CARDIOMYOPATHY ASSOCIATED GENETIC DISORDERS

Hypertrophic Cardiomyopathy (HCM)

Noonan Syndrome

Incidence & Cause
- 1 in 1,000-2,500 live births
- Autosomal dominant inheritance
- 50% of cases caused by genetic mutation in PTPN11 gene

Symptoms & Characteristics
- Distinctive physical/facial appearance: broad or webbed neck, short stature, low set ears, wide set eyes, small jaw, chest deformity, extra skin folds, and congenital heart defects
- Improperly formed bones, blood and lymph vessels; cardiomyopathy; irregular blood clotting, and mild mental retardation

Pompe Disease (Glycogen Storage Disease Type II)

Incidence & Cause
- 1 in 100,000 live births
- Autosomal recessive inheritance
- Acid maltase enzyme deficiency (body cannot break down glycogen)

Symptoms & Characteristics
- Infantile-onset: low muscle tone, muscle weakness, cardiomyopathy, feeding difficulties, failure to thrive, respiratory distress, and hearing loss

Fatty Acid Oxidation Disorders (Carnitine cycle defects, DER, Glutaric Acidemia II, IBCD, LCAD, LCHAD, MADD, MCAD, MKAT, M/SCHAD, SCAD, TFPD, VLCAD)

Incidence & Cause
- 1 in 10,000 live births
- Enzyme deficiency related to the production of energy from fatty acids
- Autosomal recessive inheritance

Symptoms & Characteristics
- Recurrent episodes of illness caused by fasting or reduced food intake, vomiting, and severe lethargy that can progress to a coma
- Low blood sugar, respiratory distress, congestive heart failure with or without arrhythmias, muscle weakness, low muscle tone, cardiomyopathy

Mitochondrial HCM (complex I, II, III, IV deficiency, myoclonic epilepsy, mitochondrial myopathy, adenine nucleotide translocator, MELAS syndrome)

Incidence & Cause
- 1 in 5,000 live births
- Autosomal recessive or maternal inheritance
- Enzyme deficiency related to the production of energy in the mitochondria

Symptoms & Characteristics
- Disturbances in brain and muscle function
- Dementia, weakness, impaired hearing, short stature, exercise intolerance, retinopathy, low muscle tone, cardiomyopathy, and respiratory issues

Dilated Cardiomyopathy (DCM)

Barth Syndrome (3-methylglutaconic aciduria type II)

Incidence & Cause
- 1 in 200,000 live births
- Occurs nearly exclusively in male infants; females can be carriers
- X-linked recessive inheritance: carrier mothers will pass to sons (affected) and daughters (carriers). Affected fathers will pass to daughters (carriers)
- Caused by mutations in TAZ gene on the X chromosome

Symptoms and Characteristics
- Changes in skeletal and cardiac muscle, weakened immune system, growth retardation or gross motor delays, short stature, low muscle tone, muscle weakness, increased levels of organic acids in the urine and blood, and cardiomyopathy

Muscular Dystrophies (Duchenne, Becker, Limb-Girdle 2F, X -linked Emery-Dreifuss)

Incidence & Cause
- 1 in 3,500 to 5,000 live births (Duchene, Becker muscular dystrophies)
- X-linked recessive inheritance
- Caused by mutations in DMD gene
- 1 in 14,500 to 1 in 123,000 individuals (Limb-Girdle)
- Autosomal recessive inheritance
- Caused by mutations in SGCD gene
- 1 in 100,000 people (Emery Dreifuss)
- X-linked recessive inheritance
- Caused by mutation in EMD gene

Symptoms & Characteristics
- Severity, age of onset, and features vary by disease type
- Progressive muscle wasting, abnormally curved lower back or spine, joint stiffness, and cardiomyopathy
- May have delayed motor skills, need wheelchair assistance, and mild to severe breathing problems

Mitochondrial Defects (Kearns-Sayre syndrome)

Incidence & Cause
- 1-3 in 100,000
- Not generally inherited; maternal inheritance is rare
- Caused by large deletion in mitochondrial DNA which leads to decreased energy production and the brain and muscles to not function properly

Symptoms & Characteristics
- Neuromuscular disorder
- Progressive paralysis of certain eye muscles, chronic inflammation and degeneration of retina, cardiomyopathy, muscle weakness, short stature, hearing lost, and ataxia

Please note: Due to the rapidly evolving nature of the genetic testing field the information provided is a general overview of common associations and is not intended to be comprehensive.