CME

Mastitis: Rapid Evidence Review

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Mastitis represents a spectrum of inflammatory conditions. Lactational mastitis is the most common, with an approximate incidence of 10% in the United States, and it usually occurs in the first 3 months postpartum. Diagnosis is made clinically based on the presence of symptoms such as fever, malaise, focal breast tenderness, and overlying skin erythema or hyperpigmentation without the need for laboratory tests or imaging. However, obtaining milk cultures should be considered to guide antibiotic therapy, and ultrasonography should be performed to identify abscesses in immunocompromised patients or those with worsening or recurrent symptoms. Because most cases of mastitis are caused by inflammation and not a true infection, a 1- to 2-day trial of conservative measures (i.e., nonsteroidal anti-inflammatory drugs, ice application, feeding the infant directly from the breast, and minimizing pumping) is often sufficient for treatment. If there is no improvement in symptoms, narrow-spectrum antibiotics may be prescribed to cover common skin flora (e.g., *Staphylococcus*, *Streptococcus*). Most patients can be treated as outpatients with oral antibiotics; however, if the condition worsens or there is a concern for sepsis, intravenous antibiotics and hospital admission may be required. Use of probiotics for treatment or prevention is not supported by good evidence. Factors that increase the risk of mastitis include overstimulation of milk production and tissue trauma from aggressive breast massage; therefore, frequent overfeeding, excessive pumping to empty the breast, heat application, and breast massage are no longer recommended because they may worsen the condition. The best prevention is a proper lactation technique, including a good infant latch, and encouraging physiologic breastfeeding rather than pumping, if possible.

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Mastitis is a common inflammatory condition most often associated with lactation, but it can also occur in nonlactating individuals.[1] It is no longer considered a single diagnosis but a spectrum of disorders that results from inflammation in the mammary gland.[2] This article provides a summary and review of the best available patient-oriented evidence for mastitis spectrum disorders.

EPIDEMIOLOGY

- Mastitis can occur in lactating and nonlactating individuals, but lactational mastitis is the most common, with an incidence of 2% to 33% worldwide and approximately 10% in the United States.[1,3-8] The wide range of incidence is due to differences in the definition of mastitis, which can impact the frequency of reporting, level of breastfeeding support, and rates of mastitis across different populations worldwide.[3,5] Low socioeconomic status and lack of studies in low-resource settings also play a role.[4,9]
- Lactational mastitis may occur within the first 2 to 3 weeks postpartum; however, 75% to 95% of patients will present within the first 3 months postpartum.[1-3,5,9,10]
- Risk factors for developing lactational mastitis include overstimulation of milk production (from hyperlactation or excessive pumping) and recent antibiotic use that may disrupt the normal balance of bacterial flora. Hyperlactation is less likely to occur when the infant is fed directly from the breast compared with pumping.[2,3,6,7,10-16]
- Other factors that may contribute to the development of lactational mastitis include the use of nipple shields; poor infant latch (e.g., due to a cleft lip and palate or ankyloglossia [tongue-tie]) that results in inadequate feeding technique and possible nipple trauma; wearing tightly fitted clothing or bras; history of mastitis; primiparity; poor maternal nutrition; and tissue trauma from aggressive breast massage.[1-3,5,6,10,14,17-22]
- Milk stasis (i.e., lack of milk flow that results in the buildup of milk in the breast) and occasional missed feedings were previously identified as risk factors for lactational mastitis but are

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SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	Comments
Most cases of mastitis are caused by hyperlactation, oversupply, and dysbiosis; overfeeding and excessive pumping should be avoided. Physiologic, or direct, breastfeeding, rather than pumping, is recommended.[2,3,6,10,11,14,17,25]	C	Consensus, disease-oriented evidence, usual practice, expert opinion, or case series
Heat application, breast massage, and frequent complete breast emptying are no longer recommended to avoid milk stasis because they worsen the condition by increasing underlying inflammation and decreasing feedback inhibition.[2,3,5,6,10,14,17-20]	C	Consensus, disease-oriented evidence, usual practice, expert opinion, or case series
Recommendations for the treatment of mastitis spectrum disorders are aimed at targeting the underlying inflammatory process and include breast rest, ice application, and nonsteroidal anti-inflammatory drugs.[2,3,6,10,11,14,17,25,28]	C	Consensus, disease-oriented evidence, usual practice, expert opinion, or case series
If antibiotics are used for acute bacterial mastitis, they should be narrow spectrum and targeted to the most common associated bacteria (e.g., *Staphylococcus, Streptococcus*).[1,2,6,8,43]	B	Inconsistent or limited-quality patient-oriented evidence

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to https://www.aafp.org/afpsort.

no longer thought to be as strongly correlated. There is also no good evidence for yeast as a causative organism.[2,23-25]

• Nonlactational mastitis is rare and more often associated with immunosuppressive conditions and Hispanic ethnicity.[26] It is also linked to a possible increased risk of breast cancer.[6,27]

PREVENTION

• Few trials have examined mastitis prevention strategies. Based on expert opinion, it is thought that optimizing infant latch and feeding the infant from the breast may prevent mastitis. This can be accomplished by working with a lactation consultant. Most cases of mastitis are caused by hyperlactation or oversupply, which is often associated with excessive pumping.[1-3,6,10,11,14,17,20,25,28,29]

• Experts suggest encouraging patients to get enough sleep, use stress reduction techniques, consume an adequate amount of fluids, and wear loose fitting clothing and bras.[2,3,10,14,17,28,30] In cases of subacute mastitis, an observational study found that an anti-inflammatory plant- and oil-based diet rich in antioxidants, minerals, and vitamins, such as the Mediterranean diet, may be beneficial to help prevent the progression to fulminant mastitis.[18]

• Whenever possible, physiologic feeding (i.e., feeding the infant from the breast rather than pumping) should be used because it discourages hyperlactation and disrupted mammary bacterial balance.[2,6]

• Pumping should be reserved for times when the mother is separated from the infant, and the volume of milk removal should be limited to only what the baby would consume.[2,6,7] Patients should be counseled to use a proper flange size for breast pumps to encourage efficient milk removal and to avoid nipple trauma. Breast pumps usually come with instructions for how to measure their flange size, or they can be found on the manufacturer's website.

• Patients may consider a daily probiotic for prevention (*Limosilactobacillus fermentum* and *Ligilactobacillus salivarius* have been studied), although evidence is weak and more rigorous studies are needed.[2,31-36]

DIAGNOSIS

• The differential diagnosis of conditions in the mastitis spectrum is outlined in Table 1.[2,23] Inflammatory breast cancer should be considered in the differential diagnosis for all patients presenting with possible mastitis because this rare but serious diagnosis may be overlooked, especially in lactating individuals.[3,6,37]

Signs and Symptoms

• With the exception of postpartum engorgement, which is most often bilateral and non-segmental and encompasses the entirety of each breast, patients typically present with an erythematous or hyperpigmented, focally tender, indurated segment in a unilateral breast.[3,6]

• Some patients may also experience systemic symptoms including fatigue, fever greater than 38.3°C (100.9°F), malaise, body aches, headache, and flulike symptoms.[1-3,6,11]

Diagnostic Testing

• Diagnosis is clinical and laboratory tests and imaging are not needed except in patients with severe disease or those who are immunocompromised.[2,3,6,11]

• Laboratory tests, including white blood cell count, white blood cell differential, and C-reactive protein, are rarely useful

TABLE 1

Differential Diagnosis of Mastitis Spectrum Disorders

Diagnosis	Clinical characteristics	Management
Early postpartum engorgement	Bilateral breast pain and swelling, usually 3 to 5 days postpartum, but can be later	Minimize pain and swelling by reducing intravenous fluids during labor; promote rooming with infant to encourage physiologic breastfeeding; and avoid pumping, which may worsen engorgement; hand expressing a small amount of breast milk for comfort may be considered
Ductal narrowing (i.e., plugged or clogged milk duct)	Palpable lump or clog of indurated or congested breast tissue (this is not a discrete "plug of milk" because ducts are microscopic and this is not physiologically possible); no systemic symptoms	May resolve spontaneously or with anti-inflammatory treatments
Subacute mastitis	Needle-like, burning breast pain, milk blebs, or recurrent areas of induration; symptoms are milder than acute mastitis and systemic symptoms are uncommon	Not infectious and does not need antibiotics; conservative treatment with NSAIDs, ice application, feeding infant directly from the breast, and short breast rest if necessary
Inflammatory mastitis	Increasing erythema or hyperpigmentation, edema, pain in a region of the breast associated with systemic systems, such as fever, chills, and tachycardia; systemic inflammatory response syndrome may occur without infection	NSAIDs and ice application; not infectious and does not need antibiotics
Bacterial mastitis	Worsening induration, erythema, or hyperpigmentation in a region of the breast that may spread to different quadrants; systemic symptoms lasting > 24 hours; no response to conservative measures. CBC and CRP levels are of limited benefit in the diagnosis because they may be elevated with inflammation	Requires antibiotics and conservative measures (e.g., breast rest, NSAIDs, ice application)
Phlegmon	Firm, mass-like area without fluctuance that represents a complex, ill-defined fluid collection; can be confirmed with ultrasonography (e.g., indistinct fluid, hypervascularity)	Should not be drained because there is no drainable fluid pocket; may require extended antibiotics and can progress to a drainable abscess; therefore, close follow-up examination and imaging are needed
Abscess	Progressive induration, erythema, and possible palpable fluid collection in a well-defined area of the breast, signifying infection; symptoms may abate as the body walls off the infection or the patient's condition may worsen	Ultrasonography can be used to diagnose; requires drainage; interval examinations and follow-up imaging are needed to ensure resolution
Galactocele (milk retention cyst)	Ductal narrowing causes a cyst-like cavity containing obstructed milk; size may increase over time, fluctuate throughout the day, or temporarily decrease after breastfeeding; no erythema, systemic symptoms, or significant pain unless it becomes infected	Should not routinely aspirate because there is almost always incomplete drainage and recurrence may necessitate repeat aspiration, which may cause infection; if aspirated, a drain should be placed

Note: Listed in order of most to least common.

CBC = complete blood count; CRP = C-reactive protein; NSAID = nonsteroidal anti-inflammatory drug.

Information from references 2 and 23.

because leukocytosis and elevated C-reactive protein levels occur almost universally in patients with conditions on the mastitis spectrum, and they do not differentiate a systemic inflammatory response from a bacterial infection.[2,3,6,11]

- Common pathogenic organisms in bacterial mastitis include *Staphylococcus* (e.g., *S. aureus*, *S. epidermidis*, *S. lugdunensis*, *S. hominis*) and *Streptococcus* (e.g., *S. mitis*, *S. salivarius*, *S. pyogenes*, *S. agalactiae*), which are part of the usual skin flora.[2,3,19,38]
- Milk cultures are rarely needed. False-positive cultures are common due to normal bacterial colonization, and negative cultures do not definitively rule out bacterial mastitis. It is acceptable to obtain a sterile, clean-catch sample of milk for culture in higher-risk patients, including those who do not improve after 48 hours on antibiotics; immunocompromised patients; those with an infant in the neonatal intensive care unit; those at high risk for methicillin-resistant *S. aureus* (e.g., significant health care exposure); those with recurrent or severe infection (e.g., requiring hospitalization, patients who are septic); or if there is a high suspicion for antibiotic resistance.[2,3,28]
- Consider ultrasonography of the breast if the condition does not improve as expected, within 48 hours, or if there is a high suspicion for abscess.[1,2,23,39]

TREATMENT

Lifestyle and Behavioral Interventions

- In 2022, based on expert opinion, the Academy of Breastfeeding Medicine updated their recommendations for the management of mastitis spectrum disorders after several traditional treatment methods were found to worsen the condition by increasing underlying inflammation and decreasing feedback inhibition. These treatments include heat application, breast massage or vibration, and frequent, complete emptying of the breast, especially if using a breast pump.[2,3,5,6,10,14,17-20,23]
- New recommendations for treatment emphasize ice or cold application to vasoconstrict the blood vessels and the use of oral nonsteroidal anti-inflammatory drugs. For most patients, continuing to feed the infant directly from the breast should be encouraged, but pumping should be limited or stopped until symptom resolution. Complete breast rest for 24 to 48 hours should be recommended only if the area around the areola is so edematous that no appreciable milk can be expressed because continued stimulation of the area will worsen the problem. Patients should be counseled to expect a drop in milk supply on the affected side, but that it can be recovered at a later time by increasing milk removal from the breast after the inflammation has subsided.[2,3,6,10,11,14,17,23,25,28]
- Because hyperlactation or oversupply is the underlying etiologic factor in most instances of lactational mastitis, patients should be counseled on pump overuse.[2,6] Use of nipple shields should be avoided.[14] When possible, physiologic breastfeeding without pumping is optimal.[2,6]
- If engorgement is present, lymphatic drainage maneuvers and reverse pressure softening may be used to reduce nipple and areolar swelling and to help with infant latch.[2,6]
- Block feeding for 24 to 48 hours should be considered to decrease oversupply. This involves feeding only from one breast for a discrete period to allow the engorged breast to get the signal to make less milk.[2,11,15]
- For nonlactational mastitis, conservative treatment (e.g., nonsteroidal anti-inflammatory drugs, ice) should be emphasized and may be adequate treatment alone; however, there is a lower threshold for antibiotic treatment, incision and drainage,

TABLE 2

Recommendations for Mastitis Treatment and Prevention

Recommended
Adequate fluids
Avoid nipple pads that do not allow nipples to dry because they may breed bacteria; allow nipples to air dry
Do not wear tight fitting bras or clothing
Ice application
Improve feeding technique and infant latch to better empty the breast and avoid nipple irritation
Infant's chin should be turned toward the blockage during feeding to drain the area
Proper size of pump flange (during the expression phase, nipple and small amount of areola should be pulled into the tunnel and nipple should be centered and move freely)
Nonsteroidal anti-inflammatory drugs
Rest, sleep, and stress reduction techniques
Equivocal recommendations
Antibiotics
Probiotics
No longer recommended
Breast gymnastics or aggressive massage, shaking the breast, or wrapping the breast in castor oil
Cabbage leaf application
Dangle feeding (i.e., baby lies flat while mother leans over infant so milk flows by gravity)
Frequent complete breast emptying (i.e., breastfeeding as much as possible or pumping affected breast to avoid milk stasis)
Heat application
Massage or vibration (e.g., electric toothbrush, commercial lactation massage devices)
Milk blebs—unroofing the blister
Use of a Haakaa device (i.e., manual breast pump) on the breast to release a plug

Information from references 2, 3, 6-8, 11, 17, 31, 32, and 38.

and imaging, with possible tissue biopsy to rule out malignancy.[37,40,41] Systemic steroids may also be prescribed.[41,42]

- Table 2 outlines recommendations, equivocal recommendations, and interventions that are no longer recommended for the treatment and prevention of mastitis.[2,3,6-8,11,17,31,32,38]
- Tables 3[2] and 4[2,30,33,36] summarize the 2022 recommendations from the Academy of Breastfeeding Medicine for anticipatory guidance and behavioral and medical interventions for the mastitis spectrum.

Drug Therapy

- Not all episodes of mastitis warrant the use of antibiotics.[6,23,29,38,43] Patients may have fever and other systemic symptoms from the inflammatory response that is seen almost universally across the mastitis spectrum, and this does not always signify infection.[23,29,43] Conservative therapy may be used initially, and if symptoms have not improved within 24 to 48 hours or are worsening, antibiotics may be considered.[1,2,6,8,29,43]

TABLE 3

Summary of the Academy of Breastfeeding Medicine Recommendations for the Mastitis Spectrum: Anticipatory Guidance and Behavioral Interventions

Recommendation	Comments
Bras should fit properly and be supportive	Lactating breasts are highly vascular and require support to avoid dependent lymphedema and progressive back or neck pain.
Breastfeeding is supply and demand (feed only on demand; goal is not to empty the breast)	Hand express small volumes of milk only for comfort until milk production downregulates to match infant's needs. If using a breast pump, express only the volume that the infant consumes. Milk volume is a feedback mechanism; increased milk removal increases production. Overfeeding or pumping until empty perpetuates a cycle of hyperlactation and is a major risk factor for worsening tissue edema and inflammation.
Complete sterilization of pumps and household items after every use is not needed	Ascending infection is not supported by the highly vascular nipple anatomy. Avoid cleaning of the nipple because it can lead to skin maceration and pain. Mastitis is not contagious and does not result from poor hygiene. Pump parts should be cleaned appropriately after each use, but routine sterilization is not necessary.
Deep massage should not be performed on a lactating breast	Avoid electric toothbrushes and other commercial vibrating or massaging devices. Hands-on pumping (i.e., gentle compressions during breast pump use) provides an effect similar to hand expression and is safe as long as no excessive force is used. It can cause increased inflammation, tissue edema, and microvascular injury. The most successful technique is manual lymphatic drainage with light sweeping of the skin rather than deep tissue massage.
Education is key (anatomy of the lactating breast)	Breast fullness, lactational glandular tissue, occasional lumps, or pain is normal and is not "plugging." Early postpartum hormonal shifts or a low estrogen state can cause sweating or hot flashes that may mimic fevers. Pain or breast discoloration in the morning after a long stretch of sleep is engorgement, not infection. Reassure the patient that infection does not develop in a period of hours.
Less is more (most cases resolve with conservative care alone)	Decrease stress, encourage rest, and resolve early signs of inflammation (e.g., with nonsteroidal anti-inflammatory drugs or ice application). If mastitis is inflammatory (not bacterial), there is no need for antibiotics. Support continued breastfeeding to prevent early weaning.

continues ➤

• Table 5 lists the recommended first- and second-line antibiotic therapies for the outpatient treatment of acute bacterial mastitis.[2] Narrow-spectrum antibiotics are the preferred treatment for bacterial mastitis and should be targeted to the most common organisms of usual skin flora, *Staphylococcus* and *Streptococcus*.[1,2,6,8,19,38,43]

• Antibiotics in the macrolide class may be the most effective (intracellular mechanism of action) for subacute mastitis.[2]

TABLE 3 (continued)

Summary of the Academy of Breastfeeding Medicine Recommendations for the Mastitis Spectrum: Anticipatory Guidance and Behavioral Interventions

Recommendation	Comments
Minimize the use of breast pumps (often better to directly feed the baby from the breast)	Bacterial mastitis is not a contraindication to breastfeeding and is not contagious, and antibiotics are safe for the infant. Do not instruct the patient to express and discard milk during mastitis. If an improperly sized pump flange is used, the suction is too high, or if pumping for an excessively long time, it can cause trauma to breast parenchyma and nipple areolar complex. If using a pump, the patient should express milk at a frequency and volume that mimic physiologic breastfeeding. Pumping should be limited to when the breastfeeding parent is separated from the infant or if required for other medical reasons. Pumps stimulate breast milk production without physiologically extracting milk like an infant. There is no opportunity for bacterial exchange between the infant's mouth and mother's breast, and this may disrupt the normal bacterial flora.
Topical treatments are not recommended (e.g., saline soaks, castor oil)	Avoid silicone breast pumps filled with Epsom salt; they can macerate skin and worsen localized hyperemia and edema. Mastitis is inflammation or infection in a deep space; therefore, topical treatment is ineffective. There is no evidence to support the use of saline soaking for pain or nipple trauma. These treatments may cause tissue damage, especially if combined with massage.
Use nipple shields only if necessary and for the shortest duration possible	Available evidence does not support their use and has not shown them to be safe or effective. Similar to pumping, they are not physiologic and result in inadequate breast milk extraction. The infant may passively drink milk from the shield repository without latching to the breast correctly.

Information from reference 2.

TABLE 4

Summary of the Academy of Breastfeeding Medicine Recommendations for the Mastitis Spectrum: Medical Interventions

Recommendations	Comments
Antibiotics should not be used in all cases; reserve only for bacterial mastitis	No indication for prophylactic antibiotics for mastitis prevention Some may find symptom relief due to the anti-inflammatory effect of some types of antibiotics, but antibiotics are not indicated if mastitis is not bacterial Try conservative measures first and use only if symptoms are worsening or not improving Use of antibiotics for inflammatory mastitis disrupts the breast microbiome and increases the risk of antibiotic resistance and progression to bacterial mastitis

continues ➤

TABLE 4 (continued)

Summary of the Academy of Breastfeeding Medicine Recommendations for the Mastitis Spectrum: Medical Interventions

Recommendations	Comments
Anti-inflammatory medication is first line to decrease swelling and relieve pain	Acetaminophen, 1,000 mg every 8 hours
	Heat can vasodilate and worsen symptoms, although some patients report comfort with this
	Ice application every hour or more often if desired
	Nonsteroidal anti-inflammatory drugs (e.g., ibuprofen, 800 mg every 8 hours)
	Sunflower or soy lecithin, 5 to 10 g orally daily to decrease ductal inflammation and emulsify milk (alternative dosing: 1,200 mg three to four times daily)
	Use of warm showers and antipyretics did not improve outcomes in randomized controlled trials
Do not forget to address mental health	Patients may have an underlying anxiety disorder if there is excessive worry about recurrence or the inability to stop or cut back on pumping
	Patients who experience breastfeeding complications experience an increase in perinatal mood and anxiety disorders
	Patients with a history of anxiety and depression experience higher rates of mastitis symptoms[30]
	Pay special attention to those feeling defeated or withdrawn due to difficulties with breastfeeding
Hyperlactation or oversupply is often the underlying cause of mastitis	Avoid early or excessive pumping
	Do not instruct to pump every 2 hours to empty the breast; this will help to prevent mastitis
	Do not instruct to feed the baby on both breasts for all feeds; this will prevent feedback inhibition
	Feed in side-lying position to reduce velocity milk flow
	First-line intervention is block feeding (i.e., use only one breast per session or for a block of time to reduce milk production by feedback inhibition)
	Hyperlactation causes luminal congestion and inflammation, which leads to mammary dysbiosis
	If hyperlactation is severe, herbal supplements (e.g., sage, peppermint, parsley, jasmine flowers, chasteberry), pharmacologic therapy (e.g., pseudoephedrine, 10 to 30 mg), estrogen-containing oral contraceptives (after 6 weeks postpartum), and cabergoline (0.25 to 0.5 mg every 3 days, if extreme) may be used to decrease milk supply
	Often iatrogenic
	Watch for purposeful or inadvertent consumption of galactagogues (i.e., substances that increase breast milk production)
Probiotics may be considered, but evidence is low	Data are mixed
	Suggest those that contain *Limosilactobacillus fermentum* or *Ligilactobacillus salivarius*[36]
	Systematic review suggests that they may be effective for treatment and prevention[33]
Recognize nipple blebs, but treat conservatively	Do not unroof; can cause trauma and further inflammation
	Nipple blebs represent ductal inflammatory cells at surface
	Oral lecithin and application of a topical, moderate-potency steroid cream (e.g., 0.1% triamcinolone) may reduce inflammation and are safe in breastfeeding patients
Therapeutic ultrasound is a treatment option	5 minutes daily until symptom relief
	Thermal energy reduces inflammation and edema

Information from references 2, 30, 33, and 36.

• For severe engorgement or breast milk oversupply that has not been responsive to conservative measures, a trial of pharmacotherapy with pseudoephedrine to vasoconstrict or combined estrogen-containing oral contraceptives to decrease breast milk supply may be used.[15,40] In rare and severe cases, a dopamine agonist, such as cabergoline, may be used.[2,15] These recommendations are based on expert opinion in the absence of clinical trials.

Surgical Treatment

• Most patients with mastitis do not need surgical intervention unless an abscess develops, which requires needle aspiration and drain placement.[23] The drain should be placed to gravity, not to suction or vacuum.[2,23,44]

• Lactating breasts should not be packed after abscess drainage because this is thought to promote inflammation and prolong healing. Drain placement is most appropriate following aspiration.[23]

• The rate of milk fistula after surgical intervention is less than 2%; therefore, patients can continue to safely breastfeed after surgery.[2,23,44,45]

Complementary Medicine

• One systematic review suggests that probiotics could be effective for treatment and prevention, but other studies show no benefit.[2,29,31-36] *L. fermentum* and *L. salivarius* are the most studied species, but data are mixed on their effectiveness.[2,32-36]

• Sunflower lecithin and *Phytolacca* (pokeweed) have benefit by possibly emulsifying breast milk and possessing anti-inflammatory properties, but this is anecdotal, and there are no studies that support their safety or effectiveness.[2]

• Acupuncture has anecdotal success, but there are no randomized trials.[29]

• Cabbage leaf application is a common home remedy, but it lacks robust evidence. It is likely no more effective than ice application.[2,46]

• Therapeutic ultrasound may be used to relieve pain and decrease inflammation based on expert opinion.[2,29]

• Herbal supplements have been used to decrease milk supply in hyperlactation, but there are no studies to support their safety or effectiveness.[2]

TABLE 5

Antibiotics for Outpatient Treatment of Bacterial Mastitis

Antibiotic	Dosage	Comments
First line		
Amoxicillin	500 mg four times daily for 10 to 14 days	Ideally taken with meals; narrow spectrum, therefore encourages less antibiotic resistance; covers normal skin flora but not MRSA
Cefadroxil	500 mg two times daily for 10 to 14 days	Coverage is similar to cephalexin but is taken less often, which helps aid in compliance
Cephalexin	500 mg four times daily for 10 to 14 days	No coverage for MRSA; may be taken with or without food
Dicloxacillin or flucloxacillin	500 mg four times daily for 10 to 14 days	Coverage is similar to cefadroxil and cephalexin
Second line*		
Clindamycin	300 mg four times daily for 10 to 14 days	—
Trimethoprim/sulfamethoxazole	One double-strength tablet (800/160 mg) two times daily for 10 to 14 days	Do not use if maternal or infant history of glucose-6-phosphate dehydrogenase deficiency; use with caution if infant was premature, has hyperbilirubinemia, or is younger than 30 days

Note: Flucloxacillin is not available in the United States.

MRSA = methicillin-resistant *Staphylococcus aureus*.

*—Both second-line medications provide better MRSA coverage than first-line agents.

Adapted with permission from Mitchell KB, et al. Academy of Breastfeeding Medicine clinical protocol #36: the mastitis spectrum, revised 2022 [published correction appears in *Breastfeed Med*. 2022;17(11):977-978]. *Breastfeed Med*. 2022;17(5):372.

Referral, Consultation, and Hospitalization

• If a multidrug-resistant organism is suspected or the patient has hemodynamic instability, hospital admission for intravenous antibiotics may be required.[1]

• Patients with breast abscesses should always be referred to a breast surgeon for drain placement.[3,11,23,44]

• For recurrences of mastitis in the same location, imaging should be obtained to rule out structural abnormality, an underlying mass, granulomatous mastitis, or inflammatory breast cancer.[11,39]

PROGNOSIS

• Prognosis is good for lactational mastitis, but it has an 8% to 30% recurrence rate.[1]

• Breast abscess is the most concerning complication of mastitis and occurs in approximately 3% to 11% of patients with acute mastitis; milk fistulas occur in less than 2% of patients.[2,6] Interruption of breastfeeding during acute mastitis, including when an abscess is present or being treated with

antibiotics, is not warranted and may impede long-term feeding goals.[2,3,6,17,39,44]

This article updates a previous article on this topic by Spencer.[3]

Data Sources: A PubMed search was completed in Clinical Queries using the key terms mastitis and lactational mastitis. The search included meta-analyses, randomized controlled trials, clinical trials, and reviews. The Cochrane Database and Essential Evidence Plus were also searched. Search dates: July 17, 2023; January 3, 2024; and June 5, 2024.

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