



Supporting optimum autonomic regulation is fundamental to the best nursing care of newborns. Supporting optimal autonomic regulation in newborns is a different and more complex process than it is in older children. Significant advances in human biology and neuroscience indicate eight key domains within which nursing practices can support optimal autonomic regulation in newborns. Minette Coetzee

Engaged Maternal Presence

This domain centers around the importance of the engaged presence of the mother to provide co-regulation as the infant encounters the extra-uterine environment, while simultaneously experiencing the distress of illness and healthcare interventions. Newborns and infants should never be left alone in clinical settings. The presence of the mother with the child is encouraged and supported at all times.

No Needless Pain

This domain acknowledges that discomfort, pain or anxiety are inevitable for newborns who require healthcare interventions either because they are sick or very small. The domain includes caring in ways that anticipate and avoid discomfort and distress while recognising and managing pain without hesitation. It also includes the imperative to recognise constraints to pain recognition and treatment in newborns, which can include individual or professional beliefs and perspectives or institutional policy and practice norms.

Hydration

This domain is primarily focused on hydration in newborns. It acknowledges the particularly complex and precise mechanisms that regulate hydration and water homeostasis. Water composes 75–80% of the newborn's body. Their proportionately large body surface area increases risk of insensible fluid loss. Maintaining optimal fluid balance in sick or small newborns and infants is imperative because these delicately balanced mechanisms are easily disrupted, and newborns have a heightened risk of dehydration.

Nutrition

This domain is centered around maintaining optimal nutrient intake primarily with breastmilk, and while managing illness and restoring health. Establishing and maintaining feeding can be challenging for newborns, more so in healthcare encounters. Treatment regimens and hospitalisation often require infants to swallow unfamiliar substances, which may further affect appetite and intake. Supporting optimal nutrition for the newborn and infant in hospital requires sensitivity, patience and creativity.

Managing the Microbial Load

This domain focuses on understanding and supporting the delicately balanced human microbiome which, in newborns, is established through the intake of the colostrum mothers produce directly after birth. This colonization of microbes has protective functions that affect the host's metabolism, immunity and response to infection. The developing and dynamic microbiome of the newborn is easily disrupted by stress, illness, and necessary treatments including antibiotic use, increasing vulnerability to pathogens.

Skin and Mucosal Integrity

This domain focusses on supporting the integrity of the skin and mucosa to provide the body's first line of defense and is vital for optimum innate immunity. Vigilance and skillful and proactive skincare can reduce risks to integrity arising from events such as dehydration, nutrient loss or venipuncture. The delicate skin-mucosal boundaries of nose, lips and the oropharyngeal mucosa are particularly at risk through common, traumatising and invasive interventions such as nasogastric or endotracheal tube insertion or suctioning of the airways.

Developmentally Supportive Care

This domain centers on providing neuro-supportive care to all newborns. It is care offered by or in partnership with the mother, caregivers and families in ways that support the newborn in supported flexion, in subdued light and low noise environments. Ideally skin-to-skin care providing an environment perceived as 'safe' by the infant neurological system. This in turn supports the infant's growth and neurodevelopment. New understandings in the neurosciences confirm that this supportive awareness extends throughout the newborn period in both premature and term infants.

A System of Action

This domain is about establishing and sustaining health care systems that work for newborns - including units, facilities and health systems. Nursing care extends to supporting the functional operation of systems that are welcoming, safe, effective, timely, efficient, equitable, age-appropriate, directed by the best available evidence and provided in ways that are supportive of families and communities.

Rationale

In 1860, Florence Nightingale asserted that:

"What nursing has to do ... is to put the patient in the best place for nature to act".¹

The rationale at the heart of our approach is that optimal autonomic regulation is this best place and that there is good evidence that these 8 key domains are fundamental to children's nursing care that intentionally supports regulation. Within these domains, nursing activities include assessing, anticipating change, preventing deterioration and injury, planning care in anticipation of discharge planning and providing an intentionally supportive environment.

Fully referenced evidence summaries for each domain are available and can be downloaded at <https://doi.org/10.25375/uct.23500752>

Observing regulatory function

Autonomic regulatory function is observable through activities that nurses routinely track and monitor, including:

Vital signs

- Thermoregulation
- Respiratory rates and efficiency of breathing
- Cardiovascular regulation measured by cardiac rate and force
- Blood pressure, including arterial pressure and central venous pressure

Other observations

- Blood glucose maintained within normal glycaemic range
- Comfort
- Emotional and behavioural regulation
- Sleep-wake rhythms

This poster can be downloaded at <https://doi.org/10.25375/uct.23500752>

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