DEPARTMENT OF HEALTH

MDH Interoperability Webinar Series: NBS Blood Spot Electronic Orders/Results Use Case

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February 3, 2022

MDH Overall Data Strategy

Join any or all MDH Interoperability Webinars in this Series:

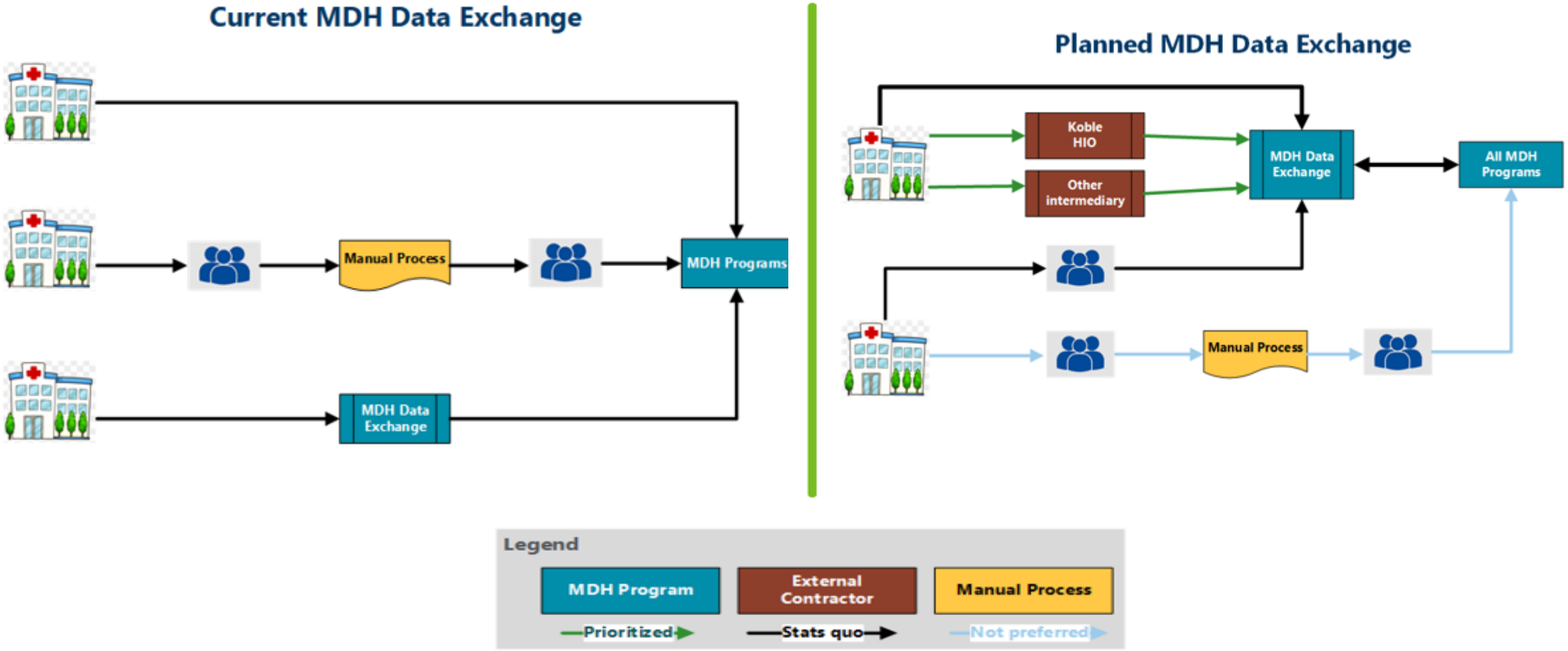
Date	Public Health Reporting Use Case
February 3	Laboratory Orders/Results – Newborn Screening Blood Spot (NBS)

Webinar materials: DSI website (https://www.health.state.mn.us/data/interoperability/webinar.html)

Webinar providing information towards:

- ✓ Reducing your reporting administrative burden
- ✓ Meeting the CMS public health reporting requirements
- ✓ Improving data quality so information shared with MDH can better address future emerging threats and address population health issues
- ✓ Learning how you, your organization, and your patients benefit from improved public health reporting

MDH Interoperability Strategy: Overall



MDH Request of External Partners

- ✓ **Schedule meeting with DSI** to discuss more details related to health system needs
  - Determine your organizations' public health reporting priorities for implementation and share with DSI (checklist)
  - Discuss any barriers or opportunities for electronic implementation with MDH
- Consider Participation Agreement with Koble (https://3b54d489-fb07-4eda-b01d-8169cc695bc4.filesusr.com/ugd/64a972_dddba6a5436949e5952abe8094b9c778.pdf)
- Plan and coordinate MDH public health reporting improvements through DSI and provide feedback to processes

Newborn Screening Program

What is Newborn Screening?

Newborn screening tests look for developmental, genetic, and metabolic disorders in newborn babies

If left untreated, these disorders can lead to illness, physical disability, developmental delay, or death

By identifying these disorders early, however, interventions, medications, or changes in diet can help prevent most health problems caused by the disorders on the newborn screening panel

Newborn Screening in Minnesota began in 1964

- Birth rate in MN is ~65,000
- MDH screens for more than 60 inherited and congenital disorders
- Three different screening methods
  - Blood spot screening
  - Critical congenital heart screening (CCHD)
  - Hearing screening

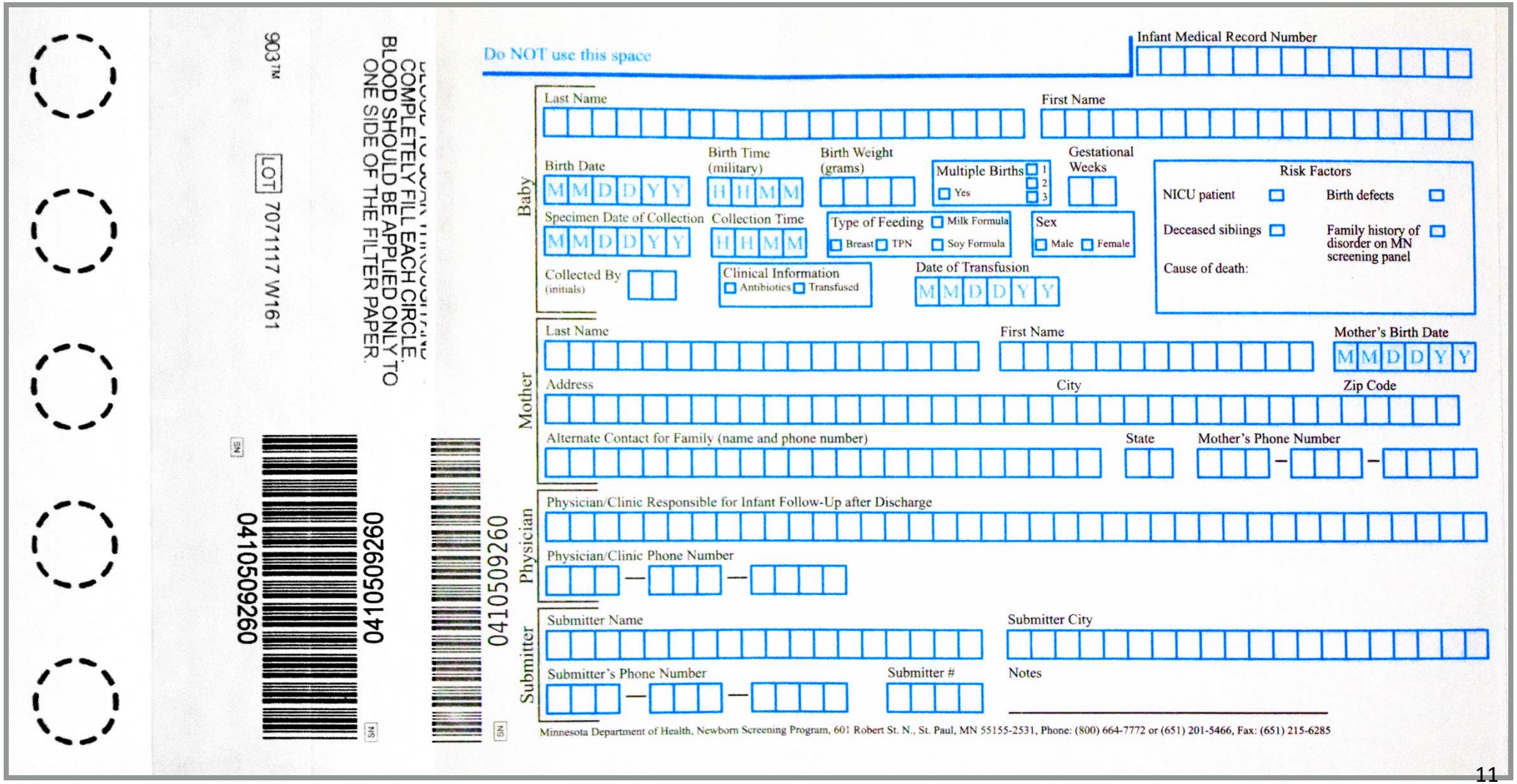
Blood Spot Screening

01 When a newborn is between 24 and 48 hours old, a health professional will take a few drops of blood from the newborn's heel

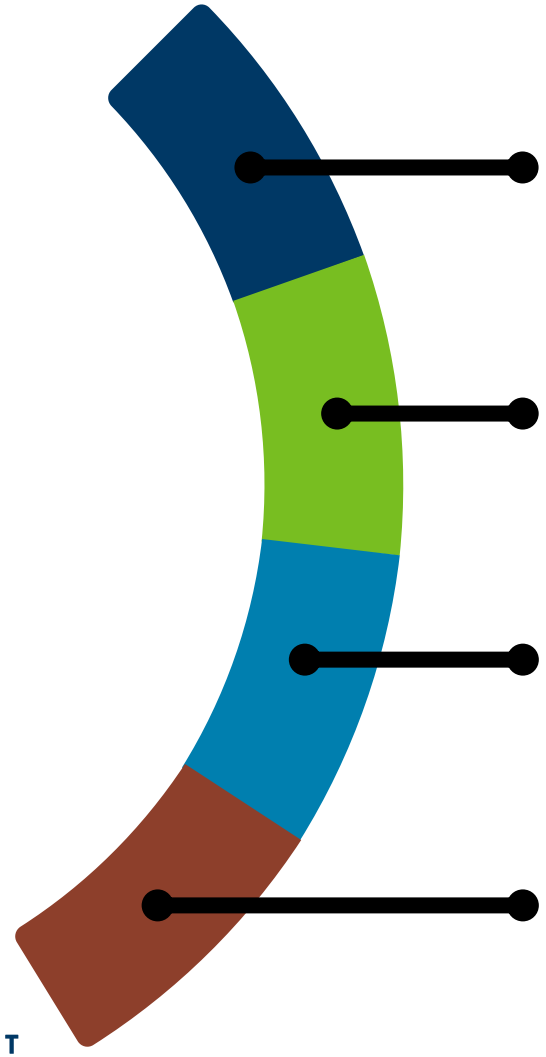
02 The drops of blood fill five spots on a filter paper card

03 After the drops of blood have dried, they are sent to the MDH laboratory to be screened

Blood Spot Screening Specimen Card



Current process is labor intensive with several manual steps



Hospital staff hand-writes data fields on the specimen card

At MDH, data is manually entered into the Laboratory Information Management System (LIMS) and results reports are generated after testing is completed

Hospital staff retrieves reports from the web portal or NBS staff mail them to the birth hospital

Results are manually entered into the hospital's electronic health record (EHR)

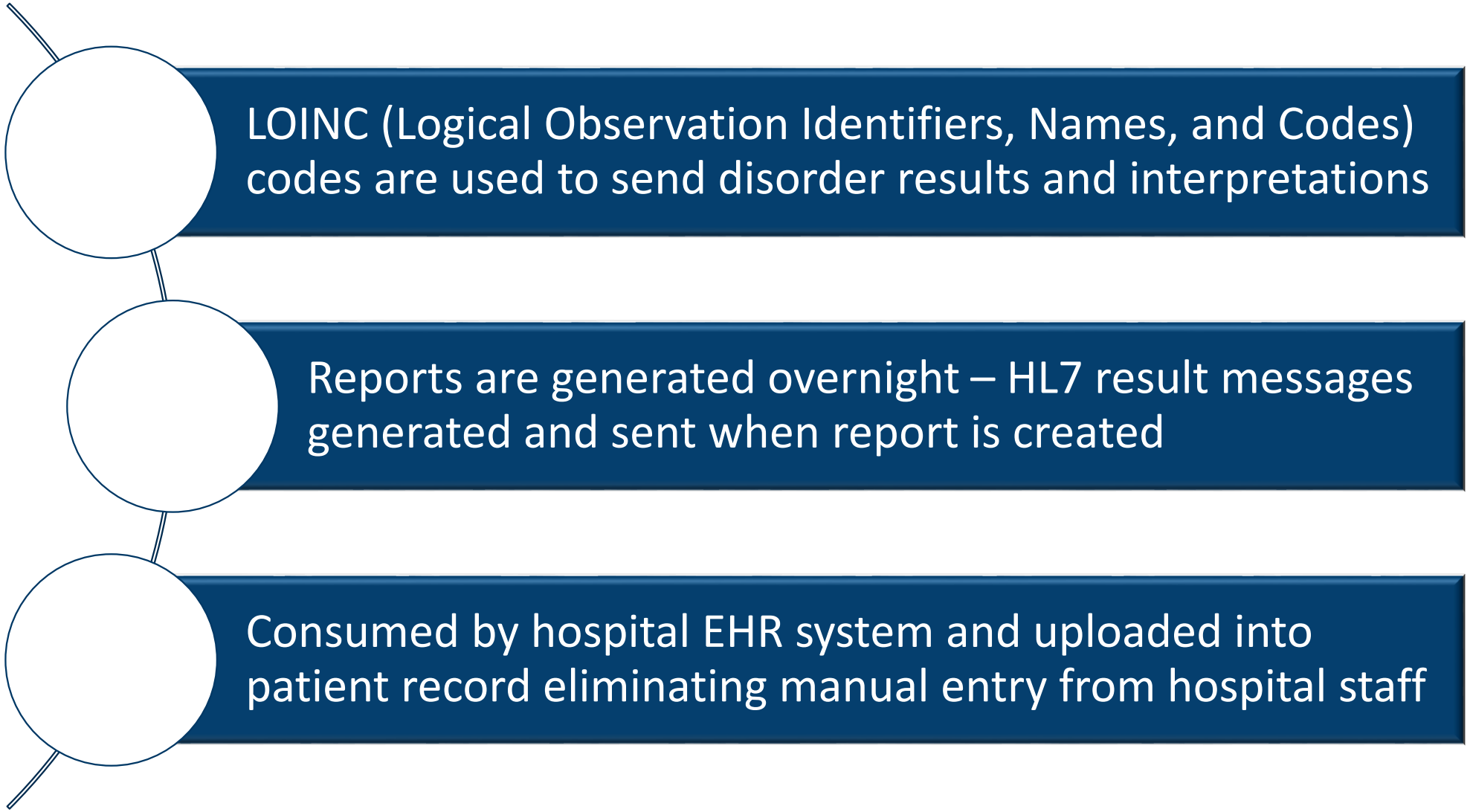
Our goal is to automate data entry for hospital staff with electronic laboratory orders and results

- Currently live with electronic orders and results from one pilot hospital within the CentraCare health system
- Project Team: Health System IT, hospital nursing and/or laboratory staff, MDH NBS operations, MN.IT messaging team, LIMS vendor
- Using the *HL7 Version 2.5.1*
  - *Implementation Guide: Laboratory Orders (LOI) from EHR*
  - *Implementation Guide: Laboratory Results (LRI) from EHR*
    - Implementation guides constrained down to specific information needed for MN NBS message

Electronic Laboratory Order Message

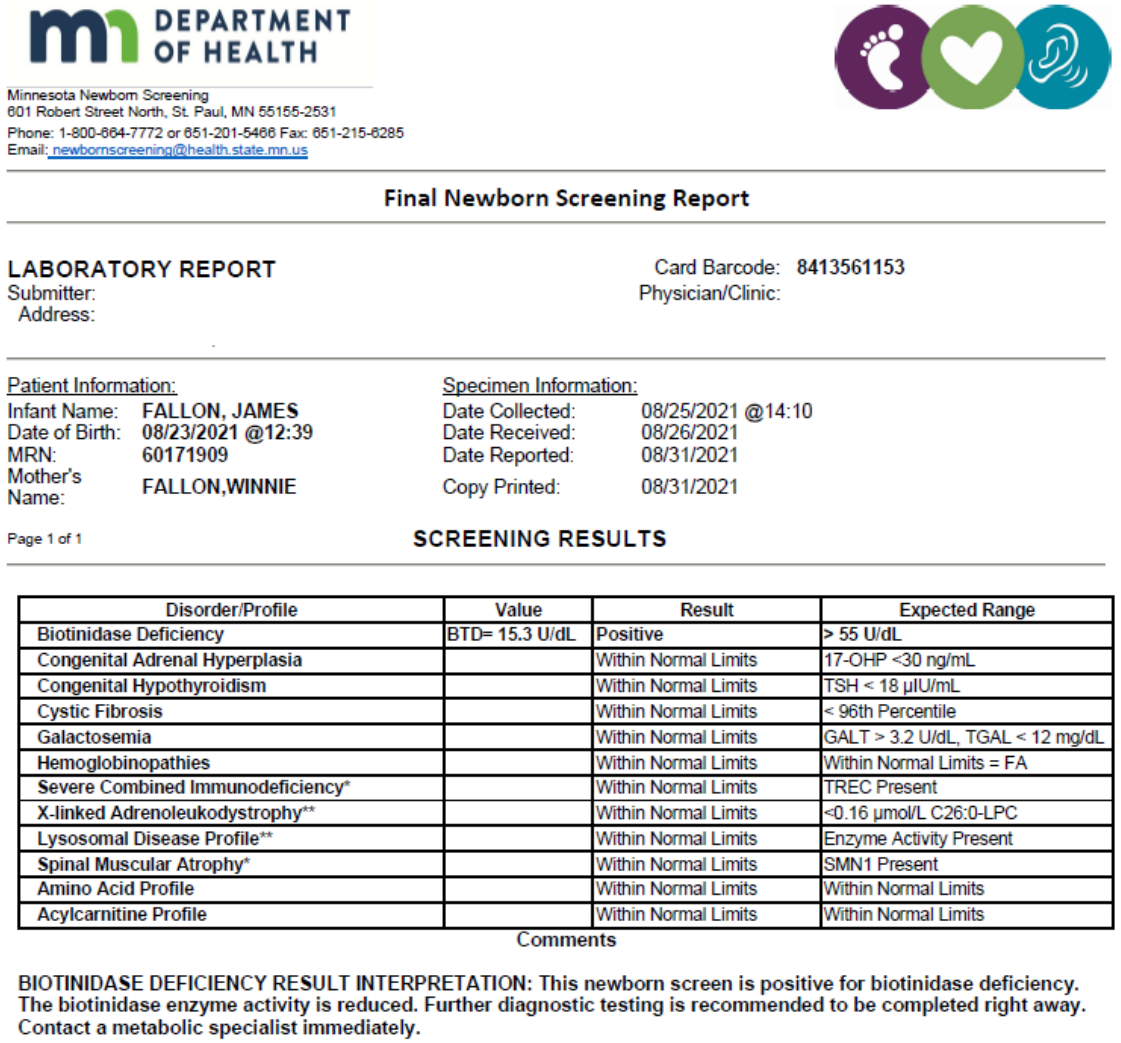
- Sending Facility Information (OID)
- Baby and Mother Demographics
- NBS Lab Order Specific Information – Ask at Order Entry (AOE) Questions:
  - Specimen Card Barcode Number
  - Date of NBS Specimen Collection
  - Time of NBS Specimen Collection
  - Infant Feeding Type
  - Has Baby Been Transfused (Yes/No)
    - Date of Transfusion
  - Primary Care Provider Name / Clinic & Phone Number
  - Infant Risk Factors that Affect NBS
  - Order Placer Number

Sending and Receiving the Result Message



NBS Result Report Example

- Information displayed on NBS report will be sent back in result message



DEPARTMENT OF HEALTH

Minnesota Newborn Screening
601 Robert Street North, St. Paul, MN 55155-2531
Phone: 1-800-664-7772 or 651-201-5466 Fax: 651-215-6285
Email: newbornscreening@health.state.mn.us

Final Newborn Screening Report

LABORATORY REPORT
Submitter:
Address:

Card Barcode: 8413561153
Physician/Clinic:

Patient Information:
Infant Name: FALLON, JAMES
Date of Birth: 08/23/2021 @12:39
MRN: 60171909
Mother's Name: FALLON,WINNIE

Specimen Information:
Date Collected: 08/25/2021 @14:10
Date Received: 08/26/2021
Date Reported: 08/31/2021
Copy Printed: 08/31/2021

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SCREENING RESULTS

Disorder/Profile	Value	Result	Expected Range
Biotinidase Deficiency	BTD= 15.3 U/dL	Positive	> 55 U/dL
Congenital Adrenal Hyperplasia		Within Normal Limits	17-OHP <30 ng/mL
Congenital Hypothyroidism		Within Normal Limits	TSH < 18 µIU/mL
Cystic Fibrosis		Within Normal Limits	< 96th Percentile
Galactosemia		Within Normal Limits	GALT > 3.2 U/dL, TGAL < 12 mg/dL
Hemoglobinopathies		Within Normal Limits	Within Normal Limits = FA
Severe Combined Immunodeficiency*		Within Normal Limits	TREC Present
X-linked Adrenoleukodystrophy**		Within Normal Limits	<0.16 µmol/L C26:0-LPC
Lysosomal Disease Profile**		Within Normal Limits	Enzyme Activity Present
Spinal Muscular Atrophy*		Within Normal Limits	SMN1 Present
Amino Acid Profile		Within Normal Limits	Within Normal Limits
Acylcarnitine Profile		Within Normal Limits	Within Normal Limits

Comments

BIOTINIDASE DEFICIENCY RESULT INTERPRETATION: This newborn screen is positive for biotinidase deficiency. The biotinidase enzyme activity is reduced. Further diagnostic testing is recommended to be completed right away. Contact a metabolic specialist immediately.

****All data on this mock-up report is fake – generated for testing purposes only. This is not real PHI data.*

Newborn testing panel results will be sent in the electronic results message

Newborn Screening Test Results Panel – Dried Blood Spot (57794-0)

OBR-4.1 LOINC code	OBR-4.2 Text	OBX-3.1 LOINC code	OBX-3.2 Text	OBX-3.5 MN Disorder/Profile Name
57087-9	Biotinidase Newborn Screening Panel	46761-3	Biotinidase newborn screen interpretation	Biotinidase Deficiency
57086-1	Congenital Adrenal Hyperplasia Newborn Screen Panel	46758-9	Congenital adrenal hyperplasia newborn screen interpretation	Congenital Adrenal Hyperplasia
54090-6	Thyroid Newborn Screen Panel	46762-1	Congenital hypothyroidism newborn screen interpretation	Congenital Hypothyroidism
54078-1	Cystic Fibrosis Newborn Screen Panel	46769-6	Cystic Fibrosis newborn screen interpretation	Cystic Fibrosis
54079-9	Galactosemia Newborn Screen Panel	46737-3	Galactosemias newborn screen interpretation	Galactosemia
54081-5	Hemoglobinopathies Newborn Screen Panel	46740-7	Hemoglobin disorders newborn screen interpretation	Hemoglobinopathies
62333-0	Severe Combined Immunodeficiency (SCID) Newborn Screen Panel	62321-5	Severe combined immunodeficiency newborn screen interpretation	Severe Combined Immunodeficiency
85267-3	X-Linked Adrenoleukodystrophy (X-ALD) Newborn Screen Panel	85269-9	X-Linked Adrenoleukodystrophy (X-ALD) newborn screen interpretation	X-linked Adrenoleukodystrophy
62300-9	Lysosomal Storage Disorders Newborn Screen Panel	62301-7	Lysosomal storage disorders newborn screen interpretation	Lysosomal Disease Profile
92005-8	Spinal Muscular Atrophy Newborn Screen Panel	92004-1	Spinal muscular atrophy newborn screen interpretation	Spinal Muscular Atrophy
53261-4	Amino Acid Newborn Screen Panel	46733-2	Amino acidemias newborn screen interpretation	Amino Acid Profile
58092-8	Acylcarnitine Newborn Screen Panel	58088-6	Acylcarnitine newborn screen interpretation	Acylcarnitine Profile

Benefits to Utilizing NBS Electronic Orders and Results

Eliminate manual data entry work for hospital staff across multiple steps of the NBS process

Results will automatically upload to patient record within hospital EHR system

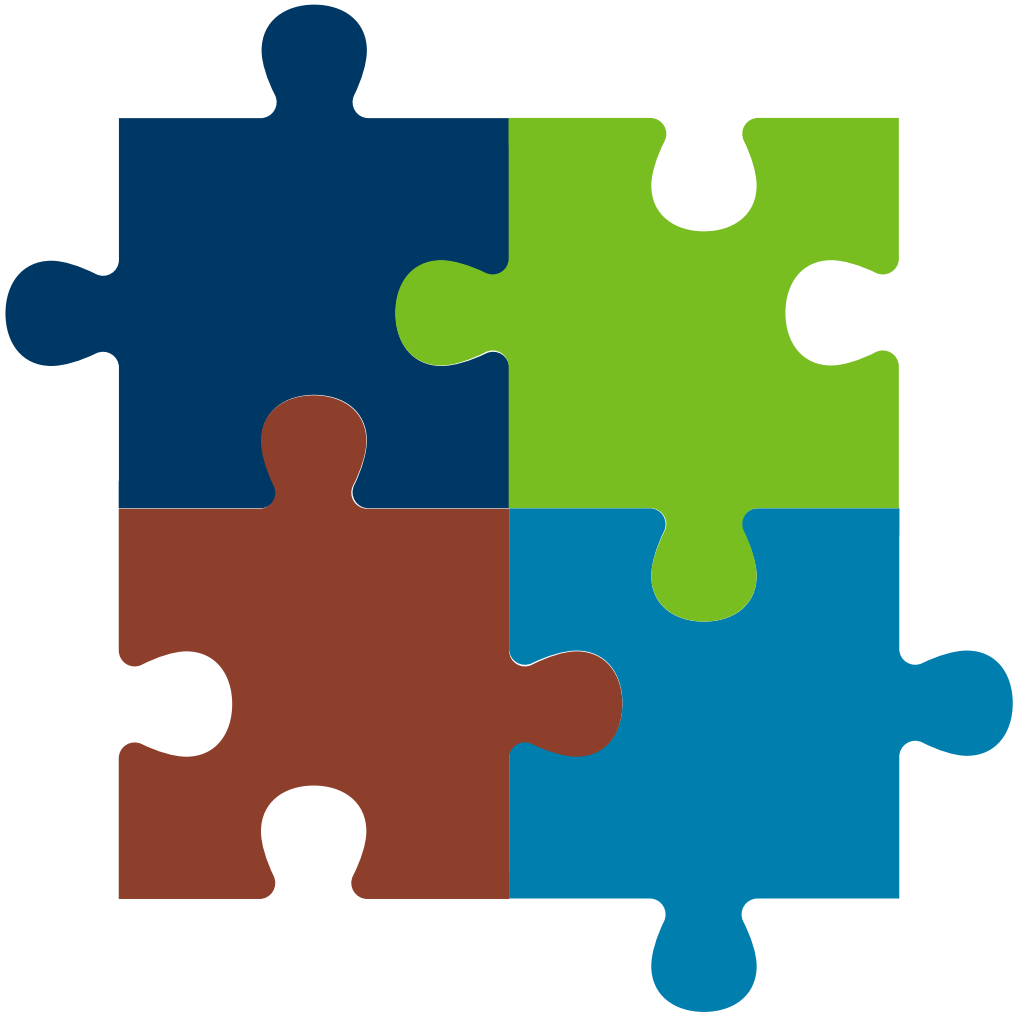
Accelerate the NBS results process, thus providing the most efficient, accurate, and earliest care to babies born in Minnesota

Increase the accuracy of the demographic and lab order specimen information

Lessons Learned

Identifying and involving key hospital staff

Understanding NBS specific verbiage for AOE questions e.g. multi-birth, gestational age format, etc.



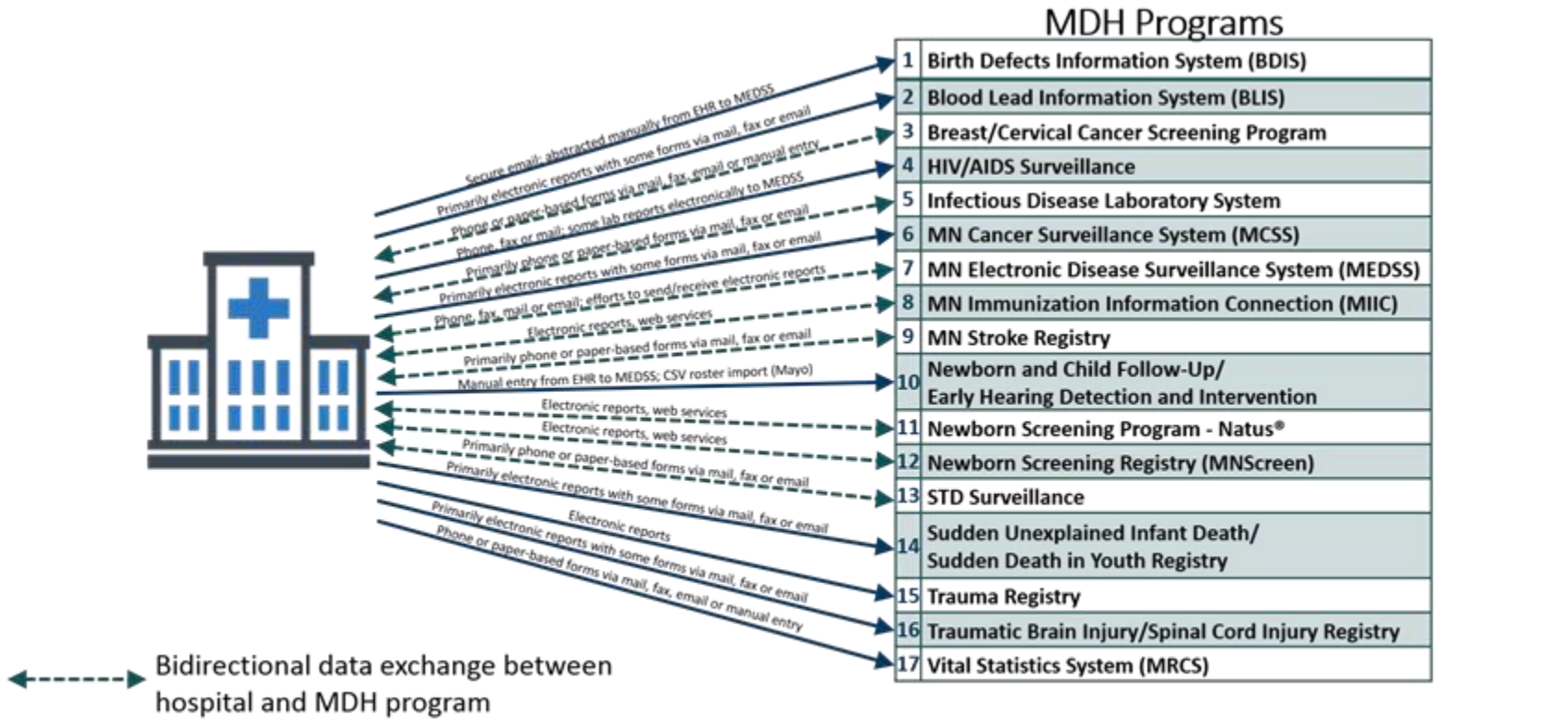
Reviewing each segment of the HL7 message with birth facility staff

Testing birth facility hardware for compatibility e.g. handheld scanners to scan NBS card barcode

Newborn Screening Resources

- MDH newborn screening website
  https://www.health.state.mn.us/people/newbornscreening/
- Newborn screening testing panel
  https://www.health.state.mn.us/people/newbornscreening/program/newbornscreeningpanel.html
- Blood Spot Disorders: Information & Resources
  https://www.health.state.mn.us/people/newbornscreening/materials/factsheets/bloodspotdisorders.html

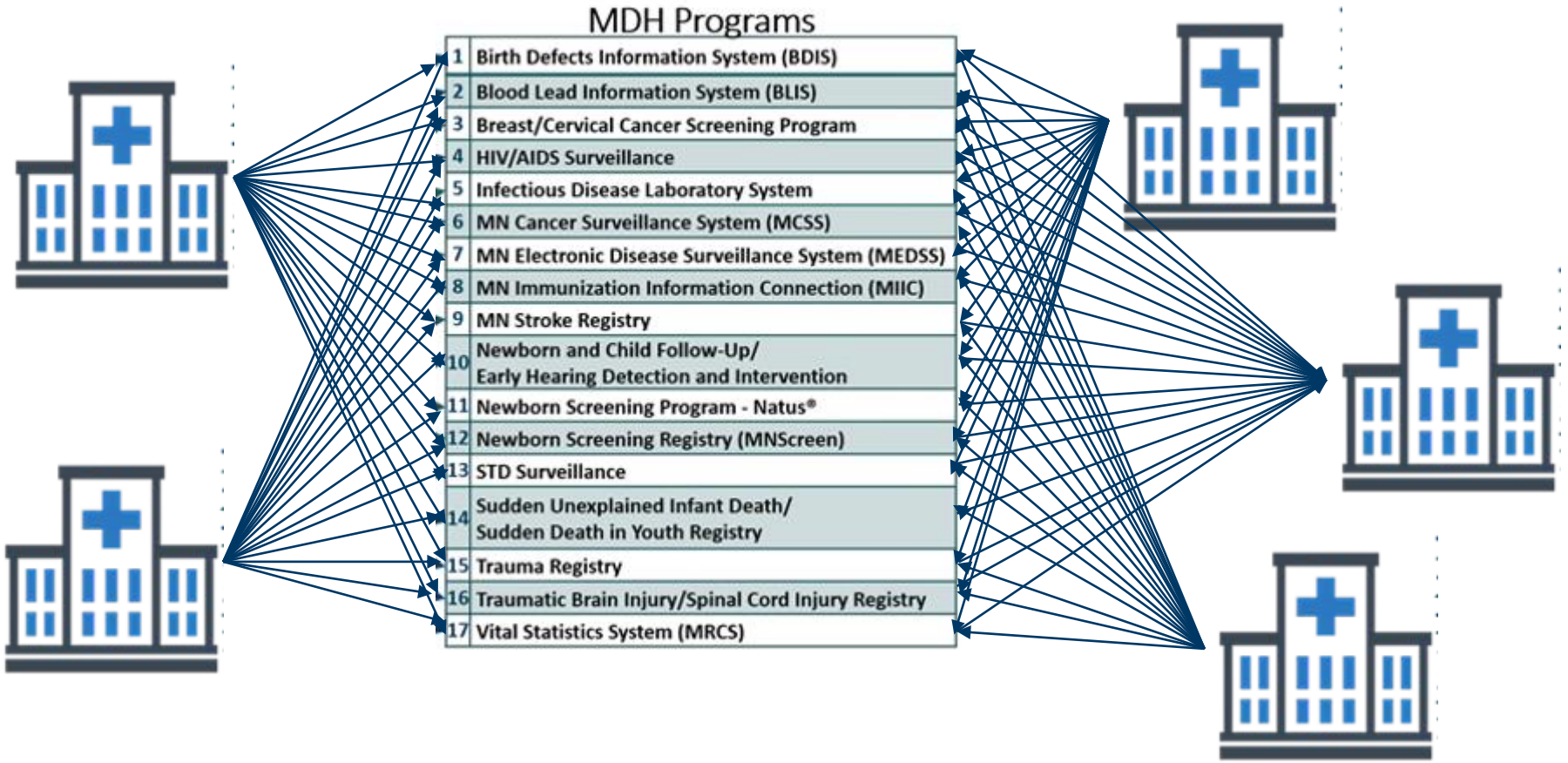
External Partner: problem that Interoperability will improve



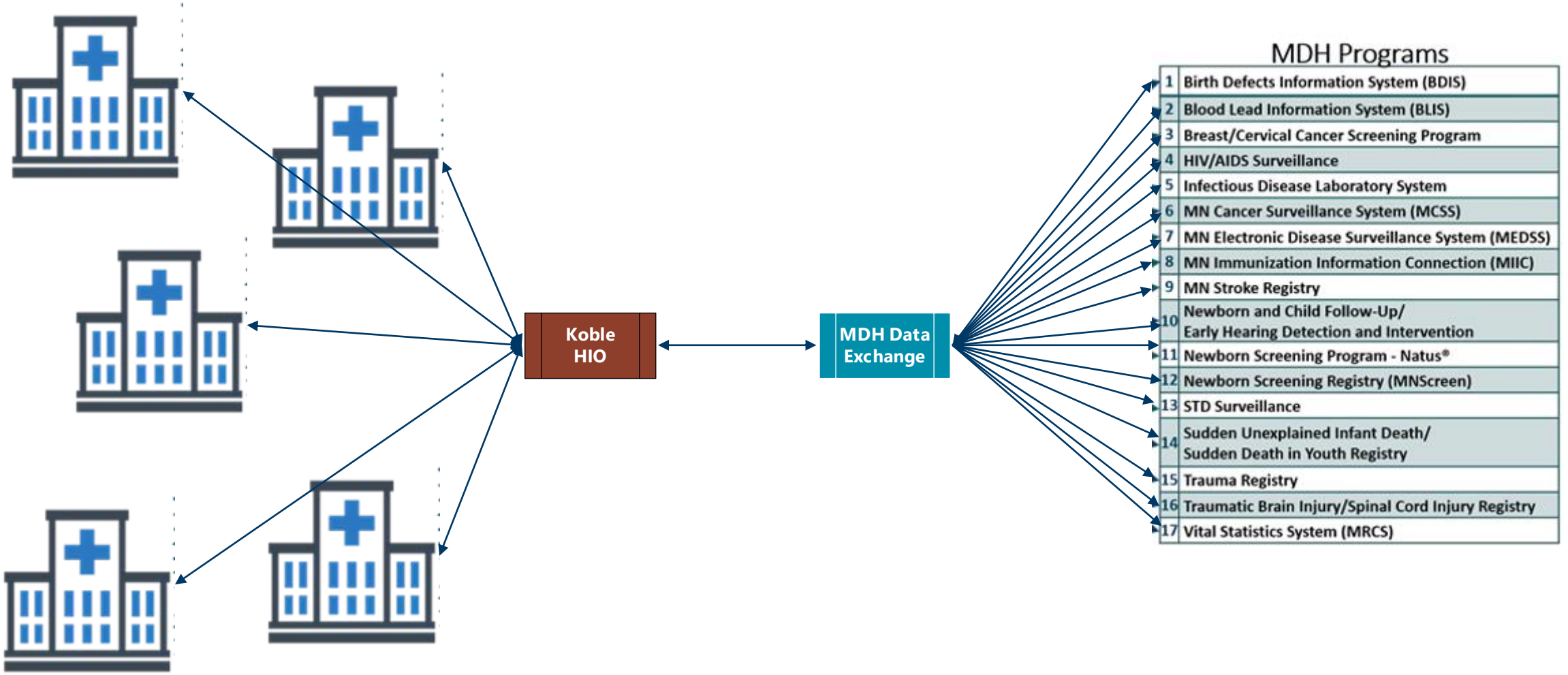
Source: MDH Informatics Assessment: Interoperability and Health Information Exchange, MDH Office of Health IT, April 2016

Slide adapted from Bryant Karras, Chief Informatics Officer, Washington State Department of Health

MDH: problem that Interoperability will improve

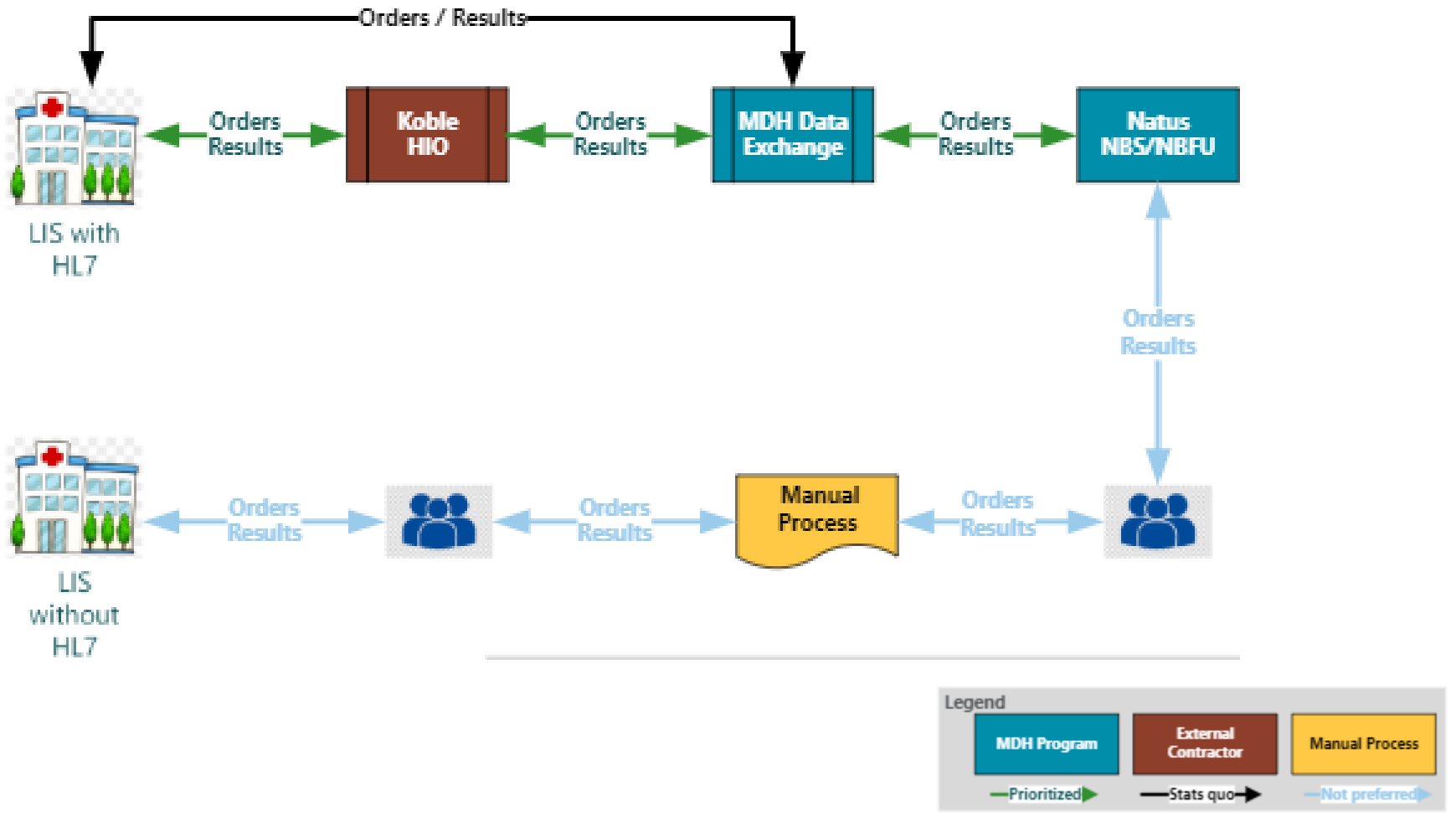


MDH Interoperability System Design Strategy



MDH Interoperability Strategy: NBS Blood Spot Electronic Orders/Results Use Case

Planned NBS Orders/Results



MDH-Koble HIO contract – how does it work?

- Connect external partners to MDH for a number of public health transactions.
- Contract pays for Koble set up fees for multiple transactions and first year of participation fee for the external partner.
- External partner provides internal IT resources to implement the projects, EHR costs, and future HIO maintenance costs (up to $10,000 annually).
- External partner may utilize HIO for other services beyond public health reporting to maximize value of HIO maintenance costs

Next Steps

MDH Request of External Partners

Contact Newborn Screening partners at MDH

- **Heather Brand** heather.brand@state.mn.us
- **Jill Simonetti** jill.Simonetti@state.mn.us

✓ **Schedule meeting with DSI** to discuss more details related to health system needs

- Determine your organizations' public health reporting priorities for implementation and share with DSI (checklist)
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Q&A

Thank you.

Webinar materials: DSI website (https://www.health.state.mn.us/data/interoperability/webinar.html)

Further questions: health.dsi@state.mn.us