Examining growth monitoring practices for children in primary care

Sarah Carsley, Catherine S. Birken, Karen Tu, Eleanor Pullenayegum, and Patricia C. Parkin

Version Post-print/Accepted Manuscript

Citation (published version) Carsley, S., Birken, C. S., Tu, K., Pullenayegum, E., & Parkin, P. C. (2017). Examining growth monitoring practices for children in primary care. *Archives of disease in childhood*, archdischild-2017.

Publisher's Statement This article has been accepted for publication in *Archives of Disease in Childhood*, 2017 following peer review, and the Version of Record can be accessed online at 10.1136/archdischild-2017-314016.

Copyright/License

This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

How to cite TSpace items

Always cite the **published version**, so the author(s) will receive recognition through services that track citation counts, e.g. Scopus. If you need to cite the page number of the **author manuscript from TSpace** because you cannot access the published version, then cite the TSpace version **in addition to** the published version using the permanent URI (handle) found on the record page.

This article was made openly accessible by U of T Faculty.
Please [tell us](#) how this access benefits you. Your story matters.

Examining growth monitoring practices for children in primary care

Sarah Carsley^{1,2}, Catherine S. Birken¹⁻³, Karen Tu^{1,4,5}, Eleanor Pullenayegum², and Patricia C. Parkin¹⁻³

Affiliations:

¹Institute for Health Policy, Management and Evaluation, University of Toronto, Toronto, Canada

²Peter Gilgan Centre for Research and Learning, Child Health Evaluative Sciences, the Hospital for Sick Children; Pediatric Outcomes Research Team (PORT), Division of Paediatric Medicine, the Hospital for Sick Children, Toronto, Canada

³Department of Pediatric Medicine, University of Toronto, Toronto, Canada

⁴Department of Family and Community Medicine, University of Toronto, Toronto, Canada

⁵Toronto Western Hospital Family Health Team, University Health Network, Toronto, Canada

Address correspondence to:

Patricia Parkin

Division of Paediatric Medicine, The Hospital for Sick Children,
10th Floor - Peter Gilgan Centre for Research and Learning
686 Bay Street, Toronto, ON, M5G 0A4, Canada

Email: patricia.parkin@sickkids.ca

Growth monitoring is the long-standing practice used to identify children who fall outside healthy growth parameters. It has been proposed as a key activity for childhood obesity prevention.¹ Accurate growth monitoring requires specific techniques and equipment, and plotting measurements on a growth chart. The objective of this study was to determine if primary care providers follow recommended growth monitoring practices, including measurement techniques, standardized equipment, and use of appropriate growth charts at all health visits.

An electronic survey was distributed between December 2016 and February 2017. The sampling frame was health professionals (physicians, dietitians, nurses) most responsible for growth measurement in primary care practices in the province of Ontario, Canada. The survey assessed the following: measurement equipment, technique, growth chart use, and timing (scheduled and/or unscheduled visits). Respondent practice discipline was collected. Descriptive statistics were performed. Chi-squared and Fisher's exact test were used to assess differences between practitioner discipline.

Seventy-three surveys were completed from physicians (36%), nurses (26%), and dietitians (38%). To measure weight, a digital scale was used by 93.2% for infants <2 years and 68.5% for children ≥ 2 years (Table 1). To measure supine length in infants <2 years, 21% reported using a length board and 60% reported using the 'paper and pencil' method with a tape measure (Table 2). For children <2 years able to stand, 31.5% reported using the 'paper and pencil' method and 32.9% used a stadiometer. Differences between professional disciplines were not statistically significant; however dietitians had the highest adherence to recommendations (Table 2). Growth was measured 'always' at scheduled well-child visits by 80.8% (height) and 86.3%

(weight); and at unscheduled sick visits was 9.6% (height) and 34.3% (weight). Reported growth chart use was 85.0%, predominately the WHO chart (80.0%).

In this study, we found that adherence to recommendations for use of appropriate equipment and technique for measuring infant and child weight was adequate to high, but for measuring infant length was low. Growth chart use was high, but measurement at unscheduled visits was low. A survey of Primary Care Trusts in the UK found that more than 50% of children under five years had both weight and height/length measured, almost always by a health visitor; however, equipment, technique and growth chart use were not examined.² A survey of primary care practices in the US showed that correct equipment was used in 22% for height and 12% for length.³

Limitations of our study include the small number of survey respondents, use of a survey rather than direct observation and the possibility that the findings may not be generalizable to practices throughout the region. These limitations may have resulted in a bias towards higher rates of adherence to current recommendations because many respondents were linked to academic centres. Finally, while we did not assess training of health professionals, the results of our study may be useful for informing future training.

Growth monitoring consists of serial measurement of weight, height/length and calculation of body mass index, with plotting of these measures on a growth chart. Our study suggests growth monitoring can be improved by increasing the use of length boards for children <2 years of age, and measuring and charting growth at both scheduled and unscheduled visits.

References

1. Canadian Task Force on Preventive Health Care. Recommendations for growth monitoring, and prevention and management of overweight and obesity in children and youth in primary care. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. Apr 7 2015;187(6):411-421.
2. Patterson L, Jarvis P, Verma A, Harrison R, Buchan I. Measuring children and monitoring obesity: surveys of English Primary Care Trusts 2004-06. *Journal of public health (Oxford, England)*. Dec 2006;28(4):330-336.
3. Lipman TH, Hench K, Logan JD, DiFazio DA, Hale PM, Singer-Granick C. Assessment of growth by primary health care providers. *Journal of pediatric health care : official publication of National Association of Pediatric Nurse Associates & Practitioners*. Jul-Aug 2000;14(4):166-171.

Table 1: Reported Current practices for measurement of weight and child dress by age

Infant (<2 years)			Child (≥ 2 years)		
Infant Weight Equipment	N	%	Child Weight Equipment	N	%
Baby scale (digital)	68	93.15	Digital or electronic scale	50	68.49
Beam balance scale	3	4.11	Beam balance scale	21	28.77
No equipment for babies	1	1.37	Other	2	2.74
Other	1	1.37			
Infant Clothing	N	%	Child Clothing	N	%
Naked	33	45.83	Light clothes, no shoes	60	83.33
Diaper only	26	36.11	Light clothes, with shoes	1	1.39
Light clothes	2	2.78	Fully clothed, no shoes	8	11.11
Fully clothed, no shoes	2	2.78	Fully clothed, with shoes	1	1.39
Other*	9	12.5	Other*	2	2.78

*Free text responses specified naked at very young ages < 12 months, light clothes otherwise

Table 2: Reported current practices for measurement of length and height by age and professional designation

Age group	Equipment for length/height	Total		Physician		Nurse		Dietitian		p-value
		N	%	N	%	N	%	N	%	
<2 years	Length Board	15	21%	5	19%	2	12%	8	29%	0.12
	Paper pencil	44	60%	13	50%	14	82%	17	61%	
	Other	12	16%	8	31%	1	6%	3	11%	
<2 years, but child can stand	Length Board	5	7%	1	4%	1	6%	3	11%	0.07
	Stadiometer	25	34%	11	42%	4	24%	10	36%	
	Paper pencil	23	32%	5	19%	10	59%	6	21%	
	Tape measure on wall/ Standing measuring stick	14	19%	5	19%	0	0%	1	4%	
	Other	6	8%	4	15%	2	12%	8	29%	
≥ 2 years	Stadiometer	47	64%	16	62%	9	53%	21	75%	0.59
	Tape measure on wall/ Standing measuring stick	22	30%	8	31%	7	41%	6	21%	
	Other	4	6%	2	8%	1	6%	1	4%	