



# The effects of handling in moderate to late preterm infants receiving neonatal intensive care

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## PURPOSE

The purpose of this study is to describe the relationship between routine caregiving procedures and renal and cerebral regional oxygenation (StO<sub>2</sub>) in hospitalized preterm infants at 32-36 6/7 weeks gestational age (moderate-to-late preterm infants).



<https://www.mccourier.com/global-neonatal-preterm-infant-care-market-2020-with-covid-19-impact-analysis-growth-latest-trend-analysis-and-forecast-2025/>

## BACKGROUND

- In the United States preterm births account for 10.2% of all births as of 2021
- Of these preterm births, 82% are moderate-to-late preterm (32-36 6/7 weeks)
- High risk for morbidity due to systemic immaturity
- Exposed to a variety of necessary procedures and events
- Most research is focused on preterm infants born <30wks
- Less is known about the moderate-to-late preterm population

## AIM

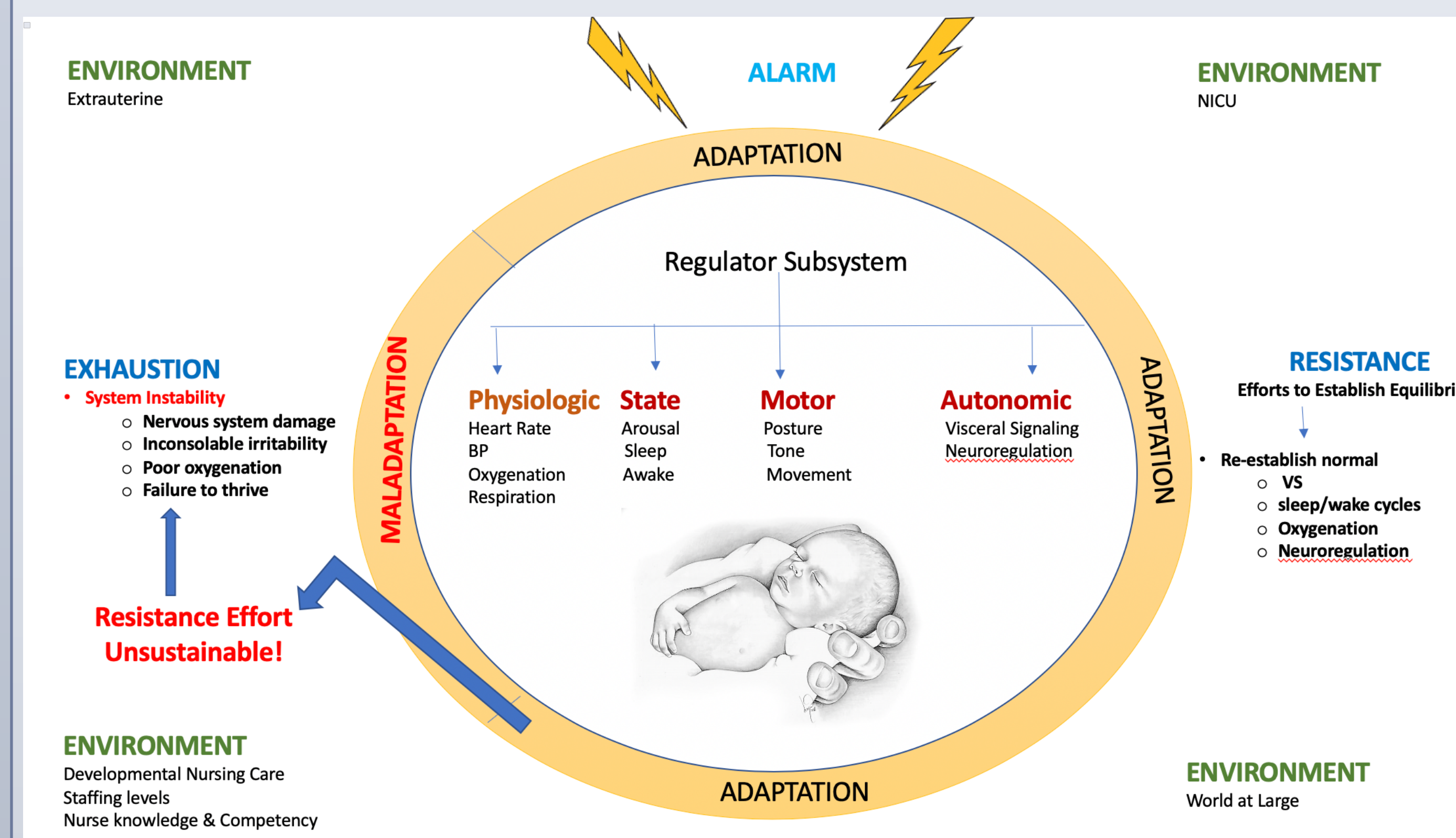
Describe the impact of single stressful care procedures (SCP), clustered stressful care procedures, and clustered care procedures with tissue-damaging procedures (TDP) on cerebral and renal oxygenation in moderate to late preterm infants as measured by near-infrared spectroscopy.

## RESEARCH QUESTION

How is cerebral and renal StO<sub>2</sub>, monitored by near-infrared spectroscopy (NIRS), affected by routine caregiving procedures, in hospitalized moderate to late preterm infants (32-36 6/7 weeks gestation)?

## THEORETICAL FRAMEWORK

### Postnatal Synactive Adaptation Model



## RESEARCH DESIGN

Quantitative descriptive research design using a prospective observation.

## METHODS/PROCEDURE

- Observation period of up to 7 hours
- Position close enough to observe all infant contact
- NIRS recording
- Pulse oximetry recording
- Score for Neonatal Acute Physiology-Perinatal Extension (SNAPPE-II) assessment
- Data collection on all contact
  - Time stamped to capture real-time events

## RESULTS

### Demographics

- Final enrollment 37 infant participants
- Mean observation time was 5.8 ± 0.3 hours,
- Observations occurring at a mean of 4.8 ± 1.4 days of life
- Mean SNAPPE-II score of 6.3, representing a mild mortality risk
- Mean gestational age of participants was 34.2 ± 1.1 weeks
  - 35% were moderate preterm (32-33 6/7 weeks gestation)
  - 65% were late preterm (34-36 6/7 weeks gestation)
- Mean birth weight of 2263 ± 602.8 grams
- 76% were born by cesarean section
- 62% were male
- 97% of participants did not require any type of respiratory support

### Inferential statistics

- Significantly lower reduction in StO<sub>2</sub> when a single procedure was performed versus when procedures were performed consecutively or in clusters.
- Larger percent reduction in renal StO<sub>2</sub> compared to cerebral StO<sub>2</sub> in all three groups

Maximum Percent Reduction from Baseline	Single SCP Procedure	Clustered SCP Procedures	Clustered SCP + TDP Procedures	P-value
Cerebral StO <sub>2</sub> (%); Median (Min., Max.)	2.3 (-3.3, 15.6)	5.1 (-3.4, 36.7)	4.8 (-0.6, 36.9)	<0.001*
Renal StO <sub>2</sub> (%); (Mean ± SD)	5.1 ± 4.6	11.4 ± 6.7	12.0 ± 8.3	<0.001*
SpO <sub>2</sub> (%); Median (Min., Max.)	3.4 (0.1, 32.7)	9.7 (0.9, 59.7)	8.6 (-5.8, 49.2)	<0.001*
HR (bpm); Median (Min., Max.)	7.8 (-5.3, 50.7)	11.6 (-1.8, 72.5)	9.7 (-4.4, 60.4)	0.255

- Cerebral, renal, and systemic oxygenation were associated with a significantly larger maximum percent reduction during clustered procedures than during single procedures
- Maximum reduction values in cerebral, renal, and systemic oxygenation, as well as heart rate, are significantly larger in clustered procedures than in single procedures, the reduction is almost twice as greater.

Maximum Reduction	Single SCP Procedure	Clustered SCP Procedures	Clustered SCP + TDP Procedures	P-value
Cerebral StO <sub>2</sub> (%); Median (Min., Max.)	4 (1, 14)	8 (1, 41)	8 (1, 34)	<0.001*
Renal StO <sub>2</sub> (%); (Mean ± SD)	7.6 ± 4.9	14.8 ± 6.6	16 ± 9	<0.001*
SpO <sub>2</sub> (%); Median (Min., Max.)	6 (1, 35)	13 (2, 63)	14 (2, 51)	<0.001*
HR (bpm); Median (Min., Max.)	27 (10, 104)	45 (13, 157)	43 (12, 144)	<0.001*

- Our results suggest that infants are affected more by the quantity or length of procedures, as in clustered procedures, than they are by single procedures.
- We observed that infants exhibit similar physiologic responses to caregiving procedures, whether the caregiving sequence has a painful procedure or not.

## CONTACT

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