Growth faltering

Background

Good nutrition is important in early life for children to grow well, for healthy brain development, and for good health in adult life. Growth faltering, sometimes called 'failure to thrive', refers to lower than expected growth velocity. No single factor is used to define growth faltering, but some useful indicators are:

- A rate of weekly weight gain is less than expected for age (see below) plotted on growth chart.
- Weight crossing the third centile, or moving further below it.

Table 1. Average expected weight gain

0-3 months	150 - 200 g/week
3-6 months	100 - 150 g/week
6-12 months	70 - 90 g/week
1-2 years	2-3 kg/year
2-5 years	2 kg/year

* Newborns loose weight initially but should be back to birth weight by 7-14 days.

Some terms used in describing growth faltering

Note: z-scores = standard deviations from the median.

- Underweight = Low weight-for-age (< 3rd centile)
- Stunting = Low height for age (< 3rd centile)
- Wasting = Low weight-for-height/length
  - z-score < -2 = moderate wasting
  - z-score < -3 = severe wasting

Causes

Growth faltering usually results from a combination of medical, social, and environmental issues that involve the child, family, and community.

Contributing factors can include:

- Intra-uterine growth restriction / low birth weight.
- Intra-uterine exposure to alcohol.
- Household food insecurity.
- Chronic/recurrent infections of the skin, chest, ears or gut.
- Attachment disorder or maternal depression.
- Feeding and eating difficulties.
- Domestic violence or community disturbance.
- Chronic disease.
- Socio-economic disadvantage.

Consequences

Short term

- impaired immune response with risk of severe infection.

Long term

- reduced growth through the rest of childhood,
- impairments in cognition, attention and behavior,
- possible increased risk of metabolic issues including type 2 diabetes mellitus in later life.

Promoting Healthy Growth

- Use all opportunities to encourage and support good nutrition, including all regular scheduled health checks (see Healthy Kids protocol) and other clinic attendances.
- Remind parents to show patience and encouragement as children learn to eat.
- Support community activities that promote positive parenting and healthy eating, eg play groups, family center, women's center.
- Use opportunities to talk to store managers/committees and councils about the availability and accessibility of a wide range of healthy food choices for babies and children.

Promote:

- Breastfeed as long as mother and child want.
- Healthy solids from around 6 months.
- Iron rich foods.
- Variety of vegetables and fruit every day
- Drink plain water
- Plenty of physical activity

Avoid:

- Tea and sweet drinks (eg soft drinks, juice)
- Sweet and fatty foods (eg lollies, fried food)
- More than 2 hours screen time per day (TV/hand-held device)

Measuring Growth

Standard Growth Charts in Western Australia

- 0-5 years: WHO Charts
- 5-18 years: CDC Charts

Measuring Weight

< 2 years: naked.

⩾ 2 years: light clothes without shoes.

Measuring Length/Height:

< 2 years: lying down (length) with fixed board or measuring mat, without nappy.

⩾ 2 years: standing up (height) using stadiometer, without shoes. Calculate BMI.

Measuring Head Circumference

Measure around the largest part of the head above the ears. Recheck and record the highest measurement.

Correcting for Prematurity

Up to 2 years of age: subtract the number of weeks the child was premature form the age at the time of measurement (eg. for a child born at 32 weeks, subtract 8 weeks from their current age).

Growth faltering

Screening

Note that children under the age of 2 years are at greatest risk of growth faltering, particularly around the time or weaning and introducing solid foods.

- Check and record weight at every clinic attendance THEN Assess growth charts regularly – allow 1 week between checks in the first year of life.
- Check weight, length/height, and head circumference and Assess growth charts at every routine child health check (see HEALTHY KIDS protocol).

If any concern regarding growth, perform full assessment.

Assessment

1. **Identify any acute illness** appropriately before addressing growth faltering (see "SICK KIDS" protocol).
2. **Measure weight, length/height and head circumference and review growth charts.**
3. **Take a detailed history** for children with identified growth faltering (see Box 1).
4. **Screen for developmental delay.** See HEALTHY KIDS protocol.
5. **Examine** for medical issues including
   - Anaemia
   - Skin infections including scabies/Ear infections/ Chest infections
   - Heart problems (eg murmur, cyanosis)
   - Dental issues
6. **Investigations.**
   - Haemoglobin: check Hb via Hemocue: Has there been a normal result recordered in last 3 months? (see ANAEMIA IN CHILDREN protocol)
   - Consider Urine: under 6 months old - Dipstick a clean/sterile specimen and send for MCS if urinalysis abnormal or if symptomatic of UTI in older children.
   - Stool: If diarrhoea present, send for MCS and OCP (ova, cysts, parasites).

Initial Management

Immediate medical assessment if:

Abnormal findings in assessment

Child acutely unwell (note malnourished children are at risk of serious bacterial illness).

Child appears dehydrated or appears significantly malnourished.

RAN/CCHN concern.

Initial management of growth faltering

- **Treat any medical issues** identified in the assessment. Consult with doctor.

  Give albendazole once daily for 3 days if over 6 months (<10kg give 200mg, >10kg give 400mg).

  Diarrhea: give metronidazole 30mg/kg daily for 3 days OR tinidazole once.

- **Address any social/environmental issues** identified in the assessment. Consider referrals to:

  Environmental health, Financial counseling, Department of Communities, Local community support services eg. Breakfast clubs, parenting groups, Allied health, Midwife/ Child health nurse, Lactation consultant, Social and Emotional Wellbeing services, Community based nutrition programs

- **Consider if information/approach is culturally safe or needs input from local Cultural mentor.**
- **Provide education as to appropriate types and amounts of food and breast milk/formula babies and children should receive.** Refer to "Healthy Kids" protocol for appropriate types of foods. (SEE BOX 2)
- **Refer to Paediatrician all babies under 6 months with Growth Faltering**
- **Refer to paediatric dietitian** for development of growth action plan and notify doctor. Record target weekly weight.
- **Review weekly:**
  - Check weight.
  - Discuss progress including feeding, behaviour, any medical concerns.
  - Catch up growth of at least 100-150g weekly.
  - Refer to doctor if no weight gain, weight loss, or otherwise concerned.
- **Review by doctor at four weeks.**
  - Comprehensive review of history examination, investigations and progress.
  - If inadequate growth i.e not achieving catch up growth 100-150g per week refer to paediatrician/paediatric dietitian in all children > 6 months at this time
  - In children under 6 months all babies with Growth Faltering should be referred to Paediatrician at time of diagnosis
  - Consider a nutritional supplement in discussion with the dietician.

Discuss with dietitian:

- On diagnosis of growth faltering (via email or phone if urgent/if no appointment available)
- Where nutritional supplements are being considered (e.g. poor catch-up growth at four weeks).
- For assistance with advising parents on appropriate diet / breastfeeding / formula / supplementing diet.

Doctor to Discuss with Paediatrics:

- Diagnosed or suspected growth faltering under 6 months or with a pre-existing medical condition including prematurity or IUGR.
- If initial management does not result in appropriate weight gain/catch up growth after 4 weeks.
- If there is weight loss during community management.
- If Doctor/CCHN is otherwise concerned.

Growth faltering

Follow Up

For a child who continues to improve review at the following intervals:

- Weekly for the first four weeks, then:
- Monthly for the next three months, then:
- Three monthly for the next two years.

At these reviews:

- Recheck growth and if growth faltering recurs, restart a growth action plan and weekly reviews.
- Provide regular screening for siblings and other children in the same household.
- Provide access for the mother to additional care and support during future pregnancies.

Box 1. History should include:

Assessment of breast milk / formula / food intake:

- How much, how often, when, and what exactly is being eaten? Identify if breast milk/formula replacing solid meals and snacks in > 6 month old.
- Is mother breastfeeding comfortably (with good attachment and not in pain)? If not check positioning, attachment.
- Is formula prepared correctly (e.g. not being diluted or replaced with fruit juice/water)?
- Who in the family helps with feeding, and who buys and prepares food?
- Does child have any specific difficulties with eating?
- If the child is over 6 months, are they eating at least 3 times a day?

A baby who is feeding is usually content, sleeping well, smiling and active; there should be several wet nappies a day and soft faeces.

Medical history:

- Is child well? Do they have vomiting, diarrhoea, chronic cough, constipation, reflux, or any other symptoms?
- Do they have recurrent infections/often unwell?
- Is mother well, including mental health assessment (see PERINATAL MENTAL HEALTH PROTOCOL)? Are family members well?

Social history:

- What are the family living arrangements?
- Is there access to money and nutritious foods? Are there days where there is no food in your house? Oler child – do you go to bed hungry sometimes?
- Is there knowledge about good eating habits for various age groups of children (refer to "Healthy Kids' for more information).
  - Are there any alcohol, drug, domestic violence, sexual assault or mental health issues, affecting the household?
  - Do the mother and child feel safe in their home?
  - Was alcohol consumed during pregnancy?(Foetal Alcohol Spectrum Disorder Screen)

Box 2. Nutrition and Feeding Advice

- Breastfeed /offer formula on demand if < 6 months.
- Discuss appropriate introduction of solid foods from around 6 months of age, or when baby is showing signs of readiness for solids.
- For the first 2 months after introduction of solids, breastmilk / formula should be offered before solid foods. Then swap to solid foods before breastmilk / formula is offered.
- Begin with a few teaspoons of smooth/ pureed iron rich food, building up to 3 times a day. Ideally in a safe supported seated position. Move through textures every 2-3 weeks, to lumpy then soft finger foods as the child learns to chew. Avoid staying with one texture too long. RESOURCE – mouthing foods
- Soft finger foods can be offered around 8 months, aiming for family style meals by 12 months, including 3 meals and 2-3 snacks per day
- Formula / breast / cows milk should NOT replace meals or snacks. Cows milk can be introduced after 12 months, with a maximum of 600 ml per day
- Advise on dietary fortification for children with growth faltering to increase the energy level of every day foods. Examples include:
  - Offer high protein, high energy foods at all meals and snacks eg meat fish, chicken, eggs, peanut butter, baked beans, yoghurt, cheese and avocado
  - Meals can be fortified by adding 2 spoons of milk powder to milk drinks, yoghurt, and stews.
  - Drizzle oil or melt margarine over rice, pasta, noodles, and vegetables
  - Spread margarine thickly on sandwiches
  - Fry vegetables , rice and eggs and meat in oil

Feeding when unwell:

There is no need to withhold food or fluids. Infants and children that are sick or have diarrhea need extra fluids (breastmilk, formula or oral rehydration solution). Give small meals often. Consider effect of secondary transient lactose intolerance from gastroenteritis.

Resources

WHO Growth charts:
http://www.who.int/childgrowth/standards/en/

CDC Growth charts:
https://www.cdc.gov/growthcharts/cdc_charts.htm

Learning resource: http://www.rch.org.au/childgrowth/Poor_growth/

PMH growth monitoring http://www.pmh.health.wa.gov.au/health/docs/CAN_Growth%20monitoring%20and%20action.pdf

Fenton growth charts for prematurity:
http://www.ucalgary.ca/fenton/2013chart
https://peditools.org/ Z score calculator

Preparation of formula video
http://raisingchildren.net.au/articles/formula_preparation_video.html

Preparation of formula handout
http://raisingchildren.net.au/articles/pip_formula_preparation.html

Pictures advising against prop feeding http://raisingchildren.net.au/articles/bottle_feeding_aboriginal_parents_pip.html/context/1455

Breastfeeding resources-
https://www.breastfeeding.asn.au/

Growth faltering

Measure weight, length/height and head circumference and review growth charts.

Identify child at risk growth faltering – e.g Crossing two major centile lines on a standard growth chart.

A rate of weekly weight gain is less than expected for age (see Table 1).

Weight crossing the third centile, or moving further below it

Identify any acute illness

Take a detailed history Screen for developmental delay.

Examine:

- Anaemia
- Skin infections including scabies
- Ear infections
- Chest infections
- Heart problems (eg murmur, cyanosis), Dental issues

Investigations.

Does the child have any other current medical issues?

No

Parent education

Weekly Target weight

Refer paediatric dietician -growth action plan address Social/ environmental issues

Yes

Treat medical illness

Discuss with regional paediatrician if required

under 6 months

⚠ URGENT Referral Paediatrician

Call via Broome Hospital if no available clinical appointment in 1 week

over 6 months

Refer Paediatrician at initial diagnosis if:

- Pre-existing medical condition including prematurity or IUGR
- There is weight loss during community management.
- If GP/CCHN is otherwise concerned.
- Is there catch up growth within 4 weeks?

No

⚠ Refer Urgently to Paediatrician

Yes

Monthly weights for the next three months – Is weight continuing on centile or at target weight?

Yes

3 monthly review until 2 years Annual health check