

## **List of Rare Diseases and Chronic Illnesses 2015-2016:**

**Achondroplasia:** is a common cause of dwarfism. People with achondroplasia have a large head and short stature, with an average adult height of 52 inches for males and 48 inches for females. A genetic trait, achondroplasia occurs as a result of a fresh (new) spontaneous change (mutation) in genetic material in about 90 percent of cases. In achondroplasia, affected individuals have impaired ability to form bone from cartilage. Achondroplasia appears to affect males and females in relatively equal numbers. This disorder begins in the developing fetus and is one of the most common forms of skeletal dysplasia that causes dwarfism. The estimated frequency of achondroplasia has ranged from about one in 15,000 to one in 35,000 births.

**Barth Syndrome:** This genetic disorder, which affects multiple body systems, is found exclusively in males. It is named after Dutch pediatric neurologist Peter Barth. Though not always present, the cardinal characteristics of this multi-system disorder include: cardiomyopathy (weakened heart), neutropenia (low production of neutrophils, the body's primary defenders against bacterial infections), underdeveloped skeletal musculature and muscle weakness, growth delay and exercise intolerance.

**Brain tumors** (neuroblastoma; medulloblastoma): NB is the most common extracranial solid cancer in childhood and the most common cancer in infancy, with an incidence of about six hundred and fifty cases per year in the U.S. Nearly half of neuroblastoma cases occur in children younger than two years. MB is a highly malignant primary brain tumor that originates in the cerebellum or posterior fossa. Medulloblastomas affect just under 2 people per million per year, and affect children 10 times more than adults.

**Congenital Heart Defects:** or **congenital heart anomaly** is a defect in the structure of the heart and great vessels that is present at birth. Many types of heart defects exist, most of which either obstruct blood flow in the heart or vessels near it, or cause blood to flow through the heart in an abnormal pattern. Other defects, such as long QT syndrome, affect the heart's rhythm. Heart defects are among the most common birth defects and are the leading cause of birth defect-related deaths. Approximately 9 people in 1000 are born with a congenital heart defect. Many defects do not need treatment, but some complex congenital heart defects require medication or surgery.

**Costello Syndrome:** is a rare genetic disorder that affects many parts of the body. It is characterized by delayed development and mental retardation, distinctive facial features, unusually flexible joints, and loose folds of extra skin, especially on the hands and feet. Heart abnormalities are common, including a very fast heartbeat (tachycardia), structural heart defects, and overgrowth of the heart muscle (hypertrophic cardiomyopathy). Infants with Costello syndrome may be large at birth, but grow more slowly than other children and have difficulty feeding.

**Cystic Fibrosis:** is a genetic disorder that affects most critically the lungs, and also the pancreas, liver, and intestine. It is characterized by thick, viscous secretions. Difficulty breathing is the most serious symptom and results from frequent lung infections that are treated with antibiotics and other medications. Other symptoms—including sinus infections, poor growth, and infertility—affect other parts of the body. The main signs and symptoms of cystic fibrosis are salty tasting skin, poor growth and poor weight gain despite normal food intake, accumulation of thick, sticky mucus, frequent chest infections, and coughing or shortness of breath.

**Cystinuria** – Cystinuria is an inherited metabolic disorder characterized by the abnormal movement (transport) in the intestines and kidneys, of certain organic chemical compounds (amino acids). Excessive amounts of undissolved cystine in the urine (cystinuria) cause the formation of stones (calculi) in the kidney, bladder, and/or ureter. The disorder occurs in approximately 1 in 7,000 to 1 in 10,000 people in the United States

**Denys-Drash Syndrome:** Denys-Drash syndrome (DDS) is characterized by abnormal kidney function, a cancerous tumor of the kidney called Wilms tumor. DDS is a genetic disorder caused by mutations in the Wilms tumor suppressor gene, WT1. The condition first manifests as early nephrotic syndrome and progresses to mesangial renal sclerosis and ultimately renal failure, usually within the first three years of life

**Duchenne Muscular Dystrophy:** is a form of muscular dystrophy, affecting around 1 in 3,600 boys, which results in muscle degeneration and eventual death. Symptoms usually appear in male children before age 6 and may be visible in early infancy. Due to progressive deterioration of muscle, loss of movement occurs, eventually leading to paralysis. Intellectual impairment may or may not be present but if present, does not progressively worsen as the child ages. The average life expectancy for patients afflicted with DMD is around 25.

**Eosinophilic Esophagitis:** Eosinophilic esophagitis (EoE) is a chronic disorder of the digestive system in which large numbers of a particular type of white blood cell called eosinophils are present in the esophagus. The esophagus is the tube that carries food from the mouth to the stomach. Eosinophils are an important part of the immune system and play a role in immune regulation and fighting certain infection. The production and accumulation of eosinophils may be caused by many factors such as particular foods or environmental irritants in some affected individuals. Some individuals with this condition have been found to have an unusually high expression of a particular gene called eotaxin-3 and an abnormal eotaxin-3 gene. This condition is characterized by vomiting, stomach or chest pain, failure to thrive (particularly in children), difficulty swallowing, and food getting stuck in the throat.

**Familial Hypercholesterolemia:** Familial hypercholesterolemia is a disorder that is passed down through families. It causes LDL ("bad") cholesterol levels to be very high. The condition begins at birth and can cause heart attacks at an early age. Familial hypercholesterolemia is a genetic disorder. It is caused by a defect on chromosome 19. The defect makes the body unable to remove low density lipoprotein (LDL, or "bad") cholesterol from the blood. This results in high levels of LDL in the blood. High levels of LDL cholesterol make you more likely to have narrowing of the arteries from atherosclerosis at an early age. The condition is typically passed down through families in an autosomal dominant manner. That means you only need to get the abnormal gene from one parent in order to inherit the disease. In rare cases, a child may inherit the gene from both parents. When this occurs, the increase in cholesterol levels is much more severe. The risk for heart attacks and heart disease are high even in childhood.

**Henoch-Schonlein purpura** - Henoch-Schönlein purpura is a rare inflammatory disease of the small blood vessels (capillaries) and is usually a self-limited disease. It is the most common form of childhood vascular inflammation (vasculitis) and results in inflammatory changes in the small blood vessels. The symptoms of Henoch-Schönlein purpura usually begin suddenly and may include headache, fever, loss of appetite, cramping abdominal pain, and joint pain. Red or purple spots typically appear on the skin (petechial purpura). Inflammatory changes associated with Henoch-Schönlein purpura can also develop in the joints, kidneys, digestive system, and, in rare cases, the brain and spinal cord (central nervous system). Henoch-Schönlein purpura is a rare

disorder that affects more males than females. The disease may occur in all age groups, although it most commonly affects children. Most affected children have been between 2 and 11 years of age. In the USA, about 14 cases occur per 100,000 school-aged children.

**Hunter Syndrome:** is a serious genetic disorder that primarily affects males. It interferes with the body's ability to break down and recycle specific mucopolysaccharides (sugars). The symptoms of Hunter syndrome are generally not apparent at birth, but usually start to become noticeable after the first year of life. Often, the first symptoms of Hunter syndrome may include abdominal hernias, ear infections, runny noses, and colds. Since these symptoms are quite common among all infants, they are not likely to lead a doctor to make a diagnosis of Hunter syndrome right away. Physical appearances of many children with Hunter syndrome include a distinctive coarseness in their facial features, including a prominent forehead, a nose with a flattened bridge, and an enlarged tongue. For this reason, unrelated children with Hunter syndrome often look alike. They may also have a large head as well as an enlarged abdomen. Many continue to have frequent infections of the ears and respiratory tract.

**Juvenile Rheumatoid Arthritis:** Juvenile rheumatoid arthritis, also known as juvenile idiopathic arthritis, is the most common type of arthritis in children under the age of 17. Juvenile rheumatoid arthritis causes persistent joint pain, swelling and stiffness. Some children may experience symptoms for only a few months, while others have symptoms for the rest of their lives. Some types of juvenile rheumatoid arthritis can cause serious complications, such as growth problems and eye inflammation. Treatment of juvenile rheumatoid arthritis focuses on controlling pain, improving function and preventing joint damage.

**Klippel-Feil Syndrome:** Klippel-Feil syndrome (KFS) is a rare skeletal disorder primarily characterized by abnormal union or fusion of two or more bones of the spinal column (vertebrae) within the neck (cervical vertebrae). Some affected individuals may also have an abnormally short neck, restricted movement of the head and neck, and a low hairline at the back of the head (posterior hairline) and fusion of certain ribs or other rib defects. The disorder is present at birth (congenital), but mild cases may go undiagnosed until later during life when symptoms worsen or first become apparent. KFS may sometimes be associated with additional physical abnormalities. These may include structural malformations of the heart, hearing impairment, kidney defects, and neurologic complications. The exact incidence of the disorder is unknown, although reports estimate that the condition occurs in approximately 1 in 42,000-50,000 live births. KFS affects females more frequently than males.

**Leukodystrophy:** is group of disorders characterized by degeneration of the white matter in the brain. The most common symptom of a leukodystrophy disease is a gradual decline in an infant or child who previously appeared well. Progressive loss may appear in body tone, movements, gait, speech, ability to eat, vision, hearing and behavior. There is often a slowdown in mental and physical development.

**Maple Syrup Disease** – also called branched-chain ketoaciduria is a genetic disorder where the body is unable to process certain protein building blocks (amino acids). The name comes from the sweet odor of affected infants' urine, and the smell can also be in the ear wax. Infants with this disease seem healthy at birth but if left untreated suffer severe brain damage and eventually die. From early infancy, symptoms of the condition include poor feeding, vomiting, dehydration, lethargy, hypotonia, seizures, hypoglycemia, ketoacidosis, pancreatitis, coma and neurological decline. Maple syrup urine disease affects approximately 1 out of 180,000 infants, and occurs most commonly in the Amish and Mennonite population.

**Marfan Syndrome** – Genetic disorder affecting the connective tissue in the body. Connective tissue holds all the body's cells, organs and tissue together. It also plays an important role in helping the body grow and develop properly. People with Marfan tend to be unusually tall, with long limbs and long, thin fingers. This disease affects the heart, blood vessels, bones, joints, eyes, lungs and skin. Estimates indicate about one in 3,000 to 5,000 individuals have Marfan syndrome.

**Metatropic Dysplasia** – This is a genetic mutation characterized by dwarfism, enlarged joints, problems with vision and hearing. The word “metatropic” is derived from the Greek word “metatropos” meaning “changing form”. Clinically, this is one that progresses over time. Affected individuals develop curvature of the spine and degenerative arthritis. Because it is so uncommon, the exact incidence is not known.

**Morquio Syndrome** – This is a rare, inherited birth defect with serious consequences. It affects the mucopolysaccharides (sugar), useful to the body as a lubricant or as a shock absorber. This disease affects the heart, dwarfism and skeletal deformities, visual problems, and dental issues. Patients with Morquio syndrome appear healthy at birth. A patient with Morquio's syndrome is likely to die at an early age. The chances of getting Morquio are 1 in 200,000.

**Pelizaeus-Merzbacher Disease** – PMD is a rare central nervous system disorder in which coordination, involuntary movements, weakness, and intellectual function are delayed to various extents; mild to severe. Muscle contractures often occur over time, and mental function deteriorates. It is a genetic disorder, and is often misdiagnosed with cerebral palsy. Diagnosis is made with MRI identifying abnormal white matter in the brain.

**Primordial dwarfism** - is a form of dwarfism that results in a smaller body size in all stages of life beginning from before birth. More specifically, primordial dwarfism is a diagnostic category including specific types of profoundly proportionate dwarfism, in which individuals are extremely small for their age, even as a fetus. Most individuals with primordial dwarfism are not diagnosed until they are about 3 years of age. It is rare for individuals affected by primordial dwarfism to live past the age of 30.

**Rett Syndrome:** Rett syndrome is a progressive neurodevelopmental disorder that almost exclusively affects females. Only in rare cases are males affected. Infants with Rett syndrome generally develop normally for about 7 to 18 months after birth. At this point, they lose previously acquired skills (developmental regression) such as purposeful hand movements and the ability to communicate. Additional abnormalities occur including impaired control of voluntary movements (ataxia) and the development of distinctive, uncontrolled hand movements such as hand clapping or rubbing. Some children also have slowing of head growth (acquired microcephaly), Affected children often develop autistic-like behaviors, breathing irregularities, feeding and swallowing difficulties, growth retardation, and seizures.

**Sickle Cell Disease:** Sickle cell disease is a rare inherited blood disorder. It is characterized by the presence of sickle or crescent shaped red blood cells (erythrocytes) in the bloodstream. These abnormally-shaped cells become rigid and lodge themselves in the very tiny blood vessels (capillaries) of the peripheral blood system (blood vessels outside of the heart). The capillaries become clogged, preventing the normal flow of oxygen to tissues. Common symptoms associated with sickle cell disease include chest pain, frequent infections, yellowing of the skin (jaundice), and low levels of circulating red blood cells (anemia).

**Skeletal dysplasia** - Skeletal dysplasia is the medical term for what most people refer to as “dwarfism”. The term is an umbrella for a group of hundreds of conditions affecting bone and cartilage growth. A child born with skeletal dysplasia will have abnormal differences in the size and shape of their legs, arms, trunk, or skull. He or she may be very short in stature. Additionally, he or she may also have arms and legs that are not in proportion with the rest of the body. Skeletal dysplasia is a genetic condition. A change or defect in a specific gene, called a mutation, causes the problems in growth. As a whole, skeletal dysplasia is an uncommon condition. It affects about one in every 4,000 births

**Spinal Muscular Atrophy** – SMA is a disease caused by a genetic defect in the survival motor neuron 1 gene. SMN1 is apparently selectively necessary for survival of motor neurons, as diminished abundance of the protein results in death of neuronal cells in the anterior horn of the spinal cord and subsequent system-wide muscle wasting (atrophy). SMA manifests in various degrees of severity, which all have in common general muscle wasting and mobility impairment. Other body systems may be affected as well, particularly in early-onset forms. SMA is the most common genetic cause of infant death.

**Tuberous Sclerosis:** Tuberous sclerosis is a rare genetic multisystem disorder that is typically apparent shortly after birth. The disorder may be characterized by episodes of uncontrolled electrical activity in the brain (seizures); mental retardation; distinctive skin abnormalities (lesions); and benign (noncancerous), tumor-like nodules of the brain, certain regions of the eyes, the heart, the kidneys, the lungs, or other tissues or organs. In addition, many affected individuals may have cyst-like areas within certain skeletal regions, particularly bones of the fingers and toes. Characteristic skin lesions include sharply defined areas of decreased skin coloration that may develop during infancy and relatively small reddish nodules that may appear on the cheeks and nose beginning at approximately age four. In most individuals with tuberous sclerosis, the disorder results from spontaneous genetic changes (mutations) that occur for unknown reasons. Tuberous sclerosis is a rare genetic disorder that affects 1 in 10,000 people in the United States.

**XYY Syndrome:** XYY syndrome is a rare chromosomal disorder that affects males. It is caused by the presence of an extra Y chromosome. Males normally have one X and one Y chromosome. However, individuals with this syndrome have one X and two Y chromosomes. Affected individuals are usually very tall. Many experience severe acne during adolescence. Additional symptoms may include learning disabilities and behavioral problems such as impulsivity.