

## Newborn Screening ACT Sheet [alpha-L-iduronidase deficiency/ With or Without glycosaminoglycans (GAG)] Mucopolysaccharidosis Type 1 (MPS I)

**Differential Diagnosis:** Mucopolysaccharidosis Type 1 (MPS I), also historically known as Hurler syndrome, Hurler-Scheie syndrome, and Scheie syndrome. Pseudodeficiency can result in a positive screen but is not associated with disease.

**Condition Description:** MPS I is an autosomal recessive lysosomal storage disorder (LSD) caused by pathogenic variants in the *IDUA* gene leading to deficient alpha-L-iduronidase activity. It has an estimated incidence of less than 1 in 100,000 live births. This deficiency leads to the accumulation of glycosaminoglycans (also known as mucopolysaccharides) in the lysosome resulting in cellular dysfunction. There is wide variability in severity and age of onset.

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### **YOU SHOULD TAKE THE FOLLOWING ACTIONS:**

- Contact family to inform them of the newborn screening results and ascertain clinical status.
- Take a family history
- Consult with pediatric genetic or metabolic specialist
- Within one week:
  - Evaluate the newborn with attention to presence of umbilical hernia and hepatosplenomegaly (though the newborn exam is usually normal).
- Report findings to state newborn screening program.

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**Diagnostic Evaluation:** Confirmatory alpha-L-iduronidase enzyme assay in leukocytes, urine /or blood glycosaminoglycans (GAGs, also called MPS). Patients with low alpha-L-iduronidase enzyme activity and elevated glycosaminoglycans in urine or blood will have *IDUA* gene analysis. This testing will also help determine if the child has a pseudodeficiency.

**Clinical Considerations:** The clinical presentation and severity of MPS I ranges from severe to attenuated. In general, clinical features may include coarse facies, progressive dysostosis multiplex, hepatosplenomegaly, cardiac valvular disease, umbilical hernia, corneal clouding, hearing loss, and developmental delay. Treatment options include hematopoietic stem cell transplantation, enzyme replacement therapy (ERT), and emerging therapies. Ongoing multi-specialty care is necessary. ERT administration should only be given under the guidance of a specialist with expertise in treatment of lysosomal storage disorders.

### **Additional Information:**

[Gene Reviews](#)  
[Genetics Home Reference](#)  
[OMIM](#)  
[Clinicaltrials.gov](#)

### **Referral (local, state, regional, and national):**

[Testing](#)  
[Find Genetic Services](#)

Disclaimer: This guideline is designed primarily as an educational resource for clinicians to help them provide quality medical care. It should not be considered inclusive of all proper procedures and tests or exclusive of other procedures and tests that are reasonably directed to obtaining the same results. Adherence to this guideline does not necessarily ensure a successful medical outcome. In determining the propriety of any specific procedure or test, the clinician should apply his or her own professional judgment to the specific clinical circumstances presented by the individual patient or specimen. Clinicians are encouraged to document the reasons for the use of a particular procedure or test, whether or not it is in conformance with this guideline. Clinicians also are advised to take notice of the date this guideline was adopted, and to consider other medical and scientific information that become available after that date.

**LOCAL RESOURCES:** Insert State newborn screening program web site links

State Resource site *(insert state newborn screening program website information)*

Name

URL

Comments

Local Resource Site *(insert local and regional newborn screening website information)*

Name

URL

Comments

**APPENDIX: Resources with Full URL Addresses**

*Additional Information:*

Gene Reviews

<https://www.ncbi.nlm.nih.gov/books/NBK1162/>

Genetics Home Reference

<https://ghr.nlm.nih.gov/condition/mucopolysaccharidosis-type-i>

OMIM

<https://www.omim.org/entry/607014?search=hurler&highlight=hurler>

ClinicalTrials.gov

<https://clinicaltrials.gov>

*Referral (local, state, regional and national):*

Testing

<https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=MPS+I>

Find Genetic Services

<https://clinics.acmg.net>

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