Comparative study of practice of Manual Osteopath in Africa and Global World

Dissertation Submitted to the faculty of the

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By

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Acknowledgement and Dedication

‘Knowing is achieved by doing but it is now left for you to choose what to learn, who to learn from and then, what to do with the knowledge because knowledge they say is Power’

With utmost regard, and sincere appreciation, I wish to thank my mentor and motivator- Dr. Shawn Pourgol, MBA, DC, DO, PhD Professor and president of NUMMS and the entire staff member especially for their wonderful commitment and support.

I will not fail to recognize the support and prayers from my Families in Africa especially, my elder sister and family Ambassador Maryann Odichinaka Anyanwu, my sons-Ikenna and Chimobi for their patience all this while, my lovely husband Alexander Ejiogu for his immeasurable support and above all,

I appreciate God for his faithfulness and Mercy over me.

To God be the Glory, Amen.

Dedication.

This work is dedicated to Almighty God and to all suffering one inflammation.

or the other.

Also, for those who help the sufferers of inflammation globally in the management.

“Don’t Give Up”

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Introduction to Manual Osteopathy

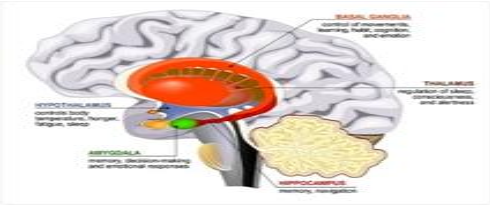
Manual Osteopathy from a lay man understanding is simply- Using hand to touch the bone, muscle, nerve or general body.

The modality of management of certain health conditions differs and determined by certain factors available. Such information as-conditions that require the services of a manual osteopathy therapist or specialist, proximity of the service site, affordability of the services, flexibility of the provider, sensitivity and testimony from customers if any, and many more factors. You can see it as a form of hands-on therapy with a primary focus of restoring function and eliminating pain by addressing the root cause and another may deal with it as a holistic or and integrative way of managing both acute and chronic body condition without medication or surgery especially in pain or inflammation.

Yes, the hand is mainly used but from every indication, other parts of the body are involved in proper therapeutic session because the brain is the chief justice in this practice because the decision on the modality to employ or the technique to use is made within the brain at the prefrontal cortex and hippocampus. That is why we talk about the cognitive function of the brain and the quality of care the therapist provides.

Manual Osteopathic therapy (MO) is used principally in the management of musculoskeletal pain. It can be particularly useful for the elderly, who are more prone to medication side effects. The Osteopathic principle states that in order to heal the pain and return your body to normal function, you must correct any structural imbalances within the musculoskeletal system. In truth, painkillers, muscle relaxants, heat therapy, electrotherapy was not designed to correct the imbalance of the body structure. This means that the real reason for the aching pain often has not yet resolved. In order to avoid surgery and completely cure the problem, the body must correct its internal structure's abnormality. The body works as a single entity, the musculoskeletal structure impact's function.

We know vividly that the body has self-governing means, the body has the capability to protect, repair, and regenerate itself to preserve its function.



The hippocampus is located deep in the brain, hidden within the medial part of the temporal lobe. On a mid-sagittal section of the brain, it can be seen lying posterior to the amygdala and extending posteriorly to the splenium of the corpus callosum.

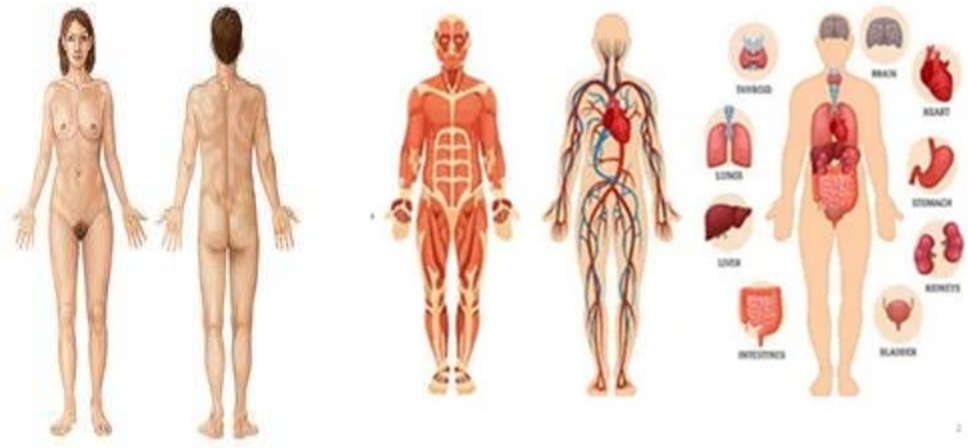
Chapter 1.1: Simple Definition of Anatomy and Physiology of the Human Body especially the musculoskeletal section (bones, muscles joints, nerves, fat)

As we delve into this, we are going to digest a little more on the anatomy of the human body and its physiology. Anatomy could be defined as the branch of biology concerned with the study of the structure of organisms and their parts. It is a branch of natural science that deals with the structural organization of living things, and it is an old science, hence it began in prehistoric times.

There are two types of anatomy:

Gross anatomy which is subdivided into surface anatomy (the external body), regional anatomy (specific regions of the body), systemic anatomy (specific organ systems).

Microscopic anatomy is subdivided into cytology (the study of cells) and histology (the study of tissues)



Anatomical structures: -External and internal organs of human body

The human body as we know is a complex structure, beautifully made and knitted naturally.

In this work, we are not concerned directly with the microscopical behavior or properties of the human body rather, we are concerned with the gross This is because we are focusing on the non-invasive approach to holistically help man to heal. Although the procedure may be external, it has internal and external effects for the benefit of humans. The practitioner harnesses both body, mind and soul by the soft and careful manipulation of the affected parts of the body gently, thus, bringing in healing especially in both acute and chronic conditions.

The muscles and skeleton (Musculoskeletal system) are our main focus notwithstanding the fact that other surrounding structures are managed at the same time and also benefit from the practice manual osteopathy.

What is the musculoskeletal system?

‘Our musculoskeletal system includes your bones, cartilage, ligaments, tendons and connective tissues. Your skeleton provides a framework for your muscles and other soft tissues. Together, they support your body's weight, maintain your posture and help you move. They work and function together’.

Google Search

Musculoskeletal challenges can be injuries. These injuries could be acute or chronic pain syndrome. They may be indescribable or pain of unknown origin (PUO).

Manual Osteopathy is one of the most complete health care systems in the world. It is a distinctive form of medical practice. The practice of osteopathy utilizes all available modern manual medicine techniques to assess injury and diseases of muscles, bones, joints and nerves. It also offers the added benefit of hands-on diagnosis and treatment through a system of therapy known as osteopathy manipulative therapy (OMT). Osteopaths understand how all the body’s systems are interconnected and how each one affects the others.

They focus special attention on the musculoskeletal system, which reflects and influences the condition of all other body systems.

The skeletal system serves a variety of functions. The bones give the shape to the body and provide the site of attachment to muscles, tendons, ligaments and cartilage. These tissues function together as a whole to generate a force that provides the biomechanical basis of movement. Due to its structural integrity, the skeletal system protects the internal organs, most importantly the brain, which is surrounded by the skull, as well as the heart and lungs, which are protected by the rib cage.

Moreover, the skeletal system serves several metabolic functions. The bones are the storage site of important minerals, most notably calcium and phosphorus. This makes the bones essential for balancing calcium levels in the blood, which is regulated by adjusting the rate of bone resorption.

Lastly, the bone marrow found in spongy bone is the site of hematopoiesis, which is a process of production of new blood cells. Cells that are produced in bone marrow are red blood cells, platelets and white blood cells, such as monocytes, granulocytes and lymphocytes. Do we see how the external and internal structures of the human body got interwoven that anything that happens to one part of the body affects the general body due to the networking capacity of the organs. The anatomy of the body is very complicated and intersected.

In this musculoskeletal system, ligaments stabilize the articulating bones and reinforce the joints. Depending on their anatomic position relative to the joint capsule, ligaments are classified into:

Capsular ligaments are essentially thickenings of the joint capsule that form either elongated bands or triangular structures. These ligaments serve to reinforce the integrity of the joint capsule. An example of the capsular ligament is the iliofemoral ligament of the hip joint.

Intracapsular ligaments are the ligaments that lie internal to the joint capsule. These ligaments reinforce the connection of the articulating surfaces of the joint but allow a far wider range of motion than other ligaments. Examples include anterior and posterior cruciate ligament of the knee joint.

Extracapsular ligaments are ligaments that lie outside the joint capsule. These ligaments provide the most stability to the articulating bones and are important for preventing dislocations. Extracapsular ligaments can lie in proximity (example is the medial collateral ligament of the ankle joint) or a bit further from the joint capsule (vertebral ligaments) even the bursae especially the suprapatellar bursa.

Bursae are small sac-like outpouchings of the joint cavity lined by synovial membrane. They are found around the joints, providing cushioning of the associated bones, tendons and muscles and reducing friction between adjacent structures.

Most synovial bursae are located near the large joints of the arms and legs. For example, one of the bursae of the knee joint is the suprapatellar bursa, found superior to the patella, between the femur and the tendon of the quadriceps femoris muscle. The suprapatellar bursa allows for these structures to slide over each other without friction during flexion and extension of the knee joint.

Each bone of the musculoskeletal system is connected to one or more bones via a joint. Joints provide a fulcrum to the bones, on which they pivot and thereby allow movements of body parts. However, movement is not a necessary attribute of a joint as some joints do not move, such as joints between the bones of the skull. The integrity or stability of a joint is provided by several factors including the bony congruence and structures that cross the joint, such as tendons and ligaments.

Hyaline cartilage is composed of type II collagen and an abundance of ground substance, which gives it a glossy appearance. It is the most abundant type of cartilage found in joints (articular cartilage), as well as the nose, larynx, trachea and ribs.

Elastic cartilage is like hyaline cartilage but contains more elastic fibers. It is found in structures such as the pinna of the ear, auditory tube and epiglottis.

Fibrocartilage is composed of plenty of collagen fibers type I and a smaller amount of ground substance. Examples of fibrocartilage include intervertebral discs, pubic and other symphyses.

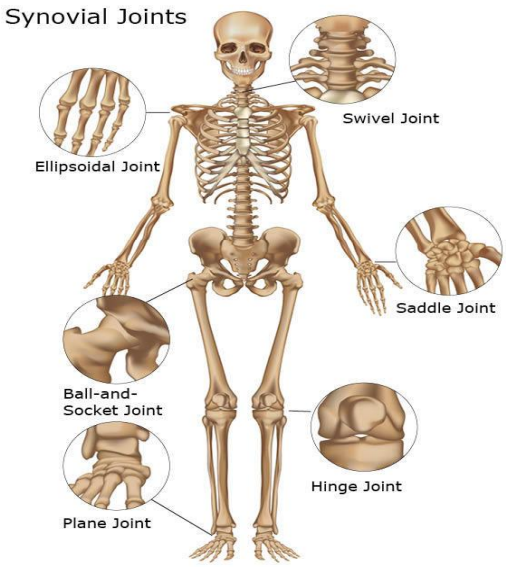
The musculoskeletal system specifically contains articular cartilage, a type of cartilage that lines the articulating surfaces of bones. The articular cartilage provides congruence to the articulating bones and allows them to bear weight and glide over each other with very little friction.

Evidence has it that the adult human skeleton is composed of 206 bones and their associated cartilages. The bones are supported by ligaments, tendons, bursae, and muscles. The bones of the body are grouped within the two distinct divisions:

Axial skeleton, that includes the bones along the long axis of the body. The axial skeleton consists of the vertebral column, bones of the head and bones of the thoracic cage.

Appendicular skeleton, that involves the bones of the shoulder and pelvic girdle, as well as the bones of the upper and lower extremities.

Bones are rigid structures made of calcified dense connective tissue. Bone tissue is composed of a mineralized bone matrix that consists of type 1 collagen fibers dispersed throughout the ground substance. The cellular component of the bones is represented by three types of specialized bone cells called osteocytes, osteoblasts and osteoclasts.



Anatomical presentation of bones and joints (Goggle)

Although the bone can be reviewed histologically but we are not going towards that direction, the bones consist of two distinct layers that differ in histological appearance and characteristics. Compact (cortical) bone is the outer much denser layer of the bone which gives it its smooth, white, and solid appearance. The outer surface of the compact bone is covered with a layer of dense connective tissue called the periosteum. On its inner surface, the compact bone is covered with endosteum, which is the boundary between the compact and spongy bones.

Spongy (cancellous) bone is the deep airy layer of the bone. Unlike compact bone, spongy bone is highly vascularized and more metabolically active. It is typically found within the ends of long bones and in the vertebrae. In certain bones, like the hip bone, sternum or femur, the central part of spongy bone houses the bone marrow, which is the site of hematopoiesis in the adult.

Bone tissue can be classified according to their shapes as follows: Humerus, Carpal bones.

Long bones have a tubular shape, with a longer longitudinal and a shorter transverse diameter. They are composed mostly of compact bone, while the spongy bone and bony marrow fill the ends of the bones. Examples of long bones include the humerus, ulna, tibia and clavicle.

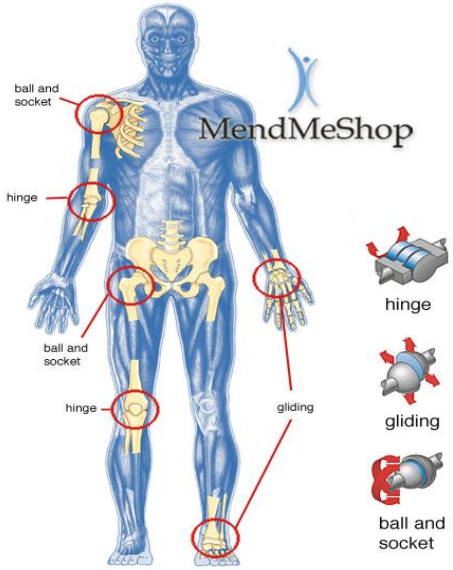
Short bones have a roughly cuboid or round shape, and only contain a thin layer of compact bone surrounding the spongy bone. Examples include the tarsal and carpal bones.

Flat bones are mostly thin, flattened and usually curved. They contain two parallel layers of compact bones surrounding a layer of spongy bone. Examples include most of the skull bones, scapula, sternum and sacrum.

Sesamoid bones are small, rounded unique types of bones that are embedded in muscle tendons where the tendon passes over a joint. The largest sesamoid bone in the body is the patella, but several other smaller sesamoid bones can be found in the hand and foot, usually near the joints.

Irregular bones do not fit into any of the other categories. Generally, irregular bones contain foramina through which soft tissue and neurovascular structures pass. Examples include the vertebrae, hip bone and some bones of the skull.

A typical long bone consists of a long shaft (diaphysis) that extends into a neck (metaphysis) and head (epiphysis) on its proximal and distal ends. It also features various markings and formations that give passage to neurovascular structures, as well as the attachment sites to the ligaments and tendons. Some of those features include Sulcus – a shallow groove on the bone surface (example, radial sulcus of humerus) Condyle – rounded articular area (example, lateral condyle of tibia) Epicondyle – eminence superior to a condyle (medial epicondyle of femur)



Cleveland clinic

(Goggle Search)

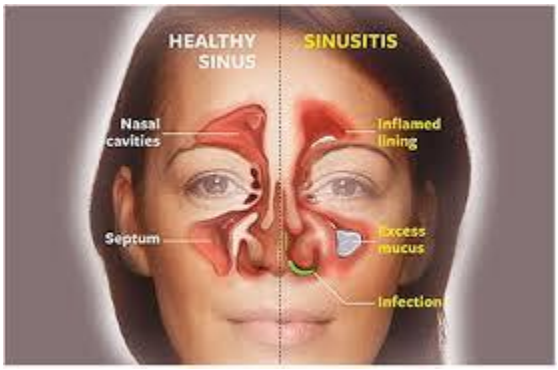
All the joints of the body

1.2: Definitions of some common conditions that we use Manual Osteopath

Techniques to treat both in Africa and the global world.

Asthma and Sinus Infections: (Breathing issues) Asthma and Sinusitis have been closely associated but there has been more concentration to severe cases of asthma globally.

Studies show about half of people with moderate to severe asthma also experience chronic sinus infections. Sinusitis can make managing asthma harder. It can sometimes stoke airway inflammation, causing breathing problems related to asthma.



Asthmatic and Sinusitis -Goggle image (Dentist Cary, NC)

This situation comes with allergy presenting with most of the following conditions:

Itchy, watery eyes, Itchy nose, Sneezing, Runny nose, Rashes, Hives (a rash with raised red patches) Stomach cramps, Vomiting.

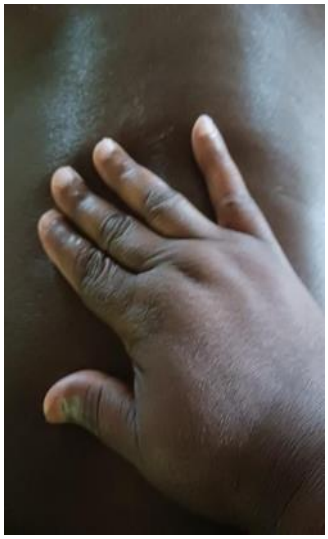
Manual Osteopathy treatment of Asthma, allergy and Sinusitis with aromatic oils and homeopathy

In Africa, we combine some special teas and oils and manual touches as displayed above to treat Asthma and its accompanying complications as mentioned above but everything normalized after the treatment as compared to most global practice where only manual osteopathy is used only. In both approaches, the soft tissues(facias) were touched gently during treatment.

Irritable bowel syndrome (IBS) and constipation (Bowel issues)

This could be a condition related to changes in the messages between the brain and the intestines with presence of abdominal pain and discomfort, along with changes in bowel function. Bloating and/or gas also may happen. Changes in bowel function may include straining, infrequent stools, hard or lumpy stools, and/or a feeling that the bowel does not empty completely. Some people may feel as if there is a "blockage" preventing them from passing stools. They may need to press on a part of their body or change body position to help them complete their bowel movement. How often a person passes stool, or the way it appears, may be different when abdominal discomfort is happening. With IBS-C, abdominal discomfort often improves after a bowel movement.

This could happen after a past infection in the gut with irritable excruciating pain chronic pain at the abdominal region with some restlessness,



(Goggle image and life image from practical)

Generally, both African and global world use visceral manipulation which is a form of osteopathic manual therapy that has the capacity to decrease the formation of adhesions and increase fluid movement. It has also been shown to increase the range of motion in the pelvis and trunk, decreasing the volatility of the gut, which can lead to an improvement in many IBS symptoms.

Specifically, in Africa, we first make sure diet is adjusted with increased fibers intake followed detoxification and then soft gentle visceral manual osteopathy therapy. We go from the back to the front. Following anatomical position of the intestine from up to down, then healing follows.

Pain- Chronic pain, including fibromyalgia, arthritis, menstrual pain and migraines.

Manual therapy can include massage or joint or soft tissue mobilizations (gentle, repeated pressure along your spine and the surrounding muscles, tendons, and ligaments) (panel B). This type of manual therapy can relieve stiffness and get your spine moving better.

Despite the manual osteopathic soft tissue, joint and surrounding structures manipulation techniques, In Africa we still use natural pain herbs as well as manipulations to treat pain be it chronic or acute even migraines.

Furthermore, we treat even fractures bones as compared to western world where Manual Osteopaths don't treat fractured bones. We also treat other conditions or inflammation as a result of infections like bacteria, Psoriasis, bites from insects and animal with certain herbs and techniques while treating with the regular manual osteopathy techniques used globally.

Images of fractured and unfractured conditions treated with manual Osteopath practitioner showcasing Africa and global practices.

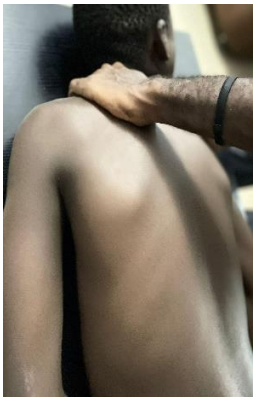
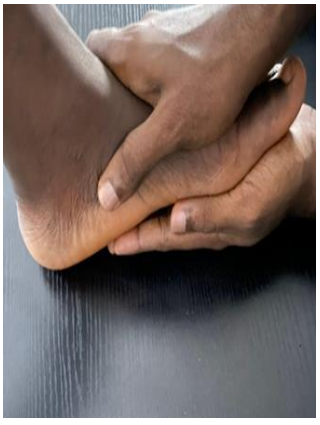
Musculoskeletal problems - back and neck pain, joint pain and carpal tunnel syndrome

The musculoskeletal system (locomotor system) is a human body system that provides our body with movement, stability, shape, and support. It is subdivided into two broad systems:

Muscular system, which includes all types of muscles in the body. Skeletal muscles are the ones that act on the body joints to produce movements. Besides muscles, the muscular system contains the tendons which attach the muscles to the bones.

Skeletal system, whose main component is the bone. Bones articulate with each other and form the joints, providing our bodies with a hard-core, yet mobile, skeleton. The integrity and function of the bones and joints is supported by the accessory structures of the skeletal system, articular cartilage, ligaments, and bursae.

Besides its main function to provide the body with stability and mobility, the musculoskeletal system has many other functions; the skeletal part plays an important role in other homeostatic functions such as storage of minerals (e.g., calcium) and hematopoiesis, while the muscular system stores most of the body's carbohydrates in the form of glycogen

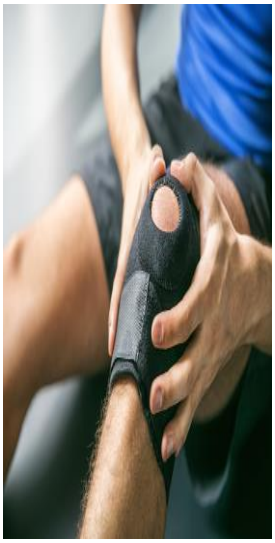



Life images of African manual Osteopathy management of joint, muscle pain using some special oils as combination with improved nutrition to boost the calcium levels.

Sports injuries and repetitive stress injuries.

This happens when movements are repeated over and over, causing damage to a bone, tendon, or joint. (Repetitive stress injuries (RSIs)) It is very common in sportive and very active individuals such as my son that bends often while reading. Now he is experiencing upper back pain. He is getting therapy below and






Above are some of the repetitive injuries being treated both in Africa and Globally!

Other professionals that use the same part of their body part regularly, such as your shoulder, elbow, forearm, wrist or hand have similar pain. For example, you can get RSI if: you do repetitive activities like hairdressing, decorating, typing or working on an assembly line. Repetitive motion injuries, also called repetitive stress injuries, are temporary or permanent injuries to muscles, nerves, ligaments, and tendons caused by performing the same motion repeatedly. A common repetitive motion injury is carpal tunnel syndrome, even bursitis.

As I have been stating from earlier discussion, in Africa, we use certain special oils and plants/herbs to treat most of such conditions as well as certain fractures as shown below.

African approach in managing musculoskeletal problems in Africa both fractures and sprain

Problems associated with pregnancy, such as swelling (edema), insomnia and sciatica.

We must remember the importance of manual osteopathy in management of pregnancy both in Africa and globally. Pregnancy we know is a positive physiological disease which affects both the physical presentation of the gravida, her emotional status, her internal milieu and her environment at large. The anatomical structure generally is affected leading to mild to partially categorized pain especially at the sciatica at the hip and lower back. This condition also affects the electrolyte levels and balances in the patient thus leading to insomnia. This insomnia could be as a result of anemia in the mother, when the mother goes through all these, confusion, restlessness and pain arise thus creating opportunity for a request for manual osteopath.

Comparing the management this situation mentioned above, we will be considering so many important factors, Factors such as age of the gravida, age of the pregnancy, past medical history of the pregnant mother, present health condition, family history, allergy status, Covid status, level of education and communication skill and many more. Also, the position of the growing baby is considered as well as the mother's habit. I believe that both African Manual Osteopaths and Global Manual Osteopath practitioners do consider same or similar factors in delivering care, but the only difference could be the application of local herbs as additional ais towards the successful therapy.





Above are presentations of pregnancy and treatment of pain and repositioning of the fetus!

As stated above, in pregnancy the mother's presentation determines the type and duration of care to be presented. One of the majors is to improve motility, control and manage pain and safe delivery. This noninvasive but holistic. African manual osteopath practitioners employ western manipulation and combine with material locally. Some herbs are bounded with sand and special stone and some chosen bone is used to administer the prepared herb and gently manipulation done as she lay upward. That helps for repositioning the baby and for pain treatment. This approach addresses structural problems in the joints, muscles and tissues.

Improve circulation (how blood and other fluids flow through the body).

Prevent health problems and help the body heal itself by improving how the body works as a unit.

Soothe tight muscles, relieve joint stiffness and improve range of motion.

Manipulation in osteopathy is a safe, effective treatment for back pain and a wide range of health conditions. Using this hands-on approach, MO realign your body, restore balance and work with you to achieve optimum health.

When this procedure has been completed, the pain goes down and the mother bounces back, Again, during delivery, she gets another session for flexibility and mobility and the edema disappears, and safety archived.

1.3: Types of Manual Osteopathy Techniques

Most known types of Osteopathic techniques are follows:

1) cranial osteopathy – addresses the vitality and mobility of the dual membranes and cerebrospinal fluid which nourish and protect the brain and spinal cord and influence nutrient exchange at a cellular level throughout the entire body.

2) Myofascial and connective tissue therapy – treats restrictions of the muscles, fascia and connective tissues, normalizing these important structural tissues.

3) osteo-articular corrections – gentle manipulation of joints which relieve restriction and restore proper motion.

4) visceral manipulation – gentle but direct work to the organs and viscera and their ligamentous/ fascial attachments to relieve pain and improve function.

Integrative approaches are also helpful globally in practicing successfully as manual Osteopath, for instance:

a) Lifestyle modification- Lifestyle modifications for IBS-C include reducing or avoiding alcohol and tobacco products, improving sleep habits and getting regular exercise.

b) Dietary and Nutrition therapy -Some people find that certain foods can “trigger” or set off symptoms of IBS-C. However, the specific foods that bring on symptoms can vary widely from person to person. Increasing the amount of soluble fiber in one’s diet (for example, oats, psyllium, and flax) can be helpful.

Cutting down on caffeine, soda and gas-producing foods is often recommended. Specific diets have been studied and have shown benefit for some patients. Examples include the “low FODMAP” diet (a diet that is low in certain fermentable sugars) and the gluten free diet (a diet that excludes certain proteins that are found in many grains).

It may be helpful to work with a dietitian to better understand possible food triggers. In addition, diets that exclude whole groups or types of food can be difficult to follow, and a dietitian can help make sure your modified diet is both nutritious and safe.

c) Psychological Therapies - Various therapies focus on treating the central nervous system and have helped patients with IBS-C. Some of these work on how the brain and mind interpret sensations, such as discomfort or bloating. Examples of psychological therapies include hypnotherapy, cognitive behavioral therapy, multicomponent psychological therapy and dynamic and/or psychotherapy. For some patients, psychological stressors can worsen IBS, such as a history of physical, mental or sexual abuse. Psychiatric conditions such as post-traumatic stress disorder (PTSD), anxiety and depression are sometimes found along with IBS-C, and treating these problems may also improve the IBS symptoms.

d) Treatments Targeted at Bacteria - Bacteria are naturally present in the intestines or "gut" of humans, and they play an important role in normal bowel health and function. "Probiotic" products are foods or pills that contain live bacteria that may promote gut health. They are sometimes recommended with the goal of changing the types of gut bacteria in the intestine. This can sometimes reduce abdominal discomfort, bloating and gas from IBS-C. Experts are not sure of the overall benefit of probiotics for people with IBS; the most beneficial types and amounts of probiotic foods or supplements also are not known.

e) Antibiotics are another way to change the population of bacteria in the gut, but there is disagreement about this approach. While antibiotics sometimes provide symptom relief of IBS symptoms, there are potential risks associated with frequent use. If antibiotics are used too often, they can become less effective, and the risk for developing serious infections increases.

f) Herbal therapies There is some evidence that peppermint oil or African or Chinese herbal formulas, such as a supplement called STW5, can improve IBS-C symptoms.

g) Spirituality/Prayer with meditation – It's the act which provided a biological framework for the powerful influence of psychological factors such as attention, expectation and emotion on pain processing and stimulated the integration of psychological approaches into the management of pain or treatment of a disorder.

h) Health and behavior coaching- Coaching is an evidence-based approach to pain recovery that gives you the strategies and support to minimize the life-crushing impact of disorder including chronic pain. Pain-management coaching offers encouragement and hope while empowering you to act and giving you the confidence to know what to do.

As a holistic health coach and Practitioner, we encourage our clients and employ an integrative cognitive approach in conceptualizing the best method to help clients to heal. That has been very helpful and even in manual osteopathy practices.

i) Hydrotherapy, immersion, waxing Suitable variable exercise and much more.

Chapter 2.1: General Effects of Manual Osteopathy (Positive Effect and Negative Effects)

This simply means the advantages and disadvantages of the practice of manual Osteopathy.

Manual Osteopathy is a type of treatment, which is helpful to treat a wide range of disorders. Some of the advantages linked with this therapy are mentioned below.

Noninvasive Treatment

The most noticeable aspect of this treatment is the fact that it involves a completely noninvasive procedure. Moreover, no surgery is needed to treat a patient. The techniques used during osteo therapy are usually relaxing rather than painful.

This is a manual treatment, as hands are the only tools used for diagnosis and treatment while offering this therapy. Besides the hands-on therapy, the osteopaths serving at Osteopath also suggest some dietary changes.

Most Manual Osteopathy Technique doesn't involve any kind of pain or discomfort. Hence, patients of all ages can undergo this treatment without any fear. Manual Osteopaths treat musculoskeletal issues by implementing gentle manipulative techniques.

No Medication If you are visiting a general practitioner or doctor to get yourself treated, you may undergo various physical tests and must consume a lot of medication. Medication has its toll on other parts of the body, which causes negative impact on their proper functioning. This is especially in the global world or western world, but, in African content, we use homeopathy starting from less to more(because less is always more better than excess chemical)

On the contrary, Manual osteopathy doesn't involve any kind of medication. Hence, your body doesn't have to face the consequences of the chemicals used as different medicines. This means there are no major side effects. So, you can relieve yourself from any kind of chronic pain by simply visiting an osteopathy facility like Manual Osteopath center coming soon at Linthicum Heights Maryland USA.

Treats a Wide Range of Ailments

Manual Osteopathy turns out to be a viable treatment while curing numerous diseases and conditions. The list of ailments that osteopathy can treat is extensive. Some of them include

back pain, Neck pain, physical stress, injuries, menstrual pain, chronic obstructive pulmonary disease, anxiety, tennis elbow, and even asthma.

Manual Osteopathy can completely treat most of these diseases, while others are partially cured. However, it is certain that you will experience substantial relief after receiving osteopathic treatment.

Preventive Therapy

Apart from providing cure and relief, Manual osteopathy also protects the body from various ailments. Through regular manual osteopathy treatment, the health can improve and a better life is lived. It helps to strengthen the musculoskeletal system of a body and prevents any kind of injury.

Medical Insurance Claim

Almost every major insurance company supports osteopathy treatment claims. Hence, if anyone needs manual osteopathic treatment, you can get these services without thinking about the expenses. Patients are not required to visit your GP to seek a referral in most cases. However, one needs to check for the requirements of your insurance policy.

Disadvantages of Manual Osteopathy

Although there are numerous advantages of osteopathy, there are a few disadvantages associated with this treatment. Some of these disadvantages reveals that-

Manual Osteopathic treatment is not recommended for serious ailments or those which require surgical treatment. For instance, it is not possible to treat serious muscle or bones disorders, complicated ailments, and extreme injuries. In addition, the patient won't feel any kind of relief from chronic pain associated with such ailments.

Challenges of this beautiful practice include the inability of the General Practitioners not recommending the patients in most cases

This is so because the clients who seek such by seeking this manual osteopath therapy, which may worsen the condition of the patient. For example, a patient suffering from joint/bone infection, unexplained inflammation or bone cancer shouldn't receive manual osteopathic treatment.

Most of the Side Effects but less to the beneficiaries of African Manual Osteopathy practitioners-

Manual Osteopathy does have some kind of side effects which may be soreness and fatigue in the affected area, but these side effects are temporary and won't bother you for more than a day or two.

Time Needed Recovery

The results of a Manual osteopathic treatment usually vary from patient to patient therefore, we should consider combining the overall recovery rate of this treatment, time is needed and a few treatments as one treatment will not help much compared to a few treatments which will be needed ordinarily.

Allergic reactions may surface as in both African and global world but from all my research and experience even from this work, 'African Approach' has no known side effects but, our combination of western or global practice and African Manual Osteopathy has been yielding great result while delivering care to patients.

Despite all, there must be some great consideration to advice the patient on the following-

Drink plenty of water: Staying hydrated allows toxins to flush out of your muscles after treatment.

Go for a walk: A short walk helps your body "settle in" or adjust to the proper alignment and balance.

Take it easy: Avoid rigorous physical activity for 24 hours after MOT. Focus on breathing and allowing your body time to rest.

Note! People who have osteoporosis, bone cancer or other joint concerns should not get osteopathic manipulative treatment.

Be sure as a healthcare provider to get all medical history from your patient before starting this treatment.

2.2: Summary and Conclusion

Concept and Principles of Manual Osteopathy

Manual Osteopathy therapists believe that abnormal functioning of one area of the body can cause symptoms to present elsewhere in the body, according to the theory of “Tensegrity”. When the body is balanced there is no excessive stress anywhere in the body, but when the body becomes out of balance this can be amplified to other areas. Osteopathic manual therapists regard the whole of the body as greater than a collection of all its parts.

Based on the type of tissue that holds the neighboring bones together and the range of motion they exhibit, joints can be classified into the following:

Synovial joints are freely mobile joints in which the bones are not in direct contact but are separated by a potential space called the synovial cavity. The synovial cavity is lined by a synovial membrane that secretes the synovial fluid which nourishes and lubricates the articulating surfaces in order to reduce friction. The articulating bones in most synovial joints are lined with hyaline cartilage. These joints usually have a wide range of motion, which is defined by the joint capsule, the supporting ligaments and muscles that cross the joint. Examples of synovial joints include the knee, shoulder, sternoclavicular and elbow joints.

Fibrous joints are the articulations in which the bones are connected by dense fibrous connective tissue. The bones in fibrous joints are firmly held together so that the joint allows negligible movement. Fibrous joints are found between the cranial sutures, the distal tibiofibular and cuboid navicular joints.

Cartilaginous joints are articulations in which the bones are connected by cartilage. The bones have a range of motion between synovial and fibrous joints. Cartilaginous joints are subdivided into synchondrosis (example. costochondral joints) and symphysis joints (e.g. pubic symphysis)

Most people get OMT to treat lower back pain, OMT do treat many conditions. Babies, children and adults can benefit from osteopathic manipulative therapy. Pregnant women get OMT to improve sleep and relieve pain. OMT can also help infants who have colic.

They acknowledge the body’s inherent ability to heal itself and seek to support that process by removing any obstacles that impede it. For this to happen Manual Osteopathy therapists specialize in individualized patients’ management, which includes educating the patient about their condition and how they can adjust their lifestyle to allow themselves the best possible chance recovery or optimal management.

Ideally, for the assessment (and possibly for the treatment) shorts or loose/stretchy pants are worn, and if you are comfortable, a sports bra (for women) and no shirt (for men). Your comfort is very important, however, there is a blanket and heating pad handy so you will not be chilled. This is for the western or global world, but, in Africa, we are conscious of our dress and public

appearance, we prefer wrapper and loose clothes but proper body covering, our weather in Africa is favorable. We combine our" God given plants and herbs" in combination during this practice. Also, we treat both fractured and unfractured bones and other complex conditions as compared to western or global world practice where only soft tissues without physical or open injuries are treated. We also practice integrative and holistic care.

This might seem new, but it is verse in practicing because the techniques are enormous, we have over or more than 40 MO techniques. The MO specialists may use one technique or several of them during treatment or session.

Before Manual osteopathic manipulation treatment (MOMT) The practitioner will ask about patient symptoms, lifestyle and other health concerns. It's important to share information about sleep habits, activity level, diet and mental health with patients. OMP use this information to gain a clear picture of how a client's lifestyle affects your overall well-being.

In the first session, we can expect to go over the health history with the manual osteopath as well as discussing what her needs are. An assessment will be done, which includes observation of posture and tests to determine where treatment will be most indicated. With the remaining time, a treatment will be given. In subsequent appointments, there will be a quick assessment (in order to see what changes have occurred and again, to guide the process), and more time will be spent on treatment, which can take place with you sitting, lying face up, face down, or on your side.

MOP will examine patients by touching or pressing on different parts of the patient's body. Depending on the patient's symptoms, your MOP may order imaging studies (like an X-ray or MRI) before starting OMP.

Depending on the technique, MOP (Manual Osteopathy Practitioner) may ask the patient to lay on your back, roll onto side, or pull knees, to chest. While patients are in these positions, The MO will use pressure and gentle manipulation to stretch your muscles and move your joints into proper alignment. The MO may ask the client to hold and release his/her breath at specific times. The MOP may use slow, continuous pressure or quick, sudden manipulations.

Some of the movements may feel a little strange or awkward. But they shouldn't hurt. If a patient feels pain or discomfort during treatment, he or she should tell your MOP right away.

During osteopathic manipulation, the specialist will make the patient stand up, sit or lie down on an exam table. MO Specialist will touch the patient's muscles and soft tissues and move the limbs in different positions.

In recent times, there has been skeletal research and review on Manual Osteopathy, it's a great attempt at least a positive move in the right direction. I will be siting the study in the reference below:

“Manual osteopathy is a form of alternative medicine that involves the manipulation of bones, muscles, and joints to promote healing and alleviate pain. In recent years, there has been an increasing interest in this practice in Africa and around the world. This essay aims to provide a

comparative study of manual osteopathy practices in Africa and the global world.

In Africa, manual osteopathy is still a relatively new field. However, it is gaining popularity due to its effectiveness in treating various musculoskeletal disorders.

Many African countries have established schools that offer training in manual osteopathy.

On the other hand, manual osteopathy has been widely practiced in Europe and North America for over a century. It has become an established form of alternative medicine with many practitioners offering their services to patients.

Despite these differences, there are many similarities between manual osteopathy practices in Africa and the global world. Both rely on hands-on techniques to manipulate bones, muscles, and joints to promote healing. Additionally, both emphasize the importance of holistic care that considers all aspects of a patient's health.

In conclusion, while there are some differences between manual osteopathy practices in Africa and the global world, they share many similarities.

As this field continues to grow globally, it is important for practitioners to continue learning from each other's experiences for improved patient outcomes”. (Shivachev Y, Mancheva P. et al)

2.3: Some common Terminologies use in Manual Osteopathy Practices

Asymmetry: Absence of symmetry of position or motion; dissimilarity in corresponding parts or organs on opposite sides of the body that are normally alike; of particular use when describing position or motion alteration resulting from somatic dysfunction.

Axis: 1. An imaginary line about which motion occurs. 2. The second cervical vertebra. 3. One component of an axis system axis of rib motion: See rib motion, axis.

ASIS (anterior superior iliac spine) compression test:

A test for lateralization of somatic dysfunction of the sacrum, innominate or pubic symphysis. 2. Application of a force through the ASIS into one of the pelvic axes to assess the mechanics of the pelvis. See also sacral motion, axis of axis of sacral motion: See sacral motion, axis of axoplasmic flow:

Axoplasmic transport.

Axoplasmic transport: The antegrade movement of substances from the nerve cell along the axon toward the terminals, and the retrograde movement from the terminals toward the nerve cell.

Backward bending: Opposite of forward bending. See extension,

Backward bending test 1: This test discriminates between forward and backward sacral torsion/rotation.

Balanced ligamentous tension technique: See osteopathic manipulative treatment, balanced.

Ligamentous technique, ligamentous articular strain

Pathologic a restriction of joint motion associated with pathologic change of tissues (example: osteophytes) barrier, restrictive physiologic, the limit of active motion.

Biomechanics: Mechanical principles applied to the study of biological functions; the application of mechanical laws to living structures; the study and knowledge of biological function from an application of mechanical principles.

cavitation: The formation of small vapor and gas bubbles within fluid caused by local reduction in pressure. This phenomenon is believed to produce an audible “pop” in certain forms of MO Isometric c., 1. Change in the tension of a muscle without approximation of muscle origin and insertion. 2.Operator force equal to patient for Arthritis

Arthritis is a group of conditions affecting the joints. These conditions cause damage to the joints, usually resulting in pain and stiffness due to aging. Arthritis can affect many different parts of the joint and nearly every joint in the body.

As an individual ages, the joint tissues become less resilient to wear and tear and start to degenerate. This degeneration manifests as swelling, pain, and often-times, loss of mobility of joints. Changes occur in both joint soft tissues and the articulating bones, a condition called osteoarthritis. A more serious form of disease is called rheumatoid arthritis. The latter is an autoimmune disease wherein the body produces antibodies against joint tissues causing chronic inflammation resulting in severe joint damage, pain and immobility.

APS: Anatomical Presentation of the structures

ART: articulatory treatment

BLT: balanced ligamentous tension treatment

CR: osteopathy in the cranial field

CS: counter strain treatment

D/IND: direct treatment/Indirect treatment

FPR: facilitated positional release treatment.

HVLA: high velocity/low amplitude treatment

INR: integrated neuromusculoskeletal release treatment

LAS: ligamentous articular strain treatment

ME: muscle energy treatment

MFR: myofascial release treatment

NM- neuromusculoskeletal

OCF: osteopathy in the crania field/cranial treatment

OMTh: osteopathic manipulative therapy (non-US terminology)

MOP-Manual Osteopathic Manual(same as OMT)

OMT: osteopathic manipulative treatment

PINS: progressive inhibition of neuromuscular structures

ST: soft tissue treatment

VIS: visceral manipulative treatment

Accessory joint motions: See secondary joint motion.

Accessory movements: Movements used to potentiate, accentuate, or compensate for an impairment in a physiologic motion (e.g., the movements needed to move a paralyzed limb).

Lumbo lumbar lordotic, an objective quantification of lumbar lordosis typically determined by measuring the angle between the superior surface of the second lumbar vertebra and the

inferior surface of the fifth lumbar vertebra; best measured from a standing lateral x-ray film.

Lumbosacral, represents the angle of the lumbosacral junction as measured by the inclination of the superior surface of the first sacral vertebra to the horizontal (this is a sacral angle); usually measured from standing lateral x-ray films; also known as Ferguson's angle.

Lumbosacral lordotic, an objective quantification of lumbar lordosis typically determined by measuring the angle between the superior surface of the second lumbar vertebra and the superior surface of the first sacral segment; best measured from a standing lateral x-ray film.

Anterior component: A positional descriptor used to identify the side of reference when rotation of a vertebra has occurred; in a condition of right rotation, the left side is the anterior

component; usually refers to the less prominent transverse process.

Posterior component anterior compression test

ASIS (anterior superior iliac spine) compression test.

Anterior iliac rotation: See ilium, somatic. Dysfunction of, anterior (forward) innominate (iliac) rotation anterior nutation, anterior rib: See rib somatic dysfunction,

Inhalation rib dysfunction articular pillar: 1. Refers to the columnar arrangement of the articular portions of the cervical vertebrae.

2. Those parts of the lateral arches of the cervical vertebrae that contain a superior and inferior articular facet.

Articulation: 1. The place of union or junction between two or more bones of the skeleton.

2. The active or passive process of moving a joint through its permitted anatomic range of motion.

Osteopathic manipulative treatment, articulatory treatment (ART) system.

Articulatory pop: The sound made when cavitation occurs in a joint. Cavitation. Articulatory technique

Isotonic c., 1. A form of concentric contraction in which a constant force is applied. 2. Operator force less than patient force. Contracted muscle: The physiologic response to neuromuscular excitation

Contracture muscle. A condition of fixed high resistance to passive stretch of a muscle, resulting from fibrosis of the tissues supporting the muscles or the joints, or from disorders of the muscle

fibers.

Dupuytren condition., shortening, thickening and fibrosis of the palmar fascia, producing a flexion deformity of a finger (Dorland's).

Substituting non-contractile tissue for muscle tissue, which prevents the muscle from reaching normal relaxed length. See also contracted muscle.

The connection of the spinal dura mater from the occiput at the foramen magnum to the sacrum coordinates the synchronous motion of these two structures coronal plane: See plane, frontal. Costal dysfunction: See rib, dysfunction.

counternutation: Posterior movement of the sacral base around a transverse axis in relation to the ilia. See also nutation. counter strain technique: See osteopathic manipulative treatment, counter strain.

Cranial manipulation: - osteopathic manipulative treatment, cranial manipulation.

Cranial rhythmic impulse (CRI): A palpable, rhythmic fluctuation believed to be synchronous with the primary respiratory mechanism.

Cranial technique: -manipulative treatment, osteopathy in the cranial field.

Primary respiratory mechanism, craniosacral manipulation

Osteopathy in the cranial field craniosacral mechanism: A term used to refer to the anatomical connection.

Chronic pain – "a symptom of modern civilization. Many people have experiences of seeking.

medical and alternative treatments for pain in the bones. The current standard of practice by

modern health professionals are to start with painkillers and muscle relaxants, followed by heat therapy, electrotherapy, physical therapy and ultimately surgery. Those who suffer from short term symptoms might be prescribed medications, injections, and physiotherapy, while those who suffer from long-term symptoms may be referred for surgery or alternative therapies such as Osteopathy, Chiropractic, and Massage Therapy to alleviate outstanding pain. Nonetheless, not all alternative therapies are performed by professionals with medical backgrounds, thus it should be important to address the potential risks and side effects for patients and practitioners in order to prevent an unfavorable outcome".

Functions of the skeletal system

Clinical correlation

There are a variety of conditions that affect the muscles, bones, and joints. Disorders of the musculoskeletal system may range from diseases to minor physical disabilities. The following are some clinical conditions of the musculoskeletal system:

Osteoporosis

Osteoporosis is a condition that affects bone strength (the word osteoporosis literally means "porous bones"). It is a condition in which the bones become fragile and brittle, leading to a higher risk of fractures than in normal bone. As a result, even a minor bump or accident can cause serious fractures.

Osteoporosis is the “bone of the old”, especially, in women. The hard, rock-like quality of bone is dependent upon calcium. When too much calcium is dissolved from bones or not enough is replaced, bones lose density and are easily fractured. Estrogen, the female sex hormone, helps maintain proper calcium levels in bones. Once the ovaries stop producing the hormone, women are at higher risk of developing osteoporosis. A collapse of bony vertebrae of the spinal column results in loss of height and stooped posture. Hip fractures are a common occurrence.

Sarcopenia -Sarcopenia is a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life and death.

Muscular dystrophy -Muscular dystrophy is a group of muscle diseases that weaken the musculoskeletal system and hamper locomotion. Muscular dystrophies are characterized by progressive skeletal muscle weakness, defects in muscle proteins, and the death of muscle fibers (muscle cells) and tissue.

It is a group of inherited diseases in which the muscles that control movement progressively weaken. The prefix, dys-, means abnormal, while the root, -trophy, refers to maintaining normal nourishment, structure and function. The most common form in children is called Duchenne muscular dystrophy and affects only males. It usually appears between the ages of 2 to 6 and the afflicted live typically into late teens to early 20s.

Osteopathic manipulative treatment (OMT) is a hands-on treatment method. OMT is sometimes called osteopathic manipulative therapy or osteopathic manipulation.

Doctors of osteopathy (DOs) use OMT to treat mechanical pain (muscle, tendon or bone pain due to structural imbalance) and a wide range of health conditions. DOs also use OMT to diagnose and prevent disease and help your body function better.

Using several OMT techniques, DOs apply gentle pressure to manipulate the muscles, soft tissues and joints. The treatment encourages your body to heal itself by ensuring that your bones and muscles are aligned and balanced properly.

TMJ Treatment (jaw pain)-The manual osteopathic approach to TMJ includes the evaluation and potentially, treatment of the whole body, as imbalances at a distance may be contributing to an imbalance at the

temporo-mandibular joint. Therefore, before a focused evaluation /treatment of the TMJ occurs, the manual osteopath will make sure that any contributing causes from elsewhere in the body (ie. an imbalance in the pelvis or spine) are addressed.

Once a global span is completed, specific assessment and treatment to the neck, jaw and cranio-facial bones will follow, and may involve techniques for the soft tissues, including the muscles, ligaments and fascia, as well as specific techniques to release tensions at the articulations of the neck, cranial and facial bones, as well as the temporo-mandibular joints. This may involve the practitioner doing gentle stretches and manipulations inside of the mouth to reach deeper structures.

Of course, this type of intra-oral work is done with disposable gloves and in careful communication with the client to ensure consent and comfort.

Muscles of the head and neck, which include the muscles of the facial expression, muscles of mastication, muscles of the orbit, muscles of the tongue, muscles of the pharynx, muscles of the larynx, and muscles of the neck.

Muscles of the trunk, which include the muscles of the back, anterior and lateral abdominal muscles, and muscles of the pelvic floor.

Muscles of the upper limbs, which include muscles of the shoulder, muscles of the arm, muscles of the forearm and muscles of the hand.

Muscles of the lower limbs, which include hip and thigh muscles, leg muscles and foot muscles.

The fact that there are more than 600 muscles in the body can be quite intimidating. If you're tired of all the big, comprehensive anatomy books, take a look at our condensed muscle anatomy reference charts, which contain all the muscle facts in one place organized into neat

Synonyms: Myocyte, Myofiber, show more...

Structurally, the skeletal muscles are composed of the skeletal muscle cells which are called the myocytes (muscle fibers, or myofibrils). Muscle fibers are specialized cells whose main feature is the ability to contract. They are elongated, cylindrical, multinucleated cells bounded by a cell membrane called sarcolemma. The cytoplasm of skeletal muscle fibers (sarcoplasm) contains contractile proteins called actin and myosin. These proteins are arranged into patterns, forming the units of contractile micro-apparatus called sarcomeres.

Manual Osteopathy uses a variety of techniques to address imbalances in the body, from a whole-body perspective. This includes treating muscles, bones, joints and fascia through the soft tissues of the body.

Osteopathic Manual Techniques and Approaches:

1.) Visceral Manipulation

Manual osteopaths use visceral manipulation to treat organs and viscera of the body, including the liver, spleen, kidneys, stomach, pancreas, intestines, bladder and uterus. Patients may feel pain in one or more of these organs, or the viscera may be less pliable than it should be. Manual osteopaths gently move the structures themselves and the fascia (connective tissue) that surrounds them to restore full movement. Most patients treated with visceral manipulation feel only the gentle pressure of the manual osteopath's hand, but the corrections are powerful enough to improve the mobility of an organ, improve blood flow, and help the organ function more effectively.

2.) Osteoarticular

Manual Osteopaths use this technique to reduce muscle spasms near a joint, ease neurological irritations around a joint, make joints more mobile and to reduce pain and discomfort. The osteoarticular technique involves gently moving 2 joint surfaces. Before doing this, manual osteopaths carefully prepare the soft tissues around the treatment area. They also move the patient into a position that will minimize or eliminate the energy and force needed to perform the maneuver. Many patients find this technique less forceful than joint manipulation.

3.) Craniosacral Therapy

This is a very gentle osteopathic technique, and it requires the most experience to use effectively. To learn this technique, Manual osteopaths undergo intensive training. Through this training, their hands become sensitive to cranial mobility and develop great precision in utilizing cranial techniques. Manual osteopaths use this gentle technique to assess and treat the mobility of the skull and its contents. They may also use it to assess and treat the spine, the sacrum, and other parts of the body. The goal of this technique is to adjust the body's physiology by restoring balance to the circulation of the blood and other body fluids. Manual osteopaths do this by treating the body's inherent biorhythm. They can feel this rhythm in the patient's head, spinal cord, and in the sacrum and the rest of the body. Manual osteopaths use the biorhythm to assess the patient's condition, and they may modify it during treatment.

4.) Advanced Fascial Release

The practitioner uses advanced fascia release in many ways. In general, they use it to evaluate the condition of tissues and to help the body's fluids (such as blood and lymphatic fluid) flow smoothly. Keeping fluids flowing smoothly reduces harmful fluid retention and makes the body's immune system more effective. Fascia is tissue found in all parts of the body. It connects

All the body's structures at both superficial and deep levels. Practitioners evaluate the fascia to find areas of restriction, and then use soft tissue manipulation to make sure the length and tension of the fascia are properly balanced. Throughout the treatment, manual osteopaths keep checking on the state of the body's tissues. If one technique isn't working to correct a restriction, they use another approach instead. Above all, manual osteopaths try to restore health without over-treating.

Conditions That Can Benefit from Manual Osteopathy:

Many Musculoskeletal Conditions like…– Low Back Pain, Rotator Cuff Injury, Neck Pain, Knee Pain, et

Manual osteopathy (MO) is a complementary form of healing. It focuses on the interrelationship between the structure and function of the body. The goal is to work toward total body health through treating and strengthening the musculoskeletal framework, which includes the joints, muscles, and spine.

• The body is a unit.

• Structure and function are interrelated.

• The body possesses natural self-regulatory mechanisms.

• The body has the inherent capacity to repair dysfunction.

• When the normal adaptability is disrupted, or when

environmental stresses overcome the body's capacity for

self−maintenance, dysfunction may occur.

• The movement of bodily fluids is essential to the maintenance

of health.

• The nerves play a crucial part in controlling the fluids of the

Body Have chronic pain due to an accident or injury

• Have pain due to overuse of muscles, tendons, ligaments, or joints

• Have unresolved discomfort or pain after surgery

• Experience decreased physical function

• Have athletic injuries

• Have lower back pain

• Decreased mobility in hips

• Tension headaches

• Tightness in the neck and shoulders

• Leg and foot discomfort

• Tendonitis

Excitability - the ability to detect the neural stimuli (action potential);

Contractibility - the ability to contract in response to a neural stimulus;

Extensibility - the ability of a muscle to be stretched without tearing;

Elasticity - the ability to return to its normal shape after being extended.

Learn everything about skeletal muscle structure with our articles, video tutorials, quizzes and labelled diagrams.

Skeletal muscle tissue

Skeletal muscle tissue

Explore study unit.

Muscle contraction

The most important property of skeletal muscles is its ability to contract. Muscle contraction occurs as a result of the interaction of myofibrils inside the muscle cells. This process either shortens the muscle or increases its tension, generating a force that either facilitates or slows down movement.

There are two types of muscle contraction: isometric and isotonic. Muscle contraction is deemed as isometric if the length of the muscle does not change during the contraction, and isotonic if the tension remains unchanged while the length of the muscle changes. There are two types of isotonic contractions:

Concentric contraction, in which the muscle shortens due to generating enough force to overcome the imposed resistance. This type of contraction serves to facilitate any noticeable movement (for example lifting a barbell or walking on an incline).

Eccentric contraction, in which the muscle stretches due to the resistance being greater than the force the muscle generates. During an eccentric contraction, the muscle maintains high tension. This type of contraction usually serves to slow down movement (for example lowering a barbell or walking downhill).

Eccentric and concentric muscle contractions

Eccentric and concentric muscle contractions

Motor neuron axon (Axon moto neuronis)

Terminal boutons of axon (Bulbuli terminales axonis)

Motor neuron axon

Axon motoneuronis

The sequence of events that results in the contraction of a muscle cell begins as the nervous system generates a signal called the action potential. This signal travels through motor neurons to reach the neuromuscular junction, the site of contact between the motor nerve and the muscle. A group of muscle cells innervated by the branches of a single motor nerve is called the motor unit.

The incoming action potential from the motor nerve initiates the release of acetylcholine (ACh) from the nerve into the synaptic cleft, which is the space between the nerve ending and the sarcolemma. The ACh binds to the receptors on the sarcolemma and triggers a chemical reaction in the muscle cell. This involves the release of calcium ions from the sarcoplasmic reticulum, which in turn causes a rearrangement of contractile proteins within the muscle cell. The main proteins involved are actin and myosin, which in the presence of ATP, slide over each other and pull on the ends of each muscle cell together, causing a contraction. As the nerve signal diminishes, the chemical process reverses and the muscle relaxes.

Motor unit

Tendon (Tendo)

A tendon is a tough, flexible band of dense connective tissue that serves to attach skeletal muscles to bones. Tendons are found at the distal and proximal ends of muscles, binding them to the periosteum of bones at their proximal (origin) and distal attachment (insertion) on the

bone. As muscles contract, the tendons transmit the mechanical force to the bones, pulling them and causing movement.

Being made of dense regular connective tissue, the tendons have an abundance of parallel collagen fibers, which provide them with high tensile strength (resistance to longitudinal force). The collagen fibers within a tendon are organized into fascicles, and individual fascicles are ensheathed by a thin layer of dense connective tissue called endotenon. In turn, groups of fascicles are ensheathed by a layer of dense irregular connective tissue called epitenon. Finally, the epitenon is encircled with a synovial sheath and attached to it by a delicate connective tissue band called mesotenon.

Functions of the muscular system

The main function of the muscular system is to produce movement of the body. Depending on the axis and plane, there are several different types of movements that can be performed by the musculoskeletal system. Some of the most important ones include:

Flexion of leg (Flexio cruris)

Extension of leg (Extensio cruris)

Flexion of leg

Synonyms: Flexion of knee, Flexio genus

Flexion and extension: movement of decreasing or increasing the angle between the bones involved in the movement, respectively. This motion takes place in the sagittal plane around a frontal axis. An example of flexion is bending the leg at the knee joint, whereas extension would be straightening knee from a flexed position.

Adduction and abduction: movements of bringing the parts of the body towards or away from the midline, respectively. These movements are carried out in the frontal plane around a sagittal axis. For example, abduction of the arm at the shoulder joint involves moving the arm away from the side of the body, while adduction involves bringing it back towards the body.

Rotation is the movement in which a part of the body rotates around its vertical (longitudinal) axis in the transverse plane. This movement is defined relative to the midline, where internal rotation involves rotating the segment towards to the midline, while external rotation involves moving it away from the midline. Examples include lateral or medial rotation of the thigh.

Supination and pronation are special types of rotatory movements usually used to describe the movements of the forearm. Supination is essentially a lateral rotation of the forearm which turns the palms anteriorly (if the arm is anatomical position) or superiorly, when the elbow is

flexed. These movements are also sometimes used to describe movements in the ankle and foot, in which supination means rolling the foot outwards, while pronation means rolling the foot inwards.

Both during movement and stationary positions, muscles contribute to the overall support and stability of joints. Many muscles and tendons pass over joints and thereby stabilize the articulating bones and hold them in position. In addition, the muscles also play an important role in maintaining posture. While the movements occur mainly due to muscles intermittently contracting and relaxing, the posture is maintained by a sustained tonic contraction of postural muscles. These muscles act against gravity and stabilize the body during standing or walking. The postural muscles include the muscles of the back and abdominal muscles.

Another important function of muscles is heat production. Muscle tissue is one of the most metabolically active tissues in the body, in which approximately 85 percent of the heat produced in the body is the result of muscle contraction. This makes the muscles essential for maintaining normal body temperature.

– Low Back Pain, Rotator Cuff Injury, Neck Pain, Knee Pain , etc…

Post Traumatic Brain Injury Conditions (e.g , Concussions ; Whiplash)

Vertigo

Urinary Incontinence

Dysmenorrhea

Insomnia

Restless Leg Syndrome

Constipation

Acid Reflux (Heartburn)

TMJ

Anxiety

The elegance of Osteopathic Manual Therapy is that it enhances your body’s natural ability to be programmed to function in a healthy, normal way.

Lupus erythematosus

Myasthenia gravis. Rotator cuff tear, Tendonitis, Carpal tunnel syndrome Osteomalecia

Ball and socket joint (Articulatio sphaeroidea)

Ellipsoid joint (Articulatio ellipsoidea)

Ball and socket joint

Articulatio sphaeroidea

Synonyms: Spheroidal joint, Cotyloid joint, show more...

According to movements they allow, the synovial joints are further subdivided into:

Ball and socket joints (e.g. hip joint)

Condylar joints (e.g. knee joint)

Hinge joints (e.g. elbow joint)

Pivot joints (e.g. proximal and distal radioulnar joints)

Ellipsoid joints (e.g. 2nd – 5th metacarpophalangeal joints)

Plane joints (e.g. joints between the carpal bones)

Ligaments

Ligaments are fibrous bands made of dense regular connective tissue which are similar in structure to tendons. Unlike the tendons that connect muscles to bone, the ligaments connect bone to bone. Besides the musculoskeletal system, the ligaments are also found in many other parts of the body, where they usually stabilize and hold internal organs in place and transmit neurovascular structures.

Iliofemoral ligament (Ligamentum iliofemoral); Image: Liene Znotina

Anterior cruciate ligament (Ligamentum cruciate anterius); Image: Liene Znotina

Iliofemoral ligament

Ligamentum iliofemoral

Crest – ridge of bone (e.g. iliac crest)

Facet – smooth, flat area, usually covered with cartilage (e.g. articular facet on vertebrae)

Foramen – passage through a bone (e.g. foramen magnum on the occipital bone)

Cartilage

Hyaline cartilage (Cartilago hyalina)

Articular cartilage of knee joint (Cartilago articularis genus)

Hyaline cartilage Cartilago hyalina

Cartilage is a flexible connective tissue found in multiple organ systems of the body. Cartilage is composed of specialized cells called chondrocytes, collagen fibers and abundant ground substance rich in proteoglycan and elastin fibers.

Cartilage is classified into the following types based on its composition:

Definition -A human body system that provides the body with movement, stability, shape, and support.

Components Muscular system: skeletal muscles and tendons

Skeletal system: bones, joints; associated tissues (cartilage, ligaments, joint capsule, bursae)

Function Muscles: Movement production, joint stabilization, maintaining posture, body heat production.

Bones: Mechanical basis for movements, providing framework for the body, vital organs protection, blood cells production, storage of minerals

Overview of the anatomy, function and main structures of the muscular system.

The muscular system is an organ system composed of specialized contractile tissue called the muscle tissue. There are three types of muscle tissue, based on which all the muscles are classified into three groups:

Cardiac muscle, which forms the muscular layer of the heart (myocardium)

Smooth muscle, which comprises the walls of blood vessels and hollow organs

Skeletal muscle, which attaches to the bones and provides voluntary movement.

Based on their histological appearance, these types are classified into striated and non-striated muscles; with the skeletal and cardiac muscles being grouped as striated, while the smooth muscle is non-striated. The skeletal muscles are the only ones that we can control by the power of our will, as they are innervated by the somatic part of the nervous system. In contrast to this, the cardiac and smooth muscles are innervated by the autonomic nervous system, thus being controlled involuntarily by the autonomic centers in our brain.

Skeletal muscles

The skeletal muscles are the main functional units of the muscular system. There are more than 600 muscles in the human body. They vary greatly in shape in size, with the smallest one being the stapedius muscle in the inner ear, and the largest one being the quadriceps femoris muscle in the thigh.

The skeletal muscles of the human body are organized into four groups for every region of the body:

Each muscle fiber is enclosed with a loose connective tissue sheath called endomysium. Multiple muscle fibers are grouped into muscle fascicles or muscle bundles, which are encompassed by their own connective tissue sheath called the perimysium.

Ultimately, a group of muscle fascicles comprises a whole muscle belly which is externally enclosed by another connective tissue layer called the epimysium. This layer is continuous with, yet another layer of connective tissue called the deep fascia of skeletal muscle, that separates the muscles from other tissues and organs.

Chapter 3.1: References

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Tensegrity Definition & Meaning - Merriam-Webster

https://www.merriam-webster.com/dictionary/tensegrity

tensegrity: [noun] the property of a skeletal structure having continuous tension members (such as wires

Musculoskeletal system

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Practically obtained images (Reference Dr Patricia C.Onuoha-PhD)

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