Queensland Clinical Guidelines

Translating evidence into best clinical practice

Maternity and Neonatal Clinical Guideline

Newborn baby assessment (routine)



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Statewide Maternity and Neonatal Clinical Network (Queensland)

Contact: Email: <u>Guidelines@health.qld.gov.au</u>
URL: www.health.qld.gov.au/qcg



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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Flow Chart: Routine newborn baby assessment

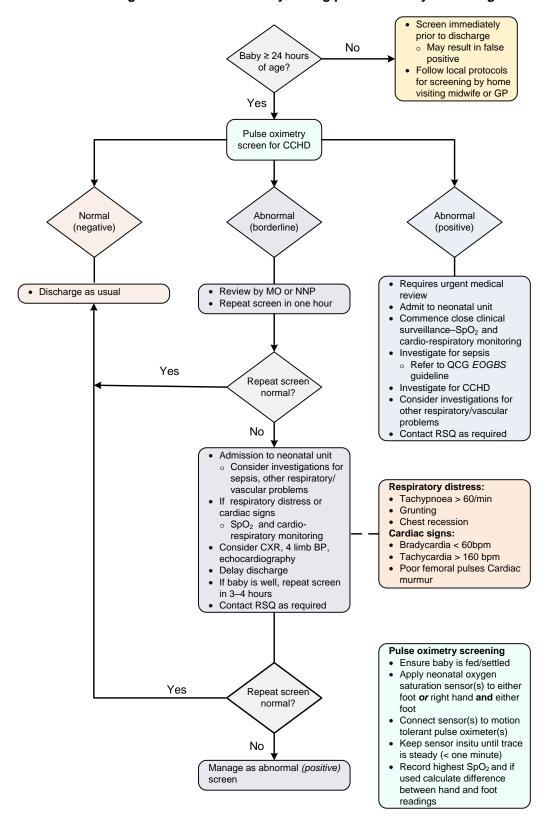
Preparation Assessment Further investigation 🗹 Ur Skin colour, integrity, **Growth and appearance** Family centred care perfusion · Consider cultural needs · Dysmorphic features General State of alertness • Discuss with parents: purpose, Excessive weight loss process, timing and limitations of appearance Activity, range of ☑ Jaundice < 24 hours of age spontaneous movement assessments ☑ Central cvanosis Posture, muscle tone · Ask about parental concerns • Petechiae new/unrelated to birth • Pallor, haemangioma · Encourage participation Chart head circumference, Head and neck Timina Growth length, weight on centile ☑ Enlarged/bulging/sunken fontanelle · Initial exam immediately after birth status · Macro/microcephaly and any resuscitation ☑ Subgaleal haemorrhage · Full and detailed assessment · Head shape, size Caput, cephalhaematoma within 48 hours and always prior Scalp, fontanelles, sutures Fused sutures to discharge · Facial palsy/asymmetry on crying • Eye size, position structure • Follow-up 5-7 days and 6 weeks • Hazy, dull cornea; congenital cataract • If unwell/premature-stage as Head, face, • Nose, position, structure Absent red eye reflex clinically indicated neck Ear position, structure Mouth, palate, teeth, gums tongue, frenulum Pupils unequal/dilated/constricted **Review history** clinical judgement Purulent conjunctivitis/yellow sclera Maternal medical/obstetric/social ☑ Nasal obstruction Jaw size and family • Dacryocyst; cleft lip/palate · Current pregnancy Unresponsive to noise • Length, proportions, Labour and birth Shoulders, Absent ear canal or microtia • Sex, gestational age, Apgar arms, hands • Structure, number of digits Ear drainage scores and resuscitation Small receding chin/micrognathia exhaustive. Use · Since birth-medications, Neck masses, swelling, webbing observations, feeding • Size, shape, symmetry, Swelling over or fractured clavicle movement Environment-consider: Upper limbs Breast tissue, nipples · Warmth, lighting Chest · Limb hypotonia, contractures, palsy • Heart sounds, rate, pulses · Correct identification Palmar crease pattern · Breath sounds, resp rate ğ Infection control precautions Chest Pulse oximetry Privacy are ☑ Respiratory distress Equipment-prepare: ☑ Apnoeic episodes urgent follow-up Size, shape, symmetry · Abnormal HR, rhythm, regularity · Overhead warmer if required Stethoscope Palpate liver, spleen, · Heart murmurs Abdomen kidneys Ophthalmoscope ☑ Weak or absent pulses Umbilicus Tongue depressor & glove ☑ Positive pulse oximetry Abdomen Pencil torch investigation and/or • Male-penis, foreskin, • Tape measure, infant scales, ☑ Organomegaly testes ☑ Gastrochisis/exomphalos growth charts Female-clitoris, labia, ☑ Bilateral undescended testes Pulse oximeter Genitourinary hymen Documentation **☑** Bilious vomiting Anal position, patency o Infant Personal Health Record • Inguinal hernia · Passage of urine and stool o Medical record Signs of umbilical infection o Neonatal clinical pathway Genitourinary ndications for further ☑ No urine/meconium in 24 hours · Ortolani and Barlow's ☑ Ambiguous genitalia Hips, legs, manoeuvres Discharge ☑ Testicular torsion feet • Leg length, proportions, • Hypospadias, penile chordee symmetry and digits Review discharge criteria micropenis, hydrocele · Observations, feeding, output Hips, legs and feet • Vitamin K · Risk factors for hip dysplasia · Hepatitis B vaccination · Spinal column, skin • Positive/abnormal Barlow's and/or Discuss Back Symmetry of scapulae, Ortolani manoeuvres buttocks • If < 24 hours of age, when to seek · Contractures/hypotonia urgent medical assistance Talipes · Routine screening (e.g. hearing, · Developmental hip dysplasia Behaviour, posture NBST, pulse oximetry) **Back** Muscle tone, spontaneous • Childhood immunisation program Curvature of spine movements Neurological · Support agencies Non-intact spine Crv · Newborn care Tufts of hair/dimple along intact spine · Reflexes-Moro, suck, · Health promotion Neurological grasp Medications as indicated Weak/irritable/absent cry · Personal Health Record (red Absent/exaggerated reflexes Discuss findings with book) No response to consoling **Discuss** parents Referral and follow-up ☑ Seizures Document Document in health o Routine 5-7 days & 6 weeks ☑ Altered state of consciousness record(s) Refer

☐ Urgent follow-up; GP: general practitioner; HR: heart rate, NBST: newborn screening test, SUDI: sudden unexpected death in infancy, <: less than
</p>

Refer as indicated

Flowchart: F21.4-1-V6-R26

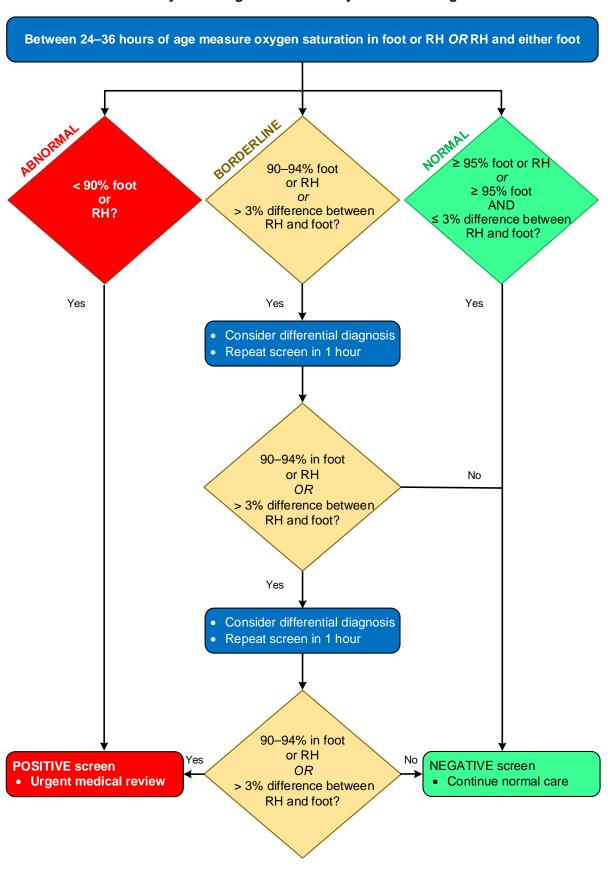
Flow Chart: Management of newborn baby during pulse oximetry screening for CCHD



CCHD: critical congenital heart disease; BP: blood pressure, bpm: beats per minute, CXR: chest X-ray, EOGBS: early lonset Group B Streptococcus, GP: general practitioner; HR: heart rate, min: minute, MO: medical officer, NNP: neonatal nurse practitioner, QCG: Queensland Clinical Guidelines, RSQ: Retrieval Services Queensland, SpO₂: oxygen saturation, >: greater than; ≥: greater than or equal to; <: less than; ≤ less than or equal to

Flowchart: F21.4-2-V1-R26

Flow Chart: Pulse oximetry screening of newborn baby for critical congenital heart disease



Flowchart: F21.4-4-V1-R26

RH: right hand, >: greater than; ≥:greater than or equal to; <: less than; ≤: less than or equal to

Flow Chart: Newborn bloodspot screening test

All babies At birth: · Complete screening card Completion: o Identification of baby Add relevant clinical o Identification of mother No information Repeat screening o Baby's UR number indicated? Complete baby's personal o Birth weight health record (red book) o Gestation Follow local procedures for dispatching screening card to Timing: laboratory Yes • Collect sample at 48-72 hours of age · If discharged from hospital Repeat screening: before 48 hours of age: • Repeat screen at appropriate o Discuss option for collection (e.g. by home visiting • Note reason for repeat on midwife, child health nurse) screening card **Feeding**—note on card: If 10% glucose note time · Type, date and time of first and date ceased milk feed • If not feeding (NBM) • If baby fed within last half hour Sampling technique: • Collect from most medial or lateral aspect on plantar surface of heel · Pain management Indication Time of repeat o Breastfeed/EBM during or immediately prior · Poor sample o Skin to skin with mother As soon as possible Incomplete/poorly applied o Face to face contact Swaddling • Baby received 10% glucose 48-72 hours after ceasing o Non-nutritive sucking infusion > 6 hours infusion o Administer sucrose 24% orally [refer to QCG: • Perinatal steroids (multiple NeoMedQ Sucrose] 7 days of age doses) • Baby < 1500 g BW • Monochorionic multiple birth 14 days of age (e.g. same sex twin) Blood transfusion in 1st 48–72 48 hours after transfusion and Collect sample prior 14 days later 24 hours after starting/resuming TPN milk feeds 28 days of age (third sample/ • Baby < 1000 g BW second repeat)

BW: birth weight; **QCG:** Queensland Clinical Guidelines; **TPN:** total parenteral nutrition; **UR:** unit record; **<:** less than; **>:** greater than; **≥:** greater than or equal to

Flowchart: F21.4-3-V1-R26

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Abbreviations

CCHD	Critical congenital heart disease
GP	General practitioner
NBST	Newborn bloodspot screening test
NEWT	Newborn early waring tool
SpO ₂	Peripheral oxygen saturation
SUDI	Sudden and unexpected death in infancy

Definitions

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; and incorporates the core concepts of respect and dignity, information and sharing, participation and collaboration. ^{1,2}
Newborn baby	A recently born infant in the first minutes to hours following birth. ³
Neonatal unit	In this document 'neonatal unit' may be interpreted to mean neonatal observation or stabilisation area, unit or equivalent as per local terminology.
Newborn baby assessment	In this document 'newborn baby 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 of age.
Urgent follow-up	Immediate and/or life-threatening health concern for the newborn requires urgent (same day) follow-up.
Positive screen	Means the screening test has detected an increased likelihood of having disease, anomaly or condition.

1 Introduction

Every newborn baby 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.⁴ A follow up assessment is required after hospital discharge at five to seven days (by a general practitioner (GP) or midwife), and then at 6 weeks of age. The physical examination is the most important screen for major occult congenital anomalies.

1.1 Clinical standards

Table 1. Clinical standards

Aspect	Consideration	
Model of care	 Adhere to the principles of family centred care when assessing the newborn baby [refer to Queensland Clinical Guideline: Standard care⁵] Perform the examination with at least one parent present⁴ Provide information to parents in a complete, unbiased and timely manner to support effective participation in their baby's care and any decision making 	
Clinician	 Develop local protocols regarding clinicians responsible for performing the newborn baby examination⁴ Develop local protocols for clinicians regarding: Training and skills maintenance in newborn baby assessment^{4,6,7} Recognising and managing variances, seeking guidance as required, and referring appropriately⁸ 	
Documentation	Complete the baby's Personal Health Record ('red book') Explain the booklet's purpose to the baby's parents	

2 Initial examination and assessment after birth

Complete the initial brief assessment immediately after birth on all babies following any resuscitation (if required). (Refer to Queensland Clinical Guideline: *Neonatal resuscitation*.

Table 2. Initial examination and assessment

Aspect	Consideration
Brief initial exam	 Assess the baby for⁴: Successful transition to extra-uterine life Any obvious dysmorphic features or gross anomalies that will require immediate attention or discussion with the family Confirm baby's sex⁴ Be flexible with the timing of this initial examination and assessment Do not restrict skin-to-skin contact and allow the healthy baby to spend time with their parents⁴
Hypoxic ischaemic encephalopathy	If the baby had a perinatal event and/or acidosis assess baby for therapeutic hypothermia criteria and management as indicated [refer to Queensland Clinical Guideline: Hypoxic-ischaemic encephalopathy9]
Newborn observations	 Commence newborn vigilance observations and document on appropriate newborn early warning (NEWT) tool¹⁰ (dependent on service level of facility as per Clinical Services Capability Framework)^{10,11} Assess, record and (if indicated) action baby's vital signs: Every 15 minutes for two hours following birth–colour, position (for airway patency), respiration rate and any respiratory distress Within 1 hour of birth–heart rate, temperature and oxygen saturation Every eight (after initial 2 hours following birth)–respiratory rate, respiratory distress, temperature, heart rate, colour If baby has signs of respiratory distress or has any oxygen requirement, monitor and record oxygen saturations Refer to NEWT¹² and Neonatal clinical pathway¹³
Hypoglycaemia	If baby has risk factor(s) for hypoglycaemia commence blood glucose monitoring [refer to Queensland Clinical Guideline: Hypoglycaemia-newborn] ¹⁴
Sub-galeal	 Risk of sub-galeal haemorrhage (SGH) is increased after an instrumental birth¹⁵ or as clinically indicated If attempted or actual instrumental birth or as clinically indicated refer to NEWT for scalp examination including: ¹⁶ Inspection and palpation of the scalp and nape of the neck Head circumference measurements If ballotable mass or free fluid in the scalp or nape of neck, or ear displacement–escalate care as a medical emergency If asymmetrical head, caput succedaneum, cephalhaematoma, new or increased bruising or abrasion–urgent follow up

3 Full and detailed newborn baby assessment

3.1 Principles of assessment

Table 3. Principles of assessment

Aspect	Consideration
Aspect	
Purpose	 Identify the baby who is acutely unwell and requires urgent treatment Review any concerns the family have about the baby and attempt to address them
	 Review any problems arising or suspected from antenatal screening, family history or labour (e.g. mental health issues, substance use, child protection issues, genetic conditions) Review weight, length and head circumference measurements Check the baby has passed urine and meconium since birth Recognise common neonatal problems and give advice to parents about management Diagnose congenital malformations and arrange appropriate management Discuss matters such as: Baby care and feeding
	 Refer to Queensland Clinical Guideline: Establishing breastfeeding¹⁷ Vitamin K Childhood immunisation schedule including where indicated Bacille Calmette-Guerin (BCG) vaccination Refer to the National Immunisation Program Schedule¹⁸ Reducing the risk of sudden unexpected death in infancy (SUDI) Any other matters relevant to the newborn baby⁴ Explain problems such as jaundice that might not be observable in the baby but may become significant a few days or weeks later Refer to Queensland Clinical Guideline Neonatal jaundice¹⁹ Convey information about local networks, services and access to members of a primary health care team [refer to Section 5 Discharge planning] Inform families how they can request and negotiate additional help, advice, and support as relevant to the circumstances
Timing	 The Royal Australian College of Physicians (RACP) recommends an initial full and detailed assessment is performed within the first 48 hours after birth⁴ If baby is discharged home within the first 8 hours after birth, complete full assessment prior to discharge even though this is not the optimal time to detect all abnormalities Advise parents that certain conditions may only become evident in the first
J	 few days after birth following discharge from hospital Provide parents with information about local health support services (e.g. Child Health Services) prior to discharge Recommend a follow-up assessment⁴ by general practitioner (GP) or midwife at 5–7 days of age Recommend a further assessment at around 6 weeks of age^{4,20}
Unwell and/or preterm baby	 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)

3.2 Preparation for the full and detailed newborn assessment

3.2.1 History

Table 4. History

Aspect	Clinical assessment
Maternal history ²⁰	 Review medical, obstetric, social and family history, including: Maternal age, social background, mental health history, Edinburgh Postnatal Depression Score (EDPS), intimate partner violence, child safety alerts Chronic maternal disease and associated treatments (e.g. vitamin D deficiency, hypothyroidism) during pregnancy Substance use including prescription and non-prescription medications, alcohol and/or tobacco Refer to Queensland Clinical Guideline: Perinatal substance use: neonatal and Perinatal substance use: maternal²¹ Previous pregnancies including complications and outcomes (e.g. neonatal jaundice, ABO incompatibility, developmental dysplasia of the hips, genetic conditions, baby Group B Streptococcus positive [refer to Queensland Clinical Guideline: Early onset group B Streptococcal disease¹⁷)
Current pregnancy ²⁰	 Results of pregnancy screening tests (e.g. blood group and type, serology, ultrasound scans) Chorionicity if twin pregnancy Any other diagnostic procedures (e.g. amniocentesis) Maternal ill health with any non-specific illnesses Complications such a gestational diabetes mellitus or hypertension [refer to Queensland Clinical Guideline: Gestational diabetes mellitus²² and Hypertension and pregnancy]²³
Labour and birth ²⁰	 Progression of labour (e.g. onset, duration, interventions during labour, duration of rupture of membranes, maternal temperature, third stage) Evidence of abnormal fetal status in labour (e.g. cord blood gases, lactate, meconium liquor) [refer to Queensland Clinical Guideline: Intrapartum fetal surveillance]¹⁴ Maternal drugs in labour (e.g. antibiotics) Presentation and mode of birth Apgar scores and resuscitation at birth Medication since birth (e.g. vitamin K, hepatitis B immunoglobulin/vaccine, antibiotics)
Gestational age ²⁴	 If discrepancy with known maternal dates perform a formal gestational age assessment⁴
Observations since birth ²⁰	 Initial observations and NEWT¹² Axillary temperature Weight Urine/meconium Relevant tool to assess substance withdrawal (if relevant) [refer to Queensland Clinical Guideline: Perinatal substance use: neonatal]⁹
Feeding since birth ²⁰	 Mode of feeding Suck behaviour Feeding since birth Refer to Queensland Clinical Guideline: Establishing breastfeeding¹⁷

3.2.2 Assessment preparation

Table 5. Assessment preparation

Aspect	Clinical assessment	
Explanation	 Explain the purpose, procedure and limitations of the assessment Ask the baby's name and confirm sex Ask about any concerns and provide opportunity for questions and answers Discuss feeding choice and progress Explain normal weight loss after birth (1–2% of body weight per day up to maximum 10% weight loss at day 5) Provide further information as required 	
Environment ²⁵	Ensure adequate warmth and lighting Ensure privacy for discussion about sensitive family/health issues ²⁶	
Equipment ²⁵	 Ensure privacy for discussion about sensitive family/health issues²⁶ Overhead warmer if required Stethoscope Ophthalmoscope Pencil torch Tongue depressor and glove Tape measure Infant scales and growth charts If indicated, bilirubinometer and jaundice nomograms [refer to Queensland Clinical Guideline: Neonatal jaundice¹⁹ Baby's Personal Health Record ('red book') 	

3.3 Physical examination

Use a systematic approach to examine the baby where possible. A recommended systematic approach is 'head to toe' and 'front to back'. Undress the baby down to the nappy as it is not possible to fully examine a dressed baby for all abnormalities. Assess the baby when they are quiet and settled, and do not interrupt breastfeeding.²⁰

Table 6 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 7. Suggested follow-up actions].

Table 6. Newborn baby examination

Aspect	Clinical assessment	Indications for further investigation ☑ Urgent follow-up
General appearance ^{20,24,27}	 While the baby is quiet, alert, not hungry or crying observe: Skin colour/warmth/perfusion Alert/responsive state Activity Range of spontaneous movement Posture Muscle tone 	Dysmorphic features
Growth status and feeding ^{20,24,28}	Document on the age and sex appropriate percentile charts: Weight Length Head circumference	 Less than 10th percentile or greater than 90th percentile Excessive weight loss (more than 10 % of birth weight)
Skin ^{20,27,28}	 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 baby 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 ^{20,24}	 Shape and symmetry Scalp Anterior and posterior fontanelle Sutures Scalp lesions/swelling/bruising/ lacerations 	 Syndrolle Enlarged, bulging or sunken fontanelle Microcephaly (less than 2nd percentile)/macrocephaly (greater than 98th percentile) Subgaleal haemorrhage Caput/cephalhaematoma (consider potential for developing jaundice) Fused sutures

Table 7. Newborn baby examination continued

Aspect	Clinical assessment	Indications for further investigation
	Comments of the state of the	☑ Urgent follow-up
	Symmetry of structure, features and movement	Asymmetry on crying
	 Eyes Size and structure Position in relation to the nasal bridge Red reflex 	 Hazy, dull cornea Absent red reflex Unequal, dilated or constricted pupils Purulent conjunctivitis Yellow sclera Congenital cataracts
	Nose Position and symmetry of the nares and septum	 Nasal flaring Nasal obstruction especially if bilateral Dacryocyst
Face ^{20,24}	 Mouth Size, symmetry and movement Shape and structure Gums and teeth (if present) Lips Palate (hard and soft) Tongue and frenulum 	Cleft lip and/or palateMouth drooping
	Ears Position Structure including patency of the external auditory meatus Well-formed cartilage	Unresponsive to noise Absent external auditory canal or microtia Drainage from ear
	Jaw size and shape	Small receding chin or micrognathia (e.g. Pierre Robin syndrome)
Neck ^{20,24,28}	Structure and symmetryRange of movementThyroid gland 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 ^{20,24,27,28}	Chest Chest size, shape and symmetry Breast tissue Number and position of nipples Respiratory Chest movement and effort with respiration Respiratory rate Breath sounds Cardiac Pulses—brachial and femoral Skin colour/perfusion Heart rate Heart rhythm Heart sounds Pulse oximetry	 Small, malformed or asymmetry Widely spaced nipples (e.g. Turner's syndrome) ✓ Signs of respiratory distress ✓ Apnoeic episodes Variations in rate, rhythm or regularity Murmurs Central cyanosis/mottling ✓ Weak or absent pulses ✓ Positive pulse oximetry screen

Table 7. Newborn baby examination continued

Aspect	Clinical assessment	Indications for further investigation ☑ Urgent follow-up
Abdomen ^{20,27,28}	 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 Erythema or swelling at base of umbilicus onto anterior abdominal wall
Genitourinary ^{20,27,28}	Urine passed including colour and amount Male genitalia Penis including foreskin Testes (confirm present bilaterally and position of testes) including any discolouration Scrotal size and colour Other masses such as hydrocele Female genitalia (discuss pseudomenses) Clitoris Labia 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 ^{20,27,28}	Meconium passedAnal positionAnal patency	✓ No meconium passed within 24 hours
Hips, legs and feet ^{20,27,28}	Use Barlow and Ortolani manoeuvres to examine hips A firm surface is necessary Assess legs and feet for Length Proportions Symmetry Structure and number of digits	 Risk factors for hip dysplasia: breech presentation, fixed talipes, fixed flexion deformity, asymmetrical buttock creases, severe oligohydramnios, first degree relative with developmental hip dysplasia Positive Barlow and/or Ortolani test Hypotonia/contractures Positional talipes
Back ^{20,27,28}	Spinal column Scapulae and buttocks for symmetry Skin	 Curvature of spine Non-intact spine Tufts of hair or dimple along intact spine Sacral pit without visible intact base
Neurologic ^{20,27,28}	Observe throughout: Behaviour Posture Muscle tone Movements Cry Examine reflexes Moro Suck Grasp	 Weak, irritable, high pitched cry No cry Does not respond to consoling Absent/exaggerated reflexes Seizures Altered state of consciousness

3.4 Isolated abnormalities

The following anomalies 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 on one hand
- · 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
- Slate grey naevi/congenital dermal melanocytosis (Mongolian spot)
- · Single ash leaf macule
- Third fontanelle
- · Capillary haemangioma apart from those described in table above
- Accessory nipples

4 Consultation and follow-up

Use clinical judgement to determine the appropriate urgency of follow-up in the context of abnormal or suspicious findings arising from a newborn baby assessment. If there is uncertainty about the urgency of follow-up seek advice from a more senior clinician.

Table 7. Suggested follow-up actions

Category	Follow-up action	
✓ Urgent Immediate and/or life-threatening health concern for the newborn baby	 Arrange same day (as soon as possible) medical review If baby is already discharged from hospital arrange review by either: Hospital emergency department GP Paediatrician Neonatologist Advise parents/family of clinical concerns and the importance of immediate review Provide verbal/written information as appropriate Consider parental support needs (e.g. social work involvement, transport requirements) 	
Follow-up Existing and/or potential health concern for the newborn baby	 Determine the urgency of the follow-up required Consider the need for: Consultation with senior practitioners (e.g. review of baby, telephone consultation about findings, telehealth consultation) Additional immediate investigation(s) (e.g. blood test) Referral for specialist review (e.g. cardiology) Re-assessment or recheck at 6 week assessment (or sooner as indicated) 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 Provide verbal/written information as appropriate Consider parental support needs (e.g. social work involvement, transport requirements) 	

5 Discharge planning

Evaluate each mother-baby dyad individually and involve the family when determining optimal time of discharge. Criteria for newborn baby discharge include physiological stability, family preparedness to provide care for the baby at home, availability of social support, and access to the health care system and community resources.²⁹

5.1 Screening newborn baby

Table 8. Screening newborn baby

Aspect	Consideration
Context	 Explain to baby's parents the importance, and how to access screening of the newborn baby If possible complete all screening before discharge Organise repeat screening and/or follow up as required
Hearing ³⁰	 Healthy hearing screening is performed in the birthing hospital prior to discharge May be provided as outpatient up to 3 months of age³⁰ Refer to local protocols
Jaundice	 Consider checking TcB (transcutaneous bilirubin) prior to discharge Follow local protocols Refer to Queensland Clinical Guideline: Neonatal jaundice¹⁹
CCHD	Refer to Table 9. Pulse oximetry screening
Newborn bloodspot screening test (NBST) ^{31,32}	 Screens for galactosaemia, phenylketonuria, primary hypothyroidism, congenital adrenal hyperplasia, cystic fibrosis and a range of rare disorders of amino acid, organic acid and fatty acid metabolism Collect sample by heel prick to medial or lateral plantar aspect of heel or lf collected from infusion line (e.g. umbilical catheter) repeat screening is usually required33 First test collected at 48–72 hours of age and then if: Baby has received 10% glucose intravenous infusion repeat 48 hours after infusion is ceased Perinatal steroids (multiple doses), repeat at 7 days Monochorionic multiple birth (e.g. same sex twins), repeat in 2 weeks, and maintain an index of suspicion for congenital hypothyroidism31 Birthweight 1000–1500 gram repeat at 14 days of age Birth weight less than 1000 gram repeat at 14 and at 28 days of age Blood transfusion is required collect sample prior to commencing, and repeat 48 hours and 14 days later Total parental nutrition (TPN) administered, repeat 24 hours after resuming/commencing milk feeds If baby is discharged before 48 hours of age discuss collection options with parents Complete all documentation on screening card including relevant clinical information, feeding status of baby and reason for repeat screening (if required) Repeat collection is also required for unsatisfactory sample Advise parents of results notification process in Queensland Refer to Queensland Health Pathology information31

5.2 Pulse oximetry screening

The Queensland Maternal and Perinatal Quality Council recommends all newborn babies are offered pulse oximetry screening for critical congenital heart disease (CCHD).³⁴ Optimal detection of CCHD occurs when pulse oximetry screening is used in conjunction with an antenatal ultrasound and a physical examination of the baby.³⁵

Table 9. Pulse oximetry screening

Aspect	Consideration
Context	 Congenital heart disease (CHD) occurs in nearly 1% of live births, approximately one quarter of these will be CCHD³⁶ If CCHD is undetected newborn babies are at risk for death in the first few days or weeks of life³⁶ Pulse oximetry: Non-invasive screening technology to assist in detecting hypoxemia, a clinical sign of critical congenital heart disease (CCHD)^{20,29} Can detect some CCHD that would otherwise be missed on routine examination or antenatal ultrasound Can also identify non-cardiac problems such as sepsis and respiratory problems, and these are common causes of a positive screen Cochrane Review³⁷ found pulse oximetry:
Target population	All healthy term and late preterm newborn babies ³⁵
Equipment	Motion tolerant pulse oximeterNeonatal oxygen saturation sensor
Timing	 Screen between 24 and 36 hours of age as³⁵: Prior to 24 hours of age is likely to result in increased false positive result³⁶ or After 48 hours delays early intervention if required If baby is less than 24 hours of age at time of discharge, screen immediately prior Consider screening by home visiting midwife³⁸
Protocol	 Ensure baby has been fed and is settled Site the sensor and then connect to motion-tolerant monitor(s)³⁹: Site either: On either foot^{36,37} (postductal) or Right hand (pre-ductal) and either foot (postductal) Keep sensor(s) insitu until a steady trace is obtained³⁹ then remove (usually less than one minute) Document-highest oxygen saturation result during the screen and if used difference between sites

5.2.1 Pulse oximetry results

Table 10. Pulse oximetry results

Aspect	Consideration
Saturation greater than or equal to 95% (normal)	 Negative pulse oximetry screen—maximum oxygen saturation: Greater than or equal to 95% on either foot or right hand, and a difference between right hand and either foot less than or equal to 3%³⁵ Baby suitable for discharge (in accordance with other discharge criteria)
Saturation 90–94%	 Borderline pulse oximetry screen—maximum oxygen saturation: 90–94% on either foot³⁹ or 90–94% right hand and/or a difference between right hand and either foot greater than 3%³⁵ Medical review indicated ^{24,39} Consider investigation of other causes including respiratory/vascular problems (e.g. sepsis, respiratory distress syndrome, lung malformations, persistent pulmonary hypertension of the newborn)—monitor as indicated Repeat screen in one hour³⁹ Consider using different oximeter) If oxygen saturations remain borderline repeat the screen in in one hour Consider right hand and either foot simultaneously If repeat screen abnormal, specialist medical review indicated: Delay discharge and admit to neonatal unit Consider chest X-ray and four limb blood pressure Consider referral for echocardiography²⁴ Contact RSQ for advice from a neonatologist or paediatric cardiologist
Saturation less than 90% (abnormal)	 Positive pulse oximetry screen: maximum oxygen saturation during recording is less than 90%³⁹ on either foot or right hand³⁵ Admit to neonatal unit–requires urgent specialist medical review Consider chest X-ray and four limb blood pressure Commence close clinical surveillance (e.g. continuous monitoring including oximetry) Investigate for neonatal sepsis Refer to Queensland Clinical Guideline: Early onset Group B Streptococcal disease⁴⁰ Consider investigations for CCHD including an echocardiogram^{36,39} Consider investigation of other causes including respiratory/vascular problems (e.g. respiratory distress syndrome, lung malformations, persistent pulmonary hypertension of the newborn)^{36,41} Contact RSQ for advice from a neonatologist or paediatric cardiologist

5.3 Discharge preparation

Table 11. Discharge preparation

Aspect	Considerations
Discharge criteria	Review the baby's status prior to discharge including ¹³ : Feeding–suck feeding adequately Newborn baby observations–temperature maintenance, respiratory rate, BGL (if measured), weight Urine and stool passage Completion of newborn baby assessment Vitamin K status–if required give script and education for further oral vitamin K Hepatitis B vaccination (and if indicated, hepatitis B immunoglobulin) administered–advise parents about next dose due
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 baby: Has not passed meconium within 24 hours of birth Appears jaundiced within first 24 hours after birth Has elevated temperature Vomiting Difficulty feeding Lethargic Has decreased urine output or stools Respiratory signs Rash Provide relevant Queensland Clinical Guidelines consumer information sheets (e.g. breastfeeding, jaundice) Advise parents about the importance of follow-up assessments at:
Referral and follow-up	 Five to seven days of age Six weeks of age Arrange referral for a newborn baby and/or family with identified problems Document arrangements and inform family If required provide scripts or medication (e.g. vitamin D) for use after discharge Provide discharge information to the GP
Documentation	 Plot anthropometric parameters on growth charts Complete the baby's Personal Health Record booklet Ensure relevant sections complete before discharge 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
Support agencies	 Provide information on the role of and how to access relevant support agencies (including but not limited to): Child health service GP Child/community Health/health worker Midwife (e.g. home visiting, drop-in clinics, group practice, eligible or private) Lactation consultant Australian Breastfeeding Association 13HEALTH (13 43 25 84) telephone help line Psychological support agencies (e.g. perinatal mental health services; PANDA; groups for fathers)

5.4 Health promotion

Discuss relevant parenting and health education topics with parents/carers prior to discharge, 8,29 and provide relevant Queensland Clinical Guidelines parent information sheets.

Table 12. Health promotion

Newborn baby care	 Hygiene Bathing Eye and mouth care Umbilical cord care Nappy changing including skin care Feeding Feeding cues and behaviour Promote and support breastfeeding Refer to Queensland Clinical Guideline: Establishing breastfeeding¹⁷ Growth and weight gain Sleep patterns Normal bowel and urine patterns Detection and management of jaundice [refer to Queensland Clinical Guideline: Jaundice—newborn]¹⁹ Sun protection⁴² Prevention of hypothermia and hyperthermia
Warning signs of illness ⁴³	Discuss and advise when to seek medical help, e.g.: Raised temperature Poor feeding Vomiting Irritability, lethargy Decreased urine or stools Jaundice Respiratory signs Rash
SUDI ⁴⁴	 Provide written information about safe infant care to reduce the risk of sudden unexpected death in pregnancy (SUDI) Discuss safe positioning of baby during breastfeeding Discuss safe sleeping: Positioning and settling Swaddling Sharing sleep surfaces Appropriate clothing Risks from smoking–provide advice about smoking cessation
Injury prevention	 Car capsule to transport baby Pram safety Reducing home hazards Hip healthy swaddling and use of slings⁴⁵
Immunisation schedule	 Provide information about childhood immunisation program Refer parents to baby's Personal Health Record ('red book')

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Working Party Clinical Lead

Dr Peter Schmidt, Director of Neonatology, Gold Coast University Hospital Ms Rhonda Taylor, Clinical Midwifery Consultant, Townsville University Hospital

QCG Program Officer

Ms Stephanie Sutherns

Peer Review Panel

Ms Seija Argyros, Neonatal Nurse Practitioner, Royal Brisbane and Women's Hospital

Ms Maxine Ballinger, Clinical Nurse Consultant, Rockhampton Hospital

Ms Anne Bousfield, Clinical Midwifery Consultant, South West Hospital and Health Service

Ms Lynne Buetow, Nurse Educator, Royal Brisbane and Women's Hospital

Ms Carole Dodd, Midwifery Educator, Caboolture Hospital

Dr Timothy Donovan, Neonatologist, Royal Brisbane and Women's Hospital

Dr Christopher Edwards, Paediatrician. Bundaberg Hospital

Dr Shivanand Hebbandi Paediatrician, Redlands Hospital

Dr Bruce Maybloom, General Practitioner, Brisbane

Dr Benjamin Reeves, Paediatric Cardiologist, Cairns Hospital

Ms Alecia Staines, Consumer Representative, Maternity Consumer Network

Ms Elizabeth Taylor, A/Midwifery Educator, Townsville University Hospital

Queensland Clinical Guidelines Team

Professor Rebecca Kimble, Director

Ms Jacinta Lee, Manager

Ms Stephanie Sutherns, Clinical Nurse Consultant

Ms Cara Cox, Clinical Nurse Consultant

Ms Emily Holmes, Clinical Nurse Consultant

Ms Janene Rattray, Clinical Nurse Consultant

Steering Committee

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