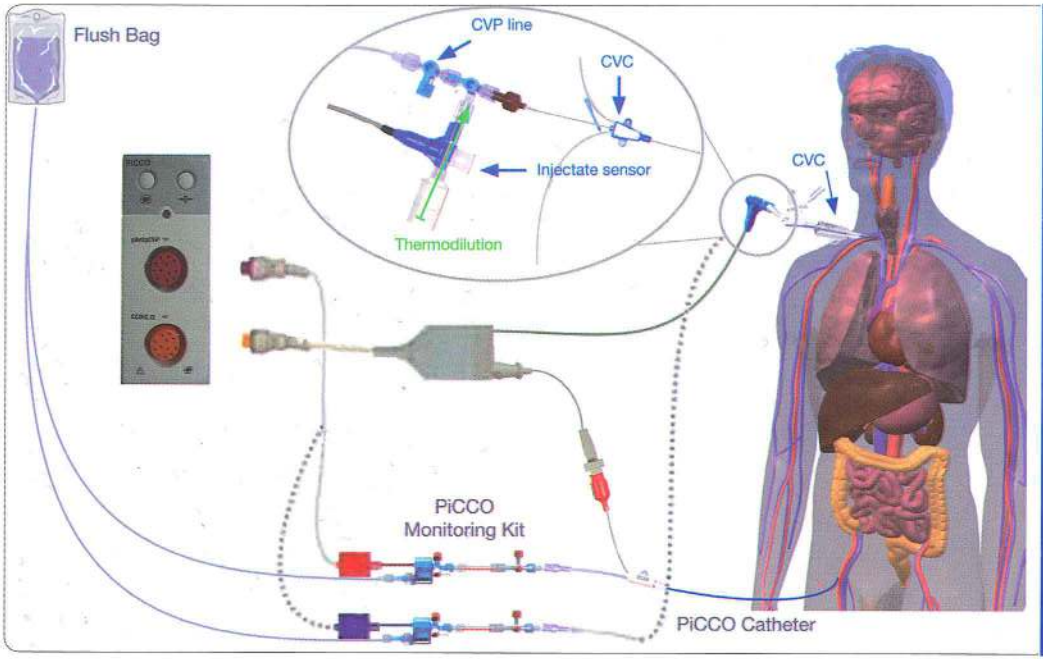
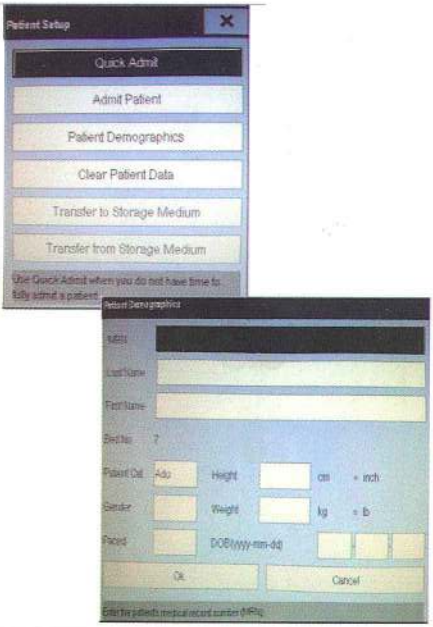
Mindray PiCCO Setup Guide

1. Setup



2. Patient Admission

- 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>**



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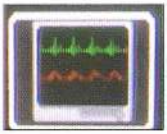
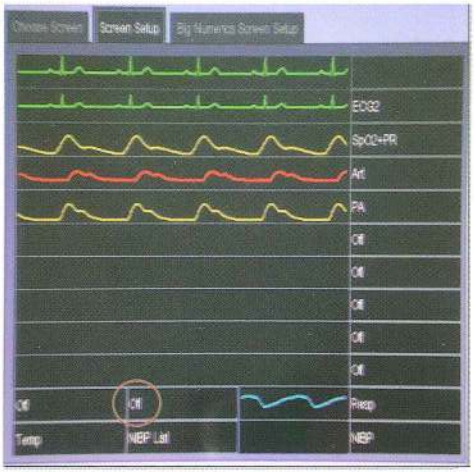
3. Screen Setup

- 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 monitoting 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 **<→O←>** on the module or monitor
- Repeat zero adjustment prior to each set of thermodilutions or when necessary

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5. PiCCO Settings

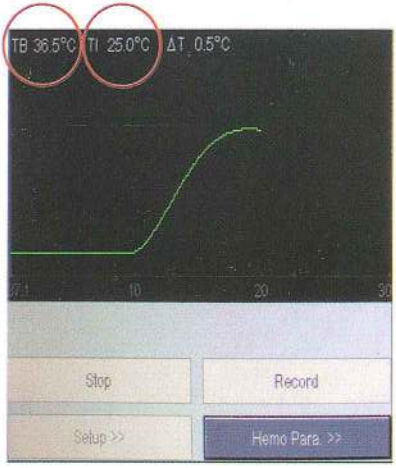
- To setup for a set of thermodilutions, select **<Start PiCCO>** and then select **<Setup>**
- Ensure that patient's demographics have been entered correctly
- Set injectate volume to desired amount (15ml for patients <100kg & 20ml for those >100kg)
- Specify the PiCCO catheter position (femoral/ brachial/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

6. Thermodilution

- 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



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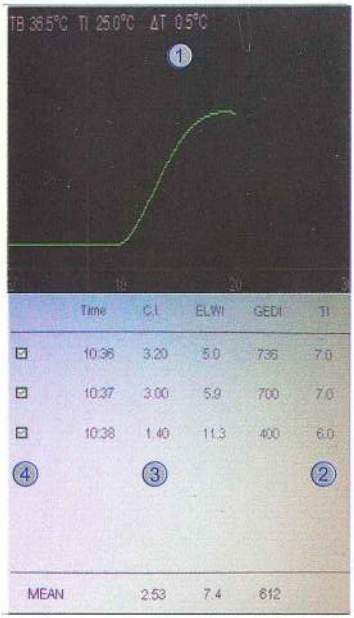
7. TD Quality

1. A thermodilution curve must have a change in temperature (ΔT) of 0.20C to be valid
2. The temperature of the injectate should be less than 10°C
3. Three measurements in close agreement (+/- 10%) should be taken to ensure accuracy.
4. Inaccurate measurements should be discarded by un-ticking the box on the left hand side

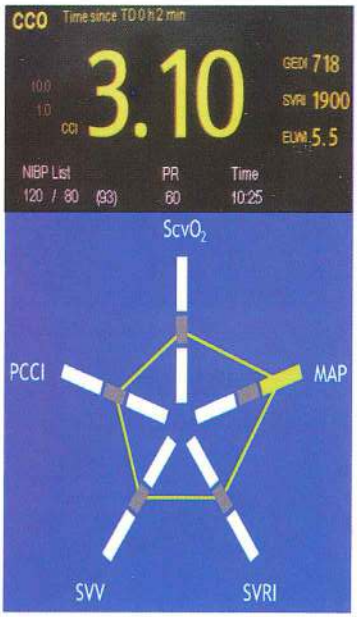
- Exit screen by touching **X** on top right of window



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, value regurgitation, elevated lung water)

8. Visual Display

- 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.



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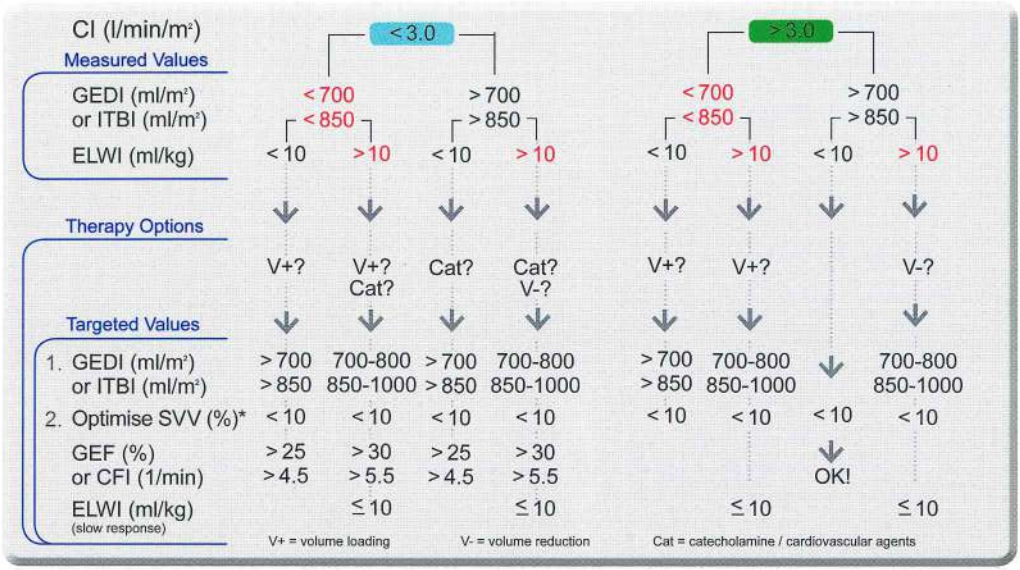
Haemodynamic Decision Model

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



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

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Haemodynamic Normal Values

	Central Venous Oxygenation - Oxygenation Balance (Oxygen load of the venous blood after passing through the organs)	$ScvO_2$ **	70-80 %
	O_2 Consumption (Consumption of O_2 by organs)	VO_2I	125-175 ml/min/m²
Oxygen Delivery	**O_2 Delivery** (Delivery of O_2 via blood to organs)	DO_2I	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)	SaO_2 / SpO_2	96-100 %
Blood Flow	Flow — **Cardiac Index**	CI	3-5 l/min/m²
	Flow — **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	**Stroke Volume Index** (Output per heart beat)	SVI	40-60 ml/m²
	Preload — **Global Enddiastolic Volume Index** (Volume of blood in the heart)	GEDI	680-800 ml/m²
	Preload — **Intrathoracic Blood Volume Index** (Volume of blood in heart and lungs)	ITBI	850-1000 ml/m²
	Preload — **Stroke Volume Variation** (Dynamic fluid responsiveness)	SVV *	0-10 %
	Preload — **Pulse Pressure Variation** (Dynamic fluid responsiveness)	PPV *	0-13 %
	Afterload — **Systemic Vascular Resistance Index** (Resistance of vascular system)	SVRI	1700-2400 dyn*sec*cm⁻⁵*m²
	Afterload — **Mean Arterial Pressure**	MAP	70-90 mmHg
	Contractility — **Global Ejection Fraction** (Ratio of stoke volume and preload)	GEF	25-35%
	Contractility — **Left Ventricular Contractility** (Increase of arterial pressure over time)	dPmax	Trend information
	Contractility — **Cardiac Function Index** (Ratio of CI and preload)	CFI	4.5-6.5 1/min
	Contractility — **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
	Lung — **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
	Liver — 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 $ScvO_2$ can be a sign of insufficient O_2 utilisation *** 14-18 g/dl (Male); 12-16 g/dl (Female)