

Newborn Screening for Duchenne Muscular Dystrophy: Phase 1 Update

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Evidence Review Group (ERG)

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Background

Duchenne Muscular Dystrophy

- X-linked progressive disease characterized by loss of muscle function with weakness
- *DMD* gene, which codes for dystrophin
 - Mainly expressed in muscle
 - Truncated gene can have some function
- Affected males
 - Noticed to have weakness around 2-3 years of age
 - Loss of ambulation in early adolescence
 - Ventilator support in early adulthood
 - Life expectancy is variable, 18 – 41 years of age

Duchenne Muscular Dystrophy

- *DMD* gene, which codes for dystrophin
 - 2.5 million base pairs long
 - Mainly expressed in muscle
 - Truncated gene can have some function
- Dystrophinopathies include
 - DMD, 16.7-20 per 100,000 males, <1 per million females
 - Becker muscular dystrophy, a less severe phenotype, <8 per 100,000 males
 - X-linked cardiomyopathy

Screening

Screening

- Creatine kinase (also known as creatine phosphokinase)
 - Two subunits, made of a combination of a muscle type and brain type
 - The muscle isoform, known as CK-MM, is generally used for screening
- Second-tier screening: *DMD* sequencing, but not necessarily confirmatory
- Muscle biopsy is confirmatory but invasive
- No state currently includes DMD newborn screening
 - There has been population screening in the past and there are several smaller screening activities

Treatment

Treatments

- Supportive care, across the lifespan
 - Physical therapy
 - Nutritional management
 - Speech and language services
 - Monitoring by specialists, including pulmonologist, cardiologist
 - Orthopedic and other assistive devices
- Pharmacotherapy
 - Glucocorticoids to reduce muscle cell damage and stabilize muscle cell membranes
 - Exon-skipping drugs
 - Gene therapy

Ongoing Activity

Ongoing activity

- Literature review
 - Going through ~7,000 articles
- The first TEP call was held 10/27/2023
- Key informant interviews regarding DMD NBS experience
- Public health system impact assessment survey to occur in early 2024
- Developing decision-analytic model
- Key challenges:
 - Outcome measures
 - Time horizon

Questions