Using Enterprise Connectivity to Make Devices IHE Compliant

Summary

Today, patient care is more complex than ever before. Patient to nurse ratio is higher. Technological developments require nurses to learn more. Hospitals are rapidly requiring that all patient data be in the EMR. And, patient safety is at the forefront of nearly every hospital's initiatives.

When hospitals don't have device connectivity, nurses are even more strained because they are spending more time documenting data, less time caring for patients. In the ICU the challenge is even greater because patients are connected to multiple medical devices and the nurse needs to chart more frequently. Manual transcription and entry into the EMR is simply not the best use of nursing time; especially when there is another option – medical device connectivity.

Medical device connectivity improves workflow because data from connected devices is AUTOMATICALLY sent to the EMR. Device connectivity simply allows nurses to focus on what they do best – care for their patients. And there's more. Device connectivity does more than just save nursing hours. It also:

- Increases staff productivity
- Eliminates transcription errors
- Leverages the existing EMR investment
- Improves overall patient care and safety

However as hospitals consider the implementation of device connectivity they are faced with the dilemma of trying to install devices that are IHE compliant, trying to ensure interoperability of their medical devices and systems and trying to minimize their points of integration. These challenges can be solved with an Enterprise, Vendor Neutral, Connectivity Solution.

Market Challenges Related to Device Connectivity and Interoperability

While device manufacturers and EMR vendors want to be able to implement the protocols required to be IHE compliant for device connectivity, there are many market challenges that make it difficult to do so. These include:

• A lack of established standards for medical device data; the use of HL7 is growing but there are still many versions of HL7 and the protocols for HL7 keep changing.
• There are hundreds of legacy devices that simply cannot support the new HL7 standards. Therefore, more often than not medical devices have and will continue to have their own proprietary protocols.
• Both device manufacturers and HIS/EMR vendors cannot keep up with developing and maintaining a comprehensive list of device drivers or with updating the software on these medical devices.
• Device integration is simply not the core competency of device manufacturers and HIS/EMR vendors. And, with so many other technological and clinical requirements, device integration often takes a "back seat" in terms of priority for what these vendors can include in their product roadmaps.

How Capsule's Enterprise Device Connectivity Solution Makes Devices IHE Compliant

Capsule's Enterprise Device Connectivity Solution is designed to process, manage and deliver data from virtually any brand or type of bedside medical device and send it to clinical or hospital information systems using HL7 standards. The Capsule solution collects all available data and alarms from bedside devices via direct serial connection to the device or via the hospital's existing wired or wireless network, directly or through a gateway.

Featuring plug-and-play connectivity enabled by automatic device identification, users can connect and reconnect medical devices without the need for reconfiguration thereby enabling easy relocation of devices between beds or hospital rooms.

Capsule's connectivity software, DataCaptor™, runs on standard Microsoft Windows based-platforms. It supports up to 500 simultaneously connected devices on a single DataCaptor™ Connectivity Server with the flexibility to link multiple systems for increased levels of scalability. DataCaptor also features built-in support for over 530 bedside medical devices such as patient monitors, ventilators, infusion pumps and anesthesia machines and supports services such as data buffering, data queuing and device management including filtering, translation and normalization.

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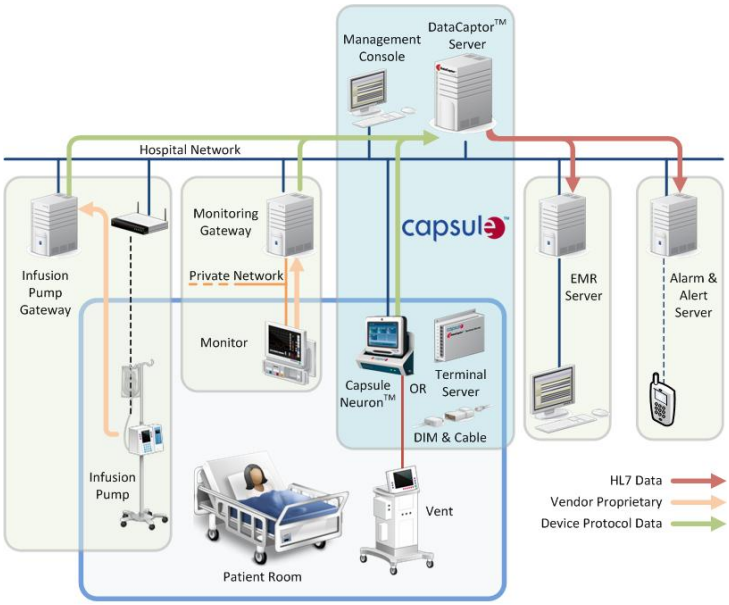

The bottom line is that Capsule's Enterprise Device Connectivity Solution actually allows hospitals to connect virtually any medical device, in any care area, to any information system and provides them with one point of integration to manage for output to multiple systems. It makes medical devices IHE compliant, including legacy devices that have been in the hospital for years, it makes the devices and systems interoperable, and it minimizes points of integration and thus points of failure.

How Capsule Fits Within the IHE Patient Care Devices (PCD) Domain

Capsule has been actively involved in the IHE Patient Care Devices (PCD) domain for the past several years, and is committed to providing end users with a comprehensive interoperability platform that supports all patient-care devices used across the clinical environment.

Capsule has implemented the Device Enterprise Communication (DEC) and Alarm Communications Management (ACM) profiles in the Patient Care Devices (PCD) domain of IHE. This allows any site that uses supported versions of DataCaptor™ to use the IHE PCD profiles to achieve semantic interoperability with minimal configuration, when communicating with other systems implementing the same PCD profiles. This allows users to overcome one of the biggest drawbacks of using just HL7- semantic variability. If the legacy medical devices in a clinical environment does not support PCD profiles or even HL7, as most do not, the DataCaptor™ system on the network will be able translate the clinical data to the IHE PCD compliant profiles, allowing enterprise wide IHE compliance.

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Why Capsule for Device Connectivity

At Capsule we understand that staff changes, that technology is continually evolving, and that hospitals don't want to have to set up an entirely new system whenever these changes occur. We partner with the leading medical device manufacturers and leading HIS and EMR vendors around the world to allow hospitals to connect any device to any HIS, EMR or alarm management system. And, our design is completely flexible and scalable allowing hospitals to add devices and information systems and even change devices and information systems, all without impacting connectivity.

Capsule is the leading provider of medical device connectivity with over 14 years of experience in the industry. Our solution is proven and installed at over **670** facilities worldwide and features:

- Vendor neutrality with connectivity from virtually any medical device to any HIS, EMR or alarm management system
- The largest device driver library available, over 530 and growing
- One of the only FDA 510(k) cleared, medical grade solution available today
- Unmatched service and support including pre-sales consulting and project management, thorough and fast implementation and on-going 24/7 technical support

These features greatly benefit the hospital because when a hospital chooses Capsule for device connectivity, they know they can deploy a solution that will work today, right away, that is flexible and scalable to grow as their needs grow, and is safe for the future.

And our solution offers numerous benefits to device manufacturers and information system providers.

For device manufacturers, our solution delivers:
- A low risk, low resource alternative to in-house development
- A standards based IHE PCD (DEC and ACM) solution that is proven to work with most CIS vendors implementing these profiles, and generic HL7 based output for all others.

For HIS vendors, our solution offers:
- An IHE DEC and ACM profile compliant data source
- Standardized variable mapping
- Unified device interface without custom coding
- Support for all device vendors

In fact, Capsule already has established relationships and proven deployment with nearly every Device Manufacturer and Information System provider in the industry. So, not only does it mean that over 530 devices are technically IHE compliant through Capsule as well as 14 information system providers, it also means that we are working with these companies to solve and develop products and solutions that will meet the connectivity needs of the future and to ensure that these solutions are integrated into their roadmap plans.

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Why Capsule's Enterprise Medical Device Connectivity Solution

Capsule's Enterprise Medical Device Connectivity solution was designed with nurses for nurses and features connectivity options that work in all care areas of the hospital - from critical care, to the OR, to med-surg, and the ED. Designed under the same open architecture principles that fostered the design of Capsule's proven DataCaptor™ software, Capsule's Enterprise Connectivity Solution does not lock hospitals into one method of operation and deployment; in fact it actually works with existing technologies and integrates with caregiver work processes. Enabled by the innovative Capsule Neuron™ platform, the Enterprise Device Connectivity Solution features a variety of options that allow a hospital to configure their solution based on their clinical and organizational needs.

Continuous Data Collection for High Acuity

In higher acuity environments, such as the ICU or OR, the Capsule Neuron is typically mounted directly on the wall near the patient. Each Capsule Neuron is assigned to one patient. The visual display at the bedside provides clinicians with continuous assurance that all patient data is being collected from connected devices and automatically sending data to the EMR. This means the nurse can focus on patient care without having to stop every 5-15 minutes to write down vital signs. And, the Capsule Neuron keeps clinicians informed by alerting them right away at the bedside if a connectivity problem occurs. The Capsule Neuron simply allows clinicians to provide care with confidence – knowing that their patient data is being captured and sent to the EMR waiting for validation when they are ready to chart.

Periodic or Mobile Data Collection for Low Acuity

In lower acuity environments, such as med-surg, the Capsule Mobile Vitals Plus™ is deployed so it can handle multiple patients. It is therefore mounted directly to a roll stand with the spot-check monitor and bar-code scanner and therefore is incorporated with the existing design of the unit. Vital signs are automatically captured by the Capsule Mobile Vitals Plus™ system for any devices connected to it, either locally or via a gateway, and validation is actually done at the point of care so clinicians can quickly move on to the next patient. And, there is an additional screen that allows the clinician to enter notations related to collected vital signs and/or enter additional manual vital signs that were taken such as blood pressure and temperature. Finally, after validation the clinician can automatically send the patients vital signs to the EMR so the patient's record is updated immediately without the clinician ever needing to log into the workstation. This is a truly unique way of handling vital signs capture in lower acuity environments. A design that fits the workflow, that allows for validation and additional entry at the point of care, and that allows the clinician to submit the information right away to the EMR and then quickly move on to the next patient.

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Capsule's Connectivity Solution in Action: One Hospital's Experience

Sherman Hospital in Elgin, Ill., wanted to integrate patient monitoring devices with its electronic health records system. However, it quickly determined that the enabling data transfer technology from its EHR vendor was not up to the task. To compound the issue, Sherman's primary medical device vendor said some older devices could not even be integrated with the EHR and suggested buying new ones at a substantial cost.

Instead, the 240-bed hospital turned to Andover, Mass.-based Capsule Technologie, a vendor that has built an interface library for more than 415 medical devices. Capsule's bedside medical device interfaces rely on device drivers that are specific to each vendor, type and version of medical device. Moreover, incorporating them into the clinical setting is a plug-and-play proposition, says Matthew Perry, R.N., a systems analyst at 240-bed Sherman Hospital. It only took a week in April 2008 to prepare some 100 devices - comprising 12 different categories - to transmit data. "The device drivers are the heart and soul of the BMDI connectivity," Perry notes.

But it took the hospital the rest of the year to fully configure and test the connections to the EHR from Kansas City, Mo.-based Cerner Corp., he recalls. That's because the task of making sure that specific vital signs data goes into the proper data field in the EHR is laborious. It's one thing to make sure heart rate data goes into the heart rate data field. But the hospital had to configure about 50 parameters of data. For instance, there are three types of parameters each for systolic and diastolic blood pressures.

The tedious task of configuring the EHR isn't specific just to Cerner's products, Perry says. "Generally, that's where the grunge work with any EHR system takes place when implementing BMDI."

To interface a monitoring device, Perry downloads the appropriate device driver from Capsule's Web site to software from the vendor called Data Captor. The software captures the data flowing out of medical devices, and then Perry can filter out extraneous data he doesn't want to stream into the EHR, such as the version of software running on the medical device.

Once the device interfaces and the EHR are configured properly, the benefits of having a direct data stream come almost immediately, Perry says. The entire site license for Capsule was less than half what Sherman Hospital's primary device vendor, Waukesha, Wis.-based GE Healthcare, wanted for new devices. About 70% of the hospital's devices come from GE.

With device data now streaming into the EHR, physicians don't have to go to specific units, such as surgery and intensive care, to leaf through papers and find the most recent vital signs. "Once it's in the EHR, physicians can see it from anywhere," Perry notes. The EHR also displays trends and generates alerts when appropriate. Lessons that Sherman Hospital learned along the way include:

* When reviewing vendors for bedside medical device interfaces, ask specific questions about how many and what types of device drivers they have in their library. "There are options for BMDI other than having to go with your device or EHR vendor," Perry says. "When we began the journey, we didn't know there were options."

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* Involve clinicians in the EHR configuration work. A computer technician may look at a monitor and see a heart rate from the EKG and a heart rate from the finger-attached lead that collects oxygen saturation data. But a clinician knows that the EKG heart rate data is more accurate and should be the data collected. "It can be very difficult for a computer technician to configure this on their own," Perry says.

* Once configuration appears to be done, "test, test, test" until you are assured the data is validated and patients can be treated without fear, Perry says.

* Monitoring device data in the EHR provides opportunities to do data mining and analysis.

SOURCE: Health Data Management, Getting Devices to Talk to EHRs, November 1, 2009

For More Information

If you're interested in finding out more about Capsule's Enterprise Device Connectivity Solution, or in seeing a demonstration of the Capsule Neuron for high and low acuity settings, stop by the Capsule booth #1931, the RFID Showcase or visit our website at www.capsuletech.com.

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