Why does it hurt?
A differential diagnosis for breastfeeding-associated pain
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- Understand the diverse etiology of breastfeeding-associated pain
- Be able to complete a detailed history and physical exam for a mother-baby dyad with breastfeeding-associated pain
- Understand how to counsel a mother regarding likely diagnosis and treatment of pain

Take-home points
Most pain begins with traumatic injury to the nipple – a problem at the "nipple-oral interface"
For mothers who are pumping, pain may result from pump overuse or misuse
Fixing pain requires fixing this problem – generally with the expertise of a lactation consultant
Trauma can cause a secondary problem:
- Mastitis
- Dermatitis
- Infection
- Vasospasm
- Functional pain

Cultures can be helpful to diagnose the secondary problem, but:
- not all problems with nipples are yeast
- not all oral thrush in infants is a problem
- not all bacteria in milk or on nipples is a problem

The prevalence of postpartum depression and anxiety symptoms among mothers with breastfeeding-associated pain is high
Among women with a predisposition to chronic pain and/or anxiety, symptoms may persist after the trauma and/or the secondary problem resolve

How common is breastfeeding-associated pain?

<table>
<thead>
<tr>
<th>Week</th>
<th>Percentage</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
<th>Day 8</th>
<th>Day 9</th>
<th>Day 10</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>72.5%</td>
<td>10.0</td>
<td>12.3</td>
<td>11.5</td>
<td>6.4</td>
<td>6.5</td>
<td>6.3</td>
<td>4.6</td>
<td>2.4</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>79.5%</td>
<td>11.7</td>
<td>11.9</td>
<td>12.6</td>
<td>9.4</td>
<td>10.4</td>
<td>10.4</td>
<td>6.3</td>
<td>6.7</td>
<td>4.4</td>
<td>2.7</td>
</tr>
<tr>
<td>3</td>
<td>95.1%</td>
<td>4.2</td>
<td>9.4</td>
<td>11.6</td>
<td>10.2</td>
<td>14.5</td>
<td>12.5</td>
<td>12.8</td>
<td>9.2</td>
<td>4.4</td>
<td>5.6</td>
</tr>
</tbody>
</table>

http://www.cdc.gov/ifps/results/ch2/table2-37.htm

Who are your patients?
Is it yeast?


<table>
<thead>
<tr>
<th>Glucan</th>
<th>Yeast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls</td>
<td>Cases</td>
</tr>
</tbody>
</table>


Prospective study of 360 nulliparous women recruited during pregnancy
- Case: burning nipple pain & non-mastitis breast pain
- 19% of women reported these two symptoms in weeks 1-8
- Authors attributed pain at 1 week to adjustment to breastfeeding

Is it yeast?
- Burning nipple pain plus breast pain
  - Candida present: 52%
  - No Candida present: 48%
- Not burning pain plus breast pain
  - Candida present: 48%
  - No Candida present: 52%

Comparing women with and without nipple pain:
- Amir 1996: Staph aureus was more strongly associated with pain than yeast, and mothers improved with medication that treats both yeast and staph
- Hale: In milk samples, there was more evidence of fungal species in control women than women with pain
- Zolner: In an asymptomatic population, 1/3 of mothers and baby had yeast in their mouths and on the breast
- Amir 2013: half of women with burning nipple and breast pain had molecular evidence of candida – but so did 1/3 of women without pain
Bottom line: It it sounds like yeast, it’s probably not

My best guess out: It it sounds like yeast, it’s probably not

Fix the OBI: Case history
- 37 yo G3P3 at 7 weeks postpartum, referred for persistent breastfeeding-associated pain
  - Breastfed each of older two infants for 1 year and recalls significant pain for first 2-3 months with each baby
  - Pain greatest during latch and let down, then gradually abates. Infant slips off breast with let down and pulls off or coughs
  - Prior to consultation, treated with expressed milk on nipples, heat, Nystatin, Diffucan, Nifedipine and Atenolol
- Physical Exam
  - During feeding, mother notes onset of pain concurrent with let down and audible tongue clicking
  - Once initial let-down complete, infant latches without pain
Fix the OBI: Tongue tie and breastfeeding-associated pain

What causes breastfeeding-associated pain?

- Tissue trauma
- Irritation / Inflammation
- Superinfection / dysbiosis
- Infant suck mechanics / pump use
- Maternal mood, catastrophization
- Central nociception pathways
- Disordered pain perception: migraines, vestibulitis, chronic pain


BMC Microbiology

Staphylococcus epidermidis strains isolated from breast milk of women suffering infectious mastitis: potential virulence traits and resistance to antibiotics

Research article

Sanana Delgado¹, Rebecca Arroyo¹, Esther Jiménez², Maria I. Martin¹, Rosa del Campo³, Leonidez Fernández⁴ and Juan M. Rodriguez*¹
What causes breastfeeding-associated pain?

- Tissue trauma
- Irritation / Inflammation
- Superinfection / dysbiosis
- Infant suck mechanics / pump use
- Predisposition to eczema, vasospasm, inflammation
- Infant / maternal exposure to antibiotics, dietary probiotics
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Pain is not a unidimensional construct
Gracely pain scale

<table>
<thead>
<tr>
<th>Unbearable</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
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<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

- When I feel pain
  - Never think or feel that
  - Sometimes think or feel that
  - Always think or feel that

1. It is terrible and I feel it's never going to get any better. 0 1 2 3 4 5 6
2. It is awful and I feel that it overwhelms me. 0 1 2 3 4 5 6
3. I feel my life isn't worth living. 0 1 2 3 4 5 6
4. I worry all the time about whether it will end. 0 1 2 3 4 5 6
5. I feel I can't stand it anymore. 0 1 2 3 4 5 6
6. I feel like I can't go on. 0 1 2 3 4 5 6


Breast sensitivity exam

- Allodynia / Functional pain
  - Definition: pain resulting from a stimulus (such as light touch of the skin) which would not normally provoke pain.
  - Presenting symptoms and signs
    - History of nipple trauma
    - Exquisite pain with light touch / brushing of nipple
    - Shooting, burning pain
    - Areolar color change during / after feeding (may be blanching or purple)
    - Persistent shooting pain after local anesthetic applied to areola


Prospective data from 2586 women who initiated breastfeeding in the Infant Feeding Practices Survey II.

Maternal mood and breastfeeding-associated pain

Early breastfeeding pain is associated with postpartum depression

OR postpartum depression at 2 months, severe pain vs. no pain

Asbill Sign

Functional Pain
- Descending pathways modulate pain signals, acting as a filter for sensory input
- When this filter is broken, allodynia and chronic pain can develop
- Fixing the pain requires repairing the filter


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Phone triage, EPDS and LC evaluation

The EPDS

In the past 7 days:
1. I have been able to laugh and see things funny
   a. Not at all
   b. Several days
   c. More than half the time
2. I feel like I’m going through things
   a. Not at all
   b. Several days
   c. More than half the time
3. I feel down, depressed, or hopeless
   a. Not at all
   b. Several days
   c. More than half the time
4. I feel calm and peaceful
   a. Not at all
   b. Several days
   c. More than half the time
5. I feel restless or fidgety
   a. Not at all
   b. Several days
   c. More than half the time
6. I feel tired or have little energy
   a. Not at all
   b. Several days
   c. More than half the time
7. I feel things have been getting on top of me
   a. Not at all
   b. Several days
   c. More than half the time
8. I feel I’m not able to do things as well as usual
   a. Not at all
   b. Several days
   c. More than half the time
9. I have lost interest in things I used to enjoy
   a. Not at all
   b. Several days
   c. More than half the time
10. I have been confused or had trouble
    a. Not at all
    b. Several days
    c. More than half the time
11. I feel I’ve gained too much weight
    a. Not at all
    b. Several days
    c. More than half the time
12. I feel I’ve lost too much weight
    a. Not at all
    b. Several days
    c. More than half the time
13. I eat too much
    a. Not at all
    b. Several days
    c. More than half the time
14. I eat too little
    a. Not at all
    b. Several days
    c. More than half the time
15. I feel I have stuff to do
    a. Not at all
    b. Several days
    c. More than half the time
16. I feel things are piled up
    a. Not at all
    b. Several days
    c. More than half the time
17. I feel I’ve been spending too much time alone
    a. Not at all
    b. Several days
    c. More than half the time
18. I feel I’ve been spending too much time with others
    a. Not at all
    b. Several days
    c. More than half the time
19. I feel I’ve been doing things I used to enjoy
    a. Not at all
    b. Several days
    c. More than half the time
20. I feel I’m sleeping too much
    a. Not at all
    b. Several days
    c. More than half the time
21. I feel I’m sleeping too little
    a. Not at all
    b. Several days
    c. More than half the time

The Cut-off Scores:
- 1-5: Normal
- 6-10: Possible depression
- 11-15: Depression

http://www.mombaby.org/breastfeeding
**Infant Anatomy**
- Oral thrush
- Tight frenulum
- Arching palate
- Disorganized suck
- Torticollis

**Latch and Milk Transfer**
- Inappropriate latch
- Poor milk transfer
- Poor pre-post test weights
- Use of supplements
- Poor growth trajectory
- Overactive letdown / oversupply

**Maternal Anatomy**
- Nipples difficult to grasp
- Nipple fissures
- Crusting
- Pustules
- Plaques
- Nipples change color postfeeding
- Throbbing pain
- Breast erythema, induration, tenderness

**Pumping Regimen**
- Flange fit observed to be inappropriate during pumping
- Use of long durations, repeated slim cycles, high suction
- Large milk volume
- Maternal/infant oversupply symptoms

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**Differential Diagnosis**

1. **Nipple Fissures, yellow crust, erosions, pusules, no systemic symptoms**
   - **Treatment:** Antimicrobials
   - **Follow-up:** 3-5 days
   - **Prevention:** Apply expressed milk to nipples and allow to dry

2. **Bacterial Infection**
   - **Symptoms:** Increased redness, swelling, and pain
   - **Treatment:** Antibiotics
   - **Prevention:** Proper hygiene and follow-up care

3. **Infant Dermatitis**
   - **Symptoms:** Redness, itchiness, and crusty appearance
   - **Treatment:** Hydrocortisone cream
   - **Prevention:** Avoid scratching and use gentle soaps

4. **Nipple Irritation**
   - **Symptoms:** Minor redness and tenderness
   - **Treatment:** Balanced diet
   - **Prevention:** Regular feeding

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**Nipple Infection**

**What is a nipple infection?**

Nipple infections are caused by bacterial growth due to poor hygiene, friction, or other irritants. They can occur in breastfeeding mothers and can lead to discomfort for both the mother and the baby.

**What to do:**

- **Nipple/areola chloasma**
  - Use baby powder and keep the area dry after feeding.

- **Antibiotics for nipple infections**
  - Take the prescribed medication, even if you feel better after the first dose.
  - Use an antibiotic cream to prevent recurrence.
Dermatitis

Vasospasm

E&M provider assessment: Pain ± trauma

Vasospasm

Supportive measures:
- After each breast milk aspiration, cover breasts with cold compresses or wet washcloths (for 5 minutes)
- Eliminate vasospastic milk (e.g., cold milk)
- Increase back support, time weaning, FL 7-10 days

Response to supportive measures:
- Portal
- No

Vasospasm

Breastfeeding: An Illustrated Guide to Diagnosis and Treatment © Elsevier 2008
Pain is a part of daily living, and suffering is optional. Pain and suffering are not the same experience. Shinzen Young teaches that suffering is a function of two variables: pain and resistance. In comparing suffering to a mathematical formula,

\[ \text{Suffering} = \text{pain} \times \text{resistance} \]

if you double the resistance and the pain remains the same, you double the suffering. If your resistance is zero and the pain remains the same, your suffering is also zero.
Functional pain


E&M provider assessment: Pain ± trauma

Ductal infection

E&M provider assessment: Pain ± trauma

Candida
What about APNO?

**Bacterial Infection**
- Mupirocin 2% ointment
- Betamethasone 0.1% ointment
- Miconazole powder to final concentration of 2%

<table>
<thead>
<tr>
<th>Cream</th>
<th>Bacterial Infection</th>
<th>Irritant Dermatitis</th>
<th>Candida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mupirocin 2% ointment</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Betamethasone 0.1% ointment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miconazole powder to final concentration of 2%</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Pain Scale (0-10)**

<table>
<thead>
<tr>
<th>Cream</th>
<th>Baseline</th>
<th>1 week</th>
<th>12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>APNO</td>
<td>5.53</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Lanolin</td>
<td>3.15</td>
<td>3.29</td>
<td></td>
</tr>
</tbody>
</table>

**Exclusive Breastfeeding**

- APNO: 72%
- Lanolin: 60%
- APNO: 46%


**APNO 15g tube**
- $61
- n/a

**APNO 30g tube**
- $96
- n/a

**Flucinonide 0.05% 15g tube**
- $11.99
- $10

**Flucinonide 0.05% 30g tube**
- $12.99
- $10

**Aquaphor 1.75oz**
- $5.99
- n/a

**Mupirocin 22g**
- $34.99
- $10

**Clotrimazole 1% 30g**
- $8.79
- n/a

**Work-up to choose which cream to use?? ??**

*Prices from Triangle Compounding Pharmacy and Drugstore.com
Clinical pearls from a pilot study

**On Vasospasm**

Mothers with vasospasm often don’t notice blanching / skin color changes until the LC points it out after a feeding.

Clinical history: warm shower feels great, but pain terrible on getting out to dry off.

Putting a damp, cool breast pad on after feeding can trigger painful vasospasm. Heat and ibuprofen make a huge difference for these mothers.

**On coping**

Asking mothers to rate their pain with a number with initial latch, and then after feeding, helps them realize that the pain abates during a feeding.

Many mothers who might have been treated empirically for yeast in the past have symptoms improve while waiting for cultures to come back.

**Take-home points**

Most pain begins with traumatic injury to the nipple – a problem at the “oroboobular interface.”

For mothers who are pumping, pain may result from pump overuse or misuse.

Fixing pain requires fixing this problem – generally with the expertise of a lactation consultant.

Trauma can cause a secondary problem:

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- Infection
- Vasospasm
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Among women with a predisposition to chronic pain and/or anxiety, symptoms may persist after the trauma and/or the secondary problem resolve.

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