Mastitis and breast abscess - Management

Scenario: Diagnosis of mastitis

How do I know my patient has mastitis?

• Clinical features of mastitis include:
  o A painful breast.
  o Fever.
  o General malaise.
  o A tender, red, swollen and hard area of the breast, usually in a wedge-shaped distribution.

• It is not possible to distinguish clinically between non-infectious mastitis and infectious mastitis. Suspect infectious mastitis if:
  o Symptoms do not improve or are worsening after 12–24 hours despite effective milk removal.
  o The woman has a nipple fissure that is infected.
  o Bacterial culture is positive (For information on when to arrange culture of the breast milk, see Investigations).

Basis for recommendation

Clinical features of non-infectious mastitis and infectious mastitis

• These clinical features are based on expert opinion form a review of the causes and management of mastitis published by World Health Organization [WHO, 2000] and review articles [Barbosa-Cesnik et al, 2003; Betzold, 2007].

Distinguishing between non-infectious mastitis and infectious mastitis

• Features to distinguish between infectious and non-infectious mastitis have been extrapolated from the criteria that the World Health Organization advises for starting an antibiotic [WHO, 2000; WHO, 2009]. As it is impossible to reliably distinguish clinically between infectious mastitis and non-infectious mastitis, CKS suggests that if these features are present an infectious cause is more likely and antibiotic treatment appropriate.

• Expert opinion in Guidelines on the treatment, management & prevention of mastitis for Northern Ireland published by the Guidelines and Audit Implementation Network is that flu-like symptoms and pyrexia are more likely to last for longer than 24 hours in women with infectious mastitis compared with non-infectious mastitis, and women are likely to experience considerable breast discomfort in infectious mastitis [GAIN, 2009].

How do I know my patient has a breast abscess?

• Suspect a breast abscess if the woman has:
  o A history of recent mastitis.
  o A painful, swollen lump in the breast with redness, heat, and swelling of the overlying skin.
○ Fever and malaise (may have subsided if the woman has taken antibiotics).
○ On examination, the lump may be fluctuant with skin discolouration.

- **To confirm the diagnosis, refer the woman urgently to a general surgeon.**

**Basis for recommendation**

**Clinical features**

- These clinical features are based on expert opinion from a review of the causes and management of mastitis published by the World Health Organization [WHO, 2000].

**Confirmation of diagnosis**

- This recommendation is based on expert opinion in narrative reviews [Mass, 2004; Betzold, 2007; Spencer, 2008].

**Should I arrange any investigation?**

- **For a woman with a suspected breast abscess:**
  ○ Refer urgently to a general surgeon for confirmation of the diagnosis by ultrasound, drainage of the abscess, and culture of fluid from the abscess.

- **For a woman with mastitis:**
  ○ **Investigations are not routinely required.**
  ○ **Culture the breast milk** when:
    ▪ Antibiotics have been prescribed and there has been no response after 48 hours.
    ▪ Mastitis is severe before any antibiotics are prescribed.
    ▪ The woman has recurrent mastitis.
    ▪ Hospital-acquired infection is likely.
    ▪ The woman is unable to take standard antibiotics (such as flucloxacillin and erythromycin).
    ▪ There is severe deep 'burning' breast pain (indicative of ductal infection).
  ○ **To collect a sample of breast milk into a sterile container:**
    ▪ Clean the nipple of the affected breast.
    ▪ Express a small amount of milk by hand and discard it (to avoid skin contamination).
    ▪ Express milk into a sterile container, avoiding touching the inside of the container with the nipple or hands.
    ▪ Send the sample to the laboratory for microscopy, culture, and antibiotic sensitivity as soon as possible.

**Basis for recommendation**

**Referral for women with suspected breast abscess**

- This recommendation is based on expert opinion in narrative reviews [Mass, 2004; Betzold, 2007; Spencer, 2008].
Investigations are not routinely required for women with mastitis

- The presence of bacteria in the milk does not necessarily indicate infection [WHO, 2000].
- Bacterial counts are not reliable, because [Betzold, 2007]:
  - Milk from non-infected areas of the breast may dilute the pathogen.
  - Adequate milk flow may flush out the pathogen.
  - The flow of milk from the infected area may be obstructed.
  - The antibacterial properties of human milk may destroy bacteria.

Recommendations for when breast milk should be cultured

- These recommendations are based on expert advice from the World Health Organization [WHO, 2000], the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008], and a narrative review [Betzold, 2007].

Collecting a sample of breast milk

- This recommendation is based on expert advice from the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] and a narrative review [Spencer, 2008].

What else might it be?

- Conditions that cause pain and discomfort of the breast that are associated with lactation
  - Full breast.
    - Full breasts are common between the second and sixth day after birth.
    - Both breasts are usually affected.
    - Milk flows well and sometimes leaks spontaneously.
    - The infant finds it easy to attach and suckle.
    - The breasts feel hot, heavy, and hard.
    - The breasts are not shiny, oedematous or red.
  - Engorged breast.
    - This either occurs in the first few days after an infant is born when the breasts overfill with milk (primary engorgement), or occurs when feeding is less frequent or the infant's demands have decreased (secondary engorgement). It is also common after augmentation mammoplasty.
    - The breasts are enlarged, swollen, and painful.
    - It is usually bilateral.
    - The breasts may be shiny and there may be oedema with diffuse red areas.
    - The nipples may be stretched so that it is flat.
    - The milk does not flow easily.
    - The infant may find it difficult to attach and suckle.
    - The woman may have a fever that usually settles within 24 hours.
    - If untreated, lactation will be inhibited.
Breast engorgement occurs more commonly in women who have had augmentation mammoplasty.

- **A blocked duct.**
  - There is a painful lump in the breast.
  - The woman has no fever.
  - The skin may be red over the lump.
  - A related condition is the appearance of a small (1 mm in diameter) white spot at the end of the nipple that is extremely painful when suckling; it is thought to be due to an overgrowth of epithelium (which forms a blister), or an accumulation of fatty or particulate material.

- **Galactocele.** Typically:
  - There is a smooth rounded, painless, swelling in the breast.
  - Milky fluid is discharged from the nipple when pressed.
  - Systemic symptoms are absent.

- **Infection of the mammary ducts** *(ductal infection is considered by some experts to be a cause of deep breast pain, but other experts dispute its existence).*
  - There is a deep burning, aching, or shooting pain in the breast that is worse during or just after breastfeeding — this may be agonizing. There may be accompanying pain down the arm or in the back.
  - The woman does not have fever or malaise.
  - Clinical signs are variable and there may be: no redness, induration, or tenderness (that is, no clinical signs in the areola or nipple); pinkness or redness, flaking, shininess, or fissure of the nipple; purulent exudate or honey-coloured crusts suggesting bacterial infection.

- **Conditions that cause nipple pain**
  - **Poor attachment.** This is the commonest cause of nipple pain and is usually present from the start of a breastfeed.
  - **Candidal infection of the nipple.** This often follows antibiotic treatment, but may also be a predisposing factor for mastitis. Clinical features include:
    - A burning sensation in the breast, intense itching, or severe nipple pain during and just after feeds.
    - The pain may last up to 1 hour after feeds.
    - Super-sensitivity of the nipple to touch.
    - Constant loss of colour in the nipples or part or all of the areola.
    - Redness of the nipple.
    - Shooting pains radiating towards the chest wall, back, and shoulder.
    - Bilateral symptoms (except in the very early stages) because the infant transfers the infection.
    - A red flaky rash on the areola with itching or depigmentation.
    - Nipples that are slightly swollen with a shiny appearance, fissure of the nipple, or mild redness around the areola. The areola and nipple may also appear normal.

- **Blanching of the nipple** — due to the pressure of suckling may cause pain and is related to poor breastfeeding technique.

- **Dermatitis of the nipple** — presents as a red itchy rash with a well-demarcated edge.

- **Bacterial infection of the nipple.** This may present as a yellow discharge from the nipple or a sloughy appearance.

- **Herpes simplex viral infections** of the breast.
Raynaud's disease of the nipple.
- Blanching of the nipple is followed by cyanosis and/or erythema.
- Pain is severe, debilitating, and throbbing.
- Breastfeeding is very painful.
- Symptoms are precipitated by cold and also occur during pregnancy and when not breastfeeding.

Conditions that cause pain and discomfort of the breast that are not related to lactation
- Breast cancer, including inflammatory breast cancer.
- Fibroadenosis.
- Breast cyst — ruptured.
- Sub-areolar abscess (duct ectasia).
- Necrotizing fascitis of the breasts.
- Fat necrosis of the breast.
- Paget's disease of the nipple.

Conditions of the chest wall
- Costochondritis.
- Mondor's disease (phlebitis of the chest wall).

Basis for recommendation

This information is based on expert opinion from a review of the causes and management of mastitis and a review of infant and child feeding published by the World Health Organization [WHO, 2000; WHO, 2009], Guidelines on routine postnatal care for women and their babies published by the National Institute for Health and Clinical Excellence (NICE) [National Collaborating Centre for Primary Care, 2006], Guidelines on the treatment, management & prevention of mastitis for Northern Ireland published by the Guidelines and Audit Implementation Network [GAIN, 2009], Guidelines on thrush and breastfeeding published by the breastfeeding network [The Breastfeeding Network, 2009], review articles [Amir, 2003; Barbosa-Cesnik et al, 2003; Giordano and Hortobagyi, 2003; Mass, 2004; Fraser and Cullen, 2006; Betzold, 2007], a Cochrane systematic review protocol [Mangesi and Muzinzini, 2009], a textbook [Inch, 2000], case reports [Lawlor-Smith and Lawlor-Smith, 1997; Cyrlak and Carpenter, 1999; Anderson et al, 2004; Acarturk et al, 2005], and a pilot study [Graves et al, 2003].

Mastitis and breast abscess – Management

Scenario: Mastitis - in breastfeeding women

What is the first-line management of mastitis?

- Reassure the woman that although mastitis is a painful condition that may make her feel very ill, the breast will return to normal size, shape, and function.
- Prescribe an antibiotic if:
Symptoms have not improved or are worsening after 12–24 hours despite effective milk removal.
The woman has a nipple fissure that is infected.

**To relieve pain and discomfort:**
- Offer paracetamol as first choice.
  - Ibuprofen is an alternative. Use the lowest effective dose for the shortest possible time.
- Advise the woman to:
  - Place a warm compress on the breast, or bathe or shower in warm water. This will relieve pain and help the milk to flow.
  - Rest, if this is possible.
  - Not wear a bra (especially at night).

**Advise the woman to continue to breastfeed.**
- Involve a breastfeeding specialist to assist the woman in improving the infant’s attachment to the breast. This will improve milk removal and prevent nipple damage.

**If the affected breast is not completely empty after feeding,** advise the woman to **express** the remaining milk by hand or by using a breast pump.

**If breastfeeding is not possible,** advise her to **express** breast milk by hand or pump until breastfeeding can be resumed.

**Treat nipple damage** — pain from nipple damage may inhibit effective milk removal. For more information, see [Scenario: Nipple soreness - management](#) in the CKS topic on [Breastfeeding problems](#).

**Advise the woman to contact a healthcare professional if:**
- Symptoms worsen.
- Antibiotics have *not* been prescribed and symptoms have not settled within 12–24 hours.
- Symptoms fail to settle after 48 hours of antibiotic treatment.

**Basis for recommendation**

**Reassurance of a positive outcome**

- Expert opinion in the guideline from the World Health Organization is that adequately treated, the outcome is a return to completely normal function and lactation. However, if mastitis is inadequately treated, there may be relapse — with more severe mastitis and permanent damage [WHO, 2000].

**Relief of pain and discomfort**

- **Analgesia**
  - The National Institute for Health and Clinical Excellence (NICE) advises an analgesic compatible with breastfeeding, such as paracetamol [National Collaborating Centre for Primary Care, 2006].
  - For further information on the use of nonsteroidal anti-inflammatory drugs (NSAIDs) in women who are breastfeeding, see the section on [Breastfeeding](#) in the CKS topic on [NSAIDs - prescribing issues](#).
- **Warm compress, or bathe or shower with warm water**
These recommendations are based on expert opinion in guidelines from the World Health Organization [WHO, 2000; WHO, 2009].

- **Rest**
  - The recommendation to advise women with mastitis to rest is based on expert opinion in a guidelines from the World Health Organization (WHO) [WHO, 2000].

- **Information about not wearing a bra at night**
  - This recommendation is based on expert opinion in a NICE guideline [National Collaborating Centre for Primary Care, 2006].

**Continuing to breastfeed**

- The World Health Organization reviewed the available evidence and concluded that stopping breastfeeding does not help, and may make the woman worse [WHO, 2000].
- Sudden cessation of breastfeeding is associated with a greater risk of abscess development compared with continuing to feed [Academy of Breastfeeding Medicine, 2008].
- The only exception is women who are HIV positive, who have no alternative but to breastfeed, and who develop a fissure, mastitis, or an abscess. The infant may continue to feed from the unaffected side but milk from the affected breast should be expressed and discarded until the woman is fully recovered [WHO, 2000].
- Mastitis increases the vertical transmission of HIV [WHO, 2000; Michie et al, 2003].

**Involving a breastfeeding specialist**

- Good infant attachment is important to prevent further problems with milk stasis and infection, and to ensure successful feeding [National Collaborating Centre for Primary Care, 2006; GAIN, 2009].

**Emptying the breast**

- This recommendation is based on expert opinion from NICE, which advises that 'the woman should continue breastfeeding and/or hand expression to ensure effective milk removal' [National Collaborating Centre for Primary Care, 2006]. Emptying of the breast after a feed is also advised by the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] and in a review article [Betzold, 2007]. The Breastfeeding Network also state that the woman may need to express milk after feeds [The Breastfeeding Network, 2006].
- There is good evidence from a prospective study that regular emptying of the breast is important in the treatment of both infectious mastitis and non-infectious mastitis. There is also limited evidence from a small prospective study that emptying the breast and rest is curative in women with no pathogenic bacteria in their milk.

**Expressing milk if breastfeeding is not possible**

- This recommendation is based on expert opinion from the World Health Organization [WHO, 2000].
Advice about when to contact a healthcare professional

• These recommendations are based on advice from NICE [National Collaborating Centre for Primary Care, 2006].

Which antibiotic should I prescribe?

Antibiotic treatment is recommended for mastitis if the woman has a nipple fissure that is infected, symptoms do not improve or are worsening after 12–24 hours despite effective milk removal, or bacterial culture is positive.

• If empirically treating infection:
  o Prescribe flucloxacillin 500 mg, four times a day, for 14 days.
  o An alternative is erythromycin 250 mg to 500 mg, four times a day, for 14 days.
  o Inform the woman that these antibiotics are only excreted in milk in very small amounts. Usually the infant is not affected, but occasionally stools may be looser or more frequent than usual or the infant may be more irritable.

• If the results of breast milk culture are available, prescribe an antibiotic according to the sensitivities of the organism that has been identified.
  o It is unlikely that the infant will become unwell but, if staphylococcal or streptococcal infection is confirmed, observe the infant for signs of infection and seek the advice of a paediatrician if the child becomes unwell.

Basis for recommendation

Choice of antibiotics

• A Cochrane systematic review found insufficient evidence to evaluate the effectiveness of antibiotics in lactational mastitis.
• Guidelines from the National Institute for Health and Clinical Excellence (NICE) [National Collaborating Centre for Primary Care, 2006] and the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] recommend a beta-lactamase resistant antibiotic for the treatment of infectious mastitis, based on expert opinion.
• The Health Protection Agency recommends that broad spectrum antibiotics (such as co-amoxiclav) should be avoided when narrow spectrum antibiotics remain effective. Broad spectrum antibiotics increase the risk of Clostridium difficile and meticillin-resistant Staphylococcus aureus (MRSA) [HPA, 2009].

  CKS therefore recommends flucloxacillin for first-line use, with erythromycin as an alternative (for women who cannot take penicillins). These antibiotics are usually effective against beta-lactamase producing organisms (such as Staphylococcus aureus), can be taken orally, and are considered to be suitable for use in women who are breastfeeding.
Penicillins (such as flucloxacillin) are the antibiotic of choice during breastfeeding, because only trace amounts are found in breast milk [Schaefer et al, 2007].

Erythromycin is excreted in breast milk in small amounts [Schaefer et al, 2007].

**Length of antibiotic treatment course**

- Expert opinion in guidelines from the World Health Organization (WHO) [WHO, 2000] and the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] is that antibiotics should be prescribed for 10–14 days; however, the duration of antibiotic treatment has not been subject to controlled trials. Expert opinion is that relapse is more common with shorter courses of treatment [WHO, 2000]. CKS recommends a 14-day course of treatment, because this allows for original pack dispensing.

**Risk of infection to the infant**

- Traditionally, healthcare workers were concerned about the risk of transmitting the infection to the infant if the woman continued to breastfeed (especially if the milk contained pus). A WHO review of the available evidence confirmed such fears are unfounded, with:
  - Six small studies (carried out between 1948 and 1988) reporting no harmful effects of continued breastfeeding.
  - Occasional case reports of staphylococcal scalded skin syndrome in infants of women with either mastitis or a breast abscess. However, it was not clear if transmission had been via close contact or through breast milk.
  - A few cases of transmission of *Streptococcus* group B infection from a woman with a breast abscess.
  - One case of transmission of salmonella infection to the infant (from salmonella mastitis).
  - The conclusion by WHO was that transmission of infection was rare and usually had a benign outcome.
- The recommendation that if mastitis is known to be due to staphylococcal or streptococcal infection, the infant should be observed for signs of infection and simultaneous treatment considered is based on expert opinion in guidelines from WHO [WHO, 2000]. CKS advises seeking specialist advice if the infant becomes unwell to determine whether admission or antibiotic treatment is appropriate.

**What information about breastfeeding should I offer a woman with mastitis?**

- **Advise the woman to continue breastfeeding.**
  - Explain that breastfeeding is extremely beneficial and continuing to breastfeed with mastitis will not harm the infant.
- **Inform the woman:**
  - To breastfeed on demand with no restrictions on frequency and length of feeds.
  - To minimize nipple discomfort, start feeding on the unaffected breast and once let-down occurs switch to the affected breast.
○ If necessary, gently massage the breast to overcome blockage and help milk flow. Massage should be directed from the blocked area moving towards the nipple.
○ To drink sufficient fluids.

- **Advise the woman to express milk by hand or with a pump if the:**
  ○ Affected breast is not completely empty after feeding.
  ○ Infant appears to dislike the taste of the milk from the affected breast (which is more salty and less sweet). Milk from this breast can be discarded.
  ○ Breast becomes full between feeds. Alternatively allow the milk to flow freely in a hot bath or shower.

**Basis for recommendation**

**Continuing to breastfeed**

- The World Health Organization reviewed the available evidence and concluded that stopping breastfeeding does not help, and may make the woman worse [WHO, 2000].
- Sudden cessation of breastfeeding is associated with a greater risk of abscess development compared with continuing to feed [Academy of Breastfeeding Medicine, 2008].

**Advice about how to breastfeed**

- These recommendations are based on expert opinion from the World Health Organization [WHO, 2000], Guidelines on the treatment, management & prevention of mastitis for Northern Ireland published by the Guidelines and Audit Implementation Network [GAIN, 2009], the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008], the National Institute for Health and Clinical Excellence (NICE) [National Collaborating Centre for Primary Care, 2006], and review articles [Mass, 2004; Betzold, 2007; Spencer, 2008].

**Encourage fluids**

- This recommendation is based on expert advice from the the National Institute for Health and Clinical Excellence (NICE) [National Collaborating Centre for Primary Care, 2006].

**Emptying the breast**

- This recommendation is based on expert opinion from NICE, which advises that 'the woman should continue breastfeeding and/or hand expression to ensure effective milk removal' [National Collaborating Centre for Primary Care, 2006]. Emptying of the breast after a feed is also advised by the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] and in a review article [Betzold, 2007]. The Breastfeeding Network also state that the woman may need to express milk after feeds [The Breastfeeding Network, 2006].
- There is good evidence from a prospective study that regular emptying of the breast is important in the treatment of both infectious mastitis and non-infectious mastitis. There is also limited evidence...
from a small prospective study that emptying the breast and rest is curative in women with no pathogenic bacteria in their milk.

**Change in taste of the milk**

- Inflammation of the breast causes the tight junctions between the milk secreting cells of the alveoli to open up and substances from plasma to pass into the milk. The increased pressure causes substances from the milk to pass into the tissues. Therefore, there is an increase of sodium chloride and a decrease of potassium and lactose in the milk, leading to a change in its taste [WHO, 2000; The Breastfeeding Network, 2006; Betzold, 2007; Spencer, 2008].

**Expressing milk between feeds**

- The Breastfeeding Network advise that milk needs to be flowing freely to relieve symptoms [The Breastfeeding Network, 2006].

**How do I support a woman to express breast milk?**

- Expressing breast milk should not be rushed. Explain that to express an adequate amount of breast milk may take up to 30 minutes.
- Teach the woman to express breast milk herself. Recommend the following:
  - Have a clean, sterilized, wide-necked container available.
  - Wash her hands thoroughly.
  - Sit or stand comfortably, and hold the container under her nipple and areola.
  - Gently massage the breast and nipple before expressing.
  - Cup her breast in her hands and feel back from the end of the nipple to the area where the breast feels different.
  - Put her thumb on her breast ABOVE the nipple and areola, and her first finger on the breast BELOW the nipple and areola, opposite the thumb. Support the breast with her other fingers.
  - Gently squeeze, this should not hurt. If it hurts, the technique is wrong.
  - Release the pressure and repeat building up a rhythm.
  - At first no milk or only drops may come but after squeezing gently a few times, milk should start to drip out. It may flow in streams.
  - If the milk does not flow at all, try moving the fingers either a little way towards the nipple or a little further away.
  - When the flow slows move to the other breast.
  - Keep changing breasts until the milk stops or drips very slowly.
  - Avoid:
    - Rubbing or sliding the fingers along the skin.
    - Squeezing or pinching the nipple.

**Basis for recommendation**
This information is based on advice from the Department of Health [DH, 2007], advice from the World Health Organization guidelines on mastitis [WHO, 2000], and guidelines on infant and young child feeding [WHO, 2009].

How should I treat a woman who has not responded to first-line treatment for mastitis?

- If the woman’s symptoms do not improve after 12–24 hours despite effective milk removal, prescribe an antibiotic (if this has not already been done).
- **If symptoms fail to settle after 48 hours of antibiotic treatment:**
  - Check that the woman has taken the antibiotic correctly.
  - Send a sample of the milk for culture.
  - Prescribe a different antibiotic for 14 days.
  - If culture results are available, treat with an antibiotic the organism is sensitive to.
  - If culture results are not available, treat empirically with co-amoxiclav 500/125 mg, three times a day. Seek specialist advice if the woman is unable to take penicillin. Review when culture results are available.
  - Consider an alternative diagnosis.
    - If there is an underlying mass, or ductal cancer or inflammatory breast cancer (a rapid onset of warmth of the breast, diffuse redness (varies from a faint blush to bright red) and oedema causing an orange skin [peau d’orange] appearance) is suspected, arrange urgent investigation or referral.
    - If a localized area of the breast remains hard, red, and tender — suspect an abscess. Malaise and fever may have subsided if antibiotics have been taken. Refer the woman to a general surgeon for confirmation of the diagnosis (by ultrasound), and for drainage of the abscess (by ultrasound-guided needle aspiration [this often needs to be repeated] or surgical drainage). Culture of fluid from the abscess is used to guide the choice of antibiotic.
    - If the infant has tongue-tie (ankyloglossia) and concerns about breastfeeding persist after a review of attachment and positioning, refer the infant (non-urgently) for consideration of frenulotomy.

Basis for recommendation

Checking that the woman has taken the antibiotic correctly

- An inadequately short course of antibiotic, and failure to complete an antibiotic course, have been associated with a higher incidence of relapse [WHO, 2000; Deshpande, 2007].

Culture of milk

- The recommendation to send the woman’s milk for culture if symptoms fail to settle within 12–24 hours is based on expert opinion in guidelines from the World Health Organization (WHO) [WHO, 2000].
**Choice of second-line antibiotic**

- A Cochrane systematic review found insufficient evidence to evaluate the effectiveness of antibiotics in lactational mastitis.

- Guidelines from the National Institute for Health and Clinical Excellence (NICE) [National Collaborating Centre for Primary Care, 2006] and the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] recommend a beta-lactamase resistant antibiotic for the treatment of infectious mastitis, based on expert opinion.

- If the infection has not responded adequately to flucloxacillin and empirical treatment is required, CKS recommends prescribing co-amoxiclav (because it is a beta-lactamase resistant antibiotic that has a broader spectrum of activity than flucloxacillin). It can be taken orally, and is suitable for use in primary care.

  - Penicillins (such as co-amoxiclav) are the antibiotic of choice during breastfeeding, because only trace amounts are found in breast milk [Schaefer et al., 2007].

**Length of antibiotic course**

- The recommendation to prescribe antibiotic treatment for 10–14 days is based on expert opinion in WHO guidelines [WHO, 2000] and guidelines from the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008]. Expert opinion is that relapse is more common with shorter courses of treatment.

**Urgent investigation/referral if an underlying mass is found or inflammatory breast cancer or ductal cancer is suspected**

- These recommendations are based on accepted good clinical practice.

- Inflammatory breast cancer may present with a rapid onset of warmth of the breast, diffuse redness (varies from a faint blush to bright red) and oedema causing an orange skin (peau d'orange) appearance [Giordano and Hortobagyi, 2003].

**Suspicion of an abscess**

- These recommendations are based on expert opinion in narrative reviews [Mass, 2004; Betzold, 2007; Spencer, 2008].

**Referral for frenulotomy**

- This recommendation is based on expert opinion in NICE guidelines [National Collaborating Centre for Primary Care, 2006].

**How should I treat a woman with recurrent mastitis?**

- If the woman has recurrent mastitis, look for an underlying cause.
o Check that all the predisposing factors for milk stasis and infection have been addressed, particularly uncorrected breastfeeding technique.

o Treat nipple damage. Consider the possibility of candidal infection of the nipple; if this is present, treat both the woman and the infant. For more information, see Scenario: Nipple soreness - management in the CKS topic on Breastfeeding problems.

o Check that previous episodes of mastitis have been treated with an appropriate antibiotic for 10–14 days.

o Ask if the woman has been using potentially-contaminated nipple ointments or breast pumps.

o Send nasal swabs from both woman and infant to identify nasal carriage of *Staphylococcus aureus*. If this is present, treat it with mupirocin cream. For further information, see the section on Managing staphylococcal carriage in the CKS topic on Boils and paronychia.

o Consider the possibility of an underlying inflammatory cancer that may mimic mastitis.

o Consider trauma (including from domestic violence).

o If there are more than two recurrences in the same location, consider the possibility of an underlying lesion that is leading to persistently poor drainage:
  ▪ Abnormal ducts.
  ▪ Cyst.
  ▪ Tumour.

• Send breast milk for microscopy, culture, and antibiotic sensitivity. See Investigations.

• If there is an underlying mass, or ductal cancer or inflammatory breast cancer (a rapid onset of warmth of the breast, diffuse redness (varies from a faint blush to bright red) and oedema causing an orange skin [peau d’orange] appearance) is suspected, arrange urgent investigation or referral.

• Treat each episode of mastitis promptly with an antibiotic for 14 days.

  o Choice of antibiotic should be guided by culture and sensitivity results, where available.

  o For empirical treatment, prescribe co-amoxiclav 500/125 mg, three times a day, for 14 days. Review when results of culture are available.

  o Seek specialist advice if the woman is unable to take penicillin.

Basis for recommendation

Consider a possible underlying cause

• These recommendations are based on expert opinion in guidelines from the World Health Organization (WHO) [WHO, 2000], the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008], and narrative reviews [Betzold, 2007; Deshpande, 2007].

• Candidal infection of the nipple is associated with recurrent mastitis. This is probably because [WHO, 2000]:

  o Candidal infection predisposes to nipple fissure, which is an entry point for bacterial infection.

  o The nipples are damaged and painful, so the breast is used less — causing milk stasis.

• The recommendation to look for nasal carriage of *Staphylococcus aureus* is based on expert opinion from a narrative review [Betzold, 2007].
Sending breast milk for culture

- These recommendations are based on expert opinion in WHO guidelines [WHO, 2000] and a narrative review [Betzold, 2007].

Urgent investigation/referral if an underlying mass is found or inflammatory breast cancer or ductal cancer is suspected

- These recommendations are based on accepted good clinical practice.
- Inflammatory breast cancer may present with a rapid onset of warmth of the breast, diffuse redness (varies from a faint blush to bright red) and oedema causing an orange skin (peau d’orange) appearance [Giordano and Hortobagyi, 2003].

The importance of investigation and prompt treatment of recurrent mastitis

- Prompt investigation and treatment of recurrent mastitis is important to prevent widespread lesions, irreversible tissue damage, breast disfigurement, and chronic inflammation [WHO, 2000; Betzold, 2007].

Antibiotic choice

- A Cochrane systematic review found insufficient evidence to evaluate the effectiveness of antibiotics in lactational mastitis.
- Guidelines from the National Institute for Health and Clinical Excellence (NICE) [National Collaborating Centre for Primary Care, 2006] and the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008] recommend a beta-lactamase resistant antibiotic for the treatment of infectious mastitis, based on expert opinion.
- If the infection recurs after appropriate treatment with flucloxacillin and empirical treatment is required, CKS recommends prescribing co-amoxiclav (as it is a beta-lactamase resistant antibiotic that has a broader spectrum of activity than flucloxacillin). It can be taken orally and is suitable for use in primary care.
  - Penicillins (such as co-amoxiclav) are the antibiotic of choice during breastfeeding, because only trace amounts are found in breast milk [Schaefer et al, 2007].

When should I refer or admit a woman with mastitis?

- Admit the woman if she is extremely unwell. The infant should be admitted with her, to allow continuation of breastfeeding.
  - Most women with mastitis do not need admitting to hospital.
- If there is an underlying mass, or ductal cancer or inflammatory breast cancer (a rapid onset of warmth of the breast, diffuse redness (varies from a faint blush to bright red) and oedema
causing an orange skin [peau d'orange] appearance) is suspected, arrange urgent investigation or referral.

- **If a localized area of the breast remains hard, red, and tender,** suspect an abscess and refer the woman to a general surgeon for confirmation of the diagnosis (by ultrasound), and for drainage of the abscess (by ultrasound-guided needle aspiration or surgical drainage).

Basis for recommendation

**Admittance to hospital**

- This recommendation is based on expert advice from the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008].

**Urgent investigation/referral if an underlying mass is found or inflammatory breast cancer or ductal cancer is suspected**

- These recommendations are based on accepted good clinical practice.
- Inflammatory breast cancer may present with a rapid onset of warmth of the breast, diffuse redness (varies from a faint blush to bright red) and oedema causing an orange skin (peau d'orange) appearance [Giordano and Hortobagyi, 2003].

**Referral for suspected abscess**

- This recommendations is based on expert opinion in narrative reviews [Mass, 2004; Betzold, 2007; Spencer, 2008].

**What advice should I give to prevent future problems?**

- **Explain that good breastfeeding technique** (good attachment and effective milk removal) is necessary to prevent mastitis.
- **To prevent future problems,** advise the woman to:
  - Make sure the infant is attached correctly.
  - Feed on demand, both for the frequency and duration of feeds.
  - Avoid missed feeds, especially when the infant starts to sleep through the night.
  - Finish the first breast before offering the other.
  - Breastfeed exclusively for 4–6 months, if possible. Avoid other foods and drinks, especially from a feeding bottle.
  - Avoid the use of a dummy (pacifier).
  - For future pregnancies, start to breastfeed within an hour of delivery, if possible.
- **Ensure that the woman knows:**
How to express milk manually (for if the infant is not able to attach because the breast is too full, or if the infant is not able to empty the breast).

How to check breasts for lumps, redness, and tenderness.

How to recognize milk stasis, and that if this develops she needs to rest, breastfeed frequently, massage any lumpy area, and seek help if problems do not resolve within 24 hours.

That damaged or painful nipples or an inadequate milk supply are not urgent concerns (and do not require same-day help).

To seek help if any other concerns do not resolve within 24 hours.

**Weaning**

If the woman does not wish to continue breastfeeding, give advice about suppression of lactation:

- Avoid abrupt weaning.
- Support the breasts with a comfortable bra or binding.
- Express enough milk to keep the breasts comfortable.
- Prescribe ibuprofen or paracetamol if pain occurs.
- Do not prescribe stilboestrol, oestrogen (either alone or with testosterone), bromocriptine, or cabergoline to stop lactation.

**Basis for recommendation**

**Recommendations on good breastfeeding technique**

- These recommendations are based on expert opinion in guidelines from the World Health Organization (WHO) [WHO, 2000], the Academy of Breastfeeding Medicine [Academy of Breastfeeding Medicine, 2008], and the National Institute for Health and Clinical Excellence [National Collaborating Centre for Primary Care, 2006].

**Advice on weaning**

- These recommendations are based on expert opinion in WHO guidelines [WHO, 2000].

**Drugs to stop lactation**

- Expert opinion in WHO guidelines is that the following drugs should not be used [WHO, 2000]:
  - Stilboestrol — there is a risk of thromboembolism, withdrawal bleeding, and recurrence of engorgement when it is discontinued.
  - Oestrogen, alone or in combination with testosterone — there is a risk of thromboembolism, it is not very effective, and engorgement may occur when it is discontinued.
  - Bromocriptine — there is a risk of myocardial infarction, hypertension, seizures and strokes. Also dizziness, hypotension, nausea, and severe headache can occur.
  - Cabergoline — headache, dizziness, hypotension, and epistaxis can occur.

**Prescriptions**
For information on contraindications, cautions, drug interactions, and adverse effects, see the electronic Medicines Compendium (eMC) ([http://emc.medicines.org.uk](http://emc.medicines.org.uk)), or the British National Formulary (BNF) ([www.bnf.org](http://www.bnf.org)).

**Mastitis (1st line): flucloxacillin**

Age from 10 years to 11 years 11 months

<table>
<thead>
<tr>
<th>Flucloxacillin suspension: 500mg four times a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flucloxacillin 250mg/5ml oral suspension</td>
</tr>
<tr>
<td>Take two 5ml spoonfuls four times a day for 14 days.</td>
</tr>
<tr>
<td>Supply 600 ml.</td>
</tr>
</tbody>
</table>

**Age**: from 10 years to 11 years 11 months  
**NHS cost**: £184.32  
**Licensed use**: yes

Age from 12 years onwards

<table>
<thead>
<tr>
<th>Flucloxacillin capsules: 500mg four times a day for 14 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flucloxacillin 500mg capsules</td>
</tr>
<tr>
<td>Take one capsule four times a day for 14 days.</td>
</tr>
<tr>
<td>Supply 56 capsules.</td>
</tr>
</tbody>
</table>

**Age**: from 12 years onwards  
**NHS cost**: £6.26  
**Licensed use**: yes

**Mastitis (penicillin allergy): erythromycin**

Age from 10 years to 11 years 11 months

<table>
<thead>
<tr>
<th>Erythromycin s/f suspension: 500mg four times a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythromycin ethyl succinate 500mg/5ml oral suspension sugar free</td>
</tr>
<tr>
<td>Take one 5ml spoonful four times a day for 14 days.</td>
</tr>
<tr>
<td>Supply 300 ml.</td>
</tr>
</tbody>
</table>

**Age**: from 10 years to 11 years 11 months  
**NHS cost**: £12.39  
**Licensed use**: yes

<table>
<thead>
<tr>
<th>Erythromycin s/f suspension: 250mg four times a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythromycin ethyl succinate 250mg/5ml oral suspension sugar free</td>
</tr>
<tr>
<td>Take one 5ml spoonful four times a day for 14 days.</td>
</tr>
<tr>
<td>Supply 300 ml.</td>
</tr>
</tbody>
</table>

**Age**: from 10 years to 11 years 11 months  
**NHS cost**: £8.28  
**Licensed use**: yes
Age from 12 years onwards

**Erythromycin e/c tablets: 500mg four times a day**

Erythromycin 250mg gastro-resistant tablets
Take two tablets four times a day for 14 days.
Supply 112 tablets.

- **Age:** from 12 years onwards
- **NHS cost:** £7.08
- **Licensed use:** yes

**Erythromycin e/c tablets: 250mg four times a day**

Erythromycin 250mg gastro-resistant tablets
Take one tablet four times a day for 14 days.
Supply 56 tablets.

- **Age:** from 12 years onwards
- **NHS cost:** £4.08
- **Licensed use:** yes

**Mastitis (treatment failure): co-amoxiclav**

Age from 10 years to 11 years 11 months

**Co-amoxiclav s/f susp: 500/124mg three times a day**

Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free
Take two 5ml spoonfuls three times a day for 14 days.
Supply 400 ml.

- **Age:** from 10 years to 11 years 11 months
- **NHS cost:** £19.64
- **Licensed use:** yes

Age: from 12 years onwards

**Co-amoxiclav tablets: 500/125mg three times a day**

Co-amoxiclav 500mg/125mg tablets
Take one tablet three times a day for 14 days.
Supply 42 tablets.

- **Age:** from 12 years onwards
- **NHS cost:** £13.60
- **Licensed use:** yes
How should I manage a woman with a breast abscess

- **Refer the woman urgently to a general surgeon for:**
  - Confirmation of the diagnosis (by ultrasonography).
  - Drainage of the abscess by ultrasonography-guided needle aspiration (this often needs to be repeated) or surgical drainage.
  - Culture of fluid from the abscess which will be used to guide the choice of antibiotic.

  **Basis for recommendation**

  This recommendation is based on expert opinion from a review of the causes and management of mastitis published by the World Health Organization [WHO, 2000].

- A thoroughly performed, ultrasonography-guided aspiration may be curative and can be done under local anaesthetic as an outpatient.
- Antibiotics alone without removal of pus are unlikely to be curative.

**What information about breastfeeding should I offer a women with a breast abscess?**

- **Inform the woman:**
  - That continued breastfeeding is safe for the infant.
  - To continue breastfeeding from the unaffected breast.
  - If breastfeeding is too painful from the affected breast then breast milk should be expressed until she is able to resume breastfeeding from that breast.
  - To resume breastfeeding from the affected breast as soon as the pain is less.

  **Basis for recommendation**

  These recommendations are based on expert advice in *Guidelines on the treatment, management & prevention of mastitis* for Northern Ireland published by the Guidelines and Audit Implementation Network [GAIN, 2009] and in guidelines on infant and young child feeding from the World Health Organization [WHO, 2009].