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Abstract:

The central venous pressure, CVP, is an important variable in the management of selected perioperative and intensive care cases and in clinical decision support systems, CDSS. In current routine, when measuring CVP the health care provider may use anatomical landmarks and a spirit level, SL, to adjust the pressure transducer to the level of the tricuspid valve, i.e. the phlebostatic axis.

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The aim of the study was to assess the agreement in the postoperative setting between the SL method and electromagnetic 3D positioning (EM). CVP was measured with patients in positions dictated by nursing routines. The staff members measured CVP using SL to position the transducer at the perceived phlebostatic level. This position was compared to coordinates based on an electromagnetic field with external sensors at anatomical landmarks and an internal sensor in the CV catheter for 3D determination of the phlebostatic axis. An electronic

survey took bearing on the accepted error in measurement among colleagues at the department. There was a clinically relevant difference between the CVP measured by the staff members and the CVP based on the 3D EM positioning. The limits of agreement extended in excess of ± 8 mmHg and half of the measurements had deviations outside an accepted error range of ± 2.5 mmHg. There was a large variation in CVP measurements when assessing the agreement with the current method. This may indicate the need for improvement in accuracy, e.g. using the electromagnetic field positioning system, in association with routine monitoring and clinical decision support systems.

Reference:

Avellan, S., Uhr, I., McKelvey, D. and Sondergaard, S. (2016) Identifying the position of the right atrium to align pressure transducer for CVP : Spirit level or 3D electromagnetic positioning? Journal of Clinical Monitoring and Computing. August 10th. .

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