

INTEROPERABILITY SHOWCASE™



Use Case Title: Patient Device Association: Closing the Gaps

Description:

In today's fast-paced healthcare environment, patients and medical equipment are constantly on the move. Staffing ratios and documentation guidelines spread nurses' focus thin. As a result, establishing device associations to a patient can be burdensome and often missed.

Julie, a 37-year-old sepsis patient, begins to recover in the ICU. Since patients are waiting in the ED for an ICU bed, Julie is rapidly transferred to a step-down unit when a bed is available. The medical devices at her ICU bedside need to be disassociated from Julie, and the devices in the step-down unit need to be associated with her. This use case highlights how the new Point-of-Care Identity Management (PCIM) standard facilitates automating the association process and reduces errors and omissions.

Point-of-Care Identity Management seamlessly associates devices to patients to ensure accurate, timely data flow. This use case demonstrates how patient-device associations are established, both by manual scanning through the Association Reporter and Manager or by automatic association through real-time locating systems (RTLS) technology. Even when a rapid transfer and stat med order causes the nurse to manually program the infusion pump outside of the automated workflow, the infusion pump is associated with Julie. Throughout her care journey, bedside medical devices are correctly associated with Julie, which ensures messages and data contain the appropriate patient identification and can flow directly into Julie's electronic health record. Alerts from associated devices are managed to assure an on-duty nurse gets the alarm in a timely manner to respond to the patient's needs.

Ensuring seamless and accurate patient device association is essential in promoting continuity of care, responding appropriately to alerts, maintaining accurate and comprehensive medical records, and above all ensuring patient safety.

Value:

Point-of-Care Identity Management (PCIM) seamlessly associates devices to patients to ensure accurate, timely data flow. Closing gaps in patient device associations is essential in promoting continuity of care, responding appropriately to alerts, maintaining accurate and comprehensive medical records, and above all ensuring patient safety.

Participating Vendors:

B. Braun Medical, Epic, GuardRFID, InnoVision Medical Technologies, SPOK

Scenario	Vendor	Products	Standards
<p>Introduction</p> <p>Bedside medical devices are a critical part of modern healthcare delivery. Identifying which device is associated with which patient is important to the quality of that care and the quality of documentation. When this association is lost it is more difficult for clinicians to manage the medical device and can lead to documentation omissions or errors.</p> <p>In today’s fast-paced healthcare environment, caregivers, patients and medical devices are constantly on the move. Device patient association needs to be easy within the normal workflow, minimizing the time and labor burden to nurses and other caregivers. There also needs to be a safety net, a way to recapture the association when the inevitable occasional break happens.</p> <p>Point-of-Care Identity Management (PCIM) is an approach to assure seamless association of devices to patients regardless of the products and systems in use. PCIM as a standard is critical to closing the gaps that can occur in busy hospitals.</p>			
<p>Today we are in a busy hospital. The ICU beds are all full, but there are several critical patients in the Emergency Department just waiting for a bed. Keeping these patients in the ED while they wait for a bed is putting the ED overcapacity too and threatening to put the hospital on diversion sending ambulances across the city.</p>			

<p>In the ICU, Julie a 37-year-old woman is in the ICU battling sepsis. It has impacted her ability to breathe, and she has to be mechanically ventilated. In addition, she is on multiple medications to both treat her infection and treat the symptoms of her septicemia. She has been in the ICU for days and the clinical team has had to use many medical devices to support her including monitors, a ventilator, and IV pumps. All of these devices are associated to Julie in her EMR. The devices are identified using a barcode scanner at the bedside to scan the device and the patient medical record tag. Inside Julie's EMR in Epic the ventilator and pump are associated with her. Any data Epic receives from these devices is added to Julie's EMR and visible to the full clinical team.</p>	<p>Epic → B. Braun</p>		<p>PCD-19 to Associate Device with patient: Julie</p>
<p>The barcode scanner from Epic internal Device-Patient Association Reporter scans Julie's wristband and the device ID on the Hamilton Ventilator. Epic's Device-Patient Association Manager sends this association assignment to the InnoVision Gateway that is attached to the Hamilton Ventilator. This Gateway enables data from the ventilator to be automatically sent to the EMR. Sending the Julie's patient Id to the Gateway allows the data sent to be tagged with Julie's ID providing another layer of data integrity assurance.</p>	<p>Epic (Association Manager → InnoVision (ventilator gateway)</p>		<p>PCD-19 Dev-Pat Association</p>
<p>The nurse programs the infusion pump and starts her IV fluids. Since it was already associated with the patient, Julie, via the same BCMA process described above. The current pump status, along with the Julie's name and ID, can be viewed with the Space DoseTrac user interface. Any status or alarm messages sent to other systems are tracked with the correct Patient ID and location. The current pump status can be viewed with the Space DoseTrac user interface.</p>	<p>Epic (Association Manager → B. Braun (infusion pump gateway)</p>	<p>Epic Space DoseTrac</p>	<p>PCD-19 Dev-Pat Association</p>

<p>As the Hamilton Ventilator is in use on Julie, its operation is monitored, and periodic status messages are sent to the Epic EMR for real time review and historical tracking.</p>	<p>InnoVision (ventilator gateway) → Epic EMR</p>		<p>PCD-01 to report ventilator status to Epic MAR</p>
<p><i>Some time passes; Julie's condition improves...</i></p>			
<p>Julie is finally beginning to recover from sepsis that put her life at risk and no longer needs the ventilator and other devices. One by one these devices are disassociated from Julie's medical record.</p> <p>The Epic barcode scanner is used to capture Julie's ID and the infusion pump's serial number so that Epic's Device-Patient Association Manager can send the B. Braun pump a "disassociation" message. Julie is stable enough to move to a step-down floor.</p>	<p>Epic→B.Braun Epic (A)evice Link → InnoVision (ventilator gateway)</p>		<p>BCMA used to create & send PCD-19 Disassociate message</p>
<p>A bed opens on the step-down unit and Julie is ready to be moved by the transfer team. Once in her room, she begins to show signs of respiratory distress. The physician suspects inflammation from the recently removed ETT and orders stat dose of steroids to reduce the risk of re-intubation. The nurse grabs a syringe pump from the nearby supply closet, programs the stat order into the pump and, takes the pump and medication to Julie's room.</p> <p>The stat steroid order is in the Epic EMR record of Julie's care. However, the new pump has not been associated with her medical record number.</p>			
<p>GuardRFID is used by this hospital for RTLS to track device location throughout the hospital. Devices used in this unit have an RFID tag that indicates the type and specific ID of the device. In addition, an RFID tag was also placed on Julie's wrist</p>	<p>Guard RFID → InnoVision (DPAM)</p>		<p>PCD-17</p>

<p>Based on location of tags attached to the equipment and Julie, Guard RFID system determines that they are very close to each other. The clinician in the room is asked to verify that the pump shown on the Guard RFID screen is indeed the one to be used on Julie. When this is done Guard RFID sends a message to the InnoVision Device-Patient Association Manager.</p>			
<p>The InnoVision Device-Patient Association Manager, in turn, sends the Association assignment to the pump.</p>	<p>InnoVision (DPAM) → B. Braun</p>		<p>PCD-19 Dev-Pat Association</p>
<p>The nurse notes that despite the steroid infusion Julie is still not breathing easily. The physician orders high velocity therapy to prevent reintubation. They bring a Vapotherm to the room. Once again, Guard RFID is used to create the device (Vapotherm) to patient (Julie) association. And, once again, the nurse verifies the correct associate was detected.</p>	<p>Guard RFID → InnoVision (DPAM)</p>		<p>PCD-19 Dev-Pat Association</p>
<p>Once the Vapotherm is attached to Julie, its real time status is sent to the EPIC through the InnoVision Gateway so that it is recorded to Julie’s medical record. Data from this unit includes settings and status. The RT director of the hospital in her office can see that the Vapotherm unit is active and communicating data by monitoring the Cloud connectivity platform that shows the connectivity status of all of the Vapotherm units in the hospital that have InnoVision Medical Technologies Gateways attached.</p>	<p>InnoVision (Gateway / Vapotherm) → Epic</p>		<p>PCD-01</p>
<p>Julie readjusts her bed and in the process crimps off the IV line. This is detected by the pump and an alert is sent to the SPOK alert manager. Spok displays the alert on the active alerts dashboard at the nurse station or a monitoring “war room.</p> <p>Simultaneously Spok reviews the content and priority of the event then sends a PCD-06 notification to the appropriate care team member on the Epic Hyperspace system (approx. 2 seconds)</p>	<p>B. Braun → SPOK</p>		<p>PCD-04</p>

<p>The SPOK Alert Manager determines the first priority for Julie is to send an Alert to the Epic Alert Dashboard</p>	<p>SPOK → Epic (AC)</p>		<p>PCD-06</p>
<p>The nurse quickly reviews the Alert pop up on the hyperspace dashboard and escalates the Alert, since she is busy with another critical patient and cannot immediately respond. This escalate response is relayed back the SPOK alert manager.</p>	<p>Epic (AC) → SPOK</p>		<p>PCD-07</p>
<p>Immediately after receiving the response from the primary nurse, The Spok Alert Manager sends the Alert message to the next highest priority responder, which is Julie's nurse, Sam.</p>	<p>SPOK (AM) → SPOK (AC / cell phone)</p>		<p>PCD-06</p>
<p>This time, Sam is able to respond and clicks on the Accept selection on his mobile phone. The accept response is sent back to SPOK which stops further escalation.</p> <p>Sam walks to Julie's room to take care of the kinked tube and clears the alarm.</p>	<p>SPOK (AC / cell phone) → SPOK (AM)</p> <p>B. Braun (pump line)</p>		<p>PCD-07</p>
<p>Julie continues to get better and in a few more days is released from the hospital. The PCIM drives device association and assures that her medical record is complete and accurate. All good!</p>			

Data exchange standards:

Vendor	Product	Category	Protocol	Interop Body	Interop Profile	Interop Actor	Interop Msg	Send or Receive	Transaction Description
B. Braun Medical	Space DoseLink	Infusion Device	HL7® v2	IHE DEV PCD	ACM	AR Alert Reporter	PCD-04	Send	Report Alert
			HL7 v2	IHE DEV PCD	MEMLS	LOC Location Object Consumer	PCD-16	Rcv	Get "Report Location Observation" to show on DoseTrac GUI
			HL7 v2	IHE DEV PCD	PCIM	DPAC Dev-Pat Association Consumer	PCD-19	Send	Subscribe to DPA status with "Query Device-Patient Associations" transaction
			HL7 v2	IHE DEV PCD	PCIM	DPAC Dev-Pat Association Consumer	PCD-19	Rcv	Get DPA status with "Query Device-Patient Associations" transaction

Epic		EMR	HL7 v2	IHE DEV PCD	DEC	DOC Device Object Consumer	PCD-01	Rcv	Get "Communicate PCD Data" message for entering into MAR
	Alert Communicator		WCTP	IHE DEV PCD	ACM	AC Alert Communicator	PCD-06	Rcv	Receive "Alert Dissemination" from AM for processing
			WCTP	IHE DEV PCD	ACM	AC Alert Communicator	PCD-07	Send	Send "Report Dissemination Alert Status" Back to AM
	Dev-Pat Association Manager		HL7 v2	IHE DEV PCD	PCIM	DPAR Dev-Pat Association Reporter	PCD-19	Rcv	Get Subscription to DPA status with "Query Device-Patient Associations" transaction
			HL7 v2	IHE DEV PCD	PCIM	DPAR Dev-Pat Association Reporter	PCD-19	Send	Send DPA status via "Query Device-Patient Associations" transaction

Guard RFID		Real Time Location Services	HL7 v2	IHE DEV PCD	MEMLS	LOR Location Object Reporter	PCD-16	Send	Send "Report Location Observation"
			HL7 v2	IHE DEV PCD	PCIM	DPAR Dev-Pat Association Reporter	PCD-17	Send	Send "Assert Dev-Pat Association"
			HL7 v2	IHE DEV PCD	PCIM	DPAR Dev-Pat Association Reporter	PCD-18	Send	Send "Assert Dev-Pat DisAssociation"
InnoVision Medical Technologies		Gateway	HL7 v2	IHE DEV PCD	DEC	DOR Device Object Reporter	PCD-01	Send	Send "Communicate PCD Data" message to EMR Transaction sent to Epic for both the Hamilton Ventilator and the Vapotherm Precision Flow Ventilator
			HL7 v2	IHE DEV PCD	PCIM	DPAC Dev-Pat Association Consumer	PCD-19	Send	Subscribe to DPA status with "Query Device-Patient Associations" transaction

			HL7 v2	IHE DEV PCD	PCIM	DPAC Dev-Pat Association Consumer	PCD-19	Rcv	Get DPA status with “Query Device-Patient Associations” transaction
		Dev-Pat Association Manager	HL7 v2	IHE DEV PCD	PCIM	DPAC Dev-Pat Assoc Consumer	PCD-17	Rcv	Get “Assert Dev- Pat Association”
			HL7 v2	IHE DEV PCD	PCIM	DPAC Dev-Pat Assoc Consumer	PCD-18	Rcv	Get “Assert Dev- Pat DisAssociation”
			HL7 v2	IHE DEV PCD	PCIM	DPAR Dev-Pat Association Reporter	PCD-19	Rcv	Get Subscription to DPA status with “Query Device- Patient Associations” transaction
			HL7 v2	IHE DEV PCD	PCIM	DPAR Dev-Pat Association Reporter	PCD-19	Send	Send DPA status via “Query Device-Patient Associations” transaction

Spok		Alert Management	HL7 v2	IHE DEV PCD	ACM	AM Alert Manager	PCD-04	Rcv	Get "Report Alert" message for processing
			WCTP	IHE DEV PCD	ACM	AM Alert Manager	PCD-06	Send	Receive Alert Dissemination" to AC for processing
			WCTP	IHE DEV PCD	ACM	AM Alert Manager	PCD-07	Rcv	"Report Dissemination Alert Status" Back to AM

References

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https://wiki.ihe.net/index.php/DEV_Technical_Framework

"IHE PCD Technical Framework - Volume 2 - Transactions" PDF document

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"IHE PCD Technical Framework Supplement - PCIM" PDF document

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