Investigation of the impact of whole-genome sequencing (WGS) on the clinical management of acutely ill newborns with suspected genetic disease

Study Objective
Evaluate the impact of WGS on the management of acutely ill newborns.
Prospective, time–delayed, randomized – control trial.
Multi-site with 5 participating children’s hospitals across the US.

Population and Methodology
Primary Objective: Assess if whole-genome sequencing leads to changes in patient management.

Delayed arm group
176 acutely ill newborns received delayed WGS. Results returned 60 days after study enrollment.

Early arm group
176 acutely ill newborns received early WGS. Results returned 15 days after study enrollment.

Change of Management
2x Change of management when having WGS compared to “usual care” leading to a more precise care path.

Diagnostic Efficacy
2x Increase in diagnostic yield when having WGS compared to “usual care.”

Types of Change of Management
- Early - Day 60
- Delayed - Day 60

Systematic Use of WGS
Using WGS as a first-line test in an acute care setting can lead to improved clinical management and higher diagnostic efficacy, and may reduce healthcare disparities.

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Population and Methodology
- 354 acutely ill newborns admitted to an intensive care unit with suspected genetic disease and aged between 0 and 120 days.

Change of Management
- Day 60
- Early arm: 21%
- Delayed arm: 10%

Diagnostic Efficacy
- Day 60
- Early arm: 37%
- Delayed arm: 19%

* “Usual care” varied by site, and included a range of genetic tests including karyotype, chromosomal microarray, single gene testing, panels, biochemical analysis, exome sequencing and in a few cases, genome sequencing.