Retrospective Analysis of Archived Newborn Dried Blood Spots Tested for CMV DNA: Experience and Perspective of a CLIA-Approved Laboratory

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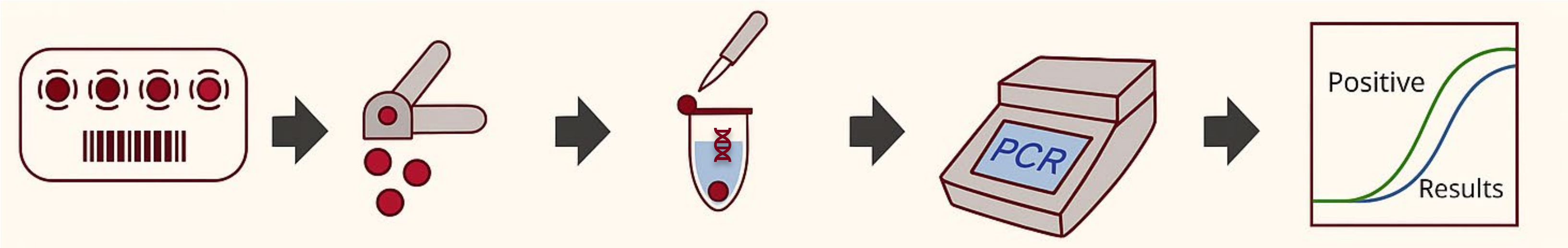
The Diagnostic Dilemma: Why Retrospective DBS-PCR is Critical

1. No universal newborn screening
2. Symptoms may appear months or years later
3. Diagnosis after day 21 is uncertain
4. Without DBS: congenital vs. postnatal unclear

Study Aims

1. Describe retrospective DBS-PCR testing across a 10-year period.
2. Identify common clinical indications prompting submission.
3. Determine CMV positivity rate and explore viral load correlations.
4. Demonstrate diagnostic value when early testing was missed.

Methods: From Dried Blood Spots to Diagnosis



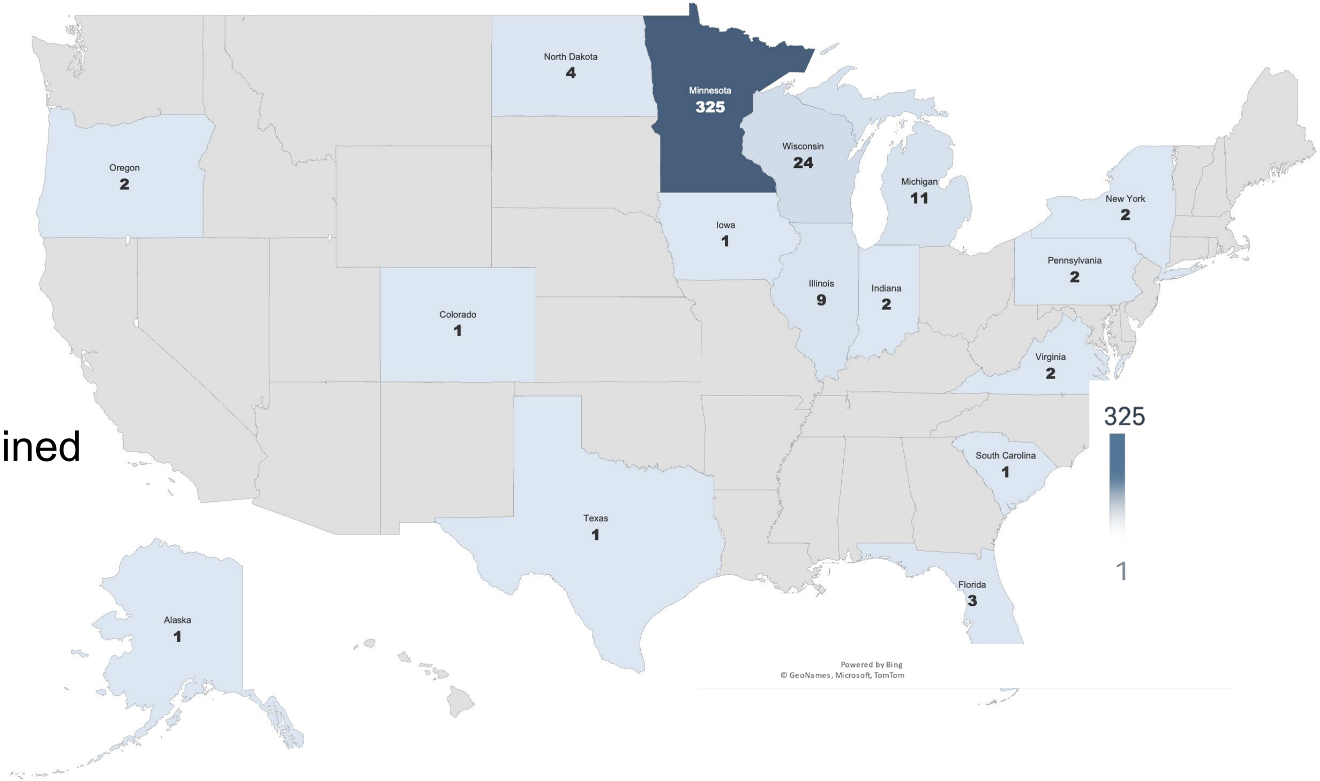
Submit request | **3 DBS punches** | **Extract CMV-DNA** | **Real time qPCR amplification** | **Interpret results**

- **413** DBS samples (2015–2025).
- Avg. age: 1 yr 5 mo (range: weeks–8 yrs).

(CLIA-ID, 24D1049829)

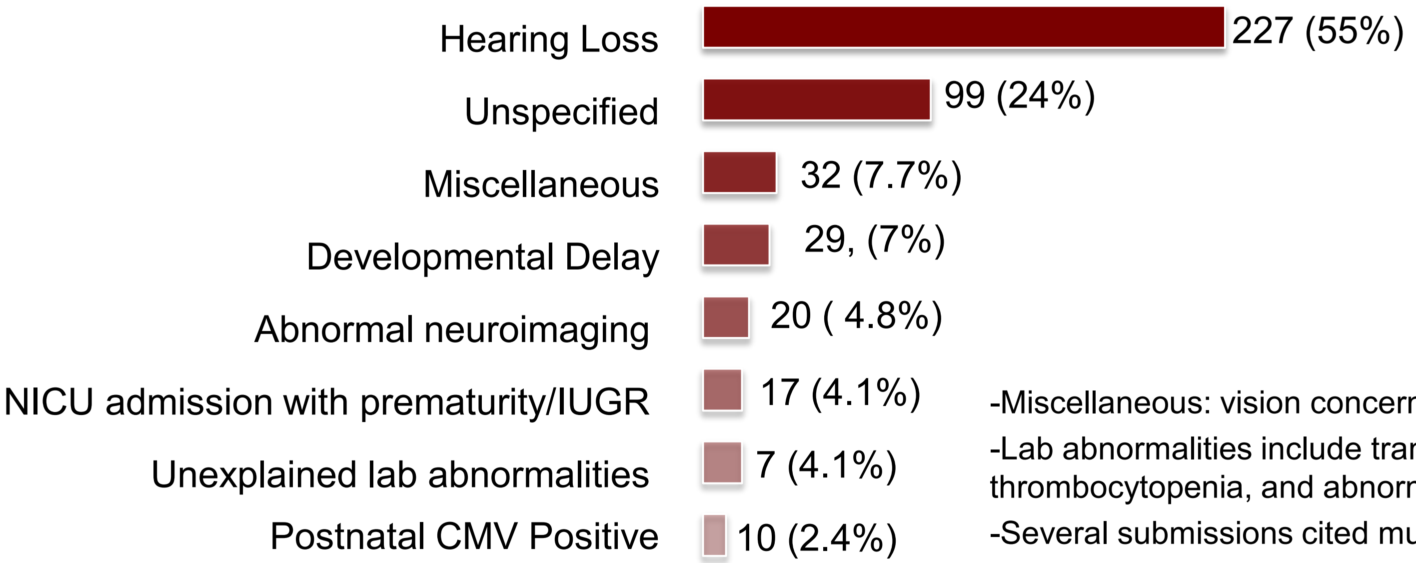
Where Did the Samples Come From?

- **Minnesota:** 325
- **Wisconsin:** 24
- **Michigan:** 11
- **Illinois:** 9
- **Other states:** 44 combined



Why were DBS Samples Submitted for Testing?

Total tested: n=**413**

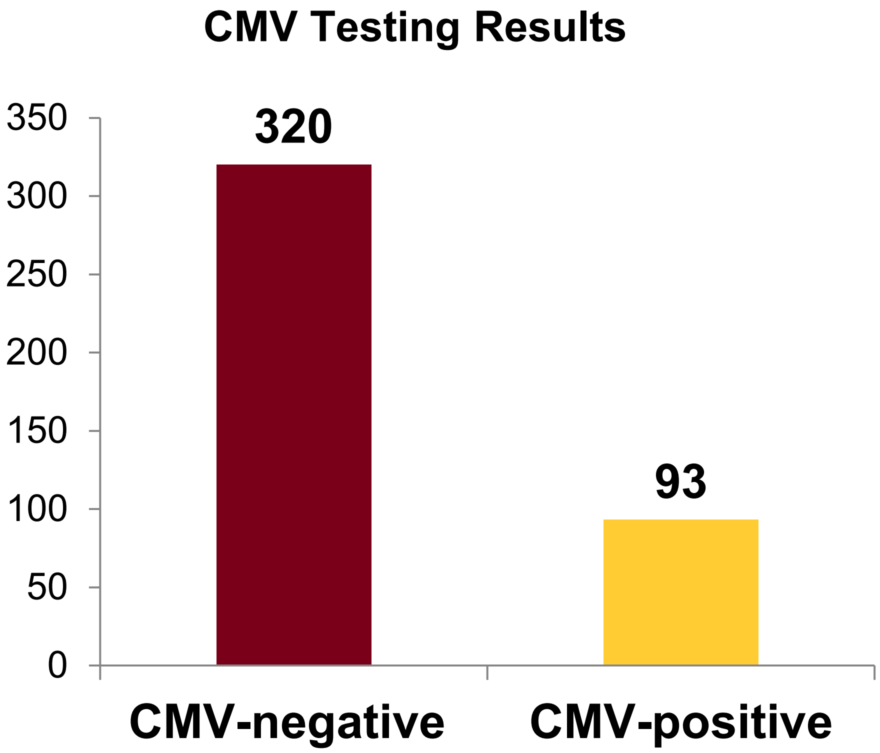


-Miscellaneous: vision concerns, parental request, autism.

-Lab abnormalities include transaminitis, thrombocytopenia, and abnormal liver function.

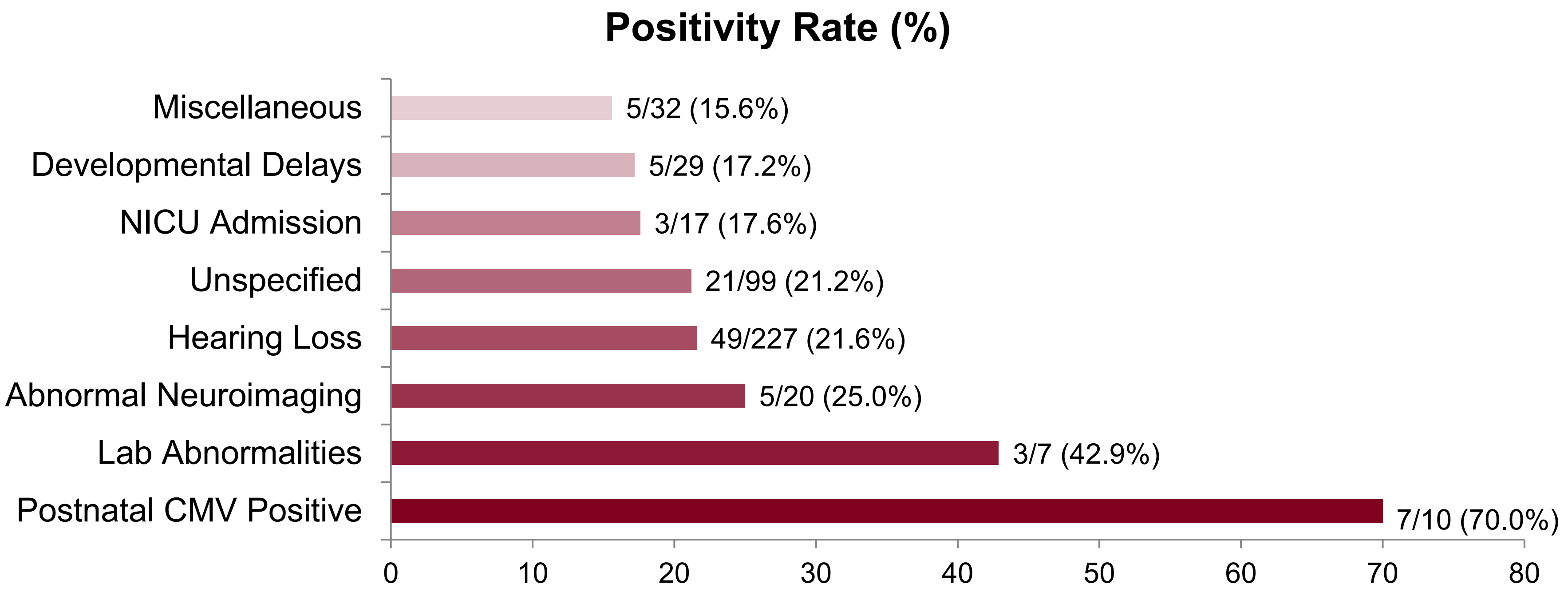
-Several submissions cited multiple indications.

One in Four Tested Positive



- Total tested: **413**
- Positive: **93** (22.5%)
- 1 in 4 children tested were CMV-positive

CMV Positivity Varies by Testing Indication



From Suspected to Confirmed: Who Tested Positive

Hearing loss accounted for **~50%** of CMV-positive cases (**47/93**).

Viral Load Was **Not** Significantly Associated with Clinical Testing Indication

- **n=93** CMV-positive samples
- Median viral load compared across clinical indications
- **No** significant difference in viral load by indication (**p = 0.064**)

Viral load levels were similar across all clinical groups.

Viral Load Distribution Among Positive DBS Samples

Median viral load across positive DBS samples was 2,800 IU/µg gDNA

Median viral load: ***2,800 IU/µg gDNA***.

What We Learned in 10 Years

1

Retrospective DBS testing adds value, even years later.

2

PCR on DBS: still the hero when testing is delayed.

3

20% of DBS submissions confirmed cCMV, often linked to SNHL suspicion.

4

Retrospective doesn’t mean too late—it means **still in time to help**.

What is Next: From Insight to Action

- Encourage DBS submissions in cases where cCMV was not initially considered.
- Promote awareness of CMV sings that may appear later (e.g., delays, vision concerns).
- Share success stories to encourage referrals and early interventions.

Acknowledgements

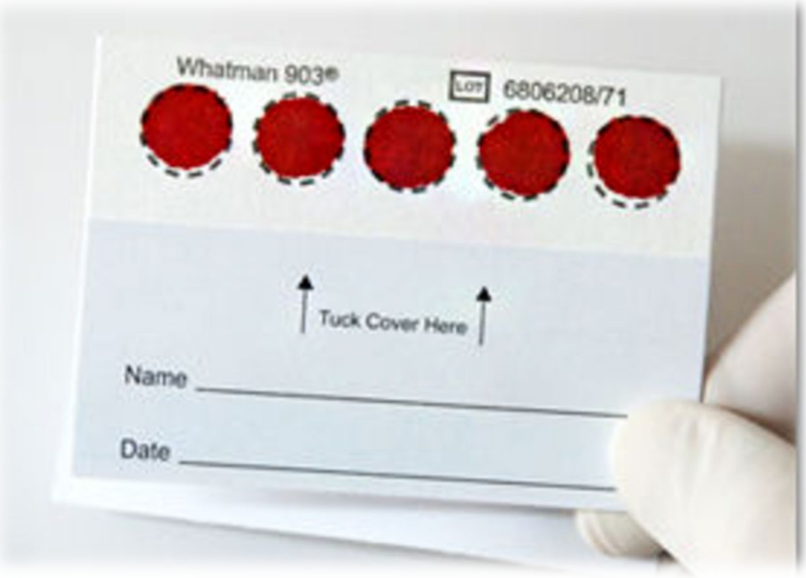
- LAB TEAM & COLLABORATORS

- FUNDING SOURCES

- CLINICIANS WHO SUBMITTED SAMPLES

Questions

- ***"Every DBS card tells a story — sometimes, it holds the answer families have waited for."***



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