

A New Age in Impedance Cardiography

NICaS™

Non-Invasive Cardiac System



A Medical Laptop for non-invasive and cost effective measuring of hemodynamic and respiratory parameters as well as fluid balance.

A BREAKTHROUGH IN ASSESSMENT
OF **CARDIOVASCULAR** FUNCTION

Care with Confidence

NICaS provides a Non-invasive, accurate (the only device that is FDA approved for statistical bioequivalence to thermodilution for cardiac output measurement) and cost-effective solution for diagnosing, monitoring and managing the care of patients with:

- Congestive Heart Failure
- Hypertension
- Dyspnea

As well as

- Cardiac Pacemaker Optimisation

Introducing NICaS, a device that transforms a laptop computer into a powerful cardiac monitor. FDA-approved, ARTG listed and CE marked for cardiac assessment, the NICaS is a portable solution for non-invasively monitoring **hemodynamic and respiratory parameters** as well as fluid balance and can also identify certain asymptomatic cardiac conditions.



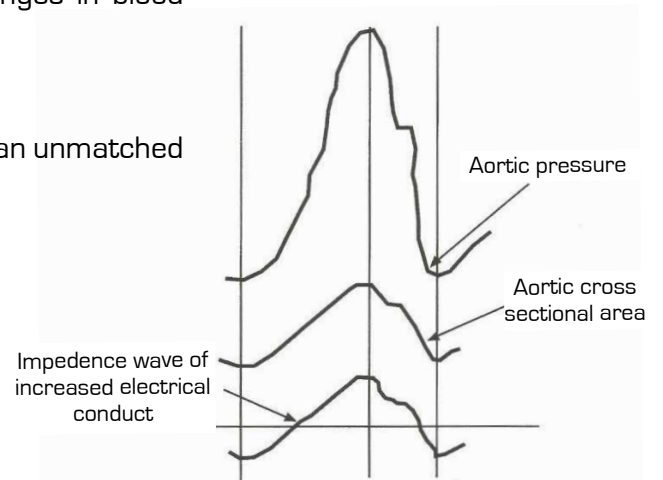
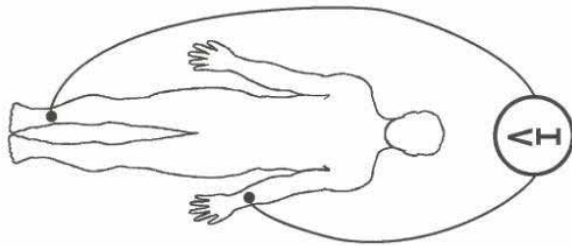
Measurements

ΔR	Resistance value	Change in whole body electrical bio-impedance measured between diastolic and systolic cycles of the heart
HR	Heart rate	Number of heart beats each minute
SV	Stroke volume	Amount of blood pumped by the left ventricle each minute
SI	Stroke index	Stroke volume normalised for body surface area
CO	Cardiac output	Amount of blood pumped by the left ventricle each minute
CI	Cardiac index	Cardiac Output normalised for body surface area
TPR	Total peripheral resistance	The resistance to the flow of blood in the arterial system (often referred to as 'Afterload')
TPRI	Total peripheral resistance index	The resistance to the flow of blood in the arterial system normalised for body surface area
TBW	Total body water	The amount of extracellular fluid in % or kilograms
Resp	Respiratory rate	Number of breaths each minute
CPI	Cardiac power index	An indicator of myocardial contractility
GGI	Granov-Goor Index	An indicator of Left Ventricular Function, which is strongly related to Ejection Fraction

A laptop turned into a Medical device

NICaS converts changes in electrical resistance to changes in blood volume occurring during the cardiac cycle.

Unlike other thoracic bio-impedance devices, NICaS utilize the principal of whole-body bio-impedance resulting an unmatched accuracy.



NICaS is designed to be used in a variety of acute and ambulatory care settings including:

- Physician Office
- Outpatient Clinic
- Homecare
- Emergency Room
- ICU/CCU
- Step-Down Unit
- Pre/Post Op

The NICaS ease of use and accurate hemodynamic profiling provides critical information that enables clinicians to effectively manage their patients' care including:

- monitoring the effectiveness of heart failure therapy
- increasing the effectiveness of hypertension drug titration
- improving differential diagnosis of dyspnea
- optimising pacemaker function and settings.

Technical Specifications

Laptop with medical cart and NICaS device sold as one integral unit.
Option without cart available upon request.

ICG

Method:	Regional impedance
Lead mode:	1 lead (I, V+, V-, I_GND)
Waveform:	Single channel
Sweep speed:	25 mm/s
Impedance range:	200-500 Ω
ΔR Range:	to 1 Ω
ΔR Signal Bandwidth:	0.3Hz to 12 Hz
Accuracy:	$\pm 5\%$
Sample Rate:	200 Hz
Injection Current:	1.35 +/- 0.1mA RMS at 32.5 +/- 0.5kHz

ECG

Lead mode:	3 lead (RA,LA,LL)
Waveform:	Single channel
Gain:	x1,x2,x4
Sweep speed:	25mm/s
Heart Rate range:	30-240bpm
HR Accuracy:	± 1 bpm

Parameters

Label	Parameter	Range/Units	Normal Range
HR	Heart Rate	30 - 240bpm	58 - 86 bpm
SV	Stroke Volume	0 - 200ml	60 - 130 ml
SI	Stroke Index	0 - 150ml/m ²	35 - 65 ml/m ²
CO	Cardiac Output	1 - 20 L/min	4.5 - 8.5 l/min
CI	Cardiac Index	1 - 15 L/min/m ²	2.5 - 4.7 l/min/m ²
TPR	Total Peripheral Resistance	0 - 5000 dn's/cm ⁵	770 - 1500 dn's/cm ⁵
TPRI	Total Peripheral Resistance Index	0 - 7000 dn's/cm ⁵ .m ²	1540 - 3000 dn's/cm ⁵ .m ²
TBW	Total Body Water	0 - 100%	40.0 - 63.0%
Resp	Respiratory rate	0 - 30 bpm	8 - 24 bpm
CPI	Cardiac Power Index	0 - 1.5 w/m ²	0.45 - 1.0 w/m ²
GGI	Granov Goor Index	1 - 20	>10

Regulations:

FDA 510(k) K080941
CE Mark 0473
Canada L/N 81879
TGA ARTG 218539

