Use Case Title: Emergency Stroke Response and Treatment

Short Description: Chandni, a 66-year-old female, was traveling out of state to visit some friends. While at dinner, Chandni had a sudden onset of slurred speech, left sided facial droop and weakness. Her friends immediately called 9-1-1. Paramedics arrived on-scene and rapidly identified Chandni's symptoms as signs of an acute stroke. Her friends were unable to provide a medical history and her daughter was not answering phone calls. The paramedics were able to scan her identification card using their electronic patient care record (ePCR) and conducted a patient search using a repeat patient database search and found a match. They were able to retrieve Chandni's medical history, current medications and known allergies. Chandni was transported to a comprehensive stroke center. During transport, the paramedics sent a notification message to the receiving facility to pre-register Chandni and to provide an update on her condition. The paramedics acquired a 12-lead EKG, obtained a blood glucose level, established vascular access, and collected blood samples for the hospital laboratory. Upon arrival, the stroke team met Chandni and the paramedics in the Emergency Department (ED). Chandni was taken directly to the CT scanner and after reviewing the imaging and laboratory results, the completed ePCR - which has been electronically sent to the facilities electronic health record system (EHR), - and speaking with Chandni's daughter, the decision made was to treat her stroke with thrombolytics. The ED physician entered the order for IV thrombolytics in the patient's electronic medical record (EMR), and via smart-pump interoperability, the order was sent to the infusion pump to automate the pump programming. Pump auto-programming also established direct medical device association which enabled infusion status and event data to be sent directly to the EMR in real time to support clinical documentation and decision support. Upon successful administration of the IV thrombolytics, her physician reviewed the infusion data and additional infusions were ordered during her admission. Chandni's timely acute care interventions significantly improved her condition, and as her stroke symptoms resolved she was transferred for rehabilitation and ultimate discharge. Upon discharge from the hospital, her discharge summary was automatically sent directly to her PCP. Additionally, the EHR automatically sent outcome data for Chandni's hospital stay back to the Paramedic agency to support continuous quality improvement and to inform prehospital stroke patient care enhancement opportunities. The hospital's stroke coordinator was also able to link Chandni's care from the EHR and the prehospital ePCR into their stroke patient registry system to submit to local, state and national repositories.

Value: Real time data sharing from the start of patient care and seamlessly integrating prehospital patient care records and infusion pumps into Electronic Health Records (EHRs) ensures optimal stroke care and door-to-intervention intervals, promoting better patient outcomes.

Participating Vendors: ImageTrend, Epic, Baxter, CDC

Scenario	Vendor	Products	Standards
While at dinner, Chandni Patel had a sudden onset of slurred speech, left sided facial droop and weakness. Her friends immediately called 9-1-1. Paramedics arrived on-scene and rapidly identified Chandni's symptoms as	ImageTrend	HIH/Elite	HL7 ADT A01

signs of an acute stroke. Her friends were unable to provide a medical history and her daughter was not answering phone calls. The paramedics were able to scan her identification card using their electronic patient care record (ePCR) and conducted a patient search using a repeat patient database search and found a match. They were able to retrieve Chandni's medical history, current medications and known allergies. Chandni was transported to a comprehensive stroke center. During transport, the paramedics sent a notification message to the receiving facility to pre-register Chandni and to provide an update on her condition.			
The hospital receives the registration message from the EMS crew and pre-registers the patient. The Emergency Department (ED) physician enters orders prior to the arrival of the EMS unit, and internal teams are activated based on the prehospital stroke activation.	Epic	EpicCare Inpatient, Willow Inpatient & Epic Bridges	XDR
The paramedics acquired a 12-lead EKG, obtained a blood glucose level, established vascular access, and collected blood samples for the hospital laboratory. Upon arrival, the stroke team met Chandni and the paramedics at the ED door and escorted them directly to the CT scanner without delay. The paramedics transferred patient care to the stroke team and headed back to the ambulance bay to complete their ePCR. Upon completion, the record was electronically sent to the facility's electronic health record system (EHR).	ImageTrend	HIH/Elite	XDR
After completing her imaging procedures, Chandni was taken to the ED. The ED physician reviewed the imaging and laboratory results, ePCR, and	Epic	EpicCare Inpatient, Willow Inpatient & Epic Bridges	HL7, IHE, IPEC

spoke with Chandni's daughter. The decision was made to treat her stroke with IV thrombolytics.			
The ED physician entered the order for IV thrombolytics in the patient's electronic medical record (EMR), and via smart-pump interoperability, the order was sent to the infusion pump to automate the pump programming.	Baxter	Novum IQ Infusion Pump with IQ Enterprise Connectivity Suite	HL7, IHE PCD-03
Pump auto-programming also establishes direct medical device association which enables infusion status and infusion event data to be sent directly to the EMR in real time to support clinical documentation and decision support.	Baxter	Novum IQ Infusion Pump with IQ Enterprise Connectivity Suite	HL7, IHE PCD-10, PCD-01
Upon successful administration of the IV thrombolytics, her physician reviewed the infusion data and additional infusions were ordered during her admission. Chandni's timely acute care interventions significantly improved her condition, and as her stroke symptoms resolved she was transferred for rehabilitation and ultimate discharge. Upon discharge from the hospital, her discharge summary was automatically sent directly to her PCP using a HIE.	Epic	EpicCare Inpatient, Willow Inpatient & Epic Bridges	HL7, IHE, IPEC
The EHR automatically sent outcome data for Chandni's hospital stay back to the paramedic agency to support continuous quality improvement and to inform prehospital stroke patient care enhancement opportunities.	ImageTrend	HIH/Elite	HL7 ADT A03

The hospital's stroke program team reviews Chandni's case with data automatically ingested from both the EHR and ePCR into their stroke patient registry. Data from this registry ensures that the hospital is meeting national benchmarks for stroke care. This data is submitted to local, regional, state, and federal repositories for further analysis.	ImageTrend	HIH/Patient Registry	HL7 ADT CSV for CDC
The Paul Coverdell National Acute Stroke Program (Coverdell Program) funds state health departments to collect, measure, and track data to improve the quality of care for stroke patients. Having access to both hospital and prehospital data would help the registry better calculate the stroke risks and better practices for treatment. As interoperability further connects the hospital and EMS data it will continue to inform the quality metrics and improvements for stroke treatments. This can be applied across different registries that can benefit from the Interoperability with EMS information systems.	CDC	Paul Coverdell National Acute Stroke Program	N/A

Data Exchange Standards:

Vendor	Product	Category	Protocol	Interop Body	Interop Profile	Interop Actor	Interop Message	Send or Receive	Transaction Description
Epic	EpicCare	Electronic Health Record	HL7	IHE PCD	PIV	Infusion Order Programmer	PCD-03	Send	Communicate Infusion Order
			HL7	IHE PCD	DEC	Device Observation Consumer	PCD-01	Receive	Communicate PCD Data
			HL7	IHE PCD	IPEC	Device Observation Consumer	PCD-10	Send and Receive	Communicate Infusion Event Data
			HL7v2	IHE ITI	PAM	Patient Encounter Consumer	ADT-01	Receive	Receive Pre-admit notification

			C-CDA	IHE	XDR	Provide and Register Document Set-b	ITI-41	Receive	Receive ePCR
			HL7v2	IHE ITI	PAM	Patient Encounter Supplier	ADT-03	Send	Send Outcome information
ImageTrend		Electronic Patient Record	HL7v2	IHE ITI	PAM	Patient Encounter Supplier	ADT-01	Send	Send Pre-admit notification
			C-CDA	IHE	XDR	Provide and Register Document Set	ITI-41	Send	Send ePCR
			HL7v2	IHE ITI	PAM	Patient Encounter Consumer	ADT-03	Receive	Receive Outcome information
Baxter	Novum IQ Syringe Pump	Infusion System	HL7	IHE PCD	PIV	Infusion Order Customer	PCD-03	Receive	Receive Infusion Order
			HL7	IHE PCD	DEC	Device Observation Reporter	PCD-01	Send	Communicate PCD Data
			HL7	IHE PCD	IPEC	Device Observation Reporter	PCD-10	Send	Communicate Infusion Event Data

References:

IHE Patient Care Device (PCD) **https://www.ihe.net/uploadedFiles/Documents/PCD/IHE_PCD_TF_Vol1.pdf**

HL7 V 2.5.1 **http://www.hl7.org/implement/standards/product_brief.cfm?product_id=144**

Paul Coverdell National Acute Stroke Program: https://www.cdc.gov/dhdsp/programs/stroke_registry.htm