

Student Name	Alex Hickey
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The document is focused on outlining the characteristics of degenerate joint disease and how it could be managed or prevented. Using the principles of osteopathic manipulative treatment, alongside other techniques, this document is aimed at educating owners in ways they can understand, prevent and manage the disease.

With experience being the operator of horse riding stables as well as trekking yard, the subject is of critical importance; the main challenge within the environment of a trekking yard is the horses will be ridden by many different riders on them, with varying abilities and often suffering from their own muscular skeletal issues. This can put an enormous strain on the horses over a prolonged period and we have discovered first hand, especially with the heavier breeds, osteoarthritis is a big problem. In the role of an equine osteopath, there is a need to better understand how to treat a horse and provide advice to the owners with regard to managing the horses to avoid these issues.

Degenerate Joint Disease

Degenerate Joint Disease (DJD), also known as osteoarthritis, is a disease of the bone joints that can cause severe pain and swelling. The cartilage around the ends of the joints, which cushions the joints and helps them move smoothly and easily, wears away, leaving the bones to rub against each other. This can make them inflamed and painful and can make the horse less mobile. The synovium, a membrane which produces a thick fluid that helps keep the cartilage healthy, can become inflamed and thickened as wear and tear on the cartilage occurs. This may lead to inflammation, which produces extra fluid within the joint, resulting in swelling and possibly the development of DJD. The disease can be present in horses of all ages and sizes and generally attacks the joints most used in their lifestyles.



Symptoms of DJD may include lameness, joint swelling, decreased joint movement, stiffness, muscle wastage, weight loss, new bone formation and uncharacteristic changes which become noticeable when handling the limbs - for example, the farrier struggling to lift a leg. If DJD is suspected, a vet should be called to diagnose the horse as the sooner it's spotted, diagnosed and managed the better.

Alex Hickey

OMT Document



A potential cause of DJD is the horse being overweight - people today often overfeed their horses (in the ironic idea that their horses will respect them more) leading to overweight horses putting excessive strain on their joints. Poor conformation or foot imbalance could also cause DJD. This should be closely monitored with the farrier and where necessary corrective shoeing should take place. Poor nutrition also plays a huge role. Lack of turnout, an inconsistent workload and a repetitive work regime can also play a part in causing DJD.

The best way to try to prevent DJD is to give a young horse the right start in life by feeding correctly for their growth rate. Horses of all ages should be allowed plenty of turnout, to encourage gentle exercise, and riders should ensure that they warm up and cool down their horses correctly. Since jumping puts more strain on the horse than flatwork, riders should avoid jumping their horses too often. Where possible, riders should opt for flatter fields with as little mud as possible.

According to the National Equine Health Survey (2016), treatments for DJD “range from intra-articular injections (especially if only one joint is affected) through to daily medication with a non-steroidal anti-inflammatory drug for more generalized DJD. Monitoring a horse with DJD is essential. Factors such as weather, activity levels and other health conditions can all affect symptoms. Remember that even with treatment and management, symptoms of DJD will inevitably worsen over time. Once treatments can no longer control joint pain, euthanasia will sadly be the most humane outcome to ensure DJD does not cause the horse to suffer unnecessarily.”

There are several natural methods of treating horses with DJD. Different osteopathy manual treatment techniques can be used to promote circulation to the affected joints, to make the horse feel more comfortable and to reduce inflammation. We must also work with the farrier to ensure that any necessary corrective shoeing is performed to aid with any foot imbalance. There are hundreds of supplements, both natural and unnatural, available on the market to aid with DJD.



The most important part of a horse's life is its start. The average age to wean a foal is about 6 months old but this can depend on the mare and situation. After weaning, a foal must be self-sufficient without the mother's milk. Concentrated feeds can be introduced to foals at least two months before weaning. With concentrated feed we must be extremely careful - if the foal is growing too rapidly then feed must be reduced. Several orthopedic conditions are related to rapid growth rate and a lack of the necessary minerals in the diet. The feet should be observed daily and trimmed by a farrier when necessary to give the best start to the foal. Horses should be left as long as possible before shoeing but regularly trimming the feet is essential.

Let us now look at prevention in relation to training programs across various disciplines. We first need to consider the age of the horse and its growth plates and the maturity of the horse, mentally as well as physically. The growth plates of a 3- to 5-year-old are not fully formed and so we can only suggest gentle exercise. One of the biggest mistakes people can make is pushing the young horse too fast, before their bones are mature, as this could ultimately lead to DJD later on in life. The first stage in a horse's training lays the foundation to healthy bones and joints later in life. A joint supplement can also be recommended for growth and

work. Looking at dressage and showjumping specifically, the breeding nowadays mainly consists of warmbloods. Warmbloods mature much slower than thoroughbreds so this needs to be taken into consideration, and too much intense or repetitive work could certainly lead to joint problems. Once a potential showjumper is mature enough



to jump, it should not be jumped more than once a week - a showjumper's coffin joints have to tolerate substantial forces being put upon them when jumping, which can lead to DJD. The training of the dressage horse is often rushed nowadays, with horses sometimes being pushed to Grand Prix level when the growth plates have only just fused. As a result, the 9 year old Grand Prix horse would not have much to offer when he reaches 12, with all that fancy movement in the spine at such a young age. A dressage horse's fetlock joints are also put under enormous strain, especially during collected work.

When we look at horses between 5 and 15 years old, we must remember that all a horse's bones are not fully formed at the younger end with some breeds. Here it is all about consistency in work and, no matter the discipline, variety of work is extremely important. Horses must also be fed appropriately according to their work load, their condition and the time of year. Keeping a horse at a healthy weight and not obese may help in the prevention of DJD (and also in the prevention of laminitis).

In the case of older horses, it is especially important to look out for signs of stiffness. No matter what discipline the horse has done in its lifetime it will be sure to develop some sort of arthritis in the future, given the way the horse has been domesticated. However, this can be easily managed with adequate turnout, appropriate feeding and the use of certain supplements.

At the other end of the spectrum we have the 2 year old racehorse. Given the amount of strain put on their body, whilst they are still growing, it is no wonder that they are susceptible to ailments such as DJD. Nowadays, racing dominates the equestrian world and brings a huge economy to the UK, providing many jobs and creating racing legends. However, are we asking too much of these horses? Has enough research been done to prove whether it is fair, from the perspective of animal welfare, to gallop an animal, weighing approximately 400kg, with an underdeveloped skeleton for almost a mile carrying up to 65kg on his/her back? It is a very grey area when converting horse age to human age but some people say that horses are approximately 3 times older than humans of the same age. If this were the case, then the above scenario would be equivalent to my six year old son running a mile carrying 3 and a half bags of sugar, at least once a week. Would this have an impact on his joints? I personally believe it would.



Nutrition also has a huge role in managing orthopedic conditions in horses. An imbalanced calcium:phosphorus ratio can have a major impact on the body, considering the fact that calcium is needed for bone growth and strengthening joints. Skeletal bones are made up of, on average, around 35% calcium; hence the roll of calcium is extremely important for skeleton growth and maintenance. Calcium also plays a very important role in muscle contraction, blood clotting and enzyme regulation, whilst phosphorus is also important for the growth of a horse's skeleton. Phosphorus makes up 14 to 17 percent of the mineral component of a horse's skeleton, and is vital in energy transfer. (BHS stage 4 workbook)

Feeding is not an exact science and we must take into account the workload, temperament, age, keeping arrangements and time of year. It is not always possible to know the levels of nutrients our horses are getting from the grass /forage we are giving them. How many equestrian premises do we know that take soil samples and give their customers an accurate analysis of the nutrients in grass / forage they are supplying? How many establishments take

water samples and can provide an analysis of the water content? I can only personally presume, not very many. Water is sometimes overlooked when talking about nutrients - although not classed as a nutrient it plays a very important part in the whole digestive process.

Benefits of soil testing

Grass quality has a major impact on horses' health and soil quality has an effect on this. Testing paddock soil can tell us what nutrients are missing and, therefore, what may need to be added.

Good quality soil will give a reliable supply of energy, protein and other nutrients to the grass and can often lengthen the season. Healthy grass has a major impact on the horse's health as they get many of the nutrients they need via natural grazing.

Carrying out a soil test tells us exactly what the soil needs, to encourage quality grazing. Knowing this means we can apply the correct amount of fertilizer, reducing the risk of over fertilizing and saving time and money.

Not only are there health benefits to the horse from a balanced soil it also gives a healthier grass sward, which will out compete many weeds including ragwort, docks, thistles and nettles. Not only will we save money but also labor.

1. Save money
2. Better performance from the horse
3. Horses will have the correct nutrients they need
4. Reduced labor time
5. Healthier paddocks
6. Lengthened turn out season

Benefits of water testing

Not only is it a benefit to test the soil, but water which contains many minerals including: Magnesium, Calcium, Potassium, Sodium, Bicarbonate, Iron, and Zinc. Knowing how much goodness the horses are getting from the water will allow us to have an overall exact science to our horse's diets.

It will also allow us to know if the water is contaminated by such things as to much lead which could lead to lead poisoning or other contaminations that could have an impact on the horse's performance.

As well as protecting the horses, water testing can also be beneficial for increasing the lifespan and integrity of pipes and fixtures. For example, pH, which tests the acid or alkaline levels in water, is helpful in this area. Acidic water can contribute to corrosion of pipes, while an alkaline result suggests a high chance of deposits of crusty minerals lining pipes, reducing their efficiency.

1. Giving an overall exact science to the horse's diet
2. Knowing if there is any potential harm to the horse
3. Saving costs on pipes and fixtures
4. Better performance from the horse

In the wild the horse can naturally get all he needed by roaming the land in search of his lacking nutrients, whereas we confine our horses to paddocks and stables and so we are in full control of their diets. As a horse cannot tell us verbally, all we can do is look out for signs and keep an eye on the horse's condition.



There are several natural feed supplements on the market that assist bone and joint conditions. Let's start with probably the most commonly mentioned - turmeric. Horse and Hound (2019) note that **"turmeric is suitable for horses suffering from stiff joints. The main active ingredient in Turmeric is curcumin, a compound found to have powerful anti-inflammatory effects in humans"**. Turmeric has been

studied in humans, showing results and proved to be safe. However, there is no safety data for horses, and whilst I believe that turmeric can work, we must consider how much is needed for the average 500kg horse.

In addition, could CBD oil, a product derived chemically from the cannabis plant, help our horse with DJD symptoms? It aids with similar problems in humans and so, perhaps, more research could be done on the effect of CBD on DJD in horses. Advantages of using CBD Oil include promoting a sense of greater physical, mental, and emotional relaxation for horses and aiding with pain or inflammation.





Natural seaweed is full of natural salts, calcium, magnesium, and is a more natural supplement for horses (although not enough research has been put into it). There are many different seaweed products available on the market, but to what extent have some of these been processed? Using natural seaweed could be beneficial for horses with DJD, especially as it is affordable and is easy to source if you live by the sea. There is a danger of iodine toxicities when a horse is fed too much seaweed but, if fed with care, seaweed can provide unique benefits to a horse's health.

(Horse-Advice.com)

The Frankincense Tree, also known as Boswellia, is a natural anti-inflammatory. It has been shown to prevent the breakdown of cartilage tissue and reduce levels of painful inflammation, making it good for conditions which affect bones, joints and tendons, such as DJD. The main body of research is, again, mainly based on humans rather than horses.



The use of cod liver oil is increasing in the equine industry. Humans have used this supplement for years to help improve the health of their joints. My personal opinion of the use of this supplement for horses is that I have never heard of a horse wishing to eat a fish so is it really natural for the horse?

Finally, “recent results of a double-blind clinical trial indicated that ginger was as effective as non steroidal anti-inflammatory drugs (NSAIDs). Additionally, Ginger is hepato protective (liver protecting) making it a nice solution for long term pain control.” (Gloria Garland L.Ac., Dipl. Ac. & CH., www.wholehorse.com) Ginger, therefore, may be a good, natural aid to assist with inflammation and pain.



Overall, I do not feel that enough research has been done into equine nutrition. Nowadays, we see a lot of nutritionists who work for feed brands and therefore may be more interested in selling their products rather than helping the horse. There are independent nutritionists but

incomplete information passed from owner to nutritionist (about the horse's condition) could result in causing more harm than good to the horse. It would be most beneficial for all if nutritionists came out to see the horse and meet the owner, in order to give the best possible advice.

Can osteopathic manipulative treatment assist with managing osteoarthritis?

Unfortunately, there is no actual cure for osteoarthritis, however Osteopaths will release muscle tension around the affected joint, improve the range of movement and encourage better joint health by promoting blood and lymph flow to and from the area. This will reduce pain and inflammation whilst also increasing flexibility.

In addition, an osteopath will work to optimize the function of related areas of the body, to ensure that movement and loading is distributed as evenly as possible.

Osteopaths can use a variety of techniques to achieve this, depending on the individual's situation. These include gentle articulation, massage, stretch and joint mobilization. An Osteopath could also help with your training program for your horse to help enable better movement strengthening the affected area.

Benefits

The approach is a holistic approach to healthcare, and it focuses on the interrelationship between the body's structure and function. Some of the key benefits of osteopathy include the following:

The osteopath is considered a whole-body approach that understands the interconnectedness of the musculoskeletal, nervous, circulatory, and other systems. The treatment can assess the overall structural integrity and allows for addressing any imbalances or dysfunctions that would help promote overall health and well-being. It also could help improve the patient's mental health (Roberts et al.; Do Vale et al.). This is based on the fact that the patients would feel better with a reduction in pain which improves their mental health and reduces stress which would influence their quality of life (Bohlen et al.). For successful person-centered care, multidisciplinary collaboration is required, which Osteopathy is able to provide. A study was undertaken to analyze how the treatment would have an impact, and based on a 2-week treatment, it was found that the patients reported a significant reduction in pain, mental health dysfunction, anxiety, and improvements related to self-care (Edwards and Toutt).

Osteopathy effectively manages various types of pain, including musculoskeletal, back, and joint pain. Osteopaths would make use of their hands to allow for soft tissue manipulation, joint mobilization, as well as spinal adjustments that would help to reduce the pain, reduce inflammation and hence improve overall joint mobility (Al-Shareef et al.; Ceballos-Laita et al.). Osteopaths also help evaluate the posture and body mechanics,

which would help identify any misalignments or imbalances of the body which is adding to the pain or dysfunction. Through manual techniques, they could help restore the proper alignment, which would relieve the strain on the joints and muscles, improving the overall posture. This could have a significant positive impact on different health aspects, including digestion, circulation, and breathing (Müller and Pietsch; Stroganova et al.). The treatment also helps restore optimal range of motion and overall joint mobility. By targeting the restriction in the musculoskeletal system, osteopaths would be able to reduce stiffness and increase flexibility and overall mobility, which is found to be beneficial for athletes, especially those recovering from injuries. This treatment is also not age restricted and is suitable for all, and could address a range of chronic pain conditions or other problems. The Osteopaths would need to adapt their technique to suit each patient's needs and preferences, ensuring safe and effective treatment.

Osteopathy is also effective when it comes to preventing future injuries. By addressing the biomechanical imbalance, strengthening the weak areas, and providing guidance for proper body mechanics, individuals would be able to reduce the risk the injuries caused due to repetitive strain, sports-related injuries, and other musculoskeletal issues. The techniques of gentle manipulation, soft tissue stretching, and rhythmic movement can create a state of relaxation that would help reduce stress and relieve the tension in the muscles, promoting a sense of overall well-being. Another benefit of this treatment is that it can complement other treatments. Over time, osteopathy is often used with other medical treatments and therapies to amplify their effectiveness. It is often found that Osteopaths would collaborate with other healthcare professionals and provide integrative and comprehensive care. The treatment plans are developed based on their consideration of medication, lifestyle modification, and surgery. Overall, we can say osteopathy helps provide complete personal care that would benefit the patients and help prevent injuries or reduce the pain in case of injuries while also tackling the mental aspects of the pain.



How it affects movement

Osteoarthritis is an occurrence due to the wear and tear of the joints in the body. Patients suffering from osteoarthritis often report joint stiffness. This joint stiffness could lead to a reduced range of motion which is attributed to the breakdown of the cartilage and the formation of bone spurs. The osteopathy technique, like joint mobilization and gentle stretching, would help tackle this issue. Through the manipulation that is gently done on the joint, the osteopaths could help break up any adhesions. In addition, it is said that the manipulation around the joint, which focuses on the soft tissues, can release tension in the muscles and the surrounding tissues that might be a factor in causing the restricted movement. The technique would also be useful in breaking up scar tissue and also release any joint capsule restriction, which helps with improved joint mobility (Aubourg et al.; Jardine et al.).

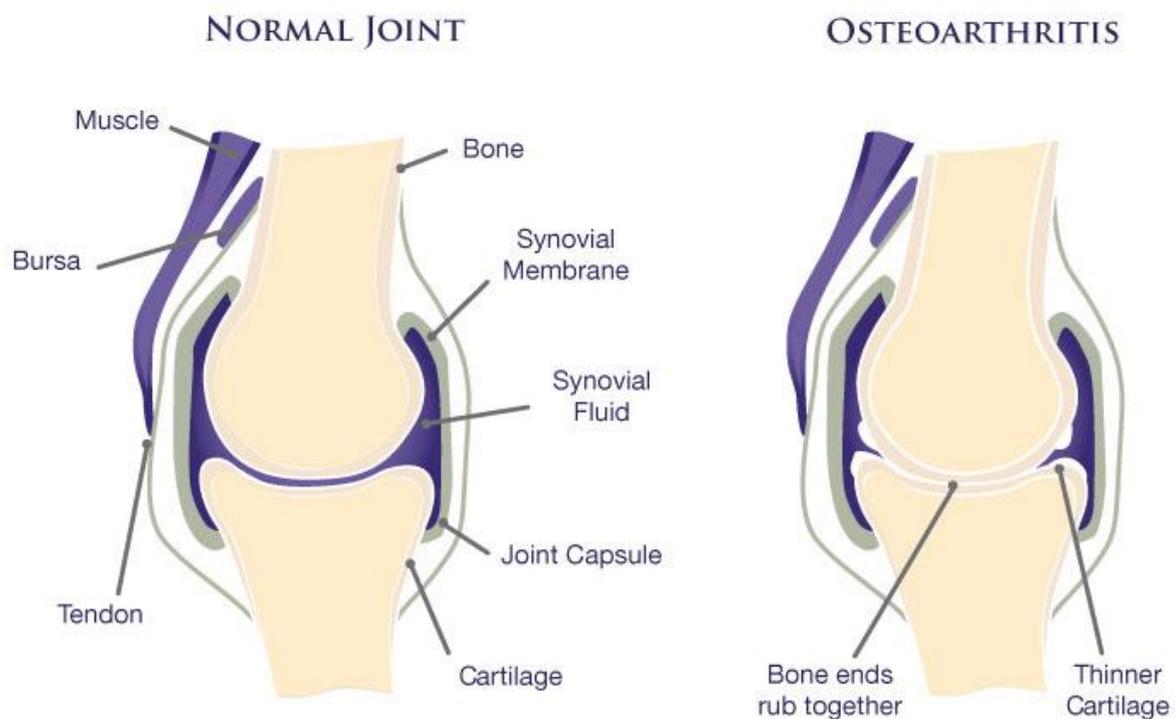


Figure 1 Osteoarthritis (Village Health)

The osteopathic treatment is also capable of enhancing the circulation of the synovial fluid. Synovial fluid is the lubricant between the joints and also helps nourish the joint cartilage, which reduces friction to help and ensure joint health. By improving the circulation of synovial fluid, osteopathy could help slow the degeneration process of osteoarthritis and also help alleviate the symptoms. This would also mean that the pain that is seen in osteoarthritis, which is due to the affected joint movement, could be reduced. Since the osteopath would focus on releasing tension and improving joint alignment, the pressure on the sensitive areas would significantly reduce, encouraging the individual suffering from the disease to move more freely and often feels less discomfort. Considering that the pain or tension could be a result of the imbalance across the joint, which is caused by the tight and overactive muscle and could lead to weak support to the joint, further worsening the pain.. the treatment would allow for regaining the balance and ensuring better stability. Osteopaths are also known to provide specific exercises for individuals with the aim of improving functional movement across the affected joint. The said exercises are to improve joint stability and increase the joints' weight-bearing capability, which would help with overall movement efficiency. The treatment also prevents joint contractures in people suffering from osteoarthritis.

This occurs when there is a permanent shifting of the joint as a result of prolonged immobilization. Osteopathy is able to ensure joint mobility and prevent or reduce contractures development which helps preserve joint function.

Most published research focuses on hip and knee osteoarthritis in humans as these are the most affected joints and are often the most debilitating. There is still, little research done in the equine world thus far.

A study carried out by Physical Medicine and Rehabilitation outpatient clinics of İstanbul Medeniyet University, Göztepe Training and Research Hospital in 2015 took 100 patients suffering from knee osteoarthritis to research whether Osteopathic manipulative treatment (OMT) improved the pain and movement of the joint.

The 100 patients had an age range of 40 to 70 years, all with stage 2-3 bilateral knee OA, the patients had knee pain lasting more than 6 months. The 100 patients were split into two groups, one group would combine OMT with exercise were as the other group would just exercise alone. During the study which took place between January 2015 to June 2015, 15 patients left on their own accord, 85 completed.

To meet the criteria of the study, the patients were prevented from taking anti-inflammatory drugs one week before beginning of the study and during the study period. They were allowed to take paracetamol up to 3 g daily for pain control. The drugs they used due to systemic diseases were continued.

A Physical examination of all the patients were evaluated in terms of pain, heat increase, effusion, crepitation, patellar grind test, valgus stress, varus stress, McMurray, anterior and posterior drawer test and Apley compression and distraction tests. Knee circumference and range of motion of all patients were actively measured using a standard goniometer.

Clinical parameters were evaluated with the Western Ontario MacMaster Questionnaire (WOMAC), pain score (0-25), WOMAC stiffness of the joints score (0-10), WOMAC physical functioning of the joints score (0-85), Visual Analog Scale (VAS) and 50-m walking time.

An exercise program was made up for the patient's group 1 and group 2, to do twice per day, 10 reps 3 sets. The exercises included quadriceps isometric strengthening straight leg lifting, iliotibial band, hamstring stretching, strengthening abductor and adductor muscle of the hip and stretching exercises. Group 1 Patients would also receive OMT as 3 min mobilization and 3 min compression for bilateral patellofemoral and tibiofemoral joint respectively with one-minute intervals in addition to the exercise program.

Physical examination findings (warmth, effusion, crepitation, patellar grind test, valgus stress, varus stress, McMurrey, anterior drawer, posterior drawer, Apley compression, Apley distraction, knee circumference measurement and range of motion). While there were no significant differences between the groups before the treatment, findings after the treatment showed statistically significant differences, clinical parameters at the follow-up after the treatment showed statistically significant differences.

Clinical evaluation parameters (VAS, WOMAC, and 50-m walking time). While there were no significant differences between the groups before the treatment, clinical parameters at the follow-up after the treatment showed statistically significant differences.

After the data was collected the findings suggest that group 1 patients had improved significantly compared with group 2 patients. This study revealed that OMT and exercise treatment together improves function and reliefs pain more than exercise treatment alone.

The Study

The study uses a randomized controlled trial that is considered a robust approach, especially for comparing the different interventions. This design would help in controlling the confounding factor and would allow for the assessment of the cause-and-effect relationship that is achieved from the study. While the study was able to achieve its goals, there is a chance of bias that might enter based on them being aware of the treatment group. A single-blind design could help to minimize any bias and improve the accuracy and reliability of the results. In addition, the sample size is 100 patients, which is a decent sample size, but the gender distribution was a bit skewed, and a more balanced study could help reduce gender-based differences. While the metrics used for outcome measures are clinically relevant and based on WOMAC scores, incorporating the impact of the treatment on the joint function and muscles through imaging assessment could have helped better understand the impact. The follow-up was also just four weeks which, if prolonged or delayed, could have helped understand the durability of the treatments.

The study and its application would require significant consideration, which is based on the difference in anatomy, physiology, and response or behavior. While the findings show the capability of OMT + Exercise in improving the situation of patients suffering from osteopathy, the same type of treatments could be used on horses. Still, more trials, basic training, muscle relaxation, and joint correction-based approaches might need to be explored first. The horse's behavior could significantly change the treatment plan, and thus it needs to be considered. The study helps us understand the possibilities and provides us with proven methods that can be adopted and developed into a treatment plan for horses.

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