Pulling Back the Curtain:
A Look at Sports Massage Therapy

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About the Instructor

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Steve has over 20 years of experience as a massage therapist and athletic trainer and holds a Bachelor’s degree in nutrition and fitness and a Master’s degree in sports medicine. He currently serves as the Director of Health and Human Services at The Community College of Baltimore County where he oversees the delivery of 20 educational programs in the workforce development division. Prior to Baltimore, he served as the Director of Massage Therapy for the WTA- Women’s Tennis Association where he was a vital component of the Sports Sciences Department helping to ensure the players received comprehensive care. Steve has worked in the clinical or sports environment his entire career; he was an athletic training intern with the Tampa Bay Buccaneers NFL Team and performed the massage therapy for the team. He has also worked with professional and US National Soccer Teams, Arena Football, Jai-Ali, Professional Ballet, and in college athletics. Outside the treatment room, Steve served as the director of the Massage Therapy Program at Trident Technical College was an adjunct faculty member in the Physical and Occupational Therapy programs at the Medical University of South Carolina and is on the Editorial Review Operational Committee for the AMTA Journal. Steve has published articles on massage therapy in numerous trade magazines, the scientific Journal of Medicine and Science in Tennis, and he has published a textbook - Clinical Massage Therapy: Assessment and Treatment of Orthopedic Conditions (www.mhhe.com/jurchclinical) with McGraw-Hill.

Steve has been teaching in some form for 19 years ranging from the classroom to continuing education courses to working as one of the developers of the AMTA Fascial Therapy continuing education program. He is accredited as an approved provider of continuing education through both the National Certification Board for Therapeutic Massage and Bodywork and the Florida Board of Massage Therapy. His continuing education courses focus on clinical and sports massage therapy though he also teaches on fascial and trigger point therapy and flexibility training. His website (www.jurchperformanceeducation.com) not only has details on courses but serves as an informational resource on the subjects of clinical and sports massage, research, and sports medicine topics.
Introduction

The field of sports massage therapy is a very popular specialization within our profession. The challenge with having such flexibility in specializations is consistency when it comes to defining them. When asking what the definition of a sports massage therapist is, answers can vary greatly and often end in confusion for the consumer.

When a therapist advertises that they are a sports massage therapist, do they really understand what that means? I have asked that question many times over the years and the common response is that they work deeper and that it is on an “athlete”. Part of this is that with all the other skills that are required to be taught in the schools to train the entry level therapist, there is not a lot of time spent on this higher level training.

So What is a Sports Massage Therapist?

When we start to define sports massage, we see that it is targeted to support fitness, help reduce the demands of sport on the body, increase performance, and shorten recovery time. In many cases, specializations are defined by the techniques that are utilized but when we dive a bit deeper and look at the techniques used in sports massage, there are no magic bullets.

The same techniques that are utilized in other types of massage are used in sports massage but are applied to a specific population. The real challenge is applying our critical thinking skills and learning when to use those techniques to achieve the best results. The ultimate goal is to contribute to the health and wellbeing of the athlete so considerations such as timing, setting, common stress areas, training schedule, and any other therapy the athlete is receiving are factored into treatment decisions.

If we wanted to look at a more formal definition, then sports massage entails applying massage and adjunct techniques to a particular client population. That population can range from the active individual to the professional athlete. The sports massage therapist treats musculoskeletal conditions by applying critical thinking using information gathered through an advanced understanding of anatomy and physiology, the understanding of injury pathology and the sport, proficient palpation, and a skilled assessment ability including history, ROM, manual muscle testing, and orthopedic tests.

History and Evolution of Sports Massage

Credited with utilizing massage for helping their athletes, the Greeks began to popularize massage on athletes throughout Europe. The modern history of sports massage started in 1924 at the Olympic Games in Paris. A Finnish runner named Paavo Nurmi, nicknamed the “flying Finn” brought a personal massage therapist with him to the games. Paavo went on to win 5 gold medals in running events and then claimed that his training program included this specialized type of treatment. In the US, the introduction of sports massage took a different route. A professional athlete named Jack Meagher was in the military in and had suffered an injury and had a chronic shoulder problem. He had already graduated from a school of Swedish massage but in 1945, a German prisoner of war who was a therapist prior to the war treated Jack with a different type of massage. He stated that “my ability to move while playing was astounding”.

Once he finished his time in the service, he then sought out training from a German instructor familiar with the techniques. He then knew what direction he wanted to take his type of work.

Despite the beneficial results of sports massage, it does not develop into a specialized field until the 1970s. In 1982, the AMTA developed a national educational program in sports massage and in 1985 as part of a public relations campaign; they created the National Sports Massage Team. A key figure in that development was an athletic trainer and massage therapist named Benny Vaughn. Shortly after that, the team was discontinued.

One outcome of the discontinuation is the lack of consistency in the specialization so that today there is no real set curriculum on sports massage. Various individuals have created their own but they are not recognized by any national governing body. The end result of this is that utilization is increasing but there is still a big lack of understanding on what sports massage actually is, how to incorporate it into a particular setting, and what it takes to work in the field.

What's It Like?

We all want to look at the glamorous side of athletics and be those people standing on the sidelines, traveling around the globe, or sharing in the celebration of a world championship. While those things are a great perk of the field, there are plenty of times where the job is not all that fun. First of all, this work is tough. Depending on what type of athlete you work with there may be a considerable size difference between you and them.

Another aspect of this type of work is that the hours can be quite long. Schedules can change at the last minute and you must be able to be flexible with your day. In a sport like tennis, you are there until the last match finishes and there is no way to accurately predict how long the matches are going to be so it could end up being a 14 hour day very quickly. Now you may not be doing massage that entire time, but the hours take their own toll. If you are going into sports massage to get rich and famous you might as well stop there. The support teams behind the scenes get very little if any recognition for what they do. They are expected to give a tremendous effort often for nothing more than personal satisfaction that you contributed to an athlete’s success. You have to love what you do.

If you were to look at the number of elite athletes across all sports it is a pretty substantial number. If you were to then look at the athletes that can earn a living doing their sports that number drops dramatically. If you take that one step further and look at the athletes who become wealthy, you are looking at a very small percentage. Access to that small population is extremely difficult and you and everyone else in a variety of health professions are fighting for a piece of the pie. So at the end of the day, all athletes need soft tissue work not just the rich ones so you have to ask yourself, why am I doing this?

The careers of many athletes can only last for a few years. In order to capitalize on every opportunity, they will try anything and everything to increase their chances of extending an already short career. This causes many athletes to be very fickle. If what someone does is not producing results, especially results they can see, they are very quick to try the next thing. They listen to every snake oil salesman selling them the next greatest thing to keep them healthy and improve their performance. Massage therapists are often an unfortunate casualty.
If you have spent any time around high profile athletes or teams, you will quickly learn that people want to be associated with them. This causes people to give away their products and services they would otherwise charge for. This can create an entitlement mentality and put us in a bad position. While working for free is not necessarily a bad idea, the pros and cons must be considered to make sure you are not being taken advantage of.

The last point I want to discuss is that creating an entire client base consisting of athletes is not necessarily a realistic undertaking. If you are fortunate enough to live in a location that has a substantial population of athletes, there will always be a fluxuation due to the mobility of their careers and the limited client base.

Where Do They Work?

Sports massage therapists practice in a variety of settings but two common ones are as part of a healthcare team working primarily or exclusively with athletes and a private setting where the therapist treats an athletic client population.

Sports Organizations

The first area that a sports therapist may work is with a team or organization as part of a defined medical team. This is an area where we can greatly increase our presence. In this setting, there is a hierarchy of roles and responsibilities. It is very important to understand the makeup of the various staff members in this setting. The team physician or medical director is responsible of the final medical decisions and generally sets up the medical program. All the medical decisions fall under their responsibility and liability. The staff member you will probably have the most contact with is the athletic trainer or physical therapist. The athletic trainer and/or physical therapist is responsible for the day to day care of the athletes and directs the onsite team. The massage therapist supports the athletic trainer/physical therapist in carrying out the treatments of the players from a soft tissue standpoint. In this setting, the massage therapist will typically have duties outside the treatment room ranging from assisting with administrative duties of the training room to assisting with first aid and critical care situations. There are often additional certifications or education required when you are in this setting, such as CPR, kinesiotaping, functional movement screen, and other specific continuing education courses.

You may interact with other staff members or consultants such as sports psychologists, chiropractors, player development, dieticians, and other specialists. Regardless of the logistics, the most important component of a successful healthcare team is communication between its members. Communication in the sports massage setting is quite different than in other medical settings. In the traditional medical model, the physician has the primary contact with the patient and then subsequent referrals to other healthcare staff. In the sports medicine model, the athlete’s point of contact maybe any one of the medical staff members from the physician down to the massage therapist and anyone in between. In this setting, the athlete will present to the practitioner with whom they have the best relationship with or are most accustomed to seeing. It is imperative that all members of the team understand their strengths and limitations and are educated about what the other team members can offer to get the best results for the athlete. All members of the team should communicate regularly about the overall athlete care with each member’s area of expertise being utilized. There should be a collaboration to provide
the best care for the athlete. Depending on the logistics, this may be a problem incorporating the massage therapist.

Things you may take for granted in a private setting may come into play in this setting. If you only work in the team facility, then equipment may not be an issue but if travel is a part of your responsibility, things like utilizing other people’s equipment may become a factor.

Another challenge of this environment is the ethical side. The quickest way to be replaced is by becoming a groupie. You have to remember that athletes have enough followers outside the staff and look to the team, specifically the medical staff as an area of safety where they can let their guard down and focus on getting better. Professionalism includes treating all the athletes the same. Do not get drawn into treating the stars any different than the third string. While there may be priorities depending on the situation, you should want to care for all the players the same. A situation that may arise is one where you are asked for your opinion on an injury or the status of the player. Never contradict what the other members of the medical team have decided in front of the athletes. Be sure to follow the hierarchy. This is why it is imperative that you are a part of the discussions with the staff.

**Private Practice**

The other common setting for a sports massage therapist and even more common than the team setting is the private setting working with athletes and active people. In the private setting the therapist may or may not be part of a defined healthcare team. This is usually the easier case but I would encourage establishing lines of communication with the sports medicine staff. The athlete or active person often does not have any resources in the healthcare world, especially if they are more of a recreational athlete. In this case, the client often utilizes the therapist as the first point of entry into the healthcare system. They will look to you as a source of information both within and outside your scope of practice. They may ask you about nutrition issues, exercises and strength training, injuries and rehabilitation, psychological issues, and other types of machines and modalities. This can be a potentially bad position to be in. It is extremely important to stay within our scope of practice and our comfort level. You should not contradict the advice or recommendations of other health care providers especially if they have more training than you. A more professional approach would be to contact the other practitioner and have a discussion about what you are finding and how to collaborate. It is appropriate to offer advice as long as is comes from a reputable source and has documentation to support it. It is a good idea to utilize information published by other respected reputable organizations in the form of hand outs so there is no confusion about where the information came from. It is also smart to have an extensive referral network to not only send your clients to but to collaborate with and learn from. Working with this population, no matter what the level, is a huge responsibility and should be treated as such. The athletic population as clients will generally ask more questions, take what you say to heart, and is not afraid to play one practitioner against another when they disagree.

**What Should I Know?**

When we looked at the definition of sports massage there were areas that required advanced understanding in order to be effective. One of the areas to get the quickest result is to review
what you already know. Go back and become an expert in bony anatomy, joint structures and characteristics, muscle anatomy and function, and surface anatomy. Some other areas should be the understanding of what type of forces act upon the tissues, what type of contractions there are, and what are the properties of various tissues: what types of injuries do they incur and how do they heal? You should have a clear understanding of the phases of healing and how to modify your treatments within each.

While expanding our knowledge base is important, information is only useful if you know how to apply it. The decisions involved in developing a proper treatment plan involve something often referred to as the clinical process. Understanding the clinical process is important in applying treatment techniques appropriately to get the best result. All too often, therapists memorize techniques and then blindly apply them hoping something will work. Memorization is helpful but only when the techniques are used in the proper context.

**Deciding to Treat**

One major benefit of having a systematic way to gather information is to determine whether massage therapy will truly benefit the athlete. The process of treating specific musculoskeletal disorders begins first with knowing what not to treat. As healthcare practitioners, therapists have a duty to provide proper care, even if that means referring athletes to other healthcare providers. We must be able to recognize situations that are outside our scope of practice; when to modify treatments; or when the use of modalities other than massage may be more beneficial. In order to accomplish this, there must be a foundation of knowledge from which to build.

**The Clinical Process**

Clinical reasoning is an important part of the process because it provides a safeguard against the risk of having the popular theory and clinical techniques of the day adopted without question. The process of clinical reasoning always begins with gathering initial information. This information will generally cause a wide range of impressions and interpretations, leading to the formulation of an initial general hypothesis; however, most therapists usually have an established assessment routine, which develops through experience, although it will vary between practitioners. Despite having a general routine in place, therapists should view each athlete as unique whose symptoms require a tailored assessment.

The more experience a therapist has with these techniques, the better he/she will recognize common patterns associated with specific conditions. Although no situation is exactly the same, similarities do exist. This process of recognizing patterns without the need for hypothesis testing is called “forward reasoning.” While this ability is linked to experience and typically employed by experts, therapists at any skill level faced with an unfamiliar situation employs what is known as “backward reasoning.” This is the process of formulating and testing a hypothesis to obtain information.

No matter how many times a therapist has seen a particular condition or worked with athletes, for a treatment to work, it must be specific. Formulating a treatment plan is an ongoing process for each athlete. It involves a constant sequence of assessing, treating, reassessing, and either
continuing with the same treatments or trying something different. This requires therapists to continually use all of their resources to provide the most effective therapy possible.

**Focused Approach vs. Global Approach**

As massage therapists, we are trained to focus on the fact that the body is an integrated organism and that in order to treat a person effectively, we must look at the whole picture. This includes not only the physical symptoms but also the way other factors such as lifestyle, diet, and activity level relate back to the changes we are seeing in the body. When deciding how to treat an athlete, therapists must focus on restoring balance to the system. All of the body systems are interdependent on each other, and when something happens to one system, all of the other systems are affected as well. By gathering as much information as possible, we can see how the body has changed its functioning and work to correct the system.

The human body is an amazing organism capable of adapting to just about any situation in order to accomplish any task. While compensation makes sense in the short term, the long-term effects of improper mechanics can be as damaging as the original injury. Therapists must follow the kinetic chain from the area of complaint to the related areas of the body. As the regional issues are resolved, the therapist can return to the initial area and complete any work there. The larger the initial trauma to the body, the greater the compensation and the more structures will likely be affected. Understanding the process of compensation will help therapists view the body as a whole entity and address all of the areas involved.

**Knowledge of Anatomy**

Another important component of the clinical process is to have an advanced understanding of anatomy and physiology. In order to know how to heal, the therapist must first understand the types of tissue involved, the ways injuries can occur, and the injury process itself. Because their composition varies, different types of tissues are damaged differently, heal differently, and respond to treatment differently.

Before discussing the different types of tissues and their pathologies, it is necessary to address some of the basic forces that can cause damage to them. One of the first steps in treating an injury is to understand the different ways that force can act on the body. In addition to understanding force, knowing the structural properties of the different tissues and how they respond to force is valuable in developing a treatment plan.

The physical properties of the tissues factor into the effects of force because many tissues are anisotropic. This means that the structure resists force better from some directions than others. One example of this occurs in ankle injuries. The lateral ligaments are damaged much easier than the medial ones because the laterals do not have as much support and are not as strong.

**Types of Force**

Force is generally described on the basis of the direction in which it is applied. An important factor, regardless of direction, is the magnitude of the stress applied. Another factor is the surface area: The larger the surface area on which the force is applied, the more the force is dispersed, allowing the tissue to handle a greater load. The opposite is also true: The smaller the
surface area on which the force is applied, the less it is dispersed, decreasing the amount of load the tissue can handle. There are five categories of force that can act on the body:

1. **Compression**: Force that is directed along the long axis of a structure and squeezes the structure together.
2. **Tension**: A pulling force that is directed along the long axis and stretches the structure.
3. **Shear**: Force that acts parallel to a plane and causes the tissues to slide past each other in opposite directions.
4. **Bending**: The result of the combination of compression and tension that is applied perpendicular to the long axis. The side of the structure where the force is applied is compressed, while the opposite side is loaded under tension.
5. **Torsion**: The application of torque about the long axis of a structure, which creates a shear stress throughout the structure.

**Tissue Properties**

**Muscle**

The structure and function of skeletal muscle classifies it as viscoelastic tissue. This means it has elastic properties, which enable the muscle to return to its original length and extensibility, or affect its ability to stretch. When working with muscle injuries, there are several factors to consider when determining the severity of damage and the type of treatment needed. The first factor is the role that the muscle was playing when it was injured. A muscle can assume one of four roles: Agonist, Antagonist, Stabilizer, and Neutralizer. The second factor is determining the type of contraction that occurred during the activity. There are three main types of contractions: Concentric, Eccentric, and Isometric.

**Muscle Injuries**

One type of muscle injury is a strain. A strain, or “pulled muscle,” typically occurs due to an excessive tensile force. Muscle strains can result from force that causes the muscle to stretch past its elastic region or, more commonly, from an excessive eccentric load. When a muscle strain occurs, it is graded into one of three degrees depending on its severity and the extent of damage:

1. **First Degree** - A first-degree strain is the mildest type, characterized by only a few torn muscle fibers. Symptoms include mild weakness and spasm, which results in some loss of function. There is mild swelling but no palpable defect in the muscle. There is pain on both contraction and stretching, and a decreased range of motion.
2. **Second Degree** - A second-degree strain is a moderate injury with nearly half of the muscle fibers torn, resulting in bruising or ecchymosis. Significant weakness occurs due to a reflexive inhibition in the area caused by pain. Spasm, swelling, and loss of function are moderate to severe but there is still no palpable defect. Pain is worse with contraction and stretching, and there is decreased range of motion.
3. **Third Degree** - A third-degree strain is the most severe and results from the total rupture of the muscle. Swelling, weakness, and spasm are severe and some bruising may occur.
There is a significant loss of function and a palpable defect in the muscle. Despite being the most severe type of strain, the pain level is mild to nonexistent due to the rupture of the nerves in the area.

**Tendon**

Tendons are also classified as a contractile tissue even though they contain no contractile fibers. Their purpose is to transmit the force of the muscular contraction to the bones in order to perform their functions.

**Tendon Injuries**

The mechanisms of tendon injuries are different to those of muscle tissue. Instead of an excessive tensile force, there is either a sudden maximum loading of the tendon or a repeated sub-maximal loading. Three of the most common injuries to the tendon occur due to chronic repetitive micro-traumas to the area.

1. **Tendonitis** is the inflammation of the tendon. Its symptoms include a history of chronic onset, repetitive mechanism, pain throughout the tendon, swelling, and pain during active motion.
2. **Tenosynovitis** involves the sheath around certain tendons. Symptoms are similar to those of tendonitis except for a few differences. Tenosynovitis only occurs in tendons that have a sheath, and there is a distinct crepitus sound with movement. If the condition becomes chronic, then a nodule may develop within the sheath that can further restrict the motion of the tendon.
3. **Tendonosis** is a degeneration of the collagen matrix within the tendon causing an overall breakdown of the tissue. It can arise from a single incident but is more likely caused by repeated insults to the tendon.

**Ligaments**

Ligaments are included in a category known as non-contractile or inert tissues. Their job is to connect adjacent bones to each other. Ligaments are made up of the same fibrous connective tissue that tendons are with a few exceptions. Ligaments contain a higher percentage of elastin fibers and some of these fibers are oriented in other than longitudinal planes. This gives the ligament more flexibility and strength to resist force that originates from different directions. While tendons only need to resist force in one direction, ligaments act around joints and most joints are exposed to force from multiple directions.

**Ligament Injuries**

Ligaments are most often damaged from excessive tensile force on the fibers. Depending on the magnitude of the force, the ligament may or may not be able to return to its original length. If the force is large enough to cause the ligament fibers to fail, then the resulting injury, known as a sprain, is classified into three degrees:
1. First degree – A few of the fibers are torn with no recognizable joint instability; a firm end-feel is present. Symptoms include mild weakness and loss of function, as well as mild swelling and decreased range of motion.

2. Second degree – In this more severe sprain, almost half of the fibers tear. There is some joint laxity and a definite end-point with mild to moderate weakness. Symptoms include loss of function, swelling, and decreased range of motion.

3. Third degree – This degree is the most severe and results in the total rupture of the ligament. There is gross joint instability, which results in an absent end-point with moderate weakness. Due to the instability, symptoms include severe loss of function and marked swelling. Range of motion may increase due to instability or decrease due to swelling. Typically, because of the magnitude of the force, other structures will be involved.

**Cartilage**

There are two types of cartilage: hyaline and fibrous. Both have poor blood supply and are slow or unable to heal if damaged. Hyaline cartilage covers the ends of the bones and provides a smooth articular surface. Fibrocartilage is located between the bones in certain joints and acts to provide extra cushioning against compressive force. The intervertebral disks and the meniscus in the knees are examples of fibrocartilage.

**Cartilage Injuries**

Compressive force is the most common cause of cartilage injury. Injuries to the hyaline cartilage are generally irreversible without surgical intervention and may result in chronic joint pain and dysfunction. Compressive force can cause ruptures in the disks or splitting and cracking in the menisci. When compressive force is coupled with other force, such as shear and torsion, the chance of injury greatly increases. A therapist’s role in treating such injuries is more supportive in nature.

**Phases Of Injury**

When gathering information to create a treatment plan, it is first necessary to determine the phase of the injury. Soft tissue heals through a series of three interrelated physical and chemical phases. Since these phases are regular and predictable, a knowledgeable therapist can monitor the healing process to determine what type of treatment should be applied or if a referral is necessary. Keep in mind that while the phases are discussed as individual stages, there is overlap of the phases during the healing process.

**Phase I: Inflammatory Phase**

This first phase of the healing process can last up to six days and has familiar signs and symptoms, including heat, redness, swelling, pain, and loss of function. Depending on the cause of the injury, inflammation can be acute or chronic. Acute inflammation is usually brief in
duration and generates swelling called exudate, which comprises plasma, protein and white blood cells. Chronic inflammation is prolonged in duration and characterized by the presence of white blood cells and scar tissue. While most therapists view the inflammatory process as negative, it is a necessary process to initiate healing. The initial job of the inflammatory phase is to stop the loss of blood from the wound and occurs through three mechanisms:

1. Local vasoconstriction occurs as a result of chemical mediators causing an increase in blood viscosity. This can last for a few seconds or up to 10 minutes, and it reduces blood flow and loss. Vasospasm of large and small vessels results in increased viscosity of the blood, which further reduces loss.
2. Platelets stick to each other and combine with fibrin to occlude the defect in the vessel, creating a mechanical plug that blocks the opening.
3. A heightened physiologic response occurs. This consists of several interrelated components known as a coagulation cascade, which converts fibrinogen to fibrin, resulting in the formation of a clot.

Once the vasoconstriction phase is over and the blood loss is under control, a period of vasodilation transpires. This process occurs in order to bring white blood cells to the area for infection control and to rid the injury site of dead and damaged tissue through phagocytosis. Along with vasodilation, there is an increase in the permeability of the vessels, which contributes to the formation of exudate. The change in permeability can last a few minutes or longer depending on the severity of the injury. In some cases, if the trauma is extensive, the change in permeability will not occur for some time after the injury. The exudate that is created is important to the overall healing process. In addition to diluting toxins in the area, it provides the cells necessary to remove damaged tissue and enable reconstruction. These two factors cause swelling in the area and, in conjunction with the damaged and necrotic tissue, form what is known as the zone of primary injury.

While this swelling process is beneficial to the overall healing process, it also can be detrimental to the area. If excess fluids, damaged tissues, chemical mediators, and white blood cells remain in the area for too long, the environment may become hypoxic. The inability of the surrounding tissues to access oxygen and nutrients, and remove waste products due to the congestion created by the swelling, will result in the expanded death of those tissues and create the zone of secondary injury. This area will continue to expand through this process until the initial inflammation is under control and the tissue returns to its normal metabolism.

Phase II: Proliferative Phase

The next phase in the healing process is called the proliferative phase. This phase can overlap the latter part of the inflammatory phase and last up to 21 days. It is sometimes referred to as the repair and regeneration phase, and includes the development of new blood vessels, fibrous tissues, and epithelial tissues. The process of new tissue formation begins when the hematoma created by the inflammation reduces in size enough to allow new growth. The accumulated fluid, containing a high level of protein and cellular materials, will form the foundation for the fibroblasts, which will generate the collagen. The formation of connective tissue and blood
vessels is an interdependent process. The fibroblasts are fueled by nutrients brought in by the blood vessels, and the vessels are supported and protected by the connective tissue matrix. This highly vascularized mass is transformed into the necessary structures in the third and final phase of healing.

**Phase III: Maturation Phase**

The maturation phase is the final phase of healing and is sometimes known as the remodeling phase. It involves the maturation of the newly formed mass from the repair phase into scar tissue. It can last over a year depending on the severity of the initial injury and whether any interventions occur. The maturation process includes decreased fibroblast activity, increased organization in the matrix, reduced vascularity, and a return to normal histochemical activity. While the tissue has been regenerated by this time, its tensile strength is only 25 percent of normal. This is thought to occur because of the orientation of the collagen fibers, which are more vertical than they are in normal tissue, where orientation is horizontal. This deficit can last for several months depending on what is done to support the process. Scar tissue is less elastic, more fibrous, and less vascular than the original tissue. This creates weakness within the tissue and decreases flexibility in the area, leaving it vulnerable for re-injury. As the scar matures, the fibers align themselves along the lines of tension. This process of creating a more "functional" scar can be enhanced through soft tissue work, flexibility training, and strength training.

**Assessment Protocol**

Another aspect of the clinical process is gathering information. This is typically done through a history, a series of observations, and various functional assessments which include range of motion, manual muscle testing and specific orthopedic assessments. Depending on your setting, you may have access to this information without having to perform it yourself but you will still need to have an understanding in order to interpret the results.

Performing assessments is nothing more than searching for dysfunctional anatomy, physiology, or biomechanics. This involves identifying signs, which are objective measurable physical findings, and symptoms, which is information provided by the athlete. The purpose of identifying signs and symptoms is to gather as much information as possible about the condition from both the perspectives of the athlete and therapist. Having a systematic and sequential method of gathering information is an important element of assessment. This ensures that nothing is overlooked and that information is obtained properly.

One method of gathering information during an assessment is the HOPS method, which stands for: H – History; O – Observation; P – Palpation; S - Special Tests.

A vital step in the assessment process is taking care to test the uninvolved side or limb first. This provides an immediate reference to the affected side, as well as a means for the athlete to demonstrate the mechanism of injury. There are two schools of thought when it comes to testing the uninvolved side. One says that testing the uninvolved side first reduces an athlete’s apprehension by showing him/her the process. The other perspective states that letting the athlete experience the test on the uninvolved side first will cause more apprehension and
guarding in anticipation of the test. The therapist should use the method that best fits the individual situation.

**History**

The athlete history is the most important component of the assessment and provides much more information than that related to the primary complaint. Eighty percent of the information needed to clarify the cause of symptoms is contained within the subjective assessment. Maintain eye contact and ask easy, open-ended questions; however, close-ended questions may be used if the athlete is not divulging the necessary information. Questions should be asked one at a time and not lead the athlete in any particular direction. Here are some examples.

**Example of questions for the athlete**

<table>
<thead>
<tr>
<th>Open-Ended</th>
<th>Close-Ended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Why are you here?</td>
<td>1. Can you lie on your back?</td>
</tr>
<tr>
<td>2. Where is it bothering you the most?</td>
<td>2. Is it pain or numbness?</td>
</tr>
<tr>
<td>3. What caused your problem?</td>
<td>3. Do you have x-rays?</td>
</tr>
</tbody>
</table>

Other relevant information to gather during the history includes:

1. The primary complaint – This provides information in the athlete’s own words about the reason for the visit.

2. The mechanism of injury – The most important piece of information that comes from the history is the mechanism of injury wherein the athlete describes what happened to cause the injury. Additional questions that can help expand on this information include:
   - Was there any trauma?
   - If it was a fall, in what position did you land?
   - Did the problem arise suddenly or occur over time?
   - What was the position of your body when you first noticed the pain?
   - Did you feel or hear anything?
   - Have you performed any new activities or movements?
   - Have you changed any of your exercise equipment?

If there is no discernable mechanism or memorable incident when the complaint was noticed, then peripheral information, including signs and symptoms, areas of pain, and dysfunction patterns can be useful to come to a reasonable conclusion.

3. Symptoms – Acquiring information about the athlete’s symptoms requires investigating the primary complaint. For the most part, the location and the characteristics of the pain indicates which tissues are involved; however, do not rule out referred pain. The therapist must be knowledgeable in common referral areas to ensure an accurate assessment. There are certain questions that can help obtain information about the pain:
• Where was the pain originally and has it moved?
• What situations make the pain worse or better?
• How long has the problem lasted?
• When do the symptoms occur?
• Are there any unusual sensations?
• Does the pain stay in one spot or radiate into other areas?
• Does it prevent you from sleeping?
• Does a joint lock, give way, or feel unstable?
• Has this problem occurred before?
• Is the pain constant or occasional?
• What type of pain is it?
  o Nerve pain is sharp and burning, and tends to follow patterns.
  o Bone pain is very deep and localized.
  o Muscle pain, which is harder to localize, is dull and aching, and can be referred.

When questioning about pain, have the athlete put the information in measurable terms by using a pain scale. This rates the athlete's pain on a scale of 1 to 10, with one being minimal and 10 being unbearable, and provides an objective baseline to use later. Keep in mind that each athlete will have a different interpretation of the pain scale.

Observation

Observation begins the moment the athlete walks in the door. It includes a visual analysis of the athlete’s overall appearance, posture, dynamic movement, and symmetry of the body. In addition to observing the athlete, inspect the injury site for factors such as redness, bruising, swelling, deformities, and other marks in the area. While observing the athlete from different views, there are specific questions to consider:

• Is there any obvious deformity?
• Do they possess normal balance?
• Are the bony and soft-tissue contours symmetrical?
• Are limb positions equal and symmetric?
• Are there any scars or other signs that indicate recent injury?
• Is the color of the skin normal?

Once the general scan is complete, assess the athlete in static and dynamic phases.

Posture

When assessing posture, it is necessary to use a straight line as a reference for testing. When assessing from the front or back, have the athlete stand with feet equidistant from the line. When the athlete is standing sideways, line up the plumb just in front of the lateral malleolus. Deviations are described as slight, moderate, or marked.
Anterior

Use the following guidelines when assessing posture from the anterior side:

- The head should sit squarely on the shoulders. Check for tilts or rotations, and try to establish their causes.
- The tip of the nose should be in alignment with the manubrium, xiphoid process and umbilicus. This is known as the anterior line of reference.
- The contour of the trapezius should appear equal bilaterally. Check for unusually prominent bony areas.
- The shoulders, clavicles, and acromioclavicular joints should appear to be equal. Deviations may indicate joint pathology.
- The tops of the iliac crests should appear level. Deviations may indicate the presence of scoliosis.
- The arms should face the same direction.
- The anterior superior iliac spine (ASIS) should appear level bilaterally. Dysfunction may indicate leg-length discrepancies or pelvic rotation.
- The pubic bones should appear level.
- The patella should face forward. An outward-facing patella is known as "frog eyes." A patella facing inward is called a "squinting" patella.
- The knees should appear straight.
- The malleoli should appear to be equal.
- Check the arches on both sides of the feet, noting any pes planus or cavus.

Lateral

Use the following guidelines when assessing posture from the lateral side:

- Check the lateral line of assessment, which is the line from the earlobe to the tip of the shoulder. It continues through the highest point on the iliac crest, slightly anterior to the axis of the knee joint, and slightly anterior to the lateral malleolus.
- Determine if the back has excessive curvature. Look at each spinal segment in relation to the sacrum.
- The musculatures of the back, abdominal, and chest regions should have good tone with no obvious deformity.
- The pelvis should appear level.
- Look for visible trunk rotation.
- Examine the position of the knees. Determine whether they are flexed, straight, or in recurvatum (hyper extended).

Posterior

Use the following guidelines when assessing posture from the posterior side:

- The head and neck should sit squarely on the shoulders, matching the anterior view.
• The scapulae should be positioned similarly on both sides. Note the rotation and tilt, levels of the superior and inferior angles, and whether they sit flat on the rib cage.
• Look for lateral curves on the spine.
• Look for atrophy of the posterior musculature.
• Look for equal space between the elbows and trunk.
• Determine whether the ribs are symmetrical.
• The posterior superior iliac spine (PSIS) should appear level bilaterally.
• The tops of the iliac crests and gluteal folds should appear equal.
• The backs of the knees should appear level.
• The Achilles should run vertical on both sides.
• Determine whether the heels are straight. Check for valgus or varus positioning.

**Palpation**

Just as the entire assessment process is systematic, so is palpation. Start at a point away from the injury site and move toward the point of greatest pain last. Pressure should be light at first and increased as the deeper structures are felt. As the areas are palpated, gather information about the physical findings, including:

1. **Tissue Temperature** – Determine tissue temperature using a larger surface of the hand or fingertips; this can provide information about the phase of the injury. Warmth in the area can mean an increase in circulation.
2. **Obvious Deformity** – Take care to identify obvious changes in the structures or the presence of abnormal structures.
3. **Swelling** – Depending on where swelling is located, the tissue will feel different. Edema is excess fluid in the interstitial spaces and can leave indentations when pressure is applied (pitting edema). Acute swelling is softer and more mobile whereas fluid that has been in an area for a period of time has a thicker feel and is more gel-like.
4. **Tissue Tone** – Note muscle tone and whether the muscle is in spasm or flaccid. Assess the presence of tight bands within the muscle and tension in other structures such as the ligaments, tendons, and fascia. **Point Tenderness** – Note the area with the highest level of pain, which is graded on four levels:
   1. **Grade 1:** The athlete complains of pain.
   2. **Grade 2:** The athlete complains and winces.
   3. **Grade 3:** The athlete winces and withdraws the limb.
   4. **Grade 4:** The athlete will not allow the area to be palpated.
5. **Crepitus** – A creaking or cracking sensation during palpation indicates damage to the bony or soft-tissue structures.
6. **Abnormal Sensation** – Changes in sensation such as dysesthesia (decreased), hyperesthesia (increased), or anesthesia (absence) may indicate nerve damage.
7. **Pulses** – Check for changes in the major pulses in the area of palpation.
Functional Testing

This next component of assessment consists of several steps and tests muscle, nerve, and other non-contractile tissues. There are several rules of thumb when performing functional testing:

- Always test the uninvolved side first unless bilateral movement is required. This lets the athlete know what to expect and establishes what is normal for the individual.
- Perform active motion before passive motion; this will prevent moving the limb past the athlete’s ability. It will also help determine the structures, contractile or inert, that are involved.
- Perform painful movements last; this prevents pain from affecting future tests during the assessment.
- Apply overpressure gently to determine end-feel of the tissues.
- Hold or repeat movement to obtain accurate information. Athletes will present with conditions that are aggravated by repetitive movements, so re-creating the conditions will provide a truer picture of the problem.
- Perform resisted muscle tests with the joint in a resting position to cancel out force on inert tissues; this allows for the isolation of contractile tissues.
- After completing the testing, inform the athlete that symptoms may worsen due to the assessment.

Active Range of Motion

Active range of motion is motion performed by the athlete with no help from the therapist. Active motion tests the range of motion, the athlete's willingness to move through the range, and the control the athlete has over that particular body part. The movements are usually standard and follow the cardinal planes. If the athlete experiences pain outside the planes or from a combination of the planes, instruct the athlete to recreate those movements, while observing:

- The athlete’s reaction to the pain
- The movement pattern
- The quality of the movement
- The location of the restrictions and when they occur
- The location of the pain and when it occurs
- Any compensatory movements

Passive Range of Motion

Passive range of motion is motion performed on the athlete by the therapist, while the athlete remains totally relaxed. To perform a passive range of motion test, place the area in a position wherein the joint is in a relaxed state. The movement should be as complete as possible and in the same direction as those that were tested actively. During testing, note:

- The location of pain and when it occurs
• Whether the movement changes the pain
• Any patterns of restriction
• The end-feel
• Any compensatory movement

Determining end-feel during passive motion is accomplished when the therapist gently applies overpressure to the athlete. The end-feel can help determine which structures are responsible for the dysfunction. There are four types of end-feel:

1. Soft – This occurs as a result of soft-tissue approximation, such as when the calf touches the thigh during knee flexion, for example.
2. Firm – This feels as though there is a rising sense of tension, and creates a feeling of springy or elastic resistance. It can occur as a result of muscle tightness, or capsular or ligamentous stretching.
3. Hard – This occurs from two bones coming in contact with one another, such as the ulna and humerus in elbow extension.
4. Empty – This occurs when there is no end-feel because the full range is never reached due to pain; it only occurs if dysfunction is present.

**Resisted Isometric Motion**

This type of movement gauges the strength of the contractile tissues and their ability to facilitate movement, stability, and support. It is important to create an isometric contraction through the application of an eccentric load so that only the contractile tissues are tested. This will determine if they are at fault. If the joint moves, the inert tissues will also move and subsequently skew the results. There are several basic principles related to performing the tests:

• Place the athlete in a position that offers the most stability. If necessary, stabilize the parts of the athlete to prevent compensation.
• Stabilize the body part proximal to the one being tested.
• Apply pressure directly opposite of the line of pull to the muscle being tested using as long a lever as possible.
• Tell the athlete to prevent you from moving him/her. Apply pressure gradually and maintain it for at least 5 seconds; repeat throughout the joint's range of motion.

There are five numerical grades for gauging a athlete’s strength, several which have a plus and minus system. The scale is based on the pull of gravity; a 3 represents a fair score.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Normal</td>
</tr>
<tr>
<td>4+</td>
<td>Good [+]</td>
</tr>
<tr>
<td>4</td>
<td>Good</td>
</tr>
</tbody>
</table>
and resist moderate pressure.

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Good [-]</td>
<td>The muscle can move through the complete range of motion against gravity and resist slight to moderate pressure.</td>
</tr>
<tr>
<td>3+</td>
<td>Fair [+ ]</td>
<td>The muscle can move through the complete range of motion and resist minimal pressure.</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
<td>This is the middle ground. The muscle has the ability to move through the entire range of motion against gravity but with no pressure.</td>
</tr>
<tr>
<td>3–</td>
<td>Fair [-]</td>
<td>The muscle can move through some of the range of motion against gravity.</td>
</tr>
<tr>
<td>2+</td>
<td>Poor [+ ]</td>
<td>The muscle can start the movement through the range but cannot continue it.</td>
</tr>
<tr>
<td>2</td>
<td>Poor</td>
<td>The muscle can move through the range with some gravity-eliminating assistance.</td>
</tr>
<tr>
<td>2–</td>
<td>Poor [-]</td>
<td>The muscle will initiate movement if gravity is eliminated.</td>
</tr>
<tr>
<td>1</td>
<td>Trace</td>
<td>A contraction is felt in the muscle, but no motion occurs.</td>
</tr>
<tr>
<td>0</td>
<td>Zero</td>
<td>There is no evidence of contraction.</td>
</tr>
</tbody>
</table>

Damage to the muscle tendon unit is not the only cause of muscle weakness. Pain, injury to the nerve root or peripheral nerve, pathology to the tendon, fractures, and psychological reasons can also produce weakness.

**Orthopedic Tests**

Just as testing the contractile tissues of the body is important, assessing the non-contractile structures is equally important. These tests are specific to each region of the body and are designed to expose pathology in the area. As with the other tests, these tests should be performed bilaterally to obtain baseline results.

**Practical Application**

Athletes get injured. It is important as therapists to understand how to recognize various pathologies. You should know the background and common conditional information such as how they present and signs and symptoms. Start with the major joints in the body and the most common pathologies and as you work with different sports, you will learn the injuries that are more common in those sports.

**Application Strategies**

There is a common wisdom that certain techniques should not be applied and that the pressure and pace should be adjusted depending on what training phase the athlete is in and how soon their next competition is. On a larger scale these general principles make sense, however, some principles should be adjusted depending on the setting. Traditionally, there are specific timing guidelines for certain types of massage therapy or techniques. Generally this theory is sound but deciding what to do should be more about where that athlete is in their training cycle, what they are used to and what the purpose is. This is why it is so important to know the population you are dealing with.
Treatment Modification

Based on all the information you have gathered during your assessment, you may be able to have a good idea on what phase of injury the athlete is in. We have always been told not to touch an acute injury for the first 24-48 and even 72 hours. The problem with that is that it gives the injury time to spread and grow in size and we want to contain the area as soon as possible. Based on what phase they might be in, you can modify your treatment techniques to provide the most effective environment for healing.

So the first strategy we want to utilize is to minimize the area of injury. This would be the case if you saw the athlete during the acute or inflammatory phase of healing. The initial swelling will create what is known as the zone of primary injury. If the excess tissue fluid, damaged tissue, white blood cells and other components of the swelling are left in the area too long, the environment will be hypoxic and result in the expanded death of those tissues and create the zone of secondary injury making the injury larger. The best way to contain the area is through the application of ice and compression. You want to leave this on for 20 minutes out of the hour and repeat several times a day.

As the injury makes its way through the inflammatory phase you can start performing very gentle effleurage in conjunction with the ice treatments. The strokes should radiate out from the center and they should not generate any additional swelling. If they do, it had not healed enough and only ice and compression should be used.

If the injury is in the next phase of healing, the proliferative phase, the next strategy that we want to use is to facilitate reabsorption of the blood and tissue fluid that has accumulated. The faster we can get the fluid reabsorbed, the quicker the injury will heal. We want to apply gentle strokes that radiate out from the center. We can do this after the ice treatment and actually use an ice cup to do the massage itself. In the initial transition, we should ice after we are done. We can use active and passive movement to help the new tissue that is being laid down in this phase to align properly. Depending on the severity, this can last a couple of weeks.

As the injury moves into the last phase of healing, the maturation phase, the strategy that we want to use is to enhance the normalization of the tissue. As the scar tissue is laid down, we want it to be aligned in the direction of the muscle and keep it to a minimum. This is sometimes referred to as creating a “functional scar”. We can start using deeper strokes and utilizing transverse and multidirectional friction and incorporating movement into the techniques.

Treatment Timing

There are four main areas of training and timing that the sports massage therapist will work in:

1. Event preparation: This is when the athlete is in competition and is more of the traditional pre-event massage. This type of massage is utilized as part of the overall warm-up but should never be a substitute for a more comprehensive warm-up routine. This type of massage is ideally performed within 90 minutes of play. It is quicker, lighter, and more general and should not last more than 10-15 minutes. The benefits with this type of massage are:
• Warms the muscles for activity
• Excites the nervous system for a sense of readiness
• Increases blood flow to an area
• Helps delay the feeling of exertion
• Can help reduce injury

Here is a general pre-event massage sequence:

• Light compression to pertinent areas working deeper as the tissue releases
• Quick light effleurage to pertinent areas
• Compression broadening to pertinent areas
• Light “modified” petrissage to pertinent areas
• Strokes with passive movement to pertinent areas
• Tapotement to pertinent areas
• Jostling and rocking to body

2. Prevention and Maintenance: This type of work is best done when there is not an upcoming competition. It is preferably done on a day off so the athlete can recover from any soreness. This is the time to work a bit deeper to remove any restrictions in the tissues and make the corrections to the body to help improve performance and reduce injury. The techniques used during this type of treatment are varied but are always therapeutic in nature. Nothing is done to disrupt the training cycle of the athlete but should be done to:

• Normalize tissue to improve function
• Improve tissue healing
• Improve Range of Motion
• Reduce muscle stiffness
• Remove trigger points in the muscles
• Improve scar mobility

Depending on the sport, this may be incorporated into competition on a day off or prior to the event starting or once the athlete is out of competition.

3. Injury Treatment: This phase can be while the athlete is still in competition or if the injury is bad enough, they will be out of competition and maybe training as well. Techniques can range from lymphatic drainage to scar massage. Depending on the situation, the athlete may be in rehabilitation so it is important to communicate with the other members of the team. This phase is often incorporated into the other phases to accomplish more than one goal. If the athlete is still training or competing, then it can be incorporated into the recovery work and if they are out, then combining it with maintenance work is very beneficial. Some of the benefits include:

• Prepares soft tissue to enhance manual therapies
• Improves tissue healing
• Normalizes tissue to improve movement
• Removes trigger points in the muscles
• Improves scar mobility

4. Recovery: This is an extremely important time to get massage done. There are a lot of studies showing its benefit at helping the muscles to recover. This phase can include the traditional post-event massage and the more thorough recovery massage. This type of massage is ideally done 1-3 hours after competition. It is designed to flush the muscles out to help them recover. While this massage uses deeper techniques, it should not be painful. Its benefits include:

• Great for post exercise soreness (DOMS)
• Improves the feeling of recovery
• Can help with muscle endurance and power output when playing multiple matches
• Can reduce muscle fatigue when there are repeated bouts
• Increased neutrophil count
• Decrease in substances that cause pain in the muscle
• Increased the pain threshold after exercise
• Improves blood flow in massaged body part
• Calms the nervous system and helps relaxation

Here is a general post-event massage sequence:

• Slower deeper effleurage to pertinent areas with compression mixed in
• Compression broadening to pertinent areas
• Petrissage to pertinent areas
• Strokes with passive movement to pertinent areas
• Tapotement (beating) to pertinent areas
• Rocking to body

**Advanced Strokes**

Because there are no magic bullets when it comes to sports massage, we must look to modify the common techniques to fit the situation. All of these strokes can be adapted to any situation and applied to any region on the body. As with any technique, therapists should always take care to use proper body mechanics to reduce chances of injury.

**Deep Parallel Stripping**

Deep parallel stripping is a modification of effleurage, the most widely used stroke in Swedish massage. It provides the same benefits as regular effleurage with the addition of specificity. It requires an advanced level of skill to know how to palpate the tissue and apply the correct
amount of pressure. Deep parallel stripping can be used to strip out entire individual muscles from one end to the other or to treat specific taut bands when deactivating trigger points.

As with effleurage, use a broad surface such as the palm or forearm or a small surface such as a thumb, finger, or pressure tool to apply the stroke. Perform the stroke along the fiber direction at a pressure level close to the client’s discomfort threshold. Generally, a broader application is used first to prepare the tissue for any specific work to follow.

**Compression**

Compression has different names depending on the factors of its application. Trigger-point therapy, acupressure, neuromuscular therapy, and shiatsu all use variations of compression. It can be applied using a large surface area such as the palm of the hand, fist, or forearm or a small surface area such as a thumb, fingertip, or the tip of the elbow. The rate of application varies depending on the desired results. A rapid succession of compression strokes may be used to stimulate the area and increase local circulation, by creating a pumping action. When applied slowly in a static fashion, compression may be used to treat a trigger point or an area of hypertonicity. The direction of pressure can be changed to affect the intent of the stroke. Various positional holds can be performed using compression in this manner. Pressure can also be applied using a variety of tools for either a broad or a specific application.

To perform compression, determine the intent and method of application based on the situation, and apply pressure to the client’s tolerance level using proper body mechanics. The duration of the pressure varies with the intent.

**Perpendicular Compressive Effleurage**

Muscle activity consists of a broadening phase and lengthening phase. When the sarcomeres of a muscle fiber shorten during a contraction, they broaden and increase in size. To function properly, a muscle must be able to shorten completely. Injury or inactivity can cause the actin and myosin fibers to stick together, inhibiting their ability to slide past each other when contracting. Applying perpendicular compressive effleurage can break up unwanted bonds between the filaments and help restore normal function by separating the muscle fibers and breaking up adhesions within the muscle. Since there is a compression component to the stroke, it will also increase local circulation to the area.

Perpendicular compressive effleurage is performed by applying heavy pressure, to the client’s tolerance level, with palms or fists for a large area or fingers or thumbs for a small area. While maintaining constant pressure, slowly slide your hands perpendicular to the fiber direction of the muscle or area on which you are working.

To rapidly bring blood to the area, lift the tissue up off the bone during the return stroke to encourage a change in
circulation. This is sometimes referred to as lifting and broadening. It is a variation of the stroke with a quicker pace and lighter pressure, which does not cause the client discomfort.

Cross-Fiber Fanning

Cross-fiber fanning is a cross between effleurage and compression broadening. It is used to increase circulation, reduce muscle tension, and separate adhered muscle fibers. It is usually applied to a small, specific area using the thumb.

Place the length of your thumb on the area parallel to the fibers. Adjust pressure to fit the situation, and move your thumb perpendicular to the tissue. It is important to keep the thumb stationary and perform the movement from the shoulder to prevent an overuse injury.

Incorporating Movement

The pain associated with musculoskeletal disorders is a challenging problem for any health care provider. Musculoskeletal dysfunction can occur for a variety of reasons and is identified by the following characteristics:

- As pain increases, motor-unit discharges decrease.
- Endurance levels decrease. As muscles fatigue, the load is shifted to unaffected muscles, increasing their burden.
- EMG activity decreases.
- Blood vessels can be compressed
- Proprioceptive functioning decreases.
- Adaptive shortening causes stretch weakness.
- Muscle imbalances lead to changed motor programming in the CNS.
- The pain-spasm-pain cycle perpetuates.

So how does movement remedy these characteristics? The main principle deals with movement reeducation. Incorporating passive and active movement with massage strokes reconnects the broken link of communication between the nervous system and the muscle. The Law of Facilitation states that when an impulse passes through a specific set of neurons to the exclusion of others, it generally takes the same course on a future occasion; each time the impulse traverses this path, resistance is less.

There are additional benefits to incorporating movement, as well:

1. Shortening a muscle during a stroke can help desensitize a trigger point or reduce the restriction that is created by the added tension when it is lengthened.
2. Passively lengthening a muscle under the pressure of a stroke will mobilize connective tissue and effectively “pull the muscle” under the stroke
3. Employing active movement during strokes works in several ways:
a. Deep fascia is mobilized better and more quickly because heat is generated internally and externally, and this helps the matrix change to a fluid state faster.
b. The pressure is intensified for the client due to the contraction of the muscle.
c. Connective tissue restrictions are broken up more effectively.
d. The client is able to control the stroke better and maintain the threshold level to increase the effectiveness.

**Passive Movement with Compression**

Perform the stroke by compressing an area of the muscle with a broad or specific contact surface, and move the limb passively. There are a few variations:

1. Apply static compression to the area, and passively shorten the limb. Remove the pressure, return the body part to the starting position, reapply pressure, and repeat. This is effective for trigger points and muscle spasms.
2. Shorten the limb, and then apply static pressure and lengthen the tissue. Repeat this shortening, compressing, and lengthening cycle; move pressure around the body part being treated.
3. Shorten the limb and perform deep parallel stripping along the muscle as the limb is passively lengthened. This can be repeated in strips over the entire area.

**Active Movement with Compression**

This stroke uses the client’s active movement while the therapist applies pressure or strokes to effect change. There are several variations:

1. Apply static compression to the hypertonic area or trigger point. Direct the client to perform an isotonic contraction of the muscle and return it to the original starting position. Repeat this several times until a change is noticed. This is effective for treating trigger points and adhesions.
2. This technique requires communication and timing between the therapist and client: Place the treatment area in a lengthened position. Perform a perpendicular compressive effleurage stroke while the client concentrically contracts the muscle. The stroke should begin when the client starts to move and should end when the muscle is fully contracted.
3. This technique is typically the most intense and is used primarily during the late stages of healing and for chronic conditions: Place the area in a shortened position. Begin deep parallel stripping at the distal end of the muscle as the client actively lengthens the muscle. You will
travel a short distance, and the client will shorten the muscle and begin to lengthen it again. Move along the muscle during the lengthening phase, and repeat this process until the entire muscle is covered.

These techniques can be intensified through the use of manual resistance or resistance with weights, exercise bands, and the like. The greater the resistance, the more motor units that are recruited, thereby increasing the pressure and number of fibers affected.

**What Does the Research Say?**

Research in massage therapy, especially in sports massage therapy, is just getting started. There is a huge lack of quality research in our profession. Most of the studies have design flaws and should be looked at carefully before drawing any conclusions. Despite the lack of supportive research, the demand for massage therapy in the sports setting is increasing.

One of the areas that the research has found to be positive is in recovery massage. The best time to do this type of work seems to be within 3 hours of completion of the activity. While that may not be possible for most people, that is the ideal time frame. This brings up the age old question of why it works. It was once, and sometimes still is, widely thought that recovery massage helps the athlete by removing the lactic acid accumulation in the muscles. Studies have shown that massage therapy does not really change lactic acid levels drastically in the muscle. That is accomplished more effective through active recovery methods. However, they have shown that tapotement is a more effective stroke at removing lactic acid than petrissage. The reason recovery massage helps reduce muscle soreness appears to be through helping reduce delayed onset muscle soreness (DOMS). DOMS is caused by the release of chemical mediators, the increase in extracellular fluid levels and a sensitization of the nerve endings in the area due to the tissue damage associated with activity. Massage helps remove excess fluid from the area and brings in substances to help with tissue repair. They also found that compression strokes seemed to have the most effect on those fluid levels. As far as helping with injury healing, they have shown that massage improves the ability of tissue to heal quicker.

**SPECIFIC TREATMENTS**

**Diaphragm**

We can use the breath of the client to help us treat the diaphragm. Stand on the opposite side of the diaphragm you would like to treat. Warm up the costal margin until the tissue has softened. With your bottom hand, place the broad lateral surface of your thumb about one inch inferior to the costal margin. Begin at the apex of the costal margin just lateral to the xiphoid process. With your top hand, reach across and around the posterior rib cage. Instruct the client to take a deep breath and as they exhale, lift their ribcage onto your thumb and slightly direct your thumb up under the ribcage and into the diaphragm. While you hold pressure with your thumb, have the client take a few deep diaphragmatic breaths. This will move the muscle over your thumb and cause the release. Release your pressure and the rib cage and move your thumb laterally. Repeat the process two to three times depending on the size of the client and your thumb. You can perform some closing strokes along the costal margin if necessary.
**Iliopsoas**

Massage using active engagement to the iliopsoas.

1. Have the client bend the knees to about 45°.
2. Place the client’s feet on the table, and have him or her take a deep breath. Starting at the anterior superior iliac spine, slide your fingertips in along the inside of the "bowl" of the pelvis as the client exhales; stay lateral to the edge of the rectus abdominus muscle.
3. Once you locate a restriction, direct your pressure down toward the table.
4. Have the client slowly extend the leg, keeping the heel on the table as he or she slides it as far as possible and brings it back up.
5. While you continue to hold the restriction, have the client repeat this process several times or until you feel the tissue release. Slowly remove your hand and repeat the process, changing the location and angle that you slide in.

The more inferior you move along the bowl of the pelvis, the greater the focus on the iliacus. Moving superiorly toward the umbilicus will focus more on the psoas. Generally, avoid going any higher than the level of the umbilicus because you may encounter solid organs.

**BREAKING IN**

The biggest obstacle in breaking into the field is the lack of understanding by other healthcare practitioners with what we do and how we can help. This results in us having to take on the role of educator as well as therapist. The educational standards in our profession vary greatly from state to state and even county to county. There is no unifying standard that would allow someone to know exactly what a massage therapist knows. Two therapists with similar backgrounds and the same number of hours of training can apply for the same job and have vastly different massage skills. The healthcare professionals that work in sports are used to dealing with practitioners that have a very clear set of skills that are recognizable across the profession. We must be extremely diligent in projecting a competent, credible, and professional image when meeting with a member of a sports medicine team.

**Initial Contact**

When meeting with a sports medicine staff member, timing is critical. You want to schedule your meeting during the off season as this is when many departmental decisions are made. Also, the most likely person to contact in the organization is the head trainer; you may ultimately be directed to one of the assistants but it is important to make the initial contact with the person in charge. If you send a letter to follow up your initial contact, address the information to a person. “To Whom It May Concern” or “Dear Head Trainer” will all but guarantee your letter will end up in the recycling bin and your chances will end there. In the letter, you should briefly discuss what your intentions are and ask permission to send them a packet of information on you and your services. Propose, if they would like to pursue it, a face to
face meeting as the next step. You can ask if they would like to set up a trial massage on themselves, an athlete, or other staff member in order to evaluate your skills.

Resume/CV advice

One tool that we can use is a resume or curriculum vitae (CV). Traditionally, we are taught that a resume should be brief and not much longer than one page. That style will not work in this environment. Because of the lack of understanding on what we do, we should use our resume as an education tool. It must be much more detailed than you might think. Here are some tips:

• For education
  o List in order of ranking (highest level first)
  o For massage education
    ▪ Detail out program – how many hours, length of program, etc.
    ▪ Write what you learned in each course – may include course descriptions
    ▪ Any practical experience while in school – events, student clinicals
    ▪ Emphasize course work relevant to sports – include descriptions

• For job experience
  o Include non-massage related jobs if appropriate
    ▪ Things that include management skills, instruction, leadership, high responsibility
  o Massage jobs – detail out specific responsibilities; types of treatments performed; possibly include treatment process

• Other Experience
  o Any other related experience – include examples that would show teamwork and collaboration.
  o Volunteer work
  o Event coverage
    ▪ Should be limited to massage experience
  o List of modalities and education in each

• Continuing education
  o List course details; what you learned; who the instructor was; information about instructor; why course is important; length of course; link to information

• References/Letters of Recommendation
  o Have several different categories (personal, professional, client)
  o Want it to be customized to job – try to avoid generic letters; want them to be current
    ▪ Describe to your references what you are applying for and what things may help

Experience

You often hear, “it’s not what you know but who you know”. Unfortunately, in the current evolution of sports massage, that is often the case. It would be fantastic to create such an awareness of the specialization among the sports medicine community that we will be sought out instead of the other way around. That being said, experience with athletes is a huge positive when breaking into the field. In our school sports massage training or in CE courses, the one
thing that is often lacking is the hands on supervised practice with real live athletes. Most of our experience comes from one day events such as road races, triathlons, or cycling events. While these are all good experiences and expose us to a lot of bodies in a short period of time, we have seen that event massage is only a small part of what a sports therapist does. The type of experience you seek out should include a variety of settings which may require a lot of volunteer work. Do not look at it as “free” work but rather gaining experience which will change the value perception and it will definitely pay off.

A very important skill when getting into sports massage is how to say no. There are times where you will need to turn down an opportunity for a variety of reasons. While the reasons don’t necessarily matter, the way in which you handle the situation can speak volumes. Be very appreciative of unique opportunities because more often than not, those people have vast networks and may recommend you for other opportunities. Always be professional when declining and don’t burn your bridges, build them.

Some other tips when searching for opportunities are:

- Look for experiences that are unique and with reputable organizations
  - Pick things that are going to give you long term experience such as:
    - Work with teams
    - Long season sports
  - Look to work with a variety of different sports
  - Try to get experience with a variety of injuries and conditions
    - Shadow or volunteer at a physical therapy clinic or in an athletic training room
- Try to work with athletes over entire training cycle or season
  - Look to sponsor athletes or teams
    - If can’t get paid, then look for other forms of compensation:
      - Advertising
      - Tickets
      - Testimonials
      - Exposure
  - Good settings to work over the entire training cycle:
    - Triathlete teams
    - Running, cycling
    - Individual athletes
    - Minor league teams
    - College/university

Another way to gain experience and advice is to look for a mentor. The easiest way into the profession is through someone already on the inside. Don’t be afraid to pay them for their time and experience. Take them to lunch to pick their brain about the profession and advice on your situation. Offer to work on them for feedback. If they are successful in the field, they can offer a great deal of advice by experiencing your work. Be sure to pick a quality mentor that can truly help you gain experience in the field.
What Should I Take?
Because a lot of what we have discussed is not taught as part of our initial massage education, we must seek out continuing education to upskill ourselves in various areas. With a plethora of courses to choose from, how do we know what to take? The first bit of advice is take courses from experienced providers with relevant experience in the particular modality. Being an athlete does not make you an expert on sports massage. Look at their experience with sports and does it give them credibility. Some of the educational areas that should be studied include:

- Lymph drainage
- Fascial therapy
- Trigger point therapy - (NMT), (ART)
- Orthopedic assessment
- Clinical massage
- Massage with movement
- Injury pathology
- Biomechanics
- Stretching

What not to do!

While we can contribute a tremendous amount to a sports medicine team and we may have been told that we are the greatest thing since sliced bread, we need to recognize our role when wanting to work with sports. You want to stay away from making claims that are not backed up through evidence. While anecdotal results are important, sports medicine professionals have 6-8 years of higher education in their fields and work very much from an evidence based model. Making a claim such as “post event massage gets rid of the lactic acid” is an example of a statement that will inform them of the fact that you are not current in your understanding of your own profession and will be an immediate turn off.

Part of being professional is portraying a professional appearance. When meeting with anyone, be sure to dress appropriately. Finally, the use of humility goes a long way. Conveying that you are valuable to the athletes that you are there because you enjoy working with that population, that you will work hard, that you want to be part of a sports medicine team and that you are a true professional will greatly improve your chances of success in this amazing area of specialization.

In closing, there are some things that you want to convey to the people you are trying to work with:

- Your value in helping the athletes
- That you are there because you enjoy working with that population
- That you will work hard
- That you want to be part of a sports medicine team
- That you are professional