Assessment and management of mastitis, current controversies

Dra Carmela K Baeza, MD, IBCLC

Disclosures

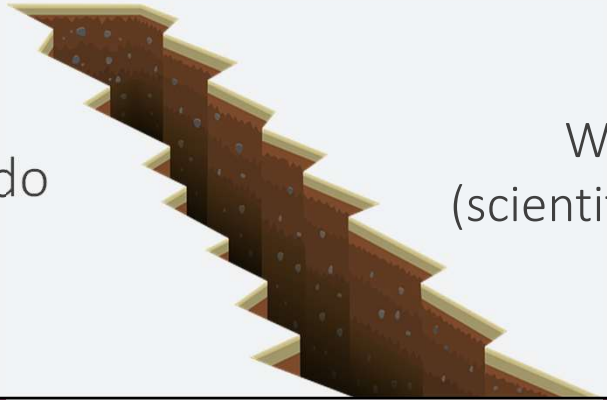
I gladly work with and honor everyone who seeks my services.

In this talk I will speak of breasts, since breast (mammary tissue) is where mastitis occurs, and of women, because all the studies I will refer are done on this population.

Even though I will name some companies/products in this talk, it is for the sake of showing reality but I in NO WAY endorse them or have any relationship with them.

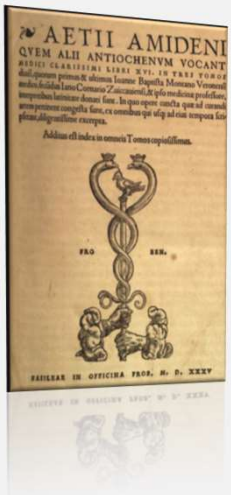
THE RIFT IN MASTITIS

What we do



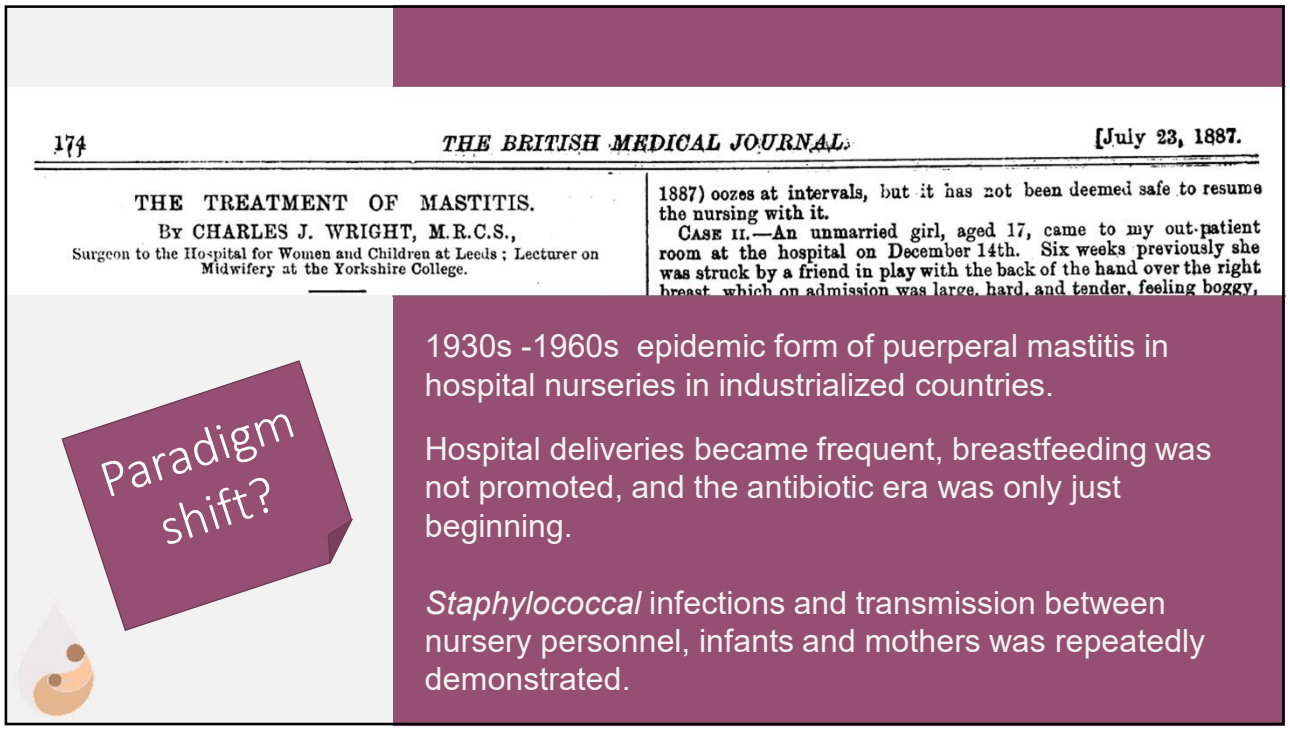
What we (scientifically) know

HISTORY OF MASTITIS



(…) in order to prevent the onset of this condition: (1) a proper diet should be prescribed and (2) it is advisable to have the milk gently pumped by old and experienced women. If women breastfeed and children suckle, it helps relieve the pain of the breasts immediately, as suckling causes more milk to flow into the breasts (pp. 51–52).

Aëtius of Amida (470 A.D. aprox)
Byzantine Greek physician and medical writer.



174 THE BRITISH MEDICAL JOURNAL. [July 23, 1887.

THE TREATMENT OF MASTITIS.

By CHARLES J. WRIGHT, M.R.C.S.,

Surgeon to the Hospital for Women and Children at Leeds; Lecturer on Midwifery at the Yorkshire College.

1887) oozes at intervals, but it has not been deemed safe to resume the nursing with it.

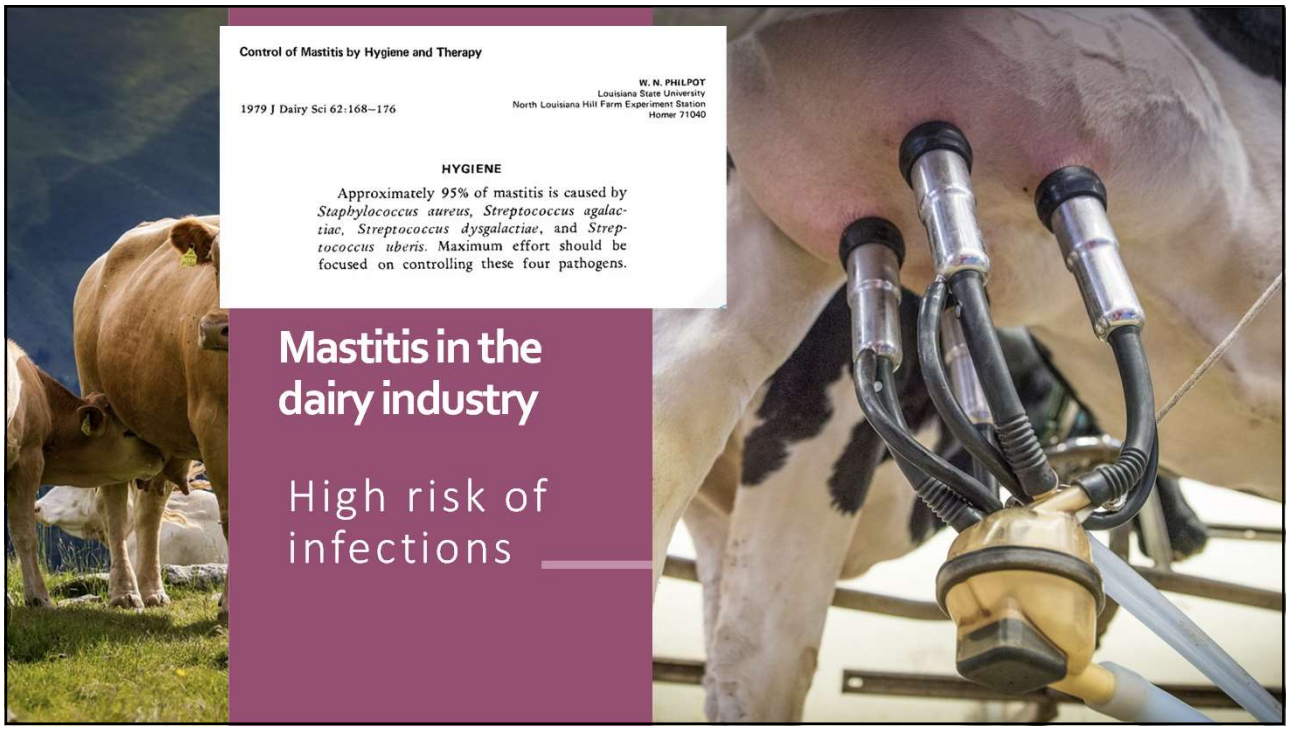
CASE II.—An unmarried girl, aged 17, came to my out-patient room at the hospital on December 14th. Six weeks previously she was struck by a friend in play with the back of the hand over the right breast, which on admission was large, hard, and tender, feeling boggy,

Paradigm shift?

1930s -1960s epidemic form of puerperal mastitis in hospital nurseries in industrialized countries.

Hospital deliveries became frequent, breastfeeding was not promoted, and the antibiotic era was only just beginning.

Staphylococcal infections and transmission between nursery personnel, infants and mothers was repeatedly demonstrated.



Control of Mastitis by Hygiene and Therapy

1979 J Dairy Sci 62:168–176

W. N. PHILPOT
Louisiana State University
North Louisiana Hill Farm Experiment Station
Homer 71040

HYGIENE

Approximately 95% of mastitis is caused by *Staphylococcus aureus*, *Streptococcus agalactiae*, *Streptococcus dysgalactiae*, and *Streptococcus uberis*. Maximum effort should be focused on controlling these four pathogens.

Mastitis in the dairy industry

High risk of infections

Mastitis: causes and management

23 March 2000 | Technical document

World Health Organization

Breastfeed Med. 2014 Jun 1; 9(5): 239–243.
doi: 10.1089/bfm.2014.9984

ABM Clinical Protocol #4: Mastitis, Revised March 2014

Lisa H. Amir[1,2]

Lactational mastitis

UpToDate®

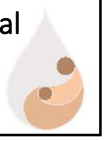
AUTHORS: J Michael Dixon, MD, Adetola Louis-Jacques, MD

Not much change

Mastitis is an inflammatory condition of the breast, which may or may not be accompanied by infection (WHO 2000)

Mastitis literally means an inflammation of the breast; this inflammation may or may not involve a bacterial infection (Amir 2014)

Lactational mastitis is inflammation of the breast tissues associated with breastfeeding. In some patients, the initial inflammatory process leads to bacterial infection (Dixon 2023)



Is it inflammation or infection?

Our clinical management is the tip of the iceberg

INFLAMMATION

- Studies of inflammatory response in breastmilk
- *25 years of research in human lactation* – Geddes 2021
- BLBI (benign lactating breast inflammation)– Pamela Douglas
- Mastitis Spectrum – ABM

When? How? Why?

INFECTION

- Classic milk culturing data
- New methods
- Dysbiosis hypothesis
- Biofilm hypothesis

Requires antibiotic response… Which? How long?

Probiotic treatments? Useful? Ethical?

Is this relevant for the clinical management?

Is it inflammation or infection?

ACUTE MASTITIS

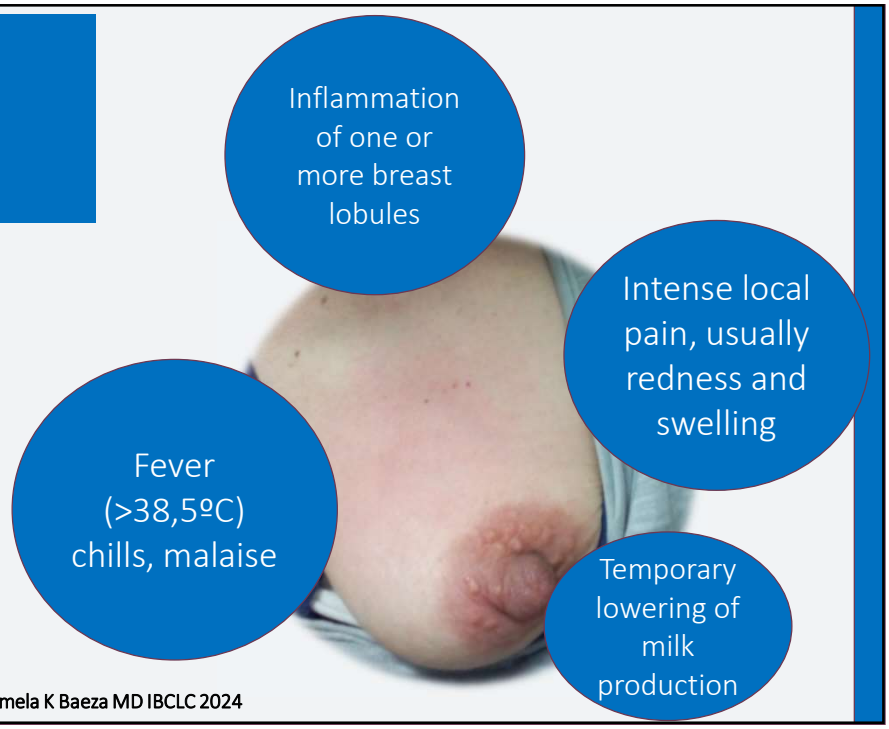
1

MASTITIS Definition

Both definition and diagnosis are **CLINICAL.**

More frequent in first 6-12 weeks postpartum.

Global incidence ranges from 10% to 33%.



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MASTITIS
Ethiology

International Breastfeeding Journal
BioMed Central

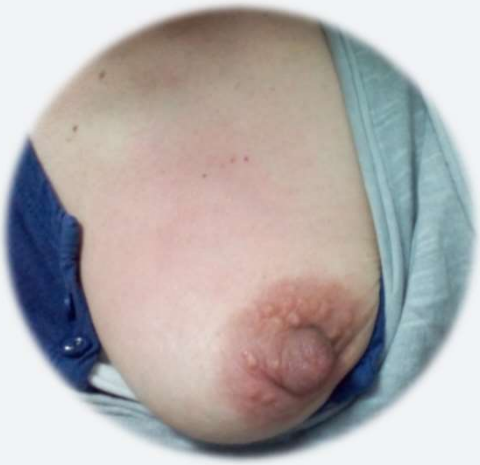
Research Open Access

The role of bacteria in lactational mastitis and some considerations of the use of antibiotic treatment

Linda J Kvist*[†1,2], Bodil Wilde Larsson[†2], Marie Louise Hall-Lord[†2,3], Anita Steen[†4] and Claes Schalén[†4]

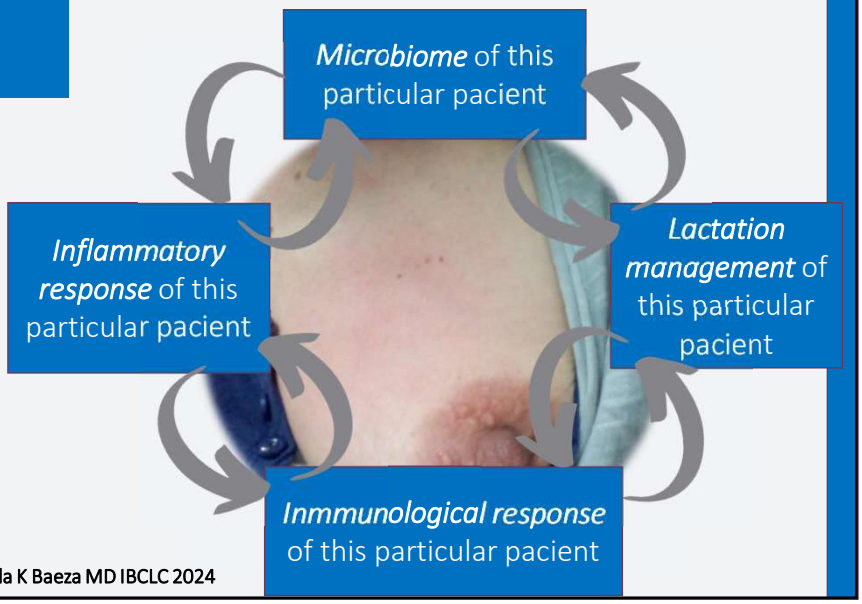
"There were no significant correlations between bacterial counts and the symptoms of mastitis as measured on scales".

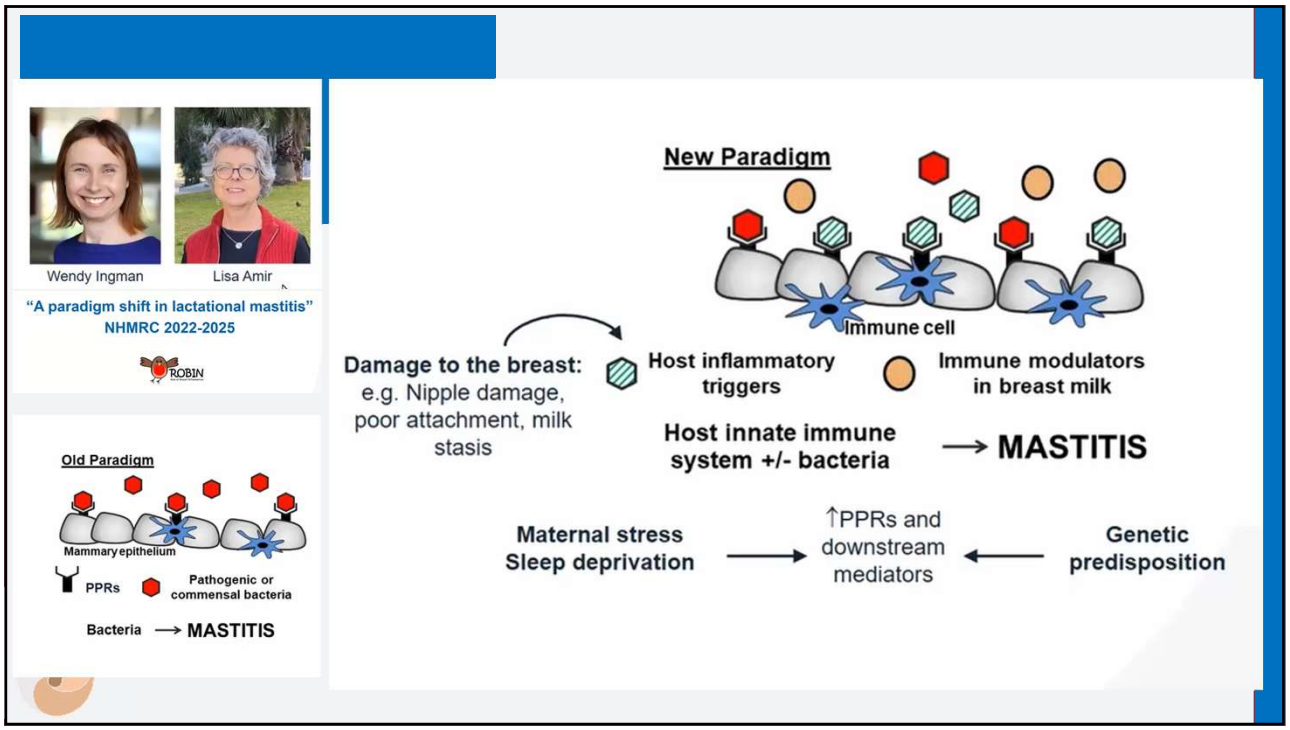
"There were no differences in bacterial counts between those prescribed and not prescribed antibiotics".

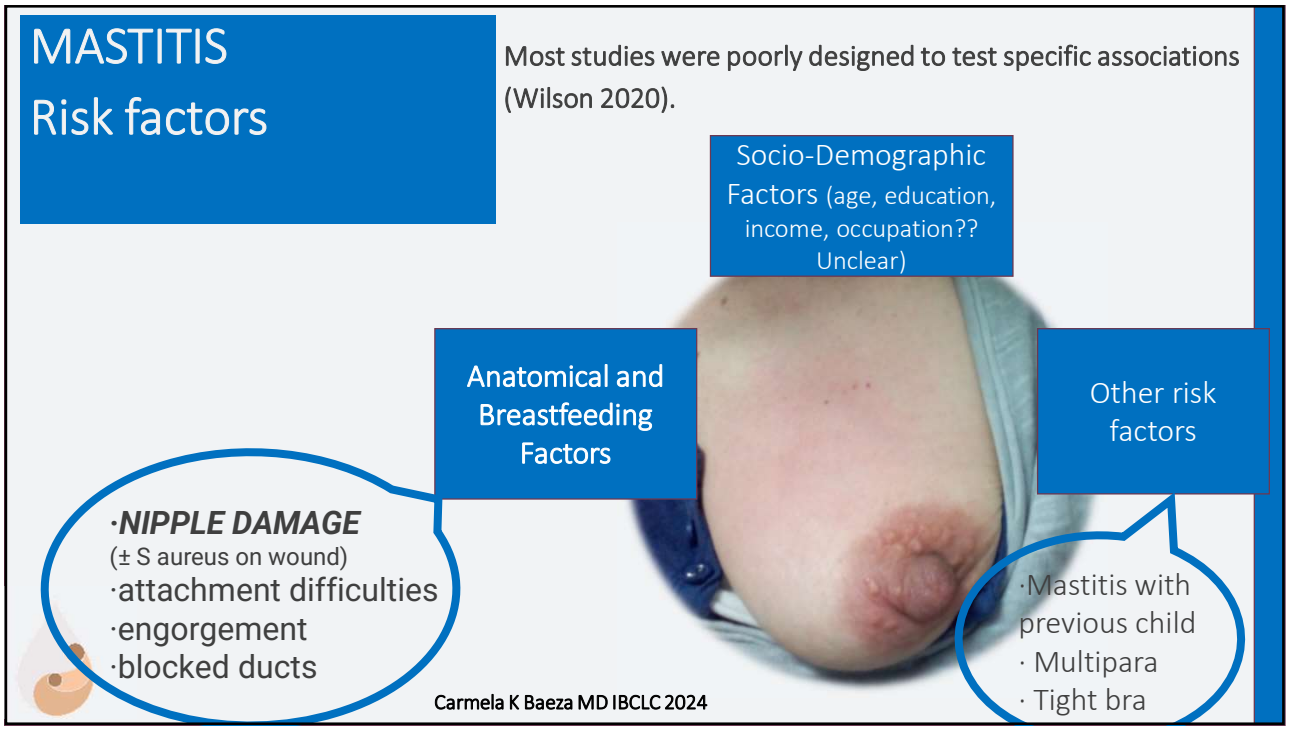


MASTITIS
Ethiology

There seems to be a complex interaction of several factors, which dictate each case evolution.




Wendy Ingman
Lisa Amir
"A paradigm shift in lactational mastitis"
NHMRC 2022-2025
ROBIN
Old Paradigm
Mammary epithelium
PPRs
Pathogenic or commensal bacteria
Bacteria → MASTITIS
New Paradigm
Immune cell
Damage to the breast: e.g. Nipple damage, poor attachment, milk stasis
Host inflammatory triggers
Immune modulators in breast milk
Host innate immune system +/- bacteria → MASTITIS
Maternal stress
Sleep deprivation
↑PPRs and downstream mediators
Genetic predisposition


MASTITIS
Risk factors
Most studies were poorly designed to test specific associations (Wilson 2020).
Socio-Demographic Factors (age, education, income, occupation?? Unclear)
Anatomical and Breastfeeding Factors
Other risk factors
·NIPPLE DAMAGE
(± S aureus on wound)
·attachment difficulties
·engorgement
·blocked ducts
·Mastitis with previous child
· Multipara
· Tight bra
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MASTITIS
Conservative management

Move the Milk:

- Keep the milk flowing!!
- FREQUENT AND EFFECTIVE nursing or, if not possible, frequent and effective milk expression.

Around 85% mastitis resolve with conservative management

(Kvist 2008 – and clinical experience)

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MASTITIS
New recommendations

ABM clinical protocol #36 has created some debate…

Overfeeding from the affected breast or ‘‘pumping to empty’’ perpetuates a cycle of hyperlactation and is a major risk factor for worsening tissue edema and inflammation.

Mothers can hand express small volumes of milk for comfort until their milk production *downregulates* (italics mine) to match the infant’s needs.

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MASTITIS
New recommendations

ABM clinical protocol #36 has created some debate…

Mothers using breast pumps should express only the volume their infant consumes.

MASTITIS
New recommendations

ABM clinical protocol #36 has created some debate… where is the evidence???

(when) the retroareolar region is so edematous and inflamed that no milk is expressible by infant breastfeeding or hand expression, the mother should not continue to attempt feeding from the affected breast during the acute phase.

She can feed from the contralateral breast and return to feeding from the affected breast when edema and inflammation subsides.

MASTITIS
New recommendations

So, a bit of confusion…

How often should a mother offer the affected breast to her infant? Should she pump?

Frequent and effective should, actually, be the "normal" i.e. physiological breastfeeding.

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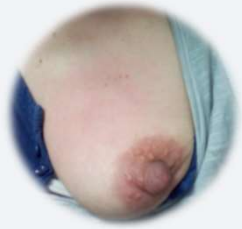
What do you currently recommend?



- That your client continue feeding in the same way as before the mastitis
- That your client pump the affected breast after the baby feeds, to drain it completely
- That your client offer the affected breast first during the next few feeds, in stead of alternating breasts.
- That your client rest the affected breast (no feeding, no pumping), offering only the unaffected one for a few feeds

MASTITIS
Conservative management

My recommendation:

Based on available science and experience:

- **Go case by case**
- **Give preference to affected breast, nursing baby on cue.**
- **If baby does not nurse, simulate expected normal breastfeeding with hand expression/ pump.**

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MASTITIS
Conservative management

Move the Milk and…

Support your client:

Physically

- Sleep!! nutrition, hidration
- Manage pain
- Warm/cold to comfort
- Gentle massage

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MASTITIS
Conservative management

Move the Milk and…

Support your client:

Emotionally

- Empathic listening
- Address fears
- Evaluate support team
- Explain evolution

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MASTITIS
Conservative management

Move the Milk and…

Support your client:

Logistics

- Help for infant care
- Care of other siblings
- Care of home

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MASTITIS
Farmacological management

Antibiotic treatment

IF (systemic) SYMPTOMS DO NOT RESOLVE IN 12-48 hours, or if mother is feeling very ill:

Refer to proper healthcare provider for antibiotic prescription.

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MASTITIS
Farmacological management

Recommendations (weak evidence, but it´s all we have):

Empirical antibiotic treatment for S. aureus:

- Dicloxacillin or flucloxacillin 500 mg by mouth four times per day, or
- First-generation cephalosporins, like Cefadroxil or Cephalexin 500 mg by mouth twice per day or as recommended by local antibiotic sensitivities.

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MASTITIS
Farmacological management

If patient has penicillin allergies:

- Clindamycin 300 mg/6-8h
- Trimethoprim/sulfamethoxazole 160/800/12h (not recommended if infant is under 6 weeks)

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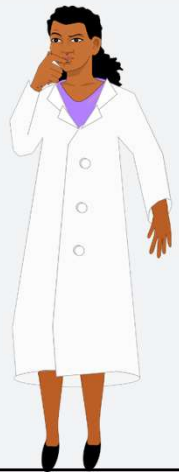
MASTITIS
Farmacological management

Length of treatment

- 10–14 day course of antibiotics (recommendation not subjected to controlled trials).
- Fever and chills should disappear within the first 12 hours of treatment.
- Redness, pain, lump take longer to resolve – warn your patient!!



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Academy of Breastfeeding Medicine Clinical Protocol #36: The Mastitis Spectrum, Revised 2022

Katrina B. Mitchell,[1] Helen M. Johnson,[2] Juan Miguel Rodríguez,[3] Anne Eglash,[4] Charlotte Scherzinger,[5] Irena Zakarija-Grkovic,[6] Kyle Widmer Cash,[7] Pamela Berens,[8] Brooke Miller,[9] and the Academy of Breastfeeding Medicine

Other interventions

Protocol states that lecithin may be taken to reduce inflammation, emulsify milk, and be effective for ''nipple blebs.'' Neither of the studies they cite support this.

Therapeutic ultrasound, no evidence. Reference no. 42 is not an original study but a review that refers to no. 43, a study with no control group and confusing methodology.

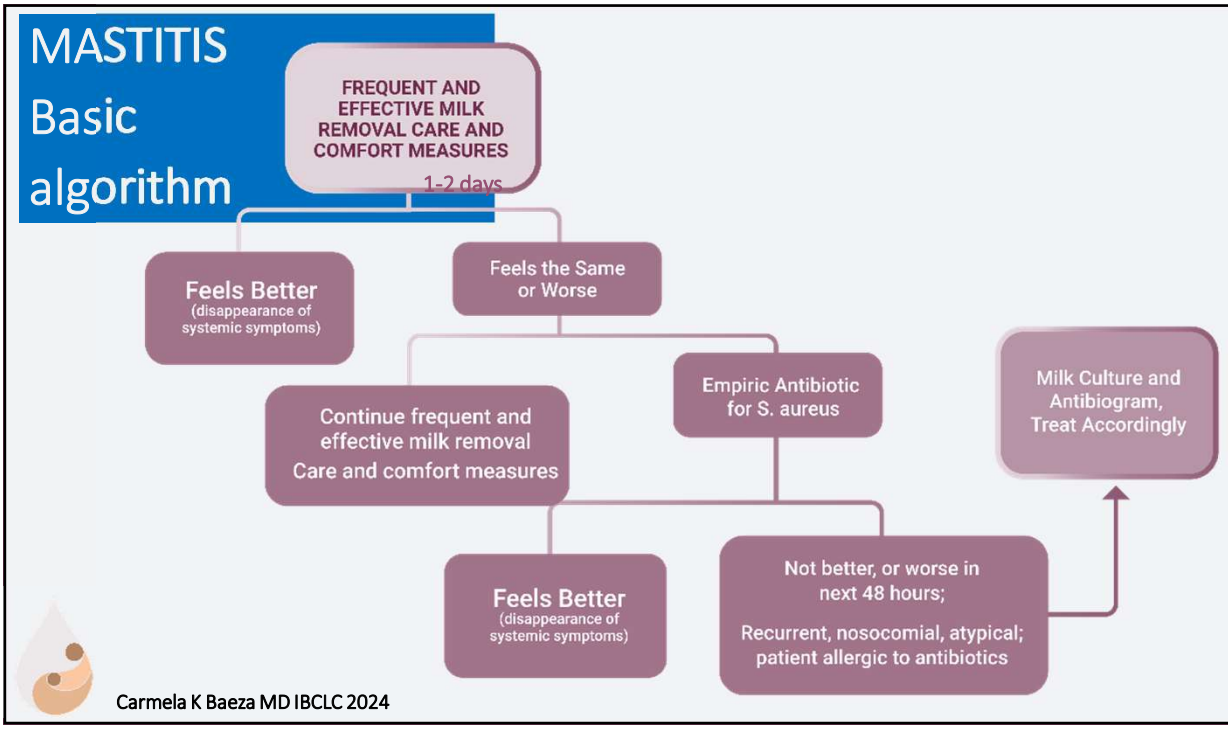
In treating hyperlactation, they imply it has to do with dysbiosis and refer to ABM protocol #32 (hyperlactation) that itself makes no mention of dysbiosis.

MASTITIS
Further investigations

When to refer for a milk culture (assessment of bacterial growth)

- If **patient not better after 24-48 hours** of antibiotic treatment (suspicion of MRSA or others)
- If **recurrent mastitis** (always rule out breastfeeding management/suck issues)
- If the mastitis has been acquired at a **hospital**
- If it is a **very severe or atypical** mastitis
- If patient is **allergic to** most commonly used **antibiotics.**

MASTITIS Basic algorithm



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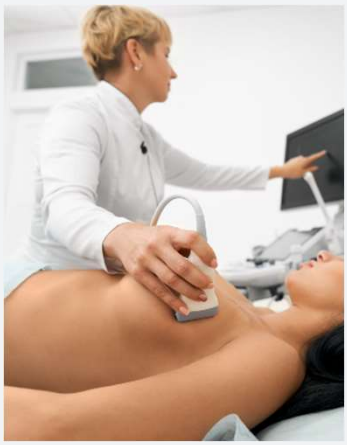
MASTITIS Further investigations



Diagnostic ultrasound

Suspicion of abscess

- Persistent lump (with or without local pain/redness)
- Fluctuating nodule on palpation

Recurrent mastitis in same place

- Rule out physical lesion that may be causing structural blocking of milk flow (including breast cancer)

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SUBCLINICAL MASTITIS

2

Subclinical Mastitis

- Seems to be an **immune activation**.
- Also occurs in the context of active infection in the infant.
- Is resolved with good lactation management

Asymptomatic lactating woman

Milk biochemistry tested

Na:K ratio >0,6 – 1
Elevated levels of IL8
Milk leukocyte count > 1 million cells/ml

Subclinical Mastitis

A person WITH THIS CONDITION HAS NO SYMPTOMS, SO WILL NOT BE CONSULTING BECAUSE OF PAIN!

Asymptomatic lactating woman

Milk biochemistry tested

Na:K ratio >0,6 – 1
Elevated levels of IL8
Milk leukocyte count > 1 million cells/ml

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37

SUBACUTE MASTITIS

3

Term originating from the field of veterinary medicine, which has also been proposed for human lactation, without reaching a consensus on its existence or its exact definition.

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"Inflammation of the breast and painful breastfeeding"

(Arroyo et al 2010, *Clin Infect Dis*)

"Local pain, more or less intense, that feels like needles, cramps or burning, without visible redness (or very slight) and with no general symptoms" (Carrera et al 2012, *Acta Ped Esp*)

"Burning/needle-like pain and engorgement"

(Jiménez et al 2015; *JHL*).

"Breast inflammation accompanied by other local symptoms (ingurgitation, needlelike and/or burning pain, reduced milk secretion) without systemic symptoms "

(Fernandez et al 2016, *Clin Infect Dis*)

Subacute mastitis named 4 times, without definition, grouped with subclinical mastitis.

(Mediano et al 2017, *JHL*)

"Breast engorgement and fever."
Scientific Reports 2017

"Deep, aching breast pain that may emanate to the nipple areolar complex, often in association with recurrent plugging, breast tenderness, intermittent acute mastitis, recurrent nipple blisters, and biofilm formation within the ducts"

(Betts et al 2021, *Bf Med*)

"Needle-like, burning breast pain, nipple blebs, recurrent areas of induration or congestion, and may have unresolved hyperlactation".

ABM protocol #36 Mastitis Spectrum 2022

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"Inflammation of the breast and painful breastfeeding"
(Arroyo et al 2010, *Clin Infect Dis*)

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"Breast inflammation accompanied by other local symptoms (ingurgitation, needlelike and/or burning pain, reduced milk secretion) without systemic symptoms "
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"Needle-like, burning breast pain, nipple blebs, recurrent areas of induration or congestion, and may have unresolved hyperlactation".
ABM protocol #36 Mastitis Spectrum 2022

Needles
Burning
Engorgement
Painful breastfeeding
CONFUSING: Why term this mish-mash of conditions as mastitis?
Reduced milk secretion
Fever
Recurrent plugging
Induration
Intermitent acute mastitis
Congestion
Nipple blisters
Hyperlactation

There is

NO SCIENCE

behind the term

"subacute mastitis"

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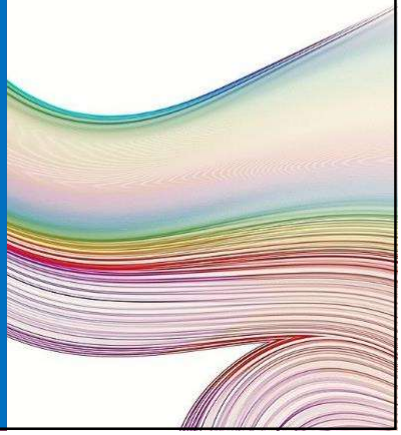
Proposed treatment for "subacute mastitis" (with NO science behind it):

Probiotics and/or antibiotics



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Fever
Needles
Hyperlactation
Burning
Painful breastfeeding
Congestion
Engorgement
Induration
Reduced milk secretion
Nipple blisters
Intermitent acute mastitis
Recurrent plugging

If we treat those who have these symptoms with probiotics…

Practically every nursing woman will be recommended probiotics – to "treat" or to "prevent".

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Academy of Breastfeeding Medicine Clinical Protocol #36: The Mastitis Spectrum, Revised 2022

Katrina B. Mitchell,[1] Helen M. Johnson,[2] Juan Miguel Rodriguez,[3] Anne Eglash,[4] Charlotte Scherzinger,[5] Irena Zakarija-Grkovic,[6] Kyle Widmer Cash,[7] Pamela Berens,[8] Brooke Miller,[9] and the Academy of Breastfeeding Medicine

PROBIOTICS

In the *Recommendations for bacterial mastitis*, authors state that probiotics have not been shown to alter human milk microbiota—which is akin to confirming they do not work.

Consider daily probiotic use with Lactobacillus fermentum or, preferably, Lactobacillus salivarius for prevention
…again referencing the same authors (JMR and his workgroup) who have had strong ties to the probiotic industry and who have not obtained supporting evidence for the efficacy and safety of probiotics in mastitis.

Eight of the 77 references in this protocol are articles by these authors

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Families are spending money on treatments that have no clear evidence.

Somebody is making A LOT of money on treatments that have no clear evidence.

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Probiotic patent sold to formula company

Biosearch S.A. firma con Nestlé un acuerdo de licencia de su cepa "Hereditum Lactobacillus fermentum LC40®".

Biosearch, S.A., compañía biotecnológica de referencia en el mundo de los ingredientes saludables, ha anunciado la firma de un acuerdo de licencia con

Nestlé announced today the launch of *MATERNA Opti-Lac*, a probiotic solution for lactating mothers, to help them reduce the risk of breast pain and mastitis – a painful inflammatory condition of the breast – during breastfeeding.

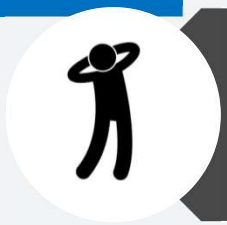
JUN 14, 2019

Nestlé launches new product for lactating mothers to support breastfeeding

MATERNA Opti-Lac is a food supplement that contains a patented unique pr *LC40*, naturally found in breastmilk of healthy mums to support breast health

MATERNA Opti-Lac is being launched first in Hong Kong with several markets to follow in the coming months globally. The hard gel capsules should be taken daily from the start of breastfeeding. Products will be available in pharmacies, drugstores, baby stores, retail shops and hospitals.

Is there a solid base of evidence to support the use of probiotics for lactation difficulties?



Yes

No

Contents lists available at ScienceDirect

Women and Birth

journal homepage: www.elsevier.com/locate/wombi

Probiotics and human lactational mastitis: A scoping review

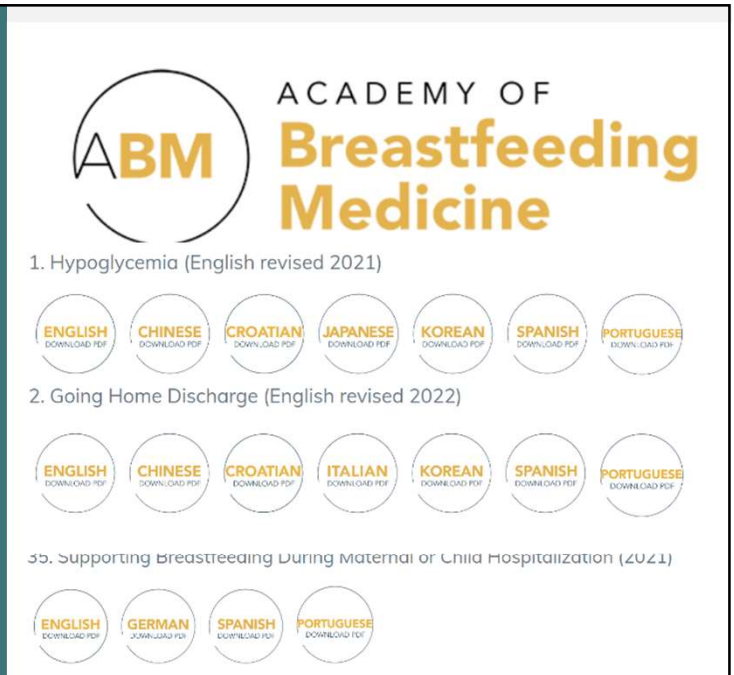
Melissa Barker[a,d,e,*], Pamela Adelson[a], Micah D J Peters[a,b,c], Mary Steen[a,d,e]

- Only 5 studies (all Spanish and 2 overlapping research groups – Nutrition, Puleva and Biosearch; patent)
- Scant collection of demographic data
- Confusing data collection regarding pain
- Results based on bacterial counts and not mastitis symptoms
- Did not comply with the CONSORT (Consolidated Standards of Reporting Trials)
- Issues with randomization, blinding, dropouts and sample sizes
- Conflicts of interest

"Well-designed studies are needed before evidence-based recommendations can be made for use of probiotics in the treatment or prevention of lactational mastitis."

The ABM Mastitis Spectrum Protocol

Thank you, ABM



Academy of Breastfeeding Medicine Clinical Protocol #36: The Mastitis Spectrum, Revised 2022

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Overall, confusing and scarcely evidence-based.

BREASTFEEDING MEDICINE
Volume 17, Number 11, 2022
© Mary Ann Liebert, Inc.
DOI: 10.1089/bfm.2022.0129

Correspondence

Open camera or QR reader and scan code to access this article and other resources online.

Re: "Academy of Breastfeeding Medicine Clinical Protocol #36: The Mastitis Spectrum, Revised 2022" by Mitchell et al.

Carmela Baeza,[1] Jose Maria Paricio-Talayero,[2] Monica Pina,[3] and Concepcion De Alba[4]

Douglas International Breastfeeding Journal (2023) 18:51
https://doi.org/10.1186/s13006-023-00588-8

International Breastfeeding Journal

REVIEW Open Access

Does the Academy of Breastfeeding Medicine's Clinical Protocol #36 'The Mastitis Spectrum' promote overtreatment and risk worsened outcomes for breastfeeding families? Commentary

Pamela Douglas[1,2,3*]

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PROBIOTICS
DYSBIOSIS
BIOFILMS

Probiotics are a **good** idea…

Isolate the "good" bacteria from human milk

→ Give it to the mother with "breastfeeding difficulties" to "set the flora to rights".

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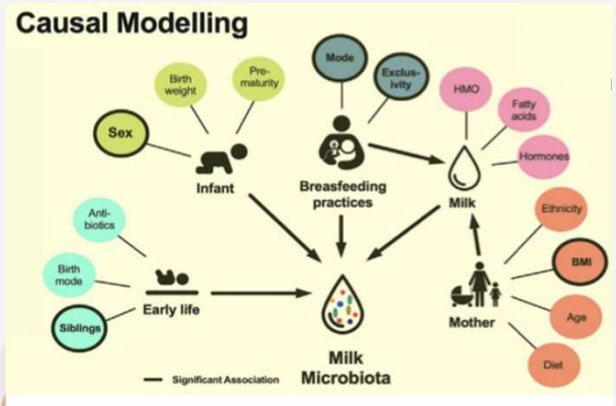
Isolate the "good" bacteria from human milk

There are no "good" or "bad" ones, it is the interrelation of sooo many factors!!!



"There were no significant correlations between bacterial counts and the symptoms of mastitis".

> Mucosal Immunol. 2016 May;9(3):757-766. doi: 10.1038/mi.2015.99. Epub 2015 Oct 14.

Human milk proresolving mediators stimulate resolution of acute inflammation

Hildur Arnardottir [#1], Sarah K Orr [#1], Jesmond Dalli [1], Charles N Serhan [1]

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Give it to the mother with "breastfeeding difficulties" to "set the flora to rights".

SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 27 June 2017
doi: 10.2903/j.efsa.2017.4917

Lactobacillus fermentum CECT 5716 and a reduction of the _Staphylococcus_ load in breast milk which reduces the risk of infectious mastitis: evaluation of a health claim pursuant to Article 14 of Regulation (EC) No 1924/2006

"The Panel concludes that a cause and effect relationship has not been established between the consumption of Lactobacillus fermentum CECT 5716 and a reduction of the Staphylococcus load in breast milk which reduces the risk of infectious mastitis."

Cureus
Part of SPRINGER NATURE

Open Access Review Article

DOI: 10.7759/cureus.62717

The Association Between Lactational Infective Mastitis and the Microbiome: Development, Onset, and Treatments

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The oral administration of probiotics to pregnant and lactating mothers effectively prevents and treats LIM.

Dysbiosis

Difficult to specify as we don´t know enough about normal microbiota.

Our undestanding of milk microbiota is still limited

Though there is a “core” microbiological population, there is high variability among women

Need to establish research methods that are standardized and less costly

Need rigorous studies BEFORE comitting to treatments!!

Carmela K Baeza MD IBCLC 2024

Biofilms

Biofilms are a normal part of healthy human microbiomes

There is no evidence to support the hypothesis that pathogenic biofilm causes sticky milk, duct blockage and breast inflammation.

Douglas 2020

Pathologic biofilm derives from the hospital setting, where they form on chronic wounds, ulcers and burns, or on medical prostheses and implants inserted into the body.

Should not be extrapolated into the radically different, uniquely immune-factor-rich environment of the lactating mammary gland.

Carmela K Baeza MD IBCLC 2024

THANK YOU!!

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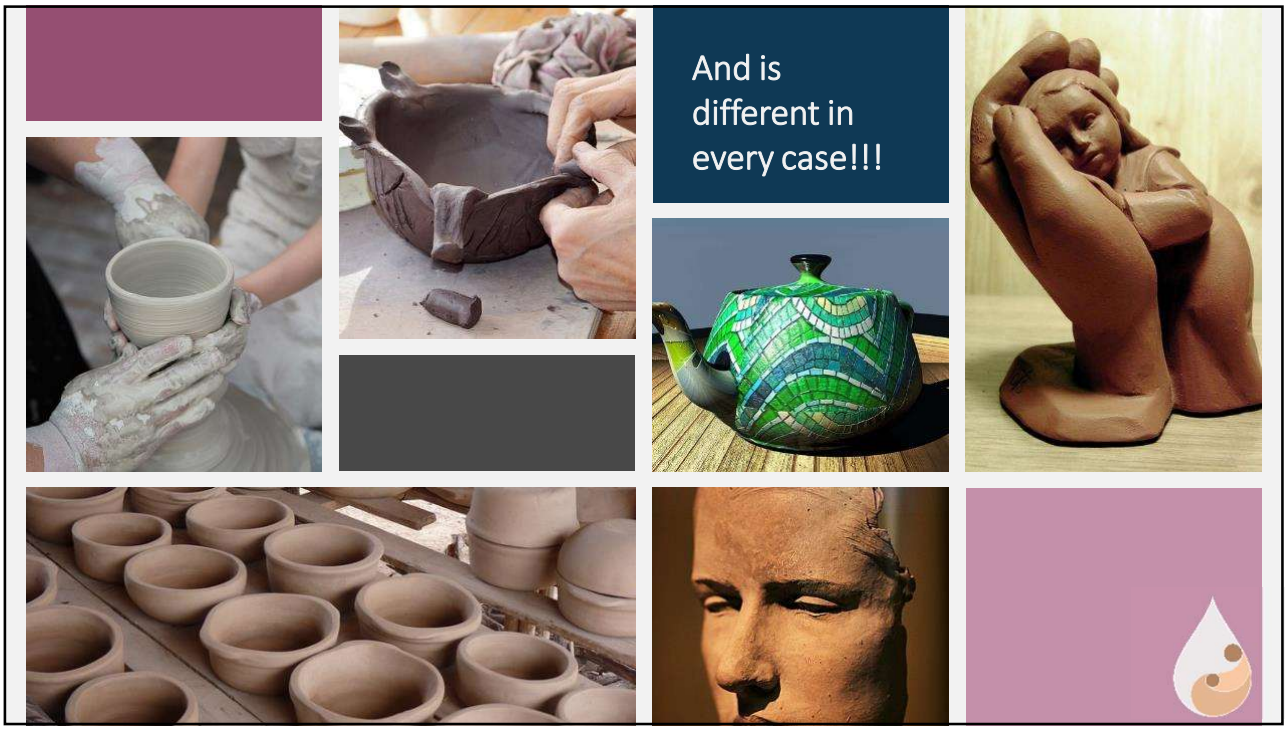
Carmela K Baeza MD IBCLC 2024

Our art is the art of caring

Taking the messy science…

Taking the messy science…

…and turning it into a support that is both empathic and clinically precise.



THANK YOU

Dra Carmela K Baeza, MD, IBCLC

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