

SLOW WEIGHT GAIN AND MALNUTRITION IN INFANTS

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Between 2020 and 2022 there has been an
increase in infant and child
DEATHS from MALNUTRITION
in Victoria.

The precise numbers cannot be given at this meeting as the CCOPMM report has not been released yet. This data should be available later this month

Key Points

1. Optimal growth assessment requires serial measurements plotted on appropriate percentile growth charts.
2. Nutrition is the main driver of growth in children under 2 years of age. Most cases of slow weight gain are secondary to inadequate caloric intake
3. Slow weight gain is commonly multifactorial in origin, but psychosocial stressors often a significant contributor
4. Red flags:

Signs of dehydration; Signs of severe malnutrition; Signs of abuse or neglect

Slow weight gain describes:

- an infant whose weight, or rate of weight gain is significantly below expected for age and sex

or

- if the weight has fallen across more than 2 major centiles

In practice:

poor or no weight gain on percentile chart compared to birth weight, length and head circumference.

Length is preserved so a discrepancy will emerge between weight and length percentiles.

Healthy small infants following a low percentile may not need referral.

Post natal slow weight gain

- Loss of <7% of birthweight is considered normal in the first days of life
- Loss of 7-10% of birthweight may be normal, but assess that the infant is well and feeding adequately
- Loss of >10% of birthweight requires infant wellness and feeding review and referral/discussion to GP/Paediatrician, and ongoing daily review until appropriate weight gain

- Baby should regain their birthweight by 14 days of life
- Once the milk supply is established, the average weight gain for the first 3 months is 20-30 g/day or 150-200 g/week

Consequences

- Chronic faltering growth can impact longitudinal growth and head circumference, which may in turn affect development and cognitive function
- In the most severe cases, Victoria has seen cases of death from malnutrition in the last 4 years

Causes of slow weight gain

Inadequate calorie intake

Inadequate calories

- Low breastmilk supply/latching issues
- Incorrect formula preparation/volume
- Abnormal feeding habits, maternal psychosocial issues

Poor suck

- Developmental delay
- Neuromuscular condition

Mechanical feeding difficulty

- Cleft palate/lip

Social factors / neglect

- Lack of parental understanding of nutritional requirements

Inadequate absorption or increased gastrointestinal losses

Inflammatory conditions

- Coeliac disease
- Cow's milk protein intolerance

Nutritional

- Anaemia
- Iron deficiency

Increased GIT losses

- Reflux
- Obstruction
- Chronic diarrhoea

Malabsorption

- Chronic liver disease
- Pancreatic disease

Inborn errors of metabolism

Increased caloric demand

Recurrent / chronic infection

- UTI
- Lower respiratory tract infection

Endocrine condition

- Hyperthyroidism
- Diabetes

Chronic medical condition

- Congenital heart disease
- Chronic lung disease
- Renal failure

Inflammatory conditions

- Inflammatory bowel disease

Malignancy

In the history

- Maternal Perinatal and Postnatal History
- Ask about current issues:
 - any ongoing medical concerns or issues in the infant.
 - prescribed or over the counter medications given to infant.
- medications and substances taken by breastfeeding carer.
- feeding method.
- sleeping patterns.
- bowel actions and voiding.
- development milestones
- pattern of growth in other family members.

Risk factors for infants at risk of abuse or neglect

- previous protective services involvement with the family
- homelessness, or lack of stable accommodation
- family violence
- alcohol or drug abuse
- intellectual disability
- history of psychiatric illness
- very young parents.

Psychosocial concerns

- Socioeconomic status may limit access to food and support
- Social isolation, parental mental illness, intellectual disability, substance abuse and domestic violence can impact the maternal-infant attachment and parenting capacity
- Consider screening tools
 - Edinburgh Postnatal Depression Scale
 - Antenatal Risk Questionnaire (Postnatal version)

Examination

- General: does the child appear in proportion and well, or do they look unwell?
 - Suggests significant malnutrition or illness
- Hydration: significant dehydration
 - Red flag
- Signs of underlying systemic diagnosis.....

Finding	Potential underlying diagnosis
Dysmorphic features or abnormal developmental age	Syndrome/genetic abnormality, inborn error of metabolism
Reduced muscle bulk/adipose tissue	Macronutrient deficiency (protein, carbohydrate, fat)
Skin rash, brittle nails, change to hair texture	Micronutrient deficiency (zinc)
Pallor, bruising	Anaemia, malignancy
Respiratory distress, clubbing, abnormal chest sounds	Chronic respiratory illness, cystic fibrosis
Clubbing, tachycardia, sweating, murmur, respiratory distress	Congenital heart disease, arrhythmia hyperthyroidism
Oedema	Chronic liver or renal disease
Jaundice, clubbing, bruising, bleeding, hepatomegaly	Chronic liver disease
Abdominal distension, abdominal pain, vomiting, diarrhoea/constipation	Coeliac disease
Abdominal pain, rash, joint pain	Inflammatory bowel disease
Bruising, uncomfortable parent-child interaction	Social stress, neglect, non-accidental injury

Possible signs of neglect

- Bruising or bite marks
- Scars such as cigarette burns
- Poorly managed napkin dermatitis
- Anal or vaginal excoriation or injury
- Finger marks on arms or trunk, which may indicate a shaking injury
- Pain or reluctance to move a limb, which may indicate a fracture
- Apathy, lethargy
- Developmental delay

Acute management

- Arrange immediate referral if:
 - signs of dehydration or severe malnutrition.
 - signs of abuse or neglect.
 - suspected organic cause.
 - significant slow weight gain persisting despite intervention.

A referral letter is of key importance

- Establishes a coordinated team response to the problem
- Encourages return correspondence from the medical practitioner
- Removes the pressure from the parents or carers to raise the concerns
- If high level of MCHN concern – consider also calling the GP or speak to the Practice Nurse to ensure appropriate assessment

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- Be clear about what you would like as a minimum – e.g. medical cause excluded, referral, mental health assessment....
 - Include the percentile charts or the weight/length/HC
 - It's useful to put in what you know about the nutritional intake
 - Document how you will continue to be involved, and your plan
 - AND include your contact details

	Investigations	Potential disorder
Blood	Full blood count , erythrocyte sedimentation rate	Anaemia, malignancy, inflammatory conditions
	Electrolytes, urea, creatinine, calcium, magnesium, phosphate	Renal disease, endocrine conditions
	Liver function tests	Chronic liver disease
	Iron studies	Iron deficiency anaemia
	Coeliac serology, total Immunoglobulin A (if on solids)	Coeliac disease (if on gluten-containing diet)
	Thyroid stimulating hormone, free T ₄	Hyperthyroidism
	Blood sugar level	Diabetes, metabolic conditions
	Vitamin A, D, E, K, B ₁₂ , folate, zinc	Nutritional deficiency
Urine	**Microscopy, culture and sensitivity (MCS) **	Infection
Stool	MCS	Infection
	Fat globules + crystals	Evidence of malabsorption

A multi-disciplinary team approach is highly recommended.

Professionals may include:

- Maternal and Child Health Nurse
- Lactation consultant
- General practitioner, paediatrician
- Dietician, speech pathologist, multidisciplinary feeding clinic
- Psychologist, infant mental health clinician
- Social worker or child protection services

For infants with likely normal infant growth variations and no concerning history or examination

- **review ?daily for neonates ?fortnightly for older infants for a period to confirm no new symptoms and that growth velocity normalises.**
 - Document weight and length on percentile charts at each visit
- **provide education about infant feeding and growth.**
 - Review feeding issues at each visit
- **Include the parent in monitoring growth using the Green book or the Maternal and Child Health app on smartphone.**

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