is a commonly used index used to assess weight status and define obesity among adults and children aged 2 years and older.
- BMI does not measure body fat, but it is highly correlated with total body fat at high levels.

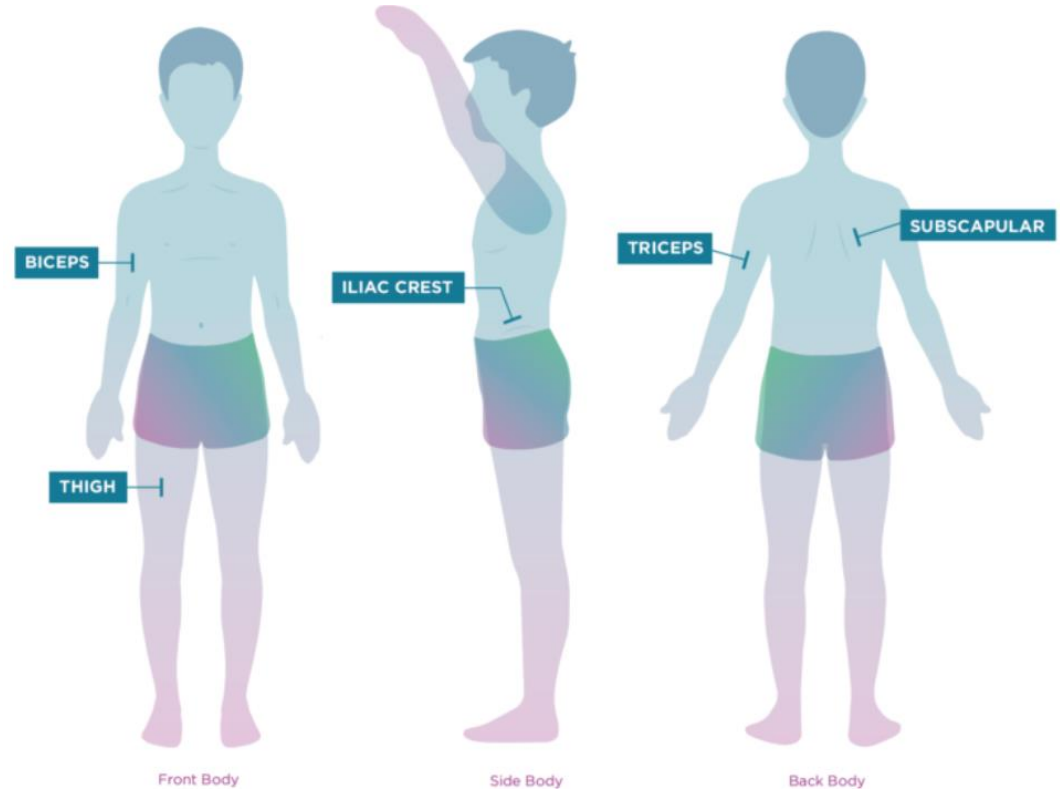
Length/Stature and Weight

Advantages

Skinfold Thicknesses

Skinfold thicknesses are measured using calipers to assess the thickness of the subcutaneous fat layer.

Skinfold thicknesses can be used across all ages.



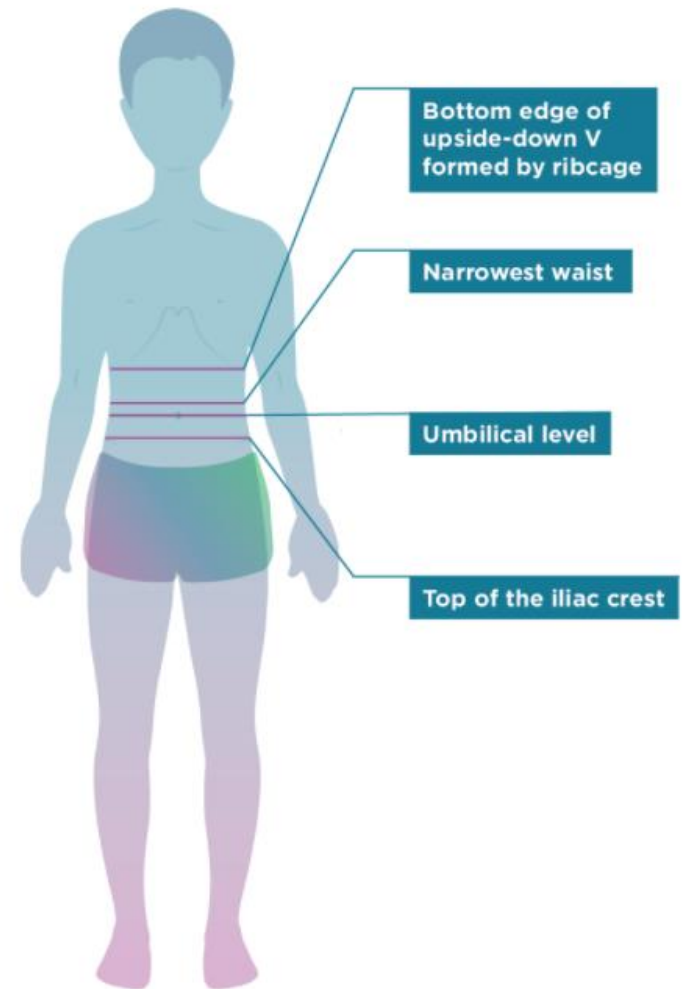
Skinfold Thicknesses

Advantages

Waist Circumference

Circumference measurements can assess body size or dimensions at the specific region of the body that is measured.

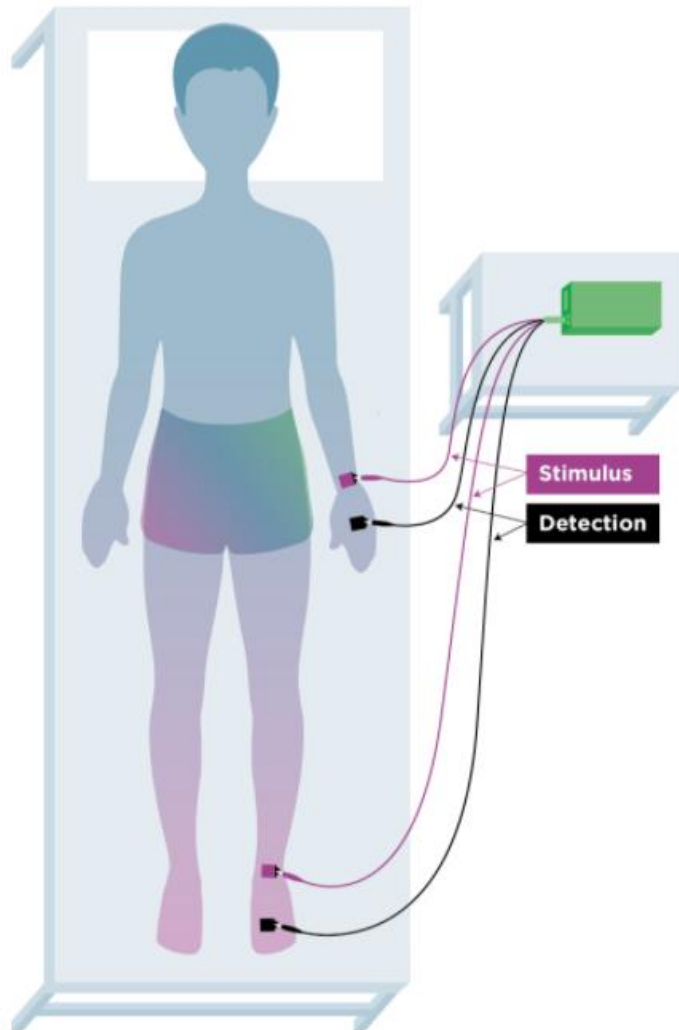
Generally conducted on individuals who are older than 8 years of age.



Waist Circumference

Advantages

Bioelectrical Impedance Analysis (BIA)



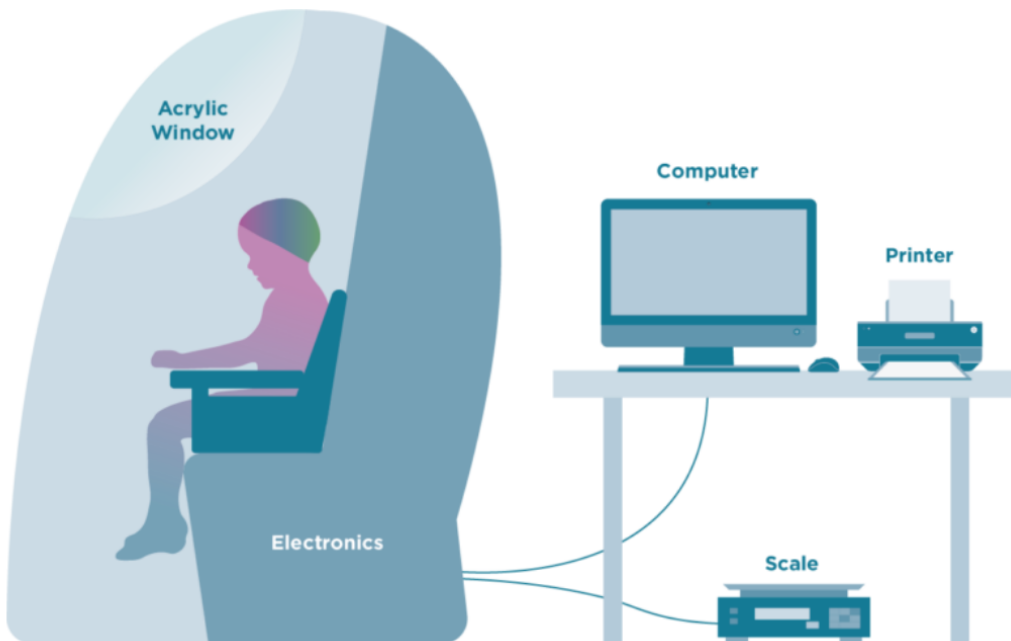
BIA estimates FM and FFM by measuring the resistance of a small, low voltage electrical current as it travels through water contained in the body tissues.

It may be used across all ages.

BIA

Advantages

Air Displacement Plethysmography (ADP)



ADP uses the volume of air displaced by a participant in a sealed testing chamber to measure body volume and estimate body density.

ADP can be used to measure infants and children of various ages and weights.

ADP

Advantages

Dual Energy X-Ray Absorptiometry (DXA)



DXA uses two low dose X-ray beams and algorithms to estimate total-body and regional estimates of body components.

It may be used across all ages.

DXA

Advantages

Case Studies

1. School-based, Cluster Randomized Control Trial to Prevent Childhood Obesity
2. Assessing Adiposity in Infancy to Predict Risk of Developing Overweight and Obesity
3. Effect of Maternal Gestational Weight Gain on Newborn Adiposity
4. Assessing Adiposity Changes in a Community-Based Healthy Weight Program
5. Assessing, Analyzing, and Presenting Health Data from Electronic Health Records (EHRs)
6. A Clinic-based Intervention to Promote Weight Loss in Adolescents with Severe Obesity

Case Study Background

- Randomized controlled trial
- Evaluates if counseling women with overweight and obesity to eat a healthy diet and maintain an appropriate level of physical activity during pregnancy affects infant adiposity
- Aims to determine if the intervention delivered to women during pregnancy has a measurable effect on the offspring body composition at birth compared to a non-intervention control group

Case Study Considerations

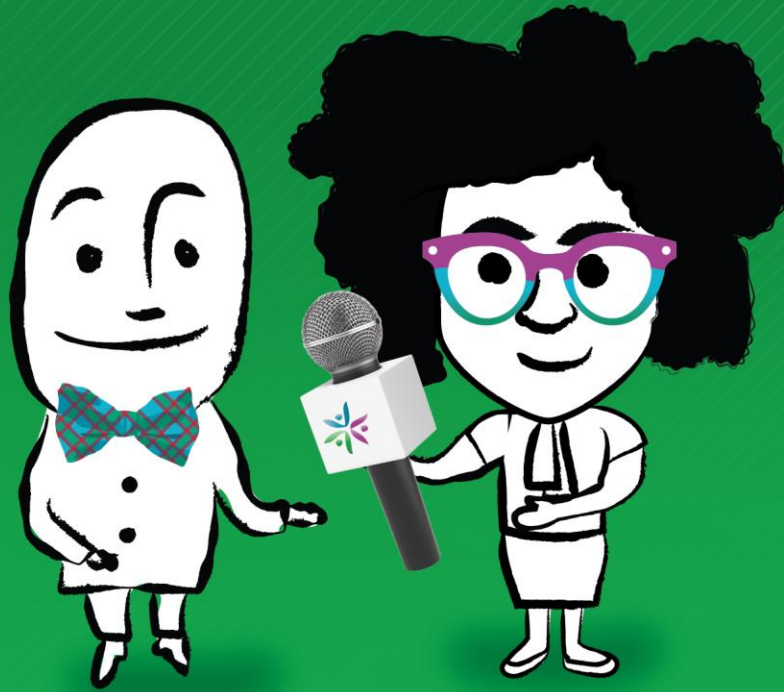
- Limited window (1–3 days) to measure most infants before discharge from hospital following delivery
- Conducting the study in the hospital ensures privacy
- Length, weight, and head circumference measurements are taken routinely after birth
 - High acceptability of the measurements to parents
- Only need to measure body composition of the newborn once before discharge
 - Eliminates the need for a method that is sensitive to changes over time
- Method(s) needs to be sufficiently sensitive to detect small differences in FM and FFM between the intervention group and usual care group

Case Study Method Selection

- Length and weight are the most common measurements taken, but do not provide information on FM or FFM
- Methods to more specifically assess total body fat:
 - Skinfold thicknesses of the triceps, subscapular, and iliac crest can be used to assess between group differences in subcutaneous fat (proxy for total body fat)
 - Noninvasive
 - Often acceptable to parents
 - Require additional time to acquire measurements
 - Can be burdensome to the parent and child
 - ADP and DXA have been validated to measure whole-body FM and FFM with high precision in the newborn
 - May be available in the hospital setting, but costly
 - Require data collector skill and training to conduct
 - Require that the infant be as still as possible during testing

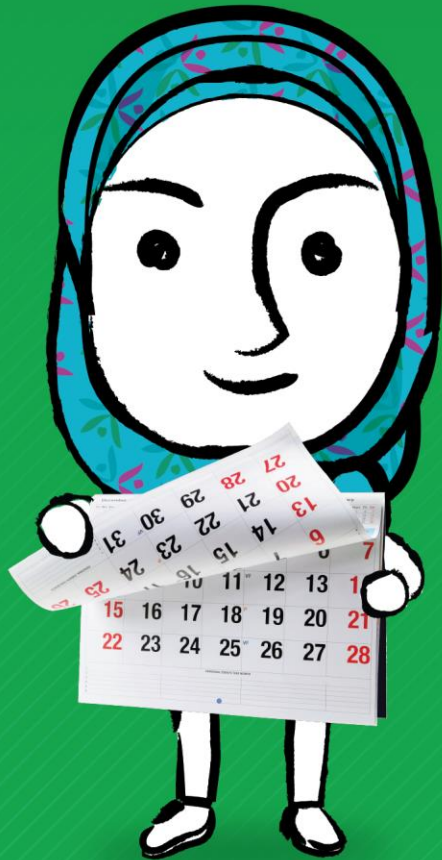
Case Study Method Selection

- Study team selects DXA for the primary outcome
 - Available in setting
 - Can precisely assess FM and bone-free FFM
- Will also measure length and weight and use their indices (weigh-for-length and weight-for-age) as a secondary outcome



ONE ON ONE

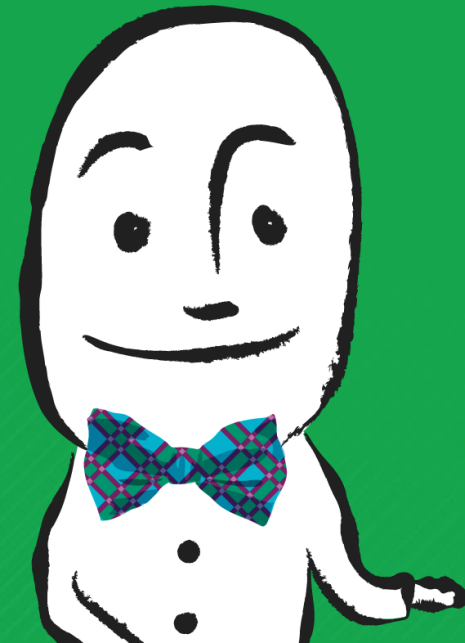
UPCOMING EVENTS



Upcoming Events

- NCCOR is presenting a poster at APHA 2020.
 - **Measures for children at high risk for obesity: Choosing whether to apply/adapt/or develop a measure for my research population**
 - The poster is available on demand from October 20–November 3.
- NCCOR presenting a poster on User Guide at ObesityWeek® Interactive 2020
 - **Assessing Childhood Obesity: A New Guide to Help Facilitate Choosing the Most Appropriate Measure**
 - The poster is available on demand from November 2–December 31.

ANNOUNCEMENTS



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Childhood Obesity Evidence Base (COEB): Test of a Novel Taxonomic Meta-Analytic Method

- Published “The Childhood Obesity Evidence Base” supplement in *Childhood Obesity*
- Four papers and two commentaries
- New NCCOR webpage: <https://www.nccor.org/coeb>

The NCCOR Childhood Obesity Evidence Base (COEB): Test of a Novel Taxonomic Meta-Analytic Method aims to:

- 1 Use a novel taxonomic (classification) method of data aggregation
- 2 Identify successful approaches used to prevent childhood obesity in children aged 2 to 5 years
- 3 Provide evidence regarding mechanisms, pathways, and implementation strategies to inform future efforts to reduce rates of early childhood obesity
- 4 Provide a scoping review of the literature regarding prevention efforts of childhood obesity for children aged 2–5 years.

Manual of Procedures

The purpose of the Manual of Procedures is to describe the methods and coding schema used to create this dataset.

Taxonomy Overview

Four taxonomies were created for the NCCOR COEB Project via the grounded approach^{1,2}: intervention components, intended recipient characteristics, intervention component context, and outcomes. Only studies that included measures of Body Mass Index (BMI) were included in the final taxonomic meta-analysis.

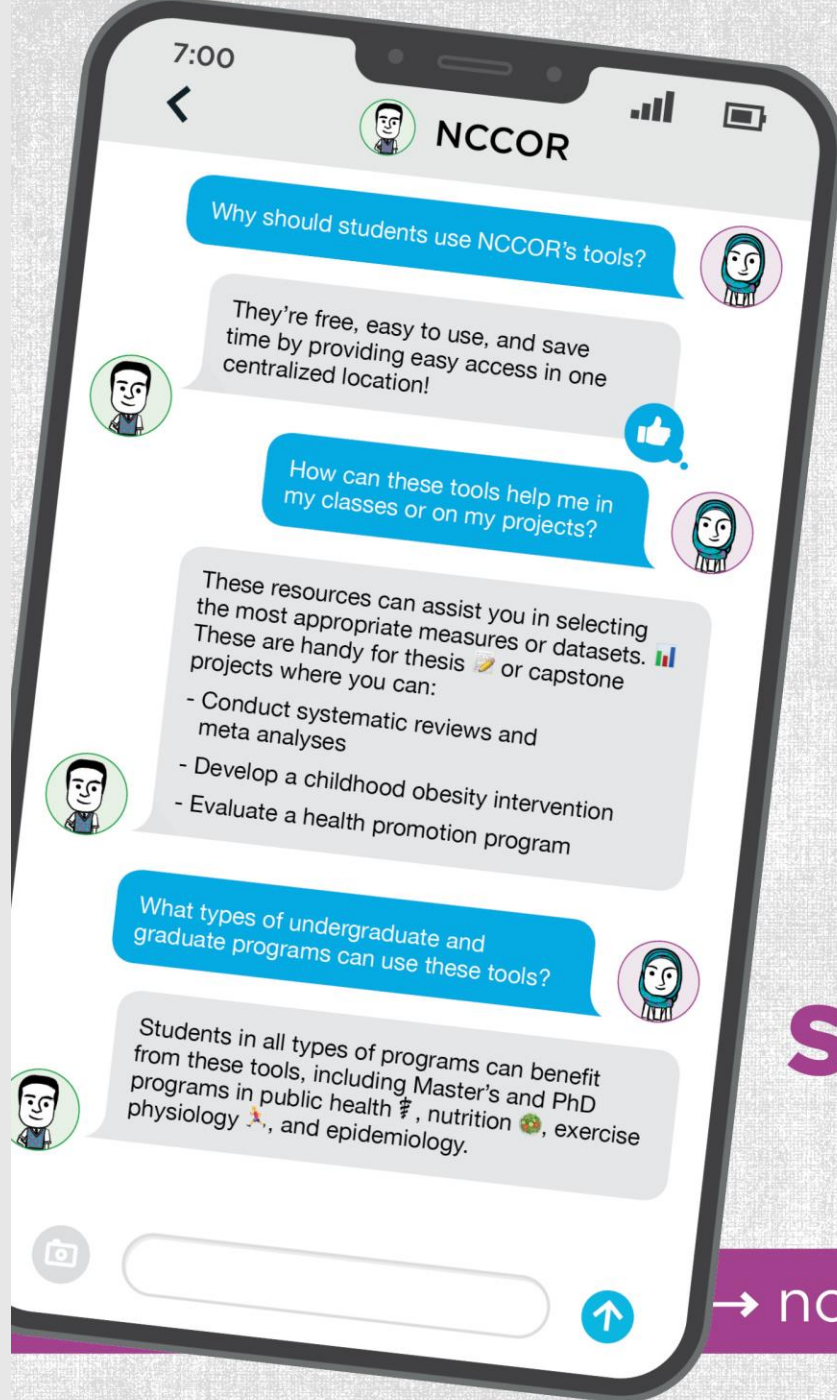
Database Instructions

This document outlines the development of the COEB dataset and instructions for how users can use the dataset for independent analysis.

Database

A primary output of the NCCOR COEB Project is a dataset of 51 unique studies with 147 supplemental documents (total of 198 articles) of childhood obesity interventions to which taxonomic categorization or coding has been applied. This dataset can be used by researchers for independent analysis. Users can analyze the dataset in its entirety, or they can identify or isolate individual studies in the database or groups of studies sharing common characteristics.

Supplemental materials for the taxonomic meta-analysis:



Sign up for NCCOR Student Hub!

→ nccor.org/e-newsletter

Check out the student hub webpage!

Funding Opportunities External Resources Events Contact

ABOUT PROJECTS TOOLS WEBINARS NEWS PUBLICATIONS RESOURCES **STUDENT HUB**

THE NCCOR STUDENT HUB

Tools and resources for students studying diet and physical activity

Discover free tools and resources supported by CDC, NIH, USDA, and RWJF to help you with your coursework and research.

ADDITIONAL RESOURCES

- Student Resources Guide
- Professor Factsheet
- Q&A for Public Health Students

CHECK OUT THE NCCOR TOOLS

- MEASURES REGISTRY RESOURCE SUITE**
A suite of three tools: the Measures Registry, User Guides, and Learning Modules, that help users understand key measurement concepts and find appropriate measures for research and evaluation projects.
- CATALOGUE OF SURVEILLANCE SYSTEMS**
An easy to navigate, one-stop access to over 100 publicly available datasets relevant to childhood obesity research.
- YOUTH COMPENDIUM OF PHYSICAL ACTIVITIES**
A list of 796 common activities in which you participate and the estimated energy cost associate with each activity.

WATCH THE WEBINARS

NCCOR has a **Connect & Explore webinar series** that connects you with leading experts in the field on a variety of public health topics.

[See all webinars](#)

SIGN UP FOR THE STUDENT HUB

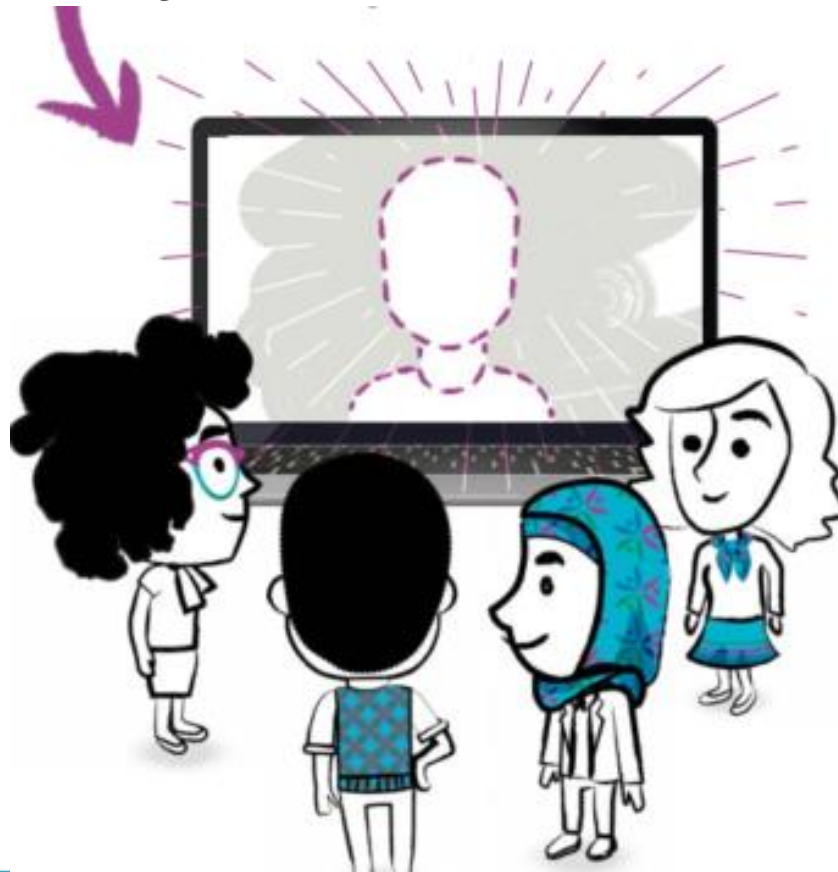
Our quarterly student e-newsletter connects you to free tools and resources that can support your schoolwork and research. Each newsletter will feature a case study of a student using one of the tools and will also share other childhood obesity events and resources.

Be sure to select **STUDENT** when signing up!

[Sign up for the e-newsletter](#)

Have you used any of NCCOR's tools?

- Let us know at nccor@fhi360.org and we may feature you in our next webinar!



FURTHER QUESTIONS?

Other questions about NCCOR
or upcoming activities?

Email the NCCOR Coordinating Center
nccor@fhi360.org

WHAT'S HAPPENING IN **NCCOR NEWS**

NCCOR publishes chapter: Behavioral Design as an Emerging Theory for Dietary Behavior Change

NCCOR is highlighting multidisciplinary partnerships to celebrate National Childhood Obesity Awareness Month 2018!

Utility of the Youth Compendium of Physical Activities

NCCOR to present at the Society for Prevention Research and the American College of Sports Medicine 2018 Annual Meetings

NCCOR updates the Catalogue of Surveillance Systems and seeks recommendations for new systems

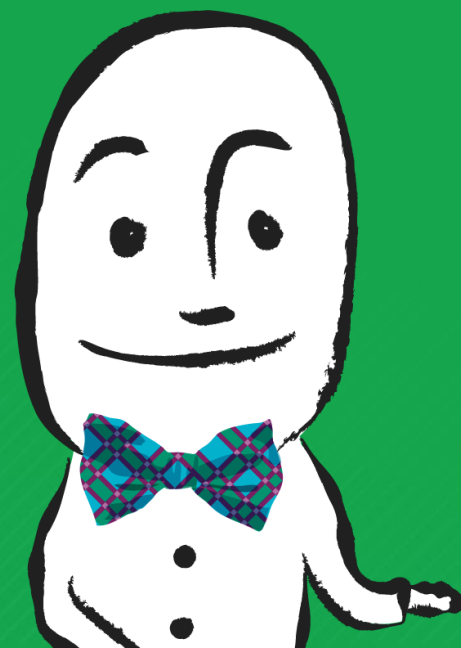
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Upcoming Webinars

Mark your calendar for these upcoming Connect & Explore webinars!

THANK
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