EVIDENCE TABLE WORKSHEET

Name: Linh Do
Date: 4/6/2011
EVIDENCE TABLE Focused Question: What is the effectiveness of superficial thermal agents on reducing pain of older adult patients with rheumatoid arthritis?

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
Ayling & Marks (2000)	This review examines whether the heat produced by melted paraffin application is conducted deeply enough to raise intra articular temperature of the hand joints and whether paraffin wax produces any beneficial therapeutic effects or detrimental effects when used to treat hand joints of people with RA.	**I- Systematic Review** **N= 4 studies** **n=2 studies relevant to focus question**	***Interventions:*** Studies examine application of melted paraffin • Daily wax – 3 weeks plus finger exercise • Wax 6 weeks daily and finger exercises • Dip wrap wax 20 mins + exercises • Ultrasound then exercises • Ultrasound and faradic bath 15 minutes + exercises. ***Outcome Measures:*** tenderness, pain at rest and on movement, swelling, grip, dexterity, patients' own impression; • Strength, IP joint, circumference, pain, articular index, ROM, time to dial 6 digits, ability to carry about ADL.	• **Results were mixed.** One included study reported no significant difference found between groups at 3 weeks, however at week 6, the group received wax treatment has a slight improvement in pain. 13/71 patients had moderate improvement at the end. • A different study reported that all groups had significant improvement with no significant difference between methods. Wax yielded significantly decrease pain, but did not improve rate of timed tasks or ADL scores. • Results also indicated paraffin wax fails to produce any functional or symptomatic benefit after six weeks, but relieves pain and	• Studies did not assess the effects of medication use during treatment. • Randomized studies of paraffin wax could be undersized and lacked assurance due to not being properly blinded. • Short-term, unblended, reliability, validity and sensitivity is unknown among these studies. • Inclusion criteria may affect outcome due to the ability to generalize the results of the study to the population of RA patients. • Because the RA participants are in functional classification of I and II (independent and slightly disable), the outcome may be difficult to be generalized to the RA population with	• This intervention may be used alone or as a preparatory method before implementation of occupation based activities for patient with RA in rehabilitation facilities, such as outpatient, inpatient, acute and skill nursing facility. • Community based programs or RA support groups could use this information to education patient with RA so they can properly manage pain that come along w/ their chronic disease. • With more treatment options, clinicians will be able to accommodate to every aspect of RA patient's lives and their disabilities and aware of when is an appropriate phrase and intervention use to manage pain for

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
				stiffness immediately after treatment and up to three weeks after.	advanced chronic disease and disability. • These results showed improvement in each treatment group, with no difference between the groups being evident, may have been attributable to the combined effects of medication, placebo attention and exercise. • The number of dips varying from 5 to 10 in these studies and they were overlooked. This is a limitation because the number of wax application correlate with the temperature of the wax application. • The study overlooked the side effects of paraffin wax application interact the medications.	these patients. • This intervention is moderately strong to inform policy makers about payment for this service. The results indicated the importance of the duration of using this paraffin wax as treatment for RA patient; however therapist must use clinical reasoning and make sure it wasn't during the active phrase. • OT practitioners and OTA require sophisticated knowledge acquired as post-graduate or continuing education for the implementation of thermotherapy due to its contra- indication and precautions. By knowing this information, clinicians will apply thermotherapy accordingly to the patient's need and able to predict the results of the treatment session. • The results of the study are inconclusive because the results are insignificant. Future study to replicate is always beneficial in

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						determining the efficacy of the intervention. Future study can focus on the affect of medication has on the intervention, greater sample, and a wider sample window in
Brosseau, Robinson, Pelland, Casimiro, Milne, Judd & Shea (2002)	Aim of this meta- analysis is to evaluate the efficacy of thermotherapy compared with placebo and other alternate interventions for pain relief in treating patients with rheumatoid arthritis (RA).	**I – Meta-Analysis** **Meta-analysis of 7 studies.** **N= 7 studies** **n=3 studies relevant to answer the evidence-based question** Trials with RA participants aged 18 years and over, with the diagnoses of RA	• ***Interventions:*** **1**: Wax bath and exercise **2**: exercises only **3**: Wax bath only **4**: control group **Exercises**: 5 repetitions for exercises for 20 mins each **Wax bath**: both hands dipped 5 times into wax and wrapped in paper and fitted in quilt mittens for 20 mins **Duration:** 5 days a week for 3 weeks. **Setting NR** • ***Intervention*** **1** – hot pack for 20 min/day for 5 days **2** – cold pack for 20 min/day for 5 days • ***Intervention*** • **1** – heat (hot pack) for 20 min + 20 mins exercise program • **2**- ice for 20 mins + exercise program Treatment duration – 20 mins, 9 sessions during 3 weeks. **Setting NR**	• Results of this meta-analysis found that there was no significant effect of hot or ice pack application or faradic bath on joint swelling, pain medication intake, ROM, grip strength or hand function when compared to control group. • Paraffin wax combined with exercise group showed greater improvement than control group for pain on non-resisted motion, however no significant improvement from baseline for pain. Study did favored paraffin wax + exercises over control group • Within group, combination of exercise and wax significantly reduce pain and stiffness. Wax alone provided pain relief and	• Insufficient detail reported for some studies to facilitate analysis. • The outcome measures of studies may not be sensitive enough to capture expected physiological effects. • Did not thoroughly describe the exercises used. • Characteristic of thermo application may affect efficacy. Characteristic such as temperature, duration of application, and schedule of treatment. • Number of participants. • Methodological may contributed to the lack of effect are the randomization method, quality of double blinding, sample size, study duration and selection of outcome measures. • The difficulty of blinding participants	• This intervention may be utilized as a preparatory method before implementation of occupational based activities or exercises for patient with RA in rehabilitation facilities, such as outpatient, inpatient, acute and skill nursing facility. • Community based program or RA support group could use this information to education patient with RA so they can properly manage their chronic disease. The results indicate limited effectiveness of this intervention, therefore it beneficial to education patient regarding the appropriate and effective mode use to manage their pain. • With more treatment options, clinicians will be able to accommodate to every aspect of RA

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
			Outcome Measures: pain relief on non-resisted motion, morning stiffness and joint ROM, pinch function and grip strength.	decrease stiffness immediately after treatment. • All three studies related to the focused question indicated paraffin relieves pain and stiffness immediately after treatment and up to three weeks thereafter. • No significant effect of hot pack or ice application, cryotherapy and faradic bath were reported for objective measure for pain for other 2 studies.	in thermotherapy. • Crossover design between studies. • The assessment used to measure outcome (Pain) was not mentioned.	patient's lives and their disabilities and help them manage their pain more efficiently. The results is limited, however it illustrated the combination of wax treatment with exercise is effective, therefore practitioners may use this as an option, versus using heat alone. • This result from the study is limited and not strong enough to inform policy makers about payment for this service. Some of the results indicated the significant for thermotherapy usage for patient with RA with paraffin wax and exercises and assisted patient in decreasing pain. But not hot pack or ice application. Therefore practitioner must documented that the intervention is use in adjunction with other treatment to increase the efficacy of the used of physical agent modalities. • OT and OTA require sophisticated knowledge acquired as post-graduate or

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						continuing education for the implementation of thermotherapy due to its contra- indication and precautions. By knowing this information, clinicians will apply thermotherapy accordingly to the patient's need and able to predict the results of the treatment session. • The results from the study indicated some support and efficacy of thermotherapy, especially with paraffin wax bath used for patient with RA. Future study could utilize a more sensitive measureable outcome, monitor characteristic of thermo application closely and appropriate data collection methodology.
Eversden, Maggs, Nightingale & Jobanputra (2007)	Compare individualized exercises whilst immersed in a heated pool to similar exercises on land for their effect on overall improvement in health, physical function and quality of life in	**I- Randomized Controlled Trial.** • 115 participants 18yrs or older with RA, functional classes I, II, or III and attending clinics • Age mean Group Hydrotherapy 57 participants – 55.2 yrs with 68% female Group Land exercises 58 participants – 56.1 yrs with	***Interventions:*** **Group Hydrotherapy –** 30 minutes session at 35º C for 6 weeks **Group land based exercises** for 30 minutes for 6 weeks. Participants were allowed up to 3 sessions for sickness and leave. Setting NR ***Outcome Measures:***	• 87% patients treated with hydrotherapy felt much better or very much better than patients treated with land exercise. Participants favor hydrotherapy. • With pain, it significantly increased after three	• Study did not specify what land exercises were utilized • Sample size from 1 rehabilitation clinic decrease the credibility to apply to a large population • Placebo effect may be an issue. • Facilitators were not mentioned in the	• This intervention may be utilized as a short term preparatory method combining with other occupational based intervention to treat patient with RA in inpatient, outpatient rehab, skill nursing facility and at home. • Community based

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
	people with RA	72% female • Inclusion criteria - stable does of disease modifying anti-rheumatic drugs (DMARDs) for 6 weeks and NSAIDs for 2 weeks before entry. • Patients who received physiotherapy or hydrotherapy in the 6 months preceding entry is exclude to prevent carryover. • Exclusion criteria – chlorine sensitivity, an infected open wound, poorly controlled epilepsy, hypertension, diabetes, incontinence of faeces, and fear of water preceding hydroptherapy. Pregnant women, comorbid condition, methicillin resistant staphylococcus aureus were also excluded.	• Measure the effect with a 7 point scale ranging from 1 (very much worse) 7 (very much better) Secondary outcome – pain measured on last treatment session nd 3 months post treatment. Pain on 10 cm visual analogue scale (VAS)	months after treatment compared with baseline values in both treatment groups. 3 month post treatment worsening of pain and of the self care domains.	study. • Study mentioned the exercises were client-based, therefore patients may experience different results due to what kind of exercises were implemented.	program or RA support group could use this information to education patient with RA about the duration of the treatment and the lasting effect of hydrotherapy so them and their care givers can properly manage their chronic disease. • RA population is growing every year, with more treatment options, clinicians will be able to come up with appropriate intervention with proper duration of treatment that can accommodate to every aspect of RA patient's lives. In this case, treatment of hydrotherapy will decrease pain for a short term. • OT and OTA require sophisticated knowledge acquired as post-graduate or continuing education for the implementation of thermotherapy due to its contra- indication and precautions. The results indicated hydrotherapy required more clinical reasoning from clinicians due to the short term and

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						long term effects of the intervention and knowing when would be appropriate to implement these types of agent modalities. • This intervention is strong enough to inform policy makers about payment for this service. The results indicated the significant for hydrotherapy usage for RA patients and may benefit the patients who use this intervention. However it is only short term relieve, therapist muse document and assure policy maker that hydrotherapy can be use in adjunction with other treatment options to enhance the effectiveness of the treatment interventions. • The results from the study are strong enough however future study should emphasize on only thermo agent modalities and assess their efficacy in pain management in adjunct with exercises and occupational based activities.

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
Hirvonen, Mikkelsson, Kautiainen, Pohjolainen, & Leirisalo-Repo (2006)	Compare the effects of whole-body cryotherapy (-110 º C) with whole body cryotherapy (-60 º C) and local cryotherapy as an adjunct to physiotherapy in patients with active RA.	**I - randomized single blinded controlled trial.** **60 participants eligible, meet the inclusion criteria, and agreed to participate in the study.** **3 randomized groups of 20 participants.** **Group 1 -** 16 female/4 male, mean age 58 yrs, duration 16 yrs. **Group 2 -** 18 female/2 male, mean age 52 yrs, duration 17 yrs. **Group 3 -** 17 female/3 male, mean age 50 yrs, duration 12 yrs.	***Intervention:*** **Group 1 –** Local cryotherapy (cold pack or cold air - 30ºC) applied to 5 swollen joints for 10 – 30 mins or cold air for 1 – 5 minutes **Group 2 –** Whole-body cryotherapy at -60 ºC **Group 3 –** whole body cryotherapy at -110 ºC. **Setting NR** ***Outcome Measures:*** pain using the visual analogues scale (VAS, 0-100mm), disease activity was express by DAS, hand grip strength measured in kilograms using dynamometer.	• Pain decreased significantly in the local and whole body cryotherapy (-110ºC) groups during 7 days intervention. But no significant increase in cryotherapy (-60ºC) • Pain decreased the most in whole body cryotherapy (-110ºC) • 19 participants in local cryotherapy reported that it was tolerable, • 1 patient found that joint pain became worse.	• Randomized group trial was not identical with differences in demographic and clinical data. • Study sample was small. • Difficult to find volunteer participant who will fulfilled strict activity and stability inclusion criteria. • Study did not mentione anything about the monitoring method to make sure the temperature of thermo application was consistent. • Other exercise methods were not used or mentioned. This may limits the effectiveness of cryotherapy.	• According to the findings, whole body cryotherapy (-110ºC) intervention may be utilized by itself or combining with other client based intervention to treat patient with RA or orthopedic condition in pain management. This intervention could be use in a rehab facility such as outpatient; inpatient or skills nursing that can afford the equipment. • Community based program or RA support group could use this information to education patient with RA about the significance of the temperature of cryotherapy have on their pain. Patients and their caregiver must be educated so that they are aware of the temperature of the hot packs of cold pack or the whole body application is being place on their body. • RA population is growing every year, with more treatment options for pain management, clinicians will be able to accommodate to

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						RA patients and educate them to manage their pain more effectively. This study brought up an important issue regarding the temperature of the superficial thermal agent application being use on RA patient. Clinicians must monitor the temperature of the superficial thermal agents and ensure that they are in the range that can produce that therapeutic effect. • OT and OTA need to be well trained and prepared during the certification process so that they are sophisticated and knowledgeable about superficial thermal agents. The implementation of thermotherapy must be monitor due to the contra- indication. Precautions and temperature of the agents. • This intervention is strong to inform policy makers about payment for this service. The results indicated whole body cryotherapy (-110ºC)has an ability

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						to assist RA patient with pain management over local or lower temperature cryotherapy. • The results from the study are strong however future replication may be necessary to add more credibility to the intervention. Future replicated study should emphasize on a larger population, identical randomized group, and use cryotherapy in combination with other exercise regime.
Welch, Brosseau, Casimiro, Judd, Shea, Tugwell & Wells (2002)	To evaluate the effectiveness of thermotherapy compared to placebo and to other alternate intervention on pain relief for treating patients with RA	**I – Systematic review** **N=7 studies** **n=4 studies relevant to answer the focus question.**	***Interventions:*** • Wax + exercises • Ultrasound +exercises • Ultrasound +faradic exercise • Ultrasound + faradic bath • Thermal pad of 50ºF, 60ºF, and 70ºF • Ice packs in damp towel for 20 mins, 1/day for 5 days • Hot packs, wrapped in Turkish towel and wrapped around knee for 20 mins, 1/day for 5 days. • Hot pack alone 20 mins + 20 mins exercise program. • Ice (20 mins) + exercise program.	***Results –*** from this systematic review on thermotherapy found that there was no significant effect for hot or ice pack, cryotherapy, faradic bath application on pain and other outcome measures mentioned when compared to control group of no active treatment or alternate therapy(Hawkes, 1986, Ivey, 1994, Kirk, 1968, Williams, 1986). There was no statistically significant difference when comparing wax and ultrasound or wax and faradic bath to ultrasound for outcomes	• Methodological consideration may contributed to lack of effect are randomization method, quality of double blinding, sample size, study duration and selection of outcome measure. • The type of thermo therapy, temperature of application, duration, and schedule of treatment may be a limitation. These factors were not and should be addressed in studies of thermotherapy and need to be reported	• According to the findings, these interventions may be use as an adjunct to treat patient with RA or orthopedic condition in pain management as palliative therapy in adjunct therapy combined with exercise. This intervention could be use in a rehab facility such as outpatient; inpatient or skills nursing. These interventions haven't shown neither positive nor detrimental effect on joint destruction or

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
			Setting NR ***Outcome Measures:*** pain measurement (McGill Pain Questionaire), hand grip, PIP circumference, articular index, ROM, timed task, activity score. Patients on controlled analgesia attempts. Preference for cold, heat, stiffness, knee circumference, joint temperature.	measured after 1, 2 or 3 weeks of treatment and no patient preference for these thermotherapy modalities offered.	consistently in studies. • Small sample size • Lack of similarity in characteristics among groups of treatment intervention. • The combination of different superficial thermal agent with medication can influenced the efficacy of the thermotherapy.	pain, therefore it can be use as needed by patients as adjunct to other intervention. • Community based program or RA support group could use this information to education patient with RA what treatments intervention are effective. This study could be to raise awareness on how effective these interventions are in term of managing their pain or in adjunct with other therapeutic exercises. • RA population is growing every year, as well as the treatment options for pain management, clinicians will be able to accommodate to RA patients and educate them to manage their pain more effectively if the clinician are aware of which intervention are effective alone or which combination of intervention has the greatest benefits for RA patients. • OT and OTA are required to be certified in physical agent modalities

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						during post graduate education or continuing education for the implementation of thermotherapy due to its contra- indication and precautions and clinical reasoning of which method of intervention are most effective and benefits the patients the most. • The results from this intervention are weak in informing the policy makers about payment for this service. The results indicated there was no significant effect for hot or ice pack, cryotherapy, and faradic bath application on pain management. • The results from the study are not strong however future replication may be necessary to add more credibility to the intervention. Future replicated study should emphasize on a larger population, identical randomized group, and use cryotherapy in combination with other exercise regime with appropriate methodology. They also required more

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						sensitive and valid clinical outcome to study thermotherapy to reflect the physiological effects. Also detailed information regarding temperature, duration and mode of application.
Verhagen, Bierma-Zeinstra, Cardoso, de Bie, Boers, & de Vet (2003)	To perform a systematic review on the effectiveness of baneotherapy in patients with RA in terms of pain, stiffness, range of motion, activities of daily living and quality of life.	**I – Systematic review.** **N= 7 randomized controlled trials** **n= 3 studies relevant in addressing the focus questions**	***Outcome Measures***-pain (VAS and McGill), global status (AIMS), functional status, morning stiffness and laboratory variables. ROM, grip strength, joint tenderness and patient and therapist self assessment. ***Interventions:*** Deep sea salt bath Mineral bath Radon carbon dioxide bath for 4 weeks, 6 months follow up. Carbon dioxin bath for 4 weeks, 6 months follow up. Seated immersion bath Hydrotherapy Land exercises Relaxation Mineral bath for 3 weeks Drug for 2 months **Setting NR**	• Overall, there was no evidence of statistically significant reduction at short term or long term in pain and quality of life. Only a significant reduction of pain improvement at 6 months follow up , not at the end of treatment or 3 months follow up, in favor of Radon Carbon Dioxide bath. Relative difference of 24.4% • Another studies indicated no significance difference could be found, pain decrease with a relative differences of 16% in tap water bath. • Results illustrated both group showed improvement on pain and global improvement in 8 weeks. Significant difference in favour of mineral baths	• Some studies in the reviews lack the clarity information concerning study design. • Outcome measure of quality of life instrument was only used in two studies. This may decrease the sensitivity of the assessment and also the aim of Balneotherapy is to improve quality of life. • Studies used blinding of observer/outcomes, however blind was never evaluated. • In Yurtkuran, 1999, pre and post analysis and measures of variability are unclear. • Strategies on avoiding bias were not mentioned and possible in the trial cannot be excluded. • Selection bias may be a limitation due to language.	• According to the results, balneotherapy may be utilized by itself to treat patient with RA or orthopedic condition in pain management. This intervention could be use in a rehab facility such as outpatient; inpatient or skills nursing that can afford the equipment and supplies • Community based program developed through an outpatient program or RA support group could use this information to raise awareness among patient with RA so they know about the chemical and minerals used that may increase the efficacy of thermotherapy. This may assist better management of their chronic disease. • Pain is one important factor that inhibits

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
				concerning pain. • One study comparing balneotherapy with drug therapy, found clinically relevant improvement on pain and overall improvement at 8 weeks.	• Pain is often assessed by the patient; this may be varied and more subjective to the participants. • Short follow up period may be a limitation, because it was discussed in the review that positive effects of spa therapy lasted up to 40 weeks follow up. • The variety of different bath combination with different chemical makes it difficult to determine what the most effective form of balneotherapy is and what the essential element responsible for the effectiveness is.	functional performance and decrease quality of life in RA population, with more treatment options for pain management, clinicians will be able to accommodate to RA patients and educate them to manage their pain more effectively. • OT and OTA require addition education to gain knowledge in their post-graduate or continuing education for the implementation of thermotherapy due to it's the variety of different therapy, as well as aware of the contra indication and precautions patient with RA have. • Only 2 studies' conclusion is consistent and has firm results on the effectiveness of balneotherapy in patient with RA. This intervention is weak in informing policy makers about payment for this service. The results indicated balneotherapy has an ability to assist RA patient with pain management in two

Author/ Year	Study Objectives	Level/Design/Subjects	Intervention and Outcome Measures	Results	Study Limitations	Implications for OT
						studies, but contradiction with other studies. • The results from two supported studies are strong however future replication may be necessary to add more credibility to the intervention. Future replicated study should emphasize on a larger population, high quality research, focusing on appropriate allocation concealment, blinding, standardized protocol, and compare various intervention with each other with detail description. Also using a no treatment control group.

Reference List:

Ayling, J., & Marks, R. (2000). Efficacy of paraffin wax baths for rheumatoid arthritic hands. *Physiotherapy, 86*(4), 190-201.

Brosseau, L., Robinson, V., Pelland, L., Casimiro, L., Milne, S., Judd, M., & Shea, B. (2002). Efficacy of thermotherapy for rheumatoid arthritis: a meta-analysis. *Physical Therapy Reviews, 7*(1), 5-15.

Eversden, L., Maggs, F., Nightingale, P., & Jobanputra, P. (2007). A pragmatic randomised controlled trial of hydrotherapy and land exercises on overall well being and quality of life in rheumatoid arthritis. *BMC Musculoskeletal Disorders*, 823.

Hirvonen, H., Mikkelsson, M., Kautiainen, H., Pohjolainen, T., & Leirisalo-Repo, M. (2006). Effectiveness of different cryotherapies on pain and disease activity in active rheumatoid arthritis. A randomised single blinded controlled trial. *Clinical And Experimental Rheumatology*, *24*(3), 295-301.

Welch, V., Brosseau, L., Casimiro, L., Judd, M., Shea, B., Tugwell, P., & Wells, G. (2002). Thermotherapy for treating rheumatoid arthritis. *Cochrane Database of Systematic Reviews,* (2).

Verhagen, A., Bierma-Zeinstra, S., Cardoso, J., de Bie, R., Boers, M., & de Vet, H. (2003). Balneotherapy for rheumatoid arthritis. *Cochrane Database Of Systematic Reviews (Online),*(4).