What is Joubert Syndrome 2?
Joubert syndrome 2 (JBTS2) is an inherited disease characterized by brain malformations, developmental delay, low muscle tone, and breathing abnormalities. Signs and symptoms of JBTS2 are thought to be caused by the abnormal functioning of cilia, which are hair-like structures found on the surface of all cells of the body. JBTS2 is also known as cerebello-oculo-renal syndrome 2 (CORS2).

What are the Symptoms of Joubert Syndrome 2 and What Treatment is Available?
Individuals with JBTS2 have variable symptoms, including:
- Brain malformations
- Mild to severe delayed development and intellectual disability
- Hypotonia (low muscle tone) in infancy, followed by ataxia (difficulty coordinating movements)
- Abnormal eye movements
- Abnormal breathing patterns

Other symptoms of JBTS2 may include:
- Polydactyly (extra fingers and/or toes)
- Oral hamartomas (skin tags in the mouth)
- Abnormal kidney function

There is no cure for JBTS2 and treatment includes supportive care for symptoms.

How is Joubert Syndrome 2 Inherited?
JBTS2 is an autosomal recessive disease suggested to be caused by mutations in the TMEM216 gene. An individual who inherits one copy of a TMEM216 gene mutation is a “carrier” and is not expected to have related health problems. An individual who inherits two copies of the c.218G>T (p.R73L) mutation one from each parent, is expected to be affected with JBTS2. Integrated Genetics includes the c.218G>T (p.R73L) mutation in its Inheritest profile. Other mutation combinations in the TMEM216 gene may result in either JBTS2 or another disease known as Meckel syndrome.

If both members of a couple are carriers, the risk for an affected child is 25% in each pregnancy; therefore, it is especially important that the reproductive partner of a carrier be offered testing.

Who is at Risk for Joubert Syndrome 2?
Joubert syndrome 2 can occur in individuals of any ethnicity; however, it is most common in individuals of Ashkenazi (Eastern European) Jewish ancestry. In the Ashkenazi Jewish population, the carrier frequency has been found to be 1/92 and the incidence of JBTS2 is calculated to be approximately 1 in 33,800.

Having a relative who is a carrier or is affected can also increase an individual’s risk of being a carrier. Consultation with a genetics health professional may be helpful in determining carrier risk and appropriate testing.

What Does a Positive Test Result Mean?
If a gene mutation is identified, an individual should speak to a physician or genetic health professional about the implications of the result and appropriate testing for the reproductive partner and at-risk family members.
What Does a Negative Test Result Mean?
A negative result reduces, but does not eliminate, the possibility that an individual carries a gene mutation. The likelihood of being a carrier is also influenced by family history, medical symptoms, and other relevant test results.

Where Can I Get More Information?
- NIH Office of Rare Diseases Research - Genetic and Rare Diseases (GARD) Information Center [www.rarediseases.info.nih.gov/GARD/](http://www.rarediseases.info.nih.gov/GARD/)

References