

# Regul8 A framework for optimising autonomic regulation in children

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Supporting optimum autonomic regulation is fundamental to the best nursing care of infants and children. Significant advances in various disciplines indicate that the process of supporting optimal autonomic regulation in infants and children is a different and more complex process than it is in adults. Emerging evidence in human biology and neuroscience indicate eight key domains within which children's nursing practices support optimal autonomic regulation.

## Engaged Mother to Child Interaction

This domain centres around the importance of the engaged presence of the mother to mediate the distress of illness, injury and healthcare interventions. Infants and children 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 may be inevitable in healthcare encounters, either as a result of healthcare interventions or as a consequence of the child's injury or illness. It includes caring in ways that anticipate and avoid pain and discomfort, recognising and managing pain without hesitation. It also includes the imperative to explore and recognise constraints to pain recognition and treatment, which can include individual or professional beliefs and perspectives or institutional policy and practice norms.

## Hydration

This domain is primarily focused on hydration in infants and children. It acknowledges the particularly complex and precise mechanisms that regulate hydration and water homeostasis. Maintaining optimal fluid balance in ill or injured infants and children is imperative because illness and injury quickly disrupt these delicately balanced mechanisms and that infants and children have a heightened risk of dehydration.

## Nutrition

This domain is centred around maintaining optimal nutrient intake when managing illness and restoring health. Loss of appetite is common in illness. In addition, children may object to unfamiliar food. Treatment regimes and hospitalisation often require that infants and children take or swallow unfamiliar substances, which may further affect appetite and food intake. Supporting optimal nutrition for the infant or child in hospital requires sensitivity, patience and creativity.



## Managing the Microbial Load

This domain focuses on understanding and supporting the delicately balanced human microbiome. This vast system of microbes has protective functions that affect the host's metabolism, immunity and response to infection. The developing and dynamic microbiome of the infant or child 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 defence and is vital for optimum innate immunity. Vigilance, skilful and proactive care can reduce risks to integrity arising from events such as dehydration, nutrient loss or venepuncture. The delicate skin-mucosal boundaries around the anus are threatened by diarrhoea. The integrity of the mucosal boundaries of nose, lips and the oropharyngeal mucosa are particularly at risk through common traumatising and invasive interventions such as nasogastric tube insertion or suctioning of the airways.

## Developmentally Supportive Care

This domain centres on providing supportive care to children of all ages, offering care in partnership with families in ways that notice what each individual child can do and the milestones they have reached, and which celebrates and encourages competence towards the next steps. New understandings of neuronal wiring and the integration of cognitive, emotional and behavioural development show the complexity of influences on how children learn to speak, think and regulate their responses and behaviour. This supportive awareness extends throughout the paediatric population, including newborns (both premature and term infants), infants, toddlers, pre-schoolers and school aged children, as well as through puberty and adolescence.

## A System of Action

This domain is about the sustaining health care systems that work for infants, children and young adolescents - 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".!*

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.23500743>

## 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.23500743>

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