Developmental Care
Practical Application in NICU

Key messages

- Preterm infants are born prior to or during critical periods of brain development.
- Developmental care aims to reduce stress on infants and promote neurological development.
- Simple, easy to implement modifications to the nursery environment and care practices may help reduce morbidity.
- Attention to noise, light and position of neonates can all help to reduce stress and maximise outcomes.

Definition of Developmental care

The process of developmental care involves creating an environment for the infant that minimises stress while providing a developmentally appropriate experience for the infant and family.

Goals of developmental care - Infant

- reduce stress
- conserve energy and enhance recovery
- promote growth and well being
- support emerging behaviours at each stage of neurodevelopmental maturation

Goals of developmental care - Family

- encourage and support parents in the primary caregiver role
- enhance family emotional and social wellbeing

Developmental care refers to interventions that:

- support the behavioural organisation of the individual infant
- enhance physiological stability
- protect sleep rhythms
- Promote growth and maturation

Developmental care interventions include:

- optimal handling and positioning measures
- reduction of noxious environmental stimuli
- cue based care

Behavioural organisation

This refers to the ability of the infant to maintain a balance between the five subsystems:

- autonomic/physiologic
- motor
- state organisation
- attention / interaction
- self-regulation

Behavioural organisation

Examples would include the infant's respiratory status, muscle tone, posture, facial expressions, colour, visceral responses and visual attention.

How these behaviours are affected by external stimuli, either positive or negative, give information about the infant's ability to cope and organise their responses

Cue based care

This is a system of caregiving in response to the infant's behavioural cues, including the appropriate provision and modification of sensory stimulation.

Implementation of developmental care

Assessment includes the:

Nursery environment - including the acoustic environment, aspects of lighting, general layout and furnishings.

Infants - including regular review and modification depending on:

- condition of the infant
- infant's level of maturity and gestational age
- behavioural responses to care.

Noise effects

The threshold for cochlear damage for adults is 80-85 decibels and the newborn will have a lower threshold than this as the immature cochlear is more sensitive. In the nursery noises of this magnitude include closing portholes with a snap or placing bottles on the top of the plexiglass incubator.

Sound level recommendations for the nursery environment (Aus. and NZ guidelines) - **background noise should not exceed an hourly Leq 40-45 DB** (A).

Noise reduction tips

Implement these interventions to reduce noise:

- Turn radio volume down or off.
- Have designated quiet times during the day (while also remembering to keep to limits at all times).
- Close incubator portholes quietly.
- Encourage staff and visitors to talk quietly, and avoid talking over the infant in an open cot
- Avoid banging bin lids
- Set monitor alarm limits and tone at appropriate levels and try to silence alarms as soon as possible
- Monitor noise levels periodically to identify times and causes of high levels

Light

Lighting should be adjustable - the adjustment level range of 100-600 lux is recommended (Aus. and NZ guidelines).

Constant bright light in the nursery can interfere with natural diurnal rhythms and overstimulate the infant.

Light

Lighting should be adjustable - the adjustment level range of 100-600 lux is recommended (Aus. and NZ guidelines).

Constant bright light in the nursery can interfere with natural diurnal rhythms and overstimulate the infant.

Light

Interventions to maintain an appropriate individualised light environment include:

- Use adjustable light levels within each cot bay plus procedure light for observation and procedures.
- Monitor ambient light levels.
- Shield infants from bright light with cot covers, eye covers and dimmed lights.
- Reduce light levels generally in the nursery, maintaining a safe level for accurate clinical observation as necessary.

Positioning

Infants should be positioned with:

- symmetrical postures
- trunk flexion, shoulder and hip flexion and adduction
- shoulder protraction, hands near face
- neutral alignment of ankles and hips
- neutral alignment of head and neck whenever possible
- the use of swaddling or nesting to provide boundaries

Parental involvement

Parents are involved in decisions about interventions where possible. This promotes their understanding of their infant's behaviour and allows them also to practice cue based care.

Parental involvement

This allows them to experience positive interactions with their baby and **empowers them to recognize behavioural cues and become more confident caring for their baby.**

Nursery practices

Cue based care and clustering of care

- This involves caring for the infant while recognising the behavioural cues or stress responses and providing an appropriate strategy such as timeout or modification of care as appropriate.
- Clustering of cares encourages a minimum handling approach and protects periods of deep sleep by minimising the number of times an infant needs to be woken up or disturbed.

Nursery practices

Cue based care and clustering of care

If an infant is unable to cope with a particular cluster of care (observation of stress cues) then cluster fewer care procedures next time if possible.

Stressful or painful procedures

Minimise painful procedures and provide appropriate pain relief measures.

During these procedures the use of some comforting techniques can reduce stress responses.

Stressful or painful procedures

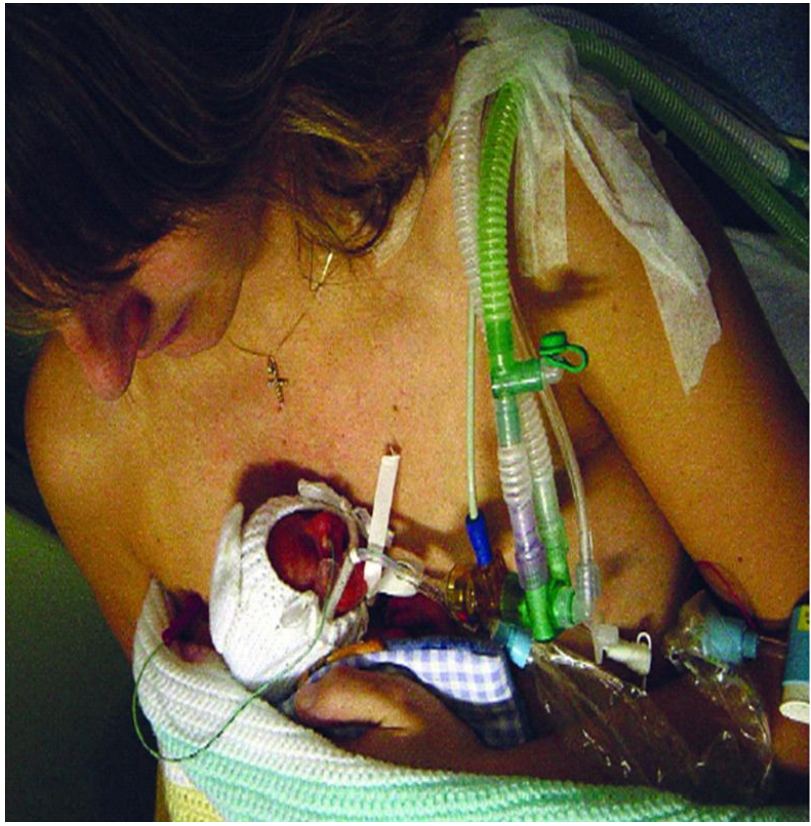
Comforting techniques include:

- non-nutritive sucking (dummy, cotton bud with breast milk or sucrose)
- containment of infant's arms and or legs (swaddle or gently holding hands together on chest and/or hold legs tucked up)
- grasping a finger

Feeding support

Provide support for breastfeeding or alternatives as required with the emphasis again on individualised family centred care.

Follow the infant's cues and pace the feeds, according to the infant’s capacity to organise sucking, swallowing and breathing.



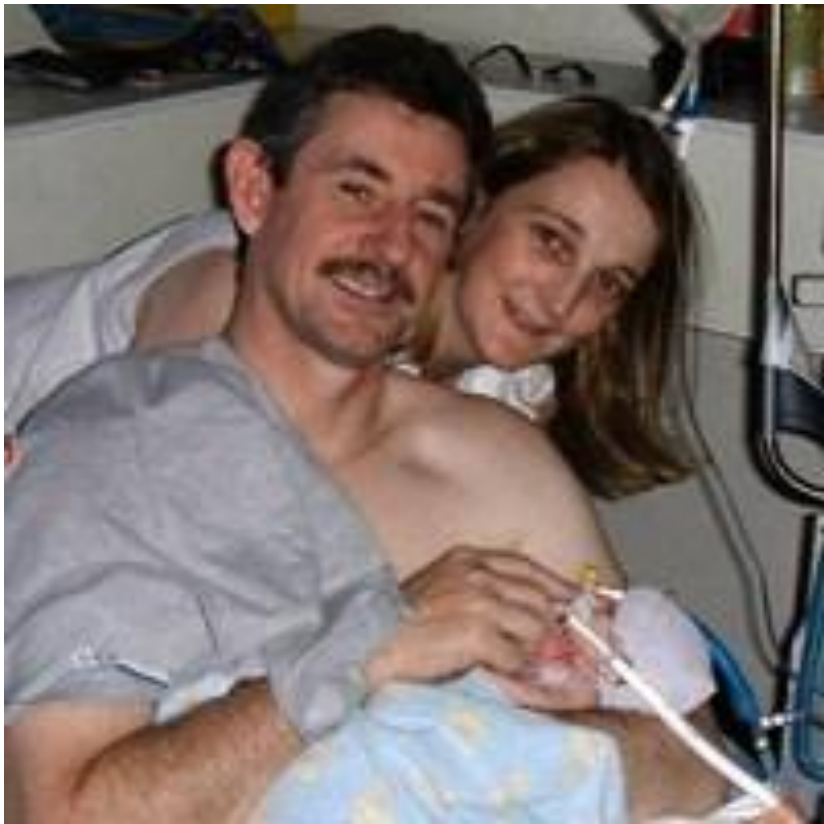
Non-nutritive sucking

Offer the infant opportunities to suck on a dummy or other suitable object, such as a finger, own hands or a suitable toy.

Use of non-nutritive sucking during tube feeding is helpful in the transition to suck feeds.

Staffing practices

Provide continuity of caregivers whenever possible. Develop caregiver groups for longer stay infants.



Handling techniques include:

- Handle infants in ways that minimise stress and uncontrolled responses.
- Contain the infant using hands or a light swaddle to keep them in a flexed and contained position.
- Move infant slowly and keep them in contact with the supporting surface whenever possible.
- Introduce touch slowly and allow time for the infant to respond and adjust to a change in position.

Noxious stimuli

Minimize the infant's exposure to noxious stimuli such as strong fragrances, open alcohol swabs outside the incubator, clinical procedures and adhere to lighting and noise guidelines.

Kangaroo care

Provide opportunities for kangaroo care when possible. Kangaroo care is early, prolonged and continuous skin to skin contact between a parent and a low birth weight infant.

Kangaroo care has been shown to:

- Improve state organisation.
- Reduce oxygen needs, improve respiratory patterns.
- Reduce apnoea’s and bradycardias.
- Improve thermal regulation.
- Enhance parent infant bonding and a parental sense of competence.
- Enhance cognitive and motor development.

Reference

Neonatal e-handbook: developmental care for neonates

http://www.health.vic.gov.au/neonatalhandbook/procedures/developmental-care.htm