



PROCEDURE

Head circumference assessment

Scope (Staff):	Community Health
Scope (Area):	CACH, WACHS

CAHS commits to being a child safe organisation by applying the
National Principles for Child Safe Organisations

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[CAHS Child Safe Organisation Commitment Statement](#)

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Aim

To correctly measure, record and interpret the head circumference of infants and young children.

Risk

Failure to conduct a head circumference assessment, or obtaining an inaccurate measurement, may delay the identification of an infant or young child with health and developmental concerns associated with deviations in head size.

Background

Measuring the head circumference of infants and young children is a fast, reliable and non-invasive procedure for determining underlying brain size¹. When conducted as part of a regular, holistic growth assessment and plotted on an appropriate growth chart, the head circumference measurement can assist in determining whether an infant or young child has age-appropriate growth, or if a deviation is apparent that warrants further assessment, early intervention and monitoring¹.

The most dramatic increase in brain growth occurs during the last three-months in utero and the first two-years of life². Therefore, measuring head circumference in the first two-years of life is crucial to detecting and monitoring slow or excessive growth, reviewing and monitoring the impact of illness and associated treatment, and identifying or monitoring those at higher risk of neurodevelopmental disorders or adverse developmental outcomes^{2,3}.

Head circumference measurements that deviate from the norm may be attributed to microcephaly or macrocephaly.

- Microcephaly is defined as:
 - a smaller than expected head circumference that is below the 3rd percentile for age, or
 - serial head circumference measurements crossing two or more centiles downward, or
 - a head circumference that is disproportionately small relative to weight and length.

Microcephaly is often associated with disturbance to brain development.⁴

- Macrocephaly is defined as:
 - a head circumference that is above the 98th percentile for age, or
 - a head circumference that is disproportionately large compared to child's weight and length.⁴

The most common cause is the familial (runs in the family) macrocephaly.⁴ Other causes can include genetic conditions like achondroplasia (disproportionate short stature and macrocephaly)⁵, acquired conditions due to increased intracranial pressure (hydrocephalus) or vascular anomalies.⁶

Variations in head shape include:

- Craniosynostosis
 - an abnormal head shape resulting from the premature fusion of one or more of the cranial sutures.
- Positional/ deformational plagiocephaly
 - an asymmetrical head shape with flattening on one side
 - results from external moulding forces acting on the developing skull (e.g., position in utero, lying in the same position)
 - does not affect brain growth or development.⁴

Refer to [Physical Assessment 0-4 years](#) for more information about the possible causes of deviation to the head from birth to four years of age.

Research shows a link between deviations in infant head circumference and autism spectrum disorder (ASD)⁷. It has been observed that the head circumference at birth is often normal or smaller than normal in those with ASD⁸. Following a period of rapid growth between six and 14-months-of-age, head circumference stabilises. Accelerated head growth in the first year of life is found in approximately 70% of children with ASD^{9,10}. There is also evidence that 15% of children with ASD have macrocephaly⁶.

Key points

- A head circumference assessment should be conducted:
 - at the 8-week, 4-month, and 12-month Universal contact appointments
 - at the 2-year Universal contact appointment if
 - previously identified concerns around growth trajectories
 - already on a growth monitoring plan

- concerns expressed by a parent/carer
 - when concerns regarding growth or any other risks are identified or raised by a Community Health Nurse or parent/carer at any Universal Plus/Enhanced Child Health Schedule contact.
- To ensure an accurate head circumference measurement is recorded, reliable equipment and the correct technique should be used. Inaccurate measurement, recording or plotting of head circumference can lead to a misleading growth assessment, clinical misinterpretation and unnecessary concern for parents/carers.
- Decisions about growth deviations should never be determined solely by growth charts¹¹. However, reviewing head circumference measurements from previous child health contacts will assist in interpreting overall growth status. Accelerations or decelerations in head circumference growth indicate the need for further assessment and/or referral.
- Community Health Nurses need to provide a culturally safe service delivery, which demonstrates a welcoming environment that recognises the importance of the cultural beliefs and practices of all clients.
- Community Health Nurses must follow the organisation's overarching Infection Control Policies and perform hand hygiene in accordance with WA Health guidelines at all appropriate stages of the procedure.
- All nurses will refer to the [Nursing and Midwifery Board AHPRA Decision-making framework](#) in relation to the scope of practice and delegation of care to ensure that decision-making is consistent, safe, person-centred and evidence-based.

Equipment

- Disposable paper tapes - use in CACH and WACHS
- Non-disposable measuring tapes - use ONLY in WACHS. The tapes should be clean, flexible, non-stretchable, and non-retractable.
- Non-disposable measuring tapes should be cleaned before and after use (see [Medical Devices: Single Use, Single Patient Use and Reusable](#)).
- The tape should have increments of 0.1 centimetres (cm) and a width of 0.5–1.0 cm.
- Check the measuring tape at least annually, or more frequently if required against a static measure for accuracy and replace if damaged or inaccurate.

Procedure

Steps	Additional information
Identification, engagement and consent • Check client identity • Review client information/ electronic health records • Explain the procedure to the parent/carer and, where appropriate, the young child. Allow sufficient time for the discussion of parent/carer concerns.	• Refer to ◦ Patient/Client identification (CACH) ◦ Patient identification and procedure matching (WACHS) ◦ Consent for services (CACH) ◦ Engagement procedure (WACHS) • Encourage parent/carer support and involvement with the procedure.
Preparation • Remove any items or hair accessories worn on the head. Cultural considerations should be applied. • Lay the infant/young child supine on the assessment bench.	• Infants/young children may need to be held firmly (yet comfortably) to prevent unexpected movement. • Young children may prefer to sit on their parent's/carer's lap, facing the Nurse.
Measuring • Place the tape above the infant/young child's eyebrows, above the ears and around the occipital prominence (most prominent part) at the back of the head. • Pull the tape gently to compress the hair. • Note the measurement to the nearest 0.1cm.	• Where there is uncertainty regarding accuracy, staff should repeat head circumference measurement to confirm the results. Take the measurements three times and record the largest to the nearest 0.1cm.
Recording • Record the head circumference measurement.	• Age is plotted in completed weeks/months/years, as appropriate.

Steps	Additional information
• CAHCH Community Health Nurses must use a CDIS assessment screen to record the head circumference measurement. The measurement will be automatically plotted on the relevant growth chart. ◦ CDIS will generate a head circumference plot on the WHO growth chart only for children up to and including 2 years of age. Where there is a clinical concern regarding the head circumference of a child older than 2 years, staff should plot the head circumference using the WHO 0-5 years paper-based head circumference chart. ◦ The paper-based growth chart must be scanned and uploaded to CDIS. • WACHS nurses must enter the head circumference measurement in relevant CHIS qualifiers and review it on the appropriate centile chart. • If CDIS/CHIS are temporarily unavailable, the relevant paper-based growth chart should be used to precisely plot the head circumference measurement (see Additional information). The measurement should be entered into CDIS/CHIS, when available.	• If an unexpected growth trajectory is evident when the head circumference measurement is plotted on the relevant growth chart, the Nurse should re-take the measurement to check for accuracy. • If a paper-based chart is used prior to entering a head circumference measurement into CDIS/CHIS, the following process applies. ◦ For infants born after 37 weeks gestation, the measurement should be plotted on the following WHO Head circumference for age growth charts: Birth to 13 weeks or Birth to 2 years. The actual age for these infants commences at birth. Growth measurement plotting begins at birth at “0 years” and continues according to actual age. ◦ For infants born at less than 37 weeks gestation, the measurement should be plotted using the Fenton Preterm Growth Charts. Once a corrected age of 40-weeks is reached, the WHO Head circumference for age growth charts should be used. Corrected age must be used until two-years. If the child catches up before this, actual age can be used.
Interpretation • Interpret the head circumference measurements on the growth chart,	• In some cases, a single head circumference measurement may

Steps	Additional information
noting any changes in growth trajectory. Discuss the findings and growth pattern with the parent/carer.	indicate the need for additional assessment and/or referral. However, serial measurements of the head circumference over time and a holistic assessment are usually required to confirm that a deviation from the normal pattern of growth has occurred. Serial measurements showing changes in the growth trajectory require additional assessment and/or referral.
Referral - If required, refer to a medical practitioner for further assessment. E.g.: - head circumference measurements below the 3rd percentile or above the 97th percentile (Note: The highest printed curve on the WHO chart is the 97th percentile) - head circumference measurements disproportionate to the length or the weight - serial head circumference measurements cross 2 or more centiles downward. - Acutely ill infants and young children require urgent referral. - macrocephaly, bulging fontanelle, and abnormal eye movements may indicate increased intracranial pressure.	- Refer to Growth – downward trajectory procedure for assessment, monitoring and referral of clients with downward trajectories on percentile charts - Refer to Physical assessment 0-4 years, Appendix 5: Head and face for: - management of head shape variations - urgent – immediate and non-urgent concern referral pathways.

Documentation

Nurses maintain accurate, comprehensive and contemporaneous documentation of assessments, planning, decision making and evaluations; according to CACH and WACHS processes.

References

1. Harris S. Measuring head circumference - Update on infant microcephaly. Canadian Family Physician. 2015;61(8):680–4.
2. Australian Institute of Health and Welfare. National Maternity Data Development Project: Baby head circumference - Research brief no.3. Canberra: Australian Institute of Health and Welfare; 2016.
3. World Health Organization. Training course on child growth assessment. Geneva: World Health Organization; 2006.
4. Perth Children's Hospital. Head shape and size abnormalities Perth: Government of Western Australia; 2025. Available from: <https://pch.health.wa.gov.au/For-health-professionals/Referrals-to-PCH/Prereferral-guidelines/Head-shape-and-size-abnormalities>.
5. Child and Adolescent Health Service. Clinical guideline: Achondroplasia. Perth: Government of Western Australia; 2024.
6. Accogli A, Geraldo AF, Piccolo G, Riva A, Scala M, Balagura G, et al. Diagnostic approach to macrocephaly in children. Frontiers in pediatrics. 2022;9:794069.
7. Fukumoto A, Hashimoto T, Mori K, Tsuda Y, Arisawa K, Kagami S. Head circumference and body growth in autism spectrum disorders. Brain and Development. 2011;33(7):569–75.
8. Elder L, Dawson G, Toth K, Fein D, Munson J. Head Circumference as an Early Predictor of Autism Symptoms in Younger Siblings of Children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2008;38:1104–11.
9. Courchesne E, Carper R, Akshoomoff N. Evidence of brain overgrowth in the first year of life in autism. JAMA. 2003;290(3):337–44.
10. Muratori F, Calderoni S, Apicella F, Filippi T, Santocchi E, Calugi S, et al. Tracing back to the onset of abnormal head circumference growth in Italian children with autism spectrum disorder. Research in Autism Spectrum Disorders. 2012;6:442–9.
11. The Royal Children's Hospital Melbourne. The 10 top things about growth charts. Victoria: The Royal Children's Hospital Melbourne; 2013. Available from: https://www.rch.org.au/uploadedFiles/Main/Content/childgrowth/10%20top%20things%20about%20growth%20charts_Nov2013.pdf.

Related internal Policies, Procedures and Guidelines

The following documents can be accessed in the Clinical Nursing Manual via the [SharePoint](#) link or CACH Clinical Nursing Policy [Internet](#) link

[Growth birth – 18 years](#)

[Growth – downward trajectory](#)

[Length assessment 0 - 2 years](#)

[Physical Assessment 0 - 4 years](#)

Universal contact [8 weeks](#), [4 months](#), [12 months](#), [2 years](#)

[Universal Plus – Child Health](#)

[Weight assessment 0 - 2 years](#)

The following documents can be accessed in the [WACHS Policy Manual](#)

Engagement procedure
Enhanced child health schedule
Patient identification and procedure matching
The following documents can be accessed in the CAHS Policy Manual
Patient/Client identification
The following documents can be accessed in the CAHS Infection Prevention and Control Policies Manual
Medical Devices: Single Use, Single Patient Use and Reusable
The following documents can be accessed in the CACH Operational Policy Manual
Consent for services
Useful internal resources
Practice guide for Community Health Nurses
World Health Organization Charts (CHS800A-11&12 head circumference 0-2 years, head circumference 0-13 weeks, head circumference 0-5 years)
Useful external resources
Fenton Preterm Growth Charts
Nursing and Midwifery Board AHPRA Decision-making framework
World Health Organization Child Growth Standards
World Health Organization growth charts: head circumference for age

This document can be made available in alternative formats on request.

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