Acute Care & Monitoring

Innovations for the moments that matter

Discover the portfolio

Medtronic

Designing technologies that support care in the moments that matter –helping simplify clinical decision making,[1-11] workflows,[12-16] and operational performance to create sustainable value.[17-24]



Technologies designed for the moments that matter

Patient monitoring



Argos™*
cardiac output monitor



BIS™
brain monitoring system



Corsano™*
multi-parameter wearable



INVOS™
regional oximetry system



Microstream™
capnography monitoring system



Nellcor™
pulse oximetry monitoring system

Airway management



DAR™
breathing systems



McGRATH™ MAC*
video laryngoscope



Puritan Bennett™
cuff pressure manager



Shiley™
endotracheal tubes



Shiley™
tracheostomy tubes

Connectivity and remote monitoring



HealthCast™
services



HealthCast™
VA telehealth solutions



Vital Sync™
remote patient monitoring system

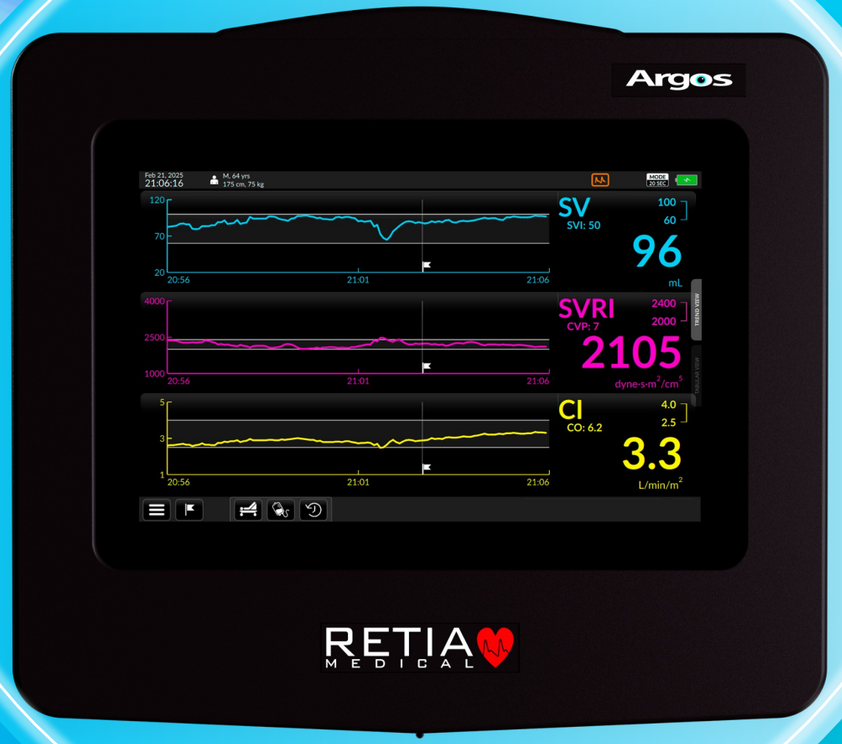
Patient monitoring

Accurate trending. Reliable data.[25]

Argos™* cardiac output monitor provides hemodynamic guidance proven effective for the sickest patients†

Among other benefits, Argos™* technology:

- Provides accurate trending with the MBA™ algorithm[25]
- Is easy-to-use with a single cable connection[26,27]
- No proprietary disposables[28]



† With patients in cardiogenic shock and heart failure in the ICU, CI-MBA measurements reliable and the trending accuracy clinically acceptable, with a concordance rate of 94%.

Argos™* cardiac output monitor is manufactured by Retia Medical Systems, Inc. and distributed by Medtronic.

Perfecting your art. Advancing patient care.

The **BIS™ Advance brain monitoring system** provides direct measurement of the anesthetic effect on each patient's brain.[29-34]

Among other benefits, BIS™ technology:

- Helps the clinician personalize anesthetic dosing to individual patient physiologies[8-11, 35]
- Indicates hypnotic effect through the easy-to-read BIS™ index[8-11, 35-43]
- Allows clinicians to use up to 38% less anesthetic agents in a procedure[8-11, 35]



BIS™ Advance monitor



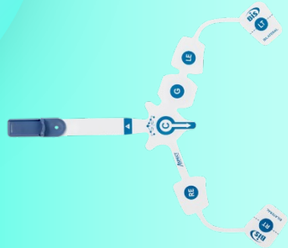
BIS™ extended sensor



BIS™ pediatric sensor



BIS™ quatro sensor



BIS™ bilateral sensor

The future of care is wireless and connected - anytime, anywhere[44]





Corsano™* multi-parameter wearable

Designed for comfort, built for accuracy[44]

- Light, weighing only 19 grams[44, 45]
- Tetherless design, enabling freedom of movement and comfort[44]
- Battery life up to 7 days[44]
- Continuous monitoring of SpO_2, pulse rate, skin temperature, and activity[44]
- Medical-grade parameters clinically validated to FDA-recognized standards[†, 46, 47]
- FDA 510(k) cleared[47]



† Activity not medical grade parameter

The Corsano™* multi-parameter wearable is manufactured by Corsano Health B.V. and distributed by Medtronic.
The Corsano™* multi-parameter wearable should not be used as the sole basis for diagnosis or therapy and is intended only as an adjunct in patient assessment.

Because seconds matter

INVOS™ regional oximetry system can help you decide if intervention is necessary when timing is critical.[48]

The INVOS™ system provides continuous measurement of cerebral oxygen saturation and indicates changes in cerebral perfusion.[48]

- Unique clinical algorithm can alert you to potential hemodynamic changes before other vital sign monitors even react[20, 49-54]
- The INVOS™ system reached 80-percent baseline threshold faster than other monitors[†, 55]
- More peer-reviewed clinical research than any other product available that consistently demonstrates ability to intervene sooner[20, 49-54]



INVOS™ 7100 monitor on stand



INVOS™ adult, pediatric, and infant sensors

[†]Compares the INVOS™ technology to Nonin EQUANOX™*, CASMED FORE-SITE ELITE™*, and Masimo Root™* O3 NIRS monitors during an induced hypoxic state in an animal model.

Help prevent the preventable

Microstream™ capnography monitoring provides an early warning of respiratory compromise, offering clinicians the opportunity to provide care sooner and quickly determine how to intervene.[56]

Microstream™ enabled technology includes:
Smart Capnography™ integrated algorithms proven to reduce alarms and simplify the use of patient monitoring to enhance patient safety and improve clinical efficiency[56]

- Microstream™ Advance filter lines are available for short- and long-term use, with or without oxygen delivery, for neonate-to-adult patients[57]
- Oxy2Pro™* and OxyMask™* with Microstream™ connector offer open and closed mask options to help manage a patient's oxygen needs[58]





Microstream™ Advance adult filter line for short-term use



Oxy2Pro™*



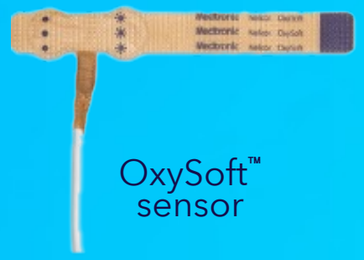
Oxy2Mask™*

Never miss a beat

Nellcor™ pulse oximetry sensors with OxiMax™ technology

From neonate to the elderly, and virtually every patient in between, count on Nellcor™ pulse oximetry to provide quick and reliable information.[59,60]

- We look at every heartbeat to ensure that readings are sensitive and timely, even in the most challenging conditions[61,62]
- Nellcor™ pulse oximetry has consistently delivered respiratory monitoring solutions that clinicians can count on[60,63,64]



OxySoft™ sensor



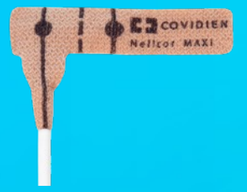
Forehead SpO_2 sensor



Non-adhesive SpO_2 sensor



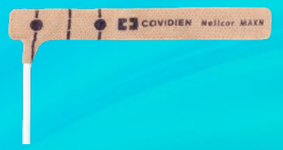
Adhesive SpO_2 sensor



Adhesive SpO_2 sensor



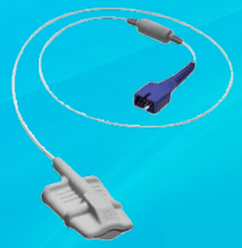
Adhesive SpO_2 sensor



Adhesive SpO_2 sensor



Reusable SpO_2 sensor



Reusable SpO_2 sensor



Two-piece reusable SpO_2 sensor cable with adhesive wraps

†Oxygen saturation accuracy can be affected by certain environmental, equipment, and patient physiologic conditions (as discussed in the operator's manual for the monitor) that influence readings of SpO_2. Please consult the IFU and manual for full safety information.

Safety made simple[65, 66]

RespArray™ patient monitor

Designed for procedural sedation and medical surgical suites, experience world-class Nellcor™ pulse oximetry and Microstream™ capnography in our newest continuous multi-parameter monitor.

Parameters: SpO_2, $etCO_2$, noninvasive blood pressure, ECG (3/5 lead), temperature monitoring, clinical decision support including Early Warning Score (EWS) & CCHD workflow app (IEC version only)[67]

Connectivity: Integration with Vital Sync™ for remote patient monitoring, analytics and reporting. HL7 direct to EMR, 5Ghz WIFI, barcode scanner inputs[68]

Algorithms: Microstream™ capnography monitors, including the RespArray™ patient monitors, are engineered with a suite of algorithms to reduce respiratory rate nuisance alarms and can simplify the use of respiratory monitoring[65, 66]

Design: Large 13.3" touch screen & modern GUI[67, 68]



Remotely monitor multiple patients in recovery units and automatically send data to EMR systems

Addressing clinical and economic challenges

Postoperative delirium (POD)

Incidence
- ~25% patients ≥65 years old undergoing inpatient procedures[69]
- Cardiac and abdominal surgeries associated with a higher risk of POD[70]

Cost
U.S. $20,000 - $44,000+ per patient[71]

Healthcare impact
Increased length of stay (LOS), post-operative complications, and hospital costs[21]



BIS™ brain monitoring system

Impact
29% POD decrease[37]

Healthcare benefit
- Reduced mortality[21]
- ~2-day reduction in LOS[21,22]

Cerebral desaturation

Incidence
26–74% in cardiac surgery with cardiopulmonary bypass[72]

Healthcare impact
3x greater risk for prolonged LOS[49]



INVOS™ regional oximetry system

Impact
78% decrease in the intraoperative cerebral desaturation load[50]

Healthcare benefit
46% reduction in the rate of post-operative cognitive dysfunction at seven days after surgery[20]

Cardiogenic shock

Incidence
Circulatory shock or hypotension can cause complications in the OR and ICU



Argos™* cardiac output monitor

Impact
- Hemodynamic monitoring plays a pivotal role in the diagnosis and management of circulatory shock[73]
- Preemptive hemodynamic intervention resulted in 1-2 day shorter stays in the ICU[23, 24]

Healthcare benefit
MBA™* algorithm delivers reliable measurements and clinically acceptable trending accuracy (concordance 94%)[25]

Addressing clinical and economic challenges

Respiratory compromise in general care floor

Incidence
Ward: 46% of patients receiving opioids[17]

Cost
$6,648 incremental in high-risk patients[74]

Healthcare impact
1.4 days LOS increase for patients experiencing >1 respiratory depression episode[74]



RespArray™ patient monitor & Vital Sync™ remote monitoring system

Impact
97% of respiratory adverse events on the general care floor are preventable with better monitoring and response[75]

Savings
$535,531 annual hospital cost reduction and 103 cumulative LOS days per median-sized hospital (annual floor volume of 2,447 patients†)[17]

†Based on data from 2018

Respiratory compromise in procedural sedation

Incidence
~1/3 of NORA closed claims deemed to be preventable with better monitoring, with inadequate oxygenation/ventilation being the single most common event[76]

Cost
According to a large-scale database analysis published in Radiology, while the average incremental cost of an inpatient respiratory compromise event during moderate sedation is $6,904 (2015 USD), the financial burden scales with procedural complexity, spiking to $10,465 per event for higher complexity procedures[77]

Healthcare impact
1.1 days LOS longer in hospital in IR procedures when patient had an RC event[77]



Microstream™ capnography monitoring system

Savings
$85 and $35 (2014 USD) reduction in cost/procedure for deep and moderate sedation cases respectively, when capnography was utilized (adjusted for 2026 inflation, these figures translate to approximately $115 and $47 saved per procedure)[78]

Blood oxygenation management

Incidence
~15% of the world's population have darker skin tones and are at risk of oxygen overestimation[79]

Healthcare impact
- 2019 neonatal resuscitation delays of a few minutes, 50% increase in death, and 20% increase in brain bleeds that can lead to life-long disability[80]
- Overestimation of oxygen leads to a 10% reduction in therapy delivery and higher readmission rates related to COVID-19[81]



Nellcor™ portable SpO_2 patient monitoring system Nellcor™ SpO_2 sensor with OxiMax™ technology

Impact
- Reduce missed hypoxemic events by 74% during the most challenging situations of low perfusion and dark skin pigmentation‡, [82]

‡ The study (not funded by Medtronic) enrolled 146 healthy subjects in the 92-96% saturation range and examined paired readings from Nellcor™ N-595 and Masimo Radical 7™* pulse oximeters generated simultaneously. This study was not designed for head-to-head comparison of the respective devices.

Addressing clinical challenges with wearable devices†

The future of care is wearable

The Corsano™* multi-parameter wearable connects to hospital systems and extends visibility of patient from both the hospital and home.[44]

Telemetry gaps

- Spot checking can leave patients unmonitored 96% of the time[83]
- Overuse of telemetry can lead to clinician cognitive overload and missed critical events[84]
- In one study, analysis showed that most alarms from telemetry are not true, only 4% being true actionable alarms[85]

The benefits of wearable remote patient monitoring†

- Earlier detection of patient deterioration[86]
- Reduced length of stay[86]
- Fewer unplanned ICU admissions[87]

† Based on studies done on wearable devices using the same, or some of the same, monitoring parameters as the Corsano™* multi-parameter wearable

Corsano™* multi-parameter wearable[44]



Pulse Rate | SpO_2 | Respiration rate | Skin temperature | Activity

† Activity not medical grade parameter

Airway management

Airway clearance and exposure protection

DAR™ closed suction is designed with patient clinical management, clinician safety, and efficient workflow in mind.

Benefits of closed endotracheal suctioning compared to open suctioning:

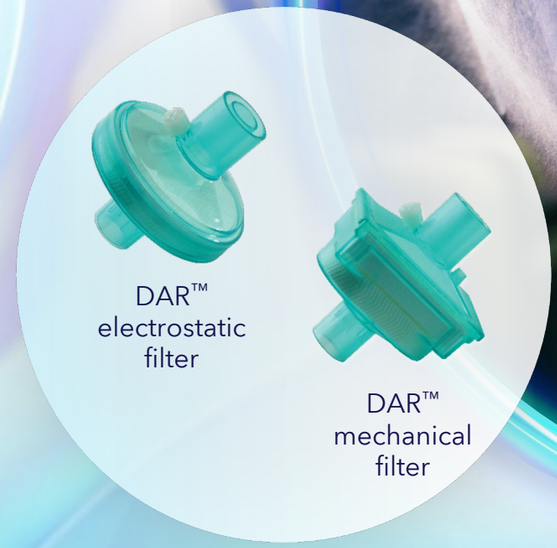
- Improved physiological impact[88]
- Effective secretion management[88]
- Improved oxygenation and PEEP maintenance[89]
- Reduced impact on intracranial pressures[88]
- Easier to use, requires shorter setup time, and uses less staff[90]
- Supports clinician safety by minimizing exposure[89, 91]



Minimize the spread of infection[92, 93]

DAR™ mechanical and electrostatic filters and filter HMEs help safeguard patients and staff

- Filters and filter HMEs help protect patients, equipment, and hospital staff from cross-contamination[94,-96]
- Mechanical and electrostatic filter HMEs minimize heat and moisture loss from patient airways[94]
- Three DAR™ filter HMEs ranked among the top 10 for humidity output in a published study comparing 48 filters and filter HMEs[97]



Always within reach: an intubation routine for anywhere

McGRATH™ MAC video laryngoscope

Performance

Make this your default technique so that your first intubation attempt is your best[98]

Minimalist material use

Disposable blades are made with 12.3g of transparent medical grade polymer[99]

Affordability

Associated with improved patient outcomes compared to direct laryngoscopy and offers significant direct cost savings compared to other VLs †, 100-102



Ergonomics

A familiar, balanced design for intuitive ease of use may support a more ergonomic, upright, and relaxed intubation[103]

Clinician Safety

Video laryngoscopes support clinicians remaining in an upright position, which creates a distance between the clinician and the patient and may reduce clinician exposure to droplet-borne pathogens[104,105]

Portability

Handheld, cable-free, and durable with a reliable power source for every intubation – regardless of location[106]

Two power options with disposable and rechargeable batteries[107,108]

† Based on evidence comparing the McGRATH™ MAC video laryngoscope, GlideScope® video laryngoscope, C-MAC video laryngoscope, and Macintosh direct laryngoscope.

Same ergonomic design, better visualization.

McGRATH™ MAC+ video laryngoscope

See the bigger picture

A 45% larger touchscreen with 4.5x higher resolution than the McGRATH™ MAC video laryngoscope.[109]

Workflow-friendly advanced features:

Seamless streaming
The handle and relay connect automatically upon powering the devices, with no clinical interaction required for connection. The ProxiLinq™ relay allows for live streaming of intubations.[110, 11

Retrospective recording
CaseCapture™ retrospective recording captures the full procedure regardless of when the recording is initiated.[110]

Training and team collaboration
During a procedure, streaming can support sharing, learning and situational awareness. Afterward, recording provides the opportunity for a larger portion of the clinical team to review the intubation.[110-112]



A reliable, ready power source

Wireless charging that supports up to five rechargeable, removable batteries. Color-coded LEDs show how much power remains to identify ready-to-use batteries.[106]

Cuff pressure management made simple.

Puritan Bennett™ cuff pressure manager

Real-time pressure feedback and management

Help protect your patients against common and costly tracheal injuries and VAP caused by cuff overinflation and underinflation with the Puritan Bennett™ cuff pressure manager.[113]

Simplified workflow

- Reduces manual work of measuring and adjusting cuff pressure with a manometer and syringe[113-115]
- Provides uninterrupted cuff monitoring and management
- Compact and portable, allowing the user to inflate and deflate the cuff quickly

Built-in safety

- Cuff leakage detection and a filtered extension tube also safeguard your ventilated patients from complications[116,117]





Puritan Bennett™ cuff pressure manager

Same trusted brand. Enhanced modern design.

Shiley™ flexible tracheostomy tube portfolio

Care

- Improved sealing performance with TaperGuard™ cuff to reduce tracheal wall pressure†, 118, 119
- Integrated 15 mm connector for direct connection without the need for an inner cannula[120]
- Transparent, flexible flange to reduce contact with skin[118]

Convenience and inclusivity

- Expanded size range to accommodate in-between sizes[118]
- Color coded for easy size identification[121]

Comfort

- Softer material for patient comfort[118]





Then ● ● ● ● ● ● ● ● ● ● ● ● ● **Now**

Since 1970 — Since 2025

Products are non-DEHP and are not made with natural rubber latex.[122]

† Based on internal benchtop testing

Seal the path to improved patient outcomes.[123, 124]

TaperGuard™ endotracheal solutions include basic and specialty options in sizes from pediatric to adult for patients across the care continuum.



Shiley™ endotracheal tubes with TaperGuard™ cuff technology:

- Reduce the area of tracheal impact with 29 percent less force versus Hi-Lo endotracheal tubes†, [125, 126]
- Provide more uniform pressure distribution than Hi-Lo cuffs at equivalent intracuff pressures†, [126]
- Reduce microaspiration by as much as 94.8 percent compared to Hi-Lo cuffs†, [127]

Products are non-DEHP and are not made with natural rubber latex.[128]

†Based on internal benchtop testing, may not be indicative of clinical performance.

Addressing clinical and economic challenges

Intubation complications

Incidence
Difficult intubations (DI) occur in >5% of all cases[129]

Cost
$14K (2018 USD) increased in-patient cost per difficult intubation[130]



McGRATH™ MAC and McGRATH™ MAC+ video laryngoscope

Impact
94% first-pass success rate with McGRATH™ MAC compared to 71.6%–82% with DL†, [98, 102]

Healthcare benefit
VL is associated with reduced hospital cost, shorter LOS, lower ICU admission rates, and fewer complications compared with DL[129]

Airway complications–ventilator-associated pneumonia (VAP)

Incidence
15.6% globally for VAP[131]

Cost
$40K (2012 USD) for ventilator-associated pneumonia[132]



Shiley™ evac endotracheal tube with TaperGuard™ cuff

Impact
Use of ETTs with SSD significantly reduced the risk of VAP[133]

Healthcare benefit
SSD can reduce ICU LOS among patients with mechanical ventilation[134]

Incidence
23% drop in cuff pressure when using a handheld manometer‡, [135]



Puritan Bennett™ cuff pressure manager

Impact
Use of continuous cuff pressure monitoring is associated with a significantly lower incidence of VAP[136]

Healthcare benefit
Continuous cuff pressure monitoring and SSD reduce VAP and the duration of mechanical ventilation[136]

Incidence
Open tracheal suction systems result in a 57% increase in VAP[137]



DAR™ filters and filter HMEs
DAR™ closed suction

Impact
Closed suction systems can significantly decrease VAP compared to open suction systems[137]

Healthcare benefit
Closed suction systems are known to reduce the amount of nursing time by 40%[19]

† Based on study done with McGRATH™ MAC video laryngoscope.

‡ Based on bench study and may not be indicative of clinical practice.

Connectivity and remote patient monitoring

Integrate simply. Connect seamlessly. Support continuously.

HealthCast™ services individualized, easy-to-implement service plan options that help you improve patient safety and provide quality care.[139-141]

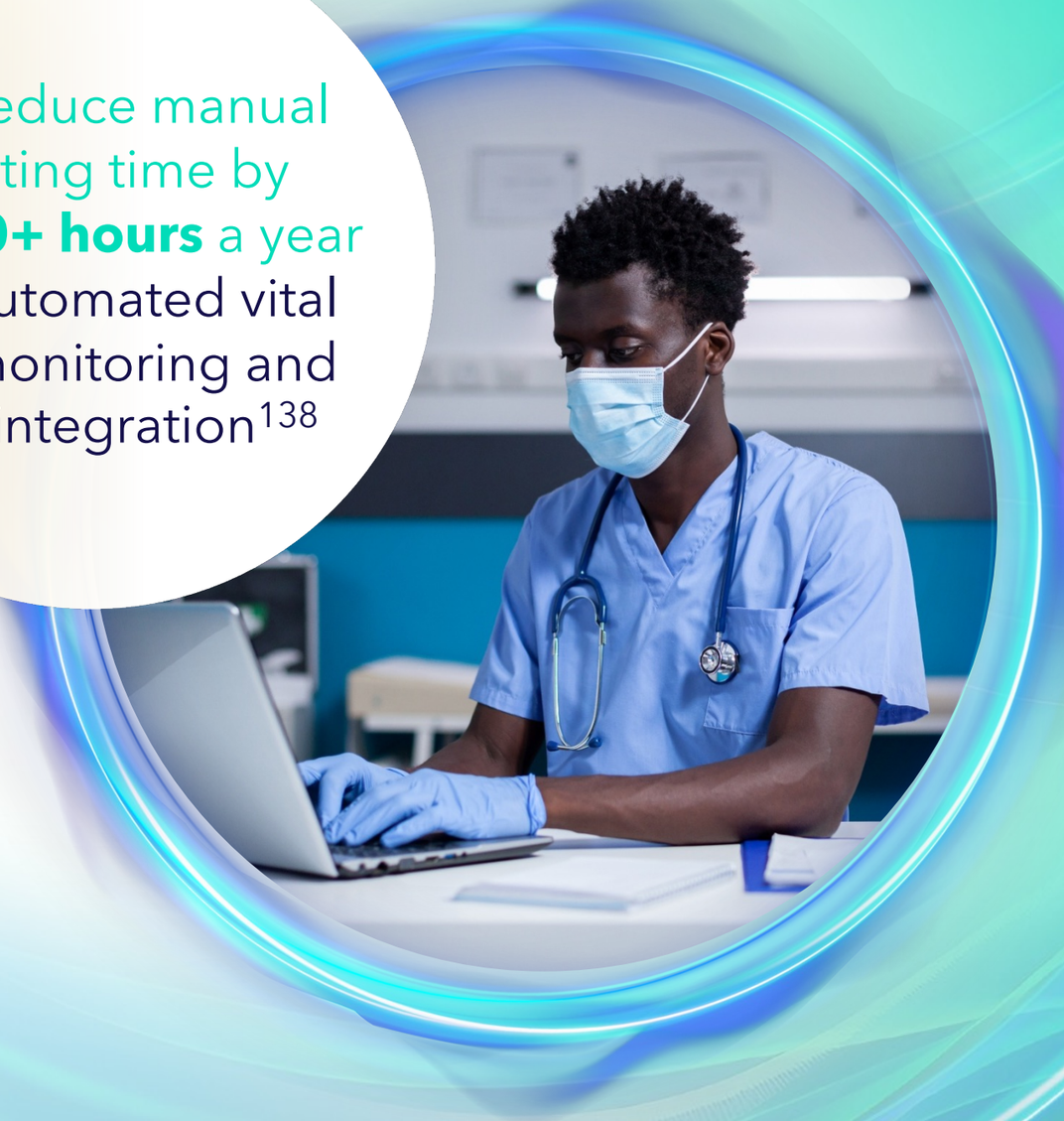
Capital-lite connectivity solutions

Ongoing **tailored support** and **technical training help**

Individualized, easy-to-implement service plans

Flexible, economical, and seamless **EMR integration** for your devices[138, 142, 143]

Can reduce manual charting time by **25,300+ hours** a year with automated vital sign monitoring and EMR integration[138]



Know who needs you. Right now.

HealthCast™ Vital Sync™ remote patient monitoring

Provides critical alerts and actionable insights, helping you stay connected to your patients from anywhere.

Get timely, meaningful data with near real time notification of physiological parameters and trend data[144]

Detect and be alerted on changes in patient conditions with custom algorithms[144]

Can reduce time-consuming manual charting with EMR connectivity[138]

HealthCast™ Vital Sync™ for ventilation

Supports more efficient care team communication, workflows, and reporting, enabling a greater focus on patient care.†, [145]

† Based on studies using technologies using the same or some of the same features as HealthCast™ Vital Sync™ for ventilation dashboard application.

Vital Sync™ patient monitoring on mobile device





Vital Sync™ for ventilation dashboard

Technologies designed for the moments that matter

Helping care teams stay focused on what matters most: patients.

For trained personnel only. For specific indications and instructions for use, please refer to the product manual.

Monitoring products should not be used as the sole basis for diagnosis or therapy and are intended only as an adjunct in patient assessment.

Medtronic Care Management Services are not intended as a substitution for, or alternative to, the medical care provided by a physician. Medical guidance and treatment decisions should always be determined by treating physicians or other properly licensed health care professionals. Service availability and performance may be impacted by patient user error and connectivity, access, and service hour limitations.

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