Informatics Project: Electronic Health Information Exchange for Diagnostic Audiology

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Background:

In 2016, Oregon EHDI implemented health information exchange (HIE) using Health Level Seven (HL7) version 2.6 standards. With the success of the newborn hearing screening HIE, Oregon EHDI saw an opportunity to mirror the same process and use the HL7 v2.6 ORU^R01 message type for diagnostic audiology reporting. In 2016-2017, the Oregon EHDI Data Quality Coordinator participated in a year-long fellowship program with the Informatics - Training In Place Program (I-TIPP) through Strengthening Health Systems through Interprofessional Education (SHINE) and Council of State and Territorial Epidemiologist (CSTE). The fellowship program required each participant to submit an informatics-focused project. Oregon's fellow proposed work on interoperability for electronic health information exchange of diagnostic audiology data. The project focused on three key areas: 1) identification of data standards for diagnostic audiology services, 2) assessment of partners' EHRs ability to capture and extract diagnostic audiology data, and 3) identification of gaps and challenges with implementation.

Methods

- Interviewed sample of audiologists to gather information on clinical workflow processes and diagnostic reporting
- Evaluated ability of EHRs to capture diagnostic audiology documentation
- Gathered diagnostic audiology reporting requirements from Center for Disease Control (CDC) Hearing Screening Follow-up Survey (HSFS)
- Mapped diagnostic data elements and value sets from CDC-HSFS to EHDI-IS, National Standards and fields in partners' EHRs
- Identified needed data elements and/or value sets absent from National Standards, which included LOINC, SNOMED-CT and PHIN-VADS
- Aligned diagnostic audiology data elements to newborn hearing screening HL7 v2.6 ORU^R01 message format and requirements

Findings (F)/Recommendations (R)

1) Data standards for diagnostic audiology services

(F) Audiologists have expressed concern about the oversimplification of severity of loss reporting to the EHDI program, and requested the ability for diagnostic electronic data exchange to convey detailed testing results that the EHDI program can use to summarize hearing loss into the ASHA categories. However, standard codes for hearing levels (dB) at the various testing frequencies do not currently exist.

(R) State EHDI programs must determine whether to move forward with summary result reporting, or whether it is viable to advance detailed reporting of hearing levels at the testing frequencies. If the latter, needed codes must be submitted to LOINC and SNOMED-CT.

(F) The HL7 v2.6 ORU^R01 message type, while appropriate for the reporting of hearing screening results, may not be the optimal message type for diagnostic results.

(R) Other message types should be considered for appropriateness and fit. Depending on the message type, additional data elements and value sets may be needed. If so, missing data elements should be submitted to LOINC and SNOMED-CT.

### 2) EHR readiness to capture and extract diagnostic audiology data

(F) Each partner's documentation of diagnostic audiology data within the EHR varies. Data are documented in multiple screens/pages within the EHR, such as progress notes, customized flowsheets, and the problem list.

(R) EHR vendors have indicated willingness to develop a standardized solutions for data collection. However, it is unclear when this solution will be available and at what cost to individual facilities. In the absence of a vendor solution, EHDI may collaborate with each partner's information technology specialist to create a standard data collection screen for easy extraction and mapping.

(F) Electronic health record support varied among the partner sites. Two sites had EHR experts embedded within the organization, while the other had general IT support.

(R) Share knowledge and support between organizations with same EHR systems.

3) Gaps and challenges with implementation

(F) EHRs require a special interface to extract and conform the data into a HL7 v2.6 ORU^R01 message type.

(R) CMS provides incentives to eligible providers and hospitals for meaningful use. This incentive may offset and justify implementation costs.

(F) Audiologists are currently reporting diagnostic data into the EHDI-IS, therefore sending diagnostic data may not be a priority.

(R) Facilities need a strong champion to push for electronic health information exchange.

Next Steps

National/expert review and recommendations are needed to determine best message type, confirm data elements needed, and submit missing data elements and values for standardized codes.

EHRs can provide systematic, standardized solutions for data capture, eliminating the need for individual facility solutions. However, standardized solutions are at the mercy of market demand and other competing development priorities. Timelines for release may be long. It is hard to know whether EHDI programs and partners can best advance interoperability and HIE by waiting for vendor solutions or moving forward with facility specific solutions.
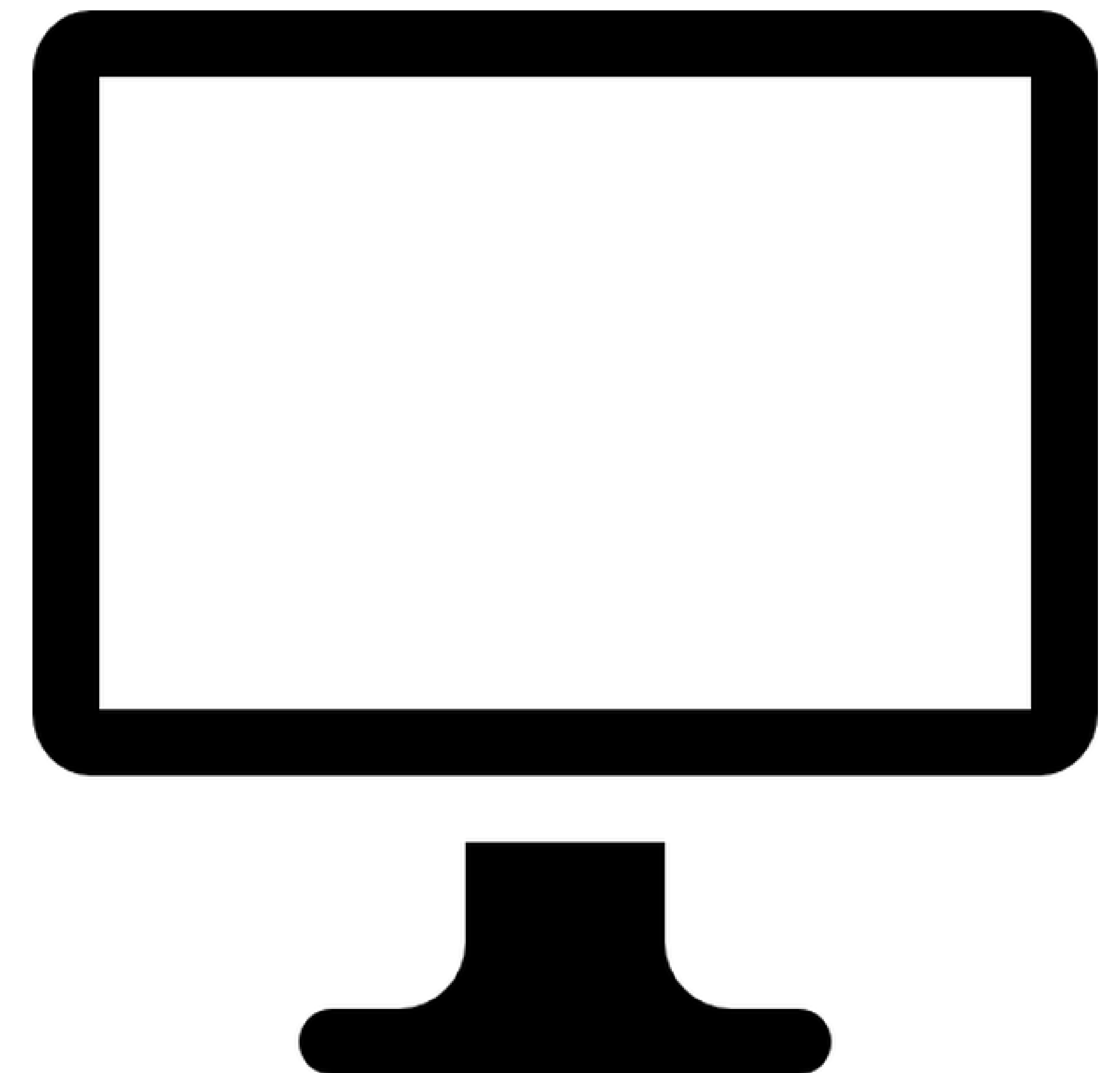
SLIDE ONE: Consumable newborn hearing screening status

SLIDE TWO: Sample case report for hearing loss
Red: Not sure if these standards can be used hearing examination/assessment. Unable to identify any other codes
Green: Standards exisits for high level reporting that meets CDC HSFS

SLIDE THREE: Sample report with details from original form
Red: Not sure if these standards can be used hearing examination/assessment. Unable to identify any other codes
Green: Standards exists for high level reporting that meets CDC HSFS
Blue: Standards for frequency (Hz) testing, but it is an incomplete list
Yellow: No standards for decibel (dB)