DEVELOPMENTALLY SUPPORTIVE CARE AND PAIN MANAGEMENT

This module is designed to improve knowledge, skills and clinical practice of all stakeholders involved in the care of preterm neonates in developmentally supportive care.

Learning objectives
The participants will learn
- The concept and importance of developmentally supportive care (DSC) and pain management
- The implementation of developmental supportive care in the unit
- Recognizing pain, and use various methods to prevent or minimize pain
- Monitoring and improving practices and outcomes related to developmentally supportive care using quality improvement methods in local context

Module contents
This module includes following elements:
- **Script:** Easy to read format, gives quick introduction and is an essential reference material for the participants.
- **Key messages:** After having read through the script, key messages highlight the important learning points in the webinar and the script
- **Video demonstration:** The videos in this module cover the activities of daily living, family centered care, protected sleep, indicators, assessment and management of pain and stress and developmentally appropriate positioning
- **Webinar:** The webinar in this module shall help the participant to learn the importance of developmentally supportive care and identification of pain and stress in neonates
- **Poster demonstration:** The participant shall learn about the essential points to be considered during Containment, Swaddling, Nesting; Healing environment; Stress signs; Positioning; Feeding; Transfers
- **Self-assessment:** This will be done at the end of each objective, based on what have you already learnt.
- **Skill check:** The skill check includes evaluation of your skills on “positioning of a sick baby (nesting, swaddling, facilitated tuck)” and “assessment of pain”.
- **Simulation:** After reading through the text material, seeing videos and webinars and reading through the posters, you shall be asked to perform the necessary procedure/act as a team followed by feedback and debriefing.
Learning objective 1

The concept and importance of developmentally supportive care (DSC) and pain management
This objective covers the concept of developmentally supportive care and is delivered as:
- Webinar
- Self-reading script
- Key messages
- Poster

After seeing the webinar and reading the script and the key messages, you shall undergo a self-evaluation based on what you have already learnt.
1.1: Webinar

You will be viewing and listening to webinar on importance of developmentally supportive care and pain management with your facilitator. You are free to interrupt your facilitator anytime for any clarifications or suggestions. The power point slides of the webinar are given here.
Module 1 - Developmentally supportive care and pain management

Brain – Experience Expectant
Experience Dependent

- postnatal
- birth
- prenatal

Environment: experience emotions learning

Epigenetic

basic networks fine-tuning

Neonatal Sensory Systems

Tactile → vestibular → gustatory-olfactory → auditory → visual

- Stimulation of early maturing senses has + influence on late maturing senses.
- Untimely stimulation within this sequence disrupts normal maturation

Challenge

High technology neonatal care

Sensitive individualised approach

Optimal neurobehavioral development

Developmentally Supportive Care

STRESS

Providing a structured care environment which supports, encourages and guides the developmental organization of the premature / critically ill infant.
Developmentally supportive care and pain management

**Tactile**

- Position - Prone
- Nesting
- Swaddling
- Facilitated tuck
- Massage

**Stimulation - Over-stimulation**

- Pain

**Tactile – Swaddling, Facilitated Tuck**

**Tactile - Massage**

- Neurobehavior
- Weight gain
- Sleep
- Pain, Stress
- Hospital stay, Infection

**Does the newborn experience pain?**

A newborn including a preterm FEELS, RESPONDS TO and REMEMBERS pain
**Protection from Pain**

- Newborns do experience pain
- They express pain with various behavioural and physiological indicators.
- Prevention/minimisation of pain is possible.
- Prevention of pain is more important than treatment of pain.

**Olfactory and Gustatory**

- ≥32 wks
- Discriminate, remember, habituate

**Non Nutritive Sucking**

- Length of hospital stay
- Better feeding

**Auditory**

*Noise is harmful*

- Stress
- Reduces sleep
- Hearing loss, IVH, PVL
- Lower intelligence
Developmentally supportive care and pain management

Module 1 - Developmentally supportive care and pain management

### Auditory – Protection from noise

Thank you for helping me sleep

### Auditory – stimulation

- Music therapy –
  - Pacification
  - Improves vital signs
- Feeding
- Sleep
- Mother singing in a soft voice

### Vision

- Intense light - interference with endogenous brain cell activity.
- Sleep deprivation.
- Healing environment
- Avoid direct and intense light
- Use point source for procedures
- Adjustable light

### Protection of sleep

- The activity occurring during REM sleep (or active sleep) seems to be particularly important to the developing organism.
- Deprivation of sleep ⇒ neuronal cell death &  \( \bar{U} \) brain mass

Provide a womb-like environment
Module 1 - Developmentally supportive care and pain management

- Developmentally supportive care and pain management

Kangaroo Mother Care

Baby’s Right, Mother’s Delight

KMC – Best Developmentally supportive care !!!

Tactile

Visual

Vestibular

Auditory

Gustatory

Olfactory

5 Core components of DSC

Pain protection
- Assessment
- Management
- Physiological / behavioral

Protected sleep
- Cluster care
- Nesting/sleeping
- Environment
- KMC

Developmentally supportive ADL
- Feeding
- NNS
- Nappy change
- Massage

Family centred care
- KMC
- Education & participation: collaboration with family

Healing environment
- Noise
- Light
- Smell
- Positioning
- KMC

DSC

- DSC is a continuous process and not an end.
- It starts with the birth of the infant
- The infants are unique and display wide variety of behaviors
- DSC has to be individualized for the infant.
What did you learn from this webinar?

1. .................................................................

2. .................................................................

3. .................................................................

What are the queries which come to your mind?

1. .................................................................

2. .................................................................

3. .................................................................
The fragile preterm infant is suddenly pulled out and placed in an environment so different from their safe and secure world in the womb. The neonatal intensive care unit is their first home. This is home also for the critically ill who have left the comfort of being with their mother or other family members to receive the intensive medical care important for their survival and wellbeing.

This artificial and over stimulating world of bright lights, loud sounds, unpleasant and painful touch, noxious smell and taste disorganizes these vulnerable babies at a time which is critical for brain development, both in terms of its structure as well as its functioning abilities.

Modifications and adaptations made in the NICU help balance the needs of giving the preterm and critically ill babies the highly specialized medical care necessary for their survival while protecting them from the challenges of the new environment. This has led to the emergence of developmentally supportive care (DSC) of the babies in the NICU. One should create a structured environment as similar as possible to that of the womb that provides care and support to these babies, helping them to organize their state of mind, reduce negative impact and develop appropriately for better outcomes.

There are five core components of developmentally supportive care: protected sleep, providing a healing environment, family centered care, developmentally supportive activities of daily living and finally appropriate pain management. The words which shall commonly be used in this module on DSC are:

**Containment**
This procedure entails holding and calming a baby placed in a bassinet/incubator during a painful procedure. One hand of the caregiver is placed firmly yet gently on the head of the baby while the other hand can be placed either on the lower back, buttocks or soles of their feet.

**Swaddling**
This is a technique of wrapping the baby in a sheet around in such a way that the infant feels safe, secure and contained. Swaddling facilitates sleep and promotes growth and development.

**Nesting/creating boundary**
Creating or preparing a nest like oval boundary around the infant using sterilized sheets in which infant is placed. Nesting holds and contains the infant simulating in-utero environment. This technique stabilizes the infants, and promotes protected sleep.
Healing environment
An environment that supports the infant's appropriate growth and development while minimizing their pain and stress caused by continuous exposure to unwanted and harsh stimuli during their NICU stay.

Protected sleep
Long duration of undisturbed sleep is essential for the development and maturation of the infant's brain. Modifying the environment and infant's cue-based care facilitate undisturbed sleep.

Family centered care
The principle of family centred care (FCC) is that the parents and the family are an integral part of the NICU team. They work together closely, taking informed decisions regarding their infant's medical and developmental wellbeing.

Activities of daily living
These are care-giving activities that are important for the infant's growth, development, hygiene and general well-being. The activities include dressing and undressing, diaper change, sponging, massage, skin care, and feeding. Involving and encouraging parents and extended family members to actively participate during care giving activities fosters bonding between them and their infant.

Non-nutritive sucking (NNS)
Non-nutritive sucking refers to the sucking opportunities provided to the infants in form of sucking own fingers, mother's finger, gauze lollipop dipped in mother's milk or even mother's breast. The NNS helps the infant to self-regulate, stay calm and organize self during painful medical and other stressful situations in the NICU.

1.3: Key messages
- Developmentally supportive care reduces stress and promotes growth in the preterm neonate.
- Stimulation of the early developing senses tactile, olfactory-gustatory and protecting the later developing senses auditory and visual is the core principle of developmentally supportive care.
- The 5 key components of developmentally supportive care include
  - Protected sleep
  - Creating a healing environment
  - Family centered care
  - Developmentally supportive activities of daily living
  - Pain management
- Kangaroo mother care is the best form of developmentally supportive care
1.4: Posters

The facilitator shall conduct a demonstration session on developmentally supportive care.
1. The sense that is first to mature and which should be stimulated most appropriately is
   a. Tactile
   b. Olfactory
   c. Hearing
   d. Visual
2. The best form of multimodal stimulation that satisfies the core principles of DSC is
   a. Massage
   b. Kangaroo mother care
   c. Facilitated tuck
   d. Swaddling
3. Which of this is a correct statement?
   a. Preterm baby should be exposed to bright red light to promote vision
   b. Preterm baby should listen to music at all times
   c. REM sleep is important for brain growth
   d. Preterm baby feels pain but do not remember it
4. Identify the incorrect statement?
   a. Newborns experience pain
   b. They express pain with only behavioural indicators
   c. Prevention of pain is possible
   d. Prevention of pain is more important than treatment of pain
5. Inadvertent noise in NICU is associated with all EXCEPT
   a. Stress
   b. More sleep
   c. Hearing loss
   d. Lower intelligence
Learning objective 2

Implementing developmental supportive care in the unit

This objective covers implementation of developmentally supportive care and is delivered as:

- Self-reading script
- Video
- Posters

After viewing the videos, posters and reading the script and the key messages you shall undergo a self-evaluation based on what you have already learnt in this objective.
2.1: Script for posters

This script shall help you to understand the steps to implement DSC in your own unit.

The pictorial representation of each of these components is clearly depicted in the job-aids/posters (2.3)

Protected sleep

Infant's undisturbed sleep, is very important for their brain growth. Apart from KMC, the other measures like providing nesting, clustering of activities of daily living, massage, and having a healing environment helps to promote sleep of infants. The containment that the uterus provides to the foetus instils a sense of safe and secure environment. The foetal position enables the foetus to develop appropriate muscle tone and patterns of movement. Unfortunately premature infants are unable to maintain this position themselves due to their low tone and the gravitational pull. External help is needed to simulate the in-utero environment to enable the new born to develop and grow appropriately. Leaving an infant without boundary or nesting disturbs the infants sleep and aggravates pain and stress.

Newborn babies admitted in the NICU are constantly handled which disturbs their sleep pattern. So, to ensure that the infants get enough undisturbed sleep, the daily routines like cleaning the baby gently, changing of diapers, oil massage, weighing of the baby, and putting cap, gloves, socks giving antibiotic and feeding can easily be done together in a cluster when the infant is awake instead of disturbing the sleep for by doing these activities individually at different times.

It is important to remember that all care giving activities are modified according to the infant's cues rather than protocol driven. While changing clothes or nappy do not make sudden changes in position. Stop and calm the newborn if stress signs are seen.

Healing Environment

Visual stimulation: Exposure to light should be minimum for preterm infants. Lights should be dimmed during the day if there are no procedures. Preterm infants should not be placed under direct bright light. Encourage a day-night light rhythm in the NICU to develop circadian rhythm. Mother's face is the best visual stimulator for the preterm infants. However, don't try to make eye contact or bring face close if infant shows signs of stress.

Auditory stimulation: Doctors, nurses and family should talk softly near the infant's bassinet or move slightly away while medical intervention is being discussed. Shouting instructions across the room, chairs being dragged rather lifted are a constant source of stress for the infant. Other simple measures taken for reducing auditory overload are reducing the volume of telephone ring, attending monitor alarms promptly, setting the volume of the alarm at a lower level and closing the incubator doors quietly. Tapping or writing on incubator should not be allowed. Mother's speaking or singing softly is the
best auditory stimulation. It comforts the infant and blocks out some of the stress sounds present in the environment. Do not hang baby chimes or put toys with loud nursery rhymes near the infant.

**Gustatory Sensation:** Preterm infants are very sensitive to noxious smell which causes stress. Mother’s smell and the smell of her breast milk are the best olfactory stimulants. These also help in reducing infant stress.

**Vestibular sensation:** Abrupt position change will negatively affect the infant's physiological parameters and optimal development. Stress can be reduced if the caregiver gently moves their body instead of rocking or swinging the infant. The mother's rhythmic breathing and the chest movement is one of the most soothing experiences for the preterm neonate while in kangaroo mother care. The caregiver should bend his/her body forward, holding the baby close to her body.

**Family centered care**
The goal of the family centered care is to support the family emotionally and encourage them to verbalize their fear, build up their confidence through education, and finally empower them to understand and handle their infants independently. Parents should be a part of decision making process and take informed decisions regarding the care of their infant. Educating caregivers and encouraging their active participation during the infants' nappy change, feeding, massage, kangaroo mother care facilitates emotional bonding between the new born and the caregivers. Kangaroo Mother Care not only supports the infant's holistic development but also, is the essence of family centered care. This is one activity where the family’s involvement fully justifies the concept. These tactile experiences have a positive feedback in the newborn’s growth and development. Listening and calming an anxious caregiver is missed due to heavy nursing schedule.

**Activities of daily living**
Activities of daily living should be carried out according to the readiness of the baby and not be protocol driven. During these activities care should be taken to position the preterm infant to ensure that it supports symmetric development.

**Feeding**
- Dim the light, reduce noise and other distractions. Caregivers should not talk to others while feeding their infant.
- While feeding with paladai or spoon infant must be awake and not asleep.
- The infant’s head, neck and trunk should be well supported by the caregiver's arm or body.
- Swaddling the infant during feeding reduces startles and unnecessary arm and leg movements, which indicate stress.
- Do not wake infants by pinching, tickling, pulling or flicking their ears or soles.

**Skin care**
- Avoid using lotions and soap.
- Care is to be taken to avoid pressure and device related sores and during removal of adhesive tapes.
Massaging

- Apply oil for very preterm and extremely low birth infants instead of massaging.
- In supine, prone and side lying positions start massaging from the head, move to the face, then the chest, the abdomen and finally the limbs.
- Fingers should be placed flat on the infant's body and the massage should be done with moderate pressure using long, firm yet gentle strokes.
- Gentle extending and flexing of limbs can be done during the massage.
- Light feathery touch should be avoided

Diaper change

- Make sure clean diapers and wet cotton swabs are ready and near the infant.
- Open the dirty nappy and pick up both the legs of the infant flexing it towards the abdomen, clean from front to back in gentle strokes.

Transfers and transportation

- Care should be taken during transportation of premature, sick and fragile infants, not to expose them to sudden movements or change in position and temperature.
2.2: Video

There will be short video films on the protected sleep, healing environment, family
centred care and activities of daily living which are to be followed in the nursery.

1. The following aspects of protected sleep were shown in the video:
   i. ..............................................................................................
   ii. ..............................................................................................

2. The following aspects of healing environment were shown in the video:
   i. ..............................................................................................
   ii. ..............................................................................................

3. The following aspects of family centered care were shown in the video:
   i. ..............................................................................................
   ii. ..............................................................................................

4. The following aspects of activities of daily living were shown in the video:
   i. ..............................................................................................
   ii. ..............................................................................................

5. Comments on video:
   Good aspects                                       Needs improvement
   ………………………………………………                 ………………………………………
   ………………………………………………                 ………………………………………
   ………………………………………………                 ………………………………………
   ………………………………………………                 ………………………………………

2.3: Posters

The facilitator shall conduct a demonstration session on:
- Positioning
- Healing environment
- Nesting
- Feeding
- Swaddling
- Containment
- Care during transfer

**Positioning**
Preterm and Sick Infants in the Neonatal Intensive Care Unit

Correct and appropriate positioning of the preterm infant is necessary to optimize the development, integration and functioning of the musculo-skeletal, nervous and sensory systems.

**DO’S**

- **Sidelying/lateral position** enhances hand to mouth, prevents retraction of shoulders and abduction of legs
- **Prone position** develops the balance between flexion and extension, improves oxygenation, reduces heat loss and energy consumption
- **Supine position** with nesting allows flexion, midline orientation and forward gaze

**DON’T**

- **Supine position** without nesting leads to retracted shoulders, delay in midline orientation and eye-mouth co-ordination
- **Continuous lateral position** leads to upward gaze, flattening of the head on one side
- **Extended position** inhibits flexion and impacts movement and functioning
HEALING ENVIRONMENT (How to make NICU stay comfortable for a preterm infant)

Simple adjustments and adaptations in the NICU reduce the noxious stimulation that preterm and sick infants are exposed to.

**DO’S**

- Reduce lights at night to follow a circadian rhythm
- Cover the bassinet for preterm infants
- Move away from the bassinet while discussing medical intervention
- Lift chairs while adjusting their position
- Gently roll the baby towards you while lifting them or changing their position

**DON’T**

- Don’t switch on the lights when not needed
- Do not write on or discuss near the bassinet
- Loud sounds in the NICU lead to stress and startling
- Do not pull chairs and add extra noise in NICU
- Do not pick up an infant in a harsh manner
Nesting

Nesting in the Neonatal Intensive Care Unit involves placing a thick boundary made by clothes around the preterm infant to reduce stress, encourage protected sleep and facilitate growth and development.

Take two square sheets

Keep it diagonally and fold into a triangle

Roll the cloth tightly towards you

Place the roll in the bassinet

Pull the roll and make it oval and tape the top end

Bring the loose ends together and tape them to keep the roll tight

Put a baby sheet and tuck it inwards on both sides

Place cotton shoulder pad 2 inches thick near the top end

Infant’s feet should be within the boundary

Prone position within boundary/nesting

Side lying position within boundary/nesting

Supine position within boundary/nesting
Feeding

Feeding is a stressful activity for a preterm baby

**Recommended Steps**

A. During Tube Feeding
   - Kangaroo mother care

B. During Paladai Feeding
   - Swaddled and held close

C. During Breast Feeding
   - Swaddled and supported

**Don’ts**

- Feed with arms dangling
- Feed while baby drools
- Feed if baby shows stress signs
Swaddling

Swaddling protects the preterm and sick infants from reacting to the noxious and overstimulating environment of the Neonatal Intensive Care Unit. Swaddling facilitates quiet time, longer sleep and regulates the infant.

Swaddling:
1. Square baby sheet is spread diagonally
2. Fold triangular portion inwards
3. Place infant on the triangular portion
4. Sheet is tucked under from the opposite side
5. Lower end of the sheet is pulled towards abdomen
6. Sheet is tucked under opposite arm
7. Infant is swaddled

Medical procedure with or without swaddling:
- Calm and regulated
- Stressed and writhing in pain
Containment

Containment is the procedure of calming a preterm or sick infant in the Neonatal Intensive Care Unit by caregiver or a healthcare provider. Place one hand on the infants head, and the other hand on either the infants arm, lower back or soles of the feet.

Containment During Sleep

- Healthcare workers regulating infants in sidelying position
- Calming infants in supine
- Caregiver regulates their infant’s sleep

Containment During Activities of Daily Living

- While Dressing and Undressing
- While Massage
- While Changing Diaper

Containment During Medical Procedures

- Sampling from the hand
- During Suction
- Sampling from the sole of the feet
Care During Transfer

TRANSFERS AND TRANSPORTATION
Fragile preterm and sick babies are stressed and traumatised during transfers from bassinet to mother or during transportation for various medical procedures. Simple measures during transfers can be taken to make the babies feel calm and secure.

1. Wash and dry hands before handling the baby.
2. Contain and calm after placing back in the bassinet.
3. Tuck the baby either supine prone or in lateral position.
4. Warm hands.
5. Hold the baby close specially if not swaddled.
6. Transfer 2: Swaddle the baby during transfer.
7. Transport: Gently roll the baby.
8. Bend forward to lift the baby.
9. Bend forward, place baby on mother’s lap.
2.4: Self-check MCQs

1. All are components of Developmentally Supportive Care EXCEPT
   a. Family centered care
   b. Early intervention therapy
   c. Developmentally supportive activities of daily living
   d. Protected sleep

2. Massage should be done
   a. With light feathery touch
   b. With at least 5 mL of coconut oil
   c. By 2 fingers flat on baby and firm gentle strokes
   d. From fingers to body and limbs to head

3. All are signs of stress in a baby EXCEPT
   a. Midline position of hands
   b. Saluting position of hand
   c. Sitting in air posture
   d. Limbs flaying

4. Healing environment includes
   a. Maximum noise levels of 60 db
   b. Point source of light for procedures
   c. Visual stimulation by bright toys hanging on warmer
   d. Bright ambient light for monitoring of sick babies

5. All are activities of daily living EXCEPT
   a. Non-nutritive sucking
   b. Pain management
   c. Massage
   d. Feeding
Learning objective 3

**Recognizing pain and use various methods to prevent or minimize pain**
This objective covers the concept of developmentally supportive care and is delivered as:

- Webinar
- Script
- Video
- Poster

After seeing the webinar, videos, poster and reading the script and key messages you shall undergo a self evaluation based on what have you already learnt.
3.1: Webinar

You will be listening and seeing a webinar on pain and stress in neonates with your facilitator. You are free to interrupt your facilitator anytime for any clarifications or suggestions. The power point slides of the webinar are given here.
Physiological Responses
Changes in
• Heart rate
• Blood pressure
• Respiratory rate
• Saturation

Autonomic Changes
• Mydriasis
• Sweating
• Pallor
• Flushing

Painful Procedures

Mild Pain
• Physical Examination
• Heel Prick
• Venepuncture
• Arterial puncture
• Im/sc injections
• Feeding tube insertion
• Umbilical cannulation
• Adhesive tape removal
Module 1 - Developmentally supportive care and pain management

Moderate Pain
- Lumbar puncture
- Intubation
- ET suction
- ICD drain
- Ventricular tap
- Rop examination
- Central line
  - insertion or removal
- Chest physiotherapy
- Dressing change
- Suprapubic puncture

Severe Pain
Surgical Procedures

Chronic Pain
- NEC
- Mechanical Ventilation
- Meningitis
- Bone and Joint Infections

Premature Infant Pain Profile

PIPP SCALE
What did you learn from this webinar?

1. .................................................................

2. .................................................................

3. .................................................................

What are the queries which come to your mind?

1. .................................................................

2. .................................................................

3. .................................................................
3.2: Script of webinar

Assessment of pain in neonates

The physiological cues that indicate stress are change in heart rate, respiratory rate, color, tremors and twitching. Visceral signs like hiccup, coughing, spitting, drooling and vomiting are also cues that the infants needs to be calmed before activity is continued. The infant shows certain signs like arching, finger splay, foot splay, sitting on air, high arm guard, startle, salute and fisting. These are motor cues that the infant uses to communicate pain and stress. Crying is the most common behavioural cue that indicates infant pain. There are however certain behavioural cues displayed by the infant which need to be carefully observed and respected. Rolling eyes up or averting gaze gaping, being fussy, grimacing, frowning while being fed or handled are all subtle indicators of stress. Observing an infant over a period of time is crucial to understand the various indicators of pain and stress. It is not necessary that the infant shows all the signs in all the areas. Some infants may show few stress indicators in all areas or may show one or two only in one area. Caregivers need to be aware and observe these communications of the infant and act accordingly.

Different scoring systems are used to measure the intensity of pain. The most common scale used is PIPP score (Premature Infant pain profile.).

The components in PIPP scale are:

1. Gestational age
2. Behavioral state of the bay
3. Change in heart rate per minute during the procedure.
4. Change SPO₂ during the procedure and
5. The facial expression consist of (brow bulge, eye squeeze and nasolabial furrow).

Each component carries a score ranging from 0-3. The interpretation of score is done as if the score is <5 it is interpreted as having no pain while a score of 6-10 is interpreted as having moderate pain and a score >10 is interpreted as having severe pain.

Pain management in newborns

General measures

Pain is managed most effectively by preventing; limiting or avoiding noxious stimuli. The following measures in combination are followed to minimize pain:

- Avoid bright light, loud noise
- Limit the number of painful procedures and handling
- Bundling of investigations and nursing interventions
- Swaddling, facilitated tucking, distraction measures like talking, music etc
Tactile stimulation like stroking, caressing, massaging

**Non-pharmacological measures**

The environmental and behavioural interventions that do not use pharmacological agents are collectively called non-pharmacological measures. These include:

1. Sucrose/glucose solution induced analgesia
2. Breast feeding/breast milk supplementation
3. Skin to skin care
4. Non-nutritive sucking using pacifiers

The non-pharmacological measures are thought to alleviate pain by activating gate control mechanism, secretion of endogenous endorphins, diversion of attention and by pre-empting hypersensitivity.

**Sucrose analgesia and breast milk**

Sucrose administration is particularly useful for short procedures like venipuncture, heel prick etc. Oral administration of concentrated sucrose solution (24% to 50%) acts by release of endogenous opioids like beta-endorphin. The analgesic effect lasts for 5-8 min and should be combined with other non-pharmacological measures for maximum benefit. Alternative to sucrose is dextrose (25%), which is less widely used.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>For babies who are NPO</th>
<th>Preterm (&lt;32 weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24% Sucrose / 25% Dextrose</td>
<td>0.1-0.2 mL</td>
<td>0.1-0.5 mL</td>
</tr>
</tbody>
</table>

The sucrose solution is given orally by a syringe 2-3 min before procedure and may be repeated 1-2 min after the procedure. Intragastric administration has no analgesic effect.

Breast feeding and breast milk supplementation is almost as effective as sucrose analgesia in reducing pain in newborns undergoing single painful procedure.
3.3: Video

There will be video demonstration by your facilitator on assessment and management of pain and stress in neonates. The video demonstration will be followed by discussion.

1. The following aspects of indicators and assessment of pain and stress were shown
   i. ........................................
   ii. ........................................
   iii. ........................................

2. The following aspects of non-pharmacological methods for decreasing pain were shown:
   i. ........................................
   ii. ........................................
   iii. ........................................

3. The following aspects of pharmacological methods for decreasing pain were shown:
   i. ........................................
   ii. ........................................
   iii. ........................................

4. Comments on video:
   Good aspect                              Need improvement
   .............................................. ..............................................
   .............................................. ..............................................
3.4: Poster

The facilitator shall conduct a demonstration session on behavioural cues of pain and stress in neonates

**Behavioural cues of pain and stress**

**Autonomic and visceral signs of stress**

- Yawning
- Drooling
- Gaping

**Motor signs of stress**

- Salute and Fingersplay
- Sitting on air
- Grimace

**State related stress signs**

- Crying
- Averting Gaze
- Staring eyes
- Arching
- Fussy
3.5: Self-check MCQs

1. Most commonly used response used to assess pain in neonates is
   a. Behavioral response
   b. Physiological response
   c. Autonomic response
   d. Endocrine and metabolic response

2. Behavioral Responses to pain include all the following except
   a. Abnormal cry
   b. Change in heart rate
   c. Facial expressions
   d. Body movements

3. Body movements associated with pain response are
   a. Arching of back
   b. Clenching of fingers
   c. Writhing movements
   d. All the above

4. Which of the following is not a physiological response to pain?
   a. Miosis
   b. Heart rate changes
   c. Drop in saturation
   d. Blood pressure changes

5. Which is the most appropriate pain management for a baby during
   venepuncture?
   a. 2 mL breast milk before the procedure
   b. Inj Fentanyl 3 µg stat before the procedure
   c. Oral paracetamol 25 mg before the procedure
   d. Restraint of limb of baby during the procedure
Skill check

After you have read through the scripts, seen the videos and the webinars, you shall be asked to undergo a skill check on task trainers. The facilitator shall assess you and provide feedback. This shall include assessment of skill of:

1. Positioning of a sick baby
2. Positioning of a baby: nesting, swaddling, facilitated tuck
3. Assessment of pain

1. Positioning of a sick baby
A preterm neonate (31 weeks, 1300 grams) admitted in the SNCU is lying flat on a mattress. Show us the abnormalities in position in this baby

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Correct Action</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Demonstrates and speaks about abduction at shoulders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Demonstrates speaks about extension at elbows</td>
<td></td>
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<tr>
<td>3.</td>
<td>Demonstrates speaks about abduction at hips</td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td>Demonstrates speaks about extension at knees</td>
<td></td>
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<tr>
<td>5.</td>
<td>Demonstrates speaks about extension at spinal cord</td>
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</tbody>
</table>

Total

Score: (Maximum Score 5): ________________

How will you correct these abnormalities and bring in a position ideal for developmental support?

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Correct Action</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Collects supplies two sheets/towels for nesting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Performs hand washing</td>
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<td></td>
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<tr>
<td>3.</td>
<td>Sets up of nested bed without baby</td>
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<tr>
<td>4.</td>
<td>Places baby within the nest</td>
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<tr>
<td>5.</td>
<td>Adjusts the nest at levels of upper limbs and lower limbs to reach ideal position</td>
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<tr>
<td>6.</td>
<td>Demonstrates and speaks about adduction at shoulders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Demonstrates and speaks about flexion at elbows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Demonstrates and speaks about adduction at hips</td>
<td></td>
<td></td>
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<tr>
<td>9.</td>
<td>Demonstrates and speaks about flexion at knees</td>
<td></td>
<td></td>
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<tr>
<td>10.</td>
<td>Demonstrates and speaks about universal flexion posture</td>
<td></td>
<td></td>
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</tbody>
</table>

Total

Score: (Maximum Score 10): ________________
2. Positioning the baby  Nesting, swaddling, facilitated tuck

A 32 week neonate day 3 old baby with a birth weight of 1.5 kg is now on full oral feeds on paladai. Mother provides intermittent KMC. Demonstrate how the baby should be “Swaddled”.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Steps for Swaddling</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cleans the hands with rub or by hand wash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Explains to the mother the procedure and its importance</td>
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<td></td>
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<tr>
<td>3.</td>
<td>Takes a sufficient size warm clean cloth</td>
<td></td>
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<tr>
<td>4.</td>
<td>Folds at the top to suit the head</td>
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<tr>
<td>5.</td>
<td>Places the baby on the cloth</td>
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<tr>
<td>6.</td>
<td>First wrap to the right. Wrapping is done so that body is tucked well without hurting the baby</td>
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<tr>
<td>7.</td>
<td>Takes one more fold taken from down to tuck into the previous fold</td>
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<tr>
<td>8.</td>
<td>Takes left wrap which is folded back</td>
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<tr>
<td>9.</td>
<td>Adjusts the wrap to show the face and ensures it is not obscuring the nose and mouth</td>
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<tr>
<td>10.</td>
<td>Places back onto the mother's lap or on the baby's bed</td>
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</tbody>
</table>

Total Score: (Maximum Score 10): ___________________

Demonstrate how the baby should be placed in the bassinet according to DSC principles, when baby is not cared for in KMC and demonstrate “Facilitated tucking”

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Steps for Nesting and Facilitated Tuck</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cleans the hands with rub or by hand wash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Prepares the baby bed and Nest (Ready made nest/ prepare the nest with 1-2 thick rolled clothes)</td>
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<tr>
<td>3.</td>
<td>Places the baby with head in midline and neck in neutral position. (Use blanket rolls or position aids)</td>
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<tr>
<td>4.</td>
<td>Holds the upper limbs close to body with one hand</td>
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<tr>
<td>5.</td>
<td>Holds the lower limbs close to body tucked in flexion with other hand (The baby may be in supine or lateral or prone during facilitated tucking)</td>
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<tr>
<td>6.</td>
<td>Places the nest close to the baby</td>
<td></td>
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<tr>
<td>7.</td>
<td>Supports soles of feet with rolls to prevent extension at ankle</td>
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<tr>
<td>8.</td>
<td>Explains to the mother the importance of nesting</td>
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<td></td>
</tr>
</tbody>
</table>

Total Score: (Maximum Score 8): ___________________
### Assessment of Pain

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Correct Action</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facilitator speaks describe the pain response depicted 1- 3; See the picture provided (Fig.1,2 &amp;3) (6×1=6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### A.
- **Figure 1**
  1. Brow bulge
  2. Eyes squeezed
  3. Deep nasolabial furrow
  4. Mouth wide and squarish

- **Figure 2**
  5. Legs flaying

- **Figure 3**
  6. Arching /Arms flaying

#### Name a scale for assessment of pain in newborns (1)

#### B.
- Says PIPP/ NIPS/ NFCS/Cries/ NPASS

#### Name two non pharmacological methods that can reduce pain (2×1=2)

- a. Swaddling / Facilitated Tuck
- b. KMC or skin to skin contact

**Total (9)**
Simulation

An essential pre-requisite before reaching this stage in each module is that the learner should have undergone the entire module, seen the videos and webinars facilitated by the facilitator, attempted the evaluation questionnaire, and demonstrated the skill check.

This session brings out learning and practice in a realistic environment for developmentally supportive care. The emphasis is on working together as a team and not on individual skills.

You shall be asked by the facilitator to participate as a team for the management of the following conditions.
1. Heel prick for blood sugar monitoring
2. Pain assessment and management

This shall be followed by feedback and debriefing.