

A Guide to Methods for Assessing Childhood Obesity

Measurement is a fundamental component of all forms of research. NCCOR developed *A Guide to Methods for Assessing Childhood Obesity* to help researchers and practitioners understand the most common adiposity assessment methods, and which one is most appropriate to meet the research objectives.

A Guide to Methods for Assessing Childhood Obesity provides an overview of body composition, its impact on health complication risks later in life, and key factors that impact the distribution of body fat mass. The guide describes six methods commonly used to assess body composition in children and highlights procedures, validity and reliability, reference data, accessibility, cost, and participant burden and risk.

Who should use this guide?

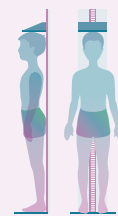
This guide is designed for researchers and for public health practitioners engaged in research as well as other professionals and practitioners who have an interest in evaluating weight-related outcomes within their clinic or community-based weight management or health promotion programs. The guide assists users on how to select the most appropriate method of measuring adiposity in children when conducting population-level research and/or evaluation on obesity.



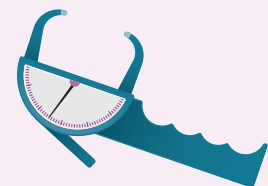
A Guide to Methods for Assessing Childhood Obesity is available at www.nccor.org/tools. A PDF version is also available for download.

6 METHODS OF MEASURING BODY COMPOSITION

1 Anthropometry: Length/ Stature and Weight



2 Anthropometry: Skinfold Thickness



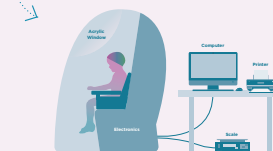
3 Anthropometry: Waist Circumference



4 Bioelectrical Impedance Analysis



5 Air Displacement Plethysmography



6 Dual Energy X-Ray Absorptiometry

Case Studies

To further assist users in learning about these methods, this guide includes six case studies to walk users through what to think about when selecting a method based on the research aim, study design, and setting they are working in.

- **Assessing Adiposity in Infancy to Predict Risk of Developing Overweight and Obesity.** A longitudinal observational study evaluating changes in adiposity in infants and toddlers aged 0–2 years. The goal of this study is to describe patterns of growth (changes in adiposity) during the first 2 years of life and observe how these patterns relate to developing overweight and obesity at age 2 years.
- **Effect of Maternal Gestational Weight Gain on Newborn Adiposity.** A randomized controlled trial evaluating whether counseling women with overweight and obesity to eat a healthy diet and maintain an appropriate level of physical activity during pregnancy affects infant adiposity.
- **Assessing Adiposity Changes in a Community-Based Healthy Weight Program.** A community-based healthy weight program evaluating the effectiveness of its 12-week evidence-based program for children and adolescents aged 6–13 years in an urban neighborhood recreation center.
- **Assessing, Analyzing, and Presenting Health Data from Electronic Health Records (EHRs).** A pediatric primary care system evaluating childhood obesity as a population health issue among the child and adolescent patients that it serves.
- **A Clinic-based Intervention to Promote Weight Loss in Adolescents with Severe Obesity.** A randomized controlled trial evaluating the effects of Liraglutide, a glucagon-like peptide-1 receptor agonist drug, when compared to a lifestyle counseling intervention to promote weight loss in adolescents aged 13–18 years with severe obesity.

CASE STUDY AT A GLANCE:

SCHOOL-BASED, CLUSTER RANDOMIZED CONTROL TRIAL TO PREVENT CHILDHOOD OBESITY

Background. This case study reviews a cluster randomized control trial evaluating the effects of a multi-component intervention that increases the weekly minutes of physical education offered to elementary students and introduces a nutrition education curriculum, culinary training for food service staff, and modified menu items for school meal programs. Healthy weight gain with favorable changes in body composition (fat mass relative to muscle mass) and prevention of inappropriate weight gain rather than weight loss are the primary goals of the intervention.

Considerations.

- Assessment method must be able detect changes over the 3-year study period.
- Study needs to enroll and measure about 5,000 children; therefore, measurements must be quick and feasible to administer in a school setting.
- Equipment must be sufficiently portable between schools and/or affordable to allow for the purchase of several sets of equipment for measurements at multiple schools at the same data collection time points.
- Measurements must always be taken with children wearing their own light clothing.
- Measurement process must not embarrass children or contribute to weight stigmatization.
- Assessment methods are acceptable to parents who will provide consent, children who will provide assent, and school leaders (e.g., district superintendent, school principal) who stipulate their terms for participating in research studies.

Measure Selection. Ultimately, the study team decides to use measures of height and weight to calculate BMI because, of the possible methods to choose from for this study, it is the least intrusive, requires little specialized training and equipment, and can be conducted quickly. This method of adiposity assessment is typically more feasible and acceptable with children in a school setting.

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