



Use Case Title: Mother and Infant Mortality Prevention

Short Description: Jada visits her OB/GYN for routine prenatal care. Based on signs and symptoms, she is diagnosed with preeclampsia and is sent to the hospital for monitoring. While at the hospital, Jada has premature rupture of membranes and develops chorioamnionitis confirmed. Labor is induced. Routine fetal monitoring is performed during labor. She has a cesarean section for failure to progress. The baby is tagged with an RFID tag to prevent abduction and mother/baby mismatch. The baby is transferred to the NICU, mother and baby culture results return positive for methicillin-resistant Staphylococcus aureus (MRSA), and the most relevant care team is sent an alarm based on the critical lab results. Both the mother and the newborn are treated for MRSA. Pathogen genomic sequencing is performed to rule out healthcare associated infection transferred in the NICU. The birth report is sent to the jurisdiction of birth, and NCHS where national birth statistics are assessed.

Value: Making the antepartum summary readily available to the hospital of birth, the hospital is able to more effectively care for the mother and newborn. While the patient is cared for in Labor and Delivery, critical data of the fetal heart rate, contraction pattern and maternal vital signs flow from the fetal monitor, are centrally displayed and stored in the Electronic Health Record. Visual alerts notify staff when the fetal heart rate falls outside of parameters. The Vital Records & Birth Defects Registries receive much needed information, which helps to determine areas of need and direct future care to develop programs targeting prevention and population health.

Scheduled times: This demonstration occurs 15 minutes past the hour.

Logos: Allscripts, CDC, Cerner, Epic, GuardRFID, Motive Medical Intelligence, Obix, Philips, Smiths Medical, Utah DOH, Voalte

Scenario	Vendor	Products	Standards
OB/GYN Jada Quinn is a 34-year-old Native American female seen for prenatal care at a clinic that uses Allscripts Touchworks. During her prenatal visit at approximately 36 weeks of gestation, based on	Allscripts Motive Medical Intelligence	TouchWorks EHR MotiveCare	ITI – 41 provide and register CCD

<p>her last menstrual period (LMP) of June 5, 2018 and a confirmatory ultrasound, Jada has an atypical presentation for preeclampsia, which is identified by MotiveCare. Using a CDS Hooks API, Touchworks calls the MotiveCare rule execution service, which processes FHIR data in real time from Jada's current visit and responds with a recommendation to the provider for preeclampsia evaluation of the patient. Based on the guidance from MotiveCare and Touchworks, the provider evaluates Jada for preeclampsia and confirms the diagnosis. The provider refers Jada to the labor and delivery ward at a nearby hospital that uses an integrated Epic system. The provider sends the finalized prenatal record, which includes the new diagnosis of preeclampsia, to the hospital.</p>			<p>via XDR CDS Hooks</p>
<p>Hospital</p> <p>Jada is admitted with preeclampsia. The care goal is to retain the pregnancy until the baby is more mature. Two days post-admission she is diagnosed with chorioamnionitis, during a prolonged ruptured membrane. She is induced, but due to failure to progress, the delivery is converted to cesarean.</p> <p>Both Mom and baby are treated for infection during labor and delivery and postpartum. The baby is transferred at birth to the NICU for IV Antibiotics and monitoring of the infection. The mother is treated postpartum for surgical site infection. Both Jada and her newborn test results show methicillin-resistant Staphylococcus aureus (MRSA), 24-48 hrs Infection control tests for possible hospital acquired infection (HAI) as there is another baby in the NICU with MRSA. The microbial test results are not conclusive. Genomic sequencing of the bacteria shows conclusively that the transmission was mother-to-child, and rules out transmission in the NICU. Jada's sample is collected at time chorioamnionitis diagnosed. Baby Jenna's sample is collected postpartum.</p> <p>The birth information is submitted to the jurisdiction vital records, leveraging the clinical information from the labor and delivery summary.</p>	<p>Epic</p>	<p>NA</p>	<p>DEC IPEC mRFD BFDR PIV ADT/ORU</p>
<p>Hospital Vitals Monitoring</p> <p>During labor, the fetal heart rate and contraction pattern, along with maternal vital signs are monitored through the OBIX system. Vital signs are taken from the fetal monitor and sent to the Epic record. Once validated by the nurse the vital signs will then flow back on to the fetal monitor strip. Alerts are provided to indicate fetal heart rate decelerations.</p>	<p>Clinical Computer Systems, Inc.</p>	<p>OBIX</p>	<p>HL7 ADT/ORU</p>

<p>Hospital Infusion</p> <p>Jada receives an infusion with the CADD Solis Infusion pump for epidural therapy. During the infusion her pump detects a downstream occlusion alarm, which is reported along with the pump's location based on the RFID tag provided by GuardRFID to the Cerner Alarm Manager, Cerner then sends the alarm notification to Voalte where it is displayed on the nurse's smart phone.</p> <p>When newborn, Jenna needs to receive an antibiotic infusion, GuardRFID's system is used to locate a Medfusion pump that is not already in use to start antibiotics for her.</p> <p>Newborn, Jenna, receives an antibiotic infusion with Medfusion Syringe Infusion pump via umbilical line to treat the effects of chorioamnionitis. The infusion parameters are automatically sent from the Epic system to the Smiths Medical infusion management system via the IHE PIV profile. The nurse confirms the parameters on the pump screen and starts the infusion.</p>	Smiths Medical	PharmGuard Infusion Management System, Medfusion Syringe Pump CADD Solis Infusion Pump	PIV, DEC, ACM, IPEC, MEMDMC, MEMLS
<p>Alarm Communicator</p> <p>The nurse who is assigned to the patient receives an alert on her Voalte smartphone, indicating an occlusion alarm and pinpointing the room where the alarm originated via location tracking from Smiths Medical. The nurse accepts the alert, then proceeds to the patient's room to silence the alarm, attend to the patient, and if necessary, communicate via group text message with the rest of the patient's care team.</p>	Voalte		PCD 04, PCD 06, WCTP
<p>Hospital Infection Control</p> <p>The infection control product receives ADT records and microbiology records (ORU), detecting possible transmission of infection through matching of time, place, and antibiotic sensitivity test results. The results of genetic sequencing of the microorganisms are used to support investigation of suspected transmission.</p> <p>The system shows that the MRSA infections of Jada and her baby are similar to infections of another mother in the Delivery area and infant in the NICU. The infections are close enough</p>	Philips	IntelliSpace Epidemiology	HL7 ADT, ORU microbiology results

<p>that the Infection Control and Prevention team needs to investigate whether transmission could have occurred within the NICU.</p> <p>The Infection Control and Prevention team orders genetic sequencing of MRSA colonies which the microbiology lab has isolated from the samples collected from all four patients.</p> <p>The system shows that Baby Girl Quinn’s case of MRSA is genetically related to her mother’s case, and not to the infection of the other infant in the NICU. This leads the Infection Control and Prevention team to conclude that there is no evidence of transmission within the NICU, and the NICU does not need to be closed.</p>			
<p>Hospital Equipment Management</p> <p>The nurse locates an available pump for the baby using the GuardRFID system, which shows pumps that are currently not in use, along with location of pump. GuardRFID system is monitoring the power supply of the pump and when the pump is unexpectedly powered down it raises an alert.</p> <p>Patient Security</p> <p>Both the mom and the baby wear a tag which prevents mother/baby mismatch. An alert is raised if the baby is taken outside of the protected perimeter without the authorization. Besides showing the alert in GuardRFID system, the same alert is sent to Cerner’s alarm manager and eventually forwarded to Voalte as alarm communicator, to be shown on nurses’ mobile devices.</p>	GuardRFID	AllGuard	MEMLS, MEMDMC, IPEC, DEC, ACM ADT
<p>Hospital Alarm Manager</p> <p>Cerner's CareAware iBus acts as a device connectivity platform to manage device observations, alerts, events, infusion data and other clinically or logistically relevant data. It will then interface this data with consumers such as Cerner's Millennium EMR or any others needing it.</p>	Cerner	CareAware iBus	PCD04, PCD06,WCTP

<p>Hospital Birth Clerk The birth information is submitted to the jurisdiction vital records, leveraging the clinical information from the labor and delivery summary.</p>	Epic		IHE BFDRE mRFD FHIR
<p>Vital Records: Electronic Birth Registration System The jurisdiction receives the birth report from the hospital, and sends the birth information to the National Center for Health Statistics (NCHS). Birth information is used for jurisdiction statistics and to issue baby Jenna's birth certificate.</p>	Utah DOH	EBRS	IHE BFDRE mRFD FHIR HL7 V2.6
<p>National Vital Statistics NCHS receives standardized birth information from the state jurisdictions. Standard coding is applied and returned to the jurisdictions. National statistic for birth defects and other conditions are analyzed to assess the health of the nation.</p>	CDC/NCHS		IHE BFDRE HL7 V2.6

HIMSS19 Interoperability Showcase Use Case

Data exchange standards:

Vendor	Product	Category	Protocol	Interop Body	Interop Profile	Interop Actor	Interop Message	Send or Receive	Transaction Description
Allscripts	TouchWorks EHR	Ambulatory EMR	HL7 CDA	HL7	CCDA	Content Creator	NA	Create	Create Continuity of Care Document
			ebXML	IHE-ITI	XDR	Document Source	ITI-41	Send	Provide and Register Document Set.b
			DSS, FHIR, CQL	HL7	Clinical Reasoning IG	Guidance artifact consumer	FHIR, CQL	Request	Request evidence-based CDS guidance.
Motive Medical Intelligence	MotiveCare Author	Clinical knowledge management	DSS, FHIR, CQL	HL7	Clinical Reasoning IG	Guidance artifact supplier,	FHIR, CQL	Send	Author, deploy, and integrate evidence-based CDS guidance.

						guidance artifact integrator			
	MotiveCare Execute	CDS tools and services	DSS, FHIR	HL7	DSS IG, CDS Hooks IG	Guidance service provider	FHIR	Send	Send CDS response to guidance service requester.
			DSS, FHIR, CQL	HL7	Clinical Reasoning IG, DSS IG, CDS Hooks IG	Guidance service provider	FHIR	Receive	Receive and process CDS guidance request.
Epic		Hospital	ebXML	IHE-ITI	XDR	Document Source	ITI-41	Receive	Provide and Register Document Set.b
			HL7 CDA	HL7	CCDA	Content Creator	NA	Consume	Consume Continuity of Care Document
			HL7 V2 IEEE 11073	IHE-PCD	DEC	DOC	PCD-01	Receive	Receive Patient Care Device Data
			HL7 V2 IEEE 11073	IHE-PCD	PIV	IOP	PCD-03 App Ack	Receive	Acknowledge of Communicate Infusion Order
			HL7 V2 IEEE 11073	IHE-PCD	IPEC	DOC	PCD-10	Receive	Communicate Infusion Event Data
			HTML Forms	IHE-QRPH	mRFD	Form Filler	QRPH-48	Retrieve	Mobile Retrieve Form (Request)
			HTML Forms	IHE-QRPH	mRFD	Form Filler	ITI-35	Submit	Submit Form
			FHIR	IHE-QRPH	mRFD	Data Responder	QRPH-52	Respond	Mobile Populate Form (Response)

			FHIR	IHE-QRPH	BFDRE	Data Responder	QRPH-46	Respond	BFDRQuery
			HL7 V2	HL7	ORU	Information Recipient	ORU-R01	Send	Receive Lab Results
			HL7 V2	HL7	ADT	Information Recipient	ADT-A01	Send	Receive Patient Admit
Clinical Computer Systems, Inc.	OBIX	Vitals Monitoring	HL7 V2 IEEE 11073	IHE-PCD	DEC	DOR	PCD-01	Send	Communicate Patient Care Device Data
			HL7 V2	HL7	ADT	Information Sender	ADT-A01	Receive	Receive patient admit notification
Smiths Medical	PharmGuard Infusion Management System, Medfusion Syringe Pump CADD Solis Infusion Pump	Infusion Pump	HL7 V2 IEEE 11073	IHE-PCD	PIV	IOC	PCD-03	Receive	Communicate Infusion Order
			HL7 V2 IEEE 11073	IHE-PCD	PIV	IOP	PCD-03 App Ack	Send	Acknowledge of Communicate Infusion Order
			HL7 V2 IEEE 11073	IHE-PCD	IPEC	DOC	PCD-10	Send	Communicate Infusion Event Data
			HL7 V2 IEEE 11073	IHE-PCD	ACM	AR	PCD-04	Send	Report Alert
			HL7 V2 IEEE 11073	IHE-PCD	MEMDM C	DMIR	PCD-15	Send	Device Management Information Reporter
			HL7 V2 IEEE 11073	IHE-PCD	MEMLS	LOR	PCD-16	Send	Location Observation Reporter
Voalte			HL7 V2	IHE-PCD	ACM	AR	PCD-04	Receive	Report Alert

		Alarm Communicator	IEEE 11073						
			WCTP	IHE-PCD	ACM	AC	PCD-06	Receive	Disseminate Alert
Philips	IntelliSpace Epidemiology	Infection Control	HL7 V2	HL7	ORU	Information Recipient	ORU-R01	Receive	Receive Lab Results
			HL7 V2	HL7	ADT	Information Recipient	ADT-01	Receive	Receive Patient Admit
GuardRFID	AllGuard	Patient Safety and Hospital Equipment Management	HL7	IHE PCD	MEMLS	Location Observation Reporter	PCD-16	Send	People or equipment location and event notifications
			HL7	IHE PCD	MEMDM C	Device Management Information Consumer	PCD-15	Receive	Equipment status notifications and alerts
			HL7	IHE PCD	IPEC	Device Observation Consumer	PCD-10	Receive	Unscheduled device alerts
			HL7	IHE PCD	DEC	Data Observation Consumer	PCD-01	Receive	Sampled and continuous device state updates
			HL7	IHE PCD	ACM	Alert Reporter	PCD-04	Send	Alert communication for human consumption
			HL7	HL7	ADT	Message Receiver	N/A	Receive	Automatic patient Admit, Discharge and Transfer
Cerner	CareAware iBus	Alarm Manager	HL7 V2 IEEE 11073	IHE-PCD	ACM	AM	PCD-04	Receive	Report Alert
			WCTP	IHE-PCD	ACM	AM	PCD-06	Receive	Disseminate Alert
Utah DOH	EBRS	Electronic Birth Registration System	HL7 V2.6	IHE-QRPH	BFDRE	Information Source	QRPH-37: JLBI	Receive	BFDRFeed: Send Jurisdiction Live Birth Information
			HL7 V2.6	IHE-QRPH	BFDRE	Information Recipient	QRPH-37: CRE	Send	BFDRFeed: Send Coded Race and Ethnicity Information
			HTML Forms	IHE-QRPH	mRFD	Form Manager	ITI-34	Retrieve	Retrieve Form

			HTML Forms	IHE-QRPH	mRFD	Form Receiver	ITI-35	Submit	Submit Form
			FHIR	IHE-QRPH	BFDRE	Data Consumer	QRPH-46	Query	BFDRQuery
CDC/NCHS	NA	National Statistics Agency	HL7 V2.6	IHE-QRPH	BFDRE	Information Recipient	QRPH-37: JLBI	Receive	BFDRFeed: Receive Jurisdiction Live Birth Information
			HL7 V2.6	IHE-QRPH	BFDRE	Information Recipient	QRPH-37: CRE	Send	BFDRFeed: Send Coded Race and Ethnicity Information