

PROMOTING OPTIMAL MONITORING OF CHILD GROWTH IN CANADA: USING THE NEW WHO GROWTH CHARTS

A COLLABORATIVE STATEMENT FROM: DIETITIANS OF CANADA
CANADIAN PAEDIATRIC SOCIETY
THE COLLEGE OF FAMILY PHYSICIANS OF CANADA
COMMUNITY HEALTH NURSES OF CANADA

EXECUTIVE SUMMARY¹

Growth monitoring and promotion of optimal growth are essential components of primary health care for infants, children and adolescents. Growth monitoring includes serial measurements of weight, length or height for all children, head circumference for infants and toddlers, and interpretation of those measurements relative to the growth of a large sample population of children depicted on a selected growth chart. These measures help to confirm a child's healthy growth and development, or identify early a potential nutritional or health problem. This enables health professionals and parents to initiate action before the child's nutritional status or health are seriously compromised.

Over the last three decades there has been substantial discussion on which reference population to use in assessing adequacy of childhood growth. In 2004, Dietitians of Canada, Canadian Paediatric Society, The College of Family Physicians of Canada and Community Health Nurses of Canada published recommendations for use of the 2000 American growth charts from the Centers for Disease Control and Prevention. At that time, limitations of the charts were noted, including the fact that these charts were growth references, describing how a sample population of children grew, regardless of whether or not their rate of growth was optimal or not. It was also noted that the decision on which growth charts to recommend would be revisited as more appropriate data became available.

Increasing evidence that growth patterns of well-fed healthy preschool children from diverse ethnic backgrounds were comparable, supported the use of a single international growth reference based on healthy, well-nourished children from different geographic and genetic origins, who had fully met their growth potential. Until recently, no such growth charts existed.

In 2006, the World Health Organization (WHO), in conjunction with the United Nations Children's Fund and others, released new international growth charts depicting the growth of children from birth to age five years, who had been raised in six different countries (Brazil, Ghana, India, Norway, Oman, USA) according to recommended nutritional and health practices, including exclusive breastfeeding for the first four to six months of life.² The optimal growth displayed in the WHO growth charts for infants and preschool children represents the prescribed gold standard for children's growth; hence these charts are considered growth standards.

In 2007, the WHO also released charts for monitoring the growth of older children and adolescents that had been updated and improved to address the growing epidemic of childhood obesity.

Dietitians of Canada, Canadian Paediatric Society, The College of Family Physicians of Canada, and Community Health Nurses of Canada make the following recommendations, intended as a practice guideline for medical practitioners and other health professionals. The desired outcome is that wide dissemination of these recommendations will promote consistent practices in monitoring growth to improve the nutritional status and health outcomes of Canadian infants, children and adolescents.

¹ The complete Collaborative Statement, the Executive Summary and references for *Promoting Optimal Monitoring of Child Growth in Canada: Using the New WHO Growth Charts* can be accessed at www.dietitians.ca/growthcharts.

² The WHO Growth Study was initiated in 1997, before WHO's policy on the optimal duration of exclusive breastfeeding was changed in 2001 from "4 to 6" months to 6 months.

RECOMMENDATIONS

1. The growth of all full-term infants, both breastfed and non-breastfed, and preschoolers should be evaluated using growth charts from the World Health Organization Child Growth Standards (birth to five years). Growth of all school-aged children and adolescents should be evaluated using growth charts from the World Health Organization Growth Reference 2007 (5 to 19 years). These are recommended as the charts of choice for use by Canadian family physicians, paediatricians, dietitians, public health/community nutritionists, nurses, and other health professionals in the primary care, community, and hospital settings.
2. Growth monitoring should be a routine part of health care for all Canadian infants, children and adolescents. Serial measurements of recumbent length (birth to two to three years) or standing height (≥ 2 years), weight, and head circumference (birth to two years) should be part of scheduled well-baby and well-child or adolescent health visits. Measurements should also be performed at acute illness visits for those who are not brought in for recommended well-child visits. Health professionals are encouraged to work together across disciplines and sectors in performing growth monitoring and promotion of optimal growth to ensure Canada's most vulnerable populations do not fall through the cracks.
3. To yield accurate measurements, weights and measures should be obtained using calibrated, well-maintained quality equipment and standardized measurement techniques. An individual child's measurements should be recorded in their personal chart or growth record, and then plotted on a consistent growth chart appropriate for age and gender to identify any disturbances in length/height or weight gain. Corrected age should be used at least until 24 to 36 months-of-age when plotting anthropometric measurements of premature infants.
4. The growth of preterm infants once discharged from the neonatal intensive care unit setting and children with special health care needs should also be monitored using the WHO Child Growth Standards and WHO References 2007.
5. BMI-for-age should be used to assess weight relative to height and to screen for thinness, wasting, overweight, and obesity for all children two years and older. Weight-for-length or percent ideal body weight can be used for children under two years-of-age.
6. Interpretation of plotted measurements should consider their centile rank, the relationship of weight, length/height, and BMI to each other, recommended cut-off values, parental heights (for stature measurements), and the trend relative to previous centile ranks to identify major shifts in growth patterns.
7. Table 1 outlines the cut-offs recommended as guidance for further assessment, referral, or intervention but not as diagnostic criterion for classifying children:

Table 1: Cut-off points

Birth to 2 years

GROWTH STATUS	INDICATOR	PERCENTILE
Underweight	Weight-for-age	< 3 rd
Severe underweight		<0.1 st
Stunting	Length-for-age	< 3 rd
Severe stunting		<0.1 st
Wasting	Weight-for-length	< 3 rd
Severe wasting		< 0.1 st
Risk of overweight		>85 th
Overweight		>97 th
Obesity		> 99.9 th

2 to 19 years

GROWTH STATUS	INDICATOR	PERCENTILE	
		2-5 YEARS**	5-19 YEARS**
Underweight	Weight-for-age	< 3 rd	< 3 rd *
Severe underweight		<0.1 st	<0.1 st *
Stunting	Height-for-age	< 3 rd	< 3 rd
Severe stunting		<0.1 st	<0.1 st
Wasting	BMI-for-age	< 3 rd	< 3 rd
Severe wasting		<0.1 st	<0.1 st
Risk of overweight		>85 th	not applicable
Overweight		>97 th	>85 th
Obesity		> 99.9 th	>97 th
Severe obesity		not applicable	> 99.9 th

* weight-for-age not recommended after age 10 years; use BMI-for-age instead

** more conservative cut-off criteria are used for young children because of growth, lack of data on functional significance of upper cut-offs, and to avoid the risk of putting young children on diets

COLLABORATIVE STATEMENT: USING THE NEW WHO GROWTH CHARTS

8. Health professionals are encouraged to take the time to teach children and their parents/caregivers how to interpret their individual pattern of growth on the growth chart and to involve them in decision-making about any potential actions they can take to correct abnormalities in their rate of weight gain and/or linear growth.
9. To ensure knowledge translation and uptake by key organizations, training on the use and interpretation of the 2006 WHO Child Growth Standards and WHO Reference 2007 charts should be provided to all health professionals involved in measuring and assessing the growth of Canadian children. This includes training in understanding of the differences a practitioner can expect to see when using the WHO vs CDC growth charts, and how to explain them to parents/caregivers.
10. While the recommendations in this collaborative statement pertain specifically to adoption of the WHO Child Growth Standards and Reference 2007 for individual children, it is suggested that these Standards and Reference charts should also be considered for the purposes of population health surveillance, so that children classified as underweight, overweight or obese at the individual level are captured in a consistent manner in population surveys.
11. Development of a Canadian Paediatric Nutrition Surveillance System is recommended for the organized and ongoing collection of anthropometric measurements in order to follow the growth and nutritional status of Canadian children and describe trends in key indicators of their nutritional status. Data could be used for program planning, development and evaluation of health and nutrition interventions such as breastfeeding promotion programs, as well as monitoring progress toward health objectives for Canada. Collaboration with key stakeholders in the community health/population health sector is needed.
12. Research is required in the following areas:
 - a) validation of using BMI-for-age to assess nutritional status in the first two years of life, with emphasis on identifying associations between BMI and subsequent health outcomes
 - b) validation of using BMI-for-age to assess underweight in children of all ages
 - c) evaluation in all age groups of the predictive power of proposed BMI cut-offs for overweight and obesity with respect to adverse short and long-term health outcomes.

IMPLICATIONS

The new WHO Child Growth Standards and WHO Reference 2007 charts provide an excellent opportunity for heightening health-care professionals' awareness about the importance of routine and accurate growth monitoring, and appropriate use and interpretation of growth charts. The process of replacing existing growth charts and providing training to dietitians, public health/community nutritionists, nurses, physicians and others in the use and interpretation of new charts is a good opportunity to revisit growth monitoring practices as a whole, and to disseminate knowledge about effective interventions to prevent or treat either excessive or inadequate growth at the individual level.

A change to these new charts has a number of implications for health professionals, including the need for:

1. easily accessible training for busy practitioners on:
 - a) performing accurate and reliable anthropometric measurements using precise equipment
 - b) different features of the WHO charts compared to the CDC charts
 - c) using and interpreting the new WHO growth charts including differences between growth on these charts and the CDC charts, as well as the significance of the new WHO cut-off points
 - d) effective nutrition-negotiation skills with parents and caregivers to effect positive changes in nutrition and health.
2. leadership at the national and/or provincial/territorial levels to create multimedia training tools and resources for use by individuals and organizations across Canada
3. accessibility to resources, including portable, accurate measuring equipment
4. a call for collective advocacy for a Canadian Paediatric Nutrition Surveillance System to monitor breastfeeding rates and growth and nutritional status of our children.

RECOMMENDED RESOURCES

WHO Growth Standards and Growth References 2007

www.dietitians.ca/growthcharts

Dietitians of Canada, Canadian Paediatric Society, The College of Family Physicians of Canada and Community Health Nurses of Canada. *Promoting Optimal Monitoring of Child Growth in Canada: Using the New WHO Growth Charts. A Collaborative Statement.* 2010

www.dietitians.ca/growthcharts

Accurately Weighing and Measurement: Technique – Maternal and Child Health Bureau Training Modules

<http://depts.washington.edu/growth/module5/text/page1a.htm>

A Health Profession's Guide for Using Growth Charts

www.dietitians.ca/growthcharts

Is My Child Growing Well? Questions and Answers for Parents

www.dietitians.ca/growthcharts

ACKNOWLEDGMENTS

This position paper was developed collaboratively with Dietitians of Canada, Canadian Paediatric Society, The College of Family Physicians of Canada and Community Health Nurses of Canada. The Public Health Agency of Canada is gratefully acknowledged for funding support. Recognition is given to the following for their contributions:

Collaborative Statement Advisory Group:

Author – Donna Secker PhD, RD, FDC, The Hospital for Sick Children, Toronto, Ontario

- Cheryl Armistead RN, MScN, Community Health Nurses of Canada / Infirmières et infirmiers en santé communautaire du Canada [CHNC]
- Lynda Corby MSc, MEd, RD, FDC, Dietitians of Canada [DC]
- Margaret de Groh PhD, Public Health Agency of Canada [PHAC]
- Valerie Marchand MD, FRCPC Chair, Nutrition and Gastroenterology Committee, Canadian Paediatric Society [CPS]
- Leslie L Rourke MD, CCFP, MClInSc, FCFP, FAAFP, College of Family Physicians of Canada [CFPC]
- Eunice Misskey MEd, RD, Dietitians of Canada Liaison to the Canadian Paediatric Society Nutrition and Gastroenterology Committee [DC/CPS]

We acknowledge Annie Dupuis PhD, Data Analyst in the Child Health Evaluative Services Department, The Hospital for Sick Children Research Institute for providing statistical guidance and analysis of the Canadian Regional Databases.

Dietitians of Canada Reviewers:

British Columbia Region: Catherine Atchison RD and Nicole Mireau RD on behalf of the 0-6 years subcommittee, Community Nutritionists' Council of British Columbia; Shefali Raja RD, Kristen Yarker-Edgar MSc, RD

Alberta/Territories Region: Carlota Basualdo MEd, RD; Kim Brunet MSc, RD; Debra Buffum RD; Rhonda Chartrand MEd, RD; Tanis Fenton PhD, RD; Kristyn Hall MSc, RD; Bodil Larsen PhD, RD; Diana Mager PhD, RD; Kaley Moran RD; Cheryl Ryan RD; Joan Silzer MSc, RD, IBCLC

Saskatchewan, Manitoba, NW Ontario: Eunice Misskey MEd, RD

Southern Central Ontario: Lorrie Hagen RD; Andrea Nash MSc, RD

Quebec, Eastern, NE Ontario: Lee Rysdale MEd, RD

Atlantic Region: Claire Gaudet-LeBlanc RD; Suzanne Clair RD; Isabelle Hall RD; Renee Cool MSc, RD; Tina Swinamer MSc, PDt; Janine Woodrow PhD, RD

DC External Reviewers:

Jean-Pierre Chanoine MD; Leah Feist RN, BScN; Brenda George RN, MN, CCHN(c), IBCLC; Chantal Martineau MSc, RD; Jennifer McCrea RD

Canadian Paediatric Society Reviewers:

Canadian Paediatric Society Nutrition and Gastroenterology Committee – Jeff Critch MD, FRCPC; Manjula Gowrishankar MD, FRCPC; Valérie Marchand MD, FRCPC; Sharon L Unger MD, FRCPC; Robin C Williams MD, DPH, FRCPC; Liaisons: Genevieve Courant NP; George Davidson MD, FRCPC; Eunice Misskey MEd, RD; Frank Greer MD, FAAP; Jennifer McCrea RD; Christina Zehaluk MSc; Consultant: Jae Hong Kim MD, FRCPC

The College of Family Physicians of Canada Reviewers:

Leslie L Rourke MD, CCFP, MClInSc, FCFP, FAAFP

Community Health Nurses of Canada Reviewers:

Cheryl Armistead RN, MScN; Ruth Schofield RN, MScN, on behalf of the Community Health Nurses Initiative Group and Childbirth Nurses Interest Group of the Registered Nurses Association of Ontario; Joanne Gilmore RN, BScN, MEd; Nancy Waters RN, BScN, MScN, IBCLC

Competing interests: The statement was developed independent of influence from commercial or other interest groups.