A Guide for Individuals and Families

What is...

Becker Muscular Dystrophy

Becker muscular dystrophy (BMD) is a genetic disorder characterized by progressive weakness and degeneration of the skeletal muscles that control movement. Heart muscle also is commonly affected, making cardiac problems a prominent feature of the disease.

There are approximately 11,000 people living with either BMD or DMD in the United States.

BMD is classified as a **dystrophinopathy**, a muscle disease that results from the deficiency of a protein called dystrophin.

In both Duchenne muscular dystrophy (DMD) and BMD, **a variation in the *DMD* gene** interferes with production of the **dystrophin protein,** a critical component in the formation and maintenance of healthy muscle. A BMD-causing gene variant typically leads to an abnormal version of the dystrophin protein that is only partially functional. However, lack of fully functional dystrophin protein in muscle cells causes them to be fragile and become damaged with use.

Because the **DMD gene** is located on the X chromosome, **BMD primarily affects males, while females typically are carriers.** Some females can experience varying ranges of physical symptoms, including muscle weakness and cramps, and are therefore called manifesting carriers.

BMD typically is inherited through the mother; however, in **some of cases**, it occurs **spontaneously** in people who do not have a family history of the disease.

There is no cure for BMD, but medications, assistive devices, and therapy can help manage some symptoms and improve quality of life.

MDA® Muscular Dystrophy Association

What are the signs and symptoms of BMD?

BMD is a multi-systemic condition, affecting many parts of the body and resulting in atrophy of the skeletal, cardiac (heart), and pulmonary (lung) muscles.

Nervous system

- Developmental delay
- Motor delay

Cognition

- Learning disability
- Behavioral deficits

Gastrointestinal

- Dysphagia
- Constipation
- Reflux
- Gastroparesis

Lungs

- Breathing difficulties
- Respiratory infections
- Sleep apnea

Skeleton and muscle

- Muscle weakness
- Fatigue
- Loss of balance
- Impaired coordination
- Muscle cramps
- Difficulty walking
- Difficulty climbing stairs
- Exercise intolerance
- Reduced stamina
- Gait abnormalities
- Walking on the tips of toes
- Contractures
- Pseudohypertrophy
- Lordosis
- Scoliosis

Heart

- Cardiomyopathy
- Congestive heart failure
- Arrhythmias
- Swelling in the feet and lower legs

What should I know about BMD?

1. BMD is closely related to Duchenne muscular dystrophy (DMD), which is caused by different variations in the same gene. Because disease progression and treatment plans differ between the two disorders, a BMD diagnosis should be confirmed with genetic testing.

2. A defining feature of BMD is a high degree of variability in symptoms—including onset, severity, and correlation between symptoms—and rate of disease progression from one individual to another. Although both skeletal and cardiac (heart) muscle typically are affected, there is no apparent association between the two. So, a boy could experience any range of skeletal muscle weakness, from mild to severe, paired with any level of cardiac involvement; the character of one does not correlate with the other.

3. Muscle weakness can begin at any time from childhood into the early 20s, but it usually becomes apparent between the ages of 5 and 15 years.

4. In some cases, the first sign of disease may be a heart condition called dilated cardiomyopathy. This form of heart disease enlarges and weakens the heart muscle, preventing it from pumping blood efficiently. Dilated cardiomyopathy progresses rapidly and can be life threatening.

5. Skeletal muscle weakness often begins in the legs and pelvic area and slowly progresses to the muscles of the shoulders, neck, arms, and respiratory system. Over time, affected individuals begin to have difficulty walking, running, hopping, and jumping, and they may have frequent falls. Although loss of muscle mass is common, the calves may become enlarged.

6. Some individuals with BMD will have problems getting up from the floor and may use a distinctive method known as Gower's maneuver or Gower's sign to "walk" their hands up their thighs in order to stand up.

7. Other symptoms of BMD can include cognitive problems, fatigue, loss of balance and coordination, and breathing problems. A small percentage of boys with the disease have some degree of learning disability, including problems in three general areas: attention, verbal learning and memory, and emotional interaction.

8. The diaphragm and other muscles involved in breathing typically weaken, making the lungs less effective at moving air in and out. Signs of poor respiratory function can include headaches, difficulty concentrating or staying awake, and nightmares. Weakened respiratory muscles also make it difficult to cough, leading to increased risk of serious respiratory infection.

9. Medical and scientific advances are helping to improve quality of life, and people with BMD often survive into their 40s and beyond.

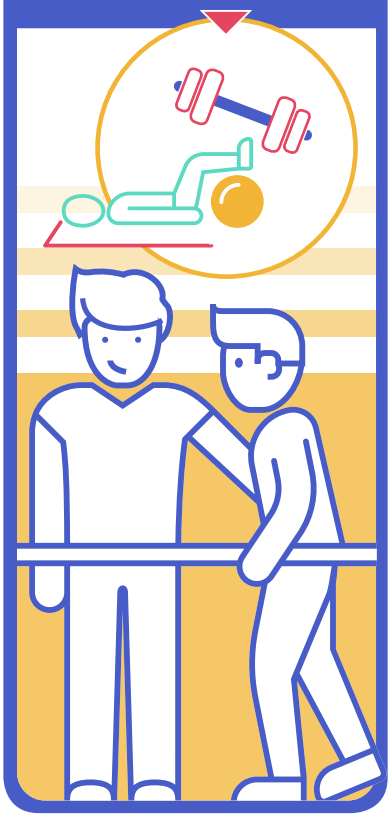
How is BMD treated?

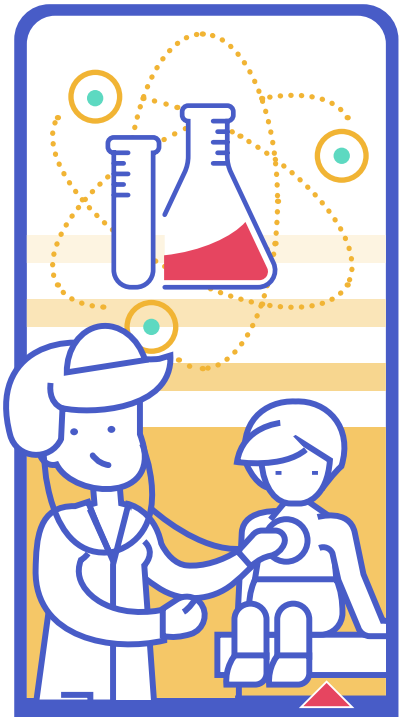
Over-the-counter pain relievers may be used to treat muscle pain or cramps.

Wheelchairs or scooters may be used to help maintain mobility.

Braces, also called orthoses, support the ankle and foot or may extend up over the knee. Ankle-foot orthoses (AFOs) are sometimes prescribed for night wear to keep the foot from pointing downward and keep the Achilles tendon stretched while a child is sleeping.

Physical therapy through exercise helps to restore and maintain muscle strength and function. Stretching helps to maintain range of motion.





Corrective orthopedic surgery, including spine-straightening surgery, may help make sitting, sleeping, and breathing more comfortable.

Speech therapy can help with swallowing problems.

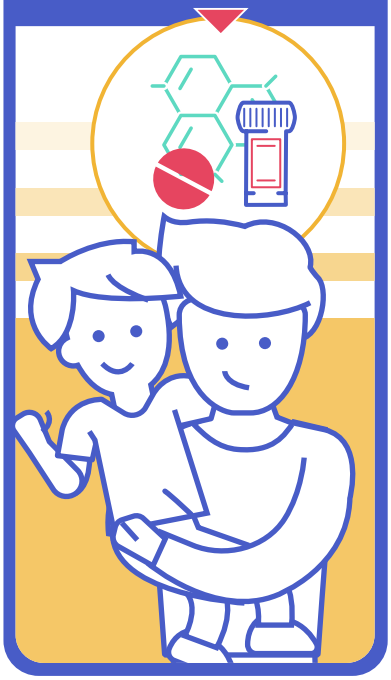
Assisted ventilation can help treat respiratory muscle weakness.

Treatment with angiotensin converting enzyme (ACE) inhibitors and beta blockers may be used to slow the course of cardiac muscle deterioration in BMD. Cardiac evaluations are recommended beginning at around 10 years old, or when symptoms first begin, and be repeated at least every two years.

Educational and psychological interventions can help with learning disabilities.

Occupational therapy can help improve daily living and work skills.

Corticosteroids (such as prednisone and Emflaza) may be prescribed in BMD to help preserve muscle strength and function, to prevent scoliosis, and to prolong the time that people with BMD can walk. It's thought that they work, at least in part, by reducing inflammation. However, corticosteroids also cause unwanted side effects such as increased appetite, weight gain, loss of bone mass, and cataracts.



Please talk to your medical provider to obtain more information on these treatments.

MDA Glossary

Atrophy
A decrease in the size and mass of muscle tissue

Cardiomyopathy
A condition in which the heart muscle is weakened, making it harder for the heart to pump blood to the body

Contracture
A shortening of muscles or tendons around joints that can limit mobility

Corticosteroid
One of a group of steroid hormones that has been shown to dampen the inflammatory response in damaged muscle

Dysphagia
Difficulty swallowing

Gastroparesis
A condition that affects the ability of the stomach to empty its contents into the small intestine, even though there is no blockage; also known as delayed gastric emptying

Gene variant
A flaw in the DNA code

Gower's maneuver
A person's use of their hands and arms to "walk" up their own body in order to rise from a squatting position; indicates weakness of the muscles in the hips and legs

Lordosis
Posture characterized by an inward curving of the lower back

Muscular dystrophy
A term that refers to a number of diseases that cause progressive loss of muscle mass, resulting in weakness and sometimes, loss of mobility

Pseudohypertrophy
A condition in which muscles become enlarged with deposits of fat and fibrous tissue

Scoliosis
An abnormal sideways curvature in the spine that occurs when weakened muscles are unable to hold the spine straight

To learn more about BMD, visit mda.org or contact the MDA Resource Center at 833-ASK-MDA1 (275-6321).

66-0015 June 2021