Peer-Reviewed Literature and Online Reference Summaries
In Support of Moist-Heat and/or Cold Compress Applications to Treat Various Breastfeeding Conditions

There is overwhelming support for the application of moist-heat compresses to relieve mastitis, clogged/plugged ducts, milk blebs and blisters, engorgement and nipple pain; to increase milk-flow, encourage let-down and to help prevent mastitis, in addition to cold compress applications in certain circumstances. Below are the peer-review literature cites and summaries.

1. The Management of Nipple Pain and/or Trauma Associated with Breastfeeding. ANJ. 2009 Aug 9; 17(2) 128. 32-35. Clinical Update. The Best Practice Information Sheet.

The objective of this clinical update and best practice information sheet is to determine the effectiveness of interventions used by and for breastfeeding women to prevent and/or reduce nipple pain and trauma. Many studies included in the reviews were randomized controlled trials with small sample sizes and a large overlap of primary studies included in the two systematic reviews. Nipple pain and trauma (defined as: pain sensation on frictional and suction lesions of nipple ranges from uncomfortable feeling to severe pain with physical trauma (cracked, sore, bleeding, oedematous, erythemic, blistered nipples that may have fissures present) associated with breastfeeding) as complication associated with breastfeeding are considered among the most significant factors impacting on breastfeeding in the first weeks of motherhood. Among the options of applying warm water compresses, breast milk or teabags, warm water compress was found to be the most effective intervention in controlling nipple pain and trauma. A RCT compared four interventions on 73 primiparious breastfeeding women and were asked to perform their allocated treatment four times a day after breastfeeding. A statistically significant improvement in pain scores and pain effect was found in the warm water compress group as compared to the others. Another RCT including 65 primiparous women showed that warm water was more effective. 90 primiparous women were randomized into 3 groups, women who applied warm compresses (as opposed to doing nothing or using milk), showed the lowest pain intensity and pain affect. An RCT involving 177 primiparious women compared four different interventions, warm water compress, milk massaged into the nipple and air dried, instruction only and modified lanolin. The warm water compress group reported the lowest pain intensity and affect.

The application of warm water compresses for nipple pain and trauma were found to be the most effective intervention in controlling nipple pain and trauma, and those that

(716) 362-0237
Email: rachel@rachelsremedy.com

used moist heat had a significant improvement in pain scores as compared to others in a controlled group that did not use moist heat.

2. Foxman, B D'Arcy, H, Gillespie, B., et al. Lactation Mastitis: Occurrence and Medical Management among 949 Breastfeeding Women in the United States. Am J Epidemiol. 2002 (155)(2): 103-114.

Between 1994-1998 the authors followed 946 breastfeeding women from Michigan and Nebraska for the first 3 months postpartum or until they stopped breastfeeding to describe mastitis incidence, treatment and associations. Risk factors fell into two categories, poor breastfeeding technique (which can lead to poor drainage of a duct, cracks of the nipple) and lowered immune status. The majority of women were diagnosed over the telephone. The most common symptom was breast tenderness (98%). In addition to antibiotics for some of the women, health care providers suggested applying hot compresses in 83% of the women in the study. Hot compress application was the second most recommended course of treatment by health care providers for mastitis. p. 105. Cracks and nipple sores were associated with an increase in mastitis rate. p. 106. The strongest risk factors were history of mastitis, cracks and nipple sores, feeding changes and using a manual breast pump. As antibiotic resistance is an increase concern, better algorithms to distinguish between milk stasis and mastitis without the benefit of physical examination are required.

Moist heat treatment was the second most recommended way to treat mastitis.

3. Giugliani, E. Common problems during lactation and their management. J Pediatr (Rio J). 2004; 80(5 Suppl): S147-54.

This article reviews major difficulties encountered in breastfeeding and their management and provides technical and practical information necessary for health professionals to promote, protect and support breastfeeding. Common problems discussed include engorgement, nipple pain/trauma, nipple infection, candidiasis, Raynaud's phenomenon, plugged ducts, mastitis, breast abscess. Warm compresses are recommended for sore nipples, Raynaud's Phenomenon, plugged ducts (and milk blebs or blisters), mastitis and engorgement to help with the ejection of the milk, and cold compresses after or between feedings to reduce edema, vascularization and pain of engorgement, and for mastitis after feedings or short intervals to help relieve the symptoms.

(716) 362-0237
Email: rachel@rachelsremedy.com

This article verifies the application of moist heat for milk flow, sore nipples, Raynaud's Phenomenon, plugged ducts and mastitis, and the application of cold compresses for engorgement and mastitis.

4. Heller, M., Fullerton-Stone, H., Murase, J. Caring for new mothers: diagnosis, management and treatment of nipple dermatitis in breastfeeding mothers. International Journal of Dermatology. 2012. 51: 1149-1161.

The purpose of this article is to educate dermatologists and act as a guide to effectively diagnose and treat various causes of nipple pain because it is the most common reason for early discontinuation of breastfeeding. There are many possible etiologies of nipple dermatitis among nursing mothers, including plugged lactiferous ducts (milk blisters/blebs), psoriasis, dermatitis, infections, HSV and or vasospasm. Plugged lactiferous ducts (milk blisters) can present as localized tenderness in the breast from inadequate expression of milk. A firm painful area may be present on the affected breast, while a tender, white small bleb may appear on the nipple. The bleb results from an overgrowth of epithelium or an accumulation of fatty substance. Plugged ducts can occur deeper in the breast tissue when the flow of milk is blocked. A chronically plugged duct can result in a milk cyst. When milk stagnates due to plugged ducts, mastitis can develop. Management of nipple dermatitis: When a breastfeeding mother presents with sore nipples, dermatologists should first and foremost manage pain. p. 1156. "Warm water compresses have been shown to be effective in treating sore nipples and superior in reducing pain compared with the use of lanolin or dried breast milk." p. 1157. "Plugged lactiferous ducts are usually treated with warm compresses or sterile needle aspiration." p. 1158.

This article verifies that moist heat compresses are effective in treating sore nipples, reducing pain, treating plugged ducts and preventing mastitis.

5. Neifert, M., Seacat, J. Medical Management of Successful Breast-Feeding. Prevention in Primary Care, Pediatric Clinics of North America. 33(4) 1986, August. 743-63.

This is a guidance article meant to assist practitioners to provide professional guidance in the management of breastfeeding conditions and throughout the course of lactation. Engorgement is best managed by frequent nursing and measures to enhance milk let-down, such as heat applied to the breasts prior to nursing, which can be helpful in improving milk flow. Cool compresses applied to the breasts between feedings may alleviate further congestion. p. 750. Several methods can minimize sore nipples,

(716) 362-0237
Email: rachel@rachelsremedy.com

including heat which enhances the let-down reflex. p. 751. The application of heat may afford temporary relief of uncomfortable engorgement and facilitate the let-down reflex. p. 756. "Because unrelieved engorgement or an obstructed duct is often the precursor to mastitis, mothers should be cautioned against allowing uncomfortable engorgement to persist or long intervals to elapse between nursings." p. 757.

This guidance article is relevant because it recommends heat applications to the breasts prior to nursing to help with let-down, milk flow and sore nipples, and cool compresses between feedings to alleviate engorgement.

6. Resmy V, Nalini S.J., Sumathi, G. Effect of Lukewarm Water Compress On Prevention of Nipple Pain and Breast Engorgement Among Primiparous At A Selected Hospital In Chennai. Journal of Science. 2014. 4(10). 620-624.

An equivalent control group study was conducted among 60 breastfeeding women who underwent caesarean section. For the study group, lukewarm water was applied with a sponge cloth over the breast which was replaced every five minutes for 20 minutes total for two sittings on the 2nd, 3rd, and 4th postnatal day. The control group received routine care. Comparison between the observations of the study and control group showed a significant reduction in nipple pain and breast engorgement in all three sittings. This study suggests that lukewarm water compress consistently prevents nipple pain and breast engorgement. "Moist heat application to engorged breasts, especially before feeding helps to increase circulation and brings the hormone ocytocin to trigger milk let-down. Wrapping breasts in warm, wet towels for ten to twenty minutes initiates milk dripping and decreases breast congestion. The options for preventing breast engorgement includes frequent breastfeeding, breast massage, hot compress and showers, cold compress before and after feedings, frozen bag of vegetables…child cabbage leaves… The lukewarm water compress is simple, easily available home remedy convenient to apply without pain and side effects, promotes the well-being and comfort of mother and baby and prevents breast engorgement." p. 621. The results showed the amount of breast milk obtained from warmed breasts were significantly higher than that obtained from nonwarmed breasts and warm water compress helps to increase the amount of breast milk because it improves vascular tone and prevents the stasis of milk and helps in milk let down. (Page 623). These results were supported by similar study conducted by comparing the effectiveness of mother's milk, tea compress and warm moist compress on the prevention of nipple problems in 105 breastfeeding women. The results showed that nipple pain was less in warm moist application to the nipple than in the milk and tea groups. P. 623

(716) 362-0237
Email: rachel@rachelsremedy.com

This study verifies the effectiveness of moist heat applications and showed a significant reduction in engorgement and nipple pain, it encourages let down and milk flow; it can be used without pain and side effects, and it promotes the well-being and comfort of the mother.

7. Spencer, J. Management of Mastitis in Breastfeeding Women. American Academy of Family Physicians. Website. 2008, Sept. 15; 78(6).

This article sets forth the incidence and treatment of mastitis in breastfeeding women. Mastitis occurs in approximately 10% of U.S. mothers who are breastfeeding and can lead to the cessation of breastfeeding. Mastitis is defined as inflammation of the breast. To extend breastfeeding duration, family physicians must become more adept at helping mothers overcome breastfeeding difficulties such as mastitis. Sore nipples may be an early indicator of a condition that may predispose patients to mastitis. Blocked milk ducts can lead to mastitis. This condition presents as localized tenderness in the breast from inadequate milk removal from one duct. A firm, red, tender area is present on the affected breast, and a painful, white, 1-mm bleb may be present on the nipple. Removal of the bleb can be beneficial. "Treatments include frequent breastfeeding **and the use of warm compresses or showers**." p. 729.

This article verifies the use of warm compresses for the treatment of mastitis, blebs and blocked ducts.

8. Strong, G. Provider Management and Support for Breastfeeding Pain. JOGNN. 2011; 40, 753-764.

This study's objective is to describe breastfeeding pain reported by breastfeeding women during the first year postpartum and provider's management of the pain as recorded in medical records. 117 breastfeeding women participated (mastitis 67.5%, candidiasis 32.4%, engorgement 18%, nipple tenderness 8.1%, and clogged milk ducts 4.5%). Limited documentation of breastfeeding support beyond prescribe medications was found. Inadequate breastfeeding support and management is evident and non-evidence based recommendations were routinely practiced. Health care providers rarely utilize non-pharmacological management options in combination with medications. Breastfeeding women took the initiative to seek assistance for their breastfeeding problems, and a registered nurse addressed the problem using standard protocols unless a physician was needed for consultation. Based on practice guidelines of the American

(716) 362-0237
Email: rachel@rachelsremedy.com

Congress of Obstetricians and Gynecologists and the Association of Women's Health, Obstetric, and Neonatal Nurses: to treat mastitis, warm compresses are one of the best practices, while antibiotics were prescribed in 96% of the cases, continuing to feed on the affected side, pumping and warm compresses were the techniques most frequently recommended; to treat engorgement, cold compresses were recommended for 55% of the participants which fell well within the recommended guidelines; and, warm compresses compromised 22.2% of the recommendations for management for plugged ducts and breastfeeding pain which fell well within the recommended guidelines. If untreated, plugged ducts can lead to mastitis. p. 760.

The application of warm compresses to treat mastitis and plugged ducts, and the application of cold compresses to treat engorgement were recommended by providers and are the recommended treatments in the practice guidelines of the American Congress of Obstetricians and Gynecologists and the Association of Women's Health, Obstetric, and Neonatal Nurses.

9. Walker, M. Conquering Common Breast-feeding Problems. J Perinat Neonat Nurs. 2008. 22(4). 267-274

This article describes strategies and interventions to alleviate common problems that breastfeeding mothers frequently encounter. More than one-third of mothers report one or more early problems with breastfeeding. Prompt resolution is essential. 80% of the women experienced blisters. Common problems need not mean the end of breastfeeding if they are recognized and treated promptly. Nurses are in an ideal position to help mothers prevent, identify and remediate early breastfeeding challenges. A nipple bleb presents as a shiny white bump on the tip of the nipple that typically causes severe pinpoint pain when the infant feeds. It results from a nipple pore that is blocked by milk seeping under the epidermis. If it completely blocks the flow of milk, plugged ducts and mastitis can result. Warm soaks are recommended to help soften the skin and open the bleb. p. 269. Vasospasm and Raynaud's phenomenon of the nipple cause extreme pain and is relieved by heat pack applications as the "first-line management." Many therapies for the prevention and soothing of sore nipples of sore nipples include application of warm wet compresses, tea bags and human milk. Mastitis can be a non-infective inflammation treated by heat, frequent breast drainage and ibuprofen, or an infective process requiring antibiotics.

Application of moist heat to treat milk blebs, plugged ducts and mastitis, and for other pain and discomfort is the first-line management for these conditions.

(716) 362-0237
Email: rachel@rachelsremedy.com

Website Literature and Reference Summaries

1. ChildrensHealthNetwork.org. Breast-Feeding: Let-Down Reflex. Website. http://www.childrenshealthnetwork.org/CRS/CRS/pa_syntocin_pep.htm. Accessed April 8, 2015.

The Children's Physician Network consists of approximately 200 primary care pediatricians, nurse practitioners, 500 subspecialty physicians. This online publication discusses let-down and advises one of the ways to improve milk flow is to put a warm washcloth or heating pad on your breasts, or take a warm shower.

2. HealthyChildren.Org through the American Academy of Pediatrics. Engorgement. Website. http://www.healthychildren.org/English/ages-stages/baby/breastfeeding/Pages/Engorgement.aspx. Accessed April 8, 2015.

HealthyChildren.org is a website dedicated to the health of children through the Amercian Academy of Pediatrics. This online publication recommends the use warm water soaked cloths on breasts for engorgement (to help with letdown and milkflow) or for severe engorgement use a cool compress.

3. HealthyChildren.Org through the American Academy of Pediatrics. Clogged Milk Ducts. Website. http://www.healthychildren.org/English/ages-stages/baby/breastfeeding/Pages/Clogged-Milk-Ducts.aspx. Accessed April 8, 2015.

This online publication recommends the use warm moist towels on the affective breast several times a day to treat clogged milk ducts.

4. HealthyChildren.Org through the American Academy of Pediatrics. Mastitis. Website. http://www.healthychildren.org/English/ages-stages/baby/breastfeeding/Pages/Mastitis.aspx. Accessed April 8, 2015.

This online publication recommends the use warm compresses as one of the treatments for mastitis.

5. La Leche League International. My breasts feel extremely full and

(716) 362-0237
Email: rachel@rachelsremedy.com

uncomfortable. What is happening and what can I do about it? Website. http://www.llli.org/faq/engorgement.html. Accessed April 8, 2015.

The La Leche League International is the an international organization that provides information and support to breastfeeding mothers. This online publication recommends warm moist compresses to help express milk to relieve engorgement, and cold compresses to be used between feedings to reduce swelling and relieve pain.

6. La Leche League International. Dealing with a Plugged Duct or Mastitis. Website. http://www.llli.org/nb/nbmarapr07p76.html. Accessed April 8, 2015.

This online publication recommends warm compresses applied to the affected breast to treat plugged ducts and mastitis to promote drainage.

7. Nursing Mothers Counsel. Maintaining a milk supply for the premature or ill infant. Website. http://www.nursingmothers.org/html/supply.html. Accessed April 8, 2015.

The Nursing Mothers Counsel is a non-profit organization and provided this pamphlet according to the policies, procedures and approval of the Mothers Milk Bank of the Institute of Medical Research. The application of moist heat to the breasts is to encourage let-down.

8. St. Luke's Hospital. Breastfeeding Your Baby. Mother-Baby Resource Guide. Website. https://www.slhn.org/imgs/facility/NewBegBreastfeeding08.pdf. Accessed April 8, 2015.

There are many breastfeeding resource guides available online and given to new mothers at their birthing hospital that are designed to help new parents prepare for breastfeeding. The St. Luke's Mother-Baby Resource Guide is a comprehensive and common such resource. In a "Treatment Measures For Let-down Difficulty" chart, before nursing, application of moist heat to the breasts is recommended to help with let-down. F-3. In a chart entitled "Here Are Some Tips That May Help Engorgement", moist heat applications before nursing to help the milk flow out of the ducts is recommended. F-16 Ice pack application to the breasts is recommended between feedings to relieve swelling and discomfort. F-16. In the chart entitled "What To Do For A Plugged Duct", warm moist heat applications to the affected breast before each feeding and between feedings is recommended. F-17. In the chart entitled "What To Do For Mastitis", Applications of warm, moist heat to the affected breast before each feeding and

(716) 362-0237
Email: rachel@rachelsremedy.com

in between feedings is one of the recommendations. Application of cool compresses after feedings is recommended. F-18. Application of crushed ice in a wet washcloth or a frozen washcloth to the nipples prior to feeding is recommended to ease sore nipples. F-19.

This Resource Guide provides identical recommendations for moist heat and cold applications.

9. WomensHealth.gov via The Centers for Disease Control and Prevention. Common breastfeeding challenges. Website http://www.womenshealth.gov/breastfeeding/common-challenges/#a. Accessed April 8, 2015.

The Centers for Disease Control and Prevention refers women to the womenshealth.gov site for breastfeeding questions and answers. This publication recommends the following treatments for breastfeeding conditions: Cold compress or washcloth to reduce discomfort and swelling for oversupply of milk; for engorgement, use cold compresses in between feedings to help ease the pain; for plugged ducts use a warm compress on the sore area; for breast infection (mastitis) apply heat to the sore area with a warm compress.

(716) 362-0237
Email: rachel@rachelsremedy.com