Use Case Title: 360X and Multimodality Technology to Support Care Transitions

Short Description: The 360X IHE balloted set of specifications facilitates both closed loop referrals and transitions of care. The protocols first facilitate optimization of referral and transfer management. [VP1] [HM2] A referral/transfer request is initiated, and the patient's pertinent information is pushed to the receiving caregivers and enables them to deliver optimal efficient care. The recipient will either "accept" or "decline" the referral or transfer request and the appointment/transfer is scheduled, eliminating back and forth phone calls and reducing "no show" rates. Once care has been delivered and the consultation has been completed, in the case of a referral, or the patient has been admitted, in the case of a transfer, the receiving providers then return a clinical outcome document (e.g., a consult C-CDA) of the referral/transfer to the initiating care team, thus closing the loop. 360X functionality is in general availability for several EHR vendors and is live in healthcare organizations with ongoing adoption across those EHR vendors' install base. Our patient is an 18-year-old single woman who has just delivered a healthy baby girl. She has no significant past medical history other than remote IV drug use. She has been regularly attending Narcotics Anonymous® and has been sober for the last three years. The scenario evolves as her sobriety is put in jeopardy when she experiences severe post-partum depression and self-medicates. The complex course for this patient includes transitions across the spectrum of care through a variety of acute, ambulatory and LTPAC care environments. These transitions are optimized by the support of multi-modality protocols, technology and standards. The patient's trajectory to recovery is optimized through: IHE 360X enabled care transitions, Condition of Participation (CoP) alerting, Carequality queries for additional results to support care as well as the patient performing a Carequality individual access query to collect her records. The standards used and demonstrated include C-CDA, HL7® V2, Direct, Carequality Network use cases and HL7 FHIR®.

Value Statement: Interoperability modalities support Christine's efficient care. 360X facilitates care transitions; Carequality queries optimize her ability to manage her health information and providers' receipt of her latest results. CoP ADT alerts update providers of her status.

Participating Organizations: Carequality, DirectTrust™, eClinicalWorks, Epic, Health Gorilla, Kno2, MedAllies, MEDITECH, Netsmart, NextGen, The Office of the National Coordinator for Health Information Technology (ONC)

Scenario	Vendor	Products	Standards
Introduction This demo will illustrate Interoperability Networks and how they work. You will see that clinicians using an edge system, such as an EHR, that is connected to a Network can send	MedAllies	MedAllies Direct Solutions	Direct Secure Messaging via the Direct Standard®

and receive messages even from organizations connected to disparate Networks as long as the networks are within the same Governance Framework. Networks are governed by frameworks such as The Carequality Framework which guides Carequality Implementers, and DirectTrust™ which regulates companies that have Direct Networks. Direct Networks are also called HISPs or Health Information Service Providers. Some companies, such as MedAllies, offer both Carequality and Direct Networks to their customers. Direct Networks are a push model, whereas Carequality started as a query, or pull, model, but has expanded to include some push use cases. Direct Networks can only exchange messages with other Direct Networks and Carequality enabled Networks can only exchange information with other Carequality enabled Networks. The Carequality Framework serves as the model for the coming QHINs. The primary goals of 360X are to enhance communication across care transitions improving care quality and efficiency, decreasing provider and staff workload, documentation burden, reducing or eliminating transcription errors and decreasing costs by eliminating unnecessary duplicate testing. 360X is an ONC sponsored IHE approved protocol. One of the features is assigning a unique ID that persists throughout the transition of care process until the transition loop is closed. This is for ease of patient identification throughout the process. Christine Rizzo is an 18-year-old single Caucasian female with a history of IV drug use. She has been attending Narcotics Anonymous (NA) and has been sober for over 2 years. Christine is pregnant at full term (40 weeks) and has no medical problems other than her history of IV drug use. She is admitted to hospital when she goes into labor.			
Christine goes into labor and is transported to a local hospital for delivery. Following a full-term Normal Spontaneous Vaginal Delivery (NVSD), Christine is discharged from the hospital to her home with her newborn daughter. At the time of her discharge, the MEDITECH Expanse EHR transmits discharge notifications to her PCP and OB/GYN to alert them that Christine has been discharged from the hospital.	MEDITECH	Expanse	DirectTrust™ Event Notifications via the Direct Standard®

Notifications using the DirectTrust™ framework allow a patient's care team to improve care coordination and schedule follow up care efficiently. These notifications include the facility where care was provided, the date of discharge, and information about the care team involved, as well as any recorded diagnoses. At discharge, a CDA-based document related to her hospital stay is also generated and made available for retrieval by members of Christine's care team.			Direct Secure Messaging via the Direct Standard®
Discharge Event Notifications travel to the OB and PCP leaving MEDITECH across the MedAllies Direct Network to the OB using Epic and then from MEDITECH across the MedAllies Direct Network to the NextGen Direct Network to the PCP using NextGen. This is an example of how Networks operate within a Framework. When both edge systems are on the same Direct Network, the message travels from the edge system across the single MedAllies Direct Network to the recipient edge system as in the first example. When the sending edge system uses one Direct Network and the recipient system uses a different Direct Network, the message travels across the first Direct Network to the next and is still delivered to the recipient edge system as in the second example.	MedAllies x 2 slides	MedAllies Direct Solutions	Event Notifications via the Direct Standard®
The OB's organization views the Discharge Event Notification in Epic and immediately has all the details of Christine's labor and delivery. They schedule a follow-up appointment for Christine in 2 months.	Epic		Event Notifications via the Direct Standard®
OB/GYN Office			
Christine arrives for her 2 month follow-up OB visit with Dr. Myers. Christine reports sadness, anxiety, intense fatigue, guilt for being a terrible mother. She is	Epic		

administered the Edinburgh Postnatal Depression Scale (EPDS) which is significant for severe postpartum depression. This is all documented in the Epic system.			
Dr. Myers orders a psychiatry consult for Christine. With this all of the details from Christine's OB visit are compiled into a CDA and sent alongside the EPDS in a 360X referral request sent to Netsmart, the Psychiatrist's system.	Epic		
The 360X referral request travels across the MedAllies Direct Network from Epic to Netsmart. In this example, again, both the sending EHR and the recipient EHR edge systems are using the MedAllies Direct Network, so the message travels across a single Network.	MedAllies	MedAllies Direct Solutions	Direct Secure Messaging via the Direct Standard®
The Psychiatry office accepts the referral ** the acceptance and auto notification back to referring provider is part of the same workflow described below**	Netsmart		
The 360X referral "Accept" notification travels back across the MedAllies Direct Network to the OB office. As above across the single MedAllies Network.	MedAllies	MedAllies Direct Solutions	Direct Secure Messaging via the Direct Standard®
The referral with the C-CDA and the EPDS is received from the Epic Ob/Gyn into the Psychiatrists Inbox via the MedAllies Direct Network as a Direct Secure Message. The referral is marked as accepted, and the admission workflow starts to admit Christine into the care record as a new patient. The Continuity of Care Document is used in the referral workflow and is directly reconciled into the patient care record and attached as an external document, the EPDS is also reviewed and then attached to the care record external documents. Psychiatrist completes the encounter with Christine and prescribes an antidepressant as noted in the progress note. The Progress note is finalized and triggers an automatic continuity of care document with updated medical information, back to MedAllies.	Netsmart	Careconnect Inbox myAvatar EHR	Direct Secure Messaging via the Direct Standard®

The Consult C-CDA from the Netsmart Psychiatrist is returned to the Epic OB/GYN Epic across the MedAllies Direct Network.	MedAllies	MedAllies Direct Solutions	Direct Secure Messaging via the Direct Standard®
The OB receives the Psychiatry C-CDA closing the referral loop. They can take the discrete information from the C-CDA, such as the medication, and reconcile this back into the Epic system to help drive future decisions made for Christine's care.	Epic		
Unfortunately, antidepressant medication often takes a week or more for the individual to start feeling better. In this case, After almost 2 weeks Christine is still feeling horribly depressed and turns to her old habit of IV heroin to self-medicate. Several weeks later she finds herself very sick and makes an appointment with her PCP. Once she started feeling sick she asked her sister to care for her baby until she is well again.	MedAllies	NA	NA
PCP Office			
Christine in PCP office c/o feeling unwell and noted to have a fever of 102 F and petechial hemorrhagic rash. The PCP office draws STAT labs. The CBC is significant for elevated white count with a left shift, indicating infection. Blood cultures are drawn and sent out to the MEDITECH hospital lab. It will take some time for the Blood cultures to grow. The PCP suspects endocarditis and also orders a cardiac echo to be done at the MEDITECH hospital.	NextGen		
The PCP receives The Echocardiogram report from MEDITECH which is significant for Aortic valve vegetation and one plus Aortic insufficiency. The PCP sends a 360X referral to cardiology and includes the C-CDA, CBC and the echo report. 360X appointment request travels across the NextGen Direct Network to the eClinicalDirect Network.	NextGen		

eCW Accepts the appointment and returns the accept status back to NextGen over the eCW and NextGen Direct networks. The Cardiologist reviews the CBC and echo report and schedules an appointment with Christine.	eCW	eClinicalWorks eClinicalDirect HISP	DirectTrust™ Event Notifications Direct Secure Messaging via the Direct Standard®
NextGen displays the "accept" notification and shows the scheduled appointment.	NextGen		
Cardiologist			
In advance of Christine's appointment, the Cardiologist knows that Christine had blood cultures drawn already. In order to appropriately treat Christine it is critical that the Cardiologist has this result. The Cardiology office staff queries MEDITECH for the blood culture and discharge summary. The query travels across the eCW Carequality Enabled Network to the Meditech Carequality Enabled Network.	eCW	eClinicalWorks	IHE Query based exchange
As we can see, Christine's blood culture results are now available and show a positive result for a staph infection, with the organism being susceptible to treatment with Vancomycin. The MEDITECH Expanse system makes these results available for retrieval, and responds to a query from eClinicalWorks with a CDA-based document showing the blood culture, heart echocardiogram report, and inpatient visit record, which are returned via the Carequality Framework to eClinicalWorks.	MEDITECH	Expanse Traverse	CDA Discharge Summary FHIR Document Reference

During the appointment, the Cardiologist, Dr. Spencer, pulls the echo report, the CBC, and the blood culture results onto the progress note. The Blood culture result shows that Christine is positive for Staph infection that is sensitive to Vancomycin. The echo result shows aortic valve vegetation, both results indicating a diagnosis of endocarditis. Dr Spencer reviews the results with Christine explaining to her that she has an infection of her heart that is very dangerous and requires at least 4 to 8 weeks of IV antibiotic treatment to recover. Dr. Spencer explains that she will need an indwelling port to receive the IV medication and that given her recent history of IV drug use she needs to be treated in a facility and recommends that she be admitted immediately (same day) to a skilled nursing facility. Christine agrees with this course of treatment.	eCW	eClinicalWorks eClinicalDirect HISP	DirectTrust™ Event Notifications via the Direct Standard® Direct Secure Messaging via the Direct Standard® 360X Direct Secure Messaging CCDA chart reconciliation
Dr. Spencer makes same day 360X referrals to two potential SNFs, Kno2 and Netsmart. The Cardiologist's Referral Coordinator sends a consult C-CDA to the PCP as part of the 360X Referral/Consult process. The 360X message to the PCP is sent across the eCW Direct Network to the NextGen Direct network	eCW	eClinicalWorks eClinicalDirect HISP	DirectTrust™ Event Notifications via the Direct Standard® Direct Secure Messaging via the Direct Standard® 360X Direct Secure Messaging CCDA chart reconciliation
The NextGen PCP Receives the consult C-CDA, reconciles the chart and closes the 360X referral loop. The C-CDA has an assessment and plan indicating that due to the urgency to begin immediately treating Christine, the Cardiologist made the 360X referrals to the SNFs rather than risking a time lapse which would threaten Christine's recovery. This closes the 360X loop between PCP and Cardiologist.	NextGen		

As we continue Christine's healthcare journey, she has been referred for treatment at a skilled nursing facility to support observation of the administration of IV antibiotics in light of her history of IV drug use. The Kno2 enabled facility, Good Health Center, is one of the skilled nursing facilities that receives a referral request. The request traveled to the Kno2 Communication API where the skilled nursing facility is able to accept the transfer in their electronic health record. Kno2 supports Skilled Nursing Facilities that lack any form of electronic health records. Kno2 also enables facilities with EHRs that lack integrated referral solutions to still participate in the 360x referral loop via the Kno2 Communication API and Kno2 application. Here in the Kno2 application, you can see the referral received by the Good Health Center skilled nursing facility. As the Kno2 Intake Coordinator, I will click Accept for this referral. The Kno2 Communication API transmits the "Accept" notification back to the originating provider system (eCW). Sending a response notification from Kno2 ensures continuity of care is maintained by informing the referring provider the referral has been received and acknowledged.	Kno2	Kno2 Communication API	360X Direct Secure Messaging
Netsmart accepts the transfer.	Netsmart		
A referral request travels across the eClinicalDirect Network to the MedAllies Direct Network to Netsmart Netsmart accepts the transfer. The "Accept" notification sent from Netsmart travels across the MedAllies Direct Network to the eClinicalDirect Network to eCW	MedAllies x 2 slides	MedAllies Direct Solutions	Event Notifications via the Direct Standard® Direct Secure Messaging via the Direct Standard®

Christine selects the Netsmart SNF based on proximity to her sister who is caring for her baby. The Cardiologist's referral coordinator sends the discontinue notification to Kno2 and sends the confirmation notification to Netsmart.	eCW	eClinicalWorks eClinicalDirect HISP	DirectTrust™ Event Notifications Direct Secure Messaging via the Direct StandardⓇ 360X Direct Secure Messaging
Christine has selected the SNF supported by the Netsmart system. Her provider sends a "Discontinue" notification to the SNF Good Health Center that the Kno2 Communication API is supporting. The "Discontinue" notification closes the loop with this particular SNF. This use of the 360x workflow creates efficiency in the broader system by eliminating the need for follow-ups from multiple systems about whether or not Christine should have shown up for admission at the SNF. The "Discontinue" notification travels into the Kno2 Application where it is received and acknowledged by the SNF.	Kno2	Kno2 Communication API	360x Direct Secure Messaging
The Confirmation Notification travels from eCW across the eCW Direct Network to the MedAllies Direct Network and to the Netsmart SNF where they receive the Confirmation Notification	MedAllies		
The 360X Referral is received by the Netsmart SNF via MedAllies Direct Network with the Continuity of Care document attached. Skilled Nursing Facility intake staff accepts patient referral, sending automatic notification back to eCW, and manages admission workflow directly from secure message. The Patient Continuity of Care document is reconciled to the care record with creation of a new patient record. The automatic accept notification is then generated with the option to free text additional info, this completes the referral and admission into the skilled nursing facility.	Netsmart	Careconnect Inbox myUnity EHR	Direct Secure Messaging via the Direct StandardⓇ

Christine Transferred to SNF			
A few weeks later, when Christine starts to feel better, she uses her Health Gorilla App to perform an Individual Access Services (IAS) Broadcast patient query for copies of her records so that she can review and understand her recent health journey and utilize her records in the future to support her ongoing care. MEDITECH, Netsmart, eCW, and NextGen will respond to the patient query based on IAL2 patient authentication token provided by CLEAR's healthcare CSP service. Epic will respond based on a SMART-on-FHIR query with OAUTH2 request utilizing the patient's MyChart portal ID/PW. Copies of medical record encounter documentation will be displayed.	Health Gorilla	My360	IAL2 OAUTH2

Data Exchange Standards:

Vendor	Product	Category	Protocol	Interop Body	Interop Profile	Interop Actor	Interop Message	Send or Receive	Transaction Description
NextGen	NGE EHR	EHR	Direct	IHE	360X	Referral Initiator	360X Initiate	Send	*360X referral initiation*
			Direct	IHE	360X	Referral Recipient	360X Initiate	Receive	*360X referral close the loop*
MEDITECH	Expanse Traverse	EHR	Direct	DirectTrust	Event Notifications via Direct	Acute Care Hospital	Discharge Notification	Send	*DirectTrust™ Discharge Notification to PCP and other care team members*
			FHIR	HL7	Document Reference	Acute Care Hospital	CDA Document	Send	*CCD Document in response to queries*
eClinicalWorks	eCW EHR eCD HISP	EHR HISP	Direct	DirectTrust	360X/Event Notifications via Direct	Referral Recipient /Initiator	360X Recipient /Initiator	Send/ Receive	*360X referral initiator/recipient*
			Query Based Exchange	IHE	ITI-38/ITI-55	Query Initiator	Document Exchange	Receive	*CDA/Non-CDA document exchange*

Epic	EpicCare	EHR	Direct	DirectTrust	Event Notifications via Direct	OB Office	Discharge Notification	Receive	*DirectTrust™ Discharge Notification to PCP and other care team members*
			Direct	DirectTrust	360X/Event Notifications via Direct	Referral Recipient	360X Recipient/ Initiator	Send/ Receive	*360X referral recipient*
Netsmart	MyAvatar MyUnity CC inbox	EHR	Direct	DirectTrust HL7	360X	Referral Recipient	C-CDA HL7 accept notification	Receive /Send	*360X received referral accept notification out*
MedAllies	Direct Solutions	HISP	SOAP	IHE	XDR/XDM	Transport	XD/XDR	Send/ Receive	*Direct Secure Messages sent or received to a connected Edge System*
			Direct	DirectTrust	SMIME/ SMTP	Transport	Direct	Send/ Receive	*Direct Secure Messages sent or received to a connected Edge System*
Kno2	Kno2	Network	Direct	DirectTrust	360X/Event Notifications via Direct	Referral Recipient	Direct Message Referral Recipient	Send/ Receive	*360X referral close the loop*

References: