

Neonatal services

CSCD v3.2

Module overview

Please note: This module must be read in conjunction with the Fundamentals of the Framework (including glossary and acronym list).

The neonatal period is generally defined as the first 28 days of an infant's life. However, infants may be cared for in a neonatal service for more than 28 days, depending on the time frame from birth to discharge.

A neonatal service can provide a range of care from well infant care to highly specialised care. This includes care for sick, low birth weight and/or premature infants, and/or infants born with congenital conditions or other conditions compromising their health and survival. Regardless of the level of neonatal service provided, it is essential neonatal staff are skilled in neonatal resuscitation, stabilisation and examination.

Maternal health directly affects the physical and psychological health of the baby, and continues to affect their health during the childhood and adult years. Therefore, high-quality neonatal services should be integrated into a continuum of care with maternal and child health services.

Neonatal care is provided across six service levels. Neonatal services at Levels 1, 2 and 3 primarily care for well infants. Infants who need intensive medical attention and specialised diagnosis and treatment are admitted into a special care neonatal service at Levels 4, 5 and 6—the level required depends on the infant's gestational age, risk factors and level of clinical care required. Health services at Levels 4 and 5 provide neonatal care as an integral component of general children's services. At Level 6, neonatal paediatric specialist staff deliver complex care to infants.

Specialised neonatal services may provide:

- antenatal consultation and planned management of birth with maternal fetal medicine (MFM) services where neonatal illness / abnormality is expected
- consultation and assessment of infants post-birth (including well newborn assessment)
- specialised transport services for infants requiring special or intensive care
- follow-up and ongoing care after discharge from the neonatal service.

Distance and other geographical implications, as well as social isolation, are important considerations in managing neonatal and maternity services in Queensland.¹ Best practice evidence states mothers and infants should not be forced to travel beyond their nearest

referral centre (or centres, if they are more or less equidistant), and higher level services should not transfer their own high-risk mothers and infants.² Furthermore, infants born outside of the expected gestational age and weight for the level of service capability may, based on clinical decision-making, be managed safely at the local level. These decisions however, will not be made in isolation. The advice of staff within a higher level service will be sought and will help to guide the risk management strategy of the service.

The general support service requirements for neonatal services include:

- access to child health services and Child Safety Services in the Department of Communities, Child Safety and Disabilities Services, and early interventional services
- access to child health and child immunisation schedules
- access to hearing screening facilities and assessment.^{3,4}

Where clinical management is considered beyond the capability of a service, care will be managed in consultation with a higher level neonatal service. The following clinical situations may indicate a higher level of care is required:

- an Apgar score of 6 or less at 5 minutes
- birth weight less than 2000 grams
- evidence of respiratory distress / recurrent apnoea
- persistent hypothermia
- neonatal hypoglycaemia
- major congenital anomaly requiring specialist care and/or surgery (e.g. gastroschisis)
- suspected congenital heart disease
- convulsions
- jaundice and appears in need of exchange transfusion
- bleeding from any site
- need for special diagnostic and/or therapeutic services.

Additionally, each service providing neonatal care must assess the environment and ensure a dedicated and secure area is available, consistent with the neonate's clinical and safety needs.

Service networks

In addition to what is outlined in the Fundamentals of the Framework, specific service network requirements include:

- established maternity policies and infrastructure (including stabilisation, transfer and back-transfer)
- consultation with the referring and receiving multidisciplinary team when infants, who no longer require intensive care services (neonatal intensive care unit / paediatric intensive care unit), are transferred back to a service near to their home.⁵

Note: The literature suggests among infants who require neonatal intensive care, mortality is significantly greater for those who are transferred post-birth than for those who are

transferred in utero. Therefore, if possible, birth of a high-risk infant should be planned to occur in a hospital with a neonatal service capable of providing the anticipated higher level of care. If birth in a facility without the necessary capabilities cannot be avoided, the infant should be stabilised and transferred to a higher level of care within the service network—one with the required capabilities to ensure the infant's optimal outcome.⁶

Service requirements

In addition to the requirements outlined in the Fundamentals of the Framework, specific service requirements include:

- provide relevant clinical indicator data to satisfy accreditation and other statutory reporting obligations.

Workforce requirements

In addition to what is outlined in the Fundamentals of the Framework, specific workforce requirements include:

- all neonatal clinical staff in non-birthing facilities must attend education on imminent birth, preferably conducted by a midwife
- in addition to site-specific requirements, staff providing neonatal services must complete child safety training and breastfeeding competency annually (as appropriate)
- clinical staff participate in neonatal resuscitation training (with re-training at least every 2 years)
- clinical staff trained in neonatal basic life support.

Neonatal services

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Service description	<ul style="list-style-type: none"> provides care for healthy infants greater than or equal to 37 weeks gestational age. emphasis is on parenting, bonding, and support for feeding and lactation. care predominantly provided by registered nurses and/or midwives in community settings or home-based care. has capability to provide basic life support for infants and can stabilise infants 	<ul style="list-style-type: none"> primarily provides planned care for healthy infants greater than or equal to 37 weeks gestational age. has capability to retain and/or accept infants of less than 37 weeks gestational age who are physiologically stable and feeding well. care of infants of less than 35 weeks gestational age must always occur in consultation with higher level of service. may be limited birthing 	<ul style="list-style-type: none"> provides planned care for healthy infants greater than or equal to 37 weeks gestational age. has capability to retain and/or accept infants of 35 to 37 weeks gestational age who are physiologically stable. care of infants less than 35 weeks gestational age must always occur in consultation with higher level of service. 	<ul style="list-style-type: none"> where continuous positive airway pressure (CPAP) device accessible on-site and adequately trained staff in sufficient numbers to care for baby on CPAP, capability to plan and deliver care to infants greater than or equal to 32 weeks gestational age, or who have estimated birth weight of greater than or equal to 1500g, with no additional risk factors (if born at that hospital). where CPAP not on-site, has 	<ul style="list-style-type: none"> capability to plan and deliver care for infants born at hospital or back-transferred from higher level service who are greater than or equal to 29 weeks gestational age with estimated birth weight of more than 1000 grams. where unplanned births of infants at less than 29 weeks gestational age and/or with birth weight less than 1000 grams occur, care must be provided in consultation 	<ul style="list-style-type: none"> provides highest level of care to infants. Has personnel and equipment to provide continuous life support and comprehensive multidisciplinary care for extremely high-risk newborns and those with complex and critical illnesses. may perform neonatal surgery. multidisciplinary follow-up programs provided for very premature infants and, where required, access to multidisciplinary early developmental

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	<p>requiring transfer to higher level of service.</p> <ul style="list-style-type: none"> transfer can be achieved via mechanisms such as Retrieval Services Queensland (RSQ). documented processes for referral to/from higher level services within relevant neonatal service network. 	<p>services available (refer to Maternity Services module).</p>		<p>capability to plan and deliver care for infants greater than or equal to 34 weeks gestational age.</p> <ul style="list-style-type: none"> may accept back-transfer of infants of any weight or gestational age from a Level 5 or 6 service once infants considered suitably stable for such transfer by higher level unit. where unplanned births of infants of less than 32 weeks gestational age and/or infants with birth weight less than 1500 grams occur, care must be provided in 	<p>with Level 6 neonatal service.</p> <ul style="list-style-type: none"> no neonatal surgery provided at this level. 	<p>programs provided.</p> <ul style="list-style-type: none"> provides education links to lower level services, as required, and has documented processes, within relevant neonatal service network, with lower levels of neonatal services to support patient transfer and care. also provides educational support to less comprehensive neonatal services. plays strategic role in planning of clinical statewide services related to perinatal care, and participates in perinatal morbidity and mortality

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
				consultation with Level 5 or 6 neonatal service. <ul style="list-style-type: none"> admissions reported according to registration criteria of Australian and New Zealand Neonatal Network (ANZNN). documented plans with public or licensed private health facilities to support patient referral and transfer to/from higher and lower level services. 		meetings within service network.
Service requirements	As per module overview, plus: <ul style="list-style-type: none"> education and support for parenting, bonding, 	As per Level 1, plus: <ul style="list-style-type: none"> access to clinician trained in undertaking complete infant 	As per Level 2, plus: <ul style="list-style-type: none"> for all births, at least one clinician accessible exclusively for 	As per Level 3, plus: <ul style="list-style-type: none"> all infants admitted to unit referred to registered medical 	As per Level 4, plus: <ul style="list-style-type: none"> minimum eight cots in nursery. manages expected short- 	As per Level 5, plus: <ul style="list-style-type: none"> supports infants of high-risk pregnancies.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	<p>feeding and lactation.</p> <ul style="list-style-type: none"> written information for parent/s using community and child health supports. breastfeeding advice and support consistent with Baby Friendly Health Initiative (BFHI). blood collection for neonatal screening. arrangements made for bilirubin testing and glucose testing. documented processes with Retrieval Services Queensland (RSQ), Royal 	<p>examination within 72 hours of birth.</p> <ul style="list-style-type: none"> adherence to patient identification policies, including use of infant identification mechanisms. consultation with higher level service for infants requiring phototherapy. provision for one nasogastric / orogastric tube feed; if more than one tube feed needed, in consultation with higher level service. neonatal bilirubin result accessible within 12 hours. 	<p>neonatal resuscitation (refer to Maternity Services module).</p> <ul style="list-style-type: none"> initiates and maintains intravenous therapy. provides phototherapy. provides controlled oxygen therapy in consultation with higher level of service. provides more than one nasogastric / orogastric tube feed in consultation with higher level of service. full blood count and blood group result 	<p>specialist with credentials in paediatrics credentialed to provide clinical neonatal care in the facility.</p> <ul style="list-style-type: none"> commences mechanical ventilation in consultation with higher level neonatal service pending transfer to Level 5 or 6 service. maintains minimum nurse-patient ratio of 1:1 for mechanically ventilated infants being managed for transfer. gives artificial surfactant, when required. inserts and manages umbilical 	<p>term mechanical ventilation (48–72 hours) in consultation with Level 6 service.</p> <ul style="list-style-type: none"> provides emergency exchange transfusion in consultation with Level 6 service. provides parenteral nutrition under supervision and in daily consultation and review with Level 6 service. access to arterial blood gas results within 30 minutes, full blood count results within 2 hours, and neonatal bilirubin results 	<ul style="list-style-type: none"> has close links with MFM services. provides services for all aspects of neonatal care, including intensive care for critically ill infants, ventilation, total parenteral nutrition, and care for complex conditions. ready access to clinical and diagnostic children's subspecialties. blood gas machine or other point-of-care laboratory equipment accessible within nursery area capable of instantly measuring blood gases,

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	<p>Flying Doctor Service (RFDS), Flying Obstetric and Gynaecology (FOG) Services, and Queensland Ambulance Service (QAS), utilised according to patient location.</p> <ul style="list-style-type: none"> access to children's specialty services for advice / referral. access to routine healthy hearing screening and diagnostic audiology services. 	<ul style="list-style-type: none"> bedside blood glucose testing. pulse oximetry, Isolette® (incubator) and/or Resuscitaire® and resuscitation equipment. Neopuff™ or similar equipment for short-term ventilation of infants awaiting transfer to higher level of service. completion of Queensland Perinatal Data Collection Form (MR63d) or electronic equivalent under Health Act 1937–1988 (Division 12– 	<p>accessible within 24 hours.</p> <ul style="list-style-type: none"> collects blood cultures. mobile chest / abdomen x-ray capability. 	<p>arterial and venous catheters.</p> <ul style="list-style-type: none"> accepts and cares for stable infants currently less than 32 weeks gestational age or 1500 grams after transfer from higher level of service. accepts and cares for infants greater than or equal to 32 weeks gestational age or 1500 grams after transfer from lower level facility, only after discussion occurred with neonatal clinical coordinator (must have CPAP on-site). arterial blood gas results 	<p>within 60 minutes, in normal circumstances.</p> <ul style="list-style-type: none"> on-site access—24 hours—to cranial ultrasonography. links with neonatal ophthalmology services. 	<p>electrolytes, bilirubin and haemoglobin.</p> <ul style="list-style-type: none"> emergency access to x-rays and high-level imaging services within 10 minutes, in normal circumstances. on-site access—24 hour/s—to neonatal echocardiography or clinician performed cardiac ultrasound. provides consultation and leadership for emergency neonatal transport. participates in perinatal mortality and morbidity meetings, engaging and

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		Perinatal Statistics). <ul style="list-style-type: none"> • neonatal service review and audit for all patient transfers. • audit in event of perinatal mortality and morbidity in consultation with higher level service. • audit of perinatal mortality in accordance with Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Death Classifications. 		accessible within 30 minutes and electrolyte results, full blood count and blood group test results within 4 hours. <ul style="list-style-type: none"> • capacity for heart rate and blood pressure monitoring. • access to cranial ultrasonography. • provides reports to ANZNN. 		including lower level services within neonatal service network.
Workforce requirements	As per module overview, plus: Medical	As per Level 1, plus: <ul style="list-style-type: none"> • staff trained in basic life support for 	As per Level 2, plus: Nursing <ul style="list-style-type: none"> • on-site 24 hour/s suitably 	As per Level 3, plus: Medical <ul style="list-style-type: none"> • registered medical 	As per Level 4, plus: <ul style="list-style-type: none"> • on-site 24 hour/s registered 	As per Level 5, plus: <ul style="list-style-type: none"> • on-site 24 hour/s at least one registered

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	<ul style="list-style-type: none"> access to registered medical practitioner/s. <p>Nursing</p> <ul style="list-style-type: none"> access to suitably qualified and experienced nursing staff appropriate to service being provided. <p>Allied health</p> <ul style="list-style-type: none"> access to allied health services, including dietetics, occupational therapy, physiotherapy, social work and speech pathology within local areas, via referral from midwife, nurse and/or general practitioner, or 	<p>infants and can stabilise those who require transfer to higher level of service.</p> <p>Medical</p> <ul style="list-style-type: none"> access—24 hours—to registered medical practitioner able to attend within 30 minutes in normal circumstances. <p>Nursing</p> <ul style="list-style-type: none"> access—24 hour/s—to suitably qualified and experienced nursing staff appropriate to service being provided. <p>Other</p>	<p>qualified and experienced nursing staff.</p> <p>Other</p> <ul style="list-style-type: none"> access to outreach, community- or hospital-based pastoral care workers. 	<p>practitioner with experience in paediatrics accessible to attend within 5 minutes (in normal circumstances) when infant unstable or mechanically ventilated.</p> <ul style="list-style-type: none"> lead clinician with responsibility for clinical governance of neonatal service. registered medical specialist (specialist paediatrician) to provide neonatal care accessible 24 hour/s and able to attend within 30 minutes, in normal circumstances. 	<p>medical practitioner or neonatal nurse practitioner.</p> <p>Medical</p> <ul style="list-style-type: none"> nominated lead clinician responsible for clinical governance of neonatal services who is registered medical specialist paediatrician with credentials in neonatology. <p>Nursing</p> <ul style="list-style-type: none"> suitably qualified and experienced nurse manager (however titled) for neonatal service. suitably qualified and experienced nursing staff in 	<p>medical practitioner with experience in paediatrics and/or neonatal nurse practitioner and whose duties solely dedicated to provision of neonatal services.</p> <p>Medical</p> <ul style="list-style-type: none"> nominated full-time lead clinician responsible for clinical governance of neonatology service, who is registered medical specialist paediatrician with credentials in neonatology. registered medical specialist paediatrician with credentials in neonatology on-site during

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	<p>from visiting or outreach service.</p> <p>Other</p> <ul style="list-style-type: none"> Aboriginal and Torres Strait Islander health workers as required who have undertaken neonatal resuscitation training. access or links to Aboriginal and Torres Strait Islander liaison officer as required. access to pastoral care. 	<ul style="list-style-type: none"> access to biomedical support for equipment maintenance. 		<p>Nursing</p> <ul style="list-style-type: none"> suitably qualified and experienced registered nurse (however titled) in charge of neonatal unit. minimum two suitably qualified and experienced nursing staff or combination on duty at any one time in neonatal unit when it is occupied exclusively by infants needing Level 4 care, or delegated second nursing staff member accessible to attend immediately (when neonatal unit is jointly located with 	<p>charge of each shift.</p> <ul style="list-style-type: none"> minimum two suitably qualified and experienced nursing staff at any one time on neonatal unit. at least one suitably qualified and experienced nursing staff member for every 2 ventilated neonates or other clinical interventions and close observation. ideally majority of nursing staff involved in caring for infants working towards post-graduate neonatal qualifications. 	<p>business hours and accessible after hours.</p> <p>Other</p> <ul style="list-style-type: none"> access to genetics counsellor. may have acute care scientist or similar for the service.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
				<p>another maternity ward).</p> <p>Allied health</p> <ul style="list-style-type: none"> access to dietetic, physiotherapy, social work and speech pathology services. <p>Other</p> <ul style="list-style-type: none"> access to lactation consultant. access to Aboriginal and Torres Strait Islander liaison officer as required. 	<p>Other</p> <ul style="list-style-type: none"> on-site access to lactation consultant within newborn and/or maternity service. 	
Specific risk considerations	Nil	In addition to risk management outlined in Fundamentals of the Framework, specific risk management	Nil	Nil	Nil	Nil

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		requirements include: <ul style="list-style-type: none"> second attendant trained in neonatal resuscitation must be immediately accessible on-site to attend birth in services where planned birthing occurs. 				

Support services requirements for neonatal services

	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
	On-site	Accessible	On-site	Accessible	On-site	Accessible	On-site	Accessible	On-site	Accessible	On-site	Accessible
Children's anaesthetics												6
Children's intensive care												5

	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
Children's surgical												6
Medical imaging			2		3		4		5		5	6
Medication		1	2		3		4		4		5	6
Pathology		1	2		3		3		5		5	6

Table note: On-site means staff, services and/or resources located within the health facility or adjacent campus including third party providers. Accessible means ability to utilise a service (either located on-site or off-site) or skills of a suitably qualified person (who may be either on-site or off-site)—without difficulty or delay—via various communication mediums including but not limited to face-to-face, telehealth, telepharmacy, and/or outreachTable reference

Legislation, regulations and legislative standards

Refer to the Fundamentals of the Framework and Children's Services Preamble for details.

Non-mandatory standards, guidelines, benchmarks, policies and frameworks (not exhaustive & hyperlinks current at date of release of CSCF v3.2)

In addition to what is outlined in the Fundamentals of the Framework and Children's Services Preamble, the following are relevant to neonatal services:

- Australian College of Midwives. National Midwifery Guidelines for Consultation and Referral, 2nd ed. ACM; 2008. www.midwives.org.au/
- Australian College of Neonatal Nurses. Competency Standards. ACNN; 2004. www.acnn.org.au
- Australian Government Department of Health and Ageing. Commonwealth guidelines on 'Neonatal facilities for the treatment of newly born children approval under the Health Insurance Act 1973'. Canberra: Australian Government; 1997. www.health.gov.au/internet/main/publishing.nsf/Content/phi-circulars-97-98.htm
- Australian Government Department of Health and Ageing. Continuous Positive Airway Pressure Guidelines. Department of Health and Ageing; 2009. www.health.gov.au/
- Australian Nursing and Midwifery Council. Competency Standards. ANMC; 2006. www.anmc.org.au
- Baby Friendly Health Initiative. BFHI; nd. www.babyfriendly.org.au
- National Institute for Health and Clinical Excellence. Routine postnatal care of women and their babies: NICE Clinical Guideline 37. NICE; 2006. www.nice.org.uk/nicemedia/pdf/CG37NICEguideline.pdf
- Perinatal Society of Australia and New Zealand. Clinical Practice Guideline for Perinatal Mortality 2nd ed, version 2.2. PSANZ; 2009. www.psanz.com.au/
- Queensland Government. Drug Therapy Protocol: Midwifery. Queensland Health; 2008. www.health.qld.gov.au/nmoq/midwifery/dtp.asp
- Queensland Government. Healthy Hearing Program: A Statewide Universal Neonatal Hearing Screening Program. Queensland Health; 2007
- Queensland Government. Informed Consent. Queensland Health; 2010. www.health.qld.gov.au/consent/
- Women's Hospitals Australasia. Benchmarking Maternity Key Indicators. WHMA; nd. www.women.wcha.asn.au/about-our-benchmarking-0

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3. Stark AR, American Academy of Pediatrics Committee on Fetus and Newborn. Levels of neonatal care. Pediatrics 2004 Nov;115(5):1341–7.
4. Liley H. Report to the National Review of Paediatric Specialty Service. New Zealand; 1998.
5. Perinatal Society of Australia and New Zealand. Clinical Practice Guideline for Perinatal Mortality 2nd ed, version 2.2. PSANZ; 2009. www.psanzpnmsig.org/guideline.html
6. Baby Friendly Health Initiative. BFHI; nd. www.bfhi.org.au/