INITIATING DIAGNOSIS OF **MORQUIO A**

CLINICAL SUSPICION OF MORQUIO A AND RADIOGRAPHIC IMAGING[3]

Urine screening option

Glycosaminoglycan (GAG) analysis

- Perform quantitative and qualitative assays in parallel
- False negative results are a concern for Morquio A

Direct testing option[a]

Dried blood spot (DBS) screening option

Enzyme activity analysis (DBS)

- Stability is a key consideration
- Measure multiple enzymes

Enzyme activity analysis (fibroblasts/leukocytes)[b]

- Measure multiple enzymes

Molecular analysis[c]

- Sequencing methods followed by quantitative methods if necessary and feasible
- Confirm mutations are on separate alleles
- Two mutations will not always be detectable

Morquio A diagnosis

[a] When evaluating the sibling of an affected individual with a confirmed Morquio A diagnosis or when clinical suspicion of Morquio A is very strong, follow the direct testing option.

[b] In regions where shipping whole blood or other tissue samples is not feasible, DBS enzyme activity results can be combined with molecular analysis to reach a diagnosis.

[c] If screening results (urine or DBS) and enzyme activity results in fibroblasts or leukocytes were both conclusively positive, confirmation by molecular analysis is still recommended but not necessarily required.

Early and **accurate diagnosis** is essential for **optimal patient management**[3]

References: 1. Coutinho MF *et al. Biochem Res Int 2012;2012:471325.* 2. Tomatsu S *et al. Curr Pharm Biotechnol* 2011;12:931–945. 3. Wood TC *et al. J Inherit Metab Dis* 2013;36:293–307. 4. Montaño AM *et al. J Inherit Metab Dis* 2007;30:165–174. 5. Hendriksz CJ *et al. J Inherit Metab Dis* 2013;36:309–322. 6. Gulati MS and Agin MA. *J Spinal Cord Med* 1996;19:12–16. 7. Harmatz P *et al. Mol Genet Metab* 2013;109:54–61. 8. Pelley CJ *et al. Respir Care* 2007;52:278–282. 9. Semenza GL and Pyeritz RE. *Medicine* 1988;67:209–219.

BioMarin Pharmaceutical Australia Pty Ltd
119 Willoughby Rd, Crows Nest, NSW 2065, Ph +61 2 9967 8662,
Medical Information 1800 387 876, medinfoasia@bmrn.com

BIOMARIN®

MORQUIO A:
MULTISYSTEMIC, PROGRESSIVE AND POTENTIALLY LIFE THREATENING

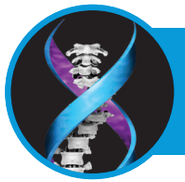
BIOMARIN®

MORQUIO A

- **Morquio A** (mucopolysaccharidosis IV A (MPS IV A)) is an autosomal recessive lysosomal storage disorder. Although commonly perceived as a musculoskeletal condition, it is in fact a progressive, multisystemic disease[1,2]
- The root cause of **Morquio A** is an inherited deficiency in the *N*-acetylgalactosamine-6-sulphatase (GALNS) enzyme. GALNS is a critical lysosomal enzyme that, when inactive or deficient, drives a cascade of progressive metabolic pathologies affecting many organ systems[1,2]
- Patients with a severe phenotype do not normally survive past their second or third decade of life[1]

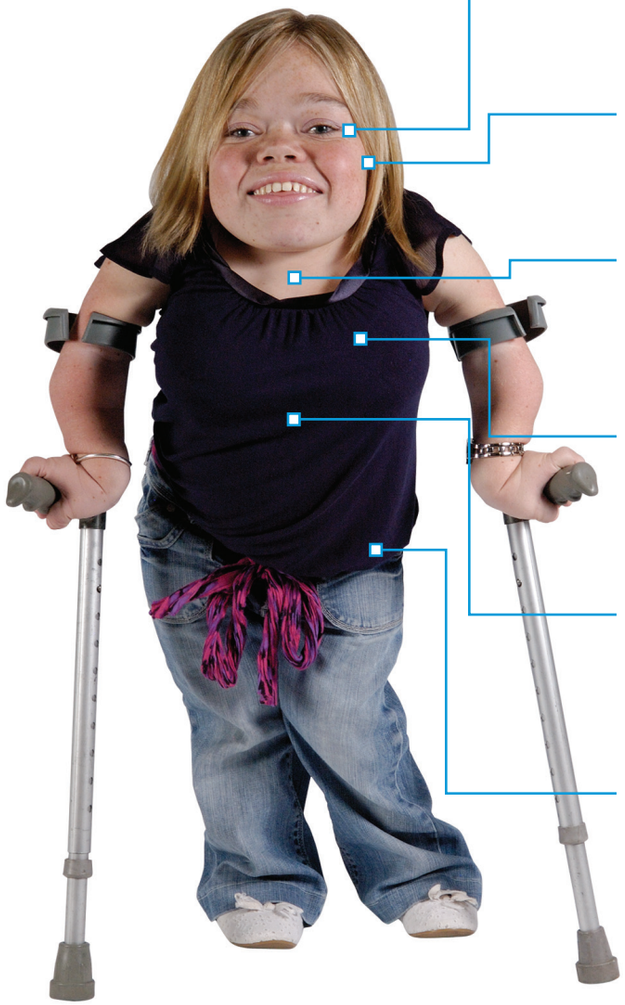
THE **CHALLENGE** OF DIAGNOSIS

- Patients usually appear normal at birth and, depending on the severity of the disease, develop signs and symptoms from the first year of life through to adolescence. Initial signs and symptoms vary between patients and may be present in different combinations[3,4]
- The variability of phenotypic presentation together with a need for multiple diagnostic tests can delay diagnosis of **Morquio A** by years and make misdiagnosis common[3]



Early and **accurate diagnosis** is essential for **optimal patient management**[3]

THE CLINICAL SIGNS AND SYMPTOMS OF **MORQUIO A** ARE MULTISYSTEMIC



OPHTHALMOLOGICAL

Diffuse corneal clouding, cataracts, reduction in visual acuity[5]

EAR, NOSE AND THROAT

Conductive and neurosensory hearing loss, airway obstruction[5]

NEUROLOGICAL

Odontoid dysplasia, cervical myelopathy, cervical spine instability, tetraplegia[2,3,5,6]

CARDIAC

Mitral and aortic valve stenosis and regurgitation, tricuspid regurgitation, hypertrophy[7]

PULMONARY

Obstructive sleep apnoea, respiratory infections, respiratory failure[2,3,8,9]

SKELETAL

Bone deformity, short stature, abnormal gait, joint laxity, contractures and subluxation, dysostosis multiplex[2,3]