There are five major conditions involving large changes of chromosome 18. Each of these conditions has a wide variety of characteristics. Additionally, each of the conditions can vary in severity. Although every child with a chromosome change is different, these pages provide a general idea of the medical and developmental concerns that are associated with the conditions.

If you are unfamiliar with genetic concepts, we encourage you to visit our website (www.chromosome18.org). There, you will find several podcasts that introduce genetic concepts. Understanding basic genetics will help give the information provided here more meaning.

The diagram below illustrates a pair of normal chromosome 18's. The conditions of chromosome 18 occur when there are changes in one of these two chromosomes. The five most common changes are shown below.
Background and Genetic Basis

There are two groups of people with 18q deletions: those with deletions involving the end of the chromosome (known as distal deletions), and those with deletions closer to the centromere (known as proximal deletions). The goal of this article is to describe the major features of distal deletions of 18q, which we will refer to as “distal 18q-” for the rest of this article. The information contained here was obtained from a thorough review of the literature as well as from the experiences of the Chromosome 18 Clinical Research Center. This information may help you and your healthcare team make decisions about how to care for a person with distal 18q-.

As you read through this article, remember that no two people with distal 18q- are exactly alike. One person may have different medical and developmental concerns from another person with distal 18q-. Also, remember that no one with distal 18q- will have all of the features listed below. In addition, people with distal 18q- share many features with their family members. They will also have their own unique skills and abilities which you will not find in the following list.

Research is critical. As we learn more about distal 18q-, we will also learn more about how to best treat it. This will improve the health and development of people with distal 18q-.

Background

About 1 in every 40,000 babies is born with distal 18q-. It is the second most common syndrome involving chromosome 18. Only trisomy 18 is more common.

Distal 18q- has been called several different names. You may hear this condition called “monosomy 18q”, “18q deletion syndrome”, “partial 18q deletion”, or “de Grouchy Syndrome”.

Genetic Basis of Distal 18q-

The term “distal 18q-” means that part of the long arm of chromosome 18 is missing, or deleted, from one of the two copies of chromosome 18. For more information about basic genetic concepts, please visit our website at www.chromosome18.org.

The diagram on the upper left shows how the bands on chromosome 18 are labeled. Most distal deletions start at band 21, 22, or 23. Distal deletions usually include the tip of the chromosome. The diagram on the lower left shows which parts of chromosome 18 are involved with these two different types of deletions.
Characteristics of Distal 18q-

Development

Distal 18q- changes the way the brain develops and works.

Infants, toddlers and young children with 18q- may develop more slowly than those without distal 18q-. For example, it may take a little longer for them to roll over, sit, crawl, and walk. It may also take longer for them to reach for and grab toys, hold a bottle, and to feed themselves. Language skills may also develop later than their peers.

People with distal 18q- may have some mental impairment, though the degree of impairment varies between individuals. Based on standardized testing, people with distal 18q- have IQ scores ranging from above-average to severe mental impairment.

Neurological Changes

They may have low muscle tone (hypotonia). Changes in muscle tone can lead to other difficulties. For example, infants with low muscle tone may have difficulty eating because the muscles surrounding the mouth are weak. People with distal 18q- may also have poor reflexes or tremors. About 10% of people with distal 18q- have seizures.

If a person has neurological problems, they may see a neurologist. If seizures are suspected, a doctor may request an electroencephalogram (EEG).

MRI Changes

Changes in the amount of myelin in the central nervous system have been seen on MRIs of people with distal 18q-. Myelin is a substance that covers nerve cells much the way the plastic coating covers the wire in an electric cord. The myelin helps transmit electrical signals to and from the brain. It appears that many people with distal 18q- have less myelin. At this point in time, we do not know if or how these changes in the amount of myelin affect a child’s development.

Eyes and Vision

Vision problems are common. The eyes may be misaligned (strabismus) or move involuntarily (nystagmus). Changes in the optic nerve (the nerve that carries signals from the eye to the brain) have also been seen in individuals with distal 18q-. Lastly, small gaps in one of the structures of the eye (coloboma) have been reported in a small minority of individuals.

Because vision problems are possible, people with distal 18q- should have regular eye exams.
**Ear and Sinus Infections**

Babies, toddlers, and children with distal 18q- may have more ear infections than other children. They often have small differences in the structure of the midface (the area between the forehead and the lower jaw). This can lead to poor fluid drainage from the middle ears. A build-up of fluid in the ear can lead to ear infections. In turn, this may lead to hearing problems. Therefore, it is important to identify and treat ear infections. Most of the time, medicine is prescribed to treat the ear infection. Some children may require surgery to insert tubes in the ears to reduce the number of ear infections.

It may be difficult for doctors to diagnose an ear infection in children with distal 18q-. This is because they often have very narrow ear canals (stenosis), or ear canals that end before reaching the ear drum (atresia). In children with these types of changes, the doctor cannot see the eardrum. If a child has symptoms of an ear infection, but the doctor cannot see the ear drum, the doctor may assume that the child has an ear infection and prescribe an appropriate treatment.

Children with 18q- also have more sinus infections than the average child. Sinus and ear infections may have similar symptoms, such as a fever or fussiness. However, the two infections are treated differently. It is important that your doctor know that children with distal 18q- can have frequent sinus infections. This will help them to make a correct diagnosis and to treat the child appropriately.

**Hearing Loss**

Hearing loss is fairly common in distal 18q-. The degree of loss varies from mild to severe.

Some people have hearing loss because their ear canals are narrow or end before they reach the ear drum. Cleft palates may also contribute to hearing loss. Other people have changes in the nerve that moves sound from the inner ear to the brain. As mentioned above, ear infections may also cause hearing loss.

Because there are several things that can cause hearing loss in people with distal 18q-, they should have regular hearing screening. This will help find and treat hearing loss early.

**Cleft Lip and Palate**

Cleft lips and palates are more common in babies with distal 18q- than in those without distal 18q-. The palate is the roof of the mouth. Sometimes the palate does not form correctly during development. This results in an opening in the roof of the mouth. A cleft lip occurs when the tissue that forms the upper lip does not fuse during prenatal development. Cleft lip and palate may lead to dental, hearing, speech, and feeding problems.

In most cases, a team of professionals is involved in the management of cleft lip and palate. This team may include surgeons, speech pathologists, dentists, audiologists, geneticists, and other professionals. To locate a team in your area, contact the Cleft Palate Foundation (www.cleftline.org).
Heart

Heart defects are found in about 25-35% of babies with distal 18q-. They may have a hole in the wall separating the chambers of the heart. These types of defects are called “septal defects.” There may be changes in the heart valves as well as the major blood vessels that connect to the heart.

Because heart defects are more common in babies with distal 18q-, they may have an ultrasound of the heart (echocardiogram) to look for defects.

Gastrointestinal Changes

Infants and toddlers with distal 18q- may have problems with reflux. This occurs when the stomach contents flow upwards. This can cause pain, irritability, and vomiting. Medication may be helpful for people with reflux. In more severe cases, surgery may be required.

Hernias may also occur in babies with distal 18q-. A hernia occurs when some organs, often the intestines, push outside of the abdomen. This problem is usually corrected by surgery.

Genitourinary Changes

Males with distal 18q- may have some changes in the genital region. The testicles may not be fully descended (cryptorchidism). The opening of the urethra may not be at the end of the penis (hypospadias). The penis may turn downward (chordee). In some cases, surgery may be required to correct these concerns.

Changes in the kidneys occur in a small number of males and females with distal 18q-. Some people have vesicoureteral reflux. This occurs when urine flows from the bladder up towards the kidneys. This can lead to recurrent urinary tract infections.

A doctor may order an abdominal ultrasound to rule out structural changes in the kidney. A test called a voiding cystourethrogram may be ordered to examine the flow of urine in the urinary tract.

Orthopedic Changes

Foot abnormalities are fairly common in people with distal 18q-. They may be born with a clubfoot or “rocker bottom” feet. They may also have flat feet or high arches and overlapping toes.

People with distal 18q- may have “bow-leggedness” (genu varum). They may also develop scoliosis or curvature of their spine. All of these bone problems can affect the way they walk and may lead to gait abnormalities.

People with foot, knee, or spinal changes may see an orthopedic specialist. Braces and inserts, surgery, and therapy may help in addressing orthopedic concerns.
Growth

Children and adults may have changes in their growth patterns. Children with distal 18q- are often small for their age. In some cases, this is due to growth hormone deficiency. Treatment with growth hormone helps normalize growth and may improve a child’s development.

If there is a concern regarding growth, a person can see a pediatric endocrinologist to rule out growth hormone deficiency. You can find several articles about growth hormone deficiency in people with chromosome 18 conditions on our website (www.chromosome18.org).

In addition to short stature, many people with distal 18q- have microcephaly, or a head size that falls below the 3rd centile.

Thyroid Changes

Some people with distal 18q- have thyroid problems. Thyroid hormones regulate a number of functions in the body, including how fast the heart beats and how quickly a person burns calories. Some signs of low thyroid hormone include fatigue, weight gain, and depression.

People with distal 18q- should be screened for thyroid problems once a year. This is because thyroid problems can arise at any time in their life. This screening can be done through an annual blood test. If a thyroid problem is found, an endocrinologist may prescribe medications to treat the problem.

Immunology

Low levels of IgA are found in some people with distal 18q-. IgA is a protein that helps fight off infections. People who have a low level of IgA are more likely to get infections and colds. For example, they may have lots of ear and sinus infections.

In most cases, IgA deficiency is managed by treating infections, allergies, and asthma early.

Facial Features

People with distal 18q- may have facial features that are slightly different from other family members. These changes do not affect a child’s health or development. They are simply small differences that might be noted by a doctor.

The middle of their face may look flat. Their eye openings may be short or slant upwards or downwards. They may have an extra fold of skin covering the corner of the eye. Their ears might be lower and look slightly different than a “typical” ear.

Although people with distal 18q- may have facial features in common with one another, it is important to remember that they also have features in common with their family members.
Family Planning and Genetic Counseling

Many parents wonder, “If we have another child, what is the chance that our next child will have distal 18q-?”

The answer to this question depends on whether a chromosome change has been identified in one of the parents. In most cases, neither parent has a chromosome change. In this situation, the chance that a couple will have another child with distal 18q- is low.

In a small number of families, one parent has an 18q deletion. If a parent has a deletion, there is a 50% chance that they will have a child with distal 18q-.

In some families, the deletion of 18q results from a more complicated chromosome rearrangement in a parent, such as a translocation. In this situation, the likelihood that another child would have a chromosome change depends on what type of rearrangement the parent has and which chromosomes are involved.

If you have questions about the implications of a chromosome change for other family members, we recommend contacting a genetics provider.

For Additional Information

The information provided here is general information based on the literature as well as the experiences in the Chromosome 18 Clinical Research Center. However, every person with 18p- is different. Therefore, this information should not replace professional medical advice, diagnosis, or treatment. If you have questions or concerns, you may find it helpful to talk with a clinical geneticist or genetic counselor. You can locate a genetics provider at one of these sites:

GeneTests Clinic Directory (www.geneclinics.org)

National Society of Genetic Counselors (www.nsgc.org)

Photographs courtesy of Rick Guidotti of Positive Exposure (www.positiveexposure.org)
Selected References


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If you found this information helpful, or would like to learn more about the Chromosome 18 Registry & Research Society, we encourage you to become a member of our organization.

To become a member, visit our website at www.chromosome18.org or call us at 210-657-4968.

With your help, we will achieve our mission:

To help individuals with chromosome 18 abnormalities overcome the obstacles they face so they might lead healthy, happy, and productive lives.