Benchmark No. 7

Inotrope Administration
(2nd Edition)

British Association of Neuroscience Nurses

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History

The Neuroscience Nursing Benchmarking Group (NNBG) was established in the 1990`s as a result of increasing concerns over inconsistencies in practices as part of a subsidiary of BANN. The group aims to improve on the quality of care by comparing and sharing practice with each other, and set explicit standards for comparison of current practice against the ideal standard. The group is committed to searching for the best evidence related to specific areas of neuroscience practice. Membership of the group consists of representatives from neuroscience units within the UK and Ireland, together with educational colleagues from both the NHS/HSC and Higher Educational Institutes. The group is further subdivided into regions and this benchmark was developed by the North East group of the NNBG in 2007.

In 2016, the NNBG consolidated back into BANN and further information about NNBG can be found on the BANN website www.BANN.org.uk .

BANN would like to acknowledge the leadership and significant contribution made by the NNBG, and all its contributors, to neuroscience nursing over the years.

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Key Points

- Norepinephrine, also known as noradrenaline, is a neurotransmitter for both the central and peripheral nervous system. It is essential for regulating cognitive function, particularly arousal, attention and memory in addition to moderating the 'fight or flight response to stress. In the rest of the body, noradrenaline regulates heart rate, blood pressure, glucose, bladder functions and gastrointestinal motility.

- Vasoactive drugs consist of inotropes, chronotropes, vasopressors and vasodilators. They work in different ways to improve cardiovascular performance. Some vasoactive drugs have a rapid half-life and require continuous infusions to maintain cardiovascular stability.

- The choice of vasoactive drugs used will depend upon the clinical assessment of the person.

- Common vasoactive drugs include: -

    - **Catecholamines**
        - Adrenaline, noradrenaline, dopamine, dobutamine, dopexamine, phenylephrine

    - **Phosphodiesterase inhibitors**
        - Milrinone, enoximone

    - **Calcium sensitising agents**
        - Calcium, digoxin

    - **Vasodilators**
        - Glyceryl trinitrate (GTN), sodium nitroprusside

- People requiring vasoactive medications must be cared for in the appropriate setting with access to accurate and continuous monitoring.

- Specific methods to ensure continuous infusion of the drug should be undertaken when changing syringes via a dedicated central line.

FACTOR 1 – Documentation – Assessment and Implementation of Care

STATEMENT OF BEST PRACTICE		EVIDENCE & REFERENCES	ACHIEVED	NOT ACHIEVED	VARIABLES
1.0	Vasoactive drugs are administered to increase mean arterial blood pressure (MAP) and optimise cerebral perfusion pressure (CPP) in brain injured patients with compromised cerebral autoregulation. Noradrenaline is usually the drug of choice, but other medications include Metaraminol, Milrinone and Dopamine may be prescribed.	Rhodes *et al.* (2017) Abulhasan *et al.* (2020)			
1.1	Evidence-based guidelines are available and have been reviewed in the past 2 years.				
1.2	Patients are nursed in a level 2/3 unit to facilitate continuous monitoring of vital signs	Bersten & Handy (2019)			
1.3	Target parameters for drug delivery and therapeutic goals are documented by the medical staff				
1.4	Any changes in vital signs and subsequent drug delivery are clearly documented so that the response to the drug can be evaluated.	Dellinger *et al*. (2017)			
1.5	Noradrenaline has a rapid half-life (15-30 seconds) and requires continuous infusion to maintain the patient's cardiovascular stability.	Dooley *et al.* (2022)			
1.6	A protocol is available to ensure consistency and minimise the potential risk of adverse effects on syringe changes (noradrenaline syringes infusing at high doses e.g., ³ 0.3 mcg/kg/min may involve a greater risk)				

FACTOR 2 – Protocol

	STATEMENT OF BEST PRACTICE	EVIDENCE & REFERENCES	ACHIEVED	NOT ACHIEVED	VARIABLES
2.0	The Protocol includes the following factors: - ▪ Criteria for commencement of therapy ▪ Guidelines for syringe / bag's changeover ▪ Central venous pressure documented as a baseline recording. ▪ Dedicated central line is identified for the therapy (distal lumen is the preferred lumen) ▪ The infusion lines are labelled, both distally and proximally ▪ Blood glucose is checked 4hrly or more frequently as required. ▪ Noradrenaline is commenced at 0.1microgram/ kg/ minute1 and infusion rate titrated according to target parameters. ▪ The effectiveness of the dose is continually assessed. ▪ Vaso-active drugs should not be started until ventricular filling is optimised.	Dooley *et al.* (2022)			
2.1	The infusion site is frequently checked for signs of extravasation that may produce profound tissue hypoxia and necrosis.	Smith & Manni (2023)			
2.2	The drug concentration in the syringe/bag is reviewed, taking into consideration recent changes in infusion rate and patient's clinical condition.				

FACTOR 3 – Education

	STATEMENT OF BEST PRACTICE	EVIDENCE & REFERENCES	ACHIEVED	NOT ACHIEVED	VARIABLES
3.0	Staff receive competency-based training in caring for a patient requiring vasoactive medication: • An awareness of possible increased sensitivities to the medication, i.e. monoamine oxidase inhibitors (MAOI's), tricyclic antidepressants • An awareness of specific actions and side effects of the medication • Knowledge of complications associated with therapy - peripheral ischaemia at high doses, reduced end-organ perfusion, headache, anxiety, restlessness, arrhythmias • Familiarity with the infusion devices • Safe practice in changing lines and labelling • Reducing and increasing Inotrope therapy • Importance of single use line and the reason flushes are not administered. • Recognition of the importance of ensuring sufficient supplies of the drug are prepared in good time to ensure smooth transition of drug during syringe transfers.	Dooley *et al.* (2022) Bersten *et al.* (2019)			

FACTOR 4 – Patient Information

	STATEMENT OF BEST PRACTICE	EVIDENCE & REFERENCES	ACHIEVED	NOT ACHIEVED	VARIABLES
4.0	Patient and family are informed of the rationale for the treatment and are offered regular updates of the patient's response to treatment				

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