Role of Physical Therapist for High Risk Infants

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Objectives

- Understand the fetal development process.
- Understand the motor development of the premature and full-term infant.
- Assess the physiologic status of the high-risk neonates.
- Realize developmental intervention and therapeutic positioning in NICU
- Introduce the discharge educational program for family centered developmental care in SMC.

Environment

	Intra-uterine	NICU
Sound	Muted sound	Consist & offensive noise
Visual input	Dim red glow	Bright light
Gravity	No gravity (amniotic fluid)	Gravity
Sensory	Proprioceptive input & Vestibular input	Adverse tactile input
Temperature	Thermoregulation	Changeable

Environmental restrictions of NICU

Sensory infarction : lights, sounds, hard surface, pain

Oxygen tube : fixed head & body

Lack of experiences for movements

Distal fixation :

lat. Malleolus, metacarpal of hand

Pain and discomfort

Homeostasis, sleeping, rhythm fluctuation

Irregular sleeping rhythm

Normal Development

- Quantity : Gross Motor Milestone

- Quality : Developmental Motor Assessment
  & Postural control

Postural Control

- Connection
- From top to bottom
- Head to feet
- Consistency

Maturation of CNS

<Postural control & Linkage of whole body>

- **1st Mass pattern:**

  Total flexion pattern (physiological flexion)

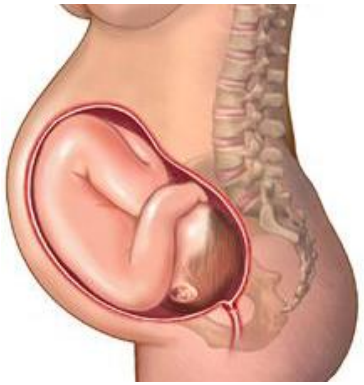
- **2nd Mass pattern:**

  Total extension pattern (Landau reaction)

Physiological Flexion

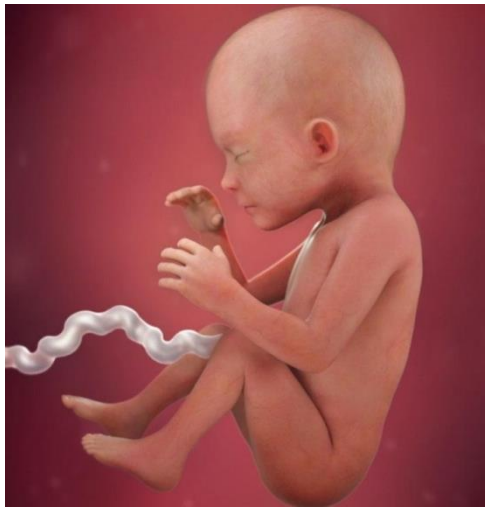
1st Mass Pattern

- Flexed neck &trunk
- Strong connection (from head to toe)
- Compact core stability
- A pivot(axis) of postural control
- Psychological, Emotional stability
- Body concept-schema (Hong, 2011)



Fetal development

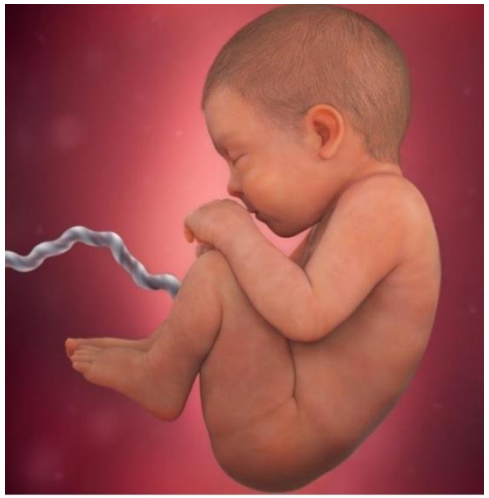
Fetal Development Process



23wks
Lung begin to develop

32wks
Bone fully develop

39wks
Muscle fully develop



41wks
Full term develop

Premature birth

- Jerky instead smooth
- Lack of muscle tone (severe weakness)
- Arms & Legs remain in an out stretched position(floppy)
- Lack of physiological flexion
- Difficulty ability to self-calm.

Landau reaction

2nd Mass pattern

- 5~6th Month
- Strong extension & midline adduction
- Extensor strong connection.
- Proximal dynamic stability
- Link of upper & Lower extremity
- Core stability in midline

Therapeutic Positioning and handling

Goal

- Decrease hyperextension of the neck and trunk
- Reduce elevation of shoulder
- Decrease retraction of the scapula
- Reduce extension of the primary flexor muscle groups

“Hammock handling”

- Activate flexor groups
- Facilitate head righting
- Facilitate alerting
- Stimulation of vestibular system

Semi-Reclined Position in Treatment

- To increase the activation of the neck flexors
- To develop improved strength and balance between neck flexors and extensors

(Girolami & Campbell, 1994)

Caution

- Avoid hyperflexion of the neck
  - ➡ cause airway obstruction and pulmonary compromise
- Begin with a light touch and proceed gradually.
- Apply ROM Ex. gently.

Common Goals in NICU

- To promote state organization
- To promote appropriate parent- infant interaction
- To enhance self-regulatory behavior through environmental modification
- To promote postural alignment and more normal patterns of movement through therapeutic handling and positioning
- To enhance oral-motor skills and assist with oral feedings
- To improve visual and auditory reactions
- To prevent iatrogenic musculoskeletal abnormalities
- To participate in interagency collaboration in order to facilitate to the home environment

Role of PTs

- Observe your baby closely (breathing, skin coloring, movements) stressful?
- Position and handle your baby in ways that support his or her movements, sleeping, waking and self-soothing abilities.
- Work with parents and NICU staff to promote comfort and good positioning of babies.
- Medically fragile babies show their response to touch or movement by changing their breathing and heart rates and their oxygen levels.
- Help your baby's development.

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(breathing, skin coloring, movements) stressful?

Position and handle your baby in ways
(movements, sleeping, waking and self-soothing abilities)

Work with parents and NICU staff
(to promote comfort and good positioning of babies)

Medically fragile babies show their response to touch or movement (heart rates and oxygen levels)

Help your baby's development.

Parent Education & Discharge program