YOUR COMPLETE PICTURE
OF OXYGENATION AND VENTILATION[1]

Capnostream™ 20p bedside capnography monitor.
Tried and true technology.

Medtronic
Further, Together

Respiratory information, when you need it

Addressing respiratory compromise begins with detecting it — the earlier the better. Continuous monitoring of pulse oximetry and capnography provide important indicators to changes in oxygenation and ventilation, two key factors in identifying respiratory compromise early.

The Capnostream™ 20p bedside capnography monitor delivers a broad range of respiratory status information and alarm management. It's designed to help enhance patient safety and clinical outcomes by offering an early indication of respiratory compromise and:

- Measuring $etCO_2$, SpO_2, pulse rate, and respiration rate and incorporating these measurements into a single number representing an inclusive respiratory profile with the Integrated Pulmonary Index™ algorithm

- Tracking and reporting apneas per hour (A/hr) and the oxygen desaturation index (ODI), which indicates "dips" in SpO_2 via the Apnea-Sat Alert™ algorithm

- Storing up to 72 hours of trend data

- Offering multiple options for remote connectivity

To offer you a complete picture of oxygenation and ventilation.[1]

Designed to reduce alarms and simplify monitoring

Our suite of algorithms is engineered to reduce alarms and simplify capnography monitoring. Algorithms like the Smart Alarm for Respiratory Analysis™ algorithm (SARA) are engineered to reduce insignificant or "nuisance" alarms by 53 percent.[2]

Smart Breath Detection™ (SBD) algorithm
This proprietary filter and pattern recognition algorithm screens out low-amplitude "nonbreath" $etCO_2$ excursions like snoring, talking, or crying, to offer a more reliable respiratory rate.

SARA algorithm
Combined with the SBD algorithm, the SARA algorithm manages breath-to-breath variability. Engineered to reduce the number of nuisance alarms while providing a comprehensive picture of respiratory status.

Nellcor™ SatSeconds alarm management
Calculates duration and severity of events, offering you insights to distinguish between minor or brief desaturations and serious hypoxemia.
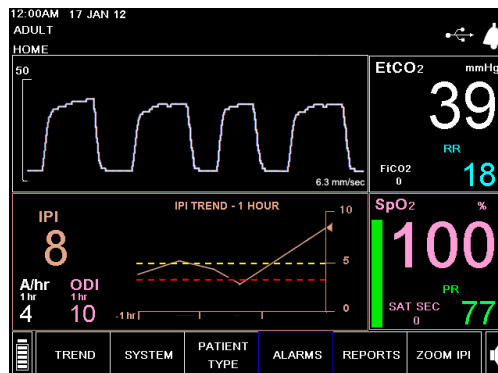
Integrated Pulmonary Index™ (IPI) algorithm
Proprietary IPI technology combines four real-time measures — $etCO_2$, SpO_2, respiratory rate, and pulse rate — into a single number.

IPI	PATIENT STATUS
10	Normal
8-9	Within normal range
7	Close to normal range; requires attention
5-6	Requires attention and may require intervention
3-4	Requires intervention
1-2	Requires immediate intervention

Apnea-Sat Alert™ algorithm
Provides key insights through summary reports of recurring apnea events per hour as well as oxygen desaturations.

Monitor screen with all parameters displayed.

Connects to powerful remote monitoring platform

The Capnostream™ 20p bedside capnography monitor connects directly with our Vital Sync™ virtual patient monitoring platform (VPMP) and clinical decision support (CDS) solution. This single platform is designed to help you gain greater value from your medical devices and respond proactively to your patients' needs.

Vital Sync™ VPMP consolidates critical patient information from wireless and bedside devices and transmits it to your hospital server. So you can:

- Provide enhanced clinical care with immediate access to smart, actionable data
- View patient physiological information remotely
- Receive updates and alerts on any web-enabled device
- Implement clinical protocols through our CDS apps

Data output and connectivity

Capnostream™ 20p bedside capnography monitor	
Data output	- USB storage to flash memory devices - Analog output for use in sleep labs and other laboratory environments - Serial port (RS-232) for data transfer
Connectivity options	- Vital Sync™ virtual patient monitoring platform - Profox™* respiratory oximetry software - Nurse call - Nuvon VEGA™* system - iSirona™* system - Capsule™* system - Cerner™* system - Epic™* system

Capnostream™ 20p bedside monitor product specifications

Warranty: Five year standard warranty to be free of defects in materials and workmanship.

Power supply	
Input voltage	100–240VAC, 50/60Hz
Fuses	Two F3.15A 250 Volt
Input power	90 VA

Battery	
Battery type	14.8V, 4Ah Lithium-Ion
Battery operation	2.5h (without thermal recorder)
Battery charging time	100% in 12 hours

Controls	
Front panel	1 switch to monitor on/off control 4 specific function keys 1 optical encoder with switch

Display	
Screen	162mm (6.4 inches) Color TFT Display Pixel pitch: 0.204 (horizontal) x 0.204 (vertical) mm Active display area: 130.56 (horizontal) x 97.92 (vertical) mm; (5.14 x 3.86 inches) Resolution: 640 x 480 pixels Viewing angle: (vertical) 110° Viewing angle: (horizontal) 140°
Trace speed	3.0, 6.3, 12.5, and 25 mm/sec
Waveform sampling rate	75.7 samples/second for SpO_2 (fixed) 20 samples/second for capnography (fixed)
Trend storage	8640 point storage - 2 hours at 5 seconds resolution - 24 hours at 10 seconds resolution - 72 hours at 30 seconds resolution
Trend display	Graphical display: 2 hour, 6 hour, 12 hour views Tabular display: 60 minutes, 15 minutes, 3 minutes, 1.5 minutes, and minimum resolution (minimum resolution settable to 5, 10, or 30 seconds)

Microstream™ capnography	
CO₂ units	mm Hg or kPa or Vol%
CO₂, etCO₂, FiCO₂ range	0–150 mm Hg
CO₂ waveform resolution	0.1 mm Hg
EtCO₂, FiCO₂ resolution	1 mm Hg
CO₂ accuracy	0–38 mm Hg: ± 2 mm Hg 39–150 mm Hg: ± (5% of reading + 0.08% for every 1 mm Hg above 38 mm Hg)
Respiration rate range	0–150 bpm
Respiration rate accuracy	0–70 bpm: ±1 bpm 71–120 bpm: ±2 bpm 121–150 bpm: ±3 bpm
CO₂ alarms	No breath, etCO₂ High, etCO₂ Low, RR High, RR Low, Integrated Pulmonary Index™ algorithm (IPI). IPI also requires pulse oximetry information.
Flow rate	50 (42.5 ≤ flow ≤ 65) mL/minute, flow measured by volume
Waveform sampling	20 samples/second
Response time	2.95 seconds (typical)
Initialization time	40 seconds (typical)
Calibration interval	Initially calibrate after 1,200 operating hours, then once a year or after 4,000 operating hours, whichever comes first

Nellcor™ pulse oximetry with OxiMax™ technology	
SpO₂ measurement range	1 to 100%
SpO₂ accuracy: Adult and neonatal	
Saturation (% SpO₂ ± 1 SD)	
70 to 100% ± 2 digits; ± 3 digits (motion)	
60 to 80% ± 3 digits	
Low perfusion	70 to 100% ± 2 digits
Pulse rate	20 to 250 bpm ± 3 digits
Low perfusion	20 to 250 bpm ± 3 digits
Alarms	Adjustable alarm limits SpO₂ High, SpO₂ Low, PR High, PR Low
Nellcor™ SatSeconds alarm management range	10, 25, 50, 100

Contact your local sales representative to learn more about the Capnostream™ 20p bedside capnography monitor.

1. Maddox RR, Williams CK, Oglesby H, Butler B, Colclasure B. Clinical experience with patient-controlled analgesia using continuous respiratory monitoring and a smart infusion system. *Am J Health-Syst Pharm*. 2006; 63(2):157–164.

2. Hockman S, Glembot T, Niebel K. Comparison of capnography derived respiratory rate alarm frequency using the SARA algorithm versus an established non-adaptive respiratory rate alarm management algorithm in bariatric surgical patients. *Resp Care*. 2009 Open Forum Abstract. December 2009.

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