Essential Oils for the Pain Management of Osteoarthritis

Introduction (needs one)

Definition
The most common form of arthritis, osteoarthritis comprises more than 100 diseases. Sometimes called degenerative arthritis or degenerative joint disease, osteoarthritis occurs when the cartilage (smooth connective tissue that lines the joints between the bones) breaks down. This breakdown leads to pain, stiffness and swelling. Osteoarthritis (OA) affects 20 million Americans, occurring most often in women and adults older than 45 (Cedars-Sinai, date).

Symptoms
The symptoms of arthritis can occur in any joint most typically in the knees, hips, spine and fingers.

Symptoms vary such as:
- Pain in a joint
- Discomfort in a joint when the weather changes (cold and humidity in my experience)
- Pain and stiffness in a joint during and after use
- Bony nodes
- Back and neck pain and stiffness from slow deterioration of discs between the bones of spine

Causes and risk factors
There are different thoughts as to the reasons for having OA. Among them are mechanical stress, which causes the cartilage cells or lining of the joint to release an imbalance of enzymes. When balanced, these enzymes allow for the natural breakdown and repair of cartilage, but too much of the enzymes can cause the joint cartilage to break down faster than it's rebuilt. Over time the smooth cartilage protecting the ends of the bones at the joint wears down and gets rough. Eventually, if it wears down completely, the bone rubs against bone, damaging the ends of the bones and making joints painful (Cedars-Sinai, date). Typically, women over 45, those with heredity conditions, joint injuries caused by work or sports, obesity and those with diseases that change the structure and function of cartilage are most at risk for OA.

Diagnosis
In my experience OA was ultimately determined by x-rays. According to Cedars-Sinai, blood tests may be done, joint fluid might be extracted, bone scans, computerized tomography scans, MRI's, and arthrography may be used in determining osteoarthritis.
Treatments
Currently, there is no cure for osteoarthritis. Exercise, a diet rich in vegetables, rest, and heat are typical things offered to counter and control pain. My doctors did not suggest any of these things, however one doctor suggested I stay on nonsteroidal anti-inflammatory drugs (NSAIDS) indefinitely.

My Personal Journey
I've been living with osteoarthritis in my hands for the past five years. It is not clear whether or not I am genetically pre-disposed to OA. My mother also has OA in her hands. Her onset was approximately ten years later than mine. According to my first surgeon the onset of OA was brought on rapidly by the work I had been doing for ten consecutive years. I had been an esthetician at a spa until I began to chronically experience pain in my right hand. The constant and repetitive motions made by massage and waxing finally took its toll. At the time, I was working double shifts. I worked through the pain believing that it was due to sore muscles from overuse. I thought that after a two-week vacation I would be back to normal. It was not the case. To my disappointment and surprise the pain persevered. I began to receive massage from fellow practitioners. I received deep muscle massage as I believed the pain was stemming from my neck, energy work and acupuncture. They would all bring temporary relief; especially acupuncture, but the pain returned as soon as I began working again.

Realizing I could not continue this way, I went to see a Workman's Compensation doctor. This was the beginning of an arduous journey. I was told this was likely muscle related and taken off of work immediately. I opted for ongoing physical therapy where massage and ice were the routine treatment. After leaving physical therapy I felt worse. The Workman’s Compensation doctor performed an x-ray, however he was unable to see any damage to the bone. I was instructed to continue with physical therapy. The doctor wanted to put me on NSAIDS, steroids, and offered cortisone injections. I refused all of these treatments believing the adverse side effects were not worth the risk. I became despondent and anxious so I went to a specialist who was a noted surgeon in the county where I lived. His x-rays indicated osteoarthritis. As I was too young for surgery and Glucosamine did not work, he advised me to take NSAIDS for the rest of my life. Unable to work any longer this reality literally sent me packing. I moved back east to be near my family for support. Workman’s comp told me they would continue to treat me. I had become desperate and sought out a surgeon who agreed to perform the surgery on my right hand. He performed the latest surgery placing a small metal ball between the “worn down” joints to allow for pain free rotation. The surgery went well. and I continued with physical therapy for about four months, however I was still in pain. Throughout this process not one doctor, physician’s assistant or physical therapist had any notion of Aromatherapy as part of a pain management plan.

While visiting the Bay Area I saw a specialist in San Francisco who was approved by Workman’s Compensation benefits. This doctor (surgeon) informed me that it was likely I was allergic to the metal implant. She had seen this before and so no longer performed this particular new surgery. I opted to have a second more "traditional" surgery in San Francisco. The ball was removed and scar tissue was used to cushion the two joints. The healing process was much longer this time both physically and emotionally. Once I was considered “healed” I was granted tuition re-training money by the Workman’s Compensation company. I had always been drawn
to the study of Aromatherapy and herbs, so with the time and the money available to me I started my studies. I believe in my heart I was put on this journey to help others with their musculoskeletal pain and the emotional disparity that can go with it. It is my desire to be of service to others.

Case Studies

Case study #1
I have researched several case studies and findings in medical settings and schools. In a study at the The Institute of Pharmacology (University of Tubingen in Germany), Amy Anderson (date) found that Myrrh (Commiphora molmol) essential oil had anti-inflammatory and analgesic effects when used on localized, acute and chronic inflammation. The study was on rheumatoid arthritis, however I have found that there is a “crossover” in helpful essential oils for either rheumatoid or osteoarthritis. The study found that swelling in the hands and feet were reduced. “It is thought to work by reducing the levels of leukotaxine (a chemical produced by injured tissue that causes inflammation) as well as helping to reduce the permeability of blood capillaries, which can also add to inflammation and pain in joints and surrounding tissue.”

Case study #2
The second study took place at the Indira Gandhi Medical College at Nagpur in India. The study was conducted on 50 patients all with osteoarthritis in the knee using Frankincense (Boswellia serrata) essential oil. “The study noted that those applying the extract (I am confused as you indicate the essential oil was studies, but the direct quote says an extract was used. Please confirm which was used.) on the skin reported up to 70% better mobility in their knee joints and a 50% to 60% decrease in knee-joint swelling.” In addition it is reported the there was a decrease in the frequency of swelling. Dr. Robert Jacobs, a general practitioner from Devon, England believes that the combination of Boswellia serrata and Commiphora molmol to be “the most effective of all plant extract formulations for anti-inflammatory purposes that he has encountered during his professional career.” He also says that he believes it is better than Naproxen a conventional prescription anti-inflammatory. Boswellia serrata chemical composition is composed of monoterpenoids of which α-pinene (over 70%) is the major constituent. Monoterpenes (in particular α-pinene) are analgesic, anti-inflammatory, relaxant and spasmylytic. There are other chemical components which support the therapeutic benefits of α-pinene such as b-pinene, myrcene and limonene. Qualities such as sedative, analgesic, spasmylytic and motor relaxant are descriptive of the other components in Boswellia serrata. Commiphora molmol is also a resin (oleoresin). The part of the plant used is from the stem and branches. Its major chemical constituents are Sesquiterpenes. They are known for their antiinflammatory activity, antispasmodic, antimicrobials and calming and soothing to the nervous system. An example of a sesquiterpene is β-elemene. This specifically is anti-carcinogenic and antitumor. Shirley Price, Aromatherapist and author also supports the use of Frankincense (Boswellia serrata) and Myrrh (Commiphor molmol). These two essential oils have a history of relieving the inflammation associated with rheumatoid and osteopathic forms of arthritis.

Myrrh (Commiphora molmol) essential oil

Botanical family: Burseraceae

Country of origin: Somalia, Oman
Part of plant used: Resin
Chemical feature: Rich in sesquiuterpenes
Chemical components: The majority are curzarerne (40.1%) and furanoeudsmadiene (15%)
Therapeutic actions: Anti-inflammatory, antimicrobial, antiseptic, balsamic, vulnerary, analgesic and local anesthetic effects
Psych and emotion: Anxiety, depression, emotional trauma, soothes the mind-body spirit (Shutes, date)

Frankincense (Boswellia serrata) essential oil
Botanical Family: Burseraceae
Country of origin: India
Part of plant used: Resin
Chemical feature: Monoterpenes
Chemical components: α-thujene (12-29.7%) myrcenes (0.8-38%), and terpinolene (1.7%)
Therapeutic Actions: Analgesic
Psyche and emotion: Sedative

Case Study 3
The In Essence Journal (Vol. 7, No. 1, Summer 2008) includes a case study by Cathy Boyle on rheumatoid and osteoarthritis and the use of aromatherapy to relieve pain. Based on her findings she was able to prove there was a pain relief benefit to using essential oils in treating both kinds of arthritis. Ms. Boyle interviewed her client who suffered from both kinds of arthritis. Her pain was chronic and at the “level of a toothache.” She ate a balanced diet and performed moderate exercise. Ms. Boyle’s aim was to “alleviate shoulder pain and swelling in the right hand (osteoarthritis) and promote relaxation and well being.” The treatment was given via gentle massage with an essential oil blend. The massage blend was to address joint pain, stiffness and swelling. She utilized a holistic approach based on chemistry and emotional well-being. Initially, she chose Juniper berry (Juniperus communis), Sweet Marjoram (Origanum marjorana), Vetiver (Vetiveria zizanoides), and Geranium (Pelargonium graveolens). The oils were chosen for their analgesic and sedative therapeutic properties.

After the first treatment of gentle massage it was determined that the client’s low mood showed no improvement. Ms. Boyle reformulated her blend. Juniper was replaced with Clove bud (Eugenia caryophyllata) and Geranium was replaced with Lavender (Lavandula angustifolia). After the second treatment the client’s mood began to show improvement. For several weeks the client spent her holiday in a warm and sunny climate where she continued to use her essential oil blend. Upon her return there was a marked improvement. It was taken into account that the warm climate possibly contributed to her reduced pain and improved emotional state. Her relief allowed her to become more active and the pain and swelling in the right hand diminished. The client underwent a series of five gentle massage treatments with the essential oil blend made for her pain relief.

The blend consisted of the following essential oils:
Clove bud (Eugenia caryophyllata)
**Botanical family:** Myrtaceae  
**Country of origin:** Sri Lanka, Madagascar  
**Plant parts used:** Grass leaves  
**Chemical feature:** Rich in the phenylpropanoid, (component: eugenol (84.94%), sesquiterpenes, esters  
**Therapeutic actions:** Analgesic, anesthetic, anti-inflammatory, anti-spasmodic, pain relieving, warming, anxiolytic

**Lavender** (*Lavandula angustifolia*)  
**Botanical family:** Lamiaceae  
**Country of origin:** France, Bulgaria, England, USA  
**Plant parts used:** Flowering tops  
**Chemical feature:** Esters (component: linalyl acetate 29.4-36.2%), monoterpenes (component: linalol 30.1-39.1%)  
**Therapeutic Actions:** Analgesic, antidepressant, anti-inflammatory, antirheumatic, antispasmodic, nervine, sedative

**Sweet Marjoram** (*Origanum majorana* L.)  
**Botanical family:** Lamiaceae syn. Labiatae  
**Country of origin:** France, Germany, Egypt  
**Plant parts used:** Flowering tops  
**Chemical feature:** Monoterpenes (component: terpin-4-ol 29.06%), monoterpenes (component: ψ-terpinene 15.18%)  
**Therapeutic actions:** Analgesic, antispasmodic, nervine, sedative, comforting, calming

**Vetiver** (*Vetiveria zizanioides*)  
**Botanical family:** Poaceae syn. Gramineae  
**Country of origin:** Haiti, Sri Lanka, India  
**Plant parts used:** Roots of grass  
**Chemical feature:** Alcohols (component: vetiverol 50-70%), esters (vetiverol acetate)  
**Therapeutic actions:** Anti-inflammatory, antirheumatic, antispasmodic, nervine, sedative  
(Shutes, date)

**Case study #4**  
At the College of Nursing in the Catholic University of Korea, Korea a study was done with 40 female patients age 65 and over who were enrolled in the Rheumatics Center, Kangnam St. Mary's Hospital, South Korea. The study was classified as, “Effects of Aromatherapy Massage on Pain, Physical Function, Sleep Disturbance and Depression in Elderly Women with Osteoarthritis.” There was an experimental group and a control group. A pre and post test were conducted. The experimental group (the essential oils were actually used) showed a significant decrease in pain after the Aromatherapy massage as well as an improvement in sleep disturbance. The control group did not show improvement (essential oils not used in massage.) The conclusion of the study was that, “Aromatherapy may be adopted as an effective nursing intervention for osteoarthritis.” The essential oils used were Lavender, Marjoram, Eucalyptus
(Eucalyptus globulus), Rosemary (Rosmarinus officinalis) and Peppermint (Mentha x piperita) in a 1.5% Jojoba (Latin) and Apricot (Latin) oil blend.

Lavender (Lavandula angustifolia)

Sweet Marjoram (Origanum marjoranum L)

Eucalyptus (Eucalyptus globulus) (I do not have this information but for the purpose of explanation I will use globulus)(I don’t understand this remark)

Botanical family: Myrtaceae
Country of origin: Australia, Spain
Plant parts used: Leaves and mature branches
Chemical constituents: Rich in the oxide (components: 1,8-cineole syn. eucalyptol 58.6-85%) and monoterpenes (20-25%)
Therapeutic actions: Analgesic (Silva et al, 2003), anti-inflammatory, antirheumatic, antispasmodic, cooling and stimulating

Rosemary (Rosmarinus officinalis)

Botanical family: Lamiaceae syn. Labiatae
Country of origin: Morocco, Spain
Plant Part used: Flowering tops
Chemical constituents: Rosemary and Biochemical Specificity Bowles (2003) states “Rosemary oil from Spain is known as CT1 and has higher levels of camphor, whereas Rosemary from Tunisia is known as CT2 and contains higher levels of 1,8 cineole (eucalyptol). Chemotype , CT3 from France, has higher levels of verbenone, which is thought to be a less toxic ketone than camphor.”
Therapeutic Actions: Mild analgesic, anti-rheumatic, stimulant

Peppermint (Mentha x piperita)

Botanical family: Lamiaceae syn. Labiatae
Country of origin: France, England, USA
Plant part used: Leaves
Chemical constituents: Alcohols (component menthol38-46.2%), ketones (component menthone 16-40%)
Therapeutic actions: Analgesic, anti-inflammatory, antispasmodic, pain relieving, warming/cooling (Kim et al, date?)

Case study #5
This last case study is an experimental study on the effectiveness of massage with Ginger (Zingiber officinale) and Orange (Citrus sinensis) essential oils for moderate to severe knee pain among the elderly in Hong Kong. This was a three-week study where massage was given twice per week to one-fourth of the 59 volunteer patients with moderate to severe knee pain. One-
fourth of the group received a massage blend of 1% Ginger and 0.5% Orange. The other one-fourth of the group received a placebo of Olive (Latin) oil. The control group did not receive any massage. “Assessment was done at baseline, post 1 week and post 4 weeks after treatment. Changes from the baseline to the end of treatment were assessed on knee pain intensity, stiffness level and physical functioning (by Western Ontario and McMaster Universities On index) and quality of life (by SF-36). The conclusion of the study showed improvement in the experimental group regarding pain after one week. Post weeks (?) the relief was not sustained. The final sum was that aroma-massage therapy has potential for short term relief.

**Ginger** (*Zingiber officinale*)

*Botanical family:* Zingiberaceae  
*Country of origin:* Sri Lanka, China, India, Nigeria  
*Plant part used:* Rhizome-Unpeeled rhizome will result in higher oil yield  
*Chemical constituents:* Sesquiterpenes (components zingeberene 20-50.9%), with support from monoterpenes and nonirritant aldehydes.  
*Therapeutic action:* Analgesic, antispasmodic, warming

**Sweet Orange** (*Citrus sinensis*)

*Botanical family:* Rutaceae  
*Country of origin:* Israel, USA, Spain, Italy  
*Plant part used:* Peel or zest of fruit  
*Chemical constituent:* Rich in Monoterpenes (component: limonene 94.87-95.37%)  
*Therapeutic action:* Anti-depressant, antispasmodic, nervine, uplifting (in this case it was chosen for its pleasant aroma) (Shutes, ).

**Conclusion**

In conclusion, by evidence of the above mentioned case studies aromatic massage can benefit those suffering from osteoarthritic pain, stiffness and disability. With proper blending of essential oils pain can be temporarily alleviated, mood and sleep improved, and a percentage of mobility restored. I hope that one day Aromatherapy in the United States will become more accepted as a part of a treatment plan for pain management. With proper diet, lifestyle and exercise NSAIDS may be avoided. It is important for people with OA to know that there are alternatives/compliments to conventional medicine.

**References**


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