

Cardiovascular Assessment, Monitoring & Nursing Care of the Critically Ill Adult in Intensive Care- Full Clinical Guideline

Reference no.:CG-CRITCARE/4512/24

These are nursing guidelines for use within critical care to support best practice. They are not prescriptive and as with all nursing practice should be utilised in conjunction with the registrant's clinical judgement

Introduction

Critically ill patients are particularly vulnerable to cardiovascular dysfunction due to the nature of their underlying illness or injury or as a potential unavoidable consequence of the intensive therapies received (Couchman *et al* 2007). It is essential therefore to undertake a comprehensive and accurate cardiovascular assessment and deliver prescribed therapy and nursing care in a safe and effective way.

Aim and Purpose

The purpose of this nursing guideline is to ensure that safe and effective cardiovascular monitoring, therapy and nursing care is delivered to critically ill adults in intensive care.

It aims to promote the maintenance of a safe environment for patients, relatives and the multidisciplinary team, to direct the delivery of excellent and informed nursing care and to ensure the nurse acts as patient advocate. (NMC. 2018)

Keywords – Cardiovascular, Critically Ill Adult, Intensive Care Unit

Main Body of Guidelines

Cardiovascular Assessment, Monitoring & Nursing Care

1. Prior to undertaking any cardiovascular assessment and care, ensure that the patient's 3 lead ECG electrodes are attached securely and positioned as follows, while avoiding any bony prominences:
 - The RED, Right Arm Limb Lead (RA) electrode is placed under the right clavicle proximal to the right shoulder within the rib cage frame,
 - The YELLOW, Left Arm Limb Lead (LA) electrode is placed under the left clavicle, proximal to the left shoulder within the rib cage frame
 - The GREEN, Left Leg Lead (LL) electrode is placed at the lower edge of the left rib cage below the pectoral muscles as directed by the Royal Marsden Manual of Clinical & Cancer Nursing Procedures (2020)
2. Ensure that all cardiovascular monitoring equipment has been calibrated (Magder 2006) and that invasive pressure transducers are at the height of the patient's phlebostatic axis / right atrial alignment (Woodrow 2009).
3. Ensure all associated monitoring alarms are engaged and set within patient specific parameters e.g. 10% above or below the patient specific target range and where an

arterial line is in situ ensure that the transduced arterial line blood pressure is comparable to that of the Non Invasive Blood Pressure (NIBP) reading.

4. Continuously monitor the patient's heart rate / rhythm, record hourly or as frequently as the individual's condition dictates and treat / report changes or dysrhythmias. Undertake a manual radial pulse and compare the rate and regularity of rhythm. Investigate and report significant changes.
5. Where clinically indicated, administer prescribed antiarrhythmic drugs and assess their effectiveness.
6. Continuously monitor the patient's blood pressure via an arterial line ensuring that the transducer is levelled at the patient's phlebostatic axis or alternatively via the non-invasive route where an arterial line is contraindicated or not required. Record the systolic, diastolic and mean arterial pressure (MAP) hourly or as frequently as the patient's condition dictates and treat / report any deviation from patient specific parameters.
7. Where clinically indicated, administer prescribed intravenous fluids and or inotropic / vasoactive drugs via the prescribed route and assess their effectiveness as directed by the ICU Nursing Guidelines for Vasoactive Drugs (2024).
8. Undertake arterial line care as directed by the Royal Marsden Manual of Clinical & Cancer Nursing Procedures (2020). Change the transducer set every 72 hours (Thompson 2009) and coincide this with an aseptic dressing change unless redressing is required sooner. Record the Visual Infusion Phlebitis (VIP) score 8 hourly, complete the appropriate Trust documentation and record the number of days since line insertion on the 24-hour observation chart.
9. Continuously monitor the central venous pressure (CVP) via the distal lumen of the patient's multi-lumen central line ensuring that the transducer is levelled at the patient's phlebostatic axis. Record hourly or as frequently as the patient's condition dictates and report significant changes in reading / waveform.
10. Undertake central venous access device care as directed by the Trust Policy & Procedures for the Care and Maintenance of Midline & Central Venous Access Devices (2022). Change the transducer set every 72 hours (Thompson 2009) and coincide this with an aseptic dressing change unless redressing is required sooner. Record the VIP score 8 hourly, complete the appropriate Trust documentation and record the number of days since line insertion on the 24-hour observation chart.
11. Record the patient's core temperature as a minimum 4 hourly using a tympanic thermometer unless contraindicated and manage hypo / hyperthermia as directed by the Royal Marsden Manual of Clinical & Cancer Nursing Procedures (2020).
12. Where the patient is mechanically ventilated post cardiac arrest and ROSC has been achieved, where clinically requested to do so maintain their temperature within prescribed parameters, most commonly between 36°C - 37°C using antipyretic agents or a surface cooling device in order to improve survival and neurological outcomes (Bisht *et al*/2022).
13. Ensure repositioning of the patient is optimised where transthoracic echocardiography (TTE) is required as part of the patient's cardiovascular assessment (Morris *et al* 2010).

Record all associated parameters on the 24-hour observation chart to include; Cardiac Output (CO), Cardiac Index (CI), Stroke Volume (SV), Systemic Vascular Resistance (SVR) or Systemic Vascular Resistance Index (SVRI).

14. Assess the patient's peripheral circulation using capillary refill time (CRT), limb temperature and / or peripheral pulses where indicated and document these at least once per shift. Report CRT > 2 seconds as an indicator of reduced circulation (Jevon *et al* 2020)) along with any significant reduction in limb temperature or pulse strength.
15. Where peripheral cannula are in situ, provide care in accordance with The Royal Marsden Manual of Clinical and Cancer Nursing Procedures (2020) and remove when redundant OR replace after 72 hours. Record VIP score 8 hourly and complete the appropriate Trust documentation and record the number of days since line insertion on the 24-hour observation chart.
16. Unless contraindications apply, ensure prescribed prophylactic or therapeutic dose anti thrombo-embolic medication is administered and ensure that appropriately sized compression stockings or an intermittent pneumatic compression device is employed in order to reduce the risk of deep vein thrombosis or pulmonary embolism and to comply with the VCB (DoH 2011, Hellyer *et al*2016).
17. Ascertain the patient's resuscitation status and ensure RESPECT / DNAR directives are clearly documented and communicated.
18. Ensure routine / patient specific blood tests have been undertaken promptly and documented on the 24-hour observation chart. Ensure available results are reviewed, recorded and acted on as promptly as required.

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APPENDIX 1

Abbreviations

CI- Cardiac Index

CO – Cardiac Output

CRT –Capillary Refill Time

CVP – Central Venous Pressure

MAP - Mean Arterial

mmHg – Millimetres of Mercury

NIBP - Non-Invasive Blood Pressure

ROSC – Return of Spontaneous Circulation

SV – Stroke Volume

SVR – Systemic Vascular Resistance

SVRI – Systemic vascular Resistance Index

TTE – Transthoracic Echocardiogram

VIP – Visual Infusion Phlebitis Score