



Topic Expert Group: Patient safety and hygiene practice

Monitoring errors

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Target group

Infants and parents

User group

Healthcare professionals, neonatal units, hospitals, health services, and technical staff

Statement of standard

Physiological monitoring is provided to any infant admitted to a NICU, which is tailored to the individual clinical situation.

Rationale

Neonatal intensive care allows the monitoring of several physiological parameters, with a range of technologies available. New techniques will expand the number of physiological parameters measurable in NICUs and will provide monitoring previously available for older patients. (1)

The increased range of monitoring parameters available produces challenges in their measurement and interpretation, due to the novelty and complexity of the monitoring technology, to a lack of understanding of some relatively new monitoring parameters or to technical errors in the monitoring itself or human error. (2,3) Neonatal quality-assurance procedures and protocols should be directed to the improving the accuracy and quality of monitoring. (4) Although monitoring errors are generally less frequent and severe than drug administration errors (2), improved evaluation of monitoring results will allow better clinical decisions.

Standard monitoring technologies are used in NICUs (ECG, saturation, plethysmography), but advanced monitoring may be necessary and include double saturation and perfusion index, (5) near-infrared spectroscopy (NIRS) (6,7), electrical cardiometry (8,9), amplitude-integrated-EEG (10,11), heart rate variability (12), complex respiratory function monitoring (including electrical impedance tomography, respiratory inductance plethysmography and semi-quantitative lung ultrasound) (13–15), and metabolic monitoring. (16,17) All these technologies provide potential benefits for neonatal care and individual use is recommended only after healthcare professionals' education and training (see TEG Education & Training).

Benefits

Short-term benefits

- Improved understanding of the disease process (18)
- Targeted clinical decisions to the individual condition (18)

Long-term benefits

- Reduced mortality (19)
- Reduced risk of major morbidities (19)



Components of the standard

Component	Grading of evidence	Indicator of meeting the standard
For parents and family		
1. Parents are informed by healthcare professionals about different monitoring technologies used and commit to help reduce monitoring errors in the unit.	B (High quality)	Patient information sheet
For healthcare professionals		
2. A unit guideline on the use of monitoring equipment, application and interpretation as well as management of monitoring errors is adhered to by all healthcare professionals.	B (High quality)	Guideline
3. Training on the use of monitoring equipment, application and interpretation as well as different monitoring technologies is attended by all responsible healthcare professionals, targeted for each professional group.	B (High quality)	Training documentation
For neonatal unit		
4. A unit guideline on the use of monitoring equipment, application and interpretation as well as management of monitoring errors is available and regularly updated.	B (High quality)	Guideline
5. Regular, timely maintenance and calibration of available devices is conducted by appropriately trained technical staff.	B (High quality)	Guideline
For hospital		
6. Training on the use of monitoring equipment, application and interpretation as well as different monitoring technologies is ensured.	B (High quality)	Training documentation
7. Monitoring errors are evaluated and actions taken. (20)	B (Moderate quality)	Audit report
For health service		
8. Monitoring errors are evaluated and actions taken. (20)	A (Very low quality) B (Moderate quality)	Audit report



Where to go – further development of care

Further development	Grading of evidence
For parents and family N/A	
For healthcare professionals N/A	
neonatal unit N/A	
For hospital N/A	
For health service	
<ul style="list-style-type: none">Develop new monitoring systems as appropriate.	B (High quality)

Getting started

Initial steps

For parents and family

- Parents are verbally informed by healthcare professionals about monitoring technologies used.

For healthcare professionals

- Attend training on the use of monitoring equipment, application and interpretation as well as different monitoring technologies and their physiological/clinical value.
- Attend training on technical details about the way to start monitoring, positioning electrodes, and calibration.

For neonatal unit

- Develop and implement a unit guideline on the use of monitoring equipment, application and interpretation as well as management of monitoring errors.
- Develop information material on monitoring for parents.
- Develop a protocol and flow chart for serial calibration and maintenance of monitoring devices.
- Develop an internal monitoring protocol, including reference values for evaluation and technical details for each device.

For hospital

- Support healthcare professionals to participate in training on the use of monitoring equipment, application and interpretation as well as different monitoring technologies and their physiological/clinical value.
- Support healthcare professionals to participate in training on technical details about the way to start monitoring, positioning electrodes, and calibration.

For health service

N/A

Source

- De Luca D, Romain O. Biomonitoring in neonatal critical. *J Ped Pueric.* 2015;28:276–300.
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First edition, November 2018

Lifecycle

5 years/next revision: 2023

Recommended citation

EFCNI, De Luca D, Tissières P al., European Standards of Care for Newborn Health: Monitoring errors. 2018.