



I CONGRESSO  
INTERNACIONAL DE  
**NEONATOLOGIA**  
**DO DF**

Position  
for Cor

Kathi Salley  
MSN, CNS, M

Realização:



[www.paulomargotto.com.br](http://www.paulomargotto.com.br)

Brasília, 1 de dezembro de 2022  
INSTITUTO DE PESQUISA EM NEONATOLOGIA  
PAULO ROBERTO MARGOTTO



Is this baby  
comfortable?



Is this baby comfortable?

Or this baby?



Or perhaps,  
this one?

---



# Definition - Comfort

---

- A state of physical ease and freedom from pain or distress

# Prematurity is a Worldwide Issue

---

- Preterm birth (before 37 weeks) is the leading cause of neonatal mortality and morbidity
  - 10 % of babies worldwide are born prematurely (less than 36 weeks)
- Extremely premature infants require life-saving interventions and are admitted to the Neonatal ICU for days, weeks, and months depending on their age and severity of complications.

# Major Morbidities

---

- The smaller and younger the infant is at birth, the more at risk they are for the major morbidities.

NEC (necrotizing enterocolitis)

IVH (intraventricular hemorrhage)

ROP (retinopathy of prematurity)

CP (cerebral palsy)

# Preterm Birth is a Stressor

---

- Despite advances in neonatal intensive care, preterm birth remains a leading cause of neurodevelopmental disability
- The NICU environment is dramatically different from the in-utero environment and the premature infant was immediately adapt to it (and are separated from their mother for the first time since conception)

# The NICU is a stressor

---



# The importance of the Every Day

---

- A new theory of brain injury in the preterm infant – Shifting away from a “one-hit brain injury” to an alteration in trajectory of brain maturation as an accumulation of environmental exposures early in life.

# “Minor” Morbidities of Prematurity

Emotional  
disturbances  
(anxiety and  
depression)

Attention Deficit

Learning  
Disabilities

Motor  
Dysfunction

Autistic Like  
Behaviors

Visual  
Processing  
Difficulties

## Minor Disabilities are not so “minor”

---

- “Minor” disabilities have been identified more frequently in the preterm population (compared to term infants)
- Described as a “phenotype” of

# The importance of the Every Day

---

- A new theory of brain injury in the preterm infant – Shifting away from a “one-hit brain injury” to an alteration in trajectory of brain maturation as an accumulation of environmental exposures early in life.
- Modifiable risk factors for these

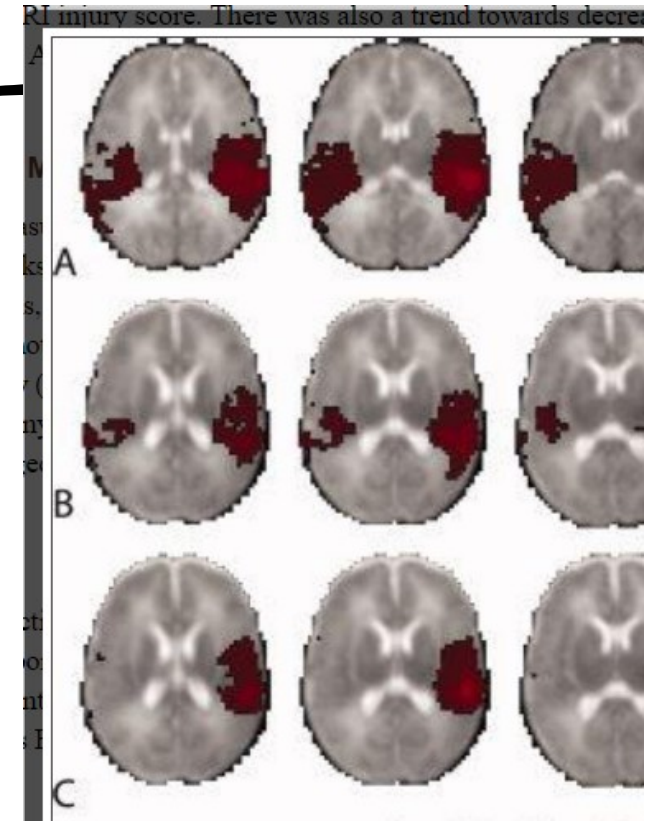
# Day in the Life of NICU Babby

---

- More than 90% of daily touch is procedural and many painful
- Up to 70 painful/stressful events per day
- There is Hope – parent presence can be a buffer to the negative effects of stress

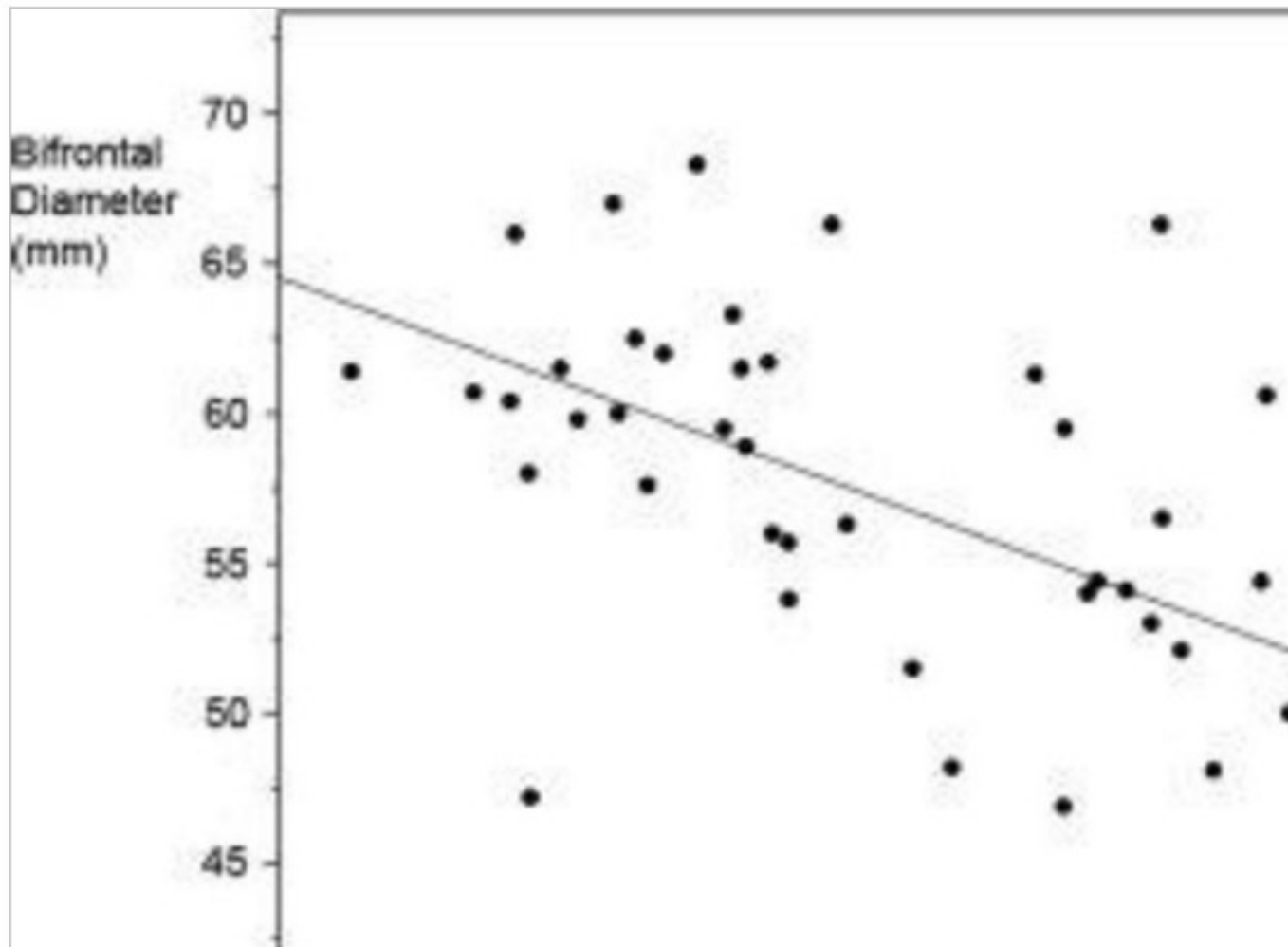
# Pain & the Brain

- Findings that high stress exposure is associated with differences in the brain on both an anatomic and functional level.
- Decreased brain size in the frontal and parietal regions and altered brain microstructure and



*NICU Stress Is Associated with Brain Development in Preterm Infants.*

*Smith et al (2014) Ann Neurol 75(4):57-69*



*NICU Stress Is Associated with Brain Development in Preterm Infants.  
Smith et al (2011) Ann Neuro, Oct, 70 (4), 541-49.*

# Types of Stress

---

## Good stress

- Challenge us - growth

## Tolerable stress

- Stress that is short term, “neutral”, usually with the presence of a support person to buffer / blunt the effect of stress

## Toxic stress

- Ongoing, chronic, adverse experiences without the support of parent/loved ones

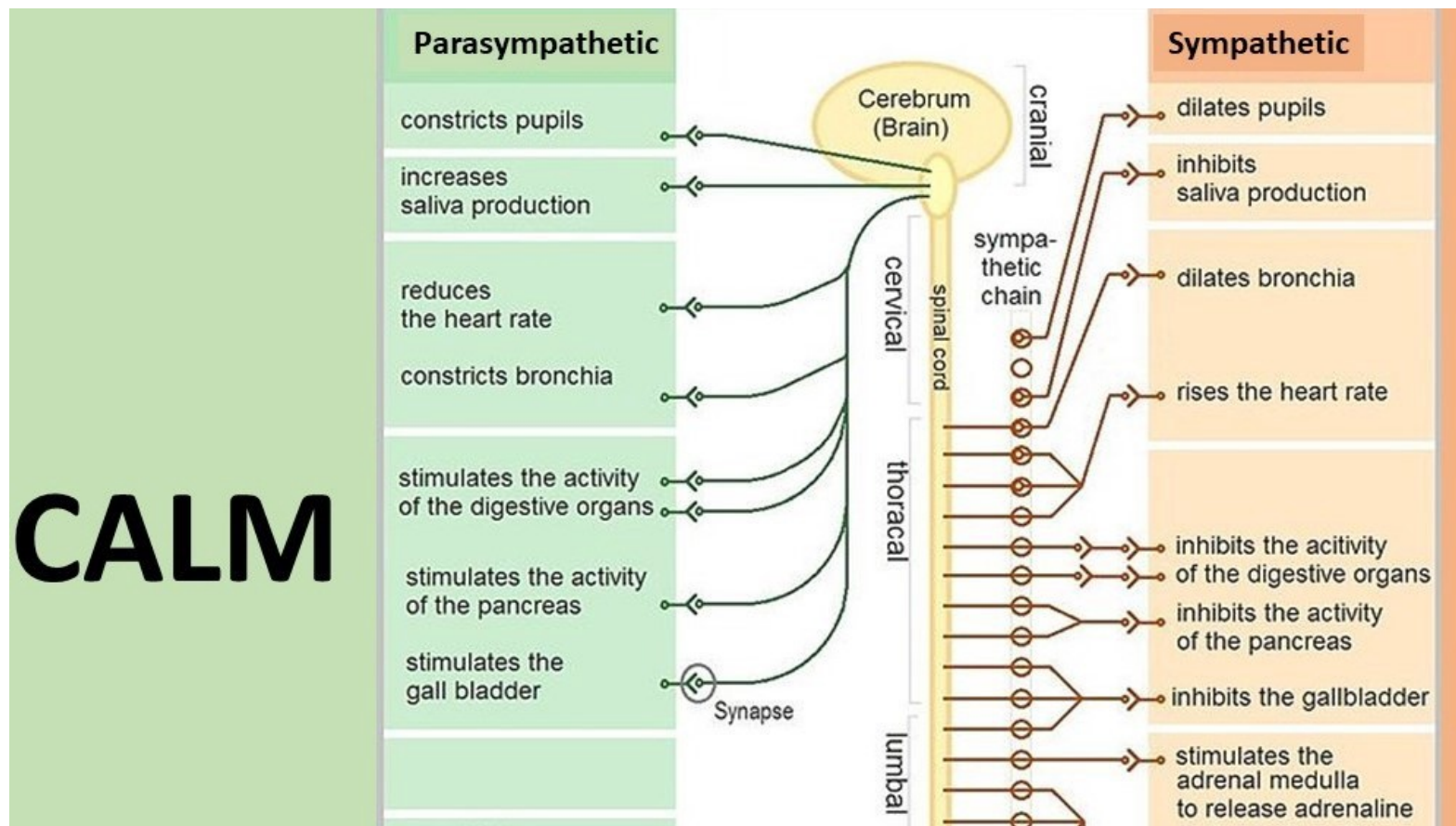
# Toxic Stress in the NICU

---

- Parental Separation
- Noxious Environmental Stimuli



# Autonomic Nervous System



# Comfort Interventions

---

## **Pharmacologic (for Pain)**

- Sucrose
- Analgesics
- Sedatives

## **Non-Pharmacologic (for Stress)**

- Touch
- Massage
- Skin to Skin
- Non-nutritive suck
- Supportive/Therapeutic Positioning

# Definition - Positioning

---

- To put or arrange (someone or something) in a particular place or way

Many names for positioning in NICU

---

- Therapeutic Positioning
- Developmental Positioning
- Supportive Positioning

# Goals of Therapeutic Positioning

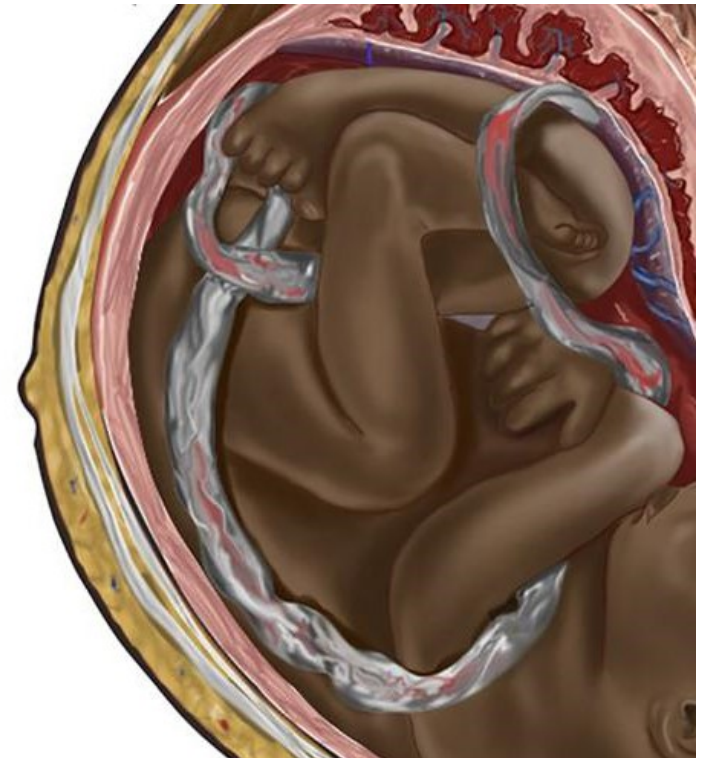
---

- Not only to prevent Musculo-skeletal deformities
- Not only to prevent IVH (intra-ventricular hemorrhage)
- To provide comfort, security, and sleep

# Preterm infants need extra support

---

- Infants born preterm are deprived of the uterine crowding during the third trimester of pregnancy.
  - This trimester encourages the development of physiologic flexion, a position characterized by shoulder



Zarem C, Connell T, Tiltges L, Madlinger L, Reynolds L, Lukas K, Pineda R. Neonatal nurses' and therapists' perceptions of positioning for preterm infants in the neonatal intensive care unit. *Neonatal Nurs.* 2013; Mar-Apr;32(2):110-6. doi: 10.1891/0730-0832.32.2.110. PMID: 23477978; PMCID: PMC3953371.

**flexion, scapular protraction,**

# Preterm infants need extra support

---

- Preterm infants often lack adequate muscle tone and strength at birth.



- This often causes
- Zarem C, Chaput T, Tilgner L, Maullinger L, Reynolds S, Lukas K, Pineda R. Neonatal nurses' and therapists' perceptions of positioning for preterm infants in the neonatal intensive care unit. *Neonatal Netw.* 2013 Mar-Apr;32(2):110-6. doi: 10.1891/0730-0832.32.2.110. PMID: 23477978; PMCID: PMC3953371.

“ . . . . .

# Therapeutic Positioning Impacts

---

- Respiratory System
- Musculo-Skeletal
- Sensory System
- State Control (behavior)
- Sleep
- Feeding
- Weight Gain
- Comfort / Stress / Pain

# Positioning Impacts

---

- **EVERYTHING!**

# 3 Goals of Positioning

---

- Flexion
- Mid-Line Alignment
- 



## 3 Essential elements of positioning

---

- **#1 Promote Flexion and Prevent Extension**



# Babies of Instagram – this week

---



## 3 Essential elements of positioning

---

### #2 Midline

- Nose
- Nipples
- Knees
- Toes



# Diaper too big ? What if baby startles?

---



## 3 Goals of Positioning

---

- #3  
Containment  
with  
boundaries
  - All 360 degrees
  - Not restrictive
  - Allow



# Contain vs Restrain

---



# In Utero...

---

- Flexion
- Mid-Line Alignment
- 



## 3 Goals of Positioning

---

- #3 Containment w
  - All 360 degrees
  - Not restrictive (allow
  - The right size for the



# Is the nest the right size?



# Is the nest the right size?

---



# Positioning Assessment

---

- The IPAT Tool
  - Infant
  - Positioning
  - Assessment
  - Tool

Indicator	0	1	2
Shoulders			
Hands			
Hips			
Knees, ankles, feet			
Head			
Neck			

Coughlin, Lohman, & Gibbins (2010) Reliability and Effectiveness of an Infant Positioning Assessment Tool to Standardize Developmentally Supportive Positioning Practices in the Neonatal Intensive Care Unit, *Newborn and Infant Nursing Reviews*, Volume 10, Issue 2, Pages 104-106, June 2010

**Indicator**

**0**

**1**

**2**

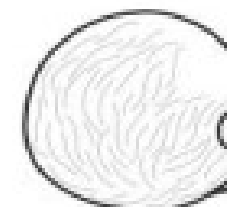
**Head**



Head rotated laterally (L or R)  
> 45° from midline

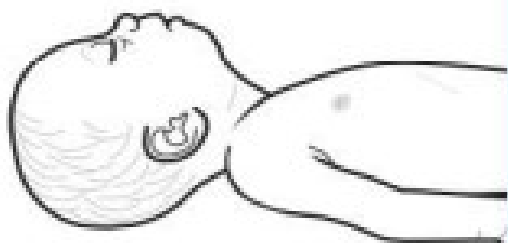


Head rotated laterally (L or R)  
30 - 45° from midline



Head aligned (L or R)  
midline

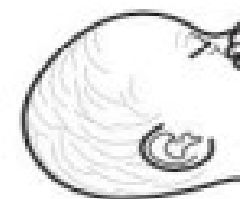
**Neck**



Neck in hyperextension  
or hyperflexion



Neck neutral



Neck neutral, aligned,  
flexed forward 10°

**Shoulder**



**Shoulders**



Shoulders retracted



Shoulders aligned, flat to surface



Shoulders rounded forward towards midline

**Hands**



Hands away from body

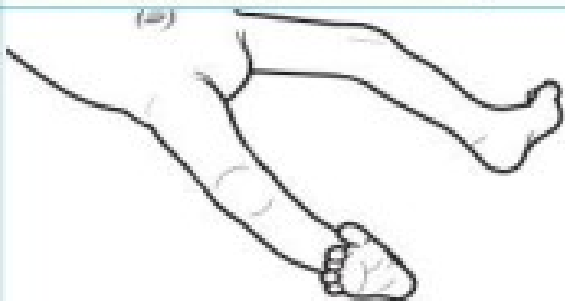


Hands touching torso

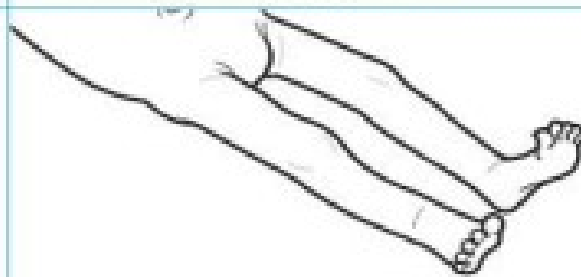


Hands touching face

**Hips/pelvis**



Hips/pelvis abducted, externally rotated



Hips/pelvis aligned but extended



Hips/pelvis aligned and flexed

# Tools for Therapeutic Positioning

---

- Hands
- Devices
- Pillow cases
- Gel Pillows
- Blankets
- Z-Flow



# Blankets are Your Best Friends

---



# Blanket Nest

---

- Make it to the size of the baby
- Do not make one-size fits all



# How to Make a Nest –Step 1

---



# How to Make a Nest – Step 2 & 3

---



A newborn baby is lying on its back on a light blue, textured blanket. The baby is wearing a light blue knit hat and a white onesie with a faint, repeating pattern of small figures. The baby's head is turned slightly to the right, and its arms are tucked close to its body. The overall scene is calm and focused on the baby's comfort.

Positioning Tips for Comfort

# Beware!

---

- : Babies below 34 weeks gestation lack physiological flexion and will 'flatten' to the



# Supine (on the back)

---

- Don't allow the legs and feet to "float"
- Without support at the feet, the baby will feel lost and vulnerable and



# Supine

---

- Provide 360 degrees of support
- A positioning roll has been wrapped around the baby and then a sheet



# Before and After

---



# Prone Tips

---

- Add a small soft roll at hip level (NOT below stomach) brings the knees into midline, and flexes the hip joints.
- Add a nest/provide boundaries (rolls) to the feet and arms using blanket rolls



# Prone Roll (Surfboard)

---

- The 'surfboard' is made of a soft flattened roll, its width must not be wider than the baby's shoulders or they will be forced out of alignment.
- The roll should start at hip level to support the



A 'surf board' can also be used to support the baby in a prone position to flex its hips and bring legs and

# Prone Tips

- Most babies will benefit from 'tucking in' with a cover or nest straps, as long as their movement is not restricted or prevented.



# Prone Roll

---

- Add boundaries with blanket rolls
- Add containment with small blanket



# Side Lying (Lateral)

---

- CAUTION!!
- Rolls should not be placed between the baby's legs as it prevents the knees and hips



# Side Lying (Lateral)

---

- Provide nests/boundaries for supporting a midline position and promoting fine motor skills



# In-Utero

- Support babies in self-soothing behaviors learned in utero



# Hands to Face Self-Soothing

 elleveekay





Grasping

---

Self-  
Soothing

neo.niguarda

ASST Grande Ospedale Metropolitano Niguarda



# Mistakes when positioning

---



# Where do we position babies?

---

## In the Bed



## In the Arms



# 3 Goals of Positioning

---

- Flexion
- Mid-Line Alignment
- 



# Positioning for Comfort

---

- Benefits Baby
- Benefits Parents
- Benefits Staff
- Benefits Long-Term  
Outcomes



What's ONE Thing You can Do?

---

We can't do  
everything,

But we can always do  
something!

# Obrigado



I CONGRESSO INTERNACIONAL DE  
**NEONATOLOGIA DO DF**



INSTITUTO DE PESQUISAS EM NEONATOLOGIA  
PAULO ROBERTO MARGOTTO