



CLINICAL PRACTICE GUIDELINE

# Central venous pressure (CVP) measurement

This document should be read in conjunction with this [Disclaimer](#)

## Aim

- To monitor pressure in the central venous circulation to detect potential problems and/ or evaluate patient status.

## Key points

1. Central venous pressure (CVP) relates to an adequate circulatory blood supply. Pressure depends on blood volume, cardiac contractility and vascular tone<sup>1</sup>.
2. CVP is measured in the right atrium or vena cava close to the heart and is a reflection of fluid volume<sup>1</sup> and guides fluid administration, replacement or diuretic administration<sup>2</sup>.

Normal range for CVP is 2 to 8mmHg **or** 3 to 10cmH<sub>2</sub>O<sup>2</sup>. The CVP may be measured with a manometer or transducer.

- Low CVP may indicate hypovolaemia
  - Elevated CVP indicates right ventricular failure or volume overload.
3. Accurate measurement requires equipment levelled to a reference point on the patient. This point is the **phlebostatic axis** (at the intersection of the mid-axillary line and fourth intercostal space) and should be marked with indelible marker.<sup>1</sup> See Clinical Guideline, Obstetrics & Gynaecology: [Arterial Line](#)
  4. Observe:
    - Hand hygiene before and after any manipulation of vascular access devices or catheter sites<sup>3</sup>. See Infection Prevention and Management, [Hand Hygiene](#) policy
    - An aseptic technique
    - Standard precautions. See Infection Prevention and Management Manual [Standard Precautions](#) policy.
  5. Disposable transducers, pressure tubing and line are replaced at 96 hour intervals<sup>3</sup>.

## For CVP monitoring with a transducer and monitor

### Equipment

- Transducer / pressure tubing / fluid path
- Pressure bag
- Monitor
- Sodium chloride 0.9% 500mL

### Procedure

- Obtain verbal consent
- Position patient supine or semi recumbent to 30-45 degree elevation
- Prime pressure tubing with Sodium chloride 0.9%, close connections
- Check flushing mechanism
- Apply the pressure bag and inflate to 300mmHg
- Connect to monitor transducer cable
- Calibrate zero and level the transducer to the phlebostatic axis
- Attach extension tubing to central venous catheter, open fluid path, and adjust rate
- Close the stopcock to the patient and open to air and read the display monitor at end of expiration
- Reopen stopcock to patient; recommence intravenous transfusion at prescribed rate
- Record the result
- Report abnormal readings or change in trends
- Monitor insertion site for infection, bleeding and disconnection. See KEMH Clinical Guideline, Obstetrics & Gynaecology: [Arterial Line](#)


## References

1. Bucher L, Seckel A, adapted by Buckley T. Nursing management: Critical care environment. In: Brown D, Edwards H, Seaton L, Buckley T, editors. Lewis's medical-surgical nursing: Assessment and management of clinical problems. 4th ed. Chatswood, NSW: Elsevier Australia; 2015. p. 1670-705.
2. Walters Billie Jean. Central Venous Pressure Management. In: Fultz Julia SPA, Walters Billie Jean, editor. Mosby's Emergency Nursing Reference. Third ed. St Louis: Elsevier Mosby; 2005. p. 793-4.
3. O'Grady N, Alexander M, Burns L, Dellinger E, Garland J, Heard S, et al. Guidelines for the prevention of intravascular catheter-related infections, 2011: Centres for Disease Control and Prevention (CDC); 2017 update. Available from: <https://www.cdc.gov/infectioncontrol/pdf/guidelines/bsi-guidelines-H.pdf>

## Related WNHS policies, procedures and guidelines

### KEMH Clinical Guidelines

- Infection Prevention and Management Manual: [Hand Hygiene](#) ; [Standard Precautions](#)
- Obstetrics & Gynaecology: [Arterial Line](#)

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