### **Clinical Measurements**

# **PiCCO**

## continuous cardiac output monitoring

PiCCO™\* (Continuous Cardiac Output) enables continuous hemodynamic monitoring using a femoral or axillary artery catheter and a central venous catheter. Employing patented algorithms, PiCCO combines real-time continuous monitoring through arterial pulse contour analysis with intermittent thermodilution measurement via the transpulmonary method. The CCO/C.O. module also supports traditional monitoring from a right heart catheter.

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PiCCO continuous cardiac output information.

Patients who can benefit from PiCCO monitoring have central venous and arterial lines and require close circulatory volume and cardiovascular management. Adult or pediatric patients and patients who have or may develop pulmonary edema or ARDS are likely candidates.

#### Crucial clinical information at hand

PiCCO technology provides clinicians with the following clinical measurements, many of which can be displayed as absolute or indexed values:

#### Via continuous pulse contour analysis

- Continuous pulse contour cardiac output (PCCO)
- Arterial blood pressure (AP)
- Heart rate (HR)
- Stroke volume (SV)
- Stroke volume variation (SVV)
- Systemic vascular resistance (SVR)
- Index of left ventricular contractility\*

#### Via intermittent transpulmonary thermodilution

- Transpulmonary cardiac output (C.O.)
- Intrathoracic blood volume (ITBV)
- Extravascular lung water (EVLW)\*
- Cardiac function index (CFI)

Index of left ventricular contractility and EVLW are not available in the U.S.







• IntelliVue



CMS 2002



V24/V26

Please ask your sales representative for details on compatibility.

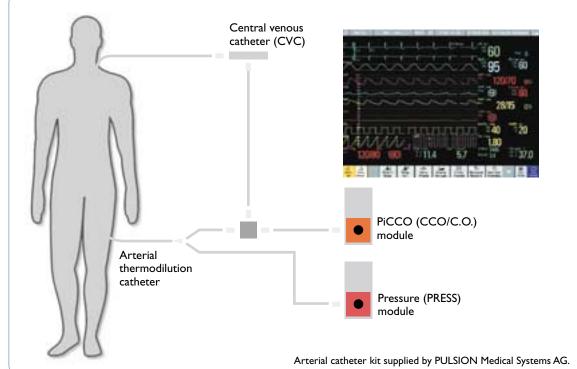
#### References

Reuter DA, Felbinger TW, Schmidt C, Kilger E, Goedje O, Lamm P, Goetz AE. Stroke volume variations for assessment of cardiac responsiveness to volume loading in mechanically ventilated patients after cardiac surgery. Intensive Care Med. 2002 Apr;28(4): 392-8.

Goedje O, Höke K, Goetz AE, Felbinger TW, Reuter DA, Reichart B, Friedl R. Hannekum A. Pfeiffer UJ. Reliability of a new algorithm for continuous cardiac output determination by pulsecontour analysis during hemodynamic instability. Crit Care Med. 2002 Jan;30(1): 52-8.

Sakka SG, Meiere-Hellmann A, Reinhart K. Assessment of cardiac preload and extravascular lung water by single transpulmonary thermodilution. Intensive Care Med. 2000 Feb;26(2):180-7.

Mitchell JP, Schuller D, Calandrino FS, Schuster DP. Improved outcome based on fluid management in critically ill patients requiring pulmonary artery catheterization. Am Rev Respir Dis. 1992 May;145 (5): 990-8.



#### Less invasive

Using PiCCO typically requires insertion of a thermodilution catheter in the femoral or axillary artery instead of a standard arterial line. Any available central venous catheter can be used for injectate solution used for the thermodilution analysis.

## A clinically solid measure of cardiac output

A major advantage of the transpulmonary method is that it is independent of ventilator and respiratory cycles and therefore PiCCO gives consistent, reproducible results. Clinical studies support that cardiac output measurements obtained using the PiCCO method are comparable to those obtained using traditional thermodilution. (Please see references in the sidebar.)

## Philips Commitment to **Measurement Technologies**

Philips is committed to providing best-in-class standard clinical measurements as well as innovative measurements to support clinicians' decisions at the patient's side.

Philips continues to build on its proven measurement expertise by:

- Maintaining and advancing the performance of existing, widely used standard-of-care measurements
- Investing heavily in research, development, and clinical validation of new, innovative parameters and algorithms
- Working with strategic partners to integrate next-generation measurements and technologies
- Providing interfaces to more than 100 third-party specialty measurement devices through the Philips VueLink module

M1012A

PiCCO module



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