

# Capsule

## Medical Device Information System™

## An Information System for Medical Device Data

Capsule's Medical Device Information System™ (MDIS) is health care's first system dedicated to capturing, harnessing and unlocking the power of data from all medical devices found throughout a health care enterprise. The system is built on four core components.

### KEY BENEFITS

- Connectivity for all your connectable medical devices
- Ability to adapt medical device data to the requirements of receiving system(s)
- Maximize the use of medical device data through analytics
- All-in-one vital signs monitoring, documentation and connectivity solution



### Connectivity

The ability to connect to a wide-variety of medical device types and manufacturers in a manner that fits your IT infrastructure and clinical workflows.



### Monitoring

Move beyond connectivity with an innovative patient monitoring system that combines ease of use, efficiency and economy with superior documentation capabilities.



### Integration

Once data is captured by Capsule, the ability for hospitals to have total control over tailoring the data to the needs of multiple receiving systems.



### Analytics

The ability to turn volumes of aggregated medical device data into actionable clinical and operational information.

*By bringing these elements together, health care organizations have the infrastructure to apply medical device data to their fullest potential as actionable information to help improve the delivery of patient care.*



## Connectivity



## Monitoring

Each medical device has its own way of providing data. Most have serial ports, while others have Ethernet or USB ports. Regardless, the number of protocols can exceed 100. So it's rare for a single connectivity solution to fit the unique requirements of each medical device, as well as the clinical workflows of various care environments and the hospital's IT infrastructure.

### Device Connections

Capsule offers five connectivity options to capture data from medical devices found throughout the health care enterprise. The appropriate connectivity solution is a function of the clinical workflow of the care area, contextual awareness at the bedside, and implementation and support requirements.

**Capsule Gateway:** Connectivity through an existing device network infrastructure.

**Capsule Client™:** A software-only solution that provides connectivity through an existing PC and hardware infrastructure. This is particularly suitable for care areas with a connected PC, such as an AIMS-running PC connected to an anesthesia machine in an OR.

**Capsule Axon™ Series:** A robust and reliable single-, four- or eight-port serial to network bridge providing reliable connectivity that's an ideal solution for crowded care areas.

**2net™ from Qualcomm Life:** A set of medical-grade connectivity solutions to power secure, scalable remote patient monitoring of at-risk patient populations in the home or on-the-go.

**Capsule Neuron™2 Based Solutions:** Capsule Neuron 2 is a mobile clinical computer with built-in connectivity ports and a display that can manage connectivity status and data from multiple devices. Thanks to its touchscreen and power autonomy, it's ideal for mobile workflows and whenever patient ID is required for successful integration. Like the original Neuron, Neuron 2 is scalable and features a field upgradeable design and runs the following applications:

**Capsule Vitals Stream™** is typically implemented in high-acuity care areas and ORs. It continuously collects patient vitals from multiple medical devices, while providing clinicians a universal view of connectivity status for all medical devices connected to a patient.

**Capsule Chart Xpress™** provides mobile connectivity for periodic monitoring in lower acuity care areas such as med-surg. It provides turnkey connectivity for all your existing spot monitors and features bedside charting capabilities that reduce vitals charting time from hours to seconds.

An optional Early Warning Scoring System (EWSS) detects the onset of potential patient deterioration at the earliest possible moment at the point-of-care to enable direct and early intervention.

**Capsule Vitals Plus™** is an innovative, all-in-one solution for vital signs monitoring and clinical documentation. Re-using the same Neuron 2 from your Chart Xpress configuration, Vitals Plus lets you retire older vital signs monitors with the added benefit of a clinician-friendly, flexible workflow that supports the charting of five vital signs modifiers, O2 delivery, and seven custom vital signs right from the point-of-care.\*

### Device Communication

Along with making the physical connections to medical devices is Capsule's ability to recognize what type of device is connected. This is essential to performing the translation of device data by the Device Driver Interfaces (DDIs). DDIs are paired to medical devices during deployment and help communicate and translate the incoming device data to Capsule's core software. This pairing occurs once, enabling true plug and play capability through Device Identification Modules (DIMs).

Virtually all medical device types, models, and firmware versions are covered through the industry's largest and most mature DDI library. Whether enabling connectivity for a wide range of both aging and new devices, or looking to expand the range of device types across different types of care environments, a comprehensive DDI library provides a truly scalable infrastructure.

#### Medical Device Categories

- Physiologic Monitors
- Cardiac Monitors
- Neurologic Monitors
- Fetal Monitors
- Pulse Oximeters
- Beds
- Scales
- Glucometers
- Urimeters
- Ventilators
- Infant Warmers
- Anesthesia Gas
- Infusion Pumps
- Dialysis
- Syringe Pumps
- Feeding Pumps
- Cardiopulmonary Bypass
- Intra-aortic Balloon Pumps



## Integration

### Data Control

Once incoming data has been captured and normalized, hospitals can adapt the data to the needs of the receiving system(s) for clinical documentation, alarm management, clinical research, etc. Capsule provides powerful data configuration options:

- **Data sampling:** Integrates data at the needed pace. For example, Capsule can send heart rates every minute to the EMR while sending heart rate alarms immediately to both the EMR and the alarm management system.
- **Data selection:** Allows the selection of all, or only the parameters needed for the receiving system(s). Data that is unnecessary to the receiving system can be filtered out prior to sending it. In some instances, data outputted from medical devices in stand-by mode can also be filtered out.
- **Data transformation:** Receiving systems often require data to be received in a specific format, such as a specific parameter label, unit, or code. Capsule can be configured to transform the data to receiving systems' requirements. For example, 1-2-3 can become low-mid high.
- **Data contextualization:** Receiving systems can require additional context to accompany the data such as location or patient ID. Most medical devices have no contextual awareness and cannot provide this data directly. Capsule leverages all available context sources (e.g. settings from the devices, user inputs, and other system interfaces such as ADT) to append the outbound message with the necessary context.
- **Simultaneous Tailored Integration:** Capsule is capable of tailoring collected medical device data to not just one, but to several downstream systems simultaneously while respecting their unique data requirements. With this capability, hospitals can empower many consumers of medical device data.



## Analytics

### Apply the Data

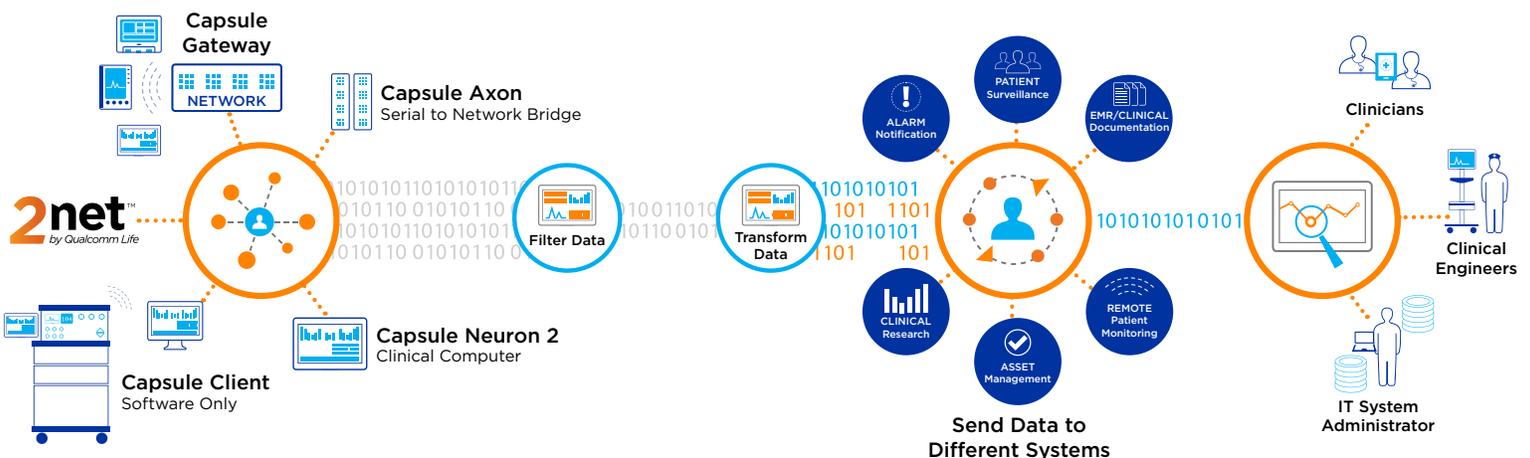
The millions of data points generated each day by medical devices represent a gold mine of information for applying analytics. In addition to passing data along to other receiving systems, Capsule can store the necessary clinical and technical medical device data, along with patient and user context to provide powerful operational dashboards to help improve the delivery of care. From detailed therapeutic settings data to information about when a medical device is in use, Capsule delivers valuable insight through health care's only analytics solution for medical device data.

At the core of the analytics solution is **Capsule IQ™**. This engine takes all the available clinical and technical device data, patient context, and user information to provide operational visibility to clinicians and to those who support them.

- IT system administrators can gain insights into the status and operations of Capsule and its infrastructure.
- Clinical engineers can make more informed decisions in the procurement, management, and maintenance of point-of-care medical devices.
- Nursing management can gather insight into existing vitals, capture workflows and improve them based on real-time data.

Capsule IQ is deployed within your existing Capsule MDIS. An agent is installed on all Capsule servers and clients, extracts data and securely sends it to the centralized platform.

- **Instant access to information:** The insights generated by Capsule IQ are accessible through any web-enabled device (desktop, tablet, TV and mobile phone).
- **Smart alerts:** Capsule IQ continuously analyzes the data generated by the Capsule MDIS. Through configurable alerts, Capsule IQ will notify users of critical information.
- **Customizable dashboards:** Customizable dashboards provide actionable information for each user in simple, understandable visual indicators.



## A System That Fits Your Organization

Capsule is designed to cover both the current and evolving requirements of today's unique health organizations. With a scalable architecture, the latest security, and centralized management, Capsule is ideal for any IT environment.

- **Scalable**  
Capsule handles the extension of data capture from one department to another, and then beyond into a health system's network of facilities through the industry's largest, most mature DDI library and connectivity solutions.

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- **Flexible**  
Clinical workflow defines the requirements for a proper connectivity solution, while the receiving information system defines how the data needs to be sent. Capsule adapts to virtually any workflow with multiple connectivity options and powerful integration tools.

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- **Secure**  
Capsule uses and supports the latest technologies: HTTPS, VPN tunnels for point-to-point communications, and WPA2 Enterprise for Wi-Fi network access.

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- **Manageable**  
Rapid deployments and effective system support is achieved through a centralized management architecture. Remote deployment, maintenance and monitoring provides "anytime, anywhere" access management.

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- **Highly Available**  
Capsule compatibility with all virtualization solutions and load balancing assures the uninterrupted delivery of data. Local caching on Capsule connectivity products provides additional resilience to outages.

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- **Compatible**  
Capsule is easily assimilated into an organization's IT ecosystem, using standard HL7 messaging, ADT for patient census, and Microsoft Active Directory for user authentication.

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- **Compliant**  
Certified to recognized FDA consensus standards and compliant with HIPAA as a HIPAA Business Associate, Capsule is compliant with the industry's most stringent standards.

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### *Powering Intelligent Care Everywhere*

Qualcomm Life is harnessing the power of near real-time data to improve care delivery and operational efficiencies across care settings. Through our smart, flexible platforms, we're enabling our customers to establish new standards for timely, informed patient-centered care.