# **Myotonic Dystrophy**

also known as Steinert's disease

A genetic disorder that affects the muscles and other body systems. It is characterized by progressive muscle weakness and myotonia, a delayed relaxation of muscles after contraction. DM is caused by an expanded repetition of a DNA sequence in specific genes, which leads to the abnormal function of various organs and tissues in the body.

DM - Dystrophia Myotonica

Two Types:

**Type 1 (DM1)**:

DM1 is the most common form of myotonic dystrophy. It is caused by an expanded CTG repeat in the DMPK gene on chromosome 19. Symptoms usually appear in adolescence or adulthood and can vary widely in severity. Common symptoms include muscle weakness, myotonia (difficulty relaxing muscles after contraction), early-onset cataracts, heart conduction defects, intellectual impairment, and endocrine abnormalities.

DMPK-Dystrophia Myotonica-Protein Kinase

**Type 2 (DM2)**:

This form of myotonic dystrophy is caused by an expanded CCTG repeat in the CNBP gene on chromosome 3. DM2 shares many similarities with DM1 but tends to have a milder course and later onset of symptoms. Common symptoms include muscle weakness, myotonia, cataracts, cardiac abnormalities, and endocrine dysfunction.

CNBP-Cellular Nucleic acid Binding Protein

**Symptoms**:

* Progressive muscle weakening
* Difficulty relaxing muscles after use (Myotonia)
* Muscle weakness, especially in the face, neck, and distal muscles
* Muscle wasting (Atrophy)
* Fatigue
* Respiratory problems, including sleep-disordered breathing
* Cardiac abnormalities, such as arrhythmias and conduction defects
* Early-onset cataracts
* Gastrointestinal issues, including difficulty swallowing (Dysphagia) and constipation
* Endocrine abnormalities, such as insulin resistance and thyroid dysfunction
* Cognitive impairment, including deficits in attention, memory, and executive function
* Behavioral and psychiatric symptoms, including depression and anxiety
* Reproductive issues, such as infertility and pregnancy complications
* Sleep disturbances, including excessive daytime sleepiness and insomnia
* Speech difficulties, including Dysarthria (difficulty speaking)
* Hand weakness and difficulty with fine motor tasks
* Joint stiffness and pain
* Sensory abnormalities, such as numbness or tingling in the hands and feet (Peripheral Neuropathy)
* Vision problems, including ptosis (drooping eyelids) and blurry vision
* Hearing loss

**Age group:**

**DM Type 1:** between the ages of 20 and 40.but this type has more chances to manifest at any age.

**DM Type 2:** usually between the ages of 20 and 60,progress rate is milder than DM1.

**Diagnosis Methods:**

**Genetic Testing:** To identify the expanded repeat sequences in the DMPK gene for DM1 or the CNBP gene for DM2.

**Electromyography (EMG):** It shows electrical activity of muscles.EMG may show characteristic patterns of myotonia, including prolonged muscle contraction and difficulty relaxing muscles after contraction

**Muscle Biopsy:** Muscle biopsies can reveal specific changes in muscle fibers that are characteristic of myotonic dystrophy.

**Electrocardiography (ECG) and Echocardiography:** To assess cardiac function and detect any abnormalities in heart rhythm or structure.

**Ophthalmologic Examination:**Early-onset cataracts are a characteristic feature of myotonic dystrophy

**Endocrine Evaluation:** Endocrine abnormalities, such as insulin resistance and thyroid dysfunction, are common in myotonic dystrophy.

**Susceptibility:**

Inherited genetic disorder, so individuals with a family history of the condition are at an increased risk of developing it themselves. The inheritance pattern of myotonic dystrophy differs between the two main types:

1. **Type 1 (DM1)**: DM1 is inherited in an autosomal dominant pattern, meaning that a person only needs one copy of the mutated gene (inherited from one parent) to develop the condition. Therefore, individuals with a parent affected by DM1 have a 50% chance of inheriting the mutated gene and developing the disorder.
2. **Type 2 (DM2)**: DM2 also follows an autosomal dominant pattern of inheritance, similar to DM1. However, the genetic mutation associated with DM2 is different from that of DM1, involving the CNBP gene instead of the DMPK gene. As with DM1, individuals with a parent affected by DM2 have a 50% chance of inheriting the mutated gene and developing the disorder.

It's important to note that myotonic dystrophy can also occur sporadically in individuals with no family history of the condition, due to new mutations in the relevant genes.

**EXERCISE RECOMMENDATIONS:**

### **Back:**

1. Seated Row Machine
2. Seated Cable Row
3. Dumbbell Row
4. Resistance Band Pull-Apart
5. Chest Supported T-Bar Row
6. Lat Pulldown
7. Wall Angel
8. Superman
9. Deadlift

**Core/Abs:**

1. Seated Leg Raise
2. Seated Russian Twist
3. Seated Bicycle Crunch
4. Pelvic Tilt
5. Seated Side Bend (with or without light dumbbells)
6. Seated Torso Rotation (using a resistance band for support)
7. Seated Leg Extension (performed with light resistance)
8. Seated Crunches (with support if needed)
9. Seated Oblique Crunches (with light resistance or support)

### **Hamstrings/Glutes:**

1. Seated Leg Curl Machine
2. Glute Bridge (performed lying down or seated)
3. Clamshell (lying on the side, lifting the top knee while keeping the feet together)
4. Seated Hip Abduction Machine
5. Seated Leg Press Machine
6. Seated Hip Thrust (using a bench for support)
7. Standing Leg Curl (with support if needed)
8. Seated Glute Squeeze (squeezing a ball between the knees while seated)
9. Seated Hip Extension (performed with light resistance or bodyweight)

### **Quadriceps:**

1. Seated Leg Extension Machine
2. Leg Press Machine (using appropriate support)
3. Seated Leg Press Machine
4. Bodyweight Squat (using support if needed)
5. Wall Sit (with support if needed)
6. Seated Step-Up (using a low platform for support)
7. Seated Squat (with support as needed)
8. Seated Leg Raise (performed with light ankle weights)
9. Seated Lunge (with support as needed)

### **Chest:**

1. Seated Chest Press Machine
2. Seated Chest Fly Machine
3. Seated Dumbbell Chest Press (using light weights and support)
4. Wall Push-Ups (performed with support if needed)
5. Seated Cable Chest Press
6. Seated Pec Deck Machine
7. Seated Medicine Ball Chest Pass (with support as needed)
8. Seated Band Chest Press
9. Seated Isometric Chest Squeeze (using a soft ball or cushion)

### **Triceps:**

1. Seated Tricep Pushdowns (using a cable machine with appropriate support)
2. Seated Tricep Extensions (with light dumbbells or resistance bands)
3. Seated Tricep Dips (using a stable chair or bench)
4. Seated Tricep Kickbacks (with light dumbbells)
5. Seated Overhead Tricep Extensions (with light dumbbells)
6. Seated Tricep Press (with a resistance band)
7. Seated Diamond Push-Ups (with support if needed)
8. Seated Close-Grip Bench Press (with light weights and support)
9. Seated Tricep Rope Pulldowns (using a cable machine with appropriate support)

### **Biceps/Forearms:**

1. Seated Dumbbell Bicep Curls (with light weights and support)
2. Seated Hammer Curls (with light dumbbells)
3. Seated Preacher Curls (using a preacher curl bench with support)
4. Seated Resistance Band Bicep Curls
5. Seated Reverse Curls (with light dumbbells)
6. Seated Concentration Curls (with light dumbbells)
7. Seated Wrist Curls (with light dumbbells or resistance bands)
8. Seated Wrist Extensions (with light dumbbells or resistance bands)
9. Seated Zottman Curls (with light dumbbells)

### **Calves/Abductors:**

1. Seated Calf Raises (using a calf raise machine with appropriate support)
2. Seated Band Abductions (with resistance bands)
3. Seated Leg Abduction Machine
4. Seated Ankle Circles (gentle ankle movements to engage calf muscles)
5. Seated Toe Taps (tapping toes on the ground to engage calf muscles)
6. Seated Calf Stretches (gentle stretches to elongate calf muscles)
7. Seated Band Calf Raises
8. Seated Ball Squeezes (squeezing a ball between the feet while seated)
9. Seated Ankle Dorsiflexion (gentle movement to engage calf muscles)

References :

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