Articles	**Physical Therapy Techniques for Breast Pain**		**Name: Nicole Mogensen** **Date: 2/27/19** **Search Sources: PubMed, Journal of Women's Health Physical Therapy, Journal of Human Lactation, Journal of Breastfeeding Medicine**		
Author/Year/Condition	**Purpose/Design/Subjects**	**Intervention(s)**	**Outcome Measures**	**Results**	**Notes/comments**
Pekyavas et al. 2014 Lymphedema[1]	*Purpose*: To investigate the effects of applying KinesioTape with Complex Decongestive Therapy in patients with lymphedema. *Design*: RCT, Single blinded study-assessment was done by different physiotherapist than performed the treatment. Randomized using an online random allocation program. *Subjects*: N= 45 patients with grade 2	Group 1: Standard CDT Group 2: CDT + KT Tape Lymphatic Correction Technique applied under compressive bandaging Group 3: CDT without bandaging + KTape Lymphatic Correction Technique Each group received 5	Lymphedema symptoms (pain, limitations in ADLs, discomfort, heaviness, tension, stiffness and numbness- all on the VAS scale). Volume reduction via circumferential measurements on the wrist and axilla then calculated the volume using the Frustum Formula. Quality of life via the SF-	No significant difference on measurements of arm volume between the groups during the treatment period, but group 2 had a continued decreasing effect after the treatment when measured at 4 weeks. Group 1 and 2 had improved SF-36 scores. Compression bandage may have a positive effect on patient mentality for effect of treatment.	In regards to limb volume, the only significant improvement was seen in group 2 after the treatment phase during the four weeks of self-care. This may suggest that including KTape can improve the longevity of CDT effects. Importantly, group 2 and 3 (both KTape) showed a significant decrease in pain. Group 2 had a significant decrease when measured before treatment and after the 4 week follow up. Group 3 had a significant decrease both when measured before treatment and after the 4 week follow up as well as when measured after treatment and after the 4 week follow up. This suggests that incorporating KinesioTape may be effective at decreasing pain due to edema.

	and 3 lymphedema divided into three groups. All patients were cancer survivors of infiltrating ductal carcinoma. No limited ROM. All patients had received chemo or chemo + radiation.	sessions per week in the 2 week intervention period, totaling 10 sessions.	36.		
Lavigne et al. 2012 Blocked Ducts[2]	*Purpose*: To report the outcomes of 25 postpartum women who had difficulties with breastfeeding and were treated using therapeutic ultrasound. *Design*: Case series of 25 women who presented to a chiropractic clinic between 2005 and 2011. Some women had multiple episodes of blocked ducts, so there was a total of 34	Patients were treated using Chattanooga/Interlect/230P US unit with intervention settings: 100% (continuous frequency) duty cycle, 1 MHz, 2 W/cm2, 8-10 minutes, 2x effective radiation area.	Pain and presence of a lump, measured in a binary of "yes" or "no". Number of days of symptoms, number of days of treatment, and number of days to improvement were also reported.	After 3.3 treatments of US, 23 of 25 women participating had resolution of pain and lump on the breast. Participants received between 1 and 7 treatments: 10 participants only received 1 treatment and 13 received 2. 11/25 participants experienced symptom relief within the first day following treatment, but the average number of days for symptom	Along with therapeutic ultrasound, all but one participant also performed self-massage of the breast while feeding. Out of 34 cases of blocked ducts, participants used heat application in 8 of those, pain medication (ibuprofen or acetaminophen) in 20 of those and 14 women used a lecithin supplement. Very low level of evidence to support therapeutic ultrasound alone as the reason for improvement. According to the international breastfeeding center, many block ducts resolve within 24-48 hours of starting, so the participants in this case may have experienced resolution without therapeutic ultrasound. There were no adverse events, and risks involved with

	episodes in the study from 25 different women. *Subjects*: N=25 women from a private chiropractic clinic in Quebec, Canada. 24 patients were white, 1 Afro-Canadian. Ages ranging from 29-45, mean age 37.8. Symptoms started the same day of treatment in 3 episodes of blocked ducts, the day before in 7 episodes, but 6 women suffered with blocked ducts for more than 20 days prior to seeking treatment.			resolution was 6.8. Longest period until resolution was 15 days.	therapeutic ultrasound are very low, so this may be a treatment option if blocked ducts do not spontaneously resolve within 24-48 hours. It would have been more convincing to look at the women who had symptoms over the typical resolution time of blocked ducts in order to attribute symptom resolution to therapeutic ultrasound.
Robson et al. 1990 Engorgement[3]	*Purpose:* To evaluate the effectiveness of cold application in reducing pain and degree of	Cold pack in a cloth halter for 15-20 minutes following two consecutive breastfeedings.	Presence and degree of engorgement were reported on the third day postpartum. The	Participants who wore cold packs experienced significantly less pain at the end of day compared to those who	Women with smaller breasts were more likely to experience engorgement than women with larger breasts. Cold packs are a safe and effective modality in treating symptoms of pain and engorgement in breastfeeding in the first

	engorgement, as well as increasing milk transfer in mothers breastfeeding during the first week following birth. *Design*: RCT. The participants were enrolled on the morning of the second postpartum day. On the third day, the participants were assessed for breast engorgement, and those that had signs of breast engorgement were randomized into control or intervention group. Single blinded - assessors. *Subjects*: N=88. Participants were selected from a large women's hospital in Canada. All mothers had cesearean births,		McGill Pain Questionnaire was used to measure breast pain. The Clinical Signs and Symptoms of Engorgement (CSSE) questionnaire was used to measure subjective and objective qualities of participant's engorgement. Milk transfer was measured via the Letdown Questionnaire which measures signs and symptoms of a functioning milk letdown reflexes, test weighing babies before and after feeding, and measurement of	did not- chose more mild words, and less words to describe pain, and less intensity. Women in intervention group had significantly less symptoms of engorgement than control group. There was no significant difference of amount of milk transferred between groups.	week following birth. Since some women have engorgement after this time period, it would be helpful to have another study with more time lapsed after birth.

	were currently breastfeeding, and had varying levels of engorgement. Women of Asian descent were not included in the study due to negative bias of cold application in some eastern medicine. Mean age was 29.		breast circumference. These measurements were all taken during the morning of the third day and in the evening of the third day following two applications of cold packs.		
Robb et al. 2007 Chronic pain following breast cancer treatments[4]	*Purpose*: To compare the efficacy of TENS vs TSE vs a placebo on pain, anxiety and depression, arm mobility, and analgesic consumption in a population with chronic pain following breast cancer treatments. *Design*: RCT, double blinded. Randomized with a computer generated	TENS: patients placed electrodes in area of pain, set to "continuous mode" with a "strong but comfortable" tingle, high-frequency, low-intensity. Patients advised to use as needed, when in pain. TSE: Pain above arm -	BPI short form- measures pain, interference with daily activities and pain relief. Completed at baseline, weekly during treatment and follow up at 3, 6 and 12 months. HAD Scale- for symptoms of anxiety and depression, completed at baseline, weekly	No significant differences were found between groups for worst pain, least pain, or average pain scores. The TENS intervention showed a significantly lower pain interference score. No significant difference between groups for anxiety, depression or shoulder ROM. Participants reported the TENS was significantly more effective than TSE or	Ninety-five percent of women reported great benefit from the opportunity to discuss their pain and have it validated. All three interventions helped significantly decrease pain intensity and pain interference, which has the strongest association with increasing quality of life. This study also shows the power of placebo as this intervention demonstrated many significant decreases in pain and 6 women decided to continue using placebo for pain management following the study. The psychosocial aspects of personal interaction and having their pain validated may also contribute to the improvement seen in all three groups.

	number chart. All patients received both active treatments (TENS, TSE) and placebo for 3 weeks each with outcome measures performed after each treatment until all 3 were completed. *Subjects*: N=41. Women with a history of breast cancer and chronic pain for at least 6 months following treatment for breast cancer. All women had undergone surgery as treatment. Must be in remission, have no experience with TENS or TSE, have sensation in areas being treated.	pads placed paravertebral at c3-c4 level, pain below with two pads over spinous processes of T1 and T10. Treatment time 10-30 minutes on full intensity, use when in pain. Placebo: identical to active machines but with disabled wires. Each intervention used for 3 weeks with 1 period of "wash-out" in between.	during treatment, and at follow up 3,6,12 months. ROM of ipsilateral shoulder at baseline and at end of each intervention. Daily pain diaries with use of machines, reports of pain relief and analgesic consumption. Questionnaire about patient satisfaction with each intervention.	placebo. 63% of participants decided to continue treatment following study, out of these women 51% wanted to continue with TENS, 23% with TSE, and 33% with placebo. Pre-post treatment: TENS - significantly lower worst and average pain scores and pain interference scores, and significantly greater shoulder flexion, anxiety scores dropped from borderline normal to within normal. TSE: significantly lower worst and average pain scores, and pain interference scores. Placebo: significantly lower worst and average pain scores, pain interference. Anxiety scores dropped from borderline to within	The authors discussed importance of educating patients about movement and exercise and pain science following breast cancer treatment, it would have been interesting to see the patient's level of understanding of pain science as well. One issue of bias in this study is the placebo machine was a TSE machine vs a TENS machine, and the patients place the TENS electrodes over the pain, whereas for TSE and placebo the pads were placed around the spine. This may contribute to the patient's feelings of efficacy of the different treatments. It would have been more informative if there had been a placebo identical to the TENS and not just the TSE.

				normal. Long term follow up: at 12 months, 10 women were still using TENS with good effect, 3 using TSE with good effect, and 2 using placebo at 12 months.	
Robb et al. 2006 Chronic Cancer Treatment-Related Pain[5]	*Purpose*: To determine feasibility and effectiveness of a pain management program with a physiotherapist and psychologist in decreasing chronic treatment-related pain. *Design*: Pilot study with a pre-test post-test design. Patients had hour long sessions with a physiotherapist and psychologist starting at once a week then decreasing to every 2 weeks or once a month. Treatment provided over	PT Intervention: goal setting, pain theory, overactivity/underactivity cycle and pacing, introduction to exercise: explanation of the different components of fitness, posture moving and handling, relapse and prevention, summary session. Psychologist intervention: goal setting, role of many factors	Fitness tests: 5 minute walk test, sit to stand test, arm endurance test. ROM of affected shoulder. Hospital anxiety and depression scale. Pain Coping Inventory, Brief pain status questionnaire, and pain report. Both physical therapist and psychologist worked with patients on goal setting.	General fitness: significant improvements in all aspects measured except for arm endurance. Psychological distress: significant improvements in anxiety and depression scores, as well as the nociception index. No significant differences in psychological maladaptive severity index or pain alienation index (from pain coping inventory). Coping success: significant improvement in coping based on 2 indices	Patients in this study are unique from general chronic pain patients because of their cancer diagnosis. Patients with cancer have higher reports of anxiety and depression, as well as a fear of recurrent cancer. Chronic pain often causes deconditioning, the use of exercise in this program was effective at treating this. As this study was a feasibility study, the improvements cannot be solely attributed to these interventions. Overall, this study shows that a combination of physical therapy and cognitive behavioral therapy from a psychologist is a promising intervention for treating chronic cancer related pain. As most of the participants in this study were breast cancer survivors, this is important in treating breast pain following cancer treatments. As the authors discussed, a large RCT is needed to further support these

	course of 3-6 months. Median number of treatments by each therapist was 10. *Subjects*: N= 13. Patients recruited from a pain clinic in London with inclusion criteria of chronic cancer-related pain at least 6 months duration, history of cancer, evidence of interference w daily living due to pain, age >18. 12 women and 1 man with an age range of 38-60, mean age of 52.	involved in pain, HW assignments: self-monitoring of factors, relaxation techniques: primarily diaphragmatic breathing and progressive muscle relaxation, cognitive skills, relapse and prevention and summary session.		from pain coping inventory. ADL: significant improvement. Pain: significant improvement in present, worst, and average pain from BPSQ. significant improvement in physical severity index. No significant change in least pain scores.	interventions as effective.
Priyanka et al. 2016 Breast Engorgement[6]	*Purpose*: To evaluate if adding ultrasound therapy for immediate post-partum mothers is effective at decreasing symptoms of engorgement.	Group a- ultrasound therapy, hot moist pack and massage. Group b- hot moist pack and massage.	VAS pain scale, hardness score indicated by hardness scale, and level of engorgement measured by six-point engorgement	Pain was measured on the VAS Scale pre and post intervention on each day. On day 2, 3, and 4 the post scores were statistically significantly lower for group a than group b. Hardness	There was no significant difference in pain scores pre-intervention between group a and b, but group a did start with a statistically significantly lower hardness score and a statistically significant higher level of engorgement based on the SPES. The methods section of this study was scarce and the actual interventions were not described,

	Design: RCT, Convenience sampling from KLE's Dr. Prabhakar Kore Hospital in Belgaum, India. Randomized into group a: ultrasound, hot moist pack and massage or group b: conventional therapy (hot moist pack and massage). *Subjects*: N=80 immediate postpartum mothers. Mean age 24.05 in group a and 24.25 in group b.		scale (SPES)	scores were significantly lower in group a compared to group b from pre to post intervention on days 1-4. SPES score was statistically significantly lower in group a then group b. Pain was decreased significantly more from day 1 pre to day 4 pre and day 1 post to day 4 post in group a then group b, but no significant difference change in hardness or level of engorgement.	so it is difficult to reproduce in the clinic based on this data. The study used US for non-thermal effects only. These results are promising that adding US can decrease pain felt from engorgement when added to conventional treatment of hot packs and massage, but the applicability of these results is greatly limited due to very little description of intervention methods.
McLachlan 1990 Breast Engorgement[7]	*Purpose*: To test the efficacy of thermal ultrasound in treating pain and hardness symptoms from postpartum breast engorgement when compared to a placebo US machine providing surface heat only.	Treatment took place about 1 hour before breastfeeding or milk expression. Treatment completed by a physiotherapist with continuous ultrasound using aqua sonic	VAS pain scale. Scores taken before and after treatment. A digital tonometer designed for this study to measure an objective hardness of the	Both ultrasound and control treatment significantly reduced pain and hardness for each breast treated. No significant differences between duration of breastfeeding after treatment.	Only 3 women were lost to follow up, two because they were uninterested in participating and one because her infant died. No evidence that cesarean delivery contributed to increased likelihood of developing breast engorgement because rate of cesarean in study group was the same as the whole hospital. Overall, another case of placebo effect. The control machine also did provide superficial warmth, which

	Design: RCT, intervention group used Medtronic model P300 and the control machine used identical machine with crystal removed and replaced with a resistor so that only surface heat was emitted. Individuals were recruited via referrals from lactation consultants to physiotherapists. Each individual breast (since some women may have pain in both breasts) was randomized to treatment A or treatment B. *Subjects*: N=109.	ultrasound transmission gel. The intensity was adjusted for comfortable warmth. Application head of US was massaged over breast towards Arellano. Duration of treatment ranged from 8 minutes for A cup breast and up to 15 minutes for DD cup breast or larger. Women were evaluated the following morning and treated again if showed poor milk flow, persistent areas of redness, pain, or hardness of the	breast. 4 tonometer readings were taken before and after treatment. Final outcome was duration of breastfeeding.		can contribute to its effectiveness. More RCTs should be performed with different dosing of US to further assess its efficacy.

	Women treated first few days postpartum, with mean interval between birth and treatment being 82 hours. Age range from 16-42 with an average age of 30.4.	breast. # of treatments ranged from 1-6.			
Witt et al. 2015 Engorgement, Plugged Ducts, and Mastitis[8]	*Purpose*: To evaluate the effectiveness of therapeutic breast massage in lactation (TBML) on short term and long term pain level in women with engorgement, plugged ducts, and mastitis. *Design*: A case controlled study. Arm 1-intervention group. Participants enrolled from those who were referred to Breasfeeding Medicine of Northeast Ohio.	Participants in Arm 1 received TBML from a trained clinician. This consists of focused gentle massage toward the axillae that alternates with hand expression of breast milk. The intervention also consisted of basic breastfeeding support: latch correction, education on engorgement	All participants filled out a medical history as well as a history of breastfeeding problems and what they had previously tried at home to address their condition. Breast and nipple pain was measured on a scale of 0-10. This measure was taken pre and post	Breast and nipple pain significantly decreased following massage. At 2-day survey, 92% reported pain improvement and 43% reported pain resolution. Engorgement severity was significantly decreased following massage and the number of participants with peri-areolar swelling also significantly decreased.	Even though there were not significant findings between arm 1 and arm 2, 86% of women at day 2 found the treatment very helpful and 82% continued to rate it helpful at 12 weeks. Mothers reported immediate relief, learning specific techniques and support received were most helpful from the treatment. This study shows promising results for TBML on reducing symptoms of engorgement for breastfeeding mothers. This study had mothers that were not immediately postpartum, which is valuable as many other studies focus on immediately postpartum women. In order for these results to have more power, a RCT should be done with a larger sample size. It would also be interesting to incorporate teaching the massage

	Arm 2-control comparisons that were enrolled from a general pediatric practice- excluded if they had received TBML. Subjects: N= 42, control group of 73. In the intervention group, 15 had a diagnosis of engorgement and 27 had a diagnosis of mastitis or plugged duct. Median maternal age was 32 years and median infant age was 5 weeks	and feeding patterns, as well as milk supply assessment. Median length of massage was 30 minutes, with a range between 15 and 60 minutes. Arm 2 received basic breastfeeding support described above as well as education on massage and hand expression, but no hands on intervention was done.	massage, during treatment, and in a 2-day and 2-week follow up email surveys. Engorgement severity was rated on Humenick engorgement scale from 1-6. This measure was recorded pre and post massage as well as at the 2-day follow up survey. Plugged duct severity was rated from 0-4 and was recorded pre and post massage. Participants were also asked if they felt the massage in office was helpful and responded categorically	Plugged duct severity also significantly decreased following massage. During 2-day follow up, participants from arm 1, who originally presented with more severe engorgement, showed no significant difference when compared to arm 2. There was no difference in pain at 2-week follow up. At 12-week follow up, there was no significant difference between groups in pain, number who were breastfeeding and breastfeeding complications.	techniques to the participants and following up to evaluate if this method can be effectively done at home. As the authors discussed, this treatment is not done in a vacuum but surrounded by standard medical care for engorgement, mastitis and plugged ducts. As physical therapists, we often treat patients postpartum for either pelvic floor issues or other pain that occurs due to birth or more relaxed ligaments. We would not be the primary treaters for this condition but could offer valuable pain relief through TMBL.

			responded between not helpful and very helpful.		
Cooper and Kowalsky et al. 2015 Blocked Ducts[9]	*Purpose*: To evaluate the effect of a comprehensive physical therapy treatment on the symptoms of blocked ducts. *Design*: A prospective pre/post test cohort study design. Each breast evaluated individually for pain and difficulty breastfeeding. *Subjects*: N= 36. All women had blocked ducts. Age range from 26-44 with mean age of 33.16. Women had symptoms of blocked ducts for more than 48 hours and were referred by lactation	Most women were seen for 1-2 visits. Treatments were approximately 1 hour followed by patients breast feeding if possible. Heat: cervical hydrocollator packs applied to involved areas for 10 minutes. Ultrasound: 1 MHz frequency, intensity 2.0 W/cm2. 5-6.5 minutes for a treatment area of 2-3x ERA (effective radiating head). US focused on area from lump	No outcome measures that exist for "difficulty nursing'' or "confidence in ability to successfully manage nursing independently", so used 3 VAS scales. 1- Pain, 2- difficulty breast feeding, 3- confidence in ability to successfully manage nursing independently.	Statistically significant differences in pre-and post VAS scores in measurements of pain, difficulty breastfeeding and confidence in breastfeeding.	The authors of this study recommend that a visit with a lactation consultant as a first line of intervention, with a referral to physical therapy as needed. This study provides low level evidence that comprehensive physical therapy treatment of heat, ultrasound, manual techniques, and patient education can be effective at reducing pain from blocked ducts. More studies looking at individual components of the treatment should be done, as well as studies with larger numbers of patients to confirm the results of this study.

	consultants.	from blockage to the nipple. Manual techniques: manual expression with therapist performing a gentle rolling motion with the thumb. Once blockage appeared to be partially cleared, the therapist expressed milk with one hand while her second hand behind the lump and applied very gentle pressure towards the nipple to help flush the blockage through the duct.			

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