Duchenne muscular dystrophy is a multifaceted, complex disease, so CureDuchenne has been working to “treat the whole disease,” with a multi-pronged approach to find treatments for the many effects that Duchenne has on the body. The ultimate goal is to offer cures for all patients.

**Exon-Skipping and Stop Codon Read-Through**

The exon-skipping drugs drisapersen and eteplirsen are two examples of CureDuchenne’s investment in this area of research. They encourage cells to “skip” or ignore damaged exons – sections of a gene that carry instructions for the rest of the body. In Duchenne patients, a mutation in one exon on the gene for the protein dystrophin can rob the body of the ability to build or maintain healthy muscle tissue.

CureDuchenne has also supported research into the drug ataluren, which aims to help individuals whose Duchenne stems from a premature stop codon mutation. Such mutations can prevent the body from producing full-length, functional proteins.

**Protein Replacement**

Duchenne results from a genetic defect that leaves the body unable to produce the muscle protein dystrophin. Without dystrophin, muscles gradually weaken and eventually die. CureDuchenne has invested in research to find therapies that would substitute the protein utrophin for the missing dystrophin. Utrophin is present in the fetus, but is gradually replaced by dystrophin at birth. The hope is that boosting levels of utrophin will compensate for the missing dystrophin – a process that could be applicable to all boys with Duchenne irrespective of their genetic mutation. CureDuchenne invested in Summit PLC, which is now in Phase Ib clinical trials.

**Anti-Inflammatory Therapy**

CureDuchenne is supporting the search for new anti-inflammatory therapies to help slow the degeneration of muscle tissue, which would prolong individuals’ ability to walk and have use of their limbs. CureDuchenne is the lead investor in MyoTherix a company doing research to target inflammation.

**Anti-Fibrosis Therapy**

As the disease progresses, muscle fibers are replaced by fat and fibrotic tissue. Much like scarring, fibrotic tissue prevents muscles from working properly as well as inhibiting the potential of new therapeutic agents. To address this symptom of the disease, CureDuchenne is investing in research to develop treatments that would reduce the spread of fibrosis in muscle tissue. CureDuchenne invested in RASRx to support the preclinical development of its potential antifibrotic molecule.

**Cardiac Function**

Like any other muscle, the heart needs dystrophin to function normally, and without it, the heart gradually weakens. Heart failure is the leading cause of death among individuals with the disease. CureDuchenne is supporting clinical development at Capricor Therapeutics, to develop a novel treatment that is designed to strengthen and improve heart function in Duchenne patients.
**Gene Correction**

Duchenne is a genetic disorder caused by mutations in the dystrophin gene. New gene editing techniques have recently been identified and developed that offer a unique opportunity to correct faulty genes within the patient’s own cells. CureDuchenne is currently involved with a number of research groups in examining and applying these new genetic editing approaches for the treatment of Duchenne. This research is currently at an early stage of development, and if successful, this approach could eventually lead to a transformative treatment of Duchenne.

Gene Editing – Technologies such as CRISPR-Cas9, Zinc Fingers and Talen are being investigated for Duchenne and could be the next generation in gene correction. CureDuchenne is following the developments closely.

**Physical Therapy and Education**

In January 2015, CureDuchenne established CureDuchenne Cares as a physical therapy, education and outreach program for the Duchenne community. Utilizing educational sessions, instructional videos, educational materials and blogs, and information on the latest research developments, the program aims to improve outcomes, extend ambulation and provide guidance on best practices while waiting for advances in medical treatment. CureDuchenne Cares Physical Therapy Certification ensures that more PT’s are trained on the specialized aspects of Duchenne.

**Accelerating Clinical Trial Design**

CureDuchenne provided initial funding for the Collaborative Trajectory Analysis Project (cTAP), a unique partnership aimed at accelerating development of treatments for Duchenne. The group was born from the determination of patients’ families, researchers, and drug developers to optimize the use of data from clinical trials, patient registries, and other sources. cTAP includes leading experts in outcomes research, clinical investigators in neuromuscular disease, pharmaceutical and biotechnology companies, and patient advocacy groups. One of the group’s key goals is to address one of the biggest challenges in drug development for Duchenne, which is patient heterogeneity – their wide biological variety. Because the disease progresses at very different rates in different patients, it’s much more difficult to evaluate trial data. By working together, applying novel tools, and sharing data, cTAP plans to create a new paradigm that will improve understanding of this disease, advance research, and give patients access to a wider range of promising treatments.