A Glance Inside a Physical Therapist's Toolbox

This FORUM is a regular contribution from BayView Healthcare to help share the knowledge and expertise of the more that 280 healthcare professionals at BayView across our continuum of care. In each issue an area of interest is addressed to help consumers be even more informed about their health and wellness. We are living longer and living longer with chronic diseases. As we age, most of us contend with multiple health care issues, many of which are chronic and cannot be cured- only managed. In this FORUM, Doug Mullin will explain how to ***maximize mobility through physical therapy*** *– through the use of therapeutic exercises, balance activities and gait training as well as incorporating various modalities to decrease healing time and promote functional independence. Doug Mullin has been with BayView Rehab at the Samantha R. Wilson Care Center since 2002. Mullin earned his Bachelor's Degree in Biology from the University of North Florida in 1989. He then earned an Associates Degree from Miami Dade State College in Science to become a Physical Therapy Assistant in 1992. He has worked in a variety of settings such as geriatrics, acute care, pediatrics and sports medicine. His specialties include wound care and geriatric rehabilitation. Doug and the BayView Rehab Team are committed to providing excellent quality care for our long and short term residents and outpatient therapy clients.*

Since the beginning of the Physical Therapy Association (now known as the American Physical Therapy Association) in 1921, the use of therapeutic exercise, balance activities and gait training have been used to promote healing and function in patients. The use of various modalities have been incorporated including thermotherapy, cryotherapy, ultrasound, various types of electric stimulation and diathermy as an adjunct to decrease healing time and promote functional independence.

Thermotherapy/Cryotherapy

The use of heat or cold to alter circulation of injuries has a long history of success in decreasing pain and improving healing times. Properly utilized, it can be beneficial for many patients.

Thermotherapy

While the moist heat is somewhat superficial (1.0 to 2.0 cm deep), it can be advantageous in many ways. Decreasing discomfort, improving joint movement and muscle extensibility are some of the ways heat can be helpful. The primary mechanism comes from increasing the circulation in the local area. In sub-acute injuries, this vasodilatation brings in extra blood supply with nutrients to aide in healing. The warming effects of moist heat aid in loosening stiff joints and can be very useful prior to stretching tight muscles to improve comfort, mobility and function. Many patients find good results from osteoarthritis with the application of moist heat. This is likely a combination of increased blood flow to the affected joint as well as the counterirritant effect of the heat.

Cryotherapy

Application of cold, by way of a cold pack, ice massage or ice water baths has been shown to decrease inflammation, pain and spasticity. After an injury, the body's response is to flood the area with blood, which can have a negative effect on the healing time. The use of cold therapy in the acute phase of healing promotes vasoconstriction to help eliminate inflammation and swelling in the area of an injury allowing the body to have an improved balance between arterial and venous blood flow. It also is helpful in decreasing pain from the injury by decreasing nerve conduction velocity as the temperature of the tissue is decreased. The decreased conduction velocity can also be useful for applications involving muscle spasms. Studies have shown that application of cold therapy soon after injury improves healing time and the return to normal activity.

Ultrasound Therapy

Ultrasound (US) therapy involves application of sound waves into the body to relieve pain, increase circulation and promote wound healing. It has several applications that are beneficial when provided in an appropriate manner. Parameters for US therapy can provide either thermal or non-thermal effects depending on the desired outcome and patient diagnosis.

Thermal Ultrasound

Thermal ultrasound allows the clinician to provide a deep heat that is created by sound waves reflecting off boney surfaces and vibrating to warm the surrounding tissue. It is able to penetrate deeper (2.3 to 5.0 cm) than moist heat, but covers a much smaller surface area. Applications include strain/sprains, scar tissue release and trigger points.

Non-thermal Ultrasound

Non-thermal ultrasound can be used to treat various injuries (tendonitis, bursitis) as well as non-infected open wounds. Ultrasound has been found to aide in mast cell degranulation which is vital in wound healing and protection against pathogens. It has also been found to effect fibroblasts to accelerate wound contraction and closure.

Electrical Stimulation

Electrical impulses are the driving force behind many workings in the human body including nerve conduction and muscle contraction. External application of electrical stimulation (e-stim) has been studied since the late 1700's. In physical therapy, e-stim has been successfully used to treat pain, weakness, immobility, circulation and wound healing. Types of e-stim include Transcutaneous Electrical Nerve Stimulation (TENS), Interferential Stimulation (IF), Neuromuscular Electric Stimulation (NMES) and High Voltage Pulsed Galvantic Stimulation (HVPGS).

Transcutaneous Electrical Nerve Stimulation (TENS)

Transcutaneous Electrical Nerve Stimulation (TENS) is a low frequency modality (2-150Hz) commonly used as a treatment to relieve pain. By surrounding the affected area with electrodes the electric current disrupts the pain message from reaching the brain, calms painful nerve fibers and stimulates the release of natural painkilling endorphins. In the clinic it is used for a variety of pain issues including chronic pain syndromes, acute injury and post operative pain. A home TENS unit requires a physician prescription and after training, the patient can self administer treatment at home. Treatment times and outcomes can vary, but it is generally tolerated well.

Interferential (IF) Stimulation

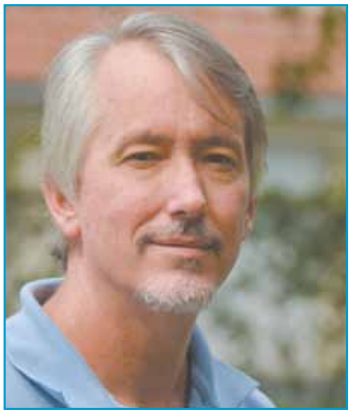
Interferential (IF) Stimulation uses a medium frequency (1000-4400 Hz). Medium frequency passes through the skin easier and allows for a deeper treatment with increased dosage to relieve pain symptoms. It utilizes four electrodes surrounding the affected area, provided a fixed and adjustable frequency during treatment. When these frequencies combine, they produce an interference frequency and provide relief to the patient.

Neuromuscular Electric Stimulation (NMES)

Neuromuscular Electric Stimulation (NMES) is used to help rehabilitate muscles that have been weakened from injury, disuse or surgery. Providing e-stim at the origination of muscle initiates a contraction of the muscle to help use the muscle more effectively or help strengthen the muscle. It is sometimes used prophylatically when a limb is immobilized. NMES can be used to minimize disuse atrophy (muscle wasting). It is also helpful in neuromuscular reeducation and when used in conjunction with active contraction of the affected muscle group it promotes reeducation of the neuro-pathways for muscle function. NMES can also be helpful in the treatment of muscle spasms. Treatment causes the muscle fibers to fatigue, providing relief from the painful spasm.

High Voltage Pulsed Galvantic Stimulation (HVPGS)

High Voltage Pulsed Galvantic Stimulation (HVPGS) uses direct current to provide pain relief, edema control and aide in wound healing. The blending of relatively high voltage and low amperage allows for a comfortable stimulation that is tolerated by a large number of patients. HVPGS provides a means to exciting sensory, motor and pain conducting nerve fibers to allow use for multiple indications. Its use for post-operative edema control aid in the healing process. For wound care, the negative current provides an anti-bacterial effect as well as increasing circulation. This increased circulation brings nutrients to the wound site as well as removing waste products from the area. Using positive current to open wounds decreases healing time to minimize risk of infection



Doug Mullin

Short Wave Diathermy (SWD)

Short Wave Diathermy (SWD) produces electromagnetic energy to provide thermal or non-thermal effects in tissue with high water content. Affected tissues can include muscle, ligaments and cartilage. Thermal SWD is useful for pain reduction, muscle spasms and increasing circulation and range of motion. Non-thermal SWD provides pain relief without the increased circulation that accompanies thermal application.

The use of modalities in physical therapy has a long history of effective treatment for wide range of conditions. As an adjunct to traditional therapeutic exercise, balance activities and gait training, modalities can be an effective tool for patient treatment. It can allow a patient to regain their prior level of function in a more time efficient manner. *mg*

BayView Rehab is proud to be a part of the Accelerated Care Plus (ACP) program. ACP provides progressive rehabilitation technologies, specialized treatment programs and advanced therapist training. Using ACP medical devises with evidence based clinical protocols that have been specifically developed around the medical complexities of aging adults. We would be pleased to further explain this program and answer your questions. Please call (904) 806-5832 today!

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BayView Healthcare, also known to many as the St. Johns Welfare Federation, is a private, not-for-profit comprehensive continuum of healthcare provider founded in 1920. Our superior level of services include short-term inpatient and outpatient rehabilitation, skilled nursing (BayView Rehab at the Samantha R. Wilson Care Center), BayView Home Health and BayView Assisted Living (The Pavilion and Buckingham Smith), BayView Charities, BayView Wellness and BayView Neighbors. Caring Hands-Caring Community is a separate 501 (c) 3 charitable organization founded in 2004 by our parent organization. It was formed to support the exceptional services and continuum of care provided to people in need of healthcare services and financial assistance.