Te Whatu Ora
Health New Zealand

Te Whakapuāwai Pēpi o Aotearoa
Newborn transitional care

Resources for health professionals

RESOURCES FOR HEALTH PROFESSIONALS PROVIDING NEWBORN TRANSITIONAL CARE

Contents

RESOURCES FOR HEALTH PROFESSIONALS PROVIDING TRANSITIONAL CARE

Executive summary

The purpose of these resources is to provide information to guide health professionals providing care to māmā, pēpi and whānau receiving Newborn transitional care.

The content is informed by national feedback provided by health professional who contributed to the Transitional Care for the Neonate Framework for New Zealand, March 2020.

There is a strong national consensus amongst health professionals of the importance of keeping māmā/ whānau and pēpi together. They also identified the need for dedicated resources, including clinical resources to ensure all staff working with near term pēpi or term pēpi with short term conditions had access to guidelines to promote the best start for māmā/ pēpi and whānau.

A working group of senior midwives, nurses, medical staff, Maori and whānau cultural support have contributed to the content in this document by reviewing best practice standards for newborn transitional care. The working group also identified where local standards should continue to be used until a national consensus is achieved.

A highlight during the working group's journey of developing resources, was Toriana Hunt – Kaimahi Hauora Māori gifting the name for this rōpu of Te Whakapuāwai Pēpi o Aotearoa (the process to help flourish/nurture babies within NZ) as the name for Newborn Transitional care in New Zealand.

These resources are not exhaustive – if no information is present for a specific condition, the following national resources maybe helpful

- Starship Clinical Guidelines
- Midwifery National Guidelines
- British Association of Perinatal Medicine | Home (bapm.org)

Members of the working group

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We would also like to acknowledge the time and expertise provided by many maternity and neonatal units across Aotearoa during the development of these resources.

Guiding principles of transitional care

The following principles relate to the care of Māmā/Primary Caregiver and pēpi, where they meet the clinical criteria for admission to Transitional Care.

Whānau supported to stay together whilst in the transitional care space.

1. Māmā/whānau and pēpi are at the centre of all discussions and decisions.
2. Māmā/whānau and pēpi have their cultural beliefs and needs understood and met, are treated equitably and with respect.
3. Māmā/whānau is assisted in caring for pēpi with appropriate support from the collaborative maternity and neonatal team including their multidisciplinary teams.
4. Māmā/whānau is supported in their Ngā Ū (breastfeeding) journey in line with the BFHI.
5. Māmā/whānau, pēpi are supported in their discharge home and ongoing care requirements, including linking to post-discharge community care supports.

Te Tiriti o Waitangi

Te Whakapuāwai Pēpi o Aotearoa (Newborn Transitional Care in New Zealand) must demonstrate practical application of the principles of Te Tiriti to enable Māori to express their mana, to ensure they receive equitable, culturally safe high-quality care to achieve equitable health outcomes for māmā and pēpi. Transitional care services must know the principles of Te Tiriti o Waitangi and demonstrate their understanding, integration, and application of Te Tiriti o Waitangi throughout their day-to-day practice with Māori.

The principles of Te Tiriti o Waitangi provide the framework for transitional care and are supported by the Pae Ora – Healthy Futures vision for all Māori to live with good health in an environment that supports a good quality of life through the interconnected elements of Mauri Ora, Whānau Ora, and Wai Ora.

- **Tino Rangatiratanga:** transitional care supports the right of Māori to receive equitable care, conceptualising wāhine decisions as a continuation of a much older, Māori collective-endorsed practice of self-determining one's own health and wellbeing and that of the whānau.
- **Equity:** transitional care services offers equitable newborn health outcomes for Māori by ensuring that, at a minimum, these outcomes match those of other New Zealanders.
- **Active protection:** transitional care providers share evidence-based information about Transitional Care outcomes so that Māori can make decisions and prepare themselves to uphold their tikanga or cultural practice. Transitional Care providers actively support Māori to make decisions that are best for them.
- **Options:** transitional care providers ensure that Māori have care that enables them to uphold their tikanga or cultural practice regardless of where birth takes place. Processes must complement wāhine Māori mana or inherent authority and dignity, support their tikanga or cultural practice, and be culturally safe as defined by Māori.
- **Partnership:** transitional care providers work in partnership with Māori, including a wāhine Māori whānau, if requested. A partnered approach to the process and decision-making ensures wāhine Māori can enact their rangatiratanga or self-determine their futures while exercising Mana Motuhake.

Cultural safety

Practicing in a culturally safe way is important and a requirement of Te Tiriti. It is important that health practitioners know that tikanga or correct protocols and practices are often specific to whānau, hapū and iwi and that tikanga is not a 'one size fits all'. Similarly, mātauranga Māori or Māori knowledge is not a single entity; rather there is traditional and contemporary mātauranga Māori, and mātauranga Māori that is specific to hapū and iwi environments that include land, seas, waterways, weather

systems, the stars, flora and fauna, and things seen and unseen. Older forms of mātauranga Māori have been somewhat protected from colonisation by having been composed or narrated in te reo Māori.

Rangatiratanga or self-determining rights over tikanga and mātauranga Māori is crucial to its safety and survival. For this reason, maternity and transitional care health practitioners should be very careful not to impose their understanding of tikanga or mātauranga Māori onto Māori. Nor should they assume that all Māori are familiar with terms such as tikanga, mātauranga and Te Tiriti. Unfamiliarity with such terms can be experienced by Māori as a diminishment of their mana as expressed by Te Tiriti; an outcome that is antithetical to Te Tiriti.

Health practitioners may find support from their professional association to be helpful in terms of giving effect to the principles of Te Tiriti. This may include the following:

- Medical Council of New Zealand: Statement on cultural safety
- Medical Council of New Zealand: He Ara Hauora Māori: A Pathway to Māori Health
- Standards and guidelines for nurses (nursingcouncil.org.nz)
- Midwifery Council of New Zealand: Statement on Cultural Competence for Midwives
- Turanga Kaupapa: principles that give life and meaning to the midwifery profession's recognition of Māori as Tangata Whenua and the profession's obligations under Te Tiriti. See Midwives' Handbook for Practice
- The Royal Australasian College of Physicians: Guideline commentary on consulting with Māori and their whānau.

Health practitioners may also value familiarisation with the following:

- Māuri Ora Associates: Best health outcomes for Māori: Practice implications. https://www.indigenouspsych.org/Resources/Best_Health_Outcomes_for_Maori.pdf
- New Zealand Medical Association: Improving Māori health through clinical assessment: Waikare o te Waka o Meihana N Z Med J . 2014 May 2;127(1393):107-19
- University of Otago MIHI 501 Health Professionals Course: Application of Hui Process and Meihana Model to Clinical Practice. https://www.otago.ac.nz/continuingeducation/mihi-501-and-mihi-online-courses
- Whakamaua Maori Health Action Plan 2020-2025 https://www.health.govt.nz/publication/whakamaua-maori-health-action-plan-2020-2025

Criteria for pēpi in transitional care (TC)

- Pēpi born 35 weeks and above who weigh >2 kg who do not require continuous monitoring.
- Inability to establish full suck feeds; predicted to require 3 hourly nasogastric tube feeds.
- Pēpi who are unable to maintain temperature following an episode of rewarming and despite skin-to-skin contact and/or adequate clothing. Use of incubators are expected to be short term.
- Pēpi monitored for hypoglycaemia who have not responded to dextrose gel and require nasogastric feeding.
- Stable pēpi who require antibiotics for more than 48 hours
- Pēpi at risk of neonatal substance withdrawal management requiring oral medication or additional feeding and nursing support.
- Any jaundice requiring Bilisoft and 1 light.

Individual transitional care services may choose to care for additional pēpi and wāhine as deemed appropriate to meet their overall service needs.

Criteria for māmā/whānau in transitional care

- Māmā presence with her pēpi 24/7 is the cornerstone of TC (allowing for short breaks)
- Māmā is physiologically stable. The admission of higher risk whānau to a TC service will be delayed until they are assessed as medically stable, e.g. cardiac, severe PET.
- It is expected that stable neonatal substance withdrawal pēpi requiring oral morphine can remain in TC where whānau demonstrate a willingness to engage with the service.

- Cases where māmā/whānau would benefit from support with parent craft, should be assessed and accepted on a case by case basis.
- Visiting policy as per local guideline

Definition and physiological differences of the late preterm and near-term pēpi

In 2005, the National Institute of Child Health and Human Development of the National Institutes of Health (NICHD) held a workshop which addressed definition and terminology, aetiology, biology of maturation, clinical care and public health issues. They elected to redefine 'near term pēpi' to those with gestational ages 34+0 to 36+5 weeks as 'late-preterm'(LPT).

The LPT experiences more in-hospital morbidity, more readmissions to hospital and increased mortality within the first year of life than their term counterparts.[1,2,3,4] Despite often appearing well grown and similar in appearance to term pēpi, late preterm pēpi are physiologically immature and have limited compensatory mechanisms to assist their transition to extra uterine life. They are more likely experience temperature instability, hypoglycaemia, respiratory distress, jaundice and have difficulties feeding. If discharged home in a similar timeframe to term pēpi, they are more likely to be admitted within the first month of life with complications including jaundice, dehydration and feeding issues.[1,5,6,7,8,9]

A further definition for 37+0 to 38+6 weeks gestation pēpi has since been adopted, categorised as 'early term' (ET) to acknowledge this group are now recognised as having worse health than their full term (FT) counterparts.[10]

When pēpi are born prior to 37 weeks gestation, accelerated brain growth occurs outside the protective uterine environment. The brain may regulate and adapt differently with lifelong effects on growth and development.[1,11] Statistically significant correlation has been found between late preterm birth and deficits in communication, poorer visuomotor and executive functions, reduction in fine motor skills and behavioural adaptability.[12,13,14,15]

However, most vulnerable pēpi can be safely managed on a post-natal ward transitional care service when their physiology is understood, and evidence-based strategies are in place to manage them.[2] The inclusion of developmental expertise in this environment could ameliorate some of the neurodevelopmental concerns related to the late preterm infant.

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Developmental care

Individualised care which promotes and supports the developmental needs of pēpi is an important part of transitional care. Helping whānau to understand their cues will strengthen the relationship between the whānau and their new pēpi.

Pēpi display a range of behavioural states and can transition between these with varying degrees of ease.

Deep sleep state	Regular, shallow breathing Eyes closed No spontaneous movement No rapid eye movement Startles may appear approximately every 5 minutes
Light sleep state	Eyes closed. Irregular respirations (in depth and rate) More modulated motor activity. Rapid eye movement present with facial expressions (e.g. half-smiles, sucking)
Drowsy or semi-alert state	Eyes may be half-open or open and closed. Variable activity levels
Quiet alert state	Bright appearance Minimal motor activity
Active alert state	Eyes open Considerable motor activity Fussing may or may not be present
Crying state	Prolonged intense crying (different from indeterminate fussing that occurs in active alert state)

Physiological instability can occur in the transition between behavioural states and may provide insights into how to approach pēpi. Signs such as changes in breathing pattern, heart rate, facial colour changes, or behaviours such as tremors, startles, hiccoughs and yawns indicate that an pēpi may be becoming unstable or distressed.

Positioning

Pēpi demonstrate a wide range of movements. For pēpi born prematurely, weaker muscle tone can lead to positioning disorders such as widely abducted hips (frog-leg position), retracted and abducted shoulders, and back-arching. Sleeping in a favoured position can lead to a flatted head posture.

To mitigate these potential issues:

- Pēpi should always be placed on their back to sleep (SIDS recommendation) allowing hand to mouth contact. Pēpi should be placed face up, with feet at the bottom of the cot, there should be not loose bedclothing around the face or head. Blankets should not be above the shoulder.
- Alternate pēpi head position from side to side for sleep.

- For pēpi who display limited flexion, or exhibit disorganised behaviour, a swaddle beneath the shoulder level could be considered, with hands positioned to the mid-line. Swaddling during bathing is also recommended for preterm pēpi. Pēpi should not be placed prone in their cot without monitoring. A kangaroo care position, with the pēpi skin-to-skin (or clothed), prone and upright on the chest of whānau should be encouraged. However, it is recommended whānau are observed by a support person or staff member as they may fall asleep risking smothering or dropping pēpi.

Skin-to-skin and Kangaroo care

Should be encouraged and promoted with evidence-based information provided to whānau.

Kangaroo care has been shown to improve whānau-pēpi attachment and reduce stress in pēpi. Pēpi have decreased variation in heart and respiratory rates, improved oxygenation, less bradycardia, and fewer and shorter apnoeic episodes. It is also an important part of lactation and breastfeeding establishment. Skin-to-skin contact with significant other whānau may also improve pēpi- whānau attachment and reduce stress.

Light and vision

Pēpi in transitional care settings are likely to open their eyes when in the alert state. This can be facilitated by a low-lighting environment. Protection from bright lights (e.g. during care giving and procedures) is important. Eye protection should be provided for pēpi receiving phototherapy. To promote the development of circadian rhythms, it is ideal to dim the room light at night if safe to do so.

Pēpi generally show preference for human faces, and can see best at a distance of 20-25cm. Opportunities for visual stimulation can be provided if pēpi is displaying longer awake times.

Sound and hearing

Pēpi generally show a preferential response to the soft human voice and are sensitive to environmental noises. Encourage whānau to gently read or sing to their pēpi. They may show startle responses to loud noises. The American Academy of Paediatrics recommends that noise levels not exceed 45 dB.

Examples of recorded noise levels in neonatal intensive care units:

EVENT	LOUDNESS
Telephone ringing	80 dB
Dash Alarms (set at 70%)	70 dB at 1 metre distance
Talking around the bedside (normal volume conversation)	60 dB

Non-nutritive sucking (NNS)

Suck, swallow and breathing coordination takes time to mature, and may need to be supported so pēpi can learn to feed effectively.

NNS (e.g. on a pacifier) during NG/OG feeds and for comfort can be used to promote nutritive sucking patterns.

Explain the purpose of NNS to whānau so that they understand why it is being encouraged

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Neonatal Observation Chart (NOC) and Newborn Early Warning Scores (NEWS)

The NOC is a vital signs chart that has been developed to standardise the initial assessment and care of all newborns in New Zealand. It provides a single view of clinical information and assists in recognising trends which may indicate a pēpi condition has deviated from the norm.

The NEWS has been developed to assist with the early recognition of clinical deterioration of infants who are at risk, with the aim of improving outcomes for these infants and to help to detect and reduce the severity of Neonatal Encephalopathy.

Some babies are at a higher risk of neonatal complications (such as hypoglycaemia) and will require more frequent and more extensive risk identification. The NOC/NEWS chart provides nationally consistent risk identification and suggested frequency of assessment of these babies.

It provides nationally agreed assessment information with scope to add operational information to suit individual situations.

The vital signs which make up the Newborn Observation Chart

Core vital signs (6+1)

- Respiratory rate
- Work of breathing
- Temperature
- Heart rate
- Colour (including jaundice)
- Behaviour (including feeding behaviour)
- Parents can express any change or concern (+1)

For those babies with a known risk, additional observations are recommended

- Oxygen saturations in air
- Blood glucose
- Repeat lactate
- Newborn scalp check (to identify sub galeal haemorrhage for babies born by instrumental birth).

The NOC/NEWS learning resources can be accessed via individual hospital learning platforms, e.g. Healthlearn, koawatealearn.

The NOC/NEWS national online resources and learning package includes:

NOC/NEWS user guide

NOC-NEWS User Guide 28022020.pdf

NOC/NEWS quick reference guide

Quick Reference Guide - NOC-NEWS

NOC/NEWS national chart

NOC-NEWS_6676_28022020.pdf

Escalation pathway

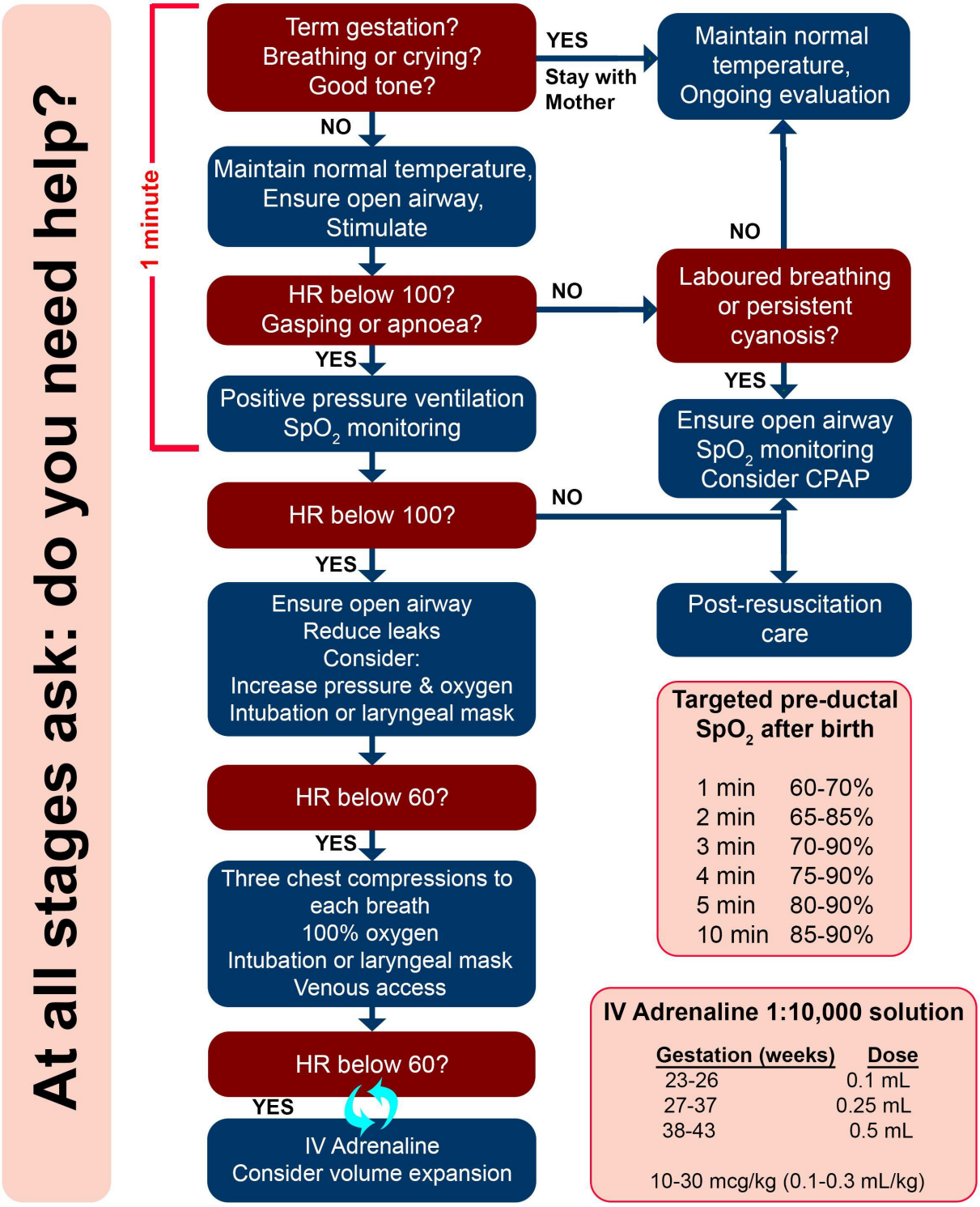
The Newborn Observation chart escalation pathway has pink highlighted areas where each service can modify the escalation pathway depending upon local policy, procedure, and guidelines. (see examples page 11 of the Newborn Observation Chart incorporating the Newborn Early Warning score (NEWS) 2021)

Key point: the timeline of escalation doesn't change.

ANZCOR newborn life support guidelines

Newborn-Life-Support-Jan-2016.pdf

Newborn Life Support



Targeted pre-ductal SpO_2 after birth

1 min	60-70%
2 min	65-85%
3 min	70-90%
4 min	75-90%
5 min	80-90%
10 min	85-90%

IV Adrenaline 1:10,000 solution

Gestation (weeks)	Dose
23-26	0.1 mL
27-37	0.25 mL
38-43	0.5 mL

10-30 mcg/kg (0.1-0.3 mL/kg)

January 2016

AUSTRALIAN RESUSCITATION COUNCIL

NEW ZEALAND Resuscitation Council WHAKAHAUORA AOTEAROA

Growth - weight, length and head circumference of pēpi

WEIGHT

There is some variability in weighing frequency of transitional care pēpi nationally. The consensus from the TC resources working group is that pēpi should not be weighed any more frequently than alternate days.

Other weighing considerations are:

- Need to weigh pēpi on arrival if transferred from another facility
- If the N/G tube not used for 24 hours, pēpi to be weighed prior to removal of N/G tube.
- Weighing frequency may decrease to twice weekly for stable pēpi with prolonged stays, e.g. maternal mental health concerns.
- Weigh pēpi if clinical indication.
- Weigh prior to discharge

LENGTH AND HEAD CIRCUMFERENCE

Pēpi length and head circumference will be documented within 24 hours of birth, often done as part of newborn check.

Clinical guidelines

Blood glucose monitoring and dextrose administration

All pēpi should be assessed for their risk of hypoglycaemia regardless of risk factors as severe glucose deficiency leads to long term neurological injury.

If any pēpi shows symptoms that could be due to hypoglycaemia, a blood sugar level should be measured immediately

Normal well-grown pēpi have sufficient alternate energy stores and capacity for glucose production to ensure normal glucose metabolism during their transition to extrauterine life and in the early neonatal period.

Some pēpi have impaired capacity to maintain adequate glucose metabolism and it is important to identify those at risk, monitor appropriately and manage according to local hypoglycaemia guidelines.

Until a national guideline for the management of blood glucose monitoring hypoglycaemia is available, hospitals should follow their local guidelines.

The newborn clinical network provides practice recommendation for the treatment of hypoglycaemia with dextrose gel, within the first 48 hours after birth in late pre-term and term infants is available on the Newborn clinical network: Practice Recommendations Dextrose Gel (starship.org.nz)

Thermoregulation and incubator care of pēpi in transitional care

OBJECTIVES

- To maintain temperature stability in a neutral thermal environment
- Allow a consistent approach to care of pēpi requiring an incubator
- To allow easy observation of pēpi without handling for those pēpi requiring incubators

Temperature stability is more challenging for[1]

- Late preterm pēpi.
- Intrauterine growth restricted pēpi
- Small for gestational age (defined using gestational age, sex and ethnicity-based charts)
- Pēpi of māmā with diabetes
- Pēpi that may have congenital conditions.

These pēpi are susceptible to heat loss because of their:[2,3,4]

- High surface area to volume ratio
- Thin non-keratinized skin
- Lack of insulating subcutaneous fat
- Lack of thermogenic brown adipose tissue

- Inability to shiver
- Less able to maintain a flexed position
- Poor vasomotor response

The late preterm pēpi also have immature hepatic enzymes for glycolysis, gluconeogenesis and ketogenesis and decreased glycogen stores.[5]

Temperature instability can also lead to further clinical complications including hypoglycaemia and respiratory distress.[6,7]

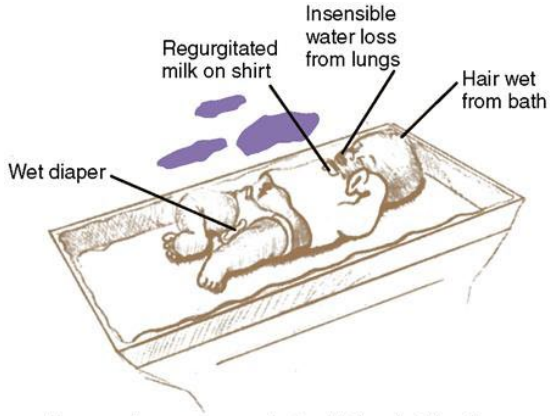
The four basic mechanisms through which heat is transferred from pēpi to the environment are:

Radiation: related to the temperature of the surfaces surrounding pēpi but not in direct contact with the infant, e.g. cold windows.

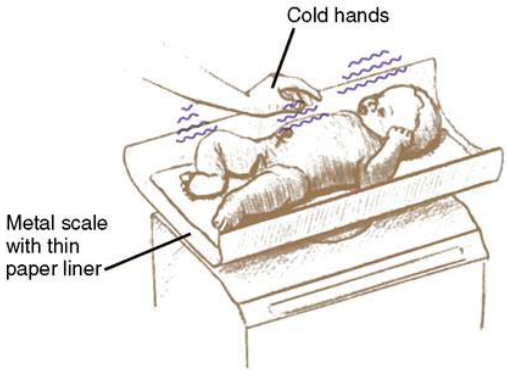
Conduction: occurs through direct contact with a surface with a different temperature, e.g. scales

Convection: occurs when air currents carry heat away from the body surface, e.g. when pēpi exposed to drafts

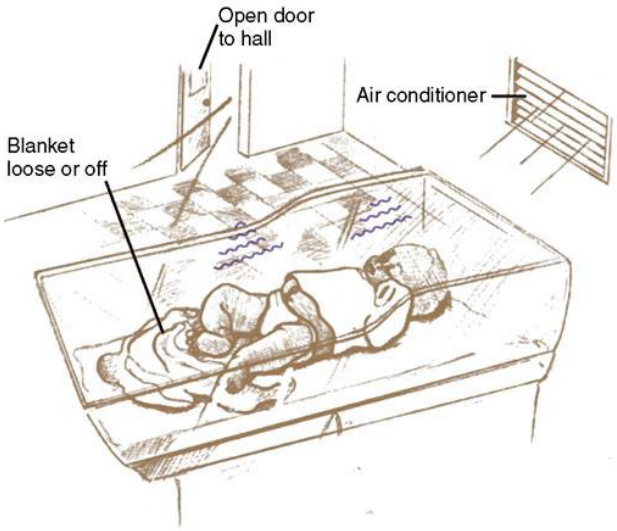
Evaporation: occurs when water is lost from the skin, e.g. at delivery, bathing.



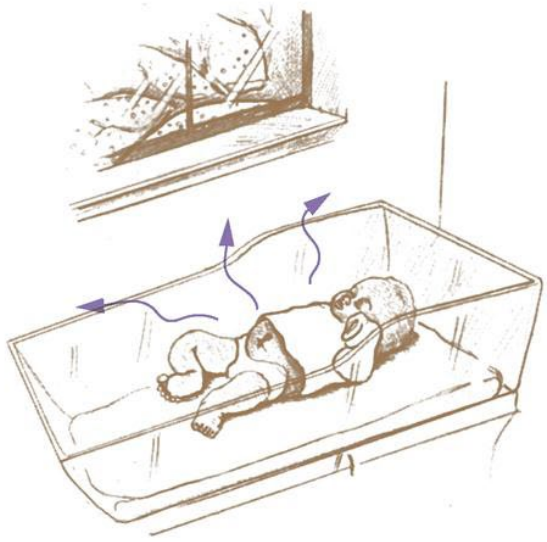
Evaporation can occur during birth or bathing from moisture on skin, as a result of wet linens or clothes, and from insensible loss.



Conduction occurs when the infant comes in contact with cold objects or surfaces such as a scale, circumcision restraint board, cold hands, or a stethoscope.



Convection occurs when drafts come from open doors, air conditioning, or even air currents created by people moving about.



Radiation heat loss occurs when the infant is near colder surfaces. Thus, heat is lost from the infant's body to the side of the crib and to the outside walls and windows.

Pēpi should be nursed in a neutral thermal environment and have a core body temperature between 36.5-37.5 degrees celsius as per NOC/NEWs. Although hypothermia is a core temperature < 36.5 degrees celsius, cold stress may be present at a higher temperature when heat loss requires an increase in metabolic heat production.

The neutral thermal environment is the temperature range where heat production is at the minimum needed to maintain normal body temperature and conserving energy for growth. It does depend on birthweight, postnatal age, and whether the infant is clothed or naked.

Because heat production requires oxygen consumption and glucose use, persistent hypothermia may deplete these stores, leading to metabolic acidosis, hypoglycaemia, decreased surfactant production, increased caloric requirements, and if chronic, impaired weight gain.[2,3,4]

Ensure windows and doors can be closed to reduce draughts.

ENCOURAGE SKIN-TO-SKIN CONTACT

If pēpi temperature is between 36-36.5 degrees celsius, try skin-to-skin contact which helps keep pēpi warm and helps provide better temperature regulation than an incubator. Māmā and whānau are usually keen to participate. Place pēpi, dressed in just a nappy and a hat, onto their chest so pēpi is resting directly onto their skin. Turn his or her head to one side and cover with a blanket to help keep pēpi warm.

Explain to māmā/whānau that it is most beneficial to hold pēpi in this manner for a minimum of one hour. Ensure they are well prepared prior to skin to skin e.g. go to the toilet prior to and have access to water/ food during skin to skin time.

Skin-to-skin contact provides many whānau/pēpi benefits:

- improved immunity and weight gain
- reduces stress, decreases crying and improved sleep
- more stable breathing and more stable heart rate
- increases initiation, duration, exclusivity and success of breastfeeding
- optimises neuro-sensory input for pēpi developing brain
- māmā/pēpi attachment
- increased confidence and competence for māmā/whānau
- enhanced attachment for māmā/whānau and increased sensitivity and responsiveness to pēpi.[8]

CLOTHING AND BEDDING

- Pēpi to be appropriately dressed. Recommendations include the use of natural fibres including wool and cotton fabrics.
- Incubators and cots to have appropriate bedding and demonstrate safe sleeping practices. Hats are not recommended when pēpi are not able to be observed constantly due to the risk of SUDI.

EQUIPMENT

- Thermocots, incubators and overhead heaters should be available for use in transitional care services.

HYPOTHERMIA

- Rewarm by placing pēpi skin-to-skin or under a radiant warmer.
- Monitor temperature every 30 minutes until within normal range.
- Consider incubator if pēpi unable to consistently maintain temperature.

INDICATIONS FOR INCUBATOR USE

- Any infant who does not maintain their own temperature 36.5-37.5 with additional clothing and wrapping (not excessive) OR skin-to-skin for 1 hour after temp identified < 36.5.
- Infants requiring phototherapy lights if a Bili Blanket or equivalent is not available.

PERSONNEL ABLE TO PERFORM PROCEDURE

- Midwifery, Nursing, Medical staff in transitional care service.

EQUIPMENT

- Incubator
- Thermometer (for axilla temperature monitoring)
- Incubator cover

PREPARE THE INCUBATOR

- Incubator kept plugged in and pre-warmed to 34 degrees Celsius – ensuring linen and warm air when pēpi placed in incubator.
- Ensure incubator is on air mode only and switched on with motor running when infant in incubator to maintain constant airflow and reduce risk of carbon dioxide build up if fan not functioning.
- Pēpi receiving phototherapy commence temperature at 30 degrees Celsius
- Position incubator away from direct sunlight and draughts.
- Average incubator air temperature needed to provide a suitable thermal environment for naked healthy infants.[9]

  2.0- 2.5kg 33 degrees
  > 2.5kg 32-33 degrees

  Note these temperatures can be used as a starting point.
- Check and record incubator temperature of the incubator hourly

CARE OF PĒPI

- Maintain axilla temperature between 36.5-37.5 degrees. Frequency as per NOC/NEWS local policy once normothermic otherwise refer to below. **
- Ensure pēpi is naked apart from a nappy.
- Position pēpi in the supine position. Nests may be used by utilising linen to secure and form boundaries to settle, ensuring pēpi face is always clear. Prone position maybe used to optimise oxygenation and lower energy expenditure in pēpi who are grunting, however pēpi in this position must be given extra supervision and monitoring.
- Access pēpi through portholes if possible as this will limit heat loss from the incubator.
- Ensure māmā/whānau are aware of the access points to provide comfort and cares in addition to maintenance of a quiet environment, no tapping on incubator canopy or placement of equipment, careful opening and closing of incubator doors. Noise is amplified within the incubator.

MONITORING

- An axilla temperature should be checked initially prior to being placed in the incubator.
- Repeat the temperature in 30 minutes, then an hour later, thereafter 3-4 hourly with observation of feeds or as condition dictates. **
- Incubator temperature should be adjusted by no more than 0.5 degrees until adequate thermoregulation is restored and maintained.
- Pēpi that are unable to maintain their body temperature may need BSL's and further investigation.

WEANING FROM AN INCUBATOR

- Incubator temperature is weaned gradually as pēpi temperature allows. This will depend upon pēpi gestation and weight.
- The clothes which pēpi will be dressed in should be prewarmed in the incubator before dressing.
- Wean until incubator temperature is 30° then transfer to a cot.
- Ensure cot is placed in the room away from draughts and away from the doorway.
- Do not bath pēpi immediately before or for 24 hours after putting them into a cot.
- Monitor temperature one hour after transfer into cot and then with feeds to ensure temperature stability.

CARE OF INCUBATOR

- Wiped down daily with soap and water (or as per local policy)
- Incubators are changed weekly, document the change in pēpi notes.
- Incubator filters need to be changed every 3 months

- Incubator covers are used to support developmental care. Ensure you can still observe pēpi and that they are not completely obscured by the cover.

USE OF A THERMOCOT IN TRANSITIONAL CARE

- Pre-warm thermocot to 37 degrees.
- Use appropriate bedding ensuring safe sleeping guidelines adhered to.
- Check and record the thermocots temperature hourly.
- Position away from draughts or direct sunlight.
- Maintain axilla temperature between 36.5°C and 37.5°C
  - Adjust the thermocot temperature until reaches 36.6°C then transfer pēpi to cot.
  - Re-check the temperature within half an hour of making any adjustment.
- Explain to māmā/whānau the purpose of a thermocot for their pēpi and educate them on the safe use of the walls

BATHING IN TRANSITIONAL CARE

Contraindications

- Temperature below 36.6 degrees Celsius
- First 24 hours of life (unless required for hepatitis B Vaccination)
- Day of discharge

Recommendations

- Close doors and windows to exclude draughts.
- Warm room to 24 degrees Celsius if possible.
- Nga pēpi requiring an incubator or thermocots to maintain temperature consider the use of an overhead heater with a setting of 50%.
- Prepare clothing and towels and prewarm linens if possible.
- Check bath water temperature.
- Discuss procedures and bathing techniques with māmā/whānau if this is a demonstration bath.
- Use a quiet voice. Uncover and unwrap infant slowly. Consider dimming lights and avoid sudden position changes. If late preterm, consider the use of a muslin wrap to provide neurodevelopmental support.
- Limit bathing time. Dry infant and dress pēpi quickly after the bath.

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Jaundice management/phototherapy

OVERVIEW

Hyperbilirubinaemia is more prevalent, more severe and has a more protracted course in the late preterm (LPT) pēpi. This is linked to a reduced ability to bind bilirubin to albumin, unsuccessful and suboptimal lactation and functional immaturity.[1] Pēpi who are large for dates and discharged early are at increased risk of hyperbilirubinaemia.[2,3] There is a strong association between gestational age and hyperbilirubinaemia, with an approximate eightfold increased risk of developing a total serum bilirubin greater than 20mg per 100ml in pēpi born at 36 weeks gestation (5.2%) vs those born at 41- or 42 weeks' gestation (0.7 and 0.6%, respectively). Neurological sequalae can be seen at lower bilirubin levels in the LPT compared to their term counterparts,[4] emphasising the need for close follow-up of late preterm pēpi.[5] Jaundice, along with poor feeding is also responsible for an increased rate of readmissions in late preterm pēpi; this is further elevated in those discharged early.[6]

RISK FACTORS FOR THE DEVELOPMENT OF JAUNDICE IN THE LATE PRETERM

- Gestational age (increased risk with decreased gestation)
- Jaundice within the first 24 hours of life
- Blood group incompatibility with positive direct antiglobulin test or other known haemolytic disease
- History of previous sibling with jaundice
- Exclusive breastfeeding with excessive weight loss
- Macrosomic infant

HYPERBILIRUBINAEMIA

Early jaundice within the first 24 hours of age should be reviewed by a paediatrician or neonatal medical staff or neonatal nurse practitioner with consideration of NICU/SCBU admission.

MONITORING

- Early identification using risk factors and serum bilirubin levels
- Monitoring as per local guidelines and paediatrician/neonatologist/NNP direction
- Use of biliblanket; ensure correct placement
- Consider addition of phototherapy light, however should intense phototherapy be required due to levels in exchange range or rapid increase refractory to treatment, admission to NICU/SCBU should be discussed with the Neonatologist/Paediatrician.
- Ensure feeding is adequate and accurately documented.
- Weigh pēpi, assess feeds and consider supplementing breastfeeding with expressed breastmilk via nasogastric tube, or formula following discussion with māmā.
- Refer to lactation consultant for ongoing support.

EQUIPMENT

- Phototherapy lights
- Biliblanket
- Access to blood testing
- **It is acceptable to screen for jaundice by obtaining a transcutaneous measurement, however the result of a serum bilirubin is required before commencing treatment.**
- Age and gestation appropriate bilirubin charts, nomograms or approved App (BiliApp)

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Sepsis guidelines

OVERVIEW

- Bacterial sepsis is a potentially significant problem for newborn pēpi.
- The incidence of sepsis is higher in preterm pēpi, especially the very low birthweight infant (<1500g).
- Common organisms identified early are *Streptococcus agalactiae* (*Group B Streptococcus*), *Escherichia coli.* Organisms identified later include other gram-negative bacteria, coagulase negative Staphylococci and *Staphylococcus aureus*.
- Other important pathogens include Listeria monocytogenes, Streptococcus pneumoniae, and Haemophilus influenza.
- The clinical presentation of sepsis in the newborn is often non-specific; and pēpi may deteriorate rapidly.
- Documentation of physiological observations (heart rate, respiratory rate, temperature, behaviour) on a NOC/NEWS chart is advised.
- Transitional Care pēpi are unlikely to need more than 7 days antibiotics.

CLASSIFICATION OF NEONATAL SEPSIS

EARLY ONSET SEPSIS *(infection occurring in the first 2 days after birth)*	LATE ONSET SEPSIS *(infection occurring after 2 days of age)*
Exposure to bacteria can occur: • Before birth due to infected amniotic fluid or occasionally following maternal sepsis. • During birth when contact with organisms in the vagina can occur. • After birth following exposure to organisms in the pēpi environment.	Usually due to: • Nosocomial infection, organisms acquired from the environment. • Coagulase negative Staphylococci are the most common causative organisms. • VLBW pēpi with indwelling catheters, central lines, chest drains etc are at particular risk.

- Antibiotics should be considered in any pēpi with signs of sepsis, particularly in the presence of risk factors.
- Risk factors may be an indication for investigation but are not in themselves an indication for antibiotics if pēpi is born at term and is clinically well.
- If there are any doubts a senior member of staff should be consulted.

RISK FACTORS FOR SEPSIS

- Prolonged rupture of membranes (>18 hours).
- Prematurity (especially in association with PROM).
- Preterm labour with no adequate explanation.
- Fetal distress without adequate explanation (fetal heart rate abnormalities especially fetal tachycardia, passage of meconium).
- Maternal fever or other evidence of infection.
- Foul smelling amniotic fluid or malodorous pēpi .

SIGNS OF SEPSIS IN THE NEWBORN

- Fever, hypothermia and/or temperature instability.
- Respiratory distress with tachypnoea and increased work of breathing (chest recession, grunting/noisy breathing and nasal flare).
- Apnoea and bradycardia.
- Cyanotic episodes.
- Tachycardia
- Lethargy, irritability, poor feeding.
- Unexplained high/low or unstable blood sugars.
- Abdominal distension and bile-stained aspirates.
- Unexplained jaundice.
- Umbilical flare, skin rashes.

SEPSIS CALCULATOR

(or app) https://neonatalsepsiscalculator.kaiserpermanente.org/

- This is validated and recommended for use in pēpi ≥ 34/40 with risk factors for sepsis, in the first 12-24 hours postnatally.
- Use 0.4/1000 for the incidence of EOS.
- You need to know the highest maternal temp in labour (use 37.0 if unknown), GBS status and duration/timing of antenatal antibiotics.
- There are 3 clinical categories for risk stratification: clinical illness, equivocal presentation, and well appearing.
- Recommendations are divided into 3 pathways – treat empirically, observe and evaluate, and continue observation.
- The calculator may advise to take a blood culture and no other blood tests, but NZ centres recommend also taking a FBC and a CRP from 6 hrs after birth if the recommendation is for a culture ± antibiotics.
- Document the calculator findings and recommendations in the clinical notes.

SUGGESTED INVESTIGATIONS

- Full blood count.
- Differential white cell count (Normal WBC 10-30,000 x 10^9/L) and percentage left shift (immature neutrophils/total neutrophil count).
  - If >20% this is moderately predictive of sepsis.
  - A low WCC especially with neutropenia is also suspicious of sepsis.
- Blood culture.
- Chest radiograph if signs of respiratory distress.
- A C-Reactive Protein (CRP) may be indicated. CRP is most useful as a trend, rather than as a diagnostic marker and may be low in the first 12 hours of infection, repeat sample may be indicated
- On occasion, skin/wound swabs will be needed, e.g. staph or herpes investigation
- Lumbar puncture (LP) may be needed in some cases after admission to SCBU/NICU.

The following investigations may need to be considered depending on the organism isolated.

Early onset infection	LP is indicated if the organism is Group B strep or E coli or if pēpi severely unwell.
Late onset sepsis	In addition to the above consider: • Lumbar puncture and CSF for microbiology/biochemistry if blood culture is positive other than for Coagulase negative staphylococci. • Urine by suprapubic aspirate or catheter

ANTIBIOTIC USE IN SUSPECTED SEPSIS

Antibiotics for Neonatal Sepsis (starship.org.nz)

- In Transitional Care services please review local guidelines for specific prescribing information

FIRST FIVE DAYS	AFTER FIRST FIVE DAYS
Start amoxycillin and gentamicin	Start amikacin and flucloxacillin i 1. Almost all Coag negative Staphylococcus is sensitive to amikacin but resistant to gentamicin. 2. Flucloxacillin is used at present because of an increased number of *Staphylococcus aureus* isolates within neonatal units. Add amoxycillin if specific cover for *Enterococci, Strep fecaelis* (suspected NEC), *Listeria* or Group B Streptococcus is needed.

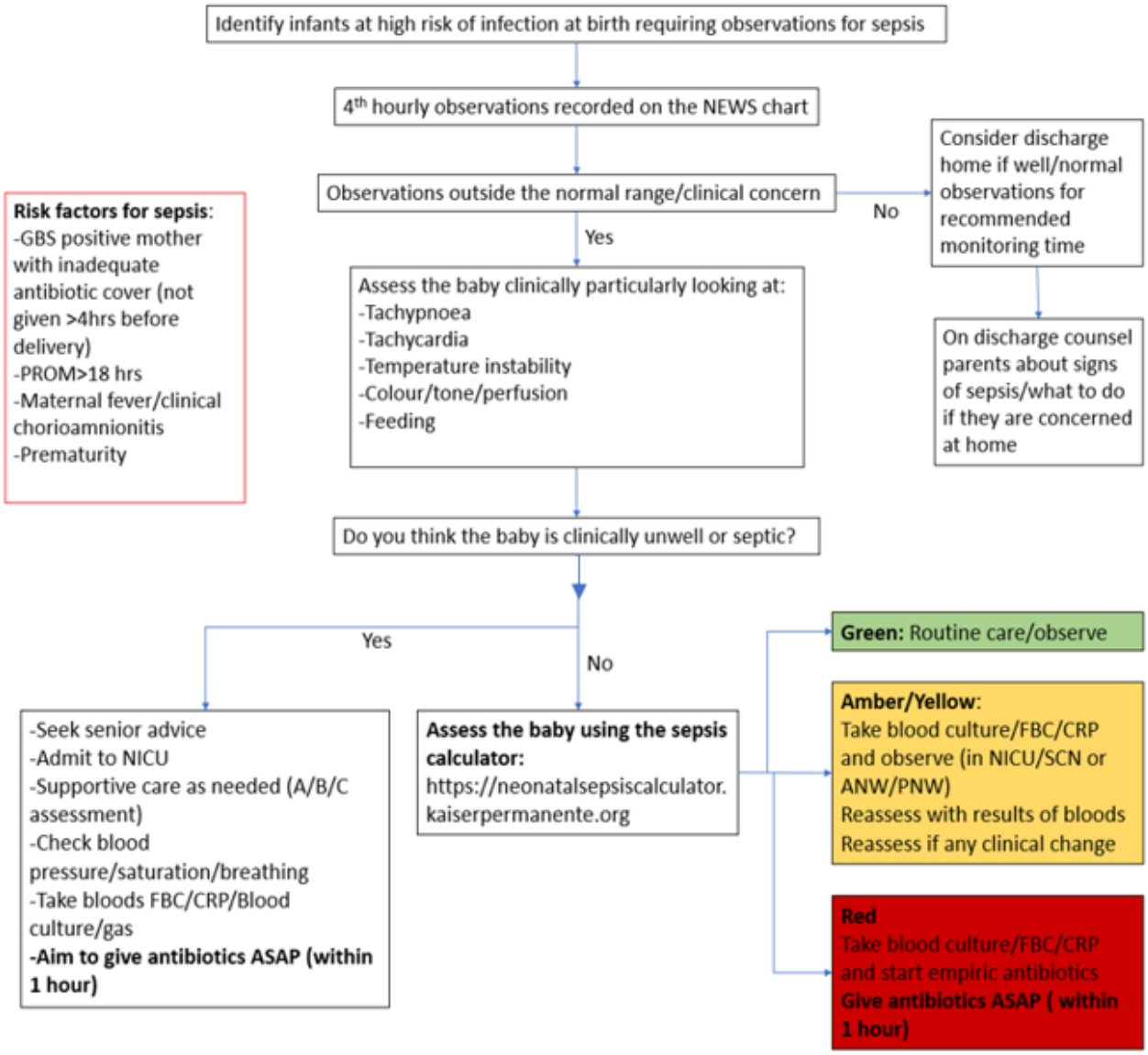
- Review clinical progress and microbiology results at 36 hours (may be 48 hours for late onset sepsis).
  - If cultures negative, consider stopping therapy.
  - Continue therapy if cultures positive or sepsis clinically very likely.

DURATION OF TREATMENT

INFECTION TYPE	DURATION (DAYS) OF THERAPY
Pneumonia	5-7
Septicaemia	7-10
Urinary Tract Infection	7-10
Meningitis	14-21 (depending on organism isolated)
Skin conditions	5
Conjunctivitis	5-7
Oral thrush	7-10

SUMMARY

Attachment 1: Flowchart for management of suspected early onset sepsis in term and late preterm (≥ 34 weeks gestation) newborns in NICU/SCN/PNW/ANW/ Birthing Suite/Birth Centre/OT



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Christchurch Women's Hospital Neonatal Unit Handbook. Date last published: 25.01.2023. Accessed 21.02.2023

Attachment 1: ACT Government Canberra Health Services Clinical Guideline Neonatal Bacterial Sepsis. Date issued 17/12/2021. Accessed 21.02.2023

IV antibiotic prescribing and administration

- The nationally developed paediatric IV learning package provides suitable educational preparation for staff required to administer IV medications in a TC setting. The learning package can be accessed via individual hospital educational eLearning platforms. Both nurse and midwife representation from all regions was provided during the development of the IV learning packages.
- The prescribing of IV antibiotics for neonates is a delegated paediatrician/neonatologist/NNP responsibility
- The prescribing and administration of IV antibiotics to antenatal and peri-natal women are within the scope of registered midwives.
- Midwives may also prescribe and administer topical medications to neonates.

Analgesia and administration of oral medication

- Staff working in TC need to have undertaken suitable training as per local regional orientation guidelines to ensure they are competent to deliver medications to both māmā and pēpi.
- Any medication given to pēpi requires a calculation and therefore **two** suitably trained staff are required to independently check all medications and be present during administration. Exception oral vitamins which may be single checked. http://edu.cdhb.health.nz/Hospitals-Services/Health-Professionals/CDHB-Policies/Fluid-Medication-Manual/Documents/Roles-and-Responsibilities-policy.pdf

Pēpi who have experienced birth trauma may experience pain requiring paracetamol for analgesia post-birth, e.g. forceps or fractured clavicle. In some cases, breastfeeding may reduce the need for paracetamol. However, if the pēpi is distressed and refuses to feed, paracetamol will be required. Māmā-pēpi skin-to-skin contact may help to calm distressed pēpi.

Procedural pain management

Staff undertaking painful procedures on pēpi should follow local oral sucrose guidelines to reduce unnecessary distress.

Randomised Control trials report that administration of sucrose reduces pain scores for heel lance, IM injection and venepuncture. There is ongoing debate as to the optimal dose and concentration of sucrose solution. Adjunct techniques such as breastfeeding have an additive beneficial effect". (5th Edition, Acute Pain Management: Scientific Evidence, 2020).

Blood sampling/heel pricks

Information is available for staff on the back of the Newborn testing card (often referred to as the Guthrie card). More in-depth information is available on the Te Whatu Ora Waitaha Policy & Procedure guideline – Newborn Metabolic Screening Programme (Ref.2403574).

Neonatal substance withdrawal management

Services across New Zealand providing care for pēpi experiencing neonatal substance withdrawal predominantly use either the Finnegan or the more recently introduced Eat Sleep Console Assessment tool. Until national consensus, TC services should continue to follow their local guidelines. Te Whatu Ora Waitaha, newborn service can be contacted for information on the Eat Sleep Console Assessment Tool.

Transitional care feeding guidance

KEY MESSAGES

Anticipate all māmā will require individual practical breastfeeding support irrespective of parity.

All pēpi require an individualised feeding plan with a referral made for lactation consultant input on admission.

The breastfeeding management plan is reviewed daily by an experienced health professional, familiar with the management of transitional care pēpi.

Service wide, consistent feeding information avoids unnecessary confusion and distress of māmā and whānau.

Feeding support

STEP ONE: ENCOURAGE PROLONGED SKIN-TO-SKIN CONTACT WITH MĀMĀ AND PĒPI

- At birth or as soon possible after birth – ensure māmā monitored closely in post-birth phase.
- Calms and relaxes both pēpi and māmā
- Regulates pēpi heart rate, breathing and temperature
- Stimulates an interest in feeding
- Enables colonisation of pēpi skin with maternal friendly bacteria, assists with providing protection against bacteria
- Important for māmā/pēpi dyad irrespective of method of feeding as stimulates release of hormones to support breastfeeding and attachment

https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/implementing-standards-resources/skin-to-skin-contact/

BFHI requirements (THE BABY-FRIENDLY HOSPITAL INITIATIVE FOR SMALL, SICK AND PRETERM NEWBORNS 2020) https://www.who.int/publications/i/item/9789240005648

STEP TWO: DISCUSS RESPONSIVE FEEDING (BREASTFEEDING/BOTTLE FEEDING) WITH MĀMĀ AND WHĀNAU

Responsive feeding means offering a feed when pēpi displays feeding cues.

It's much easier to feed pēpi when they are calm (and less stressful for the māmā)

Early cues (pēpi may still have their eyes closed while displaying these cues)

- Opening and closing mouth
- Stirring
- Licking lips
- Turning head
- Sucking on fingers

Active cues

- Rooting
- Restless movements – stretching
- Hand to mouth activity

Late cues (pēpi may need to be calmed before initiating a feed – cuddling, skin-to-skin, talking, stroking)

- Frantically moving the head from side to side
- Crying

Information about responsive feeding from the UNICEF UK Baby Friendly Initiative is here: https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/relationship-building-resources/responsive-feeding-infosheet/

https://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2017/12/Responsive-Feeding-Infosheet-Unicef-UK-Baby-Friendly-Initiative.pdf

Tips For Responsive Bottle Feeding | KidsHealth NZ

https://starship.org.nz/guidelines/feeding-bottle-feeding/

GUIDANCE FOR BREASTFEEDING LATCHING AND POSITIONING

Offer māmā support with positioning, alignment and attachment of their pēpi

Remain as hands off as possible to empower māmā and her whānau.

- Early breastfeeding (within an hour of birth) and good attachment is key to breastfeeding success - optimises milk supply for pēpi and reduces risk of painful breastfeeding for māmā
- In partnership with māmā discuss how to ensure pēpi is attached correctly onto the breast prior to attempting feed

LATCH

Ideally a staff member will be present to support a feed before the infant latches.

Māmā and staff should observe the following.

- First point of contact is the lower jaw or chin of pēpi on māmā' areola to stimulate a wide gape of pēpi mouth
- No obstruction behind pēpi head to allow pēpi to tilt backwards slightly, to assist with latch position and avoid the head being pushed forward on to the breast.
- Tongue down and forward
- Nipple aimed at the roof of mouth of pēpi

Signs pēpi correctly latched:

- Pēpi mouth wide open
- Lower lip flanged out
- Tongue forward over gums
- Cheeks not dimpled
- Chin against breast
- Jaw positioned well over the lower areola to make effective suckling possible
- Sounds of swallowing
- Pain-free breastfeed. Some brief pain may be experienced on initial latching for the first ten days to two weeks, but this should disappear once the nipple is drawn back to the junction of the hard and soft palate. Pain should not suddenly appear during a feed – a sign that the latch has been released.

What to look for after pēpi releases the nipple

- A rounded nipple
- No signs of trauma, pinched nipples or 'stripes' on the nipple or areola which indicate the latch was shallow, not effective and causing nipple damage

CHIN principles

- **C**lose – Pēpi needs to be close to māmā to enable attachment at the breast
- **H**ead free – pēpi tilts the head back when latching which allows the chin to lead
- **I**n line – the head and body of pēpi are in alignment, so pēpi does not have to twist the neck/head to latch
- **N**ose – pēpi roots for the nipple when it is resting below the nose

https://globalhealthmedia.org/videos/breastfeeding-attachment/

https://www.youtube.com/watch?v=UXyLzqsySQc

https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/breastfeeding-resources/ineffective-attachment/

POSITIONING

The way māmā holds her pēpi affects how easy it is for pēpi to feed effectively

There is no single best position. Māmā should be encouraged to find the positions most comfortable for her.

Signs of effective positioning

- Māmā is supported and comfortable
- Pēpi is held securely, facing māmā
- The ear, shoulder and hip of pēpi are in line – not twisted
- The nose of pēpi is brought towards māmā breast
- The head of pēpi if supported by māmā, can tilt back
- Māmā nipple is deep within the mouth of pēpi to get more milk

https://globalhealthmedia.org/videos/breastfeeding-positions/

Breastfeeding small pēpi – attachment & positioning: https://globalhealthmedia.org/videos/breastfeeding-the-small-baby/

Effective breastfeeding and milk transfer: https://education.possumsonline.com/video/baby-transfers-milk-beautifully

Feeding resources for māmā and whānau: https://globalhealthmedia.org/videos/attaching-your-baby-at-the-breast/

Breastfeeding small pēpi includes positioning and attachment: https://globalhealthmedia.org/videos/breastfeeding-your-small-baby-for-mothers/

Breastfeeding » Plunket

La Leche League New Zealand

Feed duration

Transitional care pēpi can tire easily whether breast or bottle fed. Māmā also needs time to rest between feeds to improve her milk supply.

Breastfeed each feed with top-up – breastfeed may be for a limited time (e.g. 20 mins) so that pēpi does not over tire. Total feed time 30mins (including top up)

Breastfeed without top-up – breastfeed and nappy change should be completed within 40 mins. After 30mins if pēpi still sucking give a top-up.

BREASTFEEDING ASSESSMENT

Provide a full breastfeeding assessment at every feeding opportunity, minimum once a shift, with ongoing review of the **TC pēpi feeding record**. Breastfeeding code (starship.org.nz)

Aim for 8-12 feeds per 24 hours – dependent on the breastfeeding assessments

If pēpi is not actively breastfeeding and expressing is necessary, colostrum is usually collected in syringes in the first 48 hours.

Hand expression rather than the use of a breast pump is more effective when collecting colostrum. Some māmā may also have collected colostrum during pregnancy – e.g. diabetic māmā. Ensure that the colostrum is safely stored and given to pēpi as necessary. Collected colostrum may be given to pēpi via the syringe in drops, but the syringe should not be placed inside the mouth of pēpi. Ongoing use of syringe feeding is not recommended after 24 hours.

At least once a shift, collaboratively discuss how to recognise an effective feed and milk transfer with māmā and whānau and jointly complete the pēpi feeding record.

NB: staff are responsible for ensuring the TC pēpi feeding record is completed each shift.

Breastfeeding code and supplemental feed guide for TC pēpi

The following 'Breastfeeding Code' is a guide only. Please consider maternal milk volume, milk ejection reflex and medical condition of the pēpi when assessing a breastfeed.

Follow the steps below to make a breastfeeding assessment of pēpi to determine how much supplement is required. Document on feeding record chart of pēpi

Use the following scale to score and document pēpi breastfeeding ability and whether a supplement/top-up is required:

A. Offered the breast, not interested/sleepy.
B. Interested in feeding but does not latch.
C. Latches onto the breast, however comes off and on or falls asleep.
D. Latches, however sucking is uncoordinated or has frequent long pauses.
E. Latches well, long slow rhythmical sucking and swallowing - Short feed.
F. Latches well, long slow rhythmical sucking and swallowing - Long feed.

Note: All infants have different sucking patterns and pauses, therefore timing a breastfeed does not provide an accurate assessment.

WHAT TOP UP IS REQUIRED?

A, B, C and D requires full supplemental feed.

(Consensus from working group pēpi 35/36 weeks of age, who are assessed as having an A-D should receive a full top-up)

E requires ½ supplemental feed.

F usually requires no supplemental feed.

If transitioning to F feeds, the pēpi may be given a smaller volume than ½. Pēpi may wake sooner for the next feed.

For the breastfed TC pēpi, supplementary feeds should ideally be given by nasogastric tube or alternative feeding methods discussed with their māmā.

If nasogastric feed is indicated, it is preferable to provide the opportunity for pēpi to have skin-to-skin contact or nuzzling at the breast.

Refer to the date on the pēpi feeding plan for volume of supplemental feed required – kept at bedside of māmā and pēpi

Guideline for feeding volumes in the first week of life

The initial volume addresses the basal metabolic requirements around 40 mLs/kg/day.

This avoids loss of stamina and condition seen in some near term and small for gestation pēpi.

e.g. When pēpi is too sleepy to latch effectively, the full feed should be given. Give all available colostrum first, and supplement above that.

e.g. Day 0 in a 2.5 kg pēpi 2.5 x 40 = 100 mLs divided by 8 for 3 hourly = 13 mLs 3 hourly

This may need to be given by nasogastric tube or tube to breast method.

Breastmilk expression should be commenced, and an experienced midwife or Lactation consultant input is recommended.

As breastfeeding establishes with improved latch and milk transfer the amount of supplementation can be reduced in collaboration with a breastfeeding expert and whānau involvement.

Expressing should be commenced as soon as possible after birth after gaining informed consent from the māmā. Lactation consultant input can be sought out if indicated.

Both the breastfeeding code and the volume of milk given for each feed should be documented on the pēpi feeding record and align with the feeding plan. The feeding plan should be updated in consultation with whānau as pēpi establishes breastfeeding. (this should be an adjustable plan not static by shift).

Pēpi age in days		0 (1st 12 hrs)	1	2	3	4	5	6	7
mLs/kg/day		40	60	75	90	105	120	150	165
		mLs per 3 hourly feed (8 feeds per day)							
Pēpi age in days		0 (1st 12 hrs)	1	2	3	4	5	6	7
Weight	2.0 kg	10	15	19	22	26	30	37	41
	2.25 kg	11	17	21	25	30	34	42	46
	2.5 kg	13	19	23	28	33	38	47	52
	2.75 kg	14	21	26	31	36	41	51	57
	3.0 kg	15	22	28	34	40	45	56	62
	3.25 kg	16	24	30	37	43	49	61	67
	3.5 kg	17	26	33	39	46	53	66	72
	3.75 kg	19	28	35	42	50	56	70	77
	4.0 kg	20	30	37	45	53	60	75	83
	4.25 kg	21	31	40	48	56	64	80	88
	4.5 kg	23	33	42	51	59	68	84	93
	4.75 kg	24	35	45	53	62	71	89	98
	5.0 kg	25	38	47	56	66	75	94	103
	5.25 kg	26	39	49	59	69	79	98	108
	5.5 kg	27	41	52	62	72	83	103	113

(Feed volumes based on Te Whatu Ora Te Toka Tumai and Capital and Coast Women's health service pēpi feeds in the first week of life).

TRANSITIONAL CARE FEEDING RECORD

Daily Feeding Record Transitional Care

(TO STAY WITH PĒPI IN ROOM – FILE IN PATIENT NOTES)

Te Whatu Ora
Health New Zealand

NHI ..... WARD .....
SURNAME .....
FIRST NAME .....
GENDER ..... DOB ..... AGE .....
(or affix patient label)

Date: ……/……/……

Mode of birth:	**Gestation:**	**CGA:**
Date of birth:		**Time of birth:**

FLUID TYPE CODES

☐ **PDM:** Pasteurised donor milk ☐ **EBM** Expressed breast milk
☐ **DBM:** Donor breastmilk ☐ Donor Health Screen suitable NHI: .....
☐ Consent form on reverse signed by parents and staff
☐ **IF:** Infant formula (ready to feed) ☐ **Consent information provided**
Consent : MOTHER'S SIGNATURE: ..... DATE: ……/……/……

Birth weight: ..... **Current weight:** ..... ↑↓ **Weight next due:** .....

	FEEDING PLAN	BLOOD GLUCOSE		EBM/DONOR BREASTMILK or INFANT FORMULA									OUTPUT	
Time	mLs/kg/ day ÷ no. of feeds	BG	Before or after feed	BF code L R	Reason code	Fluid volume	Fluid type code	Method code	Donor ID #	Mama initials	Staff initials	Comments *(include if requires assistance)*	Urine	Bowel motion colour

BREASTFEEDING CODES

A Offered but doesn't latch
B Interested but doesn't latch – **demonstrates feeding cues**
C **Latches on and off – not sustained**
D **Latches – uncoordinated suck, low to nil swallowing**
E **Latches – coordinated rhythmical sucks with some audible swallows**
F **Latches – feeds with multiple rhythmical sucks and multiple audible swallows – sustains effective milk transfer**

If any consecutive breastfeeds are A-D, do a full set of NEWS observations and consider recording 'feeding concerns' in NOC/NEWS (Ref.2401230)

REASON CODES

1. Prematurity
2. Hypoglycaemia
3. Dehydration
4. Weight loss (≥72hr) is ≥10% of birth weight)
5. Severe hyperbilirubinaemia
6. Maternal medication
7. Parental request. Not clinically indicated.
8. Other: .....
.....
.....
.....

METHOD CODES

S: Syringe (for colostrum only)
SFT: Supplementary Feeding Tube
B: Bottle
NG: Naso Gastric Tube

USE OF DONOR BREASTMILK, AND COMMERCIAL MILK FORMULA (CMF)

1. **The use of donor milk or commercial milk formula (CMF) in Transitional Care aligns with the Baby Friendly Hospital Initiative – Ten Steps to Successful Breastfeeding**[1]

   TC complies fully with the International Code of Marketing of Breastmilk Substitutes and relevant World Health Assembly resolutions

   Staff avoid giving breastfed pēpi any food or fluids other than breastmilk unless clinically indicated or requested by māmā/ whānau.

   Should māmā decide not to breastfeed, discuss with māmā the use and risks of using feeding bottles, teats and pacifiers.

   The use of donor milk and CMF requires consent process.

2. **Transitional Care guidelines also align with the National Breastfeeding Strategy for New Zealand Aotearoa | Rautaki Whakamana Whāngote**[2]

   System settings support the safe provision of donor breastmilk for pēpi in need.

   Wherever possible, screened and pasteurised or screened donor milk can be used as a supplement, if māmā own milk is not fully available. This is an informed consent process. Access to donor milk will vary between units.

3. **No food or drink other than breastmilk should be given to breastfed nga pēpi unless clinically indicated or as a requested by māmā**.

   Breastfeeding wāhine are supported to make informed decisions regarding the introduction of any milk substitute other than breastmilk if clinically indicated, and/or at maternal request.

4. **Formula fed pēpi**

   Māmā who decide not to breastfeed will receive information and support. Whānau who are using commercial milk formula are supported to feed their pēpi responsively and provided with information about pēpi feeding cues.

   Staff will provide whānau with information and demonstrations about the safe reconstitution of powdered milk and safe storage and handling prior to discharge.

   On the final day of stay, whānau will provide their own formula for pēpi (individual supply).

   While inpatients, the New Zealand national standard is for all pēpi to receive ready to feed commercial milk formula, unless there is a medical reason for pēpi to have a special formula.

5. **Pēpi transferred from NICU who are on human milk fortifier**

   This only applies to pēpi transferred from NICU and the clinical team will determine duration.

6. **Maternal and neonatal conditions that impact on breastfeeding**[3]

   Infants for whom breastfeeding is contraindicated, for either maternal or infant reasons, will require supplementation.

   Supplementation may be required for a time if the māmā is not able to provide sufficient breastmilk. Māmā should be supported to increase milk supplies whenever possible.[4]

References

1. https://www.babyfriendly.org.nz/fileadmin/Documents/The_Ten_Steps_to_Successful_Breastfeeding_2020.pdf
2. https://www.health.govt.nz/our-work/life-stages/breastfeeding/national-breastfeeding-strategy-new-zealand-aotearoa-rautaki-whakamana-whangote/protecting-promoting-and-supporting-breastfeeding-new-zealand-hapaingia-te-whangote-ki-aotearoa/outcome-5-putanga-5-system-settings-support
3. https://www.who.int/publications/i/item/9789240005648
4. https://med.stanford.edu/newborns/professional-education/breastfeeding/maximizing-milk-production.html

Maternal conditions that impact on breastfeeding[1]

It is important staff can identify māmā who may require additional support or who have identified risk factors which may impact the initiation and establishment of lactation. This includes, but is not limited to, māmā who:

- Are medically/obstetrically unwell or have medical conditions such as diabetes
- Have a history of breastfeeding difficulties
- Have had breast surgery of any kind
- Have a history of illness involving hormonal function
- Have a history of infertility treatment
- Have had a difficult birth
- Have had a caesarean section birth
- Have had a multiple birth
- Have had a postpartum haemorrhage
- Have pēpi who are sleepy, mucousy or disinterested in breastfeeding
- Have been separated from their pēpi for a clinical reason
- Have mental health challenges/addictions and maybe on medications that impact on maternal alertness, concentration, milk supply or impact on the pēpi ability to settle and feed and in some cases showing signs of withdrawal and specialist support for the māmā is required.

Reference

Breastfeeding Support Guideline (GLB05) – *page 2*

EXPRESSING BREASTMILK

Most māmā don't need to express milk or use a breast pump, however many TC pēpi initially have limited stamina and both māmā and pēpi require additional expert support to ensure effective breastfeeding is established.

For māmā to establish and maintain a good milk supply, it is essential for māmā to express milk either by hand or pump as often as pēpi would normally feed. (At least eight times every 24 hours, including at least once overnight).

https://www.healthinfo.org.nz/patientinfo/82319.pdf

https://www.thewomens.org.au/images/uploads/fact-sheets/Expressing-breastmilk-05819.pdf

HAND EXPRESSION

For the first two to three days after birth, it's usually more effective to express by hand, as colostrum is too thick for breast pumps to remove effectively. Some māmā also find that expressing by hand works well for them long-term if they need to remove milk in between breastfeeding. You can find useful information and tips about expressing milk by hand on

KidsHealth – How to express breastmilk: this includes a video on how to hand express.

BREAST PUMPS

The reason for using a pump will determine which pump is necessary.

Intensive and Long-term use

Pēpi is not feeding from the breast at all, for example:

- Pēpi is low birth weight and in a special care or neonatal intensive care unit
- Early term pēpi is not feeding at the breast and this is likely to be a long-term issue
- Pēpi has a long-term feeding challenge – for example pēpi who is cleft affected

Electric pumps

While in a TC service a hospital duty electric pump, consumables and educational support need to be provided for māmā. While hospital grade electric pumps are ideal for long-term intensive usage, these pumps cost over $2500 for the basic model, so usually not within the budget of most on discharge home and usually rented.

These are closed system pumps, and individual users will need to purchase a personal kit when hiring this type of pump. Pumps are cleaned by the rental service between users.

Less intensive Long-term usage
Once discharged, māmā may prefer to purchase a mini electric pump. These pumps are open-system, single user, personal models.

Short term or occasional usage
For short-term breastfeeding challenges, or for māmā with pēpi who are breastfeeding well but who are separated occasionally from pēpi, a hand pump is usually sufficient. Hand expressing is also a good option

Health professionals should provide pre-discharge advice regarding the pros and cons of each system, that considers the individual needs of pēpi/ māmā / whanau.

Double or single pumping – or both?
Breast pumping may be done using one breast at a time (single) or both breasts together (double) which is why there are two types of personal kits available to purchase. If a double kit is purchased this may also be used as a single option.

Advise māmā to stimulate the breast/s before the pumping starts, whether single or double pumping. It is also a good idea to switch to single pumping when the milk flow stops or slows significantly in one breast. This enables pumping to continue on the breast where milk is still flowing, and it also makes breast compression possible as a free hand becomes available. After the milk flow has stopped in the second breast māmā may return to pumping the first breast using single pumping, and breast compression.

BREAST SHIELDS

A correctly sized breast shield of an adequate diameter avoids unnecessary compression of the milk ducts and avoids friction around the nipple area which can result in nipple damage.

The nipple should be centred carefully in the opening of the breast shield tunnel prior to switching the pump on. During pumping, the nipple should move freely in the shield tunnel, rhythmic movements should be noted during the pump cycle and pumping should feel comfortable and pain free. If the nipple is not moving and appears squashed into the tunnel, then a larger breast shield is necessary. If the nipple and a large amount of areola are being pulled into the shield tunnel during pumping a smaller shield may be necessary. There are four or five different sizes of breast shield available.

A comfort breast shield, soft fit breast shields or soft fit kits are also available for use with some brands to increase comfort during pumping.

MILK STORAGE

Expressed breastmilk can be stored in plastic or glass containers with airtight, sealed lids. The date and time can be written on the bottle/container or on a sticky label securely attached to the bottle/container.

Fresh breastmilk or breastmilk in the fridge has more beneficial properties than frozen milk but frozen milk is still fine and far preferable to infant formula in multiple ways.

Milk should be stored in amounts from around 60mls to 200mls making sure there is a space free from milk at the top of the bottle as the milk will expand when freezing and spill over the top.

If māmā is planning to express a few times a day and getting small amounts at each expressing time the milk expressed may be placed at the back of the fridge. When next expressing, this ‘new’ milk should also be placed in the fridge. When the second bottle of milk has cooled to fridge temperature the two bottles may be mixed. This can occur over a 24-hour period as long as the milk to be added is cooled first.

Warm milk should never be added to cold milk or to frozen milk as this can cause some thawing of part of the milk and may lead to bacterial contamination.

Expressed breastmilk should be stored at the back of the fridge. Fridge doors tend to get opened a lot and the back of the fridge is cooler. If breastmilk is unable to be stored in a fridge or a freezer straight away, the milk can be stored in a chilly bin with ice packs in contact with the bottles of milk for about 24 hours only.

Breastmilk storage times for well and healthy full term pēpi at home
(MOH NZ Storage of breastmilk guidelines)

STORAGE CONDITIONS	STORAGE TIME	HANDY HINTS
In a room (< 26ºC)	4 hours	Cover the breastmilk and keep in the coolest place possible
Fridge	48 hours	Store milk in the back of the fridge
Frozen ☐ Freezer box in fridge ☐ Separate fridge/freezer ☐ Deep chest freezer	☐ 2 weeks ☐ 3–6 months ☐ 6–12 months	Use the frozen breastmilk to mix with your baby's food when you introduce this from six months

Using stored breastmilk
Frozen breastmilk can be thawed in the fridge slowly, or by placing the bottle of milk in warm water if there is a need to thaw faster.

Microwaves should never be used to thaw or heat breastmilk as this causes uneven heating which can scald a baby's mouth and it also damages some of the important immune proteins in breastmilk. Warm the expressed breastmilk in a jug of hot water. Test the temperature of the milk by shaking a few drops on to the inside of a wrist.

Do not re-warm breastmilk that has been defrosted and previously heated.

How to Pump & Store Breastmilk (Video) (for Parents) - Children's Health Network (kidshealth.org)

Nasogastric tube feeding

Overview

Late preterm pēpi and their māmā have unique needs related to successful breastfeeding, their management is challenging for māmā and healthcare professionals.[1] Late preterm pēpi have decreased reflexes, decreased feeding cues and inadequate breastmilk transfer due to low muscle tone and decreased stamina. Because of their immaturity, they are less alert and have greater difficulty coordinating latch, suck, and swallow than full-term pēpi. Some physically large pēpi appear deceptively vigorous and therefore more mature. Outwardly they may seem to demonstrate effective feeding, and may receive less attention; however they often do not transfer adequate breastmilk volume when checked with test weights.[2] Assessment for readiness to feed and supplementation via nasogastric tube, or bottle can be provided in transitional care. Syringe feeding is not advised due to aspiration risk[3]

Equipment

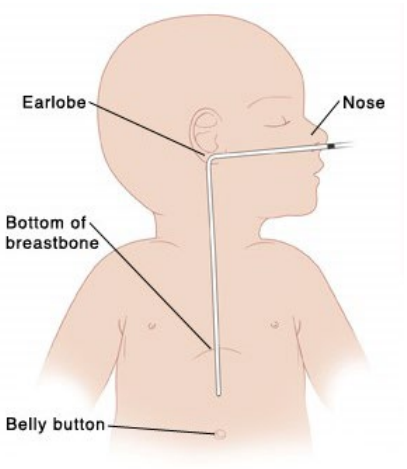
- Gastric tube – F 6
- Duoderm (or similar) for base tape
- Hyperfix (or similar) tape
- pH indicator strip
- 2ml syringe
- Sucrose[4]
- Non-sterile gloves

Procedure

Explain in appropriate terms to the family the rationale for, and procedure of a nasogastric tube

1. Swaddle pēpi and administer sucrose as charted prior to procedure (4)
2. Select the appropriate size gastric tube; size 6 French for most pēpi.
3. Measure with the feeding tube the length from the nose to the base of the ear and then to midway between the xiphisternum and umbilicus. This will be the length of insertion.
4. Place duoderm base tape on the cheek where the tube is to be anchored.

5. Put on gloves. Place your hand under the head of pēpi, insert the tube into the nostril angling it towards the back of the nose to the correct insertion length. Do not force the tube. If there is resistance, the tube comes back via the mouth or other nostril, or there is a change in infant's colour or work of breathing, then the procedure should be stopped to allow the infant to recover prior to any further attempts.



6. Aspirate the tube with the syringe. If no aspirate can be obtained position pēpi on to left side, try aspirating again.
7. Test the aspirate on the pH indicator strip – pH strip needs to show a reading of 5 or less to indicate the tube is in the stomach and safe to use. (In the event of pH 6+ aspirate or no aspirate – see table below ('Reducing the risk of harm from misplaced gastric feeding tubes')
8. Secure the tube with hyperfix to the duoderm base tape. Fix right up to the nostril, taking care not to obstruct the nostril or apply tape to the lips.
9. The tube must be re-tested prior to any feed.
10. Document the tube length and date of insertion in the record of pēpi.

Checking of position and tube feeding can be performed by māmā/whānau once appropriate training has been given or performed by healthcare professional's dependent on local guidelines.

Top up volumes will be dependent on blood sugar levels, gestation, effectiveness of feeding, weight loss/gain and age of infant. Breastfeeding codes can provide guidance and volumes can be discussed with senior midwives, nurses, or the paediatric/NP service overseeing care.

Top-ups can be given whilst pēpi is at the breast to stimulate further sucking and to support association of breast with feeding.

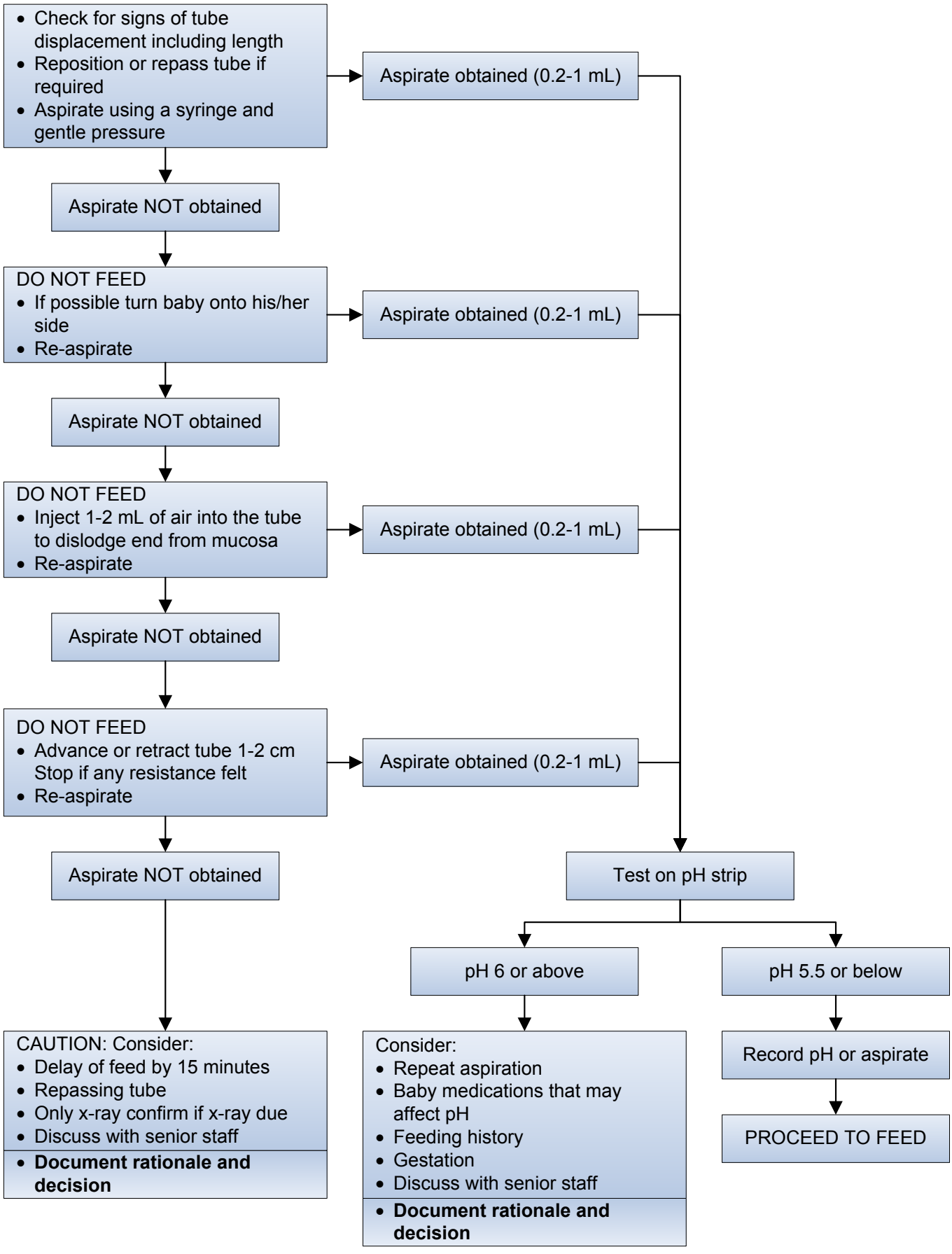
Transition from nasogastric to oral feeding

As breastfeeding attempts improve, and weight gain occurs gradually reduce NGT top-ups and increase breastfeeding time as tolerated by pēpi and establishment of lactation. Individual changes will be discussed with māmā/whānau and documented on pēpi Transitional care feeding record.

Aim is for pēpi to be discharged home fully breastfeeding or with top-ups via bottle if lactation delayed.

However, for pēpi needing longer term NGT feeds, **and** there are tube feeding protocols for nasogastric feeding in the community, a feeding plan discussed with whānau and agreed to by the provider needs to occur prior to discharge.

Reducing the risk of harm from misplaced gastric feeding tubes



- Discuss with senior staff
- Document rationale and decision

References

1. Tomashek, K.M., Shapiro-Mendoza, C.K., Weiss, J., Kotelchuck, M., Barfield, W., Evans, S., . . . Declercq, E. (2006). Early discharge among late preterm and term newborns and risk of neonatal morbidity. *Seminars in Perinatology, 30*(2), 61-68. doi:10.1053/j.semperi.2006.02.003
2. Academy of Breastfeeding Medicine. (2016). Academy of breastfeeding medicine clinical protocol #10: Breastfeeding the late preterm (34–36 6/7 weeks of gestation) and early term infants (37–38 6/7 weeks of gestation). Retrieved from https://abm.memberclicks.net/assets/DOCUMENTS/PROTOCOLS/10-breastfeeding-the-late-pre-term-infant-protocol-english.pdf
3. de Rooy, L., & Johns, A. (2010). Management of the vulnerable baby on the postnatal ward and transitional care unit. *Early human development, 86*(5), 281-285. doi:10.1016/j.earlhumdev.2010.05.004
4. Schug,S., Palmer,G., Scott,D.(2015) Acute Pain Management: Scientific Evidence . The paediatric patient p468

Discharge criteria for transitional care pēpi

Every pēpi, māmā and whānau should be assessed and consulted individually to determine the support needed.

If possible, avoid discharges on a Friday or before Public Holiday if a home visit cannot be provided over the weekend/holiday period.

Criteria for discharge

GENERAL

- Pēpi condition is stable
- A discharge pēpi check is completed by midwife, LMC or neonatal team.
- Pēpi temperature is stable, within normal limits with light clothing and bedding.
- Will depend on reason for TC, e.g. duration of antibiotics (5D), Gestation and Birthweight.

FEEDING AND GROWTH

Pēpi can be discharged from Transitional care when māmā feels confident with her chosen method of feeding and the following additional criteria has been met.

- Satisfactory feeds have been observed and documented on the Pēpi Feeding Chart. Māmā is independent with feeding and NG ceased (in most cases).
- Weight loss is less than 10% of birth weight and depending on age now gaining.
- Pēpi has a weight gain following cessation of NGT feeds for a minimum of 48 hours.

OR

- If pēpi is bottle feeding or breast with bottle top-ups, they can be discharged when they have had a weight gain
- Regardless of method of feeding, pēpi with a birthweight less than 3rd % or has lost more than 10% of its birthweight, two consecutive weight gains are required prior to discharge
- If pēpi is suitable for discharge on NG top-ups, then appropriate education and discharge support must be available. Pēpi will have BF skills, but lack stamina and is expected to not require NG for longer than 7 days.
- If specialised milk has been prescribed, māmā/whānau need to be aware they will be required to follow up with the GP or a paediatrician for advice on when to discontinue the specialised milk. This will need to be prescribed prior to discharge.

Information for māmā and whānau on discharge

- In partnership with māmā, whānau and LMC, provide a written discharge plan that includes feeding plan, LMC visiting plan and contact numbers for their key community supports, e.g. lactation consultant, Neonatal homecare/outreach (if > 6 weeks), Well Child Tamariki Ora (WCTO)provider.
- Ensure māmā/whānau
  - Know how to administer any prescribed medications if required post discharge
  - Is aware of any follow up appointments that pēpi needs
  - Knows who to phone if any concerns once home
  - Has Well Child book and discharge paperwork

- Provide information about Safe Sleep and SUDI
- Provide information sources, e.g. Kidshealth, local support groups, e.g. multiple birth and church groups and pamphlets, on what to expect with respect to the development and progress of their pēpi.

Communication

Prior to discharge, ensure a robust handover of care and sharing of information with appropriate community and primary care teams.

Documentation

Ensure all aspects of the discharge process are documented and are appropriately shared in timely manner with māmā/whānau/health care professionals involved in care.

National safety guideline links

Safe sleeping

Safe Sleep For Your Baby | KidsHealth NZ

Smoke free

HealthInfo Canterbury

Family violence

Family Violence | KidsHealth NZ

National SUDI training

https://training.sudinationalcoordination.co.nz/

Maternal considerations

Criteria for māmā/whānau in transitional care

- Māmā presence with her pēpi 24/7 is the cornerstone of transitional care. (allowing for short breaks)
- Māmā is physiologically stable. The admission of higher risk whānau to a TC service will be delayed until they are assessed as medically stable, e.g. cardiac, severe PET.
- It is expected that stable neonatal substance withdrawal pēpi requiring oral morphine can remain in TC where whānau demonstrate a willingness to engage with the service.
- Cases where māmā/ whānau would benefit from support with parent craft, should be assessed and accepted on a case-by-case basis.

Maternal care and assessment

Most māmā/pēpi dyads who meet the criteria for transitional care will be able to be admitted soon after birth. However, admission of higher risk māmā to a TC service will be delayed until they have been assessed as medically stable, e.g. cardiac, severe PET.

Time of admission of māmā/pēpi dyads to transitional care services will vary regionally depending on the physical location of the transitional care service, access to specialist services for māmā and pēpi, in particular, the time required to access emergency care if required.

Handover to transitional care

A thorough LMC/midwifery/obstetric handover is required for any māmā admitted to a TC service, as per local policy.

Maternal in-service training for staff

All services providing TC need to ensure appropriate in-service training that covers common post-natal conditions is provided prior to staff delivering TC service. This is especially true for those TC services that are remote from secondary care. Local training resources and escalation plans needs to be developed to respond to emergency care requirements, e.g. delayed PPH.

This should include but not be limited to all staff trained in:

- Assessment and documentation of maternal vital signs and use of escalation tool, e.g. MEWS
- Adult CPR
- Identifying and managing common post-partum conditions such as post-partum haemorrhage
- Knowledge of how to access further expertise/support after hours, if required. Individual services to develop maternal escalation pathway.
- Common chronic health conditions impacting māmā, e.g. diabetes.
- Care of women with mental health needs, including appropriate referrals to ensure post discharge support
- Family violence
- Power to protect (training and teaching)
- Safe sleep (training and teaching)
- Smoke free MOH site (training and teaching)

MEWS

Clinical deterioration/escalation pathway

New Zealand National Maternity Early Warning System (MEWS): for all pregnant women of any gestation including up to 6 weeks after birth.

https://www.hqsc.govt.nz/our-work/improved-service-delivery/patient-deterioration/workstreams/maternity-early-warning-system/

As per information from the website link, the system includes:

- a standardised maternity vital signs chart (or electronic equivalent) with an early warning score
- a localised escalation pathway
- effective clinical governance and leadership
- appropriate clinical and non-technical education and training
- ongoing measurement for improvement
- an escalation process for clinician, woman, family and whānau concerns.

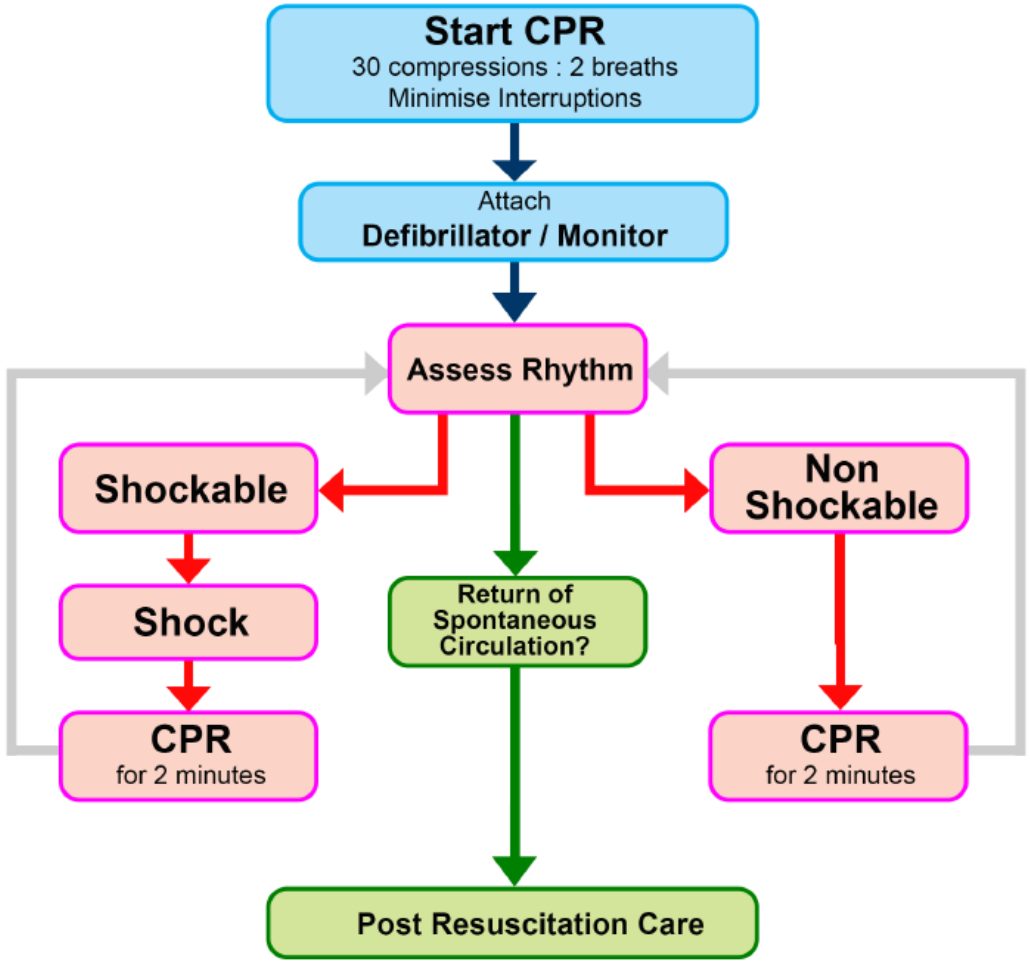
The system is designed to identify acute deterioration in women who are admitted to a hospital during pregnancy or within 42 days of birth (not routinely during labour).

The maternity vital signs chart is based on the existing national adult vital signs chart, which the Commission has introduced to hospitals as part of its patient deterioration programme. It uses eight vital sign parameters specific to maternity to calculate a maternal early warning score. When the score is reached, it triggers a response based on the local escalation pathway, so the appropriate actions can be taken to manage the woman's condition.

Most hospitals will have implemented either in maternity or hospital wide by early 2021.

The Commission handed over MEWS to the Ministry of Health's maternity team for ongoing monitoring and sustainability.

Advanced Life Support for Adults



During CPR

Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
(e.g. charge manual defibrillator)

Drugs

Shockable

* Adrenaline 1 mg after 2nd shock (then every 2nd loop)
* Amiodarone 300mg after 3 shocks

Non Shockable

* Adrenaline 1 mg immediately (then every 2nd loop)

Consider and Correct

Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care

Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Aim for: SpO2 94-98%, normocapnia and normoglycaemia
Targeted temperature management

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AUSTRALIAN RESUSCITATION COUNCIL
NEW ZEALAND Resuscitation Council WHAKAHAUORA AOTEAROA