The INDeSC study

Implementing neurodevelopmental supportive care in the South African context

Neuroprotective developmental care: How is your unit doing?

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9th National NNASA conference 18-20 September 2025 | Pretoria, South Africa

“Research reported in this presentation was supported by the South African Medical Research Council under a Self-Initiated Research Grant. Th views and opinions expressed are those of the author(s) and do not necessarily represent the official views of the SA MRC”.

Short term (hospital) benefits of developmental care

Medical Benefits

- Improved physiological stability.
- Improved oxygenation.
- Shorter ventilation and weaning from supplemental oxygen.
- Better weight gain, height and head circumference.
- Improved medical status with fewer complications.
- Quicker transition to oral feeding.

Cost effectiveness

- Sooner discharge
- Cost effectiveness
- Fewer consumables
- Less interventions, e.g. x-rays

Improved growth and development

- Improved neurobehavioural developmental outcomes (vital signs, growth measure, posture, tone, flexion, midline, sleep states, self-regulation and ability to interact) during the hospital stay of the preterm infant.
- Parental satisfaction and empowerment.

Pilot from 2019 to 2025

4 public and 5 private hospitals

North West	Gauteng	KwaZulu Natal	Eastern Cape	Northern Cape

Next step – scale-up

Some hospitals not part of pilot – due to permission mis-communication

Problem

- The evidence supporting NDSC has been stated clearly, however NDSC still seems to be implemented only by some healthcare professionals in selected units and even then, only in a fragmented manner and not as a comprehensive model of care.

Question

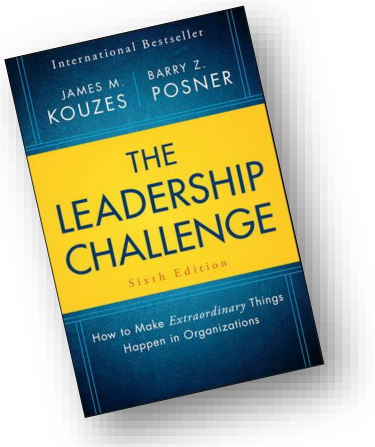
- How can Neurodevelopmental Supportive Care (INDeSC) be implemented to ensure integration and what is the effectiveness of the implementation strategy?

From evidence to implementation using a leadership model

Aim

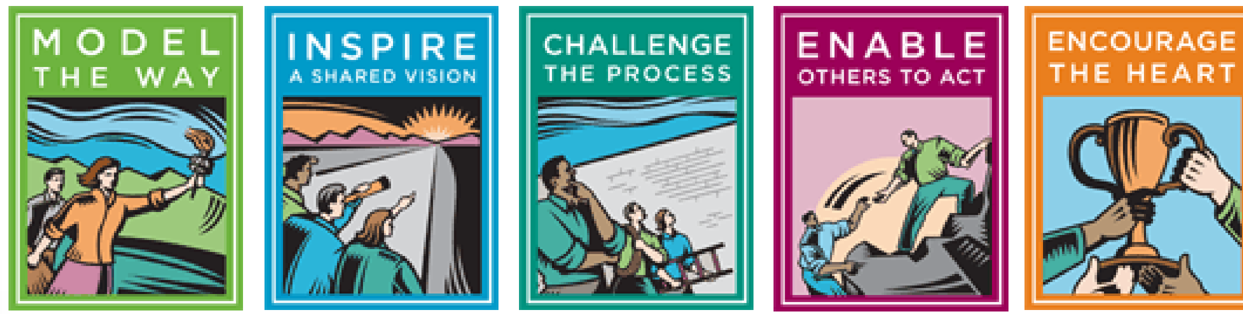
To implement neurodevelopmental supportive care as a comprehensive model of care to protect and support preterm infant development in all neonatal units in South Africa.

Train Leaders (champions)



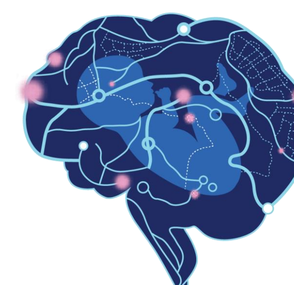
Kouzes & Posner Transformational Leadership Model (2011)

5 practices of exemplary leadership

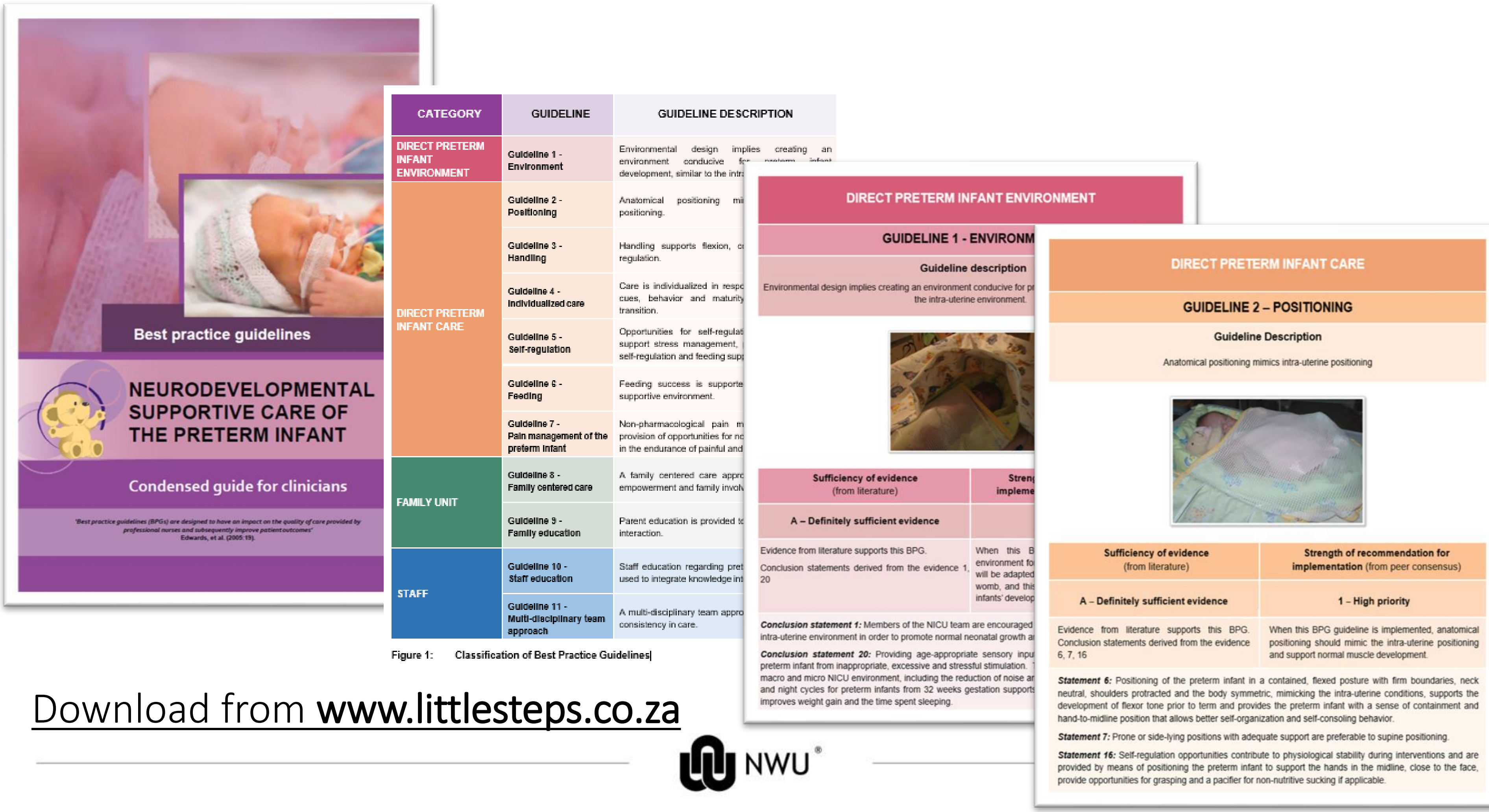


POPULATION: Project champions that are nominated by their hospital management in collaboration with peers in the neonatal unit and who are willing to participate in the research.

Implementation of Neurodevelopmental Supportive Care in the NICU



Best Practice Guidelines for NDSC in SA



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NWU

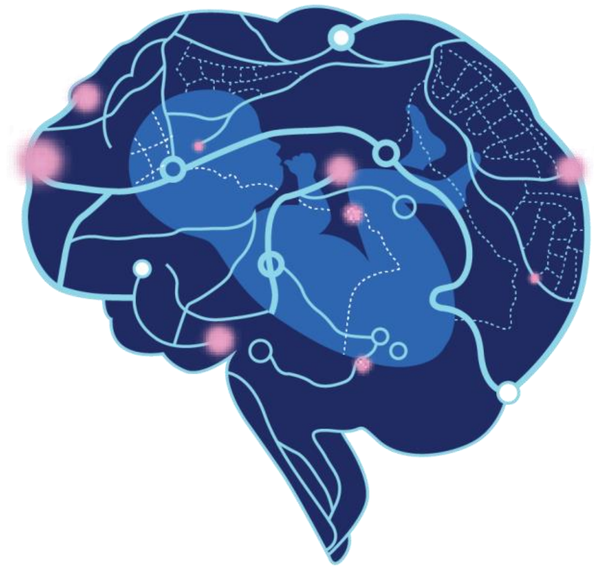
NDSC Situational Analysis

Situational analysis for Neurodevelopmental Supportive Care of the Preterm Infant

Unit:		Beds:	
Date:		Occupancy:	
Auditor:			

Situational analysis NDSC compliance

		Subtotal	Sectional total
1. NICU Design			0%
2. Individualised care			0%
3. Family centred philosophy			0%
4. Positioning			0%
5. Handling Techniques (transition support)			0%
6. Environmental manipulation	Noise	0%	0%
	Light	0%	
	Smell	0%	
7. Pain management			0%
8. Knowledge of infant development			0%
9. Feeding			0%
Total for unit			0%



Tool overview

NDSC Situational Analysis

Evaluation of the implementation of the principles of NDSC is based on compliance. Compliance = 2, Partial compliance = 1, Non-compliance = 0.

Scoring: General: If all the criteria for a certain item is met, it is deemed to be compliant to the criteria, score a 2. If some of the requirements are met, but there are room for improvement, it is partially compliant and scores 1. If very little or none of the requirements are met, it is non-compliant and score 0. Specific scoring is addressed if particular areas need to be compliant in the guideline section for that item. If the component is not applicable or observed, select N/A from the dropdown list. Comments to be included when 1 or 0 is scored as explanation of non-compliance.

Situational analysis NDSC

Principle	No	Guideline	Measurement Criteria	Score	Comments
1. NICU Design	1	First impression on entering the NICU. Does the unit overall create a quiet, dim, warm, impression. Lights should be dimmed, individual incubators shielded or covered. Low ambient noise. Minimal activity in general, with infant spaces away from traffic.	A uterine-like environment is created for each infant to support and environment conducive to growth and optimum development		
			Section Subtotal:	0.0%	
2. Individualised care	2.1	**Observation**: Observe the interaction between caregivers and infants. Interventions should be relevant to the infant's gestational age, adaptations to interventions and infant's cues and behaviours communicated during interventions.	The caregiver reads the infant's cues and behaviours		
			The staff responds to infant cues and behaviours		
			The caregiver continuously and systematically assess and evaluate the infant's developmental needs		
			Care is adapted according to cues and behaviours.		
	2.2	**Care:** Staff should individualise their caregiving interventions, including acting on the infant's cues. Individualised interventions respect the individuality of the infant. Appropriate actions include engaging in eye contact, gentle touch, and respectful communication.	Care is provided according to the infant's individual developmental maturity		
			Autonomic, motoric, and behavioural cues are identified and used to support individualised caregiving.		
			Section Subtotal:	0.0%	
3. Family centred philosophy	3.1	**Parents as active participants**: Family centeredness emphasises the individuality of the infant, and reduces maternal stress with increased self-esteem of the parent. Observe parent involvement and interaction with their infant. Check patient notes for entries related to parent visits and interactions. Discharge training starts on admission (2), when stable (1), just before discharge (0)	Parents see their infant immediately after birth		
			Parents touch their infant immediately after birth		
			Parents hold their infant		
			Parents are involved with care, e.g. feeding, bath, KMC.		
			Parents are allowed to personalise their infant's bed space		
			Mother's are encouraged to express milk for their infant, or to breastfeed.		
			Discharge training commenced		
	3.2	**Privacy and comfort:** The NICU should provide a warm homelike atmosphere where parents feel welcome, that promotes information sharing between professionals and parents, and parents privacy are respected and catered for. Information is supplied to patents that is relevant to their infant's developmental needs, not generic but tailored to their infant's gestational age, development and clinical condition.	Nursery atmosphere is warm, comfortable and soothing with a homelike appearance		
			Privacy is provided for parents		
			Information is shared between professionals and parents regarding their infant's developmental needs.		
	3.3	**Visitation:** Family cantered care is provided by 24 hour visitation policy for parents, and sibling visitation is encouraged. When parents are allowed any time of the day, (2). If there are times they are excluded e.g. handover or quiet times (1) if parents are required to leave the unit for more than 3 hours a day (0)	Parents are allowed to visit at any time		
			Siblings may visit		
	3.4	**Parent support groups:** Family support is provided as parent support groups. If the facility provide support groups for preemie care (2) If Parents are referred to external support groups (1), if none is available or referred to (0)	The facility has parent support groups		
	3.5	***Parental education:*** *Parents should be taught the stress cues of their infants. Information are shared with parents, could be verbal, hand-outs, training sessions etc.*	*Parents are taught preterm infant behavioural cues and stress signs.*		
			Parents are taught how to interact with their preterm infant based on the cues and behaviours.		
			Section Subtotal:	0%	

Tool overview

NDSC Situational Analysis

5. Handling	5.5	**Positive tactile stimulation:** Still holding or containment hold incorporates cupping the infant's head or resting a still hand on the body. Gentle massage can be provided, but light stroking avoided. Skin -to-skin care is provided. Infants are swaddled if applicable, with tight wrapping in a blanket with the limbs flexed, hips neutral without rotation, shoulders forward, head neutral and hands accessible for exploration of the face.	Positive tactile stimulation is provided, including stroking or gentle massage if applicable.		
			Containment or still hold is provided.		
			Parents are allowed to do skin-to skin care with their infants within 24-48 hours (2), after 48 hours (1) never or no proof of skin-to-skin (0)		
			Preterm infants are swaddled.		
	5.6	**Movement (Kinaesthetic stimulation)** Observe movement of infants, no abrupt stimulation or quick turning takes place. Infants are moved slowly. Appropriate bedding is used that does not provide overstimulation of the vestibular system, waterbeds are not used, and knotted sheepskin is not in the beds. Multiples are co-bedded as they direct motor-activities at their siblings.	Preterm infants are moved slowly, as a whole, keeping the body and head aligned and limbs tucked in.		
			Appropriate soft bedding is used		
			Multiples are co-bedded. Always (2) if stable (1) never (0)		
	5.7	**Self-regulation:** Self regulation is promoted by providing support before, during, and after routine cares. Observe if the infant is provided with opportunities for grasping like fingers or bedding. State regulation is promoted by gentle touch and decreasing stimulation and non-nutritive sucking is provided with appropriate pacifier.	Self-regulation of infants are promoted.		
			Infants are provided with opportunities for grasping.		
			State regulation is promoted.		
			Non-nutritive sucking is provided to support self-regulation		
			Subtotal:	0%	
...ental manipulation	6.1	**Reduction of noise:** Observe the sound of the ambient environment. Noise levels should not exceed 45dB, with a maximum transient sound not exceeding 70dB. Observe for active intervention to reduce noise levels in all areas of the unit and measurement of noise e.g. "sound ear" or other devices.	No radio or stereo equipment used in the unit, telephones away and rings softly.		
			Doors and drawers are padded to reduce noise		
			Bottoms of trash cans are padded/lids with peddle bins padded		
			Sound levels are measured and kept below 45dB		
			Soft music is used where appropriate.		
			Infant beds are placed away from traffic		
			There are effective sound absorption in infant spaces e.g. curtains, wall hangings or padding.		
			Monitor alarms are kept at a safe minimum volume or set to vibrate/flashing		
			Staff respond to alarms quickly		
		Immediate infant environment: The infant space is not noisy, sound reduction equipment is used with minimal noise around the infant.	Noise reduction incubator covers are used.		
			Soft ear plugs or covers are used.		
			Closed incubator portholes are closed quietly by using the latch		
			Sound levels are measured in the incubator		
			Ventilator tubes are emptied regularly, no water build-up		
			Minimal background noise at the infant		
		Staff generated noise kept to a minimum: No tapping or banging on top of closed incubators, no stock items or documents placed on top of incubators and no loud discussions next to the infants.	Charts and stock items are placed next to incubators, not on top.		
			Staff keep their voices down and away from the infant's bedside		
			Subtotal:	0%	

Tool overview

NDSC Situational Analysis

6. Environm	6.2	**Reduction of light: Ambient light** is reduced to less than 100 foot-candles (1076 lux). Observe the unit for light reducing strategies and general brightness. Activities are kept low to prevent the need for bright light.	Ambient light is reduced/dimmed		
			Blinds are closed during daylight hours		
			Activity levels are kept as low as possible		
		Immediate infant bed space: Light reduction strategies are in place to protect the infant from direct bright light.	Incubator covers are used with closed incubators		
			Direct bright light is avoided		
			Bedside lights are titrated/controlled		
			Light levels inside incubators are measured		
			Eye protection is used with phototherapy		
			One source of daylight is used with a shading device		
			Overhead lights are dimmed		
			Procedures are kept to a minimum to ensure minimum handling		
			Toys, pictures and appropriate music used to reduce sensory monotony		
		Cycled light: Cycled light are provided from 32 weeks or when the infant begins to differentiate sleep and wake cycles. Observe if there are quiet times scheduled for at least 2 hours in the day, and a 12 hour sleep period at night with low voices and limited activities.	The unit provides cycled light		
			Day/night cycle is provided with 12 hours of low light and sound at night		
			Subtotal:	0%	
	6.3	**Olfactory stimulation:** positive smells are provided. Observe smell of cleaning materials, hand disinfectants etc.	Positive olfactory stimulation is provided, such as mom's smell inside the incubator.		
			Subtotal:	0%	
			Section Subtotal:	0%	
7. Pain manageme nt	7	Observe for the use of non-pharmaceutical pain reduction strategies such as oral sucrose, non-nutritive sucking, swaddling and containment. Check for appropriate use of sucrose at the correct dose and route.	Oral glucose is effectively and correctly administered as pain management option		
			Non-nutritive sucking is provided during painful minor procedures		
			Subtotal:	0%	
8. Knowledge of infant development	8	**Staff:** All professionals should have accurate knowledge of the development of preterm infant development in the NICU. Ask for proof of training regarding NDSC attended by staff working in NICU. Collaboration between all health care professionals in the NICU is evident with knowledge sharing sessions.	Staff attended training and are able to read infant cues and behaviours		
			Knowledge is shared between professionals		
			The unit applies a multidisciplinary team approach		
			Subtotal:	0%	
9. Feeding	9	Observe if infants are prepared for feeding by wrapping and positioning het inside the incubator in a manner that will decrease the need for repositioning after the feed. (gavage feeds) Reduce light and noise during oral feeding, the infant is cradles in arms with face approximately 20cm away from the caregiver to provide containment and visual stimulation.	Preterm infants are prepared for feeding.		
			Preterm infants are positioned in a way that prevents the need for repositioning after a gavage feed.		
			Non-nutritive sucking is provided during gavage feeding.		
			Subtotal:	0%	
			Total for unit	0%	

Tool overview

NDSC Situational Analysis

4. Positioning	4.1	**Anatomical infant positioning:** Anatomical positioning means that the preterm infant is positioned with the neck in a neutral position, shoulders protracted, body symmetric, knees flexed with hips and arms in midline. This state is reached with the use of containment and firm boundaries. If all of the infants in the unit are positioned correctly (2) more than 50% infants positioned correctly (1) less than 50% positioned correctly (0)	Infants are positioned anatomically with the neck in a neutral position, shoulders protracted, body symmetric, knees flexed with hips and arms in midline. This state is reached with the use of containment and firm boundaries.		
		Containment: The infants are contained with the use of individualised bedding and positioning tools to contain the infant in flexion and the hips neutral.	The infants are contained		
			The infants have firm boundaries that fit snugly		
		Midline: The head should be positioned in midline and in line with the body - especially in acutely ill infants to promote hands to face.	The body position is symmetric		
			The neck is in neutral position with the head in midline in line with the body.		
			The shoulders are protracted		
			The arms are in midline.		
		Flexion: Limbs and shoulders should be flexed (bent) during positioning with postural support using firm boundaries.	The knees are flexed		
			The hips are flexed in a neutral position with some adduction		
			Infant is kept in flexion (limbs and shoulders) during positioning and postural support.		
	4.2	**Orientation:** Prone or side-lying positions should be used rather than the supine position. Evaluate the infants in the unit, if more than 75% of infants are prone or side lying (2) if about 50% of infants are supine (1) more than 50% positioned supine (0)	Prone or side-lying positions are rather used than supine, especially in acutely ill infants		
	4.3	**Individualised bedding:** Individualised bedding and support is used such as blanket rolls, support wedges, stuffed toys, nappies or loose swaddling that provides gentle pressure for bracing, but flexible enough to allow movement.	Individualised bedding is used to position infants.		
			Section Subtotal:	0%	
Techniques (transition support)	5.1	**Care according to maturation:** Caregiving interventions by healthcare providers should be adapted according to the preterm infant's gestational age, adaptation and maturation. Observe caring and handling to ensure all infants are not managed the same despite differences in age and maturation.	Care changes as infants matures.		
	5.2	**State changes:** Observe if infants are prepared before procedures, infants are aroused gently using mild stimuli initially that gradually increases as the infants respond. The infants are assisted to reach a calm and regulated state before beginning an intervention.	The care giver supports gradual state changes by using transitional touch.		
	5.3	**Promotion of rest and sleep:** Check if infants are asleep between routine cares for 2-3 hours at a time, consult the patient record for notes on interventions performed. Check if the unit has scheduled quiet times or rest periods where all routine care is delayed.	The infants receive at least 2-3 hours uninterrupted sleep		
			The unit has quiet times where all routine cares and interventions are delayed.		
	5.4	**Modified hands-on care-giving:** Hands-on care is provided as the infant becomes more alert, rather than interrupting sleep. Check nursing notes for entries such as "minimal handling' where routine care is delayed, or if notes are attached to the infant bed/incubator indicating minimal care. Containment is provided after intervention to help infants transition to a sleep state. Observe care during handling if time out periods are provided to the infant based on correct interpretation of stress cues. Opportunities are provided to suck on a finger or pacifier, and gentle touch provided as positive tactile stimulation to calm the infant.	Care interventions are clustered around sleep.		
			Calm, gentle containment and facilitation is provided during handling procedures to support flexion.		
			The infant is provided with "time-out" or rest periods according to his/her cues		
			Direct hands-on-caregiving is modified by providing positive tactile stimulation.		

SCORING using the INDeSC Tool

Evaluation of the implementation of the principles of NDSC is based on compliance. Compliance = 2, Partial compliance = 1, Non-compliance = 0.
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- Evaluation of the implementation of the principles of NDSC is based on compliance.
- Compliance = **2**, Partial compliance = **1**, Non-compliance = **0**.
- **Scoring**:

Explanation	Compliance level	Score
All criteria for item is met	*compliant*	**2**
Some requirements are met	*room for improvement* (partially compliant)	**1**
Very little or none of requirements are met	*non-compliant*	**0**

- Specific scoring is addressed if particular areas need to be compliant in the guideline section for that item.
    - If the component is **not applicable or observed**, select **N/A** from the dropdown list.
- *Comments* to be included when **1 or 0** is scored as explanation of non-compliance.

GUIDELINE 1 – NICU Design

Principle	No	Guideline	Measurement Criteria	Score	Comments
1. NICU Design	1	First impression on entering the NICU. Does the unit overall create a quiet, dim, warm, impression. Lights should be dimmed, individual incubators shielded or covered. Low ambient noise. Minimal activity in general, with infant spaces away from traffic.	A uterine-like environment is created for each infant to support and environment conducive to growth and optimum development	1	
			Section Subtotal:	50,0%	

GUIDELINE 2 (&4) – Individualised care

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	50,0%	
2. Individualised care	2,1	**Observation**: Observe the interaction between caregivers and infants. Interventions should be relevant to the infant's gestational age, adaptations to interventions and infant's cues and behaviours communicated during interventions.	The caregiver reads the infant's cues and behaviours	1	
			The staff responds to infant cues and behaviours	1	
			The caregiver continuously and systematically assess and evaluate the infant's developmental needs	1	
			Care is adapted according to cues and behaviours.	1	
	2,2	**Care:** Staff should individualise their caregiving interventions, including acting on the infant's cues. Individualised interventions respect the individuality of the infant. Appropriate actions include engaging in eye contact, gentle touch, and	Care is provided according to the infant's individual developmental maturity	1	
			Autonomic, motoric, and behavioural cues are identified and used to support individualised caregiving.	1	
			Section Subtotal:	50,0%	

GUIDELINE 3 (&8) – Family centered philosophy

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	50,0%	
3. Family centred philosophy	3,1	**Parents as active participants**: Family centeredness emphasises the individuality of the infant, and reduces maternal stress with increased self-esteem of the parent. Observe parent involvement and interaction with their infant. Check patient notes for entries related to parent visits and interactions. Discharge training starts on admission (2), when stable (1), just before discharge (0)	Parents see their infant immediately after birth	1	
			Parents touch their infant immediately after birth	1	
			Parents hold their infant	1	
			Parents are involved with care, e.g. feeding, bath, KMC.	1	
			Parents are allowed to personalise their infant's bed space	1	
			Mother's are encouraged to express milk for their infant, or to breastfeed.	2	
			Discharge training commenced	2	
	3,2	**Privacy and comfort:** The NICU should provide a warm homelike atmosphere where parents feel welcome, that promotes information sharing between professionals and parents, and parents privacy are respected and catered for. Information is supplied to patents that is relevant to their infant's developmental needs, not generic but tailored to their infant's gestational age, development and clinical condition.	Nursery atmosphere is warm, comfortable and soothing with a homelike appearance	1	
			Privacy is provided for parents	1	
			Information is shared between professionals and parents regarding their infant's developmental needs.	1	
	3,3	**Visitation:** Family cantered care is provided by 24 hour visitation policy for parents, and sibling visitation is encouraged. When parents are allowed any time of the day, (2), If there are times they are excluded e.g. handover or quiet times (1) if parents are required to leave the unit for more than 3 hours a day (0)	Parents are allowed to visit at any time	2	
			Siblings may visit	0	
	3,4	**Parent support groups:** Family support is provided as parent support groups. If the facility provide support groups for preemie care (2) If Parents are referred to external support groups (1), if none is available or referred to (0)	The facility has parent support groups	0	
	3,5	***Parental education:*** *Parents should be taught the stress cues of their infants. Information are shared with parents, could be verbal, hand-outs, training sessions etc.*	*Parents are taught preterm infant behavioural cues and stress signs.*		
			Parents are taught how to interact with their preterm infant based on the cues and behaviours.		
			Section Subtotal:	54%	

GUIDELINE 4 - Positioning

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	54%	
4. Positioning	4,1	**Anatomical infant positioning:** Anatomical positioning means that the preterm infant is positioned with the neck in a neutral position, shoulders protracted, body symmetric, knees flexed with hips and arms in midline. This state is reached with the use of containment and firm boundaries. If all of the infants in the unit are positioned correctly (2) more than 50% infants positioned correctly (1) less than 50% positioned correctly (0)	Infants are positioned anatomically with the neck in a neutral position, shoulders protracted, body symmetric, knees flexed with hips and arms in midline. This state is reached with the use of containment and firm boundaries.	1	
		Containment: The infants are contained with the use of individualised bedding and positioning tools to contain the infant in flexion and the hips neutral.	The infants are contained	1	
			The infants have firm boundaries that fit snugly	1	
		Midline: The head should be positioned in midline and in line with the body - especially in acutely ill infants to promote hands to face.	The body position is symmetric	1	
			The neck is in neutral position with the head in midline in line with the body.	1	
			The shoulders are protracted	1	
			The arms are in midline.	1	
		Flexion: Limbs and shoulders should be flexed (bent) during positioning with postural support using firm boundaries.	The knees are flexed	1	
			The hips are flexed in a neutral position with some adduction	1	
			Infant is kept in flexion (limbs and shoulders) during positioning and postural support.	1	
	4,2	**Orientation:** Prone or side-lying positions should be used rather than the supine position. Evaluate the infants in the unit, if more than 75% of infants are prone or side lying (2) if about 50% of infants are supine (1) more than 50% positioned supine (0)	Prone or side-lying positions are rather used than supine, especially in acutely ill infants	1	
	4,3	**Individualised bedding:** Individualised bedding and support is used such as blanket rolls, support wedges, stuffed toys, nappies or loose swaddling that provides gentle pressure for bracing, but flexible enough to allow movement.	Individualised bedding is used to position infants.	2	
			Section Subtotal:	54%	

GUIDELINE 5 - Handling Techniques (transition support) & self-regulation

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	54%	
5. Handling Techniques (transition support)	5,1	**Care according to maturation:** Caregiving interventions by healthcare providers should be adapted according to the preterm infant's gestational age, adaptation and maturation. Observe caring and handling to ensure all infants are not managed the same despite differences in age and maturation.	Care changes as infants matures.	2	
	5,2	**State changes:** Observe if infants are prepared before procedures, infants are aroused gently using mild stimuli initially that gradually increases as the infants respond. The infants are assisted to reach a calm and regulated state before beginning an intervention.	The care giver supports gradual state changes by using transitional touch.	1	
	5,3	**Promotion of rest and sleep:** Check if infants are asleep between routine cares for 2-3 hours at a time, consult the patient record for notes on interventions performed. Check if the unit has scheduled quiet times or rest periods where all routine care is delayed.	The infants receive at least 2-3 hours uninterrupted sleep	2	
			The unit has quiet times where all routine cares and interventions are delayed.	2	
	5,4	**Modified hands-on care-giving:** Hands-on care is provided as the infant becomes more alert, rather than interrupting sleep. Check nursing notes for entries such as "minimal handling' where routine care is delayed, or if notes are attached to the infant bed/incubator indicating minimal care. Containment is provided after intervention to help infants transition to a sleep state. Observe	Care interventions are clustered around sleep.	2	
			Calm, gentle containment and facilitation is provided during handling procedures to support flexion.	1	
			The infant is provided with "time-out" or rest periods according to his/her cues	1	
			Direct hands-on-caregiving is modified by providing positive tactile stimulation.	1	
	5,5	**Positive tactile stimulation:** Still holding or containment hold incorporates cupping the infant's head or resting a still hand on the body. Gentle massage can be provided, but light stroking avoided. Skin -to-skin care is provided. Infants are swaddled if applicable, with tight wrapping in a blanket with the limbs flexed, hips neutral without rotation, shoulders forward, head neutral and hands accessible for exploration of the face.	Positive tactile stimulation is provided, including stroking or gentle massage if applicable.	1	
			Containment or still hold is provided.	1	
			Parents are allowed to do skin-to skin care with their infants within 24-48 hours (2), after 48 hours (1) never or no proof of skin-to-skin (0)	1	
			Preterm infants are swaddled.	1	
	5,6	**Movement (Kinaesthetic stimulation)** Observe movement of infants, no abrupt stimulation or quick turning takes place. Infants are moved slowly. Appropriate bedding is used that does not provide overstimulation of the vestibular system, waterbeds are not used, and knotted sheepskin is not in the beds. Multiples are co-bedded as they direct motor-activities at their siblings.	Preterm infants are moved slowly, as a whole, keeping the body and head aligned and limbs tucked in.	1	
			Appropriate soft bedding is used	2	
			Multiples are co-bedded. Always (2) if stable (1) never (0)	1	
	5,7	**Self-regulation:** Self regulation is promoted by providing support before, during, and after routine cares. Observe if the infant is provided with opportunities for grasping like fingers or bedding. State regulation is promoted by gentle touch and decreasing stimulation and non-nutritive sucking is provided with appropriate pacifier.	Self-regulation of infants are promoted.	2	
			Infants are provided with opportunities for grasping.	2	
			State regulation is promoted.	1	
			Non-nutritive sucking is provided to support self-regulation	2	
			Subtotal:	71%	

GUIDELINE 6 – Environmental manipulation

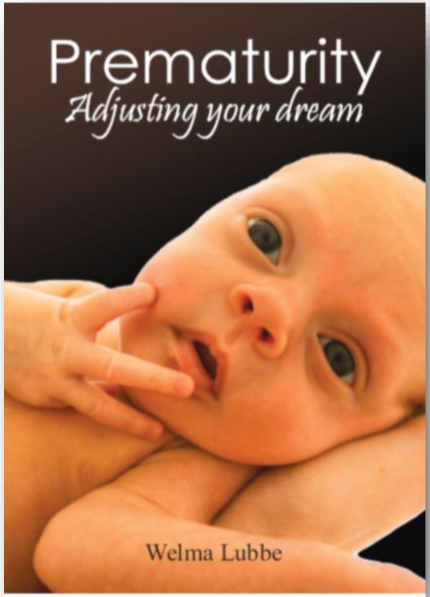
Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	54%	
6. Environmental manipulation	6,1	**Reduction of noise:** Observe the sound of the ambient environment. Noise levels should not exceed 45dB, with a maximum transient sound not exceeding 70dB. Observe for active intervention to reduce noise levels in all areas of the unit and measurement of noise e.g. "sound ear" or other devices.	No radio or stereo equipment used in the unit, telephones away and rings softly.	1	
			Doors and drawers are padded to reduce noise	0	
			Bottoms of trash cans are padded/lids with peddle bins padded	0	
			Sound levels are measured and kept below 45dB	0	
			Soft music is used where appropriate.	0	
			Infant beds are placed away from traffic	0	
			There are effective sound absorption in infant spaces e.g. curtains, wall hangings or padding.	0	
			Monitor alarms are kept at a safe minimum volume or set to vibrate/flashing		
			Staff respond to alarms quickly		
		Immediate infant environment: The infant space is not noisy, sound reduction equipment is used with minimal noise around the infant.	Noise reduction incubator covers are used.		
			Soft ear plugs or covers are used.		
			Closed incubator portholes are closed quietly by using the latch		
			Sound levels are measured in the incubator		
			Ventilator tubes are emptied regularly, no water build-up		
			Minimal background noise at the infant		
		Staff generated noise kept to a minimum: No tapping or banging on top of closed incubators, no stock items or documents placed on top of incubators and no loud discussions next to the infants.	Charts and stock items are placed next to incubators, not on top.		
			Staff keep their voices down and away from the infant's bedside		
			Subtotal:	3%	
	6,2	**Reduction of light: Ambient light** is reduced to less than 100 foot-candles (1076 lux). Observe the unit for light reducing strategies and general brightness. Activities are kept low to prevent the need for bright light.	Ambient light is reduced/dimmed		
			Blinds are closed during daylight hours		
			Activity levels are kept as low as possible		
		Immediate infant bed space: Light reduction strategies are in place to protect the infant from direct bright light.	Incubator covers are used with closed incubators		
			Direct bright light is avoided		
			Bedside lights are titrated/controlled		
			Light levels inside incubators are measured		
			Eye protection is used with phototherapy		
			One source of daylight is used with a shading device		
			Overhead lights are dimmed		
			Procedures are kept to a minimum to ensure minimum handling		
			Toys, pictures and appropriate music used to reduce sensory monotony		
		Cycled light: Cycled light are provided from 32 weeks or when the infant begins to differentiate sleep and wake cycles. Observe if there are quiet times scheduled for at least 2 hours in the day, and a 12 hour sleep period at night with low voices and limited activities.	The unit provides cycled light		
			Day/night cycle is provided with 12 hours of low light and sound at night		
			Subtotal:	0%	
	6,3	**Olfactory stimulation:** positive smells are provided. Observe smell of cleaning materials, hand disinfectants etc.	Positive olfactory stimulation is provided, such as mom's smell inside the incubator.		
			Subtotal:	0%	
			Section Subtotal:	1%	

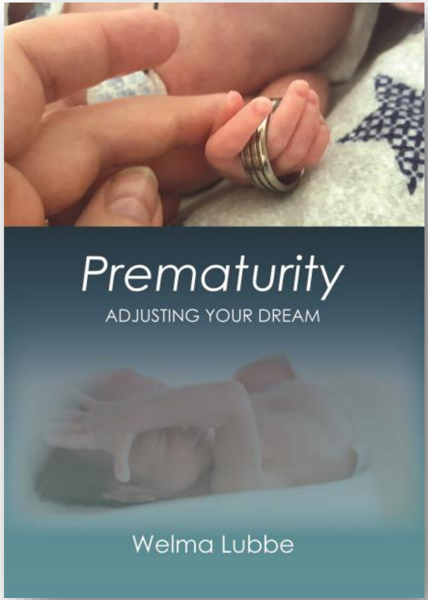
GUIDELINE 7 – Pain management

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	54%	
7. Pain management	7	Observe for the use of non-pharmaceutical pain reduction strategies such as oral sucrose, non-nutritive sucking, swaddling and containment. Check for appropriate use of sucrose at the correct dose and route.	Oral glucose is effectively and correctly administered as pain management option		
			Non-nutritive sucking is provided during painful minor procedures		
			Subtotal:	0%	

GUIDELINE 8 – Knowledge of infant development

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	54%	
8. Knowledge of infant development	8	**Staff:** All professionals should have accurate knowledge of the development of preterm infant development in the NICU. Ask for proof of training regarding NDSC attended by staff working in NICU. Collaboration between all health care professionals in the NICU is evident with knowledge sharing sessions.	Staff attended training and are able to read infant cues and behaviours		
			Knowledge is shared between professionals		
			The unit applies a multidisciplinary team approach		
			Subtotal:	0%	





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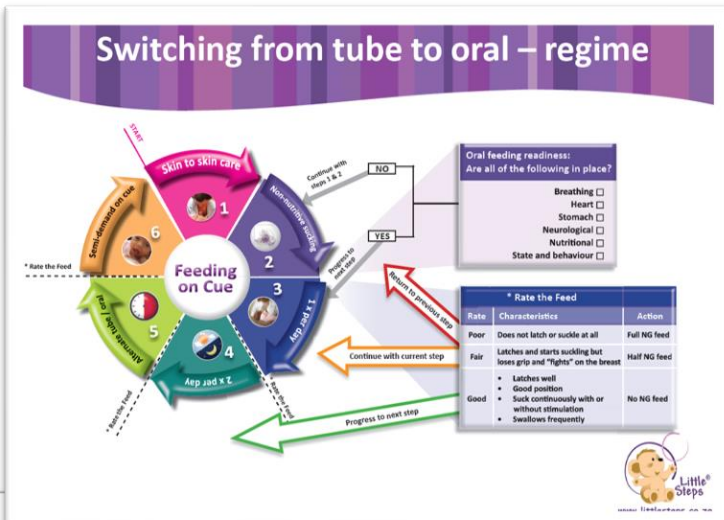
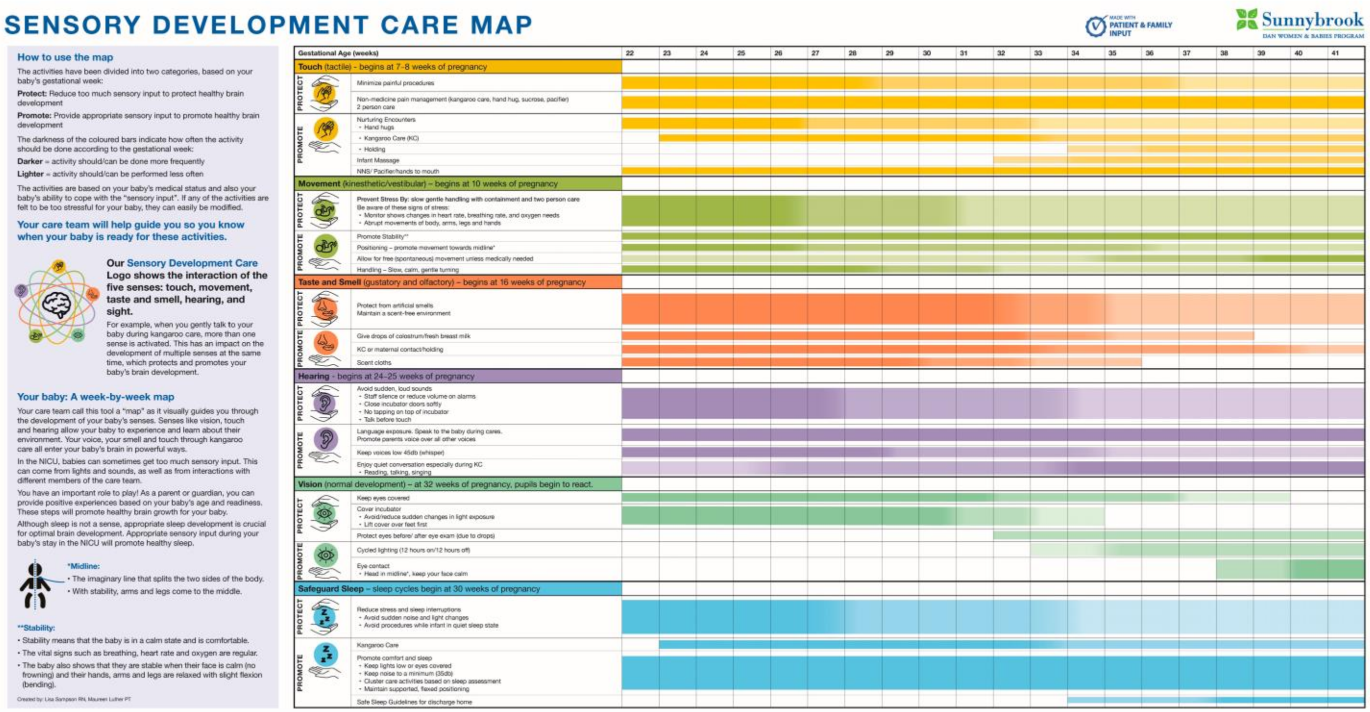
GUIDELINE 9 – Feeding

Principle	No	Guideline	Measurement Criteria	Score	Comments
			Section Subtotal:	54%	
9. Feeding	9	Observe if infants are prepared for feeding by wrapping and positioning het inside the incubator in a manner that will decrease the need for repositioning after the feed. (gavage feeds) Reduce light and noise during oral feeding, the infant is cradles in arms with face approximately 20cm away from the caregiver to provide containment and visual stimulation.	Preterm infants are prepared for feeding.		
			Preterm infants are positioned in a way that prevents the need for repositioning after a gavage feed.		
			Non-nutritive sucking is provided during gavage feeding.		
			Subtotal:	0%	
			Total for unit	31%	

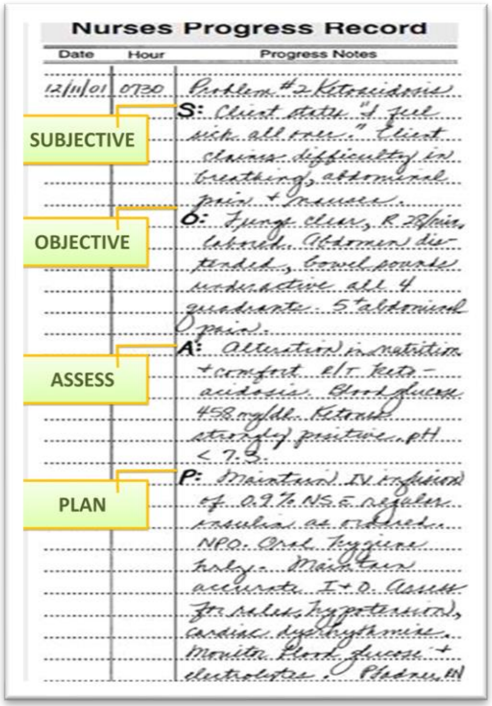


Document audit

What do we want to measure?



How?



The document is housed in the Sunnybrook NICU public webpage (https://sunnybrook.ca/uploads/1/patients/mysunnybrook/sensorycaremap-acc.pdf (accessed on 31 January 2025)

NWU

Siyakhula Project “We are growing” – isiXhosa/Zulu

- Attendees developed a collective vision statement for the project: *“Building and empowering a compassionate family-centred environment that supports the neurodevelopmental growth of every infant’s unique path to a thriving future.”*

- Participants conducted a stakeholder analysis, explored engagement strategies, and discussed appreciation plans to sustain project enthusiasm.

Significance of the Implementation

- In preterm infants, based on the best available evidence;
- Evidence of sustainable practice of NDSC in all enrolled neonatal units;
- **Result**: decrease burden of disease of preterm infants on the healthcare system, both during acute and follow-up care.

Improved quality of care

Improved positive work environment leading to:

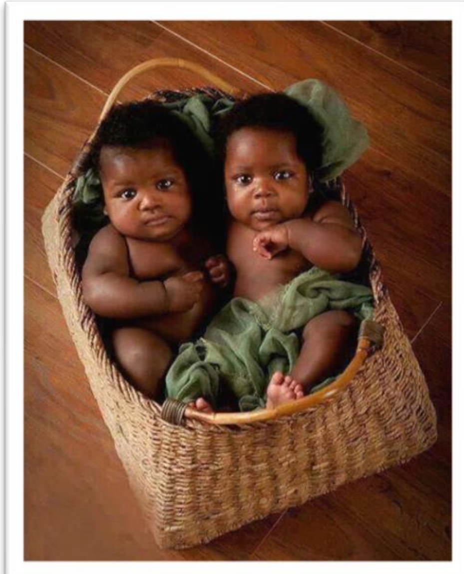
- Staff retainment
- Multi-disciplinary team work in NICUs.

- Develop leadership skills in clinicians in non-management positions and prepare them to be change agents.

Capacity building

Research dissemination

- Post-graduate qualifications
- Articles submitted for publication.



Thank you

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