

The Impact of Therapeutic Neonatal Positioning in the NICU

Background



- Neonatal Positioning is essential to receiving optimal comfort and is a standard of care.
- Important for premature babies.
- Lack of proper positioning can later influence crawling, walking, sitting, and balancing on their own
- Skin is prone to breakdown regardless of age.
- Ischemia can set in after too long in one position.
- Standard of care is to be reposition every 3-4 hours with cares.
- Promotes growth and development.

(Mark, 2020) (Larkin et al., 2019) (Marcellus, 2004)

American Academy of Pediatrics (AAP) Guidelines

- 1992: Keep babies on their backs for sleeping to reduce SIDS
 - This led to 50% fewer deaths
- 2020: back to sleep with no swaddling.
 - Advised not to sleep on sides or stomach.

American Academy
of Pediatrics



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Negative Effect:

- Delay in infant motor development milestones
- Cranial asymmetry has increased by about 46.6% most recently.

(AAP, 2020) (Zachry et al., 2017).

Literature Review

Study #1

Quantitative study with descriptive statistics

Setting: 75-bed NICU

Intervention: Nurses and therapists were educated on positioning.

Purpose: Thoughts and preferences of each professional were compared.

Survey was sent to 242 neonatal nurses, 16 therapists (speech, occupational, and physical) on what they thought was valuable about positioning neonates and which positioning aid they preferred.

Results: There was a 99% agreement that positioning is important for neonates.

(Zarem et al., 2013). (Charafeddine et al., 2018)

Study #2

Quality Improvement (QI) project done at a tertiary center in a 22-bed Level III NICU from Sept. 2014 – March 2016.

Purpose: Observe correlation between nurses being continuously educated on positioning and increasing IPAT scores

Educational components: educational sessions, hands-on skills lab, PowerPoint presentations, detailed video, online module, simulations one-on-one with a mannequin to run through scenarios.

After education, staff performed IPAT over 3 cycles and gathered a cumulative score.

Limitation: No positioning aids available

Results: The IPAT score increased, but they did not reach a therapeutic score of a 9.

Purpose/Aim

Promote rest periods of 2-3 hours and maximize comfort.

- Neonates require a quiet environment.
- Literature supports nurses being educated on positioning neonates.

Research Questions

1. Is there a difference in therapeutic neonatal positioning scores with the use of a positioning aid after implementing a nursing educational intervention?
2. Is there a relationship between neonatal positioning and select neonatal demographics?

(Zarem, et al., 2013)



Methods/Approach

Quasi-experimental Study Jan. 2022 – March 2022 14-bed Level III NICU

- Measured neonatal positioning pre and post use of a positioning aid and the tool used was the IPAT.
- Educational was provided prior to the start of the study.
 - Educational component for RNs of NICU (two in person sessions and one mass email)
 - Education on how to use positioners, refresher on positioning, information on care for development and IPAT scoring was explained.

Goal: Post-mean score of 9 or higher for therapeutic positioning

Convenience sampling **Power analysis: 28** Goal sample size: 35

Inclusion Criteria: All babies admitted to the NICU

Exclusion Criteria: Babies on pain medication or an oscillator

Instrument

Infant Positioning Assessment Tool (IPAT)



















- Developed by Philips – validity and reliability confirmed
- Permission was obtained to use this tool.
- Assessed extremities and body alignment of neonates
- Six items: head, neck, shoulders, hands, hip/pelvis, and knees/ankle/feet measured 0, 1, 2.
- Two is reflective of therapeutic positioning
- Zero is inadequate positioning
- Pre- and post-positioning (2 scores per baby)

(Philips, 2018)

Patient's name: _____ Birth gestational age/corrected gestational age: _____

Clinician's name: _____ Date/time of assessment: _____

Infant position: Supine Side-lying Prone

| Indicator | 0 | 1 | 2 | Score |
|--|---|--|--|-------------------------------|
| 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) 0 - 30° from midline | |
| Neck |  Neck in hyperextension or hyperflexion |  Neck neutral |  Neck neutral, aligned, head slightly flexed forward 10° | |
| 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 softly flexed | |
| Knees/ankles/feet |  Knees extended, ankles and feet externally rotated |  Knees, ankles, feet aligned but extended |  Knees, ankles, feet aligned and softly flexed | |
| 12 = ideal cumulative score. 9 - 11 = acceptable cumulative score. ≤ 8 = need for repositioning. | | | | Total cumulative score |

Results

- Final sample size (n=31)
- Descriptive statistics performed for the pre vs. post mean/SD.
- **Goal of a post-mean >9 was achieved!**

Table 2

Analysis of Differences in Pre- and Post-Test Scores (N = 31) on the Infant Positioning Assessment Tool (IPAT) before and after Use of Positioning Aids

| Paired Differences | Pre-test | | Post-test | | t | df | p | Cronbach Alpha |
|--------------------|----------|-------|-----------|-------|--------|----|---------|----------------|
| | M | SD | M | SD | | | | |
| Q1- Head | .87 | .619 | 1.68 | .475 | -7.470 | 30 | <.001** | |
| Q2- Neck | 1.03 | .657 | 1.68 | .475 | -5.064 | 30 | <.001** | |
| Q3- Shoulders | 1.06 | .680 | 1.90 | .301 | -7.325 | 30 | <.001** | |
| Q4- Hands | 1.10 | .746 | 1.68 | .475 | -4.491 | 30 | <.001** | |
| Q5- Hips | 1.13 | .806 | 1.94 | .250 | -5.387 | 30 | <.001** | |
| Q6- Knees | 1.06 | .772 | 1.87 | .341 | -5.387 | 30 | <.001** | |
| Total Score | 6.29 | 3.185 | 10.71 | 1.346 | -8.974 | 30 | <.001** | .85 |

Note: Score item 0= non-therapeutic, 1= somewhat therapeutic, 2= therapeutic positioning, maximum total score = 12.
p<.05* level of significance, *p*<.01**

Demographics

- Multivariate analysis revealed that there is no correlation between demographics and the post-mean total IPAT scores.
- Handmade blanket rolls by the RN's were the most used positioning aid
- Linear regression (shown below) shows that there is a correlation between gestational age being a predictor of weight.

Table 3

| Linear Regression Model Predicting Weight at Birth | | | | |
|--|-----------|------------------|------|--------------|
| | B | Standard Error B | Beta | Significance |
| Gestational Age | 29.291 | 3.649 | 0.83 | p<0.001 |
| Consent | -4816.463 | 911.783 | -- | p<0.001 |
| R ² =0.69 (p<0.001) | | | | |

Table 1

Descriptive Statistics of Demographics on IPAT

| Demographic Variable | M | SD | n | % |
|---|---------|---------|----|------|
| Gestational Age (180 days – 291 days) | 248.42 | 27.208 | - | - |
| Gender | | | | |
| Male | | | 21 | 67.7 |
| Female | | | 10 | 32.3 |
| Total | | | 31 | 100 |
| Ethnicity | | | | |
| White/Caucasian | | | 8 | 25.8 |
| Hispanic | | | 12 | 38.7 |
| African American | | | 3 | 9.7 |
| Asian | | | 4 | 12.9 |
| Indian | | | 1 | 3.2 |
| Thai | | | 2 | 6.5 |
| Hawaiian/Pacific Islander | | | 1 | 3.2 |
| Total | | | 31 | 100 |
| Type of Positioning Aid | | | | |
| Blanket Rolls | | | 17 | 54.8 |
| Halo Sac | | | 3 | 9.7 |
| Swaddled | | | 3 | 9.7 |
| Blanket & Bean Bag | | | 3 | 9.7 |
| Blanket Roll/Bean Bag/Gel Pillow | | | 2 | 6.5 |
| Bean Bag/DandleROO | | | 1 | 3.2 |
| Bean Bag/Halo Sac | | | 1 | 3.2 |
| DandleROO/Gel Pillow | | | 1 | 3.2 |
| Total | | | 31 | 100 |
| Weight (925grams – 5000grams) | 2459.97 | 959.677 | - | - |
| Delivery Method | | | | |
| Vaginal | | | 9 | 29 |
| C-section | | | 22 | 71 |
| Total | | | 31 | 100 |

Conclusion

- Increased HCP awareness on therapeutic positioning
- Educated on positioning aids and development
- Increased opportunities for positive development of neonates
- IPAT provided a visual for therapeutic positioning



Implication for practice



(DandlePAL,2020)

- Positioning should remain a standard of care
- Continuing education on positioners and positioning for positive developmental progress
- Positioning champion on the unit.

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Questions?



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