Queensland Clinical Guidelines

Translating evidence into best clinical practice

Maternity and Neonatal **Clinical Guideline**

Routine newborn assessment

Queensland Government

Document title:	Routine newborn assessment
Publication date:	October 2014
Document number:	MN14.4-V5-R21
Document supplement:	The document supplement is integral to and should be read in conjunction with this guideline.
Amendments:	Full version history is supplied in the document supplement.
Amendment date:	Content endorsed as current in June 2019. Review date extended
Replaces document:	MN14.4-V4-R19
Author:	Queensland Clinical Guidelines
Audience:	Health professionals in Queensland public and private maternity and neonatal services
Review date:	October 2021
Endorsed by:	Queensland Clinical Guidelines Steering Committee Statewide Maternity and Neonatal Clinical Network (Queensland)
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Cultural acknowledgement

We acknowledge the Traditional Custodians of the land on which we work and pay our respect to the Aboriginal and Torres Strait Islander elders past, present and emerging.

Disclaimer

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The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances, may be appropriate.

This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision making, including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

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Flow Chart: Routine newborn assessment

Preparation

Family centred care
- Seek parental consent
- Consider cultural needs
- Discuss with parents: purpose, process, timing and limitations of assessments
- Ask about parental concerns
- Encourage participation

Timing
- Initial exam immediately after birth and any resuscitation
- Full and detailed assessment within 48 hours and always prior to discharge
- Follow-up 5– 7 days & 6 weeks
- If unwell/premature – stage as clinically indicated

Review history
- Maternal medical/obstetric/social and family
- Current pregnancy
- Labour and birth
- Gender, gestational age, Apgar scores and resuscitation
- Since birth: medications, observations, feeding

Environment
- Warmth, lighting
- Correct identification
- Infection control precautions
- Privacy

Equipment
- Overhead warmer if required
- Stethoscope
- Ophthalmoscope
- Tongue depressor
- Pencil torch
- Tape measure, infant scales, growth charts
- Pulse oximetry (optional)
- Documentation
  - Infant Personal Health Record
  - Medical Health Record

Discharge

Review discharge criteria
- Observations, feeding, output

Discuss
- Routine tests (hearing screen, NNST, Hepatitis B)
- Support Agencies
  - GP, Child/Community Health, Lactation support, 13 HEALTH
- Health promotion
  - Feeding and growth
  - Jaundice
  - SUDI, injury prevention
  - Immunisation
  - Signs of illness
- Infant Personal Health Record
- Referral and follow-up
  - Routine 5–7 days & 6 weeks

Assessment

General appearance
- Skin colour, integrity, perfusion
- State of alertness
- Activity, range of spontaneous movement
- Posture, muscle tone

Growth status
- Chart head circumference, length, weight on centile charts

Head, face, neck
- Head shape, size
- Scalp, fontanelles, sutures
- Eye size, position structure
- Nose, position, structure
- Ear position, structure
- Mouth, palate, teeth, gums tongue, frenulum
- Jaw size

Shoulders, arms, hands
- Length, proportions, symmetry
- Structure, number of digits

Chest
- Size, shape, symmetry, movement
- Breast tissue, nipples
- Heart sounds, rate, pulses
- Breath sounds, resp rate
- Pulse oximetry (optional)

Abdomen
- Size, shape, symmetry
- Palpate liver, spleen, kidneys
- Umbilicus

Genitourinary
- Male - penis, foreskin, testes
- Female - clitoris, labia, hymen
- Anal position, patency
- Passage of urine, stool

Hips, legs, feet
- Ortolani and Barlow's manoeuvres
- Leg length, proportions, symmetry and digits

Back
- Spinal column, skin
- Symmetry of scapulae, buttocks

Neurological
- Behaviour, posture
- Muscle tone, spontaneous movements
- Cry
- Reflexes - Moro, Suck, Grasp

Discuss Document Refer
- Discuss findings with parents
- Document in health record(s)
- Refer as indicated

Further investigation ☑ Urgent

Indications for further investigation and/or urgent follow-up are not exhaustive. Use clinical judgement

Growth and appearance
- Dysmorphic features
- Excessive weight loss
- ☑ **Jaundice < 24 hours of age**
- ☑ **Central cyanosis**
- Petechiae new/unrelated to birth
- Pallor, haemangioma

Head and neck
- ☑ **Enlarged/bulging/sunken fontanelle**
- Macro/microcephaly
- ☑ **Subgaleal haemorrhage**
- Caput, cephalhaematoma
- Fused sutures
- Facial palsy/asymmetry on crying
- Hazy, dull cornea
- Absent red eye reflex
- Pupils unequal/dilated/constricted
- Purulent conjunctivitis/yellow sclera
- ☑ **Nasal obstruction**
- Dacryocyst
- Cleft lip/palate
- Unresponsive to noise
- Absent ear canal or microtia
- Ear drainage
- Small receding chin/micrognathia
- Neck masses, swelling, webbing
- Swelling over or fractured clavicle

Upper limbs
- Limb hypotonia, contractures, palsy
- Palmar crease pattern

Chest
- ☑ **Respiratory distress**
- ☑ **Apnoeic episodes**
- Abnormal HR, rhythm, regularity
- Heart murmurs
- ☑ **Weak or absent pulses**
- ☑ **Positive pulse oximetry**

Abdomen
- ☑ **Organomegaly**
- ☑ **Gastrochisis/exomphalos**
- ☑ **Bilateral undescended testes**
- ☑ **Bilious vomiting**
- Inguinal hernia
- < 3 umbilical vessels
- Signs of umbilical infection

Genitourinary
- ☑ **No urine/meconium in 24 hours**
- ☑ **Ambiguous genitalia**
- ☑ **Testicular torsion**
- Hypospadias, penile chordee micropenis

Hips, legs and feet
- Risk factors for hip dysplasia
- Positive/abnormal Barlow's and/or Ortolani manoeuvres
- Contractures/hypotonia
- Fixed talipes
- Developmental hip dysplasia

Back
- Curvature of spine
- Non-intact spine
- Tufts of hair/dimple along intact spine

Neurological
- Weak/irritable/absent cry
- Absent/exaggerated reflexes
- No response to consoling
- Inappropriate carer response to crying
- ☑ **Seizures**
- ☑ **Altered state of consciousness**

☑ **Urgent follow-up**, **GP:** General Practitioner, **HR**: Heart Rate, **NNST**: Neonatal Screening Test, **SUDI**: Sudden unexpected death in infancy, **<:** less than, **>:** greater than

Queensland Clinical Guideline: Routine newborn assessment. Flowchart version: F14.4-1-V1-R21

Abbreviations

BCG	Bacille Calmette-Guerin
CCHD	Critical congenital heart disease
GP	General Practitioner
NNST	Neonatal screening test
RACP	Royal Australian College of Physicians
SUDI	Sudden and unexpected death in infancy

Terms

Term	Definition
Family centred care	Is an approach to the planning, delivery and evaluation of health care that is grounded in mutually beneficial partnerships among health care providers, patients and families.[1,2] It incorporates the core concepts of respect and dignity, information and sharing, participation and collaboration.[1]
Newborn	A recently born infant.[3] An infant in the first minutes to hours following birth.[4]
Newborn nursery	In this document 'newborn nursery' may be interpreted to mean neonatal observation or stabilisation area or equivalent as per local terminology.
Routine newborn assessment	In this document 'routine newborn assessment' is a broad term referring to the assessment of the newborn occurring at various points in time within the first 6–8 weeks after birth. It includes the brief initial assessment, the full and detailed newborn assessment within 48 hours of birth and the follow-up assessments at 5–7 days and 6 weeks.
Urgent follow-up	Immediate and/or life-threatening health concern for the newborn requires urgent (same day) follow-up.

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1 Introduction

Every newborn requires a brief physical examination within the first few minutes after birth and then a full and detailed assessment within the next 48 hours and prior to discharge from hospital.[5] A follow up assessment should be performed later in the first week (by a midwife or General Practitioner (GP) outside the hospital setting) and then at 6–8 weeks after birth. The physical examination component of the newborn assessment is the most important screen for major occult congenital anomalies. There is no optimal time to detect all abnormalities.[6] Moss et al[7] found 8.8% of newborns had an abnormality on the first detailed examination with an additional 4.4% having abnormalities only diagnosed at follow up examination.

1.1 Family centred care

Adhere to the principles of family centred care when assessing any newborn [refer to Table 1. Family centred care].

Table 1. Family centred care

Aspect	Consideration
Dignity and respect	• Always seek parental consent before examining their newborn • Listen to and honour parent views and choices regarding planning and delivery of care • Respect family values, beliefs and cultural background and consider culturally appropriate supports (e.g. indigenous liaison personnel or an interpreter)
Information sharing	• Communicate fully and involve the parents as appropriate. This may be a brief reassurance after the initial examination in the birthing room but a more detailed discussion before, during and after a full neonatal assessment for questions and explanations • Ask the parent/s about their concerns for their newborn[8] • Ensure information is shared in a complete, unbiased and timely manner to ensure parents can effectively participate in care and decision making
Participation and collaboration	• Parents and families are encouraged to participate in care and decision making at the level they choose • Wherever possible perform the newborn assessment with at least one parent present[5,6]

1.2 Clinical standards

- Individual birthing units are responsible for:
  - Identifying the clinician responsible for the newborn assessment[5,6]
  - Identifying health discipline specific criteria for performance of the neonatal assessment. For example, criteria for performance by a midwife *may* include:
    - Gestational age greater than 37 weeks and less than 42 weeks
    - Birth weight greater than 2500 g and less than 4500 g
    - Apgar score greater than 7 at 5 minutes of age
    - No antenatal abnormality identified
  - Providing access to clinical training[5,6]
  - Establishing appropriate referral pathways[6]
- Clinicians performing newborn assessment are required to:
  - Be appropriately trained in the required assessment skills
  - Practise and maintain skills to a satisfactory level[6,9]
  - Recognise variances from normality
  - Seek guidance for management of variance as required and refer appropriately[6,10]
  - Maintain accurate records of the newborn assessment[5,6]
  - Document findings and discuss the results with parents[5,6,11]

1.1 Initial brief examination after birth

Complete the initial brief assessment after any resuscitation (Refer to Queensland Clinical Guideline *Neonatal resuscitation*[12]). Assess the newborn for successful transition to extra-uterine life, any obvious dysmorphic features or gross anomalies which will require immediate attention or discussion with the family. Confirmation of gender is important. The timing of this review should be flexible and not restrict skin-to-skin contact.

1.2 Full and detailed newborn assessment

1.2.1 Purpose of the routine newborn assessment

The newborn assessment provides an opportunity to[6]:

- Identify the newborn who is acutely unwell and requires urgent treatment
- Review any concerns the family have about the newborn and attempt to address them
- Review any problems arising or suspected from antenatal screening, family history or labour (e.g. mental health issues, drug use/misuse, child protection issues, genetic conditions)
- Review weight and head circumference measurements
- Check the newborn has passed urine and meconium
- Recognise common neonatal problems and give advice about management
- Diagnose congenital malformations and arrange appropriate management
- Discuss matters such as newborn care, feeding, Vitamin K, Hepatitis B and Bacille Calmette-Guerin (BCG) vaccines, reducing the risk of Sudden Unexpected Death in Infancy (SUDI) and any other matters relevant to the newborn5
  - Refer to Queensland Clinical Guideline: *Establishing breastfeeding*[13]
- Explain problems such as jaundice that might not be observable in the newborn but could be significant a few days or weeks later
  - Refer to Queensland Clinical Guideline *Neonatal jaundice*[14]
- Convey information about local networks, services and access to members of a primary health care team [refer to Section 4 Discharge planning]
- Inform families how they can request and negotiate additional help, advice, and support as relevant to the circumstances

1.2.2 Timing of the routine newborn assessment

- The Royal Australian College of Physicians(RACP) recommends an initial full and detailed assessment be performed within the first 48 hours after birth.[5] Many babies are discharged home within the first 8 hours after birth and it is important that all babies have a full assessment prior to discharge even if this is not the optimal time to detect all abnormalities
- It is important to advise parents that certain conditions may only become evident after discharge home. Information about local health support services should be provided to parents prior to discharge
- Recommend a follow-up assessment at 5–7 days of age
- Recommend a further assessment at around 6 weeks of age[5]

1.2.3 Unwell and/or premature newborn

- Stage the assessment as clinically indicated
- Recognise the impact of prematurity on the assessment findings
- Identify the requirement for additional condition specific assessments (e.g. ophthalmology review for retinopathy of prematurity)

1.2.4 Pulse oximetry screening

Table 2. Pulse Oximetry screening

Aspect	Consideration
Context	• Pulse oximetry is a non-invasive technology that can be used to detect hypoxemia, a clinical sign of critical congenital heart disease (CCHD)[15-17] • Its incorporation into the routine newborn assessment is becoming more common nationally and internationally
Recommendation	• Inclusion of pulse oximetry screening into the newborn assessment **is optional** at the discretion of the local service • Refer to Appendix A: Pulse oximetry screening

2 Preparation for the full and detailed newborn assessment

Table 3. Assessment preparation

Aspect	Clinical assessment
Review history[18]	• Review maternal medical, obstetric, social and family history, including: o Maternal age, social background, mental health history, Edinburgh Postnatal Depression Score (EDPS), intimate partner violence, child safety alerts o Chronic maternal disease and associated treatments o Recreational drug, alcohol or tobacco use o Prescribed medications and effect on newborn (e.g. anti-depressants) o Previous pregnancies including complications and outcomes (e.g. neonatal jaundice, ABO incompatibility, genetic conditions) • Current pregnancy o Results of pregnancy screening tests (e.g. blood group, serology ultrasound scans) o Chorionicity if twins o Any other diagnostic procedures such as amniocentesis o Mother unwell with any non-specific illnesses o Complications such a gestational diabetes or hypertension • Labour and birth o Progression of labour (e.g. onset, duration, interventions during labour, maternal temperature, third stage) o Evidence of non-reassuring fetal status in labour (e.g. cord gases) o Presentation and mode of birth o Apgar scores and resuscitation at birth o Medication since birth (e.g. Vitamin K, Hepatitis B immunoglobulin/vaccine, antibiotics) • Gestational age • Observations since birth o Axillary temperature, o Weight o Urine/meconium o Finnegan score (if relevant) • Feeding since birth (e.g. suck behaviour, mode of feeding)
Explanation	• Introduce yourself to the parents with an explanation of the purpose, procedure and limitations of the assessment • Ask the baby's name and confirm gender • Ask about any concerns/provide opportunity for questions and answers • Discuss feeding choice and progress o Explain normal weight loss after birth (1–2% of body weight per day up to maximum 10% weight loss at day 5) o Provide further information as requested
Environment	• Ensure adequate warmth and lighting • Correctly identify the newborn, as per hospital identification policy • Prevent cross infection by implementing standard precautions as per local Infection Control Guidelines[18] • Ensure privacy when discussing sensitive family/health issues[6]
Equipment	• Overhead warmer if required • Stethoscope • Ophthalmoscope • Pencil torch • Tongue depressor • Tape measure • Infant scales and growth charts • Documentation o Infant Personal Health Record o Hospital medical record

3 Physical examination

Use a systematic approach to examine the newborn where possible. A recommended systematic approach is 'head to toe' and 'front to back'.[18] Undress the newborn down to the nappy as it is not possible to fully examine a dressed baby for all abnormalities.

Table 4 includes aspects of the clinical assessment and possible indications for further investigation or follow up. Indications for urgent follow-up are identified but the list is not exhaustive. Use clinical judgement when determining the need and the urgency of follow-up for all abnormal or suspicious findings. [Refer to Table 5. Suggested follow-up actions].

Table 4. Newborn examination

Aspect	Clinical assessment	Indications for further investigation ☑ **Urgent follow-up**
General appearance	• While the newborn is quiet, alert, not hungry or crying observe: o Skin colour/warmth/perfusion o State of alertness/responsiveness o Activity o Range of spontaneous movement o Posture o Muscle tone	• Dysmorphic features
Growth status and feeding	• Document on the appropriate centile charts: o Weight o Length o Head circumference	• Excessive weight loss
Skin	• Colour • Trauma • Congenital or subcutaneous skin lesions • Oedema	☑ **Any jaundice at less than 24 hours of age** ☑ **Central cyanosis** • Petechiae not fitting with mode of birth or newly appearing or associated with purpura • Pallor • More than 3 café-au-lait spots in a Caucasian, more than 5 in a black African newborn • Multiple haemangioma • Haemangioma on nose or forehead (in distribution of ophthalmic division of trigeminal nerve) • Haemangioma or other midline skin defect over spine • Oedema of feet (consider Turner syndrome)
Head	• Shape and symmetry • Scalp • Anterior and posterior fontanelle • Sutures • Scalp lacerations/lesions	☑ **Enlarged, bulging or sunken fontanelle** • Microcephaly/macrocephaly ☑ **Subgaleal haemorrhage** • Caput/cephalhaematoma (consider potential for jaundice) • Fused sutures

Table 4. Newborn examination continued

Aspect	Clinical assessment	Indications for further investigation ☑ **Urgent follow-up**
Face	• Symmetry of structure, features and movement	• Asymmetry on crying
	• Eyes o Size and structure o Position in relation to the nasal bridge o Red eye reflex	• Hazy, dull cornea • Absent red reflex • Pupils unequal, dilated or constricted • Purulent conjunctivitis • Yellow sclera
	• Nose o Position and symmetry of the nares and septum	• Nasal flaring ☑ **Nasal obstruction especially if bilateral** • Dacryocyst
	• Mouth o Size, symmetry and movement o Shape and structure ▪ Teeth and gums ▪ Lips ▪ Palate (hard/soft) ▪ Tongue/frenulum	• Cleft lip/palate • Mouth drooping
	• Ears o Position o Structure including patency of the external auditory meatus o Well-formed cartilage	• Unresponsive to noise • Absent external auditory canal or microtia • Drainage from ear
	• Jaw size	• Small receding chin/micrognathia
Neck	• Structure and symmetry • Range of movement • Thyroid or other masses	• Masses/swelling • Neck webbing
Shoulders, arms and hands	• Length • Proportions • Symmetry • Structure and number of digits	• Swelling over clavicle/fractured clavicle • Hypotonia • Palsy (e.g. Erb's palsy, Klumpke's paralysis) • Contractures • Palmar crease pattern
Chest, Cardio-respiratory	• Chest o Chest size, shape and symmetry o Breast tissue o Number and position of nipples • Respiratory o Chest movement and effort with respiration o Respiratory rate o Breath sounds • Cardiac o Pulses – brachial and femoral o Skin colour/perfusion o Heart rate o Heart rhythm o Heart sounds o Pulse oximetry (optional)	☑ **Signs of respiratory distress** ☑ **Apnoeic episodes** • Variations in rate, rhythm or regularity • Murmurs • Poor colour/mottling ☑ **Weak or absent pulses** ☑ **Positive pulse oximetry screen (if performed)**

Table 4. Newborn examination continued

Aspect	Clinical assessment	Indications for further investigation ☑ **Urgent follow-up**
Abdomen	• Shape and symmetry • Palpate for enlargement of liver, spleen, kidneys and bladder • Bowel sounds • Umbilicus including number of arteries • Tenderness	☑ **Organomegaly** ☑ **Gastroschisis/exomphalos** ☑ **Bilious vomiting** • Inguinal hernia • Less than 3 umbilical vessels • Erythema or swelling at base of umbilicus onto anterior abdominal wall
Genitourinary	• Has the newborn passed urine? • Male genitalia o Penis including foreskin o Testes (confirm present bilaterally and position of testes) including any discolouration o Scrotal size and colour o Other masses such as hydrocele • Female genitalia (discuss pseudomenses) o Clitoris o Labia o Hymen	☑ **No urine passed within 24 hours** ☑ **Ambiguous genitalia** ☑ **Bilateral undescended testes** ☑ **Testicular torsion** • Hypospadias, penile chordee • Penile torsion greater than 60% • Micropenis (stretched length less than 2.5 cm) • Unequal scrotal size or scrotal discolouration • Testes palpable in inguinal canal
Anus	• Has the newborn passed meconium? • Anal position • Anal patency	☑ **No meconium passed within 24 hours**
Hips, legs and feet	• Use Ortolani and Barlow's manoeuvres [19] • A firm surface to examine hips is necessary[6] • Assess legs and feet for o Length o Proportions o Symmetry o Structure and number of digits	• Risk factors for hip dysplasia: breech presentation, fixed talipes, fixed flexion deformity, severe oligohydramnios, 1st degree relative with developmental hip dysplasia • Positive/abnormal Barlow's and/or Ortolani manoeuvres • Hypotonia/contractures • Fixed talipes
Back	• Spinal column • Scapulae and buttocks for symmetry • Skin	• Curvature of spine • Non-intact spine • Tufts of hair or dimple along intact spine
Neurologic	• Observe throughout: o Behaviour o Posture o Muscle tone o Movements o Cry • Examine reflexes o Moro o Suck o Grasp reflex	• Weak, irritable, high pitched cry • No cry • Does not respond to consoling • Inappropriate carer response to crying • Absent/exaggerated reflexes ☑ **Seizures** ☑ **Altered state of consciousness**

3.1 Isolated abnormalities

The following abnormalities are usually of no concern when isolated (3 or more such abnormalities are of concern)

- Folded-over ears
- Hyperextensibility of thumbs
- Syndactyly of second and third toes
- Single palmar crease
- Polydactyly, especially if familial
- Single umbilical artery
- Hydrocele
- Fifth finger clinodactyly
- Simple sacral dimple just above the natal cleft (less than 2.5 cm from anus and less than 5 mm wide)
- Single café-au-lait spot
- Single ash leaf macule
- Third fontanelle
- Capillary haemangioma apart from those described in table above
- Accessory nipples

3.2 Consultation and follow-up

Clinical judgement is required to determine the appropriate urgency of follow-up in the context of abnormal or suspicious findings arising from a newborn assessment. If there is uncertainty about the urgency of follow-up in relation to any aspect or finding, seek expert clinical advice.

Table 5. Suggested follow-up actions

Category	Follow-up action
☑ **Urgent** Immediate and/or life-threatening health concern for the newborn	• Arrange same day (as soon as possible) medical review • If neonate already discharged from hospital arrange review by either: o Hospital Emergency Department o GP o Paediatrician o Neonatologist • Document all follow-up actions and arrangements • Advise parents/family of clinical concerns and the importance of immediate review o Provide verbal/written information as appropriate o Consider parental support needs (e.g. social work involvement, transport requirements)
Follow-up Existing and/or potential health concern for the newborn	• Determine the urgency of the follow-up required • Consider the need for: o Consultation with senior practitioners (e.g. review of newborn, telephone consultation about findings, telehealth videoconference examination) o Further immediate investigation (e.g. blood test) o Referral for formal specialist review (e.g. cardiology) o Re-assessment or recheck at 6 week newborn assessment (or sooner as indicated) o Distribution of written summary information (e.g. GP, referring hospital) • Advise parents/family of clinical concerns and the importance of review and follow-up arrangements o Provide verbal/written information as appropriate o Consider parental support needs (e.g. social work involvement, transport requirements)

4 Discharge planning

Evaluate each mother-newborn dyad individually and involve the family when determining optimal time of discharge. Criteria for newborn discharge include physiologic stability, family preparedness to provide newborn care at home, availability of social support, and access to the health care system and resources.[15]

Table 6. Discharge planning discussions

Aspect	Considerations
Discharge criteria	• Review newborn status prior to discharge including: o Feeding: suck feeding adequately o Newborn observations: temperature maintenance, respiratory rate o Urine and stool passage o Completion of newborn assessment o Vitamin K status: give script and education for further oral vitamin K if required
Routine tests	• Explain the importance and how to access: o Healthy Hearing screen o Neonatal Screen Test (NNST) ▪ For same sex twins, consider repeat in 2 weeks or if not repeated, maintain an index of suspicion for congenital hypothyroidism o Hepatitis B vaccination
Discharge at less than 24 hours of age	• If discharged at less than 24 hours of age, advise parents to seek urgent medical assistance if: o Meconium not passed within 24 hours o Appears jaundiced within first 24 hours o Elevated temperature o Vomiting o Difficulty feeding o Lethargy o Decreased urine or stools
Referral and follow-up	• Advise parents about the importance of follow-up newborn assessments: o At 5–7 days of age o Six week newborn check • Arrange referral for a newborn and/or family with identified problems • Document arrangements and inform family • Provide discharge information to the GP
Documentation	• Anthropometric parameters plotted on growth charts • Infant personal health record o Ensure relevant sections complete before discharge o Explain parental use and completion after discharge • Document completion of the newborn assessment and associated discussions, findings and follow-up requirements in the medical record

4.1 Health promotion

Discuss relevant parenting and health education issues with parent(s) prior to discharge[11,5]

Table 7. Health promotion

Aspect	Considerations
Support agencies	• Provide information on the role of and accessing relevant support agencies (including but not limited to) o GP o Community Child Health o Community Health/health worker o Midwife (e.g. group practice, eligible or private) o Lactation consultant/Australian Breastfeeding Association o 13HEALTH (13 43 25 84) telephone help line o Psychological support agencies
Health promotion	• Discuss normal newborn care o Feeding (e.g. feeding cues, behaviour) o Growth and weight gain o Sleep patterns o Normal bowel and urine patterns o Umbilical cord care o Detection and management of jaundice ▪ Refer to Queensland Clinical Guideline: *Neonatal Jaundice*[14] • Warning signs of illness and when to seek medical assistance o Raised temperature o Poor feeding o Vomiting o Irritability, lethargy o Decreased urine or stools • Provide written information on safe infant care to reduce the risk of Sudden Unexpected Deaths in Infancy (SUDI)[20] o Parental smoking cessation o Safe infant sleeping positions and bed/room sharing • Injury prevention o Use of car capsules o Reducing home hazards • Immunisation schedule o Including recommendations for relevant immunisation of parents • Advocacy, promotion and support on breast feeding • Provide anticipatory guidance as indicated (e.g. circumcision)

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Appendix A: Pulse oximetry screening

Where no local protocols exist and the decision has been made by the facility to perform pulse oximetry screening, the following protocol is recommended.

Aspect	Consideration
Context	• Congenital heart disease occurs in nearly 1% of live births, approximately one quarter of these will be critical congenital heart disease (CCHD) • In the absence of early detection, newborns with CCHD are at risk for death in the first few days or weeks of life • Pulse oximetry can detect some CCHD that would otherwise be missed on routine examination or antenatal ultrasound • Pulse oximetry can also identify non-cardiac problems such as sepsis and respiratory problems and these are common causes of a positive screen • If incorporated into the routine newborn assessment, develop local protocols and parental information for: o Timing and performance of screening o Management of referral and/or transfer if screening positive o Management of false positive screening o Maintenance/purchase of necessary equipment o Staff education/training requirements
Target population	• All healthy newborns
Equipment	• Motion tolerant pulse oximeter • Disposable or reusable neonatal oxygen saturation probe
Timing	• After 24 hours of age or • If less than 24 hours of age at discharge, immediately prior to discharge (pulse oximetry screening prior to 24 hours of age is likely to result in increased false positive results)
Protocol	• Newborn should not be feeding and should be settled • Site the saturation probe on one foot • Keep saturation probe on the foot until a steady trace is obtained then remove (normally less than 1 minute) • Document the highest saturation achieved during the screen
Saturation ≥ 95% (Normal)	• *Negative pulse oximetry screen*: maximum oxygen saturation during recording is greater than or equal to 95% • Newborn suitable for discharge (in accordance with other discharge criteria)
Saturation 90–94%	• Medical review indicated • Consider investigation of other causes including respiratory/vascular problems (e.g. respiratory distress syndrome, lung malformations, persistent pulmonary hypertension of the newborn) • If newborn otherwise well, repeat screen in 3–4 hours • If repeat screen abnormal, specialist medical review indicated o Delay discharge and consider admission to newborn nursery
Saturation < 90% (Abnormal)	• *Positive pulse oximetry screen:* maximum oxygen saturation during recording is less than 90% • Requires urgent specialist medical review • Investigate for neonatal sepsis o Refer to Queensland Clinical Guideline: Early onset Group B streptococcal disease • Investigate for CCHD • Consider investigation of other causes including respiratory/vascular problems (e.g. respiratory distress syndrome, lung malformations, persistent pulmonary hypertension of the newborn) • Commence close clinical surveillance (e.g. continuous oximetry, admission to newborn nursery)

Adapted from: Mahle WT, Newburger JW, Matherne GP, Smith FC, Hoke TR, Koppel R, et al. Role of pulse oximetry in examining newborns for congenital heart disease: a scientific statement from the American Heart Association and American Academy of Pediatrics. Circulation. 2009; 120(5):447-58.

Acknowledgements

Queensland Clinical Guidelines gratefully acknowledge the contribution of Queensland clinicians and other stakeholders who participated throughout the guideline development process particularly:

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Mrs Bernice Ross, Midwife Lactation Consultant, Private Sector Brisbane
Ms Georgina Sexton Rosos, Consumer Representative, Friends of the Birth Centre, Brisbane
Dr Jacqueline Smith, Neonatal Nurse Practitioner, Neonatal Unit, The Townsville Hospital
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Funding

This clinical guideline was funded by Queensland Health, Healthcare Improvement Unit.