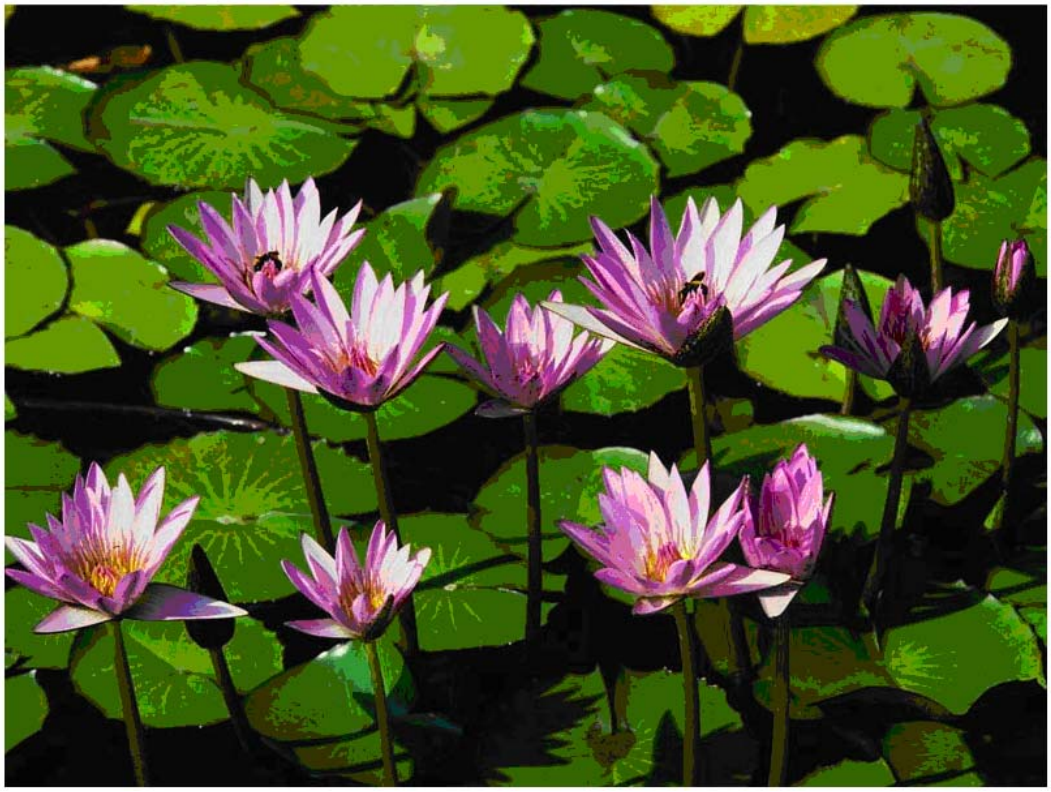
JOURNAL OF THE AMERICAN MANUAL MEDICINE ASSOCIATION



The Professional Journal of Advanced and Postgraduate Medical Massage and Medical Manual Therapy

Member Research and Article Issue
Medical Massage Therapy
Winter 2008

A Publication of American Health Source

Journal of American Manual Medicine Association

The Journal of American Manual Medicine Association was created to serve as a rational scientific voice for the medical massage and medical manual therapy community. The AMMA Journal is peer reviewed scientific publication. Articles and papers that are published in the AMMA Journal are presented in three main subject groups, editorial opinion, and scientific research, and legal, regulatory, and political events that pertain the medical massage and medical manual therapy professions.

Articles and papers written by outside contributors to the AMMA Journal do not necessarily reflect the view or position of the American Manual Medicine Association.

A PUBLICATION OF AMERICAN HEALTH SOURCE

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From the editor...

Dr. Gregory T. Lawton

Dear AMMA Member:

In this issue you will find articles and research papers that have been submitted by the AMMA membership. The purpose of this issue is to provide our members with an "inclusionary" experience and the ability to contribute directly to their professional journal, JAMMA.

There is a noticeable lack of quality research and articles prepared and written by massage and manual therapists. One of the avowed purposes of JAMMA is to remedy this deficiency by giving our medical massage and medical manual therapy members a voice. This issue is dedicated to our members who have prepared papers related to the study and practice of medical massage and medical manual therapy.

This issue is also, in a sense, a celebration of our associations diversity of interests and expression of opinions. Through these articles and papers the contributing AMMA members demonstrate that we are indeed an organization of varied backgrounds and a broad membership base.

As a member of the AMMA you have completed a concentrated program of study in medical massage, passed the most difficult national board exam in the profession, and you stand at the highest pinnacle of the massage profession. To remain at the top you need to invest in your professional development on a daily basis. Since you are a medical massage therapist there is simply no limit to the knowledge that you need and can acquire that pertains to the conditions that you treat and the practice skills that you need to master. Your acquired knowledge and abilities pertain to being able to sort out the numerous false doctrines, pseudo scientific theories and fringe practices of your profession so that you do not commit the ethical errors of other massage therapists and so that you can select the most appropriate technique or treatment protocol for your patient.

One of the primary purposes of the American Medical Massage Association is to create a distinctive identity for our members through the actualization of the highest professional standards in the industry. Hopefully it is the members of the AMMA, through their professional conduct and high educational standards that will contribute to uplifting this noble profession.

Yours in good health,

Dr. Gregory T. Lawton

As a manual therapist, I enjoy the fact that I have the opportunity to learn and grow with every client that comes into my office. My fervent desire is that this educational journey would never end.

Through both the joys and storms of life there is impact on life; there are lessons to be learned; there is opportunity for growth.

As a practicing therapist and educator, I try to cultivate this same desire for growth with my clients and students on a daily basis. I am thankful that many have risen to the challenge.

The articles in this issue of JAMMA have been contributed by therapists just like you. They are individuals who understand that learning never ends, and have a hunger to grow and blossom to their full potential.

If you too wish to contribute to JAMMA, please fell free to contact me. I would love to hear what you have been researching and its effects on you and the clients whose lives you touch.

Thank you for the honor to serve you as together, we continue along this educational journey.

Christina Harangozo

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Submission Guidelines

The Journal of American Manual Medicine Association is a peer reviewed scientific journal that publishes research and articles related to manual medicine.

How to Submit:

- Potential articles must be an original contribution to, or report in, the field of medical massage and manual therapy. It must use objective evaluation criteria. Articles are subject to editorial and peer review.
- Articles should be submitted by e-mail as a Microsoft Word or rich text format document to JAMMA@americanmedicalmassage.com
- Include your name, address and the best way to contact you.

JAMMA is published quarterly by the American Manual Medicine Association. If your article is chosen to be reviewed, you will be contacted.

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The effects of manual therapy on symptoms of Multiple Sclerosis

Karen Fackler

According to the National M.S society, currently Scientists and researchers have no preventions or cures for MS. Because of this, it is treated primarily to return function after an attack, prevent new attacks and prevent disabilities. Treatment is typically medication, physical therapy, occupational therapy and counseling. Although complimentary medicines have always been an option, they are not generally recommended in modern medicine. My research, in addition to the research from the M.S Society information source book, research from Francis Pottenger M.D., Weston Price D.D.S., and Roy Swank M.D., Aspartame Toxicity Information Center, Thomas Kruzel N.D., American Association of Naturopathic Physicians, usgovernetics.com Mus/multiple sclerosis.php, and Ruth Werners pathology for the massage therapist, provide strong evidence that certain complimentary therapies like manual therapy, massage, yoga, and dietary therapies should not only be recommended, but aggressively pursued throughout the entire treatment process

Sclerosis means, “hardened scar or plaque”. In Multiple Sclerosis several different areas in the Central Nervous system often show these “plaque” where myelin should be. MS is thought to be an autoimmune disease in which the body attacks its own tissue. In this case the tissue is the myelin sheath, which surrounds your brain and spinal cord, resulting in multiple areas of scarring. Eventually this damage can slow or block the nerve signals that control muscle coordination, strength, sensations and vision, attributing to all the various symptoms occurring with a relapse. This disease is unpredictable and varies in severity.

According to the MS society handbook, there are four primary stages of MS, these stages are: Relapsing-Remitting: clearly defined flare-ups (also called relapses, attacks, or exuberations) or episodes of acute worsening of neurological function. They are followed by partial or complete recovery periods (remissions) free of disease progression. This is the most common form of MS at initial diagnosis. Approximately 85% of MS patients have this form of MS, including both of my patients. Primary-Progressive: a slow but nearly continuous worsening of his or her disease from the onset, with no distinct relapse or remission. However, there are variations in rates of progression over time, occasional plateaus, and temporary minor improvements. This is relatively rare, approximately 10% of patients. Secondary-Progressive: an initial period of relapsing-remitting MS, followed by a steady worsening disease course with or without occasional flare-ups, minor recoveries (remissions), or plateaus. 50% of people with relapsing-remitting MS develop this form of the disease within 10 years of their initial diagnosis. Progressive-Relapsing: A steady worsening disease from the onset but also have clear acute relapses (attacks or exacerbations), with or without recovery. In contrast to relapsing-remitting MS, the periods between relapses are characterized by continuing disease progression. This form is relatively rare, only approximately 5%.

An exacerbation (attack or flare-up) is a sudden worsening of MS symptom/s, or the appearance of a new symptom, which lasts at least 24 hours and is separated from a previous one by at least one month. A true exacerbation in MS is caused by an area of inflammation in the central nervous system, followed by the destruction of the myelin and formation of plaque in that area

causing the symptoms. They may be mild or significantly interfere with daily life. They usually last from several days to several weeks. In my study I have not treated either patient during an exacerbation, and only one of my patients had experienced an exacerbation during the course of treatment.

Anyone may develop MS, but there are some patterns. Although these patterns have been identified, no definitive cause has been found. Statistically, MS favors people born and raised farther away from the equator. Although adults are more common, recently there have been more and more children diagnosed with MS, some even as young as 18 months. Most people experience their first symptoms and are diagnosed between the ages of 20 and 50. There are also two-three times more women with MS than men. While MS is not strictly a hereditary disease, increasing scientific evidence suggests that genetics may play a role in determining a person's susceptibility to MS. Some populations such as Gypsies, Eskimos, and Bantus, never get MS. Native Indians of North and South America, the Japanese, and other Asian peoples have very low incident rates. MS occurs more commonly among people with Northern European ancestry. It is unclear whether this is due mostly to genetic or environmental factors. In the generation at large, the chance of getting MS is less than a tenth of 1 percent.

This disease is unpredictable and varies in severity. In some people MS is a mild illness, but for others, it results in permanent disability. The prognosis is favorable for the population of people who have MS. Although there is no cure as of yet, about one third of the people diagnoses have no lasting debilitations. 70% are fully functional after five years, half are still working after 10 yrs, and 66% are fully ambulatory after 25 years. On the other hand 20% don't experience a total relapse-remission; instead it is a slow gradual degeneration. These patients usually have a late onset (Ruth Werner Therapist guide to pathology)

My patients, both women, one in her mid thirties, the other in her mid forties. Both were born and raised in Northern Michigan. Both are in the relapse-remitting stage and had experienced episodes around the age if 18-20 but neither was diagnosed for several years later. Both patients have very different symptoms, but similar lifestyles and dietary consumption. While one patient is fully functional now five years after diagnosis (when in remission), the other has some residual effects to deal with in her daily life that has forced her into retirement.

MS," the great imitator", that statement is very accurate with both my patients, for they experienced very different symptoms. Patient 1 experienced urinary hesitancy and retention, increased urinary tract infections, muscle weakness, burning, itching, and electrical impulses running down the spine while her neck was in flexion, increase of severity of symptoms with extreme heat, (such as sauna or hot tubs), partial paralysis as well as partial numbness and tingling in her legs.

While patient 2 experienced, double vision, blurred vision, bowel urgency, and bowel inconsistency, muscle weakness, loss of muscle tone causing stiffness, pain, and restricting free movements of affected limbs, muscle atrophy, spasms, cramps, problems with posture, jerkiness, involuntary leg movements- especially at night, foot dragging across the floor while she was walking, short and long term memory problems, forgetfulness, slow recall, violent mood swings, impaired speech, facial pain, and depression

These are all common symptoms of MS; other would include eye pain, Loss of color, jerky eye movements and blindness, urinary urgency and incontinence, male and female impotency, total or near total loss of muscle strength, slurred speech and related speech problems, complete numbness/loss of sensation, pain without apparent cause, loss of coordination, shakiness when performing fine movements, abnormal balance function of the inner ear, stuttering, loss of ability to perform rapid alternating movements (move to a rhythm) dementia, , bipolar, anxiety, impaired comprehension. Acid reflux, impaired sense of taste and smell, epileptic seizers, and problems in respiratory and swallowing.

As you can see there are many symptoms that resemble several other inefficiency and diseases, such as Lymes disease, Aids, vascular problems in the brain, Herniated or ruptured disks, CNS tumors, and Fibromalgia just to name a few. Because of this, MS is very difficult to diagnose and may even be misdiagnosed for years before any physical evidence is present. In the case of my patients that was exactly what had happened. Both patients had symptoms occurring two-three years before a diagnosis was made.

Some people can live their entire lives with M.S and not be diagnosed until an autopsy has been performed. Others are not so fortunate and the disease can be crippling both physically and mentally.

Both of my patients were diagnosed with an MRI as well as a complete family and occurrence history, Consequently, both of my patients have a very similar family history including Rheumatoid arthritis, Lymphoma, and fibromyalgia As well as a very similar diet and environment. Other ways MS can be diagnosed is with a spinal tap and some Naturopathic physician may also use other tests such as pulse and tongue diagnostic procedures. While there really is no typical course for this disease (everyone's disease is different and unique to them), and despite the unpredictable nature of MS, different phases of the relapsing-remitting (RRMS) and Secondary-progressive (SPMS) forms of the disease may be predicted.

We see that during the early phases of the disease there are inflammatory lesions, but no symptoms are produced, this is called asymptomatic MS. Some peoples MS never progresses beyond this point and therefore can only be recognized from an autopsy. As the disease progresses to relapsing-remitting, some of the inflammatory attacks start to produce symptoms. As time goes on remission from relapse becomes incomplete and there are some residual effects, this phase is worsening-relapsing. Typically secondary-progressive MS follows worsening RRMS. The onset of SPMS is when the disability really starts to take hold. During the whole course of the disease, inflammatory attacks become less and less frequent, despite this, people with SPMS continue to deteriorate and eventually move into a secondary progressive phase where there are no more relapses.

For both of my patients, their triggers are relatively unknown; each patient has had very few relapses since their original diagnosis. However, both patients' relapses occurred during the summer and during periods of severe stress. In general relapses occur more frequently during spring and summer than during autumn and winter. Infections such as the common cold, influenza, and gastroenteritis increase the risk for a relapse. Emotional and physical stress may also trigger an attack, as can severe illness of any kind.

Although heat can transiently increase symptoms (known as Uhthoff's Syndrome), heat itself is not an established trigger. It is advisable however that MS patient should avoid extremely strenuous exertions; such as marathon running, and Saunas, hot showers even hot weather can temporarily aggravate MS symptoms. These are not triggers because once the body temperature returns to normal, the symptoms subside as well.

Pregnancy can directly affect the susceptibility for relapse. The last three months of pregnancy offer a natural protection against relapse; however during the first few months after delivery, the risk for a relapse is increased by 20%-40%. The good news is pregnancy does not seem to influence long-term disability.

Both of my patients started treatment primarily with drugs; Copaxone was their first attempt to fight this disease. This particular drug is designed to block immune system attacks. Some others would include Betaserone, avonex, and Rebif, these three are all Beta interferons, which help to fight infection and regulate your immune system. Other drugs used would include Coracosteroids for inflammation, Muscle relaxants, and anti-depressants. The problem is, according to the National MS society handbook, none of these drugs are guaranteed for any one person, what works for some may not work for others.

Along with drugs, physical, occupational, and speech therapies are also recommended to treat true exuberations. Rehabilitation is considered a necessary component of comprehensive, quality health care for people with MS at all stages of the disease (MS information sourcebook).

According to Thomas Kruzel N.D (Multiple sclerosis and alternative medicine), in a study published in Germany In December 1997,129 Multiple Sclerosis patients were asked to fill out an anonymous questionnaire about their use of alternative medicine. Of the 129 patients 82 (or 63.3%) have been using alternative therapies. Some of the patients had used up to nine different methods. The most popular methods were found to be relaxation therapies such as yoga, homeopathy, herbal medicine, and diet therapy. Most of the patients felt that alternative treatment was having a positive effect, but they did not inform their general practitioner or neurologist about it. The study was published in Fortschr Neurol Psychiatry, 1997, Dec 12

One of the cornerstones of treatment for MS is diet, or rather it should be, and is for naturopathic physicians. Swank MD and his colleagues have shown that diets low in fats case the illness to go into remission and the symptoms to diminish. Further, in following patients over a period of 35 years, he has shown that those who follow this diet have lower disease progression rates than those who do not. Most notable research is that of Francis Pottenger MD, Weston Price DDS, and Roy Swank MD.

In addition to being essential to general health and well being, exercise is beneficial in managing many MS symptoms. According to a study publishes in1996 by researchers at the University of Utah, MS patients who participated in an aerobic exercise program had better cardiovascular fitness, improved strength, better bladder and bowel function, less fatigue and depression, a more positive attitude, and increased participation in social activities. If body temperature getting too high is a problem swimming, yoga, and manual therapy, are wonderful alternatives, at the least all three provide a wonderful semi/ passive exercise to help keep patients muscles active and

reduce stress, without the risk of patients becoming too over heated. Manual Therapy also keeps the joints freely moveable as to reduce the chance of muscle pain and disfigurations. It is designed to be adjusted with each and every treatment for patient's maximum comfort and limitations. This is very important because, any exercise program needs to be appropriate to the capabilities and limitations of the patient, and may need to be adjusted when changes occur in MS symptoms.

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Carpal Tunnel Syndrome
Arvilla Bogucki

Ten percent of Americans have Carpal Tunnel Syndrome (CTS) to some degree. It has been estimated that three people out of every 10,000 employees missed work due to CTS. Half of these workers will miss ten days of work or more annually. If you factor medical bills and time lost from work, the cost averages around $30,000 per CTS patient. Factor in that around one million new cases are diagnosed each year with more than 200,000 surgeries performed, and the results are staggering.

What is Carpal Tunnel Syndrome? CTS is a painful disorder of the wrists and hands caused by a combination of pressure on the tendons and the median nerve that runs through the canal of the wrist which can potentially lead up to the shoulders and neck. The carpal tunnel is a narrow tunnel formed by the bones and other tissue of the wrist. It is surrounded by bone on three sides and on the other side by a fibrous sheath known as the flexor retinaculum. Numerous tendons pass through the carpal tunnel. This tunnel allows for protection of the median nerve. The median nerve gives feeling to the thumb, index and middle fingers. When pressure is applied on the median nerve through swelling or irritated tendons, pain in the wrist can result.

CTS is commonly known as entrapment of neuropathies where the body's peripheral nerves are compressed or traumatized. Carpal Tunnel Syndrome can lead to numbness or tingling in the patient's hands. Most people attribute these symptoms of numbness /tingling to be caused by poor circulation or blood being cut off to their extremities rather than CTS.

Symptoms tend to start gradually, beginning with frequent burning, tingling, itching, numbness in the palms of the hands and fingers. The patient will notice more pain in the thumb, index and middle fingers. Some feel a burning sensation in the wrist while others feel like their hands are swollen even though no noticeable swelling is observable. Because a lot of people tend to sleep with their hands bent, symptoms become more noticeable at night. Eventually these symptoms develop during the day in either one or both hands.

As Carpal Tunnel Syndrome progresses, loss of grip strength will become more noticeable. It becomes difficult to squeeze objects in their hand. Cramping in the hand or wrist is often experienced. Their sense of touch can start to deteriorate. Some people have cold hands while their forearms are warm to the touch. As CTS progresses up the shoulder, pain can be experienced in the elbow.

There is a wide range of symptoms, but overall it will become more difficult to do normal everyday tasks. For instance, brushing your hair or teeth could be both a painful and frustrating daily experience. Opening jar lids or just holding on to objects may become a challenge. Loss of sleep or waking up with the need to shake your hands to try and get rid of the tingling feeling may also become a daily ritual. A person may experience one or more symptoms initially, however, the longer CTS progresses, the more symptoms will occur with greater the severity. Therefore, it is important to correctly diagnose these symptoms early, before major damage to the median nerve occurs.

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There are several factors which can lead to developing CTS. Occupation, previous injuries, medical conditions, age, gender and genetic factors can play a role in susceptibility. The more factors one has, the more prone one is to develop CTS. Carpal Tunnel Syndrome is most commonly seen in those whose occupation requires doing repetitive hand movements on a daily basis. CTS is seen frequently with people who work consistently with the wrist being bent, such as data entry, carpenters, grocery checkers, assembly line workers, meat packers, violinists, mechanics, typists, accountants, and writers. CTS is three times more common in assembly workers than in computer based jobs. Some hobbies such as gardening, needle work, golfing, and

canoeing can sometimes bring on the symptoms as well.

CTS is most often seen in women than in men by a 3:1 ratio; most often occurring between the ages of 30-50, although expert opinion varies on this fact. Genetically, if one is born with a narrowed carpal tunnel, this would increase the chances of developing CTS.

Other risk factors would include arthritis, fracture or previous injuries to the wrist, diabetes, and an under active thyroid. Metabolic disorders affecting the bodys, nerves tend to make them more susceptible to compression thus resulting in CTS. Pregnant women in the last few months of pregnancy can sometimes develop Carpal Tunnel Syndrome due to fluid retention and joint swelling. Smokers are also at high risk, as smoking decreases blood circulation. However, in some cases, there is no definitive cause for CTS.

It is important to diagnose CTS early to avoid permanent damage to the median nerve. A physician will exam the wrist for tenderness, swelling, warmth and discoloration. Then each finger will be examined for sensation with exception of the little finger as it is unaffected by CTS. This helps the physician to make the correct diagnosis. The muscles at the base of the hand should be checked for muscle strength atrophy at the same time. Laboratory test and X-rays should be performed to detect diabetes, arthritis, and fractures. The physician will have the patient undergo several tests to produce symptoms of CTS.

In the Tinel Test, a physician will tap on the wrist to produce enough pressure in the patient's wrist to see if they experience tingling in the fingers or a sensation of shock which is considered a positive reaction.

The Phalen test, commonly called wrist-flexion test, has the patient hold their forearms vertically while applying pressure by pushing their hands together and pointing the fingers down. The diagnosis of CTS will be made if one or more of the symptoms, like tingling or increasing numbness occur within a minute or less.

Confirmation of diagnosis of Carpal Tunnel Syndrome is often done through electrodiagnostic tests. Electromyography uses a fine needle to insert into a muscle. The electrical activity measured will help to determine the severity of damage to the median nerve. Ultrasound imaging can help to show impaired movement on the median nerve. Magnetic Resonance Imaging tests show the anatomy of the wrist but have not been helpful in diagnosing CTS.

Initially, the physician will modify behavioral habits. One may have to rest their wrists or change how they use their hands to take the pressure off of the nerve tissue. This can give the needed time for the nerve tissue to heal properly. Tissue damage is slow to heal thus requiring a long period of down time. The physician may ask the patient to wear a splint on the wrist to keep it from moving. This forces the hand to do most of the work that the wrist would normally do. The patient may be required to wear the splint at night to help relieve the pain. Propping the arm up with pillows when lying down can also help. It is necessary that the wrist is not down for prolonged periods of time. Using ice on the affected area helps to reduce swelling, thus decreasing pain.The physician may also suggest physical therapy, rehabilitation or even surgery.

In some instances drugs can be used to help alleviate the pain and swelling associated with CTS. Nonsteroidal anti-inflammatory drugs, like aspirin, ibuprofen and other nonprescription pain relievers help to alleviate short time symptoms caused by strenuous activity. Some physicians like to administer oral diuretics like water pills to reduce swelling. Lidocaine can also be injected directly into the wrist or taken orally to relieve the pressure on the median nerve. This will provide immediate, albeit temporary, relief for mild/intermediate symptoms. Those patients that have diabetes or are predisposed to diabetes should not take corticosteroids for long periods of time as this makes it difficult to regulate insulin levels. Some studies have shown Vitamin B6 supplements can help alleviate symptoms of CTS.

Some patients have experienced benefits by stretching and strengthening exercises. These exercises should be under the supervision of a physical or occupational therapist. Stretches have been shown to improve flexibility and range of motion, lessen risk of injury and overall, feel good. It is important to remember to stretch slowly while avoiding bouncing or jerking. Stretching should be held no longer than 10-15 seconds. A contradiction to any stretch is if it hurts, do not do it. Another exercise is to stretch the fingers as wide as possible (wide 5) then make a tight fist with wrist curls and extensions. Some patients have also experienced benefits from some alternative therapies, such as acupuncture and chiropractic care. However, these results have not been substantiated. A great way for a patient to reduce pain is yoga which allows for the patient to strengthen their grip.

If the patient has not improved after six months the doctor may recommend surgery. Performing surgery involves severing the band of tissue around the wrist allowing for reduction of pressure on the median nerve. Typically, patients will have surgery on both hands but not necessarily at the same time. There are several types of surgery to choose from.

Open release surgery is used to correct Carpal Tunnel Syndrome. An incision is made up to two inches on the wrist, followed by cutting the carpal ligament, enlarging the carpal tunnel itself. This the traditional procedures used to correct CTS. However, there is another surgical option.

Endoscopic surgery is the other form of surgery a physician might choose. This surgery allows for the patient to have a faster functional recovery and less post-operative discomfort compared opening release surgery. The surgeon will make two one-half inch incisions in the wrist and palm. He will then insert a camera attached to a tube to observe the tissue. He will then cut the carpal ligament or the tissue that holds the joints together.

While the surgery allows for immediate relief of symptoms, the full recovery can take several months. Some patients may experience infection, nerve damage, stiffness and pain at the scar after surgery. It is imperative that the patient undergo physical therapy after recovering from surgery to allow time for strength to build up in the wrist. The patient will be assigned hand, wrist and finger exercises to strengthen the wrist. Job responsibilities might need to be adjusted or even changed after surgery. Most patients recover completely, although some do experience a reoccurrence.

Prevention is the best way to protect oneself from developing Carpal Tunnel Syndrome. While at work, workers should perform stretching exercises of the wrist, arm and neck. These stretches

should be performed a minimum of three times a day. The same guidelines and benefits to stretching mentioned earlier also apply for prevention. Taking breaks at regular intervals (about 5 minutes every hour), wearing a wrist brace, and being conscience of posture and wrist position also help. The general thought is that CTS can be prevented, but caution needs to be exercised. While some patients improve with stretching and exercise, there are also those who will deteriorate. The following list contains suggestions for prevention of CTS:

- Lose weight as needed
- Proper treatment of any existing disease the increases the risk of CTS
- with repetitive movement, keep from bending, twisting or extending the wrist for long periods of time
- Make sure the arms are not held too close or too far from the body
- Keep from resting the wrist on hard surfaces for extended periods of time
- Do not repeat the same task with the same hand continually
- Tools need to be the adequate size for one's hand size make sure that the chair is properly adjusted so the forearms are level with the keyboard when typing
- Do not sit or stand in the same position for a full day

Massage therapy not only helps to alleviate the discomfort associated with Carpal Tunnel Syndrome but also helps in its prevention. A massage therapist needs to avoid direct palpation of the damaged nerve. Myofascial stretching is recommended over the flexor retinaculum. This helps to reduce the aggravating symptoms of CTS. The massage therapist needs to spend extra time on the wrist and fingers as this area tends to be hypertonic. Begin palpating these areas lightly and over time the pressure may be increased.

Use of deep longitudinal stretching and compression-broadening methods should be used on the forearm flexors allowing the tone in these tissues to firm up. These strokes should be slow and light to allow for increase of the flexors to become engaged in an isometric contraction encouraging elongation in the muscles.

In addition to the work performed on the wrists, the massage therapist needs to concentrate on the upper extremity and neck. The median nerve could potentially be compressed in more than one area. The massage therapist needs to treat the wrist, arm, shoulder and neck to ensure the best treatment for their patient. Too many times only the wrist is treated, and while the symptoms may initially decrease, eventually, they will return.

The patients initial complaint consisted of numbness in both hands. The patient does a lot of driving as a means of employment. The patient has seen several doctors with surgery as the recommendation. The patient has refused surgery and is seeking alternative help. He went to chiropractors until there was nothing more they could do for him. The patient stated nothing seems to be helping. He has had numbness and stiffness in his hands every day for the past two years. His diet includes a medium amount of red meat and fruit or vegetables and moderate water intake. His caffeine intake is low. His consumption of sweets is mild.

The patient chose massage therapy as his alternative therapy. Therapy was performed three to

four times over the course of two months. The patient was advised to reduce his intake of caffeine and alcohol, increase his water intake and begin wide five stretching techniques. At the first return visit, the patient commented about the vast improvement in his mobility. Pain did return on day three and continuing with the same treatment was recommended with another return visit within 72 hours. At the second return visit, patient again commented on his improvement and agreed to continue treatment as before with return within 72 hours as before. Patient has also agreed to continue to return for treatment until such time as he has to return to his home in Florida for the season.

Carpal Tunnel Syndrome can affect a person's quality of life. Daily tasks almost become impossible. Pain, stiffness, and loss of grip are common. Since a lot of people have heard of Carpal Tunnel Syndrome but do not fully realize what the symptoms are few rarely get treatment at early onset. Only when it affects their work is treatment sought. Employers are realizing that repetitive work can hurt not only the employees but also their bottom line. Carpal Tunnel Syndrome is not caused by one particular job. It affects various repetitive occupations and can even be caused by a person's hobbies or injuries. Treatment is individual. Extreme cases may resort to surgery to try and help relieve symptoms. Others who seek alternative methods will go to chiropractors or engage in massage therapy. Massage therapy in many cases is proving to be a noninvasive alternative. Working with a massage therapist on a regular basis can improve a person's range of motion and grip strength. Stretching and strengthening exercises are also helpful in reducing pain and soreness. In earlier years, most people, including doctors, believed that surgery was the only method to correct CTS. However, with today's advances in science, we know more about the carpal tunnel and how it affects mobility. Alternative therapies are on the rise as a viable means of correction without invasive surgical maneuvers. As education on CTS increases, it is highly likely that more people will cease to suffer from this painful condition.

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Manual Therapy for Temporomandibular Joint Disorders
Manuela S. Thames

Headaches, tension in the neck and shoulders, facial pain, or ear pain: these are maladies very familiar to everyone. However, most people would not consider that a dysfunction of one particular joint could be a common cause of these complaints. Even in these days of knowing more and more about TMJ/TMD, this remains one of the last possible causes that people consider when symptoms such as those arise. As Ruth Werner remarks, “Some estimates suggest that up to 20% of the US population has some degree of TMJ disorders, but only a small fraction may ever seek help.” To further complicate matters, people who do seek help are often aware of only a limited range of treatment options.

In response to all of this, I will aim in this paper to explain what TMJ is and how it is often related to many common ailments, and how manual therapy can be an effective and affordable (though often overlooked) alternative treatment option for people who suffer from chronic TMD.

A Description of the Temporomandibular Joint

The temporomandibular joint is a connection between the mandible and the temporal bone on either side of the face. Specifically, the condyle of the mandible articulates with the articular tubercle of the temporal bone, and also articulates with the anterior part of the mandibular fossa of the temporal bone, which is therefore the third bony landmark that builds this joint.

In the past, the temporomandibular joint was described as a diarthrotic ball-and-socket joint. Often the joint is simply called a modified hinge type. However, nowadays this joint is most commonly recognized as of a unique kind, namely, a ginglymo-arthrodial joint. This sort of joint allows many different jaw positions and postures which make it possible to speak and chew all different kinds of food. I will explain below why this unique structure allows such a variety of movements.

The joint is stabilized and held together by three ligaments, an articular disc, and the articular capsule. The three ligaments are named after the bones they attach to: the temporomandibular ligament, the sphenomandibular ligament, and the stylomandibular ligament (styloid process of temporal bone).

The articular capsule is also sometimes called the articular ligament. But instead of only attaching to two different bony landmarks of two different bones, it surrounds the joint like an envelope. It attaches to the three different bony parts which make up the joint: the circumference

of the mandibular fossa, the anterior side of the articular tubercle of the temporal bone, and the neck of the condyle of the mandible.

The articular disc can be described as a thin, oval shaped plate that lies in between the mandibular fossa and the condyle and adapts to either shape. It plays an important role in this joint in that it protects the two bones connected to it from wear and tear. Moreover, along with the other ligaments mentioned above, it is ultimately what enables the variety of movements that this joint can perform, which I will describe in more detail below.

Other important parts of this joint include the two synovial membranes that lubricate the diarthrotic joint with synovial fluid. They are situated superior and inferior to the articular disc, lining either side of the fibrous layer of the capsule.

The Muscles of the Temporomandibular Joint

The five movements of the joint are the five movements of the mandible at the joint: elevation (closing the jaw); depression (opening the jaw); protrusion and retrusion (forward and backward movements of the chin). These four movements are performed bilaterally. Unilaterally the mandible can also perform lateral movements that are important for chewing.

These movements are enabled by the four muscles of mastication, the Temporalis, the Masseter, and the medial and lateral Pterygoids. The Temporalis attaches broadly to the temporal fossa and to the coronoid process and ramus of the mandible. The Masseter, palpable when clenching your teeth, has an attachment at the maxillary process of the zygomatic bone and zygomatic arch, and attaches distally to the ramus of the mandible.
The medial Pterygoid is also called a “mirror image” of the Masseter with two heads attaching to the pterygoid plate and pyramidal process of the palatine bone and the tuberosity of maxilla, and distally to the ramus of mandible on the medial side.
The lateral Pterygoid is attached to the sphenoid bone and lateral pterygoid plate.
Its two distal heads attach one to the joint capsule and articular disc, and two to the condyloid process of mandible.

The movement of elevation is caused by the Temporalis, Masseter and medial Pterygoid together. The prime mover for depression is the lateral Pterygoid, although it is said that depression is generally caused by gravity. The lateral Pterygoid is also the prime mover for protrusion, and the Temporal and Masseter are responsible for retrusion. The reason why this system is so unique is because these two joints on either side of the face work as a unit but yet independently. The articular disc is able to move in coordination with the movement of the bones.

A unique gliding movement which dentists call “translation” works as follows: In order for the mouth to open wide, the head of the mandible and the articular disc move towards the anterior side until the head of the mandible lies inferior to the articular tubercle of the temporal bone. This must happen bilaterally. If this gliding movement happens unilaterally, it causes the opposite head of the mandible to rotate on the inferior side of the articular disc which results into a chewing and grinding movement.

The complex structure of the temporomanibular joint is a strong and very adaptable structure if functioning correctly. However, the forces that are placed upon this joint can result into dysfunctions which can cause a variety of often confusing symptoms, which we will now proceed to discuss.

Temporomandibular Joint Disorders and its Symptoms

TMD, which is the abbreviation for "temporomandibular disorder", includes any dysfunction or imbalance of the jaw joint, muscles of mastication and the bite (dental occlusion). The term describes a group of diseases and disorders caused by these dysfunctions or imbalances.

We can differentiate between two kinds of symptoms associated with TMD: intracapsular, meaning symptoms directly at the joint capsule, and extracapsular, meaning symptoms occurring in areas surrounding the joint (soft tissue etc.). Patients usually have a combination of intracapsular and extracapsular symptoms.

Intracapsular symptoms would include joint noise, subluxation (partial dislocation), preauricular pain (pain at the joint), and locking of the joint. There are four different kinds of joint noise: click, pop, snap and crepitus (like grinding sand or glass). The most common joint noise is clicking. Joint noise is created when the articular disc does not move anymore in coordination with the bones, or the mandibular condyle positions itself upon the articular disc. Joint noise can occur unilaterally or bilaterally. The bilateral clicking noise is categorized in three stages. The stages are determined by when you hear the click, which indicates when the mandibular condyle positions itself. The patient is diagnosed with stage one when the joint noise occurs as he opens and closes the jaw. Stage two is described as "mid range of motion": the click happens while opening and closing. If the joint noise happens at the end of opening and closing the jaw, it is stage three. The most common diagnosis is bilateral reciprocal click stage one, reciprocal meaning a closing click. The earlier the click, the less serious is the condition.

There are various extracapsular symptoms. One of the most common ones is headaches. Patients may complain about temporal headaches, unilateral retroorbital (behind the eye) headaches, and headaches in the morning. Further, patients may suffer extracapsular symptoms such as toothache, head, neck, upper back, shoulder and chest pain, facial myalgia, and muscle fatigue. Other extracapsular symptoms may also include ear pain, which can be described as ear ringing called tinnitus, or ear fullness, accompanied by dizziness. Finally, they include dysfunctional symptoms such as limited or deviated jaw movement, limited head range of motion, or the patient may simply feel his bite is off. Patients often suffer a combination of the symptoms above, with different constellations that may change over time.

In the case study attached to this paper, the patient I was treating suffered a combination of several of the symptoms mentioned above. When he was diagnosed with TMD he had suffered from facial pain, ear pain, and several instances of joint locking. Indeed, frequent ear and facial pain had become part of his normal life for several years. At the time that he came to see me, he was complaining in particular about tension in his neck, his bite feeling off, and frequent biting of his lip. He was also able to hear a joint noise, but only on the right side. He described it as

sometimes clicking, and sometimes crepitus, and he only could hear the noise at the end of opening the jaw.

Causes of Temporomandibular Joint Disorders

Causes of TMJ can be divided into two groups, macrotraumas and microtraumas.

Among the macrotraumas that can contribute to TMJ are fractures of the face, jaw, and skull, a blow to the face, and whiplash injuries from car accidents. It is important to know that TMJ symptoms after an accident may not show up for several weeks. According to American Dental Association estimates, 44% to 99% of TMJ problems are brought on by some kind of trauma. Included in that range are traumas that happened even years before the symptoms emerge, e.g., traumas which caused structural problems in the back which then affects the neck and jaw years later. Indeed, sizable gap that may exist between the cause and the symptoms is a common reason why it is often so difficult to pinpoint the cause of TMD.

Microtraumas include certain things that often can be simultaneously cause and symptom. An example of this is bruxism, which is "an oral habit involving involuntary rhythmic or spasmodic nonfunctional gnashing, grinding and clenching of teeth, usually during sleep." The constant grinding or clenching of teeth during sleep or even subconsciously during the day puts a lot of pressure on the joint and causes a constant muscle engagement, which can lead to muscle fatigue. Ideally, the teeth should never be in contact except when swallowing; all other times the space in between teeth should be 2-6 mm, often called "freeway space". Underlying causes for bruxism may be stress, anxiety, poor bite alignment, dislocated jaw, central nervous system disorder, new dental filling, or habitual teeth grinding.

The role of stress in TMD is an important one. Stress causes but also increases bruxism during sleep and subconsciously during the day. Stress also affects the patient's adaptability and pain threshold and the patient will experience symptoms of TMD more likely. Although stress plays an important part in TMD development, however, it will never be the only cause of TMD. Dr. Barry Cooper remarks that "Stress and tension may awaken a quiet, asymptomatic TMJ / TMD or aggravate an existing temporomandibular condition. However, stress alone does not cause TMJ / TMD if a patient has healthy dental occlusion and muscle and jaw function."

There are other kinds of causes as well. One can be systemic diseases like Arthritis or Lupus erythematosus.

Osteoarthritis is more common than Rheumatoidarthritis. Malocclusion is another cause. The term means simply "bad bite" or the bite "feels off". Tooth loss or dental work can contribute to this. A bite that is uncoordinated with joint and muscle function puts strain on the muscles of mastication and puts pressure on the joint capsule.

In the case of the patient described in my case study, he could not recall any accident or other trauma that could have been the cause for his problems, nor could he determine any other cause

other than occasional moderate levels of stress. He does often find himself grinding his teeth during the day, due more to habit than anything else.

Evaluation and Diagnosis

Since causes of TMD can often be events that happened years ago, it is most important to take a thorough health history. In this chapter I would like to explain the evaluation and diagnosis procedures of a medical professional who is especially trained in the assessment of TMD and other facial disorders, and how the medical massage therapist can evaluate someone who comes with symptoms such as those mentioned above.

It is important, first of all, to bear in mind the complexity of symptoms and causes of TMD that we have discussed in order to diagnose it and find a successful treatment. A medical professional takes a thorough medical and dental health history, taking special note of past injuries, past surgeries, family history and the progression of symptoms. Often the history will indicate what could have caused the TMD symptoms.

A physical examination would be the next step, and would include the examination of muscles, bones, nerves, vessels, and the dentition. To finally determine whether a person has TMD or which stage it is in, the medical professionals will use radiographs such as x-rays, MRI, or CT. A dentist is usually able to take a panoramic x-ray, meaning an x-ray taken from both sides at the same time.

X-rays are useful for showing the general anatomy of the patient. MRI (magnetic resonance imaging) is necessary to assess any disc or other soft tissue structure changes, where as a CT scan is useful in showing for example sclerotic, degenerative, or traumatic changes in the bone structure. There are also other diagnostic tools a physician might use. Sonography measures joint noise and helps to determine the quality, quantity, and location of joint noises such as popping, clicking, snapping and crepitus. Evaluating the joint noise can be very helpful in assessing the ligament and joint damage.

Electromyography is used to measure the electrical activity in the muscles of mastication, and therefore the ability of the muscles to function correctly. Computerized Jaw Tracking is a method of measuring the jaw functions in three dimensions. TENS, which stands for Transcutaneous Electrical Neuromuscular Stimulation, is used to relax the muscles. An instrument called a Myo-Monitor sends a mild electrical impulse to the muscles to relax them, increase the blood flow and remove toxins. Sometimes the diagnostic procedure will also include laboratory tests and a psychological assessment. Laboratory testing is necessary, for instance, if rheumatoid arthritis is suspected.

Medical massage therapists typically don't have access to these diagnostic tools, but he or she is certainly able and responsible for taking a thorough health history, assessing facial symmetry, facial scoliosis and range of motion and certainly palpating the muscles. Asking questions is most important. Taking the health history should include questions about headaches, muscle fatigue, surgery history, dental work including hygiene appointments, dentures, injuries of the head, neck, and face, facial and ear pain, joint noises or locking, medications, overall stress level,

and pain and functionability level. The evaluation should also include questions about the general lifestyle, exercise and diet, which is useful in getting a bigger picture of the patient's health. As a medical massage therapist, one should also ask their client whether he or she chews gum and how often, whether he or she is aware of clenching teeth, and if he or she wakes up in the morning with a "stiff" face. It is also important to get some information about other disciplines: Has the patient been to a dentist, chiropractor, PT or maybe another massage therapist?

All these factors are important to get a better sense of what might have caused the symptoms the client complaints about.

Treatment of TMD

Dentists are generally the health care professionals that deal with TMD in the first place, diagnose it and offer the patient a treatment option.

Generally dentists can offer three treatment options: splints, anti-inflammatories, and surgery. Splints are the most effective and helpful option that dentists have to offer, since it is not invasive. A splint is a clear plastic appliance that the patient puts in the mouth to cover either the upper or bottom teeth. It creates the important so-called "freeway space", and thereby reduces bruxism. The patient will be more aware of clenching the teeth, and the splint helps to break that habit. It also reduces the pressure on the joint. A splint is usually worn during the night but sometimes the dentist will prescribe a splint to be worn 24 hours a day.

When my patient was diagnosed with TMD, his dentist also prescribed him a splint. After wearing the splint for several months during the night, the condition got better, meaning in this case that there was no more joint locking, and there was a significant decrease in pain.

Dentist or other Physicians often prescribe anti-inflammatories or pain relievers (NSAIDS), which reduce pain and reduce inflammation, often in combination with muscle relaxants. This can be a temporary solution, though it is scientifically known that NSAIDS may have an adverse effect on muscle fibers, affecting collagen and creating cross linkage and adhesion. Also, the muscle fiber regeneration may be delayed. Thus, while these types of medication can reduce some of the symptoms, they may end up making the condition even worse in the long run.

The last options for dentists are surgeries of different types. Invasive treatments would include surgical replacement of jaw joints with artificial implants, orthodontics to change the bite, using crown and bridge work to balance the bite, and occlusal adjustment, which is grinding down teeth to bring the bite into balance. These irreversible treatments may cause long term pain and permanent damage, which is why the National Institute of Health recommends, "before undergoing any surgery on the jaw joint, it is very important to get other independent opinions…Surgical treatments," they explain, "are controversial, often irreversible, and should be avoided where possible. There have been no long-term clinical trials to study the safety and effectiveness of surgical treatments for TMJ disorders."[i]

Interestingly enough, almost any article about surgical options for treating TMD that one will find agrees that surgery should be the very last option, only if nothing else seems to work for the patient. But what other options does a patient have?

Self care for Patients with TMD

One important point to understand about treatment of TMD is that there are a lot of self-care exercises that the patient can and should do in order to successfully treat specific symptoms. In fact, depending on the severity of the disorder the patient might be able to completely self-manage the symptoms. Some of the self care techniques include soft diet, avoiding gum at all times, controlled yawning, stress management (e.g. yoga or meditation), heat and cold therapy, jaw exercises, exercise in general, good nutrition, and the avoidance of long dental appointments. A TMD patient should also consider his/her sleeping position. The best way for the neck and face muscles to relax is sleeping on the back.

A lot of TMD patients complain of muscle fatigue. The best treatment for muscle fatigue is rest. The most relaxed position for the jaw is with lips closed and teeth apart. Throughout the day, the patient should remind himself to keep the jaw in this position, especially when he/she is aware of clenching the teeth during the day.

A helpful exercise for the jaw would be to stand in front of a mirror to and practice opening and closing the jaw in a straight line. This will retrain the muscles, and eventually the patient will develop the habit of always opening and closing the jaw in a straight line.

Manual Therapy for Patients with TMD

As a manual therapist it is very important, after taking a thorough health history, to take a full body or at least an upper body assessment of the body. This will indicate what else is going on with the patient's body, and whether there may be any connections to the symptoms the patient complains about.

The manual therapist should also look at facial symmetry, facial scoliosis, range of motion of the jaw, and most important, s/he should palpate the tissue, and treat according to the findings. Before the manual therapist treats the jaw area itself, it is important to include detailed laminar groove work, shoulder and neck work according to the findings.

The specific TMJ treatment includes palpating and massaging the origins and insertions of the four muscles of mastication, though it is only possible to access three of them. Since the medial Pterygoid is a "mirror" image of the Masseter we affect it by stretching and compressing the Masseter. The manual therapist works around the area of the ear directly at the joint, the skull area around the ear, along the zygomatic arch, along the jaw line at the angle of the mandible, and underneath the jaw line. Different stretches would include the Masseter glide, jaw juts, lateral stretching, the zygomatic lift, frontal lift, and temporal press.
To achieve optimal results the therapist should use the laser or bioptron for one minute per side as part of each treatment, and the patient should be sure to ice the treated areas afterwards. Other

modalities may also include the application of hand friction heat. In general, the treatment of TMJ is focused and slow, and accordingly the therapist should plan on some extra time.

In the case of my patient I used either a bioptron or laser during each treatment. I also instructed him in the retraining of his muscles in front of the mirror.

Initially I achieved some changes in the neck and shoulder area, but not in the TMJ region, at least not noticeably. The patient stated that he could tell a slight difference after each treatment, but it wasn't until the fifth treatment that I was able to feel a clinical change in the soft tissue structures surrounding the TMJ.

Conclusion

Manual therapy will not cure TMD, nor will other treatment options. But given what manual therapy can do, it is clearly one of the best options available to a TMD sufferer. The analysis of the case study has shown that, though individual treatments may be somewhat helpful to a patient, TMD treatments require significant time to be optimally effective. In my case, I achieved the first clinical change directly at the jaw only after five treatments, although my patient did state that he felt "looser" after each treatment.

We have also discussed how an actively participating patient is important in the treatment process. If the patient follows the self care recommendations, and does the exercises regularly, it is much more likely that you can achieve treatment results faster, bearing keeping in mind, of course, that every individual responds differently. Finally, based on the research and case study, we conclude that combined with self care techniques and the wearing of a splint if bruxism is involved, regular manual therapy treatments can be an effective and optimal alternative to other treatment options to decrease symptoms and maintain a good comfort level.

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Edema
Jewel Borgeld

Edema is an accumulation or swelling of fluid between cells that surround body tissue and organs. (1) It can affect different areas of the body due to many circumstances. It does not discriminate between age or sex. It can also be caused by systemic diseases that affect various organ systems of the body. The most common involve the heart, liver, and kidneys. This is primarily due to the retention of too much salt. Most importantly, edema is a sign of an underlying disease process which needs to be treated. (2)

There are many causes of edema which include:

In most cases it occurs when fluid leaks from the body's blood vessels (capillaries) into surrounding tissue. This happens because pressure in the vessels is weakened. When the body senses fluid is lost it signals the kidneys to hold onto sodium and water which in turn adds to additional leakage. This in turn causes other organs to also become affected and the cycle continues. Most causes are :(3)

- Weak heart - which leads to congested heart failure
- Obstructions
- Accumulation of proteins in interstitial fluid
- Kidneys not filtering properly
- Congested liver - cirrhosis
- Infection
- Mechanical blockage
- Pregnancy
- Cancer - more associated with lymphedema
- Damage to veins
- Drug interaction

The different kinds of edema:

There are three kinds of edema which are pitting, non-pitting and idiopathic. Pitting occurs when pressure is applied to the skin of a swollen leg by depressing the skin with a finger. If an indentation persists for some time after the release of pressure, the edema is referred to as pitting edema.

In non-pitting edema, which usually affects the arms or legs, pressure that is applied to the skin does not result in a persistent indentation. This can occur in disorders of the lymphatic system and hypothyroidism. Non-pitting of the legs is hard to treat. Diuretic medications are not usually helpful and effective.

Idiopathic edema occurs most often in women and just prior to their menstrual cycles.. The most common sites are varicose veins and the deep veins of the legs. This is caused by inadequate pumping of the blood by the veins (venous insufficiency). This results in the veins leaking into interstitial spaces.

Generalized edema involves an increase in extra cellular fluid which does not communicate freely with the rest of the body. It is due to increases in both total body water and sodium and can occur with low, normal, or high serum sodium concentration.

The effects of edema on various organs are:

1. Pulmonary and Heart Failure - The most harmful effects of edema is pulmonary edema which can be life threatening. (4) Which can lead to congestive heart failure (CHF). This happens when there is an imbalance in the pump function of the heart which causes an imbalance in lung fluid and edema happens. Approximately 30-40% of patients with CHF are hospitalized each year. The most common cause of death is progressive heart failure. It is greater in males than in females for patients aged 40-75 years and affects about 10% of the population older than 75 years. (5)

2. Kidney Disease - When the kidneys are not filtering properly it causes swelling in the legs and around the eyes because the kidneys fail to excrete the normal amount of sodium and fluid. The decreased amount of blood pumped out by the heart to the kidneys fools the kidneys into thinking it needs to retain salt and water. This fluid increase is a result in fluid increase in the lungs, which causes shortness of breath.

3. Liver - This happens when cirrhosis, congestion in the liver, leads to an increase in pressure in the blood vessels in the liver which causes swelling of the abdomen, this is also called ascites. If the patient lies down most of the day, they may also have swelling the lower back.

4. Veins - This can happen after blood clots. This interferes with normal blood circulation.

The rational for treatment:
Excessive fluid in the extra cellar space can markedly impair normal organ function. Edema of the skin can be painful, interferes with normal blood circulation, impairs wound healing, increases the possibility of infection and is unattractive. It can impair normal respiration, decrease blood exchange to the heart and is a major cause of morbidity and mortality. (6) Therefore, it would be beneficial to the client to receive treatment as soon as possible to elevate potential problems.

Ways to treat edema:

1. Pulmonary edema is the only form that is life-threatening and needs immediate treatment because it interferes with breathing. Treating with diuretics and restricting sodium help minimize fluid around the lungs.

2. Diuretics- medicines that stimulate the kidneys to remove fluid. Although they are beneficial, they are not recommended in pregnancy

3. Restriction of sodium in the diet- sodium can cause kidneys to retain more fluid.

4. Body positioning- elevation of the legs, in particular, and the use of elastic stockings can help drain excess fluid.

5. Cryotherapy-the use of cold applications to affected areas which decrease pain, edema, inflammation, slows down cellular metabolism.

6. Actinotherapy-the use of actinic and photo light sources which produce photochemical effects and facilitates tissue healing.

7. Hydrotherapy-the use of water which provides passive exercise and compression to the tissue.

8. Mechanotherapy-the use of mechanical equipment that facilitates movement to affected areas.

9. Electrotherapy-the use of electricity to stimulate circulation.

10. Other measures- other drugs may help in the underlying disease.

Contraindications for treating edema:

Edema is always a red flag and calls for precaution, but if the cause is from a musculoskeletal injury, then massage is very appropriate and vital to the healing process. (7). The various precautions that may avert treatment are:

1. Congestive Heart Failure- if the heart is overtaxed massage could make it worse by putting an even greater load on the system.

2. Kidney failure- if the kidneys are not filtering fast enough, massage could make it worse.

3. Congested liver- Cirrhosis or a congested liver that is already stressed may make it work harder to push blood through a system already impaired.

4. Local infection- the risk of pushing pathogens into the lymphatic and circulatory system before the body has its defenses up and running.

5. Mechanical blockage- if it is anywhere in the circulatory system massage may cause it to break loose a clot.

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