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MITO 101 – Therapies for Mitochondrial Disease Symptoms

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OVERVIEW

•Utilize an individualized, multidisciplinary approach to the care of the patient with mitochondrial disease including the "allied health" professions such as physical, occupational, speech, respiratory and animal-based therapies. Focus can be on treating symptoms, helping patients to cope with disabilities and enhancing quality of life.

•While therapeutic interventions will not change the underlying mitochondrial problem, they will assist in adapting to the condition. Goals are the preservation, and if possible, the improvement of an individual's existing strength, mobility and functioning**.**

•Referrals to appropriate specialists should be offered before functioning is lost.

•Other professionals worth considering include audiologists, dieticians, vision therapists, recreational therapists, and social workers.

•Funding for these therapies may be problematic. Providers may be persuaded that benefits to therapy include prolonged strength, pain relief, and minimized hospitalizations.

•Figure 1 pairs symptoms of common syndromes with potentially appropriate therapies for each.

PHYSICAL THERAPY

•Goals are functional movement and mobility, injury prevention, pain management, and - where possible - strengthening of the large muscle groups. Changes in strength can be monitored and reported.

• PT can help to maintain strength in unaffected muscle tissue and delay the onset of muscle shortening and contracted joints.

•An exercise regimen, developed and supervised by a physical therapist, can be a vital intervention for the patient with exertional fatigue, which can lead to a sedentary lifestyle. Exercise can prevent the deconditioning that could exacerbate the disease process (Mahoney et al., 2001) even if it may come at the cost of increasing the population of mutant mtDNA (Taivassalo et al., 2001).

•Aquatic therapy offers advantages over traditional PT: The body is supported in the water, which allows for physical exercise with decreased stress on joints, bones and muscles, and increases independence of movement. The water also provides a natural resistance medium to promote strengthening.

OCCUPATIONAL THERAPY

•OT focuses on functions of the upper extremities and on cognitive, fine-, and visual-motor skills, with a goal of maximizing functional independence within a patient's own environment.

•Initiate interventions as early as possible. Therapists can help a child to meet appropriate physical, cognitive and behavioral milestones and help diagnose and treat specific learning disabilities. In adults, OT may focus on addressing increasing muscle weakness, decreased range of motion, mobility limitations and fatigue, and rehabilitation, when necessary.

•Therapists work with clients to promote independence in performing activities of daily living; they may develop plans and suggest adaptations to help the client compensate for disabilities.

SPEECH THERAPY

•Speech-Language Pathologists evaluate, diagnose, treat, and help to prevent speech and language, cognitive, communication, voice, fluency, and swallowing disorders.

•Exercises, activities and other interventions can help to strengthen speech and respiratory musculature. When functional speech and/or hearing are problematic or absent, alternative means of communication can be implemented.

•ST can treat language disorders (apraxia, aphasia, etc.) brought on when mitochondrial dysfunction disturbs higher cortical functioning.

•Assessment and treatment of dysphagia (strengthening exercises, safety strategies, diet modifications) can minimize the effects of incorrect swallowing (malnutrition, dehydration, respiratory problems).

RESPIRATORY THERAPY

•Pulmonary manifestations of mitochondrial disease are respiratory weakness or failure (Clay et al., 2001). Respiratory therapists recommend aides and techniques to increase ventilation and augment efforts to cough and mobilize secretions.

•Levels of treatment range from occasional oxygen supplementation to permanent ventilation support based on comprehensive assessments that include PFT's, ABG analyses, oximetry, polysomnography, etc.

•RT is invaluable for the management of the patient with respiratory difficulties who must undergo anesthesia and surgery.

HIPPOTHERAPY

•Equine- or hippotherapy is a prescribed, specialized intervention used by physical and occupational therapists wherein the natural, multidimensional movement of the horse is used as a tool for increasing physical abilities.

•Astride the horse, the pelvis, lumbar spine and joints are mobilized; deep muscles not accessible in conventional physical therapy are stretched and strengthened. It is hypothesized that the complex movement of the horse influences rider's balance and postural control (Sterba et al., 2002).

• Hippotherapy has been said to improve speech, language and cognitive function and may help the rider develop patience, responsibility and emotional self-control (Rolandelli and Dunst, 2003). Improvement in respiratory, circulatory and digestive functions may be generated by benefits in the areas of gross motor function, muscle tone, posture, and balance.

PET THERAPY

•Pet therapy is an emerging treatment modality using the human-animal relationship to improve physical and emotional health (Howell-Newman and Goldman, 1993).

•Animal-assisted therapy is a formal treatment program designed to promote improvement in physical and cognitive functioning, using animals as a therapeutic

modality. Patients work with therapy animals on specific goals and treatment protocols.

- Animal-assisted activities are motivational, educational and/or recreational opportunities for interactions with animals.
- Assistance animals are trained to do work or perform tasks for a disabled person.

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Figure 1

Benefits of Supplementary Therapies to Common Symptoms of Mitochondrial Disease

PHYSICAL THERAPY	Hypertonia, hypotonia, dystonia, spasticity, muscle weakness, mobility deficits, exercise intolerance, myalgia, dysphagia, developmental delay, stroke, ataxia
OCCUPATIONAL THERAPY	Motor control, developmental delay, learning disabilities, dementia, dysphagia, mobility deficits, stroke, ataxia
SPEECH THERAPY	Developmental delay, dysphagia, feeding disorders, hearing impairments, stroke, speech and language dysfunction
RESPIRATORY THERAPY	Apnea, respiratory insufficiency, bulbar dysfunction, pulmonary complications from anesthesia and/or surgery
HIPPOTHERAPY	Neuromotor functioning, sensory processing, muscle weakness, increased quality of life, posture, balance
PET THERAPY	Motor function, cognitive function, increased quality of life