

## ABSTRACT

In 2014, Oregon EHDl initiated Phase 2 of a pilot project to receive live newborn hearing screening results electronically from a partner hospital's electronic health records system (EHRs).

## BACKGROUND

EHDl has been participating in national efforts towards data standards, interoperability and exchange since 2011. Our goal is to reduce duplicative data entry for our hospital screening partners and improve the timeliness, completeness and quality of the newborn hearing screening data received.

## METHODS

**Today:** Hospital staff screen the baby, enter results into their EHR, and then enter results into birth registry.

**Future:** Epic EHR sends hearing screening and discharge data to OZ, OZ creates HPoC CDA from EHR data and sends to OHA, OHA receives the HPoC and consumes the content into the Oregon EHDl-IS.

### The Change Process:

#### • Project Plan.

OHSU, OZ Systems and Oregon EHDl collaborated to create the project plan and are now carrying out their respective roles. Additional help comes from Public Health Informatics Institute (PHII) whose staff serve as project managers, Lantana staff who assure conformance with the IHE profile, and CDC stakeholders who provide direction and sponsorship.

#### • Data Mapping.

EHDl-IS data elements and value sets were mapped to the Integrating the Healthcare Enterprise (IHE) Hearing Plan of Care (HPoC) Profile, OHSU Epic data elements, and OHSU HL7 data elements.

#### • Data Flow.

In Phase 2, OHSU's EHR (Epic) sends hearing screening results to OZ Systems in an HL7 version 2.6 message format. OZ Systems collects the screening results for an infant and repackages them into a standard HPoC document based on decision support rules used to determine the final screening outcome. Oregon EHDl-IS then receives the data into the newborn hearing screening registry.

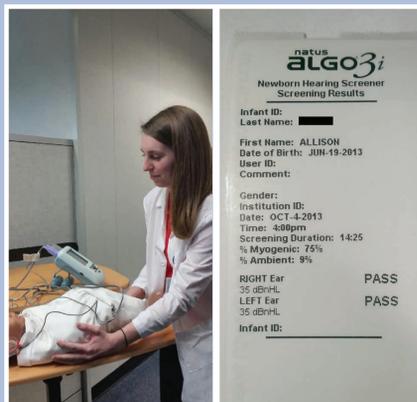
#### • Data Validation.

Test scenarios were developed to compare data received via HIE with the current method of receiving the data from the Oregon Vital Events Registration System (OVERS). OHSU staff will continue to enter newborn hearing screening results into OVERS throughout the pilot.

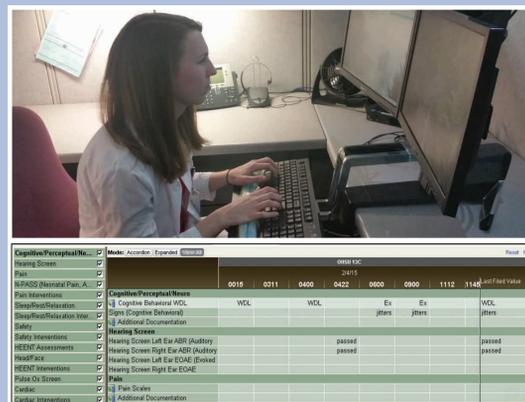
## DISCUSSION

Demonstrating a sustainable methodology for EHDl programs to obtain newborn hearing screening data from EHRs could encourage other state EHDl programs to initiate HIE programs of their own. Newborn hearing screening is a Stage 2 Meaningful Use quality measure so hospitals have financial incentives to participate in HIE with EHDl programs. Lessons learned from the Phase 2 pilot will be shared for the benefit of other states engaging in HIE with hospital screening partners.

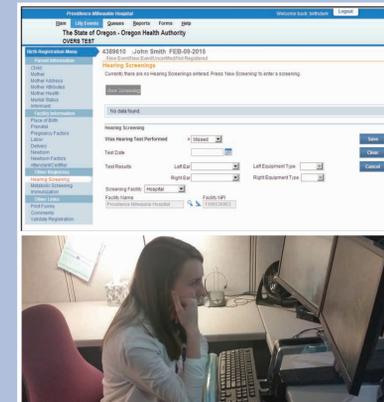
## Hospital staff screen the baby with AABR or OAE device



## Hospital staff enter hearing screening data into the EHR Newborn Assessment Flowsheet

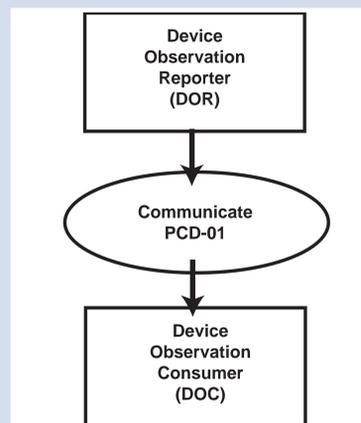


## Hospital staff enter hearing screening data redundantly into birth registry



Today

## Epic EHR sends hearing screening and discharge data to OZ

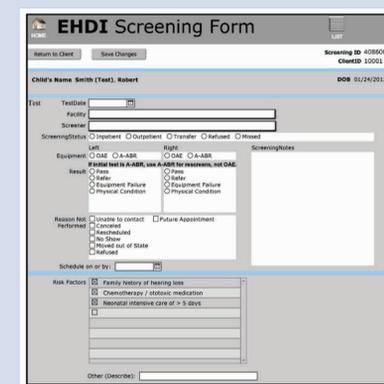


## OZ creates the HPoC CDA document from the EHR data and sends to OHA

<b>Patient</b>	Baby Johnson
<b>Date of Birth</b>	July 11, 2014, 04:00:00-0900
<b>Sex</b>	Female
<b>Race</b>	White
<b>Ethnicity</b>	Hispanic or Latino
<b>Contact Info</b>	Primary Home: 2345 Desert Sage Road Bend, OR 97701 Tel: +1(541)-385-1234
<b>Patient IDs</b>	767767 2.16.840.1.113883.3.969

Screening Date	Screening Type	Method	Target Site	Result	Reason
7/11/2014 1:20PM	Neonatal hearing test LEFT (procedure)	OAE	Left Ear	Pass	
Date of Birth	Neonatal hearing test RIGHT (procedure)	OAE	Right Ear	Pass	

## OHA receives the HPoC and consumes content into EHDl-IS



Future

## Partners collaborate to identify and address steps in the process to move hearing screening data from EHR to EHDl-IS

Steps	Activity	OHSU	OZ	OHA
Planning	Charter	X	X	X
	Contracts	X	X	X
	Project Plan	X	X	X
	Timeline	X	X	X
Partners	Business Associate Agreements	X	X	X
	Security agreement	X	X	X
	IT Review	X	X	X
	Legal review	X	X	X
Content & Process Evaluation	EHR module license fee	X	X	X
	Process change review	X	X	X
	User story	X	X	X
	HPoC to HPoC review	X	X	X
Device Observation Reporter	Data elements mapping to HPoC	X	X	X
	Process change review	X	X	X
	EHDl-IS update to consume HPoC	X	X	X
	Connectivity without encryption	X	X	X
Data Consumer	Connectivity with encryption	X	X	X
	QA on ADT data	X	X	X
	QA on results data	X	X	X
	EHDl-PCD-01 message review	X	X	X
Testing	Secure channel set up	X	X	X
	Secure channel test message receipt	X	X	X
	HPoC document created	X	X	X
	HPoC document transmitted	X	X	X
Production	EHDl-IS content consumption strategy	X	X	X
	Data element representation review	X	X	X
	Data element strategy	X	X	X
	Validation of EHDl-IS set up	X	X	X

## EHDl Data Manager maps EHDl-IS data to HPoC data

EHDl-IS FIELD	HPoC FIELD	OHSU FIELD	OHSU EPIC ITEM ID	OHSU HL7 FIELD
LEFT_EAR_RESULT	RESULT/INTERPRETATION	Hearing Screen Result- Left Ear -AABR Test-Passed -AABR Test Failed -AABR Test Referred -AABR Test Other -EOAE Test-Passed -EOAE Test Failed? Refused? -EOAE Test Referred -EOAE Test Other ? Physical condition- can't test	PSD:1000 = FLO: 30501366 and FLO: 30501368	TBD OBX probably
LEFT_EQUIPMENT TYPE	TEST TYPE	See results OAE or ABR	Hardcoded?	TBD OBR/OBX Probably
RIGHT_EAR_RESULT	RESULTS/INTERPRETATION	Hearing Screen Result- Right Ear -AABR Test-Passed -AABR Test Failed -AABR Test Referred -AABR Test Other -EOAE Test-Passed -EOAE Test Failed -EOAE Test Referred -EOAE Test Other	PSD:1000 = FLO: 30501367 and FLO: 30501369	TBD OBX probably

## Partner hospital Informatician maps data to Epic EHR and HL7

## EHDl Data Manager validates the HPoC content by comparing to OVERS birth registry

OVERS Birth Registry	EPIC EHR
Medical ID: 193384	Medical ID: 193384
Child's Last Name: Smith	Child's Last Name: Smith
Child's First Name: John	Child's First Name: John
Child's Middle Name: [Blank]	Child's Middle Name: [Blank]
Date of Birth: 02/09/2015	Date of Birth: 02/09/2015
Gender: M	Gender: M
Mother First Name: Mary	Mother First Name: Mary
Mother Last Name: Smith	Mother Last Name: Smith
Mother Maiden Name: Williams	Mother Maiden Name: Williams
Address: 123 Screening Lane	Address: 123 Screening Lane
City: Portland	City: Portland
State: OR	State: OR
Zip: 97232	Zip: 97232
Phone: 503-123-1234	Phone: 503-123-1234
Test Date: 12/8/2014	Test Date: 12/8/2014
L Result: Pass	L Result: Pass
R Result: Pass	R Result: Pass
L Equipment: A.ABR	L Equipment: A.ABR
R Equipment: A.ABR	R Equipment: A.ABR