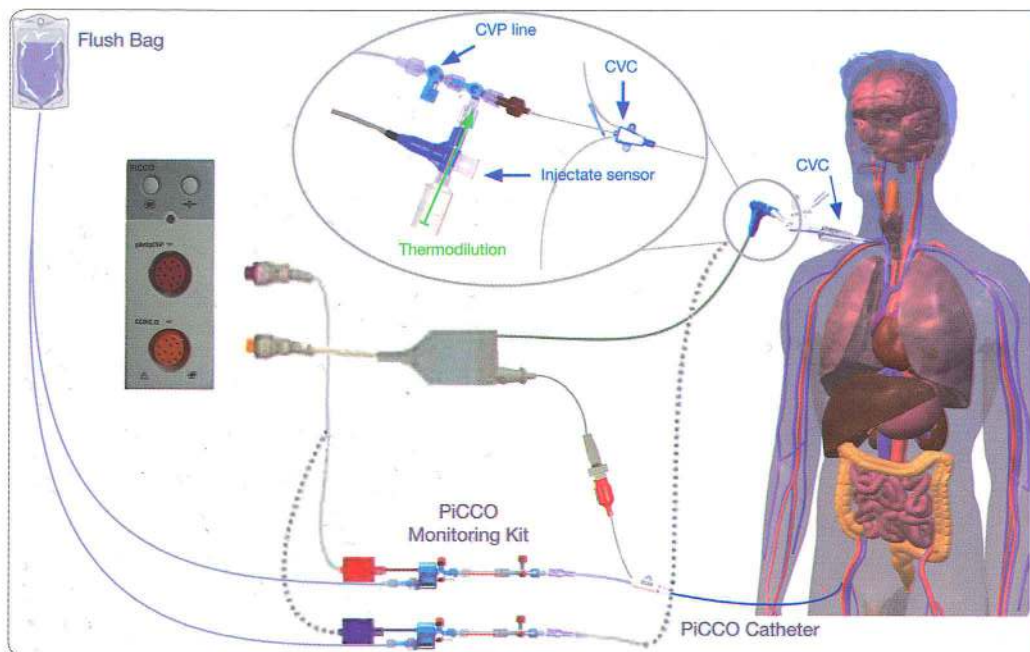
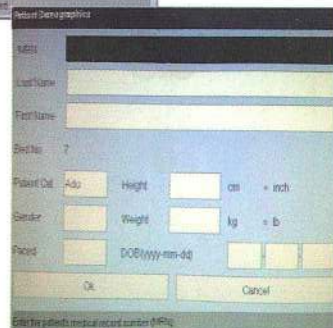
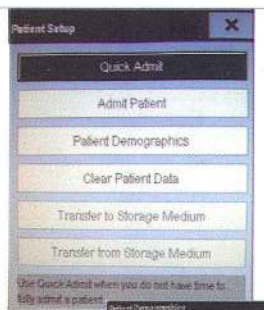


Mindray PiCCO Setup Guide

1. Setup



- Select **<Patient Setup>** from the tab on the main screen
- To admit a new patient select **<Admit Patient>** and input details
- For existing patients, select **<Patient Demographics>** and ensure that the following are entered;
 - Last Name • Patient Category • Height
 - Gender • Actual Weight • DOB
- Complete by selecting **<OK>**

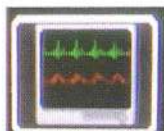


2. Patient Admission

Mindray PiCCO Setup Guide

3. Screen Setup

- To activate PiCCO cardiac monitoring, select the waveform icon on the monitor
- On bottom left of screen there are 4 boxes. Touch one that is labelled OFF and select CCO
- To display a PiCCO monitoring screen, select the **<Choose Screen>** tab at the top of the display and select PiCCO
- Exit screen by touching **X** on top right



4. Zero Adjustment

- Perform zero adjustment of the PiCCO arterial line and central line as usual
- Open three way stop-cocks of the arterial and venous pressure transducers to the atmosphere
- For zero adjustment press $\leftrightarrow O \leftrightarrow$ on the module or monitor
- Repeat zero adjustment prior to each set of thermodilutions or when necessary



- To setup for a set of thermodilutions, select **<Start PiCCO>** and then select **<Setup>**
- Ensure that patient's demographics have been entered correctly
- Set injectate volume to desired amount (15ml for patients <100kg & 20ml for those >100kg)
- Specify the PiCCO catheter position (femoral/ brachial/ axillary)
- Set CVP Measure to auto when measuring CVP continuously

NB: C.O. Measure set to Auto will automatically perform a series of thermodilutions one after the other



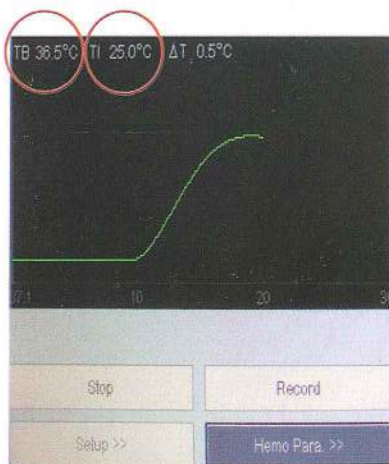
CCO Setup

Height	175.0	cm	Inj. Volume	15ml
Weight	110.0	kg	Cat Type	Ph2013L07
Patient Cat	Adu		Cat Position	Axillary/brachial a.
Gender	Male		C.O. Measure	Auto
PBW	70.5	kg	Exit PiCCO Screen	
BSA	1.900	m ²	PiCCO Guide >>	
PBSA	1.900	m ²	Select Parameter >>	
pCVP Measure	Auto		Hemo Para >>	
pCVP	9.5	cmH ₂ O	Alarm Setup>>	

Enter the patient's height

- To ensure that there are no connection errors, check that the blood temperature (TB) is displayed and accurate (+/- X°C), and that the injectate temperature (TI) is ambient
- To begin thermodilution press **<Start>**
- Follow the instruction given on the screen, and when prompted; Inject the cold bolus of saline as quickly and smoothly as possible (< 7 seconds)
- Repeat this procedure until three agreeable results are obtained [see next section]

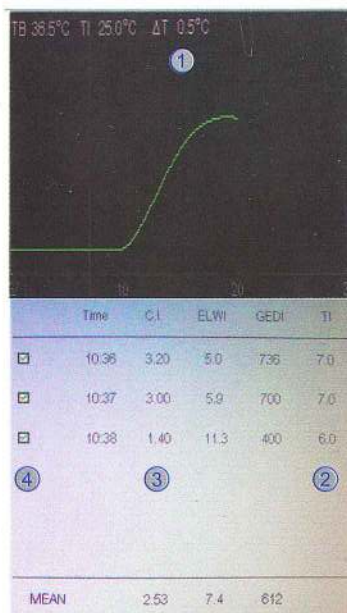
NB: To increase accuracy use colder saline, inject faster or more smoothly. In patients with elevated lung water or very weak bloodflow; use 20ml instead of 15ml



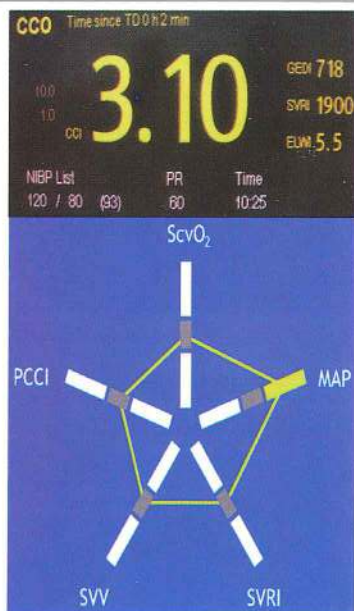
7. TD Quality

- ① A thermodilution curve must have a change in temperature (ΔT) of 0.20°C to be valid
 - ② The temperature of the injectate should be less than 10°C
 - ③ Three measurements in close agreement ($\pm 10\%$) should be taken to ensure accuracy.
 - ④ Inaccurate measurements should be discarded by un-ticking the box on the left hand side
- Exit screen by touching **X** on top right of window

NB: Changes in temperature (ΔT) < 0.2°C may be due to temperature of saline, speed of injection or a patient condition (e.g. very weak blood flow, valve regurgitation, elevated lung water)



- To specify parameters to display, select **<PiCCO Start>-<Setup>-<Select Parameters>**. Here you can choose 3 parameters to monitor
- Spider Tab displays continuous PiCCO parameters and can be configured to user preference
- **<Haemodynamic Parameters>** tab displays all parameters calculated.
- **<Record>** will send to programmed printer.



8. Visual Display

Haemodynamic Decision Model

This decision model is not obligatory. It cannot replace the individual therapeutic decisions of the treating physician.

CI (l/min/m²)

Measured Values

GEDI (ml/m²)
or ITBI (ml/m²)

ELWI (ml/kg)

Therapy Options

Targeted Values

	< 3.0				> 3.0			
	< 700 < 850		> 700 > 850		< 700 < 850		> 700 > 850	
	< 10	> 10	< 10	> 10	< 10	> 10	< 10	> 10
	↓	↓	↓	↓	↓	↓	↓	↓
	V+?	V+?	Cat?	Cat?	V+?	V+?	V-?	V-?
	↓	↓	↓	↓	↓	↓	↓	↓
1. GEDI (ml/m ²) or ITBI (ml/m ²)	> 700 > 850	700-800 850-1000	> 700 > 850	700-800 850-1000	> 700 > 850	700-800 850-1000	↓ OK!	700-800 850-1000
2. Optimise SVV (%)*	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
GEF (%)	> 25	> 30	> 25	> 30				
or CFI (1/min)	> 4.5	> 5.5	> 4.5	> 5.5				
ELWI (ml/kg) (slow response)		≤ 10		≤ 10		≤ 10		≤ 10

V+ = volume loading

V- = volume reduction

Cat = catecholamine / cardiovascular agents

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Haemodynamic Normal Values

Central Venous Oxygenation - Oxygenation Balance

(Oxygen load of the venous blood after passing through the organs)

ScvO₂** 70-80 %

O₂ Consumption (Consumption of O₂ by organs)

VO₂I 125-175 ml/min/m²

O₂ Delivery (Delivery of O₂ via blood to organs)

DO₂I 400-650 ml/min/m²

Haemoglobin (Oxygen transporter in blood)

Hb *** 8.7-11.2 mmol/l (Male)
7.5-9.9 mmol/l (Female)

Arterial / capillary oxygen saturation (Oxygen load of arterial blood)

SaO₂ / SpO₂ 96-100 %

Flow Cardiac Index

CI 3-5 l/min/m²

Pulse Contour Cardiac Index (Cardiac Index related to body surface)

PCCI 3-5 l/min/m²

Chronotropy Heart Rate

HR 60-80 bpm

Stroke Volume Index (Output per heart beat)

SVI 40-60 ml/m²

Global Enddiastolic Volume Index (Volume of blood in the heart)

GEDI 680-800 ml/m²

Intrathoracic Blood Volume Index (Volume of blood in heart and lungs)

ITBI 850-1000 ml/m²

Stroke Volume Variation (Dynamic fluid responsiveness)

SVV* 0-10 %

Pulse Pressure Variation (Dynamic fluid responsiveness)

PPV* 0-13 %

Afterload Systemic Vascular Resistance Index (Resistance of vascular system)

SVRI 1700-2400 dyn*sec/cm⁵*m²

Mean Arterial Pressure

MAP 70-90 mmHg

Contractility Global Ejection Fraction (Ratio of stroke volume and preload)

GEF 25-35 %

Left Ventricular Contractility (Increase of arterial pressure over time)

dPmax Trend information

Cardiac Function Index (Ratio of CI and preload)

CFI 4.5-6.5 1/min

Cardiac Power Index (Global cardiac performance)

CPI 0.5-0.7 W/m²

Lung Extravascular Lung Water Index (Lung oedema)

ELWI 3-7 ml/kg

Pulmonary Vascular Permeability Index (Permeability of lung tissue)

PVPI 1.0-3.0

Liver Plasma Disappearance Rate ICG (Performance of the liver)

PDR 16-25 %/min

Retention rate of ICG after 15 minutes (Performance of the liver)

R15 0-10 %

Absolute values (non-indexed values) are only usable in trend screens and have no normal range. * SVV/PPV are only applicable in fully ventilated patients without cardiac arrhythmias.

** A high-normal / high ScvO₂ can be a sign of insufficient O₂ utilisation *** 14-18 g/dl (Male); 12-16 g/dl (Female)

*SVV is only applicable in fully ventilated patients without cardiac arrhythmia

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