



Lay Language Protocol Summary

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Study/Protocol Title: **Triheptanoin Treatment of Long-Chain Fatty Acid Oxidation Disorders**

Please answer all of the following questions using lay language, similar to the language used in a consent form. Please number your responses.

1. **Purpose:** Humans eat long-chain fat in their diet and use it for energy during exercise and during periods of fasting. Patients with long-chain fatty acid oxidation disorders cannot use dietary fat for energy. They sometimes develop muscle breakdown, and severe pain with exercise or illness. They can also develop a heart that does not function properly. These patients are tired and expend less energy than people who do not have a long-chain fatty acid oxidation disorder. However, they can use a supplement oil called medium chain triglyceride or MCT. This study will determine if a new experimental oil called Triheptanoin can decrease the muscle pain and increase the heart function and the amount of energy in patients with long-chain fatty acid oxidation disorders.
2. **Recruitment:** Patients with a long-chain fatty acid oxidation disorder will be recruited through our clinic, past research participants, a patient support website, and recruitment letters mailed to physicians around the US. We will enroll 16 subjects at OHSU and 16 subjects at the University of Pittsburgh, age 7 to 40, with a disorder in fatty acid oxidation.
3. **Procedures:** Subjects will be admitted to the clinical research center for 4 days. They will collect all their urine for 24 hours. Heart function will be measured using ultrasound and an electrocardiogram (ECG). For this test, the patient lies still on a bed and a probe is placed on their chest. The motion of the heart will be measured by magnetic resonance imaging/spectroscopy (MRI/MRS). For this test, the patient lies in the magnetic field of the MRI machine in the Advanced Imaging Resource Center (AIRC) for about 45 minutes. The amount of muscle and fat in the whole body and inside the liver and muscle will be measured by MRS and by dual X-ray absorptiometry (DEXA). Subjects will walk on a treadmill for about 45 minutes. The amount of Calories they use, their heart rate, and if they burn fat or carbohydrates will be measured. Blood samples will be collected before and after exercise. A meal test will be used to determine how much fat they burn. The subjects will drink a liquid breakfast with a stable isotope labeled fat in the breakfast. Breath and blood samples will be collected before and after the meal. The amount of Calories burned by each subject will be measured when they are at rest on a bed by indirect calorimetry. The amount of Calories burned by subjects when they are doing their routine daily activities will be measured at home by doubly labeled water. All of these tests will be done at baseline. Then, subjects will be randomly assigned to consume MCT (current standard of care) or triheptanoin at 20% of their estimated Calorie needs for 4 months. The subject and/or the parent will be taught how to use the supplement oil in their diet for cooking and baking. The subject will be sent home and the oil will be shipped to their home. The study coordinator will call the subject or subject's guardian each week to monitor the subject's diet, potential side effects and assist with diet planning. At the end of 4 months, all of the baseline tests will be repeated.
4. **Survey Instruments:** Subjects will record what they eat for three days. They will write down what foods they eat, how they were prepared and how much they ate on a form provided to them. Subjects will complete the 3-day diet record 2 times during the study.
5. Triheptanoin is experimental oil. It is a clear, odorless oil that can be mixed with foods and used in cooking. Almost all oils are made from even chains of carbon molecules. Triheptanoin is different because the carbon chains are odd in number. The co-investigator of this study at the University of Pittsburgh, Dr. Jerry Vockely, holds an IND for the prescription, and use of triheptanoin in humans (IND 106011).
6. **Data Analysis:** The change in exercise ability, heart function, Calories used and body fat after 4 months will be compared between subjects randomized to MCT versus triheptanoin.