Michigan Pulse Oximetry Screening for Critical Congenital Heart Disease

Michigan Options for Data Reporting and HL7 Messaging

CCHD Stakeholders Meeting: State Implementation
February 27, 2014

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HRSA Demonstration Program, 2012-2015
Michigan Goals

1. Increase the number of Michigan newborns screened for CCHD using a validated screening protocol

2. Develop state infrastructure for collection of CCHD screening data through electronic health information exchange to enable effective public health follow-up, quality assurance and evaluation

Image courtesy of Masimo

Data Elements Identified by CCHD Advisory Committee

Pulse Ox Screening

- Demographics
- Dates and times
- Foot sat
- Right hand sat
- Difference
- Outcome
- Perfusion index (if measured)
- Reason screening not done

Clinical Exam

- Date and time
- Performed by (nurse, physician, other)
- Findings (normal, normal translational circulation, abnormal cardiac/circulatory, abnormal other)

Echo

- Date, location, name of physician
- Finding (normal, limited/inclusive, abnormal suspect CHD)
- Diagnosis

Case Report

- Antenatal ultrasound performed (yes, no)
- How CCHD was first suspected, confirmed
- Surgery date, hospital
- Catheterization (yes, no)

Pulse Ox Screening Results: Data Submission Options for Birthing Hospitals

- Individual baby results entered and submitted through web-based module (PerkinElmer eReports)

- Batch file extracted from EHR system and uploaded to secure FTP site

- Direct HL7 messaging via Michigan Health Information Network (MiHIN)
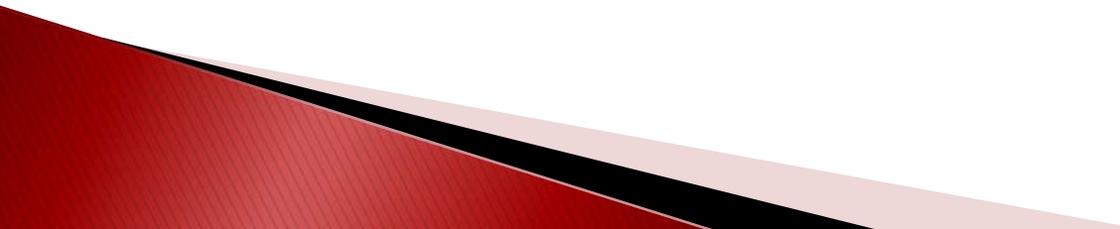
1. eReports

▸ Reporting completed through eReports web-based module
  - Accessed via MI Single-sign-on application
  - Customized for pulse oximetry
  - Real-time reporting
  - Data entry by clerks, nurses, or other clinical staff
  - Data accessible to MDCH follow-up staff

State of Michigan Single Sign On

User ID [   ]

Password [   ]

[Login]

* If you do not have a User ID, please click [Register]

eReports Data Entry Screen

2. Data Submission to FTP (file transfer protocol) site through Data Exchange Gateway (DEG)

- Hospital prepares batch file with required data elements extracted from EHR
  - Delimited text file (txt) or comma separated values text file (csv)
  - Alternatively, may hand enter data into Excel spreadsheet
- Obtain appropriate user authorizations
- Upload to secure state FTP site
- File downloaded to eReports pulse oximetry holding table, then merged with NBS blood spot card information
- Frequency of submission: daily to weekly

3. Transmission of pulse oximetry screening results by HL7 messaging

- Hospital builds CCHD reporting fields into EHR
- Messages sent nearly instantaneously from hospital EHR directly to MDCH using appropriate LOINC codes
- Data routed from Data Hub to PerkinElmer eReports database

MiHIN Basic Data Flow
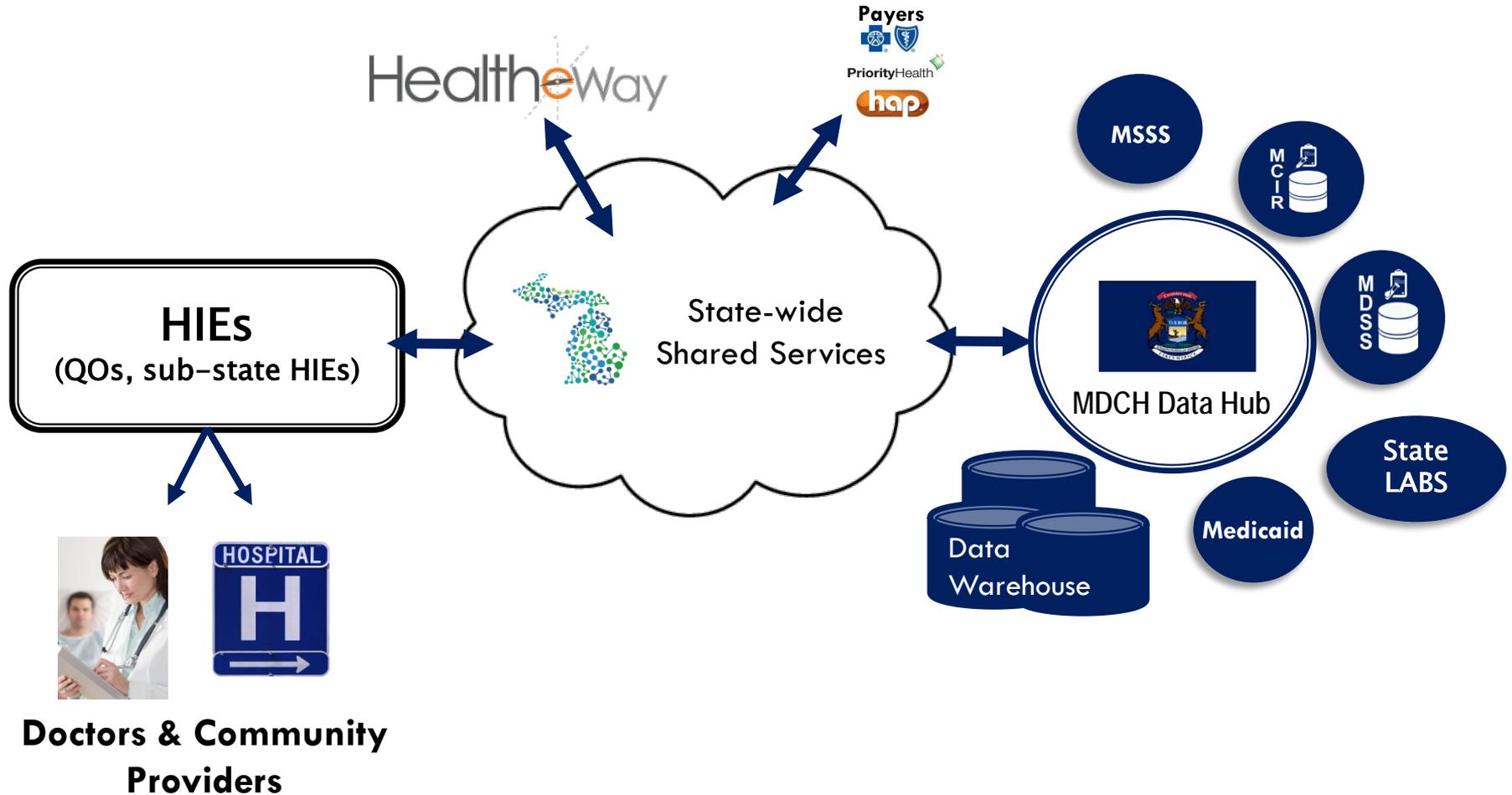
CCHD Reporting

HIE
(QOs, sub-state HIEs)

MiHIN
Shared Services

CCHD App

MDCH Data Hub
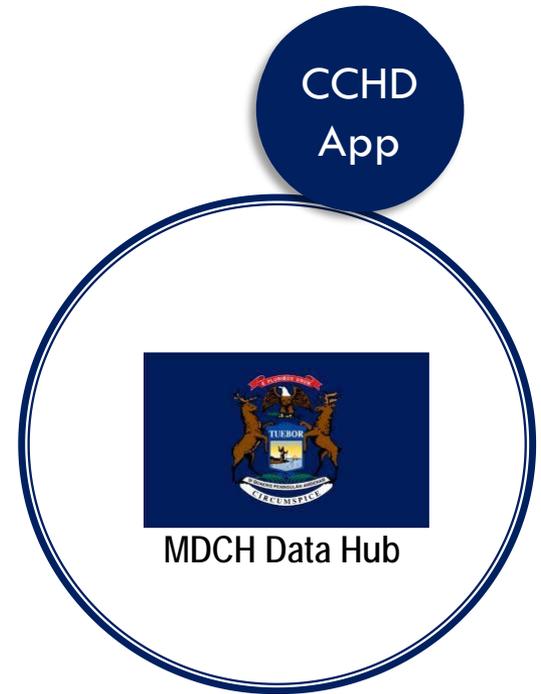
Developing Infrastructure for Receipt of HL7 Pulse Oximetry Screening Messages

- MDCH Office of Medicaid Health Information Technology and Department of Technology, Management and Budget (DTMB)
  - Medicaid Meaningful Use funding
- Project Charter
  - 1st step in state project management methodology to initiate activities
- Requirements Gathering
  - Business, Functional, Technical

High Level Description

- "This project includes the interface to receive electronic reporting from health care providers to the newborn screening CCHD application as well as the related technical connections between the MDCH Data Hub and newborn screening CCHD application. The project will also include the development of the newborn screening CCHD HL7 message format and the related Implementation Guide. An external vendor will develop the message validator which will be used to test the HL7 message."

Developing Infrastructure for Receipt of HL7 Pulse Oximetry Screening Messages

- Creation of <u>Implementation Guide</u> based on national draft HL7 reference guide
  - HL7 version 2.5.1 or 2.6
  - Identification of relevant LOINC codes and CCHD message format
- Creation of mapping specs for Data Hub
  - Receive messages from hospitals and parse to CCHD database
  - Handle errors and log for trouble shooting
- Hospital pilot testing
  - Onboarding estimated to take ~1 week
  - Work with 1-2 hospitals per week

HL7 Version 2.6 Implementation Guide: Newborn Screening for Critical Congenital Heart Disease (CCHD) Using Pulse Oximetry

Version 0.8.2

DRAFT – NOT for Implementation or Use

Table of Contents

Michigan Preliminary Optionality Table (partial)

LOINC #	LOINC Name	Optionality
73700-7	CCHD Newborn Screening Interpretation	R
57716-3	Blood Spot Fiber Paper Card ID	R
73699-1	Number of Prior CCHD Screens	R
62324-9	Post Discharge provider name	R
62328-0	Post Discharge provider telephone number	R
62328-0	Post Discharge provider telephone (FAX) number	R
73698-3	Reason CCHD Oxygen Saturation Screening Not Performed	C
73696-7	Difference Between Preductal and Postductal Oxygen Saturation	C
59407-7	Oxygen Saturation in Blood Preductal by Pulse Oximetry	C
73698-3	Reason CCHD Oxygen Saturation Screening Not Performed	C
73696-7	Difference Between Preductal and Postductal Oxygen Saturation	C
59407-7	Oxygen Saturation in Blood Preductal by Pulse Oximetry	C
73798-1	Perfusion Index Blood Preductal Pulse Oximetry	C
57714-8	Estimated Gestational Age	RE

Required, **RE** required if known, **O**ptional,
Conditionally required, **CE** conditionally required if known

Hospital Training and Technical Assistance

- Notification of mandatory screening date and need to begin preparing for data submission
- Mini-grants
- Instruction sheet for hospitals detailing data submission options; file formats, etc.

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

JAMES K. HAVEMAN
DIRECTOR

November 20, 2013

Dear Hospital Administrator:

The Department of Community Health administers the statewide Newborn Screening Program under authority of the Michigan Public Health Code which allows for addition of new conditions after approval by the Legislature. I am writing to inform you that **critical congenital heart disease** was recently approved for addition to the mandatory screening panel as of April 1, 2014.

Critical congenital heart disease requires surgery or catheter intervention the first year of life. It represents one of the most significant causes of infant death in the United States. The objectiv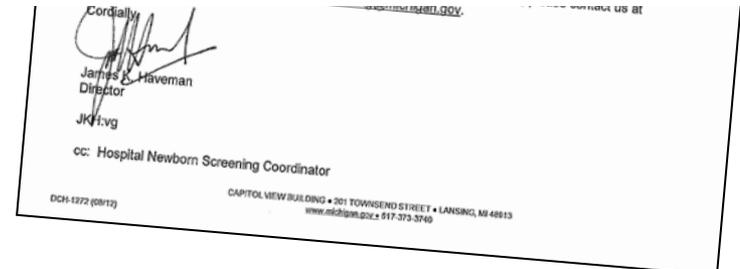e of newborn screening by pulse oximetry is diagnosis and intervention before the onset of symptoms. Late detection puts a baby at risk for serious complications, even death, within the first day or weeks of life. We estimate that 85-104 Michigan babies will be diagnosed each year.

Most Michigan birthing hospitals have already initiated routine pulse oximetry screening for newborns, or plan to begin soon. We urge all hospitals to follow the standard screening algorithm developed by our Newborn Screening Program together with experts in pediatric cardiology, neonatology, and mother nursing. Infants with a "failed" pulse oximetry screen will need evaluation, and possible referral

Beginning no later than April 1, 2014, every hospital will be required to report each infant's pulse oximetry screening results to the state Newborn Screening Program. **It is important for hospitals to begin preparation now for data submission.** Multiple options are being developed including a web-based portal through the State of Michigan's Single Sign On and a secure file transfer protocol for those wishing to submit a data file. We are also working to establish reporting of pulse oximetry data through electronic health information exchange. The Newborn Screening Program will use the data collected for quality assurance, evaluation and monitoring.

Cordially,

James K. Haveman
Director

JKH:vg

cc: Hospital Newborn Screening Coordinator

DCH-1272 (08/12)

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Hospital Training and Technical Assistance

- Follow-up emails and contact by nurse educator
  - Tracking Log for method selected and EHR vendor
- Technical assistance for hospital IT staff
- Conference call series

Michigan Department of Community Health
Newborn Screening Program

CCHD Screening Data Reporting Requirements

Technical Assistance
Conference Calls

1-877-336-1829
Access Code: 1916507

Wednesday February 12, 2014 3:00-4:30 pm and
Friday February 14, 2014 10:30 am -12:00 pm- General Information/eReports
- *This call will address general questions about data submission of CCHD screening results as well as some more information for those hospitals choosing to submit data directly into the Michigan eReports module.*

Friday February 21, 2014 3:00-4:30 pm HL7 Messaging
- *This call is for those hospitals that may be interested in submitting CCHD screening data via HL7 messaging*

Monday February 24, 2014 10:30 am- 12:00 pm Direct Data Transfer
- *This call is for hospitals who plan to submit data electronically via upload to the Michigan FTP site*

For questions about required data reporting please contact
Karen Andruszewski - andruszewskik@michigan.gov

For information about CCHD Screening please visit our website www.michigan.gov/cchd

Summary of Michigan data submission methods

Method	Pro	Con
eReports	✓ Lowest upfront cost for hospital ✓ Does not require modification to hospital EHR ✓ Provides CCHD follow-up database linked with existing NBS system	✓ Staff time to log in and submit individual baby data time consuming ✓ Moderate development cost at state level
FTP	✓ Does not require individual baby data entry ✓ Semi/Automatic transmission of data file on multiple babies ✓ Minimal cost at state level	✓ Upfront cost to modify hospital EHR and/or develop batch file report ✓ Hospitals may choose to only submit once a week
HL7	✓ Nearly instantaneous transmission of individual baby data upon entry into EHR ✓ No additional hospital staff time ✓ Future transmission of NBS blood spot card data fields	✓ Upfront cost to modify hospital EHR and/or establish HL7 messaging ✓ Must have access to MiHIN through substate HIE ✓ Not available by April 1st; retroactive data submission ✓ Substantial development cost at state level

Challenges

- Data element fields developed before NICU screening algorithm complete
- Missing LOINC codes to describe referrals in cases where screening protocol is abbreviated
  - submitted request for additional codes
- Hospital test files not meeting format for FTP submission
- Delays in overall timeline to prepare for hospital data submission (but HL7 option moving quickly!!)

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