



**COLORADO**  
Department of Public  
Health & Environment



**Wyoming**  
Department of Health

# Collaborative Improvement and Innovation Network (CoIN) for Timeliness in Newborn Screening in Colorado and Wyoming

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# Objectives

- Barriers to timely transit of newborn screening (NBS) specimens in Colorado and Wyoming.
- Describe groundwork leading up to CoIN
- Identify strengths and weaknesses of CO/WY NBS programs
- Development of SMART goals
- Outcomes thus far
- Next steps

# Durango, Colorado

- 337 mile drive to Denver (7 hours) includes Highway 550 between Durango and Ouray.
  - three 10,000-plus-foot mountain passes
- Described as one of the most “scenic” drives in America.
- Nicknamed the Million Dollar Highway for the views
- Ranked as one of the most dangerous roads in the world.



# ...Durango, Colorado

- Home to Mercy Regional Medical Center
- About 900 births a year.
- 2013 transit time: 4.73 days via mail
  - 5.1% received within 48 hours of collection
- 2015 transit time: 1.97 days via courier
  - 80.0% received within 48 hours of collection
- Switched to 6 day a week courier in 2014 as part of a pilot project on timeliness.
- Required a 3 step process to get specimens to the NBS Lab in Denver.



# ...Durango, Colorado

- Step 1: Kangaroo courier picks up specimens and drives to Durango La Plata Airport (2:30 pm)
- Step 2: Specimens loaded on either designated cargo flight (weekdays) or commercial flight (weekends/holidays) to Denver International Airport in the late afternoon (4pm).
- Step 3: Kangaroo courier picks up specimens at airport (9:30 pm) and transports to CDPHE NBS Lab (10:30 pm).
  - Logged in at 5am the following morning.



**Kangaroo Express** 

# Colorado's groundwork leading up to CoIIN

- In 2014, CDPHE NBS Program collaborated with the Colorado Hospital Association.
- Proposed the “Timeliness Improvement Project” in April 2014 following a successful workgroup meeting.
  - Goal of identifying best NBS practices at Colorado Hospitals
  - 4 pilot hospitals selected
- Partnership with Kangaroo Express, our state contracted courier service



# Timeliness Improvement Pilot Project

- Launched the pilot project from October –December 2014 at 4 hospitals with focus on improving specific quality indicators.
  - Collection time
    - Goal of all specimens collected at 24-48 hours, with aim of 24 hours
  - Reduction unsatisfactory specimens
    - Utilized existing resources of informational posters and CLSI DVD
    - Initiated “spot checker” program
  - Completion of NBS card demographics
    - Development of “accuracy poster” to emphasize accurate, complete, and legible documentation.
  - Transit time
    - Switched hospital to Kangaroo Express courier 7 days/week
    - Used standard envelope and “Chain of Custody”

# Every time you fill out a newborn screening form you hold a baby's life in your hands.

Filling out the newborn screening form

- ✓ *Accurately*
- ✓ *Completely*
- ✓ *Legibly*



could be a matter of life and death!

In the event of a positive screening test, the information you provide is essential to locate the baby and a provider!

*It's not just a form ... It's a baby.*



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# Newborn Screening Blood Spot Specimens



# Chain of Custody

Today's Date: \_\_\_\_\_ # Specimens \_\_\_\_\_

Facility of Origin: \_\_\_\_\_ Phone: \_\_\_\_\_

Type of Facility:  Clinic  Clinical Lab  Hospital  Midwifery  Other \_\_\_\_\_

Manifest Enclosed  No blood spot specimens are available today for pickup\*

\*This envelope must be completed and transported via courier daily, even when no blood spot specimens are available.

Packed for pickup by :						
First / Last Name (Please Print)	Init	Date (m/d/yr)	Time	AM	PM	
1						
Picked up from facility of origin by:						
First / Last Name (Please Print)	Init	Date (m/d/yr)	Time	AM	PM	
2						
Transferred to 3, otherwise sign on line 5						
3						
Transferred to 4, otherwise sign on line 5						
4						
Dropped off at CDPHE Laboratory by:						
First / Last Name (Please Print)	Init	Date (m/d/yr)	Time	AM	PM	
5						
CDPHE drop Site (check appropriate box):		<input type="checkbox"/> Receiving Desk (8 am - 5 pm) <input type="checkbox"/> After-hours drop box				
Received at CDPHE Laboratory by:						
First / Last Name (Please Print)	Init	Date (m/d/yr)	Time	AM	PM	
6						

(Newborn Screening Lab Use Only) # Specimens received: \_\_\_\_\_ by (Init/date): \_\_\_\_\_/\_\_\_\_\_

**Please Note:** The CDPHE Laboratory business hours are Monday-Friday, 8am-5pm.

The after-hours drop box is available to the left of the specimen receiving door.

Please do not use the drop box during regular CDPHE Laboratory business hours.

Colorado Department of Public Health and Environment (CDPHE)

Laboratory Services Division

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*Every Hour Counts!*

# Lessons Learned

- Collaboration and education work!
  - Improved collection time and completion of NBS cards at all participating hospitals.
- Importance of a state-wide courier.
  - Both hospitals and courier appreciated having “chain of custody” form
  - Allowed NBS lab to accurately determine time of drying, packaging, transport, and receipt of NBS specimens.
- Spot checker initiative resulted in ZERO unsats at pilot hospitals for 6 consecutive months.
- Pilot hospitals reported that success was a result of partnership within the hospital between nurses and lab staff.
  - Emphasized importance of buy-in from all parties involved

# Next Steps

- How do we expand the successes of our pilot project to the remaining birth facilities in Colorado and Wyoming?
- NewSTEPS Collaborative Improvement and Innovation Network (CoIIN) for Timeliness
- Submitted application in November 2014 with face to face meeting in January 2015 at APHL.
- Team included representatives from CDPHE NBS lab and follow-up unit, WDH, hospital lab staff, and a midwife.

# Identified Strengths and Weaknesses

- Strengths

- Statewide courier in both Colorado and Wyoming (5 days a week)
- Quarterly performance “report cards” to birth facilities
- Good collaboration with hospitals
- Expansion of CDPHE’s NBS follow-up with focus on education and quality improvement
- Expansion of weekend lab hours in 2015

- Weaknesses and barriers

- Large geographical region
  - Average transit time in Colorado: 2.82 days
  - Average transit time in Wyoming: 3.18 days
- Rural communities served by small community hospitals
  - The majority of Colorado and Wyoming counties are classified as “rural” or “frontier”.
  - Almost half (47%) of Wyoming’s population lives in these frontier counties.
- Home births
  - Greater than 1% of births

# SMART Goals

- Established SMART goals
  - Specific, Measurable, Attainable, Relevant, and Time-bound
- Goals
  - Reduce transit time
    - Reduce by 1 day with 95% of initial screens received within 72 hours of collection.
    - Ideally receipt within 24 hours of collection
  - Ensure 100% of initial newborn screens are collected prior to 48 hours.
  - Reduce unsatisfactory specimens
  - Develop education program

# Aims for our Goals

- Development and dissemination of a hospital survey
- Improve utilization of courier
  - Add additional birth facilities
  - Add weekend pick-ups with goal of Sunday pick-ups
- Improve data capture of transit times through additional data fields in Specimen Gate.
- Improve lay-out of our performance report cards.
  - Begin monthly dissemination of report cards
- Education efforts
  - Reinstitute site visits
  - Educate hospitals with high unsatisfactory rates with spot checker initiative
  - Educate hospitals that continue to collect specimens >48 hours of age.
  - Conduct conferences and webinars

# Hospital Survey

- Conducted survey via survey monkey to all birth facilities in CO and WY.
- Goals of survey:
  - Gain knowledge regarding NBS processes at each hospital
  - Identify key players and organizational structure
  - Identify barriers to getting specimens to NBS lab within 24 hours
  - Identify educational needs
- Relationship building with hospitals



# Hospital Survey Results

- Completed by 85.5% of CO hospitals and 90.9% of WY hospitals.
- Identified issues at many of the hospitals
  - 68.67% of hospitals drying specimens >4 hours
  - 6% of hospitals reported that weekend courier pick-up would be an issue due to staffing
- Confirmed that report cards are being reviewed but many stated that they were not being shared with nursing and lab staff.
- Showed that previous distribution of the CLSI DVD distribution was unsuccessful (costly).
  - Only 36.2% of CO hospitals recalled receiving the video with even less stating that they have utilized the video 1 year post distribution.
- Identified the need to go “back to the basics” for education.

# Every Hour Counts!

Timing is critical for saving babies

# Newborn Screening

- Collect the newborn screening specimen at **24 - 48** hours of life. Aim for **24**.
- Fill out the screening card completely, accurately, and legibly.
- Check the specimen. Is it a good specimen? If there is any doubt, recollect immediately.
- Dry the specimen horizontally for **3 - 4** hours.
- Package dried specimens **daily** for the courier – know your courier's pick-up time.
- Specimens should arrive at the newborn screening lab within **24** hours of collection.



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# Revised Report Cards



303-692-3482

## Newborn Screening Report Card

Submitter: **Rose Medical Center**

Report Period: December 01, 2015 - December 31, 2015

	Submitter	Colorado
Total Specimens Submitted	283	5,461

### Unsatisfactory Specimens

*Goal: EVERY specimen is collected properly and is valid for analysis.*

	Submitter	Colorado	Goal
Total unsatisfactory specimens	0	39	0
Percentage of unsatisfactory specimen	0.0	0.7	0

### Missing Demographics

*Goal: All essential demographics are completed allowing for proper analysis and rapid follow-up.*

	Submitter	Colorado	Goal
Total missing demographics	17	582	0
Percentage of missing demographics	6.0	10.7	0

### Collection Time

*Goal: Collect specimens between 24 to 48 hours of age - aim for 24 hours!*

	Submitter	Colorado	Goal
Percentage of specimens collected less than 24 hours	10.6	11.2	0
Percentage of specimens collected between 24 - 48 hours	88.3	83.1	100
Percentage of specimens collected greater than 48 hours	0.4	3.8	0

### Transit Time

*Goal: Specimens received by NBS lab ideally within 24 hours of collection.*

	Submitter	Colorado	Goal
Percentage of specimens received within 24 hours	10.2	1.8	100
Percentage of specimens received between 24 - 48 hours	69.3	48.4	0
Percentage of specimens received between 48 - 72 hours	19.1	28.5	0
Percentage of specimens received greater than 72 hours	1.4	20.5	0

Average Time of Transit	1.61 days	2.56 days	1.0 days
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- Goals clearly stated
- Hospitals compared to Colorado/Wyoming as well as stated goals
- Working to include rankings for transit time
- Working on “outlier” report to identify specific specimens that fell short.

# Utilization of Courier

- In April 2015, Colorado expanded courier service to 6 days a week
  - For many hospitals (58%), able to institute a Sunday-Friday schedule with next day guaranteed delivery by 6 am.
  - For smaller rural hospitals, able to only have Monday-Saturday due to limited routes and \$\$\$.
- Also, we began to strongly encourage hospitals to switch to the state courier versus their own courier, FedEx, or mail.
- In October 2015, Wyoming began to pilot Saturday courier service at their two largest hospitals, capturing 34% of birth population.

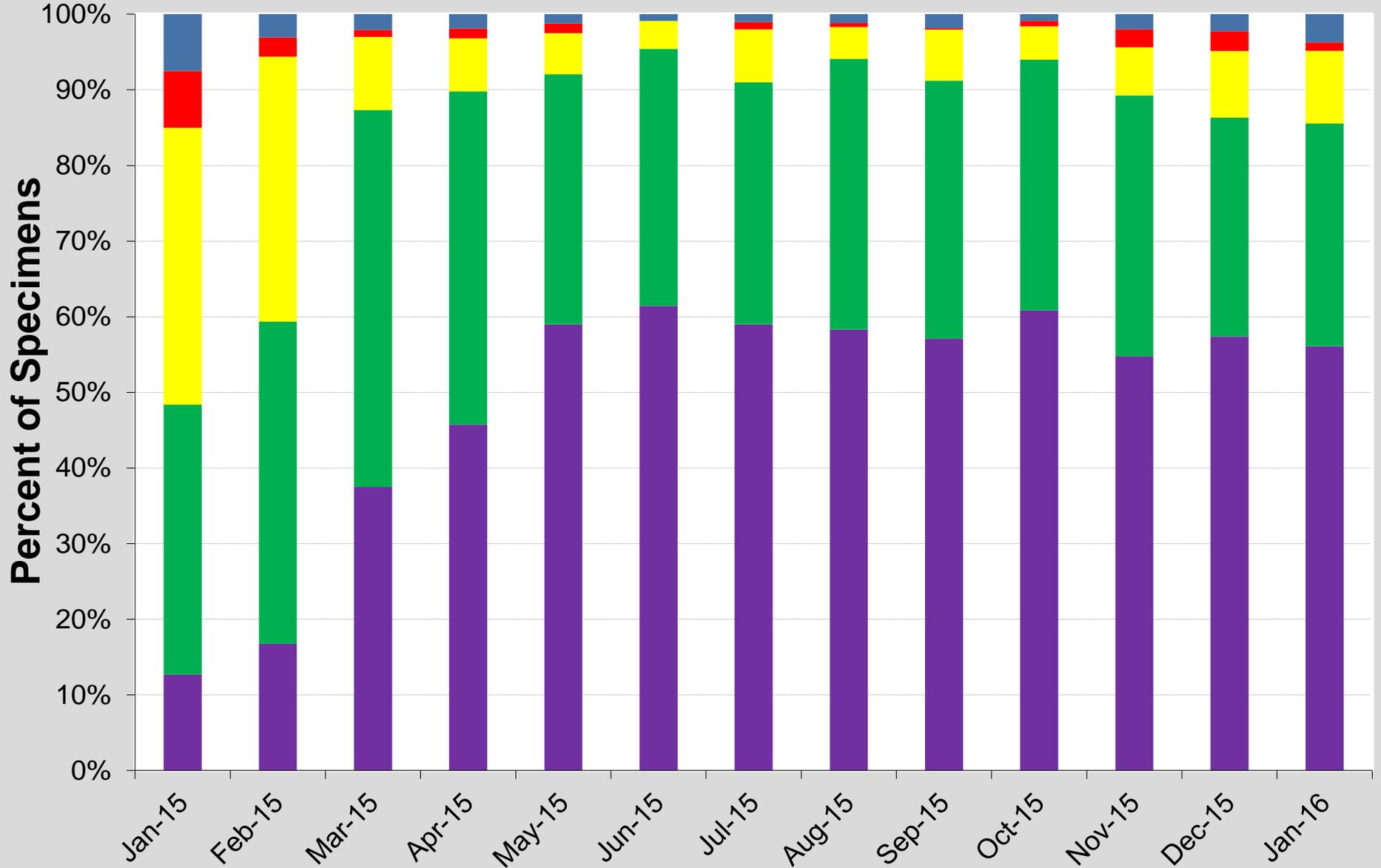
# Colorado Receipt by Lab: Displayed by Time Frames

0-2 d      3-4 d      5-6 d      7-14 d      UNK



# Wyoming Receipt by Lab: Displayed by Time Frames

0-2 d      3-4 d      5-6 d      7-14 d      UNK



# Site visits

- Re-initiated site visits as component of our NBS programs.
- Visited largest birth hospital in Colorado in February 2015 to give educational presentation to nursery and lab staff.
  - Spent time reviewing their NBS process
  - Identified multiple issues regarding timeliness
  - Had second site visit to address unsatisfactory specimens
    - CDPHE lab staff and lab staff from another hospital
- Follow-up included multiple conversations with lab supervisor and monthly analysis of report cards.
- Reinforced that “Boots on the Ground” works and identification of a champion at each hospital is key.
- Some facilities may require more than one visit and that sustainability can be difficult!

# NewSTEPs 360

- Our experiences through CollN allowed us to identify areas of continued educational focus.
- Goals
  - Create a video for hospitals and midwives addressing timely collection and transport of NBS specimens.
  - Complete an educational toolkit to accompany the video for hospital staff and midwives.
  - Develop a standardized site-visit curriculum including a pre-site needs assessments, an educational presentation, and post visit evaluation identifying strengths and weaknesses of the birth facility.
  - Complete the accreditation of the educational module for laboratorians, nurses and physicians for acquisition of continuing educational credits.

# Durango, Colorado

- In 2015, a baby was born at Mercy Regional Medical Center.
- NBS obtained at 24 hours of age (8am).
- Dropped off by courier at CDPHE NBS lab same day of collection at 10pm.
- Logged in at 5am at the NBS lab the following morning with testing beginning later that day.
- Results called out at 73 hours of age, consistent with MCADD deficiency!



# Thank you!

- Other CoIIN states for freely sharing their experiences, resources, and advice
- Our team:
  - CDPHE representatives
    - Mark Dymerski, lab supervisor
    - Emily Fields, NBS follow-up coordinator
    - Jeana Foster, physical scientist (spearheaded our pilot)
    - Laura Taylor, NBS follow-up coordinator
    - Dan Wright, NBS Program Manager
    - Erica Wright, NBS follow-up supervisor
  - Wyoming Health Department (WDH) representative
    - Carleigh Soule, NBS and Genetics coordinator
    - Danielle Marks,
  - Hospital representatives
    - Sandy Towne, referral testing, Rose Hospital , Denver, CO
    - Dawn Schultz, pre-analytic supervisor, Mercy Regional Medical Center, Durango, CO
    - Karen Flynn, lab manager, Memorial Hospital, Colorado Springs, CO
    - Bev Alden, lab, Cheyenne Regional Medical Center, Cheyenne WY
    - Erin Rooney, lab, Cheyenne Regional Medical Center, Cheyenne WY
  - Certified Midwife
    - Gina Gerboth

# Contact Information

Please feel free to contact me if you are interested in receiving any of our developed resources.

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