Nutrition Guideline
Healthy Infants and Young Children
Weight Velocity
Applicable to: Nurses, Physicians and Health Professionals

Recommendations

- Weight velocity (weight change over a specific time period) is one component of childhood growth monitoring.
- Weight velocity should only be used when investigating growth concerns, should only be used in conjunction with growth charts, and should be interpreted with caution.
- Using weight velocity as a component of childhood growth monitoring is most relevant for children from birth to 6 months of age when growth is most rapid.
- Repeated or successive measures at or below the lower end of the approximate weekly weight gain ranges provided in this guideline can signal a growth concern and will require further assessment.
- For public health settings, there is currently not enough evidence to identify a specific upper weight velocity threshold signaling excessive or rapid weight gain. However, if the child’s weight is also inclining on the growth chart from the previously established growth pattern, further assessment may be warranted.

Health Benefits

Serial growth measurements (e.g. weight, length and head circumference), and interpretation of these measurements when plotted on an age and gender appropriate growth chart, help to assess a child’s growth and development.¹ When younger infants are seen within short time intervals, there may be limited ability to detect growth changes on a growth chart.² In such cases, weight velocity tables (weight change over a specific time period) may help with earlier identification of growth problems,³ but should only be considered in conjunction with other measures of growth (length and weight-for-length) and the child’s placement on the growth chart in order to interpret growth rate.²

Key Questions

What is weight velocity?

Weight velocity refers to weight change over a specific time period.¹ Compared to size-for-age measures on growth charts, weight velocity reflects weight changes over shorter periods of time, such as one week.² Therefore, weight velocity has potential for earlier identification of growth problems that may not be as easily captured by a growth chart alone.¹,³

How can weight velocity tables be used in growth assessment?

A child’s weight velocity can be influenced by a variety of factors and will fluctuate.² For example, a low weight velocity may be expected if a child was previously growing at a higher percentile and the rate of weight gain is now slowing² as the child is settling into their unique pattern of growth. A higher weight velocity may reflect recovery after an illness.² Since there are a number of reasons why a child’s weight velocity may be increasing or slowing, it is imperative that weight velocity be interpreted in conjunction with the child’s placement on the growth chart² and in consideration of recent medical history.
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Table 1 provides approximate weekly weight gain ranges for healthy infants. It was designed for use in public health settings to provide guidance for health care providers when investigating potential growth concerns. Health professional judgment is required along with this information to determine the best course of action for an individual child.

Table 1. Approximate weekly weight gain for healthy term infants (Birth – 6 months)
The purpose of the values presented in this table is to provide a reference for typical growth of healthy infants. This table is for health professional reference only and should not be distributed to clients.

<table>
<thead>
<tr>
<th>Approximate Weekly Weight Gain (grams)*</th>
<th>Points of emphasis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Months</td>
<td>Girls</td>
</tr>
<tr>
<td>Birth-1 mo</td>
<td>Infants lose weight during the first few days after birth.</td>
</tr>
<tr>
<td></td>
<td>Infants usually return to their birth weight by 2 weeks of age.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 mo</td>
<td>130 – 360 g</td>
</tr>
<tr>
<td>2-4 mo</td>
<td>90 – 235 g</td>
</tr>
<tr>
<td>4-6 mo</td>
<td>50 – 170 g</td>
</tr>
</tbody>
</table>

*Conversion – To convert grams to ounces divide by 28.

Adapted from: WHO Growth Velocity Standards6
Data for 1 to 2 months: 1-month weight increments (g) Girls and Boys Birth to 24 months (percentiles)
Data for 2 to 6 months: 2-month weight increments (g) Girls and Boys Birth to 24 months (percentiles)

Note: The lower and higher ends of the approximate weight gain ranges are based on growth at the 5th - 97th percentile for weight velocity, respectively. These values have been chosen to represent a range for weight velocity unlikely to signal a growth concern.

How do I interpret growth using the approximate weekly weight gain ranges in Table 1?

The purpose of the values presented in Table 1 is to provide a weight velocity reference for typical growth of healthy infants. In a given time period, children may gain above or below the reference values provided in Table 1 and still be experiencing normal healthy growth. For this reason, the reference values in Table 1 should be interpreted with caution and should only be used in conjunction with growth charts.2
Repeated or successive measures at or below the lower end of the ranges provided can signal a growth concern\(^2\,^4\) and will require further assessment.

Rapid postnatal weight gain has been linked to long-term effects, such as increased risk for hypertension, cardiovascular disease, type 2 diabetes, osteoporosis and obesity, particularly for preterm and/or low birth weight infants experiencing catch-up growth\(^7\,^8\,^9\). However, there is not enough evidence to determine a specific weight velocity threshold for “rapid” growth or to suggest that repeated or successive measures at or above the upper end of the ranges selected for Table 1 signal a growth concern. In these situations, if the child’s weight is also inclining on the growth chart from the previously established growth pattern, further assessment may be warranted. Future research is needed to determine what patterns of successive measurements, over what velocity thresholds, and over which time intervals have the best diagnostic and prognostic validity for specific diseases.\(^2\)

When further assessment is indicated, it is important to consider the many factors that could be affecting growth. These factors may include the child’s overall health, presence or recent history of acute or chronic illness, nutrition (e.g. breast or formula feeding, formula preparation), feeding relationship, stress or change in child’s life, family growth patterns, availability/access to healthy foods, physical activity and sleep.

A referral to a physician should be considered to look into any biological causes such as digestive issues, endocrine disorders, allergies, infections or diseases. A referral to a dietitian for individual consultation may also be beneficial.

**When is weekly weight gain less relevant?**

Weekly weight gain becomes less relevant as a growth monitoring tool after 6 months of age when a child’s growth typically slows. At this time, the lower end of the approximate weekly weight gain ranges may be too low to be a sensitive indicator for potential growth concerns. Longer time intervals may be necessary to identify changes in growth patterns after 6 months of age; therefore growth charts are the preferred tool.

**What data was used to develop the approximate weekly weight gain ranges in Table 1?**

The ranges provided in Table 1 were calculated from the World Health Organization’s child growth velocity standards.\(^6\) The lower and higher ends of the approximate weight gain ranges are based on growth at the 5th - 97th percentile for weight velocity, respectively. These values have been chosen to represent a range for weight velocity unlikely to signal a growth concern.

It should be noted that a child’s percentile for weight velocity is not necessarily the same as their percentile on the growth charts. For example, if a child is growing at the 5th percentile for weight velocity, it does not mean that they are growing along the 5th percentile on the growth chart. This is because growth charts represent *attained* weight and weight velocity represents the *rate* of weight gain.
Are there any handouts on healthy growth for infants and young children that I can use with my clients?

For nutrition resources visit Nutrition Education Materials at http://www.albertahealthservices.ca/nutrition/Page11115.aspx and click on Child/Adolescents.

For more information related to healthy infants and children see Healthy Parents Healthy Children.

References


