# Complementary and Alternative Practices in Patients with Rheumatoid Arthritis and Osteoarthritis: An Integrated Approach

## Recorded September 17, 2020

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OccupationalTherapy.com Course #4893

- Today's course is complimentary and alternative practices and patients with rheumatoid arthritis and osteoarthritis and integrated approach. Our presenter today is Sindhu Narayan. She is an occupational therapist, a registered yoga teacher and a freelance writer. In her 16 years of clinical experience, she has worked in various settings and currently practices, home health and home health OT, and independent assisted and memory care facilities. She is passionate about exploring scientific evidence on complimentary and alternative approaches and integrating these with traditional occupational therapy. She is trained in EMG biofeedback and is currently pursuing the HRV certificate program by BCIA. She has previously developed CE courses for occupational therapists and assisted numerous authors in the editorial process for publication in medical journals. Welcome back Sindhu, we're so happy to have you.

- [Sindhu] Thank you, Fon. Good afternoon everyone, thank you for joining me today. Today's presentation is about the use of complimentary and alternative practices in the United States, and an evidence based discussion of an integrated approach in patients with rheumatoid and osteoarthritis. I will also briefly discuss documentation and reimbursement at the end of the presentation, I hope that you find the information interesting and useful. These are the disclosures for the presentation, basically saying that I have received an honorarium and that this presentation does not focus on a specific product or service. Here are the learning outcomes, at the end of this presentation, you will be able to discuss the use of common complementary and alternative practices in the United States, identify effective evidence-based complementary and alternative practices in patients with rheumatoid arthritis and osteoarthritis. And lastly, describe an integrated approach in these patients. So I'd like to start with this quote from the 18 hundreds by Thomas Edison, "the doctor of the future will give no medication, but will interest his patients in the care of the human

frame diet, and in the cause and prevention of disease. So in recent years, we've witnessed the roles of patients and physicians in the healthcare system undergo a huge shift today's patient is informed, has access to more information than ever before, is an active participant and making healthcare decisions and is also open to exploring the unconventional. And there are also a growing number of physicians interested in complimentary and alternative practices, and also the impact of lifestyle changes and diet on health.

This is for, of course , largely driven by consumer interest and demand, physicians are now realizing the importance of being educated in the benefits, and also the side effects of unconventional practices, because of the large number of patients, that are using these practices, and we'll talk about that shortly in the presentation. So these are three terms, complimentary, alternative and integrative, that are often used interchangeably, but mistakenly so, according to the national institutes of health, when a practice that is not considered mainstream is used together with conventional medicine, it's considered complimentary. If a non-mainstream practice is used in place of conventional medicine, it's considered alternative and, integrative health refers to a holistic team approach, that's focused on treating the patient as a whole combining, complimentary and conventional practices, and also different disciplines come together to address not only the physical, but other aspects as well, such as the mental, emotional, spiritual, social, and community aspects. So the federal government's lead agency for research on systems practices and products that are not generally considered part of conventional medicine, is the national center for complementary and integrative health, the NCCIH, which is a part of the national institutes of health, and it was formerly known as the national center for complementary and alternative medicine. The NCCIH is involved in funding and conducting rigorous research on complementary health approaches, and their mission is to define the usefulness and safety of complementary and integrative health interventions and their roles in improving health and healthcare. Their vision is to

ensure that decisions made by the public, by healthcare professionals, and by health policy makers regarding the use of these approaches, are based on scientific evidence. These are two links that I think you will find useful if you are looking for information on safe use of complimentary health products and practices. The first link provides information on the FDA and FTC, which is the federal trade commission notices about recalls, tainted products, and other alerts, and advisories.

The second link is for healthcare providers, it provides information basically articles on various health topics, evidence based medicine, continuing education and clinical practice guidelines. So I'd like to present some statistics from the national health interview survey, the NHIS which is an annual study that is conducted by the centers for disease control interventions, national center for health statistics. So for this survey, thousands of Americans are interviewed about their health and illness related experiences. The survey has a section on complementary health approaches that was developed by NCHS and NCCIH, and it is administered every five years, starting in, I believe it was 2002 and then 2007, 2012 and 17, the 2017 survey focused on the use of complementary practices that were not included in other large national surveys, So practices such as meditation, yoga and chiropractic care. Here are some of the survey highlights for adults. So yoga was the most commonly used complimentary health approach, among you as adults in 2012 and 2017. The use of meditation increased more than three fold, from 2012 to 2017. In 2012, chiropractic care was as popular as yoga, followed by meditation, however, the popularity of meditation sort of passed that of chiropractic care to become the second most used approach among those surveyed in 2017. And also in the same year, women were more than twice as likely to use yoga, compared with men. Women were also more likely than men to use meditation and see a chiropractor.

Also non-Hispanic white adults, were more likely to use yoga, meditation and chiropractors compared to Hispanic, and non-Hispanic black adults. The use of yoga

was highest among adults aged 18 to 44 compared to older adults, while the use of meditation and chiropractic care was higher among adults age 45 to 64, compared to the younger and older age groups. Now these are some survey highlights for children. The percentage of children who used yoga increased significantly from 2012 to 2017, the use of meditation also increased significantly, and there was no significant difference in the use of chiropractic care. Some of information on children, girls were significantly more likely to have used yoga compared to boys, no significant differences between boys and girls in the use of meditation or chiropractic care. And as with the adults, non-Hispanic white children were more likely to have used yoga and chiropractic care than non-Hispanic black children, or Hispanic children. And in 2017 older children aged 12 to 17 years, were more likely to have used meditation and chiropractic care than younger children aged 4 to 11 years. So, next I want to briefly list what's included in the integrated approach in this presentation.

So as mentioned previously, an integrated approach combines conventional and complementary practices with the aim of treating the person as a whole. So that will include conventional treatment, which based on patient's needs, will include medical surgical intervention, and there'll be now, for this presentation, I will be discussing the role of the occupational therapist in rheumatoid and osteoarthritis. We will then look at complimentary health approaches, which include natural products. And according to the NCCIH, natural products include herbs, vitamins, and minerals, and probiotics, also wanna add that use of natural products was the most popular complimentary health approach in 2012, and the most commonly used natural product was fish oil. We will also look at mind and body practices, there is a long list of different practices that fall under this category of which I think yoga and meditation are probably the most well known, this is the list, I won't read all of them out, but I'm sure most of you have heard these names before, this list is from the NCCIH website. And lastly, we will talk about the role of diet in patients with rheumatoid arthritis and osteoarthritis. Okay, so let's talk about rheumatoid arthritis, I thought it might be a good idea to start with basic

information and some clinical features of rheumatoid arthritis. It affects about 1.3 million Americans, it is an auto immune chronic inflammatory disease that causes joint pain, swelling, stiffness in a symmetrical pattern, mostly affecting joints in the wrist, hands feet, spine knees, and jaw, patients with rheumatoid arthritis may also experience fatigue, occasional fevers and loss of appetite and other organs such as the heart, lungs, blood, nerves, eyes and skin may also be involved. In rheumatoid arthritis, there is Synovial inflammation and thickening, which causes pain, redness, and warmth, and also destroys cartilage and bone, over time, the surrounding muscles and ligaments weaken causing more pain, joint damage and impaired function. Now rheumatoid arthritis is also been known to be associated with certain genetic and environmental factors. There are specific genes called HLA, that's stands for human leukocyte antigen class to genotypes, which increase the likelihood of developing RA and also make arthritis symptoms worse. The risk of rheumatoid arthritis may be highest when people with these genes are exposed to environmental factors, like smoking or when a person is obese. So it's really a combination of genetic and environmental factors.

All right, here are the risk factors for rheumatoid arthritis, it can begin at any age, but the likelihood increases with age, the onset being highest among adults in their 60s. New cases of rheumatoid arthritis are typically two to three times higher in women than men. If a family member has rheumatoid arthritis, you may be more likely to develop the disease. We already discussed the genetic factor in the previous slide. And multiple studies have shown that cigarette smoking increases a person's risk of developing RA and can make the disease worse. Being obese can increase the risk studies, examining the role of obesity also found that the more overweight a person was the higher their risk of developing RA. Also gum disease or periodontitis has been known to be associated with the disease. Women who have never given birth may be at increased risk of developing RA. Some early life exposures may increase the risk, For example, one study found that children whose mothers smoked had doubled the risk of

developing Arias adults, and children of lower income parents, are also at increased risk of developing the disease.

Okay, so the members on the arthritis team, and this slide is common to both rheumatoid and osteoarthritis, so this will be, you know, primary care providers or the first point of contact for most patients, with arthritis, and depending on the need, the patient may be referred to rheumatologists, orthopedist or surgeon, therapists, dieticians play an important role, and especially for patients struggling with weight management, nurse educators, and then mental health professionals for patients who may have difficulty coping with stress and changes that come with chronic pain and disability, in some cases, other professionals such as a dermatologist, neurologist, physiatrist, a pain specialist or podiatrist may be needed, also a sleep specialist may be needed in those who may have sleep deficits, related to chronic pain or other comorbidities that may affect one's pain tolerance. So this is starting with conventional treatment for RA, this is a list of drugs, commonly prescribed to slow disease and prevent joint deformity in patients. One, the first one is disease modifying antirheumatic drugs, biologic DMARDs interleukin 6 and interleukin 6 receptor inhibitors, anti-CD 20 antibody targeted synthetic DMARDs, as expected all these come with side effects, when it comes to surgery, that is not very common in patients with rheumatoid arthritis, in some cases, a patient may elect to have surgery, to reduce joint pain and improve function. Some of the common surgeries that you will notice in patients with rheumatoid arthritis are arthroplasty, arthroscopy, some undergo synovectomy, back neck, wrist surgeries, nerve release.

So, some patients will go through those surgeries. Before I talk about occupational therapy in these patients, I wanna mention the CDCs strive for five strategies, which is a part of the CDCs arthritis program. CDC recommends five self management strategies. The first is learning new self management skills. This is basically CDC recommendation to join self-education management workshops, to learn skills, to

manage arthritis and improve quality of life. These are generally interactive community based programs, that teach participants skills for managing arthritis. And you can go to the CDC website for more information on programs that are recommended by CDC. The second is staying active, being physically active, can reduce pain, improve function, mood, and quality of life, for adults, with arthritis, talking to your doctor is especially important. If you also have other chronic conditions like diabetes or heart disease, managing your weight for people who are overweight or obese, losing weight reduces the stress on joints, particularly the weightbearing joints like hips and knees, and lastly joint protection during EDLs and any exercise programs.

Alright, so as occupational therapist, we address pain using different modalities, heat, cold, ultrasound electrical STEM and paraffin are some of them, we prescribe exercises for flexibility, strength, and endurance. We address environmental modifications and recommend adaptive and assistive devices for safety, EDL, independence, and joint protection. We advise patients in the use of orthotics, static or dynamic. We are also educators and we provide strategies pertaining to diet, weight management, sleep, and energy conservation. We teach stress management, coping strategies, and relaxation techniques. Patients with arthritis often need advice regarding ergonomics at their workstations and may need job modifications. Lastly, we encourage participation in leisure activities and provide modifications as needed to ensure that the patient can continue to participate at their maximum level of function.

Okay, let's talk about complimentary approaches in patients with rheumatoid arthritis based on information from the NCCIH supplements containing Omega-3 fatty acids, gamma linolenic acid and the herb thunder God vine are helpful in relieving rheumatoid arthritis symptoms. I'll briefly mention the side effects of these products, Omega-3 supplements usually produce only mild side effects, if any, there is conflicting evidence on whether Omega-3 supplements might influence the risk of prostate cancer. Also, if you are taking medicine that affects blood clotting, or if you're allergic to fish or

shellfish, it's important that you consult your healthcare provider before taking these supplements. With GLA, again, it produces only mild side effects such as an upset stomach or headache, but the longterm safety of GLA supplements is not clear. Some borage products, borage oil products may contain alkaloids that can harm the liver. And then the herb thunder God vine has been known to cause serious side effects, including male infertility and decreases in bone density. So next I want to discuss three studies on use of natural products in rheumatoid arthritis. The first study is an 18 month randomized double blind trial that was conducted in 2014 to determine whether a combination of borage seed oil, rich in gamma linolenic acid and fish oil, rich and EPA, and DHA is superior to either oil alone for treatment of rheumatoid arthritis. So the patients here were randomized into three groups, one receiving borage, seed oil, another receiving fish oil, and the third receiving both. And each group showed significant reductions in disease activity after 9 months, and the improvements persisted after 18 months, there were no significant differences in disease activity changes and in change of rheumatoid arthritis medications among the three groups. So study patients were able to reduce the DMARD therapy, given in combination with TNF untagonist, to a greater extent when compared to patients from an ARI registry.

The second study is a randomized 12 week trial, that use Marine and three polyunsaturated fatty acids and GLE, which are well known, anti-inflammatory agents. Here's 60 patients with active rheumatoid arthritis were randomized into three groups. Those that took fish oil, then fish oil with Primrose oil was group two, and then the third group took notes of the Patanol supplementation. So the results showed that the disease activity score 28 number of tender joints and the visual analog scale that was used, to score, all this, showed significantly decreased scores in groups, one and two, showing that the supplementation made a huge difference in patients with rheumatoid arthritis. And the third study is a review conducted in 2017, for which several databases was searched to identify research reporting the role of n-3 polyunsaturated fatty acids in rheumatoid arthritis, up to the end of March, 2017. In humans, they found

several studies that suggested that a high content of n-3 polyunsaturated fatty acids in the diet, could have a protective role, for incident RA in subjects at risk. Moreover, these, the supplementation also helped improve pain symptoms, the tender joint count the duration of morning stiffness and the frequency of ensades. So there was some, there was a limitation to this study, the impact of n-3 polyunsaturated fatty acids on radiographic progression and Sinovial histopathology, has not yet been evaluated, also their role in early arthritis and the combination with biologics has not been investigated.

Okay, we will now look at mind and body practices for rheumatoid arthritis. So there are several studies that have demonstrated the benefits of some of these techniques, such as acupuncture, mindfulness meditation, yoga, tai Chi, massage, on decrease in pain, improved function, and improve mood in patients with RA. However, according to the NCCIH, the amount of research on these approaches is insufficient, to conclude whether they can really help relieve rheumatoid arthritis symptoms. I'd like to present two studies here, one on acupuncture and the other on biofeedback. Okay, so this is a review that was done to investigate the clinical efficacy of acupuncture on rheumatoid arthritis symptoms and to reveal the proposed mechanisms behind the benefits of acupuncture. So several databases was searched from, I believe it was 1974, all the way to 2018 and 43 studies were included here in the review. And it was concluded that acupuncture alone or combined with other treatment modalities is beneficial, to the clinical condition of RA, without adverse effects, and can also improve the patient's function and quality of life. And the mechanisms that were suggested behind these effects were the anti-inflammatory effect, anti-oxidative effect and regulation of immune system function.

And again, there was a limitation here, there was, still inconsistency regarding the clinical efficacy and there aren't enough double-blinded randomized controlled trials on acupuncture. The next is a study from 2018 that looked at the use of biofeedback and treatment of patients with rheumatoid arthritis and also patients with systemic

sclerosis. So the effectiveness of biofeedback training on symptoms of anxiety and depression was evaluated because these symptoms can complicate the adaptation response of these patients, it reduces the level of subjective control when a patient is anxious and depressed along with the physical symptoms. And what was found was that there was a significant reduction in anxiety and depressive reaction in patients, with biofeedback, which indirectly improve the efficiency of the treatment that was offered to these patients. It improved the efficiency of rehabilitation and the patient's quality of life.

Okay, now let's look at the association between diet and rheumatoid arthritis. So this is an interesting 2017 review where the outcomes of published randomized clinical trials performed on rheumatoid arthritis patients to observe the effect of various dietary interventions were analyzed, to see the effects basically of several different diets, which included seven days of fasting followed by a vegan diet, a vegan diet alone, Mediterranean diet, elemental diet, elimination, and then also several food groups were analyzed. And the findings were that fasting followed by vegan diet or vegan diet alone can potentially reduce symptoms and disease activity possibly due to reduced exposure to potential antigens that may be present in an omnivorous diet, and adding olive oil to one's diet decreases risk of rheumatoid arthritis. The elemental diet was associated with reduced symptoms, but these symptoms returned on discontinuation of the diet, which could be an effect of certain food allergens that were not present in the elemental diet. So food allergens are thought to be potential immune system triggers that cause inflammation. The recommendations based on this review, these were the recommendations for a good diet. One is to include raw or moderately cooked vegetables, lots of greens and legumes, include spices like turmeric and ginger, seasonal fruits, probiotic, yogurt, all of which are known to be good sources of natural antioxidants and deliver anti-inflammatory effects. Also the patient should try to avoid processed food, high salt oils, butter, sugar, an animal products, dietary supplements like vitamin D, Cod liver oil, and multivitamins can also help in the

management of rheumatoid arthritis. Okay, so with this study, we complete the rheumatoid arthritis section and move on to osteoarthritis, and just like with rheumatoid, we will start with the clinical features, and the risk factors, and then go on to treatment. I will not repeat some of the slides that are common to both, these conditions, such as the ones with the info on arthritis care team, on the CDC strive for five, the role of the occupational therapist, you know, those three slides were just were common to both the conditions.

All right, so starting with osteoarthritis again, it's the most common form of arthritis, it affects over 32.5 million Americans. It's also known as a degenerative joint disease, the areas that are most commonly affected, are the hips, knees, hands, neck, and low back. In osteoarthritis, the cartilage within the joint breaks down and the underlying bone begins to change. It usually develops slowly and gets worse over time. The pain associated with osteoarthritis may get better with rest in later stages of the disease, it gets worse at night, the patient will also experience stiffness, usually lasting less than 30 minutes and felt more commonly in the morning or after resting, sort of period of time. Some of the other features that we know are decreased range of motion and decrease in flexibility, swelling in and around the joint and joint instability. So the risk factors for osteoarthritis include joint injury or overuse. The risk of developing osteoarthritis increases with age, women are more likely to develop osteoarthritis than men, especially after age 50. And we know that extra weight puts more stress on joints, particularly the weightbearing joints and destress increases the risk of osteoarthritis. Obesity may also have other metabolic effects that can increase the risk of osteoarthritis.

Now, as far as genetics, people inherit an increased risk, of developing this condition, not the condition itself, they inherit an increased risk and this predisposition can be passed through generations in families, but it's not clear how this inheritance pattern works. People who have family members with osteoarthritis are more likely to develop

osteoarthritis. People who have their hands affected by osteoarthritis are more likely to develop knee osteoarthritis. So these are some things that have been noticed, in these patients, and about race there is, there are some Asian populations that have a lower risk of developing osteoarthritis. So starting with the treatment for osteoarthritis, here's a list of commonly used drugs, oral pain relievers, oral anti-inflammatory medications, to treat pain and inflammation, topical creams that you can apply, or the skin over sore joints, corticosteroids that are usually injected into the joint to temporarily relieve pain. Hyaluronic acid substitutes, these are injected into the knee to replace a normal component of the joint that's involved in lubrication and nutrition. And so this is generally recommended for patients with knee osteoarthritis, and then selective serotonin and norepinephrine reuptake inhibitors that you take orally, to help control chronic pain. And as far as surgery goes, common surgeries again are arthroscopy, arthroplasty, arthrodesis in some cases and osteotomy.

Okay, we will now move on to complementary approaches, starting with natural products for most of these products that are listed on this slide, the evidence is insufficient and there are potential side effects. So glucosamine and chondroitin supplements are used by many, for pain relief, but the evidence is insufficient. These may also interact with anticoagulant drug warfarin, same with some of the other names here, the DMSO, the MSM and SAMe, there's just not enough evidence. There's also an herb that is used in ayurvedic medicine called the avocados-soybean unsaponifiables, and boswellia Serrata. These have been known to have some effect on pain in patients with osteoarthritis, but again, the evidence is not sufficient. Of the topical products, a 2013 study concluded that arnica gel and comfrey extract gel might be helpful. They did not find the very commonly used capsicum extract gel to be useful, just not enough evidence. Okay, and I just wanted to include this, the FDA has warned the public about several dietary supplements, promoted for arthritis or pain that were tainted with prescription drugs, the hidden ingredients in these products, could cause side effects or interact in harmful ways with medicines. So you can find a

list of tainted arthritis or pain products and general information about fraudulent dietary supplements on the FDA website. It's also a good idea to encourage patients to talk to their healthcare provider about dietary supplements, if they are thinking about taking one for their arthritic symptoms.

So, let's move on to mind and body practices, for acupuncture, there are several studies that have found acupuncture to be helpful for pain in patients with osteoarthritis, specifically for knee osteoarthritis, we know acupuncture is generally safe, but if it is not performed correctly, it can potentially have serious side effects. Cupping, and moxibustion, these have been known to be helpful, but limited research there's limited research and possible bias. There are also safety concerns, both cupping and moxibustion can leave marks on the skin, which are usually temporary, but cupping can, may also draw blood. And that could expose people to disease causing microorganisms, if the same devices used on more than one person without being sterilized. Moxibustion has been linked to allergic reactions, burns and infections. With massage therapy, there is a small amount of evidence that suggests that massage may help to reduce symptoms. And the risk are few, when performed by a trained practitioner. Just a few more here, a value of therapy, some studies have shown that it can reduce pain in osteoarthritis again, although it has a good safety record, the evidence is just not sufficient, and insufficient evidence for homeopathy as well, generally safe, but may contain ingredients that can cause harmful effects and magnets. We know a lot of people are interested in using magnets, but again, there is not enough evidence to support the use of magnets in osteoarthritis. And use of magnets may be hazardous in people with pacemakers or other implanted medical devices. Tai Chi and Qigong, some of the more popular practices. These have been known to help short term with pain and stiffness in patients with knee osteoarthritis, some studies have shown improved balance and reduce depression.

However, there is just not enough research and there is definitely not enough research on Qigong. Although there is improvement noticed in osteoarthritis symptoms in some patients. These are generally safe with some reports, of temporary increase in knee pain. Yoga is considered beneficial for improving strength and flexibility in these patients. Again, the research is not sufficient, but also you have to be careful using any technique you have, you know, people with osteoarthritis may need extra props, may need modifications depending on their limitations. So those are things to be aware of, when we use yoga. So I want to present a few studies on these practices, I think I have a total of seven studies that I'd like to go through quickly one on each of these. So there's one on tai chi and one on Qigong, yoga meditation, and then different exercises, and then also diet. The first is a meta-analysis, that was conducted in 2013 to assess the effectiveness of tai Chi exercise for pain, stiffness, and physical function in patients with osteoarthritis. So several databases were search to identify relevant studies. And what was found was a 12 week tai Chi program, was found to be beneficial for improving arthritic symptoms and physical functions in patients with osteoarthritis. And again, the evidence is limited by potential biases and larger scale randomized control trials, are needed to know the longterm effects of tai Chi.

The second is a study, it review conducted in 2017 to summarize the research base for use of Qigong exercises as a possible strategy for arthritis and Qigong, which is practiced in China lightly, maybe useful, that was a result of the review, it may be useful as an intervention strategy, for adults with painful disabling arthritis, mostly to improve the quality of life, reduce pain and depression. The third is a randomized control trial to investigate the effect of integrated approach of yoga therapy intervention, in individuals with knee osteoarthritis. So here 66 individuals with knee osteoarthritis between the ages of 30 and 75 years were randomized into two groups, yoga group, and a control group. And what was found that the group that underwent the yoga practice, showed an improvement and timed up and go sit to stand hand grip strength and goniometer test for range of motion. So they suggests that yoga is

beneficial for improved muscular strength, flexibility, and mobility in these patients. And there were again, some limitations to this study. Moving on to the next one, so this is on meditation and this is a pilot randomized control trial, where the effects of two mind body practices, mantra-meditation, and music listening, were compared their effects were compared on knee pain function and related outcomes. So here, 2022 older ambulatory adults diagnosed with knee osteoarthritis, were randomized to a monthly meditation group or a music listening group.

They were asked to practice for 15 to 20 minutes, twice daily for about 8 weeks and relative to baseline participants in both groups demonstrated improvement, post intervention in all outcomes, including knee pain function and perceived osteoarthritis severity. There was also improvement noticed in mood perceived stress and quality of life. Relative to music listening, the mantra-meditation group, showed greater improvements in overall mood and sleep, quality of life, kind of phobia and some domains of the knee injury and osteoarthritis outcomes score. So the findings of this study suggest that a simple mantra-meditation and possibly a music listening program may be effective in reducing the pain and dysfunction, and decreasing the patient's stress, improving mood, sleep, and quality of life. Okay, this study is a systematic review and a meta-analysis to investigate the relative efficacy of different exercises, for improving pain, function, performance, and quality of life in patients with knee and hip osteoarthritis, add or notice to 8 weeks. So several databases again, until December, 2017 was searched for these randomized controlled trials. And these studies that right in defied compared exercise with usual care or with another exercise type.

So what was found was that aerobic exercise was the most beneficial for pain and performance. Mind-body exercise, had pain benefit that was equivalent to that of aerobic exercise and was the best for function. Strengthening and flexibility or skill exercises, improved multiple outcomes at a moderate level. Whereas mixed exercise was the least effective, and had significantly less pain relief than aerobic and

mind-body exercises. This is a review to explore the association between the Mediterranean diet and osteoarthritis. So there were three studies that were included in this, two were cross sectional studies and the other was a randomized 16 week randomized control trial. So these studies suggested that there was a positive association between a higher adherence to a Mediterranean diet and the quality of life. In participants with osteoarthritis. Also the prevalence of osteoarthritis was lower in patients with the higher adherence to the Mediterranean diet. Biomarkers of inflammation and cartilage degradation were also analyzed and there were significant differences detected, which were decreased in the Mediterranean group.

Again, with like some of the other studies that there were limitations, more prospective and longer interventions are required to evaluate the long term efficacy of the Mediterranean diet. This is a study that was conducted in 2015 to evaluate the effectiveness of a whole foods plant based diet, to reduce symptoms of osteoarthritis. It was a 6 week prospective randomized open label study. The patients were aged from, I think it was 19 years to 70 years with osteoarthritis and they were randomized to the whole foods plant based diet group or the current diet, whatever diet they were on, that was the control group. And I think there were a total of 37 participants and the intervention group were the one with the whole based whole foods, plant based diet reported a significantly greater improvement than the control group, and energy and vitality, physical functioning and the physical component summary skills. The differences between the intervention and the control PGIC, which is a physical component summary scale, were statistically significant over time. The intervention group improvement in the weekly mean VAs score was also significantly greater. So the study results suggested that a whole foods plant based diet significantly improves self-assessed measures of functional status, among these patients. So with that, we are done with the treatment approaches for osteoarthritis. I would like to mention AOTAs position here regarding the use of complimentary and alternative practices. AOTA, supports the use of these practices by occupational therapist, if the practitioner

has received adequate training to be able to practice in a safe and competent manner, keeping the OT scope of practice in mind. And also if the technique utilized is appropriate and specific to the patient.

Also the approach should facilitate engagement in activities of daily living. I'd like to briefly discuss documentation and reimbursement, as with any other intervention documentation for these approaches, if use needs to be clear, with an explanation for why this technique was superior or necessary, the explanation must be related to patient and treatment goals that were set during evaluation. And lastly, the progress toward goals for improved function should be measurable. With reimbursement when it comes to billing for these services, one can use codes for services that reflect the effect of the technique used, in other words, what was the change seen, when this technique was used? Or which goal were we working toward with this approach? So some of these things would help with reimbursement for these services, right? Well, this brings us to the end of today's presentation, I, hope that I provided you with some information that you will be able to use in your practice. I don't know if there are any questions? Any thoughts?

- [Fon] Thank you Sindhu, for a great talk and presenting all that great research. I do see one question that is coming in. What interventions have you used with this population specifically? Is there anything that you like to use?

- [Sindhu] Yes, my, like I mentioned previously, I work, I did not mention, I think Fon mentioned that, that, I practice home health, occupational therapy. So I do get a lot of patients with osteoarthritis and rheumatoid arthritis. And I have mostly practiced yoga and meditation because that's what I'm trained in. I'm also trained in biofeedback, so I combine these three approaches. I help patients with relaxation techniques, breathing exercises in some cases, yoga postures, which would be sort of like neuromuscular reeducation in some cases or stretching postures for pain management. So I do

combine yoga, meditation, and biofeedback, all these three techniques that I'm trained in.

- [Fon] Okay, great, thank you. Another question that came in is have you seen any studies about taking night shade plants, or a solanine from the diet?

- [Sindhu] No, I have not come across any study, with that as one of the things tested. I'm sorry, no.

- [Fon] Okay, specifically to rheumatoid arthritis, any suggestions for documenting a regression and progress during flare ups.

- [Sindhu] We're documenting a regression.

- [Fon] Like with flare ups, with rheumatoid.

- [Sindhu] I guess you would have to, you would have to explain if the patient is going through a certain stage in rheumatoid arthritis, If, the patient is having limitation in certain joints, that you're working on, and that's what you're trying to explain, you can explain the disease severity and documented it as a medical change in the patient's status.

- [Fon] Okay, there are a couple of questions that I'm gonna combine because I think they're all trying to get at the same thing. So one person is saying, would we build these techniques, under therapeutic activity, someone else's asking how to build Quigong training and then someone else is asking what CPT code would be specific for these types treatments. So if you could just address building again, that would be great.

- [Sindhu] Okay, I think some of the codes that you could use, I don't have the numbers, but you could use neuromuscular reeducation, you could use therapeutic activity, you could use ADL training, if what you are doing if what you're working on with the patient is helping a patient's activities of daily living. You could relate your treatment to that goal, but with yoga, you can definitely use neuromuscular reeducation and therapeutic activity.

- [Fon] Okay, that do you think about cherry tart juice intake for osteoarthritis?

- [Sindu] I have not come across any studies, I didn't actually look for it, I'm sure if I look for those studies, I will find some, but I don't think it's one of the commonly used natural product for arthritis. So I have not investigated or looked for any research on cherry juice.

- [Fon] Okay, are there any foods that RA patients should avoid?

- [Sindhu] Generally the night shade plans. That's one of the things I have read, and then we did, when we discussed the study that on rheumatoid arthritis patients, we talked about animal products that should be avoided, we did talk about, any products that we know, any foods that we know are unhealthy. We already have that information, our patients have that information. So based on that study, animal products was one thing that stood out. And then, I think there was also a mention of certain fat, fatty products that could worsen arthritis symptoms. So those are things that one would avoid with rheumatoid arthritis.

- [Fon] Okay, and what are your thoughts on homeopathic medicine, for OA?.

- [Sindhu] For oestearthritis, the one that I know of is the arnica gel, I mentioned that in my slides. Arnica, gel has been known to have a positive effect In fact, just yesterday I

was working with the patient and she said, she has this ointment that she applies to her knee that gives her so much relief. And when I asked her for the ingredients, it was the arnica gel, which is a homeopathic remedy. So that's the only one that I know of.

- [Fon] Okay, I think we have answered all questions and someone did make a comment, arnica gel is effective. So I don't see any more questions coming in, so if you have any more comments for Sindhu or you want to reach out to her with another question you come up with, there's her email, she has graciously provided that, and she has a great reference list as well. So thank you so much for today's talk.

- [Sindhu] Thank you again, as Fon mentioned, please feel free to email me if you would like to share any thoughts or questions about the presentation, thank you again for your time and your attention.

- [Fon] Hope everyone joins us again on continued and occupational therapy.com. Thanks everyone.