

Mastitis

*Just the tip of
the Iceberg*



BODY SIZE is NOT an
accurate indication of HEALTH



health-and-the-fat-girl.tumblr.com

Oregon WIC 5th Annual Joint Meeting
August 27, 2024
Nicole Marshall, MD MCR IBCLC FABM

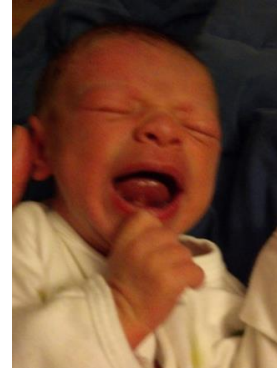
Disclosures

Academy of Breastfeeding Medicine Protocol Committee member volunteer 2018-2023

Section Editor, UpToDate©

Volunteer on Northwest Mother's Milk Bank Medical Advisory Board

I have personal biases related to my own 54 months of breastfeeding experiences



Reproductive Justice

**WE BELIEVE
IN REPRODUCTIVE
JUSTICE, BECAUSE
EVERYONE
SHOULD HAVE
CONTROL OVER
THEIR BODIES
& ACCESS TO
THE RESOURCES
THEY NEED.**



WOVEN TEACHING

Human milk is like ice cream, penicillin, and the drug ecstasy all wrapped up in two pretty packages.

- Florence Williams



Background

- Exclusive breastfeeding for the first 6 months is recommended for optimal infant nutrition
- Breastfeeding confers maternal lifelong health benefits including decreased rates of:
 - Cardiovascular disease
 - Stroke
 - Obesity
 - Type 2 diabetes
 - Cancer
 - All-cause mortality
- Degree of maternal health benefit proportional to increased lactation intensity and duration

Requirements for Exclusive Breastfeeding in the US for lactating people who work away from their child

- Must produce sufficient milk to meet infant needs
- Infant needs to be able to transfer milk effectively
- Infants eat ~8-12 times per day
- On demand feeding is recommended, with typical intervals every 30 minutes to 3 hours

The world's richest countries guarantee mothers more than a year of paid maternity leave. The U.S. guarantees them nothing.



Analysis by [Christopher Ingraham](#)

Reporter

February 5, 2018 at 3:11 p.m. EST



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- Infants eat ~8-12 times per day
- On demand feeding is recommended, with typical intervals every 30 minutes to 3 hours
- Expressing milk to mimic feeding intervals is option for maternal-infant separation or ineffective transfer

Oregon Breastfeeding Law

- Age of child: up to 18 months.
- Time: The employer shall provide the employee a reasonable rest period to express milk each time the employee has a need to express milk.
- Space: The location must be in close proximity to the employee's work area, and cannot be a toilet stall or restroom. The space needs to be shielded from view and free from intrusion from coworkers and the public. The space provided needs to be functional as a space for expressing breast milk. If the space is not dedicated to the employee's use, it must be available when needed in order to meet the statutory requirement. A space temporarily created or converted into a space or made available when needed by the employee is sufficient.

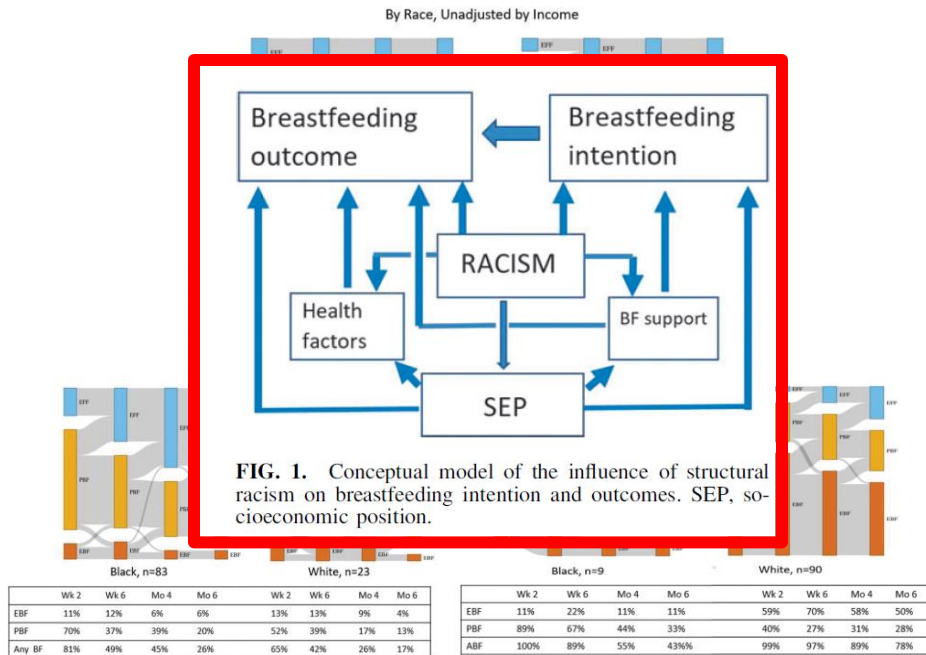


**IT'S NOT ABOUT
MY RIGHT
TO BREASTFEED,
IT'S ABOUT
MY CHILD'S
RIGHT TO EAT.**

The Fresh Quotes


Breastfeeding Disparities and Their Mediators in an Urban Birth Cohort of Black and White Mothers

Ardythe L. Morrow,^{1,2} Janelle McClain,³ Shannon C. Conrey,¹ Liang Niu,¹ Alexandra Kinzer,⁴ Allison R. Cline,²
 Alexandra M. Piasecki,⁵ Emily DeFranco,⁴ Laura Ward,⁶ Julie Ware,⁷ Daniel C. Payne,⁸
 Mary A. Staat,² and Laurie A. Nommsen-Rivers⁹



IS BREASTFEEDING REALLY FREE?

These are some of the direct costs of forgoing formula, not including tax.

 = \$20 USD



PUMP - \$269.99*

*free with most health insurance



MILK STORAGE - \$256.93

breastmilk bags, bottles, cooler



NURSING WEAR / ACCESSORIES - \$186.92

nursing bras, nursing tops, nursing covers



PUMP ACCESSORIES - \$102.41

parts, collection accessories, cleaning supplies



NURSING ACCESSORIES - \$46.06

nursing pads, cream & shields, necklace



TOTAL SPENT \$862.31
in 12 months

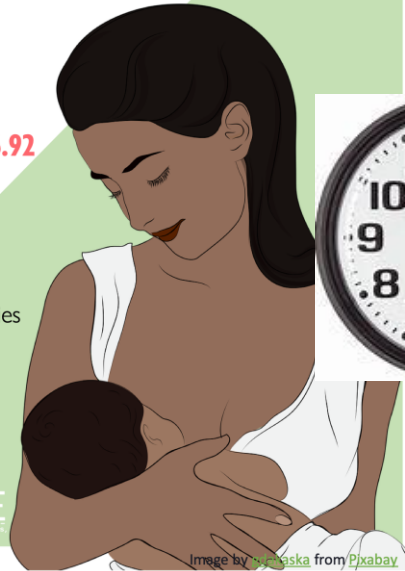


Image by [Kriszka](#) from [Pixabay](#)

UTA dataCAVE
LIBRARIES A Center for Data Creation, Analysis,
Visualization and Exploration

TikTok - Elyse Myers

- 398 days exclusively pumping for her son
- “2,388 hours I have spent hooked up to a machine to feed my kid,” she said. “And that’s over 125 gallons of milk that my body has created to sustain life after it already grew it for nine months. And I am so proud of myself.”
- 2,388 hours x \$20 hour = \$47,760
- 1 year = 2,190 hours/8 hour day = 273.75 days or ~55 work weeks, \$43,800



Milk Supply when Infant in NICU

MILK OUT = MILK MADE

Milk needs to be removed frequently and routinely to initiate and maintain milk production.

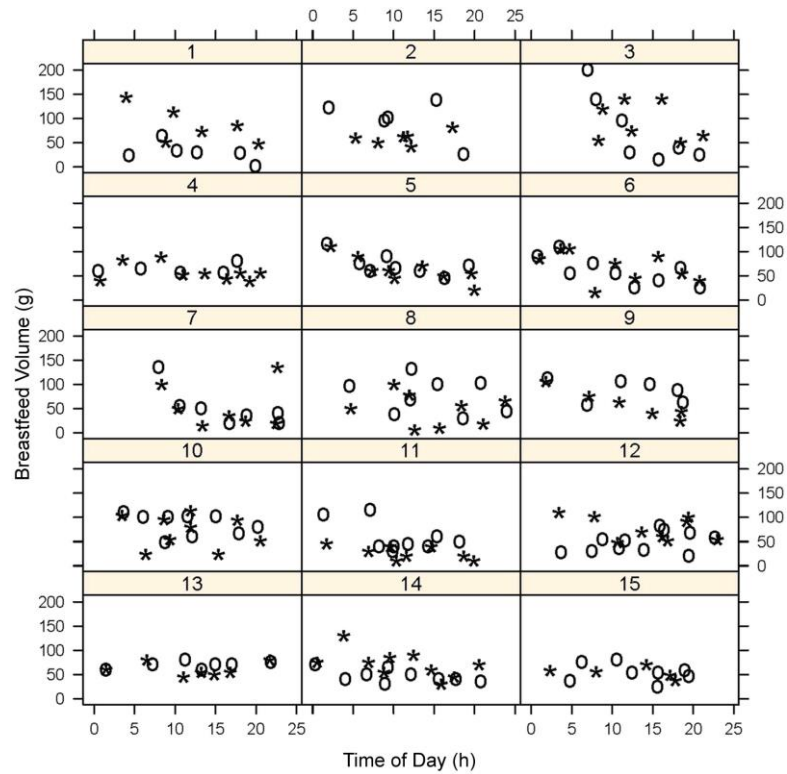
Start hand expression within the first 6 hours (ideally first hour)

Hand express at least 5x/day for the first 3 days

Start mechanical pumping with hospital grade pump with hands on pumping at least 8x/day

- Pump every 2-3 hours
- One 5-6 hour break for sleep at night
- Goal is at least 750 mL by DOL #10
- This technique had an average of 900+ mL by DOL #10

Each lactating person has a different capacity to make milk.



Each box of the lattice plot represents a single mother-infant pair, and symbols represent the feed from left (*) and right (o) breasts.

“A pair of substantial mammary glands has the advantage over the two hemispheres of the most learned professor’s brain in the art of compounding a nutritious fluid for infants.”

- Dr. Oliver Wendell Holmes Sr (1809-1894)



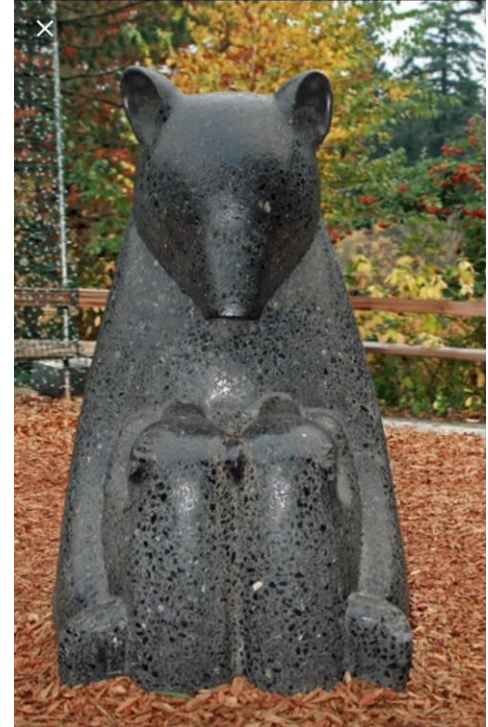
Table 1. Milk Composition and Breastfeeding Pattern over a 24-Hour Period

	Time of the Day			
	Morning	Day	Evening	Night
Feed volume, g	75 (34) ^{ab}	59 (29) ^a	53 (26) ^b	75 (36)
Feed duration, min	12.0 (4.9)	10.7 (4.17)	12.2 (4.6)	12.3 (5.0)
Degree of breast fullness				
Prefeed	0.63 (0.23) ^a	0.55 (0.24) ^a	0.59 (0.22)	0.72 (0.25)
Postfeed	0.23 (0.17) ^{ab}	0.15 (0.14) ^a	0.19 (0.16)	0.31 (0.19) ^b
Fat, g/L				
Average fat	40.4 (11.1) ^{ab}	47.8 (12.3) ^a	43.2 (10.1)	37.9 (10.6) ^b
Prefeed	29.3 (10.9) ^a	35.0 (12.9) ^a	31.6 (10.4)	28.1 (12.2)
Postfeed	52.9 (16.3) ^{ab}	61.8 (18.8) ^a	56.3 (15.7)	48.9 (14.4) ^b
Lactose, g/L				
Average lactose	67.7 (7.6)	67.9 (6.3)	68.5 (6.8)	68.5 (6.9)
Prefeed	67.9 (8.0)	68.1 (7.0)	69.0 (7.8)	69.0 (8.0)
Postfeed	67.6 (8.5)	67.6 (7.9)	68.0 (7.7)	68.0 (8.4)
Total protein, g/L	13.0 (2.1)	13.3 (2.1)	13.7 (2.4)	13.4 (1.9)
Whey, g/L	7.5 (1.6)	7.6 (1.5)	7.6 (1.6)	7.6 (1.2)
Casein, g/L	3.3 (1.0)	3.4 (1.0)	3.5 (1.0)	3.6 (1.0)
Energy, kcal/L	687 (116) ^{ab}	755 (118) ^a	716 (104)	669 (110) ^b

Data presented as mean (SD). Data for left and right breasts for all samples within the time point of the 15 mothers are combined. The superscript letters ^{ab} represent significant difference, such that time point of the day containing the same symbol was significantly different from each other ($P < .05$).

Outline

- Pathophysiology of mastitis spectrum conditions
- Treatment approach to mastitis spectrum conditions



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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

Abstract

A central goal of the Academy of Breastfeeding Medicine is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient. The Academy of Breastfeeding Medicine recognizes that not all lactating individuals identify as women. Using gender-inclusive language, however, is not possible in all languages and all countries and for all readers. The position of the Academy of Breastfeeding Medicine (<https://doi.org/10.1089/bfm.2021.29188.abm>) is to interpret clinical protocols within the framework of inclusivity of all breastfeeding, chestfeeding, and human milk-feeding individuals.

Keywords: abscess, breastfeeding, dysbiosis, engorgement, galactocele, lactation, mastitis, phlegmon

Introduction

MASTITIS IS A common maternal complication of lactation and contributes to early cessation of breastfeeding.¹ In the past, mastitis has been regarded as a single pathological entity in the lactating breast.² However, scientific evidence now demonstrates that mastitis encompasses a *spectrum* of conditions resulting from ductal inflammation and stromal edema (Fig. 1). If ductal narrowing and alveolar congestion are worsened by oversimulation of milk production, then inflammatory mastitis can develop, and acute bacterial mastitis may follow (Fig. 2). This can progress to phlegmon or abscess, particularly in the setting of tissue trauma from aggressive breast massage. Galactoceles, which can result from unresolved hyperlactation, can become infected. Subacute

mastitis occurs in the setting of chronic mammary dysbiosis, with bacterial biofilms narrowing ductal lumens.

The pathophysiology, diagnosis, and management of each condition in the mastitis spectrum (ductal narrowing, inflammatory mastitis, bacterial mastitis, phlegmon, abscess, galactocele, and subacute mastitis) will be discussed hereunder. Early postpartum engorgement, a distinct condition that can share some clinical features with mastitis spectrum disorders, will also be reviewed.

Note that this protocol now replaces ABM Protocols #4, Mastitis, and #20, Engorgement, which will both be retired. ABM Protocols #32 (Management of Hyperlactation)³ and #35 (Supporting Breastfeeding During Maternal or Child Hospitalization)⁴ may serve as useful adjuncts to this protocol.

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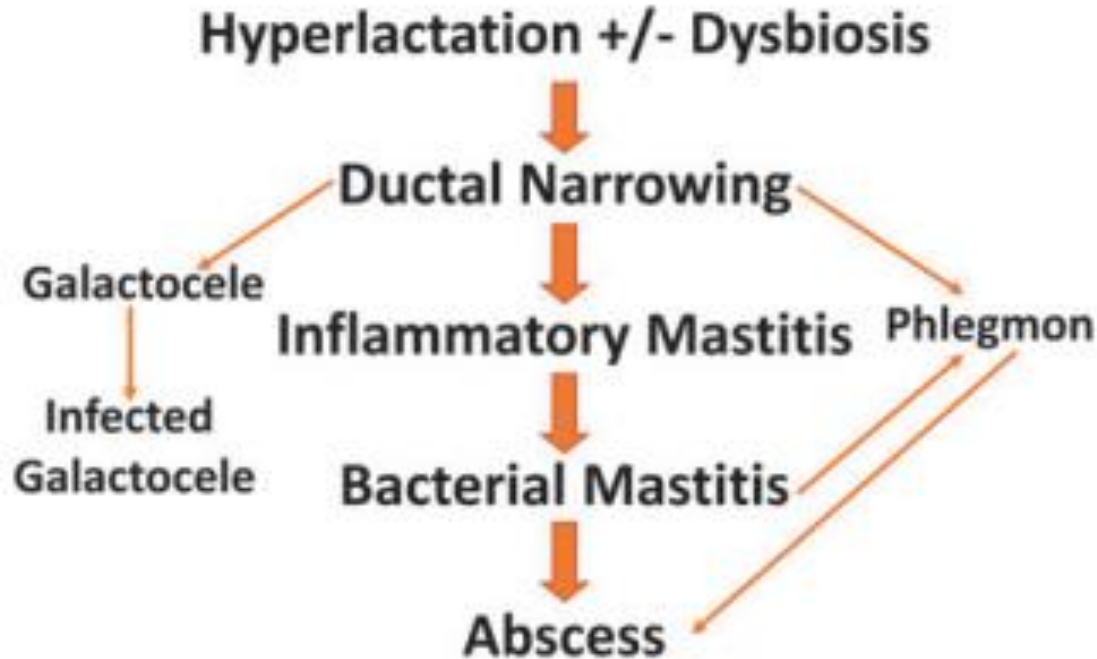
⁹Department of Family Medicine, University of Calgary, Calgary, Alberta, Canada.

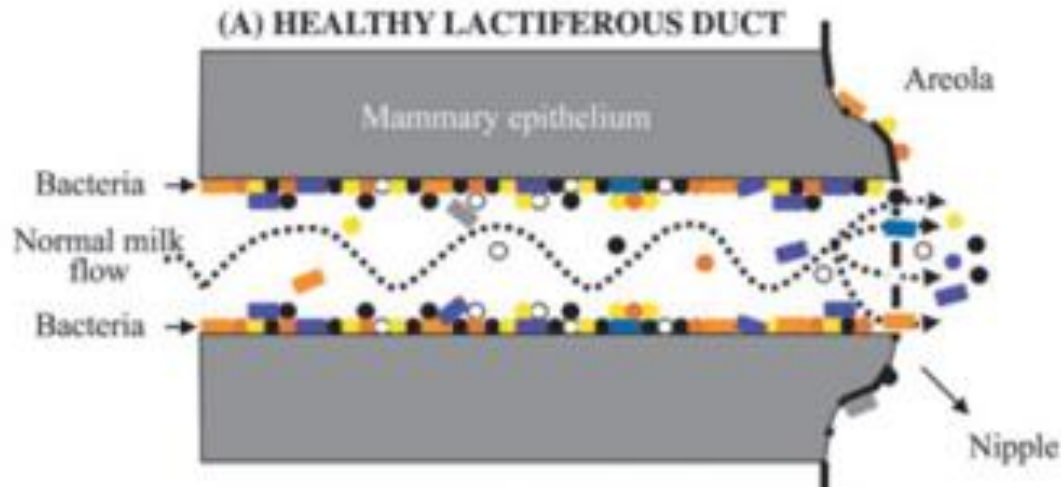
The Past....

- Heat! Warm Compresses, warm showers, hot packs
- Vigorous massage
- Vibration
- Additional feeds! Extra pump sessions!
- More massage! More heat!

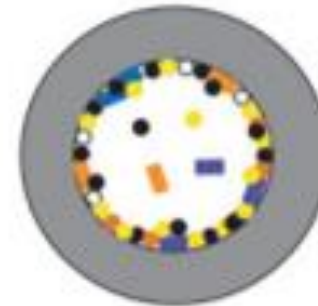


What is Mastitis?



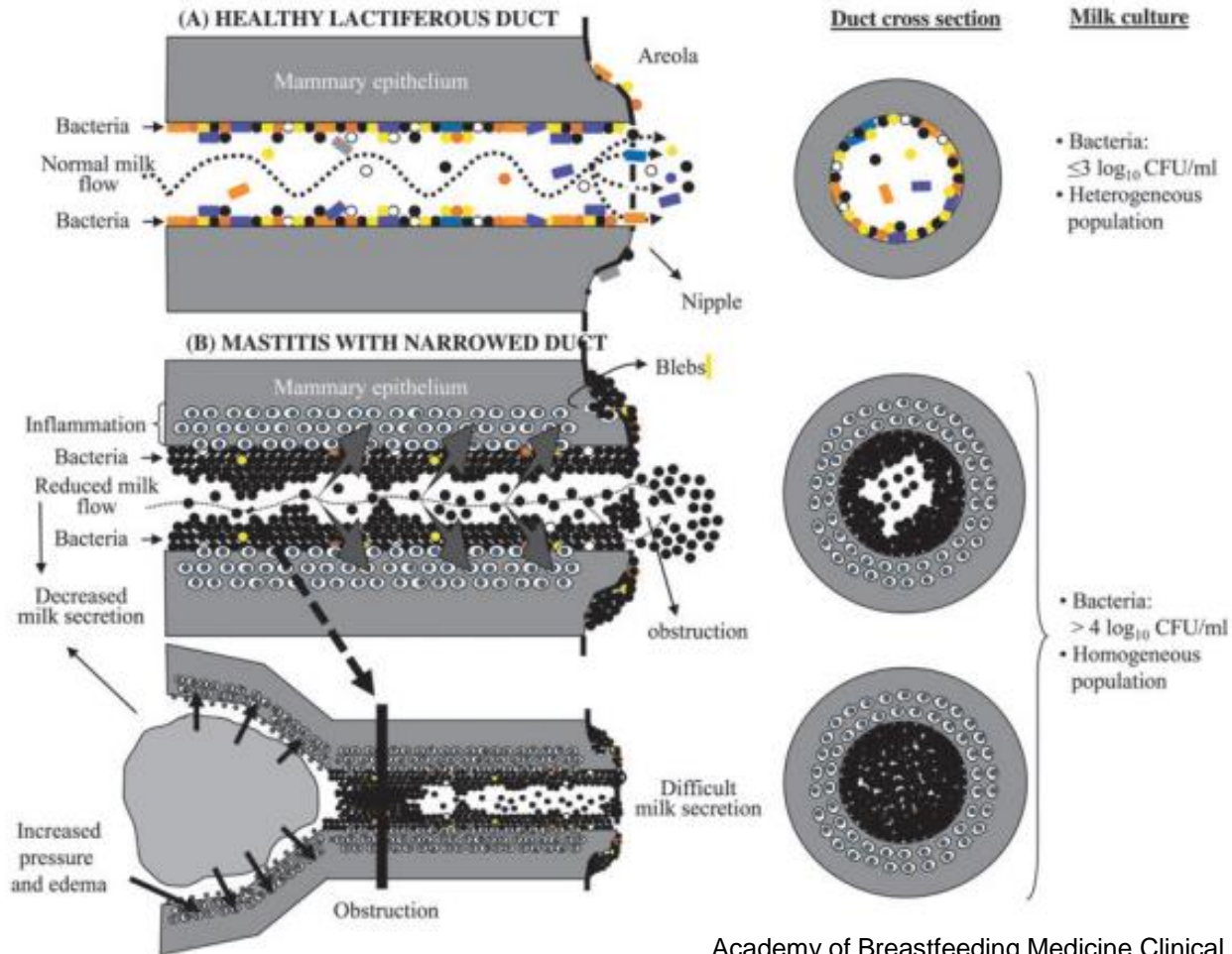


Duct cross section

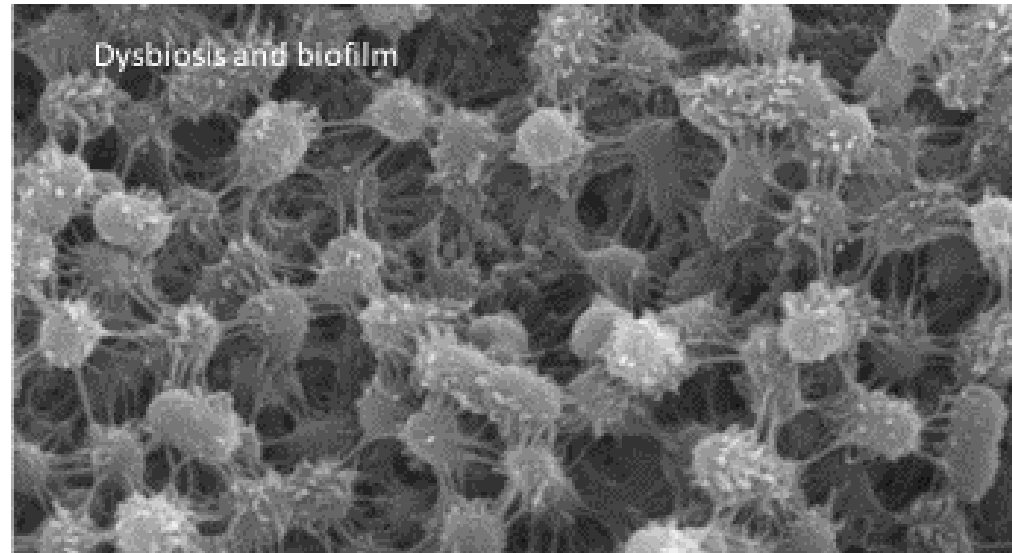
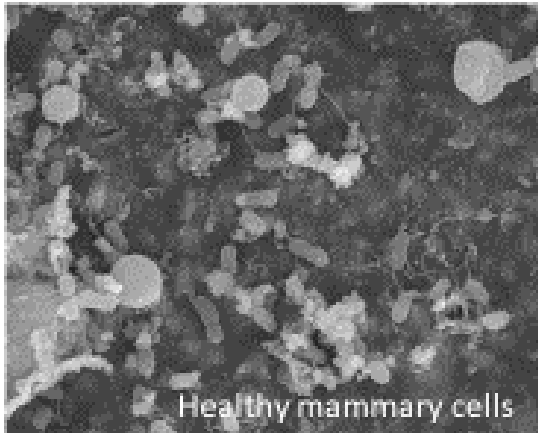


Milk culture

- Bacteria: $\leq 3 \log_{10}$ CFU/ml
- Heterogeneous population



Dysbiosis: Imbalance of Flora



Treatment of Mastitis Spectrum conditions

Reduce Inflammation and edema surrounding duct

Ice

Ibuprofen 800 mg q8 hours, acetaminophen 1000 mg q8 hours

Nurse/express milk for comfort

Make milk less chunky

Sunflower or soy lecithin 5-10 mg daily

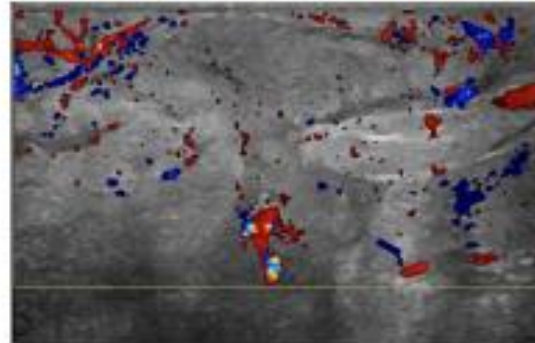
Lymphatic Drainage



- Reduces swelling by assisting movement of lymph fluid, decreasing edema
- Technique
 - “Very gentle touch/traction of skin - “like petting a cat”
 - The purpose is to lift skin to allow flow of lymphatic drainage and vascular decongestion
 - Ten small circles at junction of internal jugular and subclavian veins
 - Ten small circles in axilla
 - Continue with light touch massage from nipple towards clavicle, axilla
- Start during pregnancy if experiencing painful rapid breast growth, and use as needed postpartum for engorgement

Bacterial Mastitis

- Beefy red, indurated skin
- Worsening systemic symptoms that do not resolve within 24-48 hours of **appropriate** conservative treatment
- **Vast majority of the time, the patient has been told to pump, continually breastfeed, massage**
 - Tissue damage, cell death = **bacterial infection**



ABM protocol antibiotics

BOX 1. EMPIRIC ANTIBIOTIC MANAGEMENT^{58,74}

First line

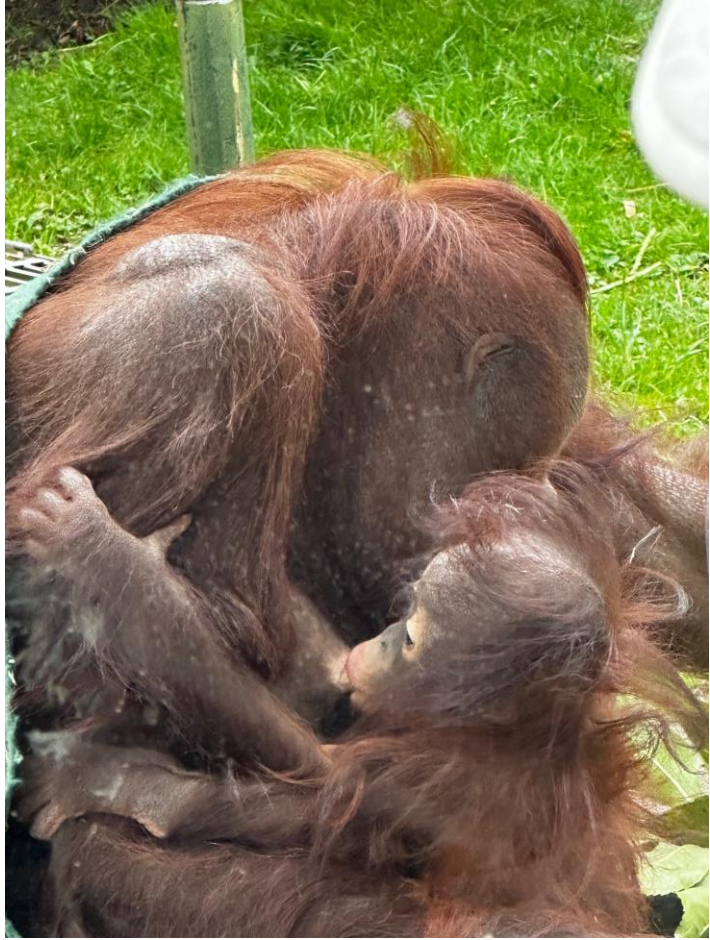
- Dicloxacillin or flucloxacillin 500 mg QID for 10–14 days
 - Where dicloxacillin and flucloxacillin are not available, cloxacillin can be used alternatively; however, oral bioavailability is more variable with cloxacillin.⁷⁵ All drugs have low Relative Infant Dose of the drug.⁷⁶
- Cephalexin 500 mg QID for 10–14 days
- Broader coverage including gram negative rods; does not need to be taken separately from meals

Second line

- Clindamycin 300 mg four times daily for 10–14 days
- Trimethoprim-sulfamethoxazole DS BID for 10–14 days
 - Not recommended for mothers of children with G6PD deficiency. Use with caution in mothers with premature infants or infants with hyperbilirubinemia, especially under 30 days old.⁷⁷

Key points (.pimastitis)

- Treat the breast as any other organ with inflammation: only use ice (no heat). If you are going to massage the breast, do so very gently. Apply ice after feeding or pumping.
- Pump or hand-express a small amount of milk before breast/chest-feeding if your breasts are too full. This will make your breasts less full and may make it easier for your baby to latch on.
- Pump or express milk from the affected breast if it hurts too much to breast/chest-feed.
- Take an over-the-counter pain medicine to relieve pain and fever. Options include ibuprofen (Advil, Motrin) or naproxen (Aleve). Always take ibuprofen or naproxen with food or milk.
- Rest as much as possible. Drink extra fluids.
- A lactation consultant appointment is recommended to address possible causes of mastitis and to prevent it from happening again.



Objectives

- Describe modifications learners can make to their clinical setting and clinical approach to reduce weight stigma
- Better understand the limitations of BMI and potential impacts on breastfeeding dyads
- Leave with more questions than answers and a curiosity to challenge assumptions

Background



- Obesity during pregnancy is associated with increased risk for metabolic dysfunction
- Birthing persons with obesity are significantly less likely to exclusively breastfeed
 - Less likely to initiate breastfeeding
 - More likely to start earlier supplementation
- The distinction between underlying physiologic factors impeding successful lactation versus decreased breastfeeding support is critical for determining interventions

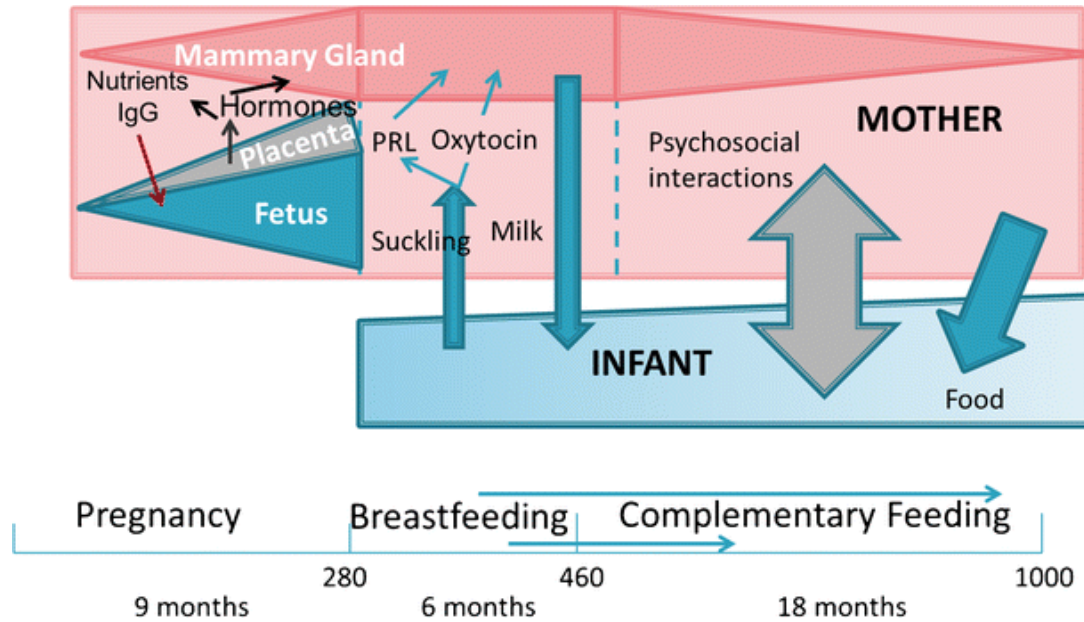


Fig. 1 The first 1,000 days. The crucial periods in infant metabolic and cognitive development are thought to occur during the first 1,000 days of fetal/infant life and can be divided into three phases: pregnancy, breast (or formula) feeding, and a period of increasing complementary feeding. General maternal/fetal and maternal/infant interactions are indicated for each phase

Gestational Weight Gain

Table 1: New Recommendations for Total and Rate of Weight Gain During Pregnancy, by Prepregnancy BMI

Prepregnancy BMI	BMI (kg/m²)	Total Weight Gain (lbs)
Underweight	<18.5	28–40
Normal weight	18.5-24.9	25–35
Overweight	25.0-29.9	15–25
Obese	≥30.0	11–20

Variation by maternal BMI

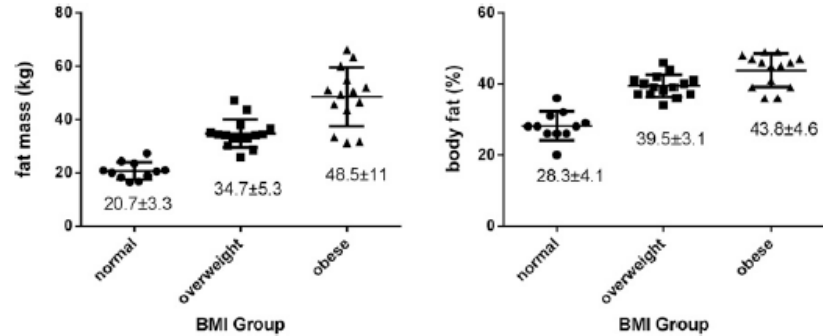
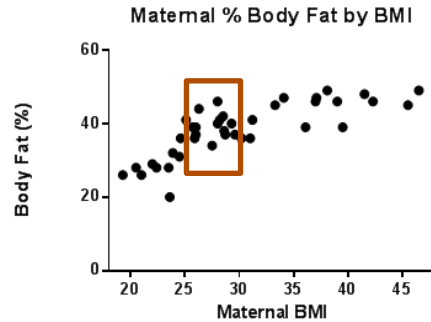
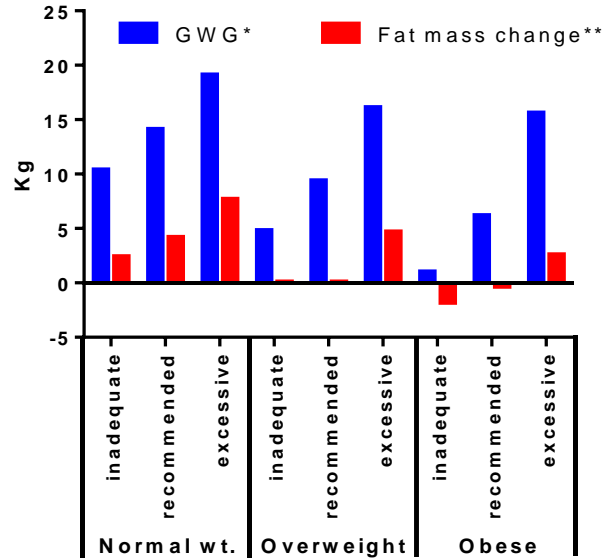


FIGURE 3 Maternal fat mass (left graph) and percent fat (right graph) by BMI group ($n = 41$). Values are given as means \pm SDs.



Change in fat mass by gestational weight gain



*p-value <0.001 *p-value <0.001 *p-value <0.001
 **p-value 0.002 **p-value 0.001 **p-value 0.059

SEPTEMBER 19, 2019

Everything You Know About Obesity Is Wrong

For decades, the medical community has ignored mountains of evidence to wage a cruel and futile war on fat people, poisoning public perception and ruining millions of lives.

Do you need to check weight?



- Ask permission
- Explain how the information will be used
- Reframe conversation to move from weight to nutrition

Systematic Review, 2012

- Women with obesity are
 - Less likely to intend to breastfeed
 - Decreased initiation of breastfeeding
 - Shortened duration of breastfeeding
 - Less adequate milk supply
 - Delayed onset of lactogenesis II
- Possible explanations
 - Larger breasts = mechanical barrier
 - More reported difficulty breastfeeding
 - Social art, influenced by psychosocial and cultural factors
 - Feeling uncomfortable
 - Lower SES

Original Article

Obese women experience multiple challenges with breastfeeding that are either unique or exacerbated by their obesity: discoveries from a longitudinal, qualitative study

Christine D. Garner*, **Shanice A. McKenzie***, **Carol M. Devine***, **Loralei L. Thornburg†** and **Kathleen M. Rasmussen***


**Division of Nutritional Sciences, Cornell University, Ithaca, NY, USA, and †Department of Obstetrics and Gynecology, University of Rochester, Rochester, New York, USA*

Key messages

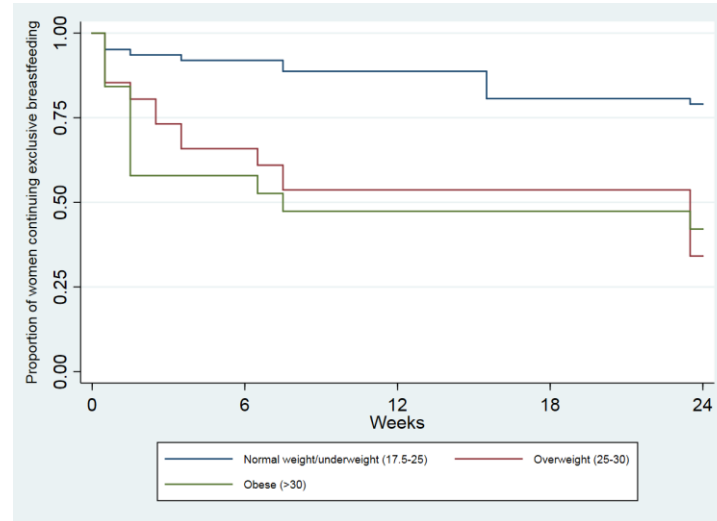
- Obese women experienced breastfeeding challenges similar to normal-weight women, such as positioning difficulties, but to a greater degree or for a longer duration.
- Prenatal confidence about breastfeeding plans was lower among obese women, particularly those who were primiparous or lacked previous breastfeeding experience.
- Post-partum health concerns, such as post-caesarean health/healing and infant low blood glucose, were more common among obese mother–infant dyads and negatively affected breastfeeding.
- Obese mothers had greater need for tangible support post-partum.
- Interventions are needed to address obese women's concerns about and challenges with breastfeeding from pregnancy through the post-partum period.

Impact of maternal obesity and breastfeeding intention on lactation intensity and duration

Nicole E. Marshall¹  | Bernard Lau¹ | Jonathan Q. Purnell² | Kent L. Thornburg²

- PDX  Breastfeeding (n=144)
- 100% of participants intended to breastfeed
- 91.7% intended to exclusively breastfeed
- 0% intended exclusive formula
- 100% initiated breastfeeding

End of exclusive breastfeeding by BMI



Proportion of women exclusively breastfeeding among those intending exclusive breastfeeding at:

pBMI class	6 weeks n (%)	P-value	6 months n (%)	P-value
Normal/Underweight	58 (90.6)	0.004	49 (79.0)	<0.001
Overweight	34 (68)		14 (34.2)	
Obese	17 (65.4)		8 (42.1)	

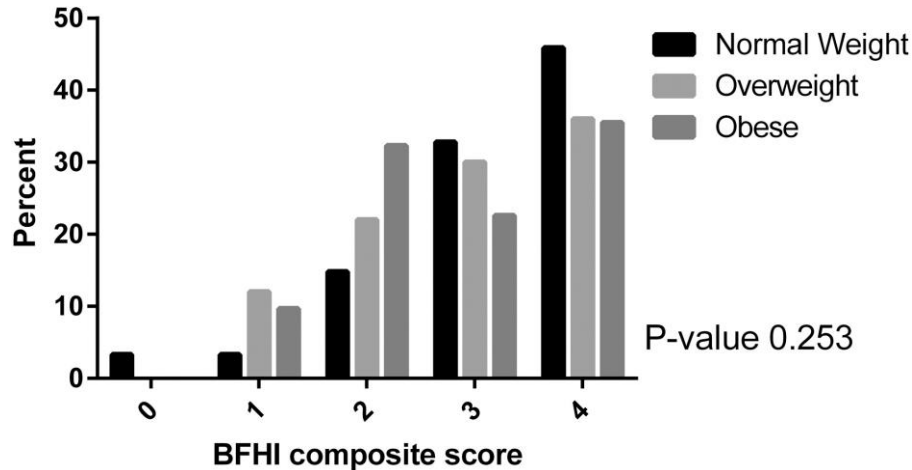
R01 critique

Weaknesses

- The analysis lacks consideration of established risk factors for breastfeeding failure, such as maternal education, socioeconomic status, family support, overall lifestyle habits, and depression and anxiety etc.

Exclusive Breastfeeding Rates at 6 Weeks Postpartum as a Function of Preconception Body Mass Index Are Not Impacted by Postpartum Obstetrical Practices or Routines

Nicole E. Marshall,¹ Laura F. Lallande,² Pepper J. Schedin,^{3,4} Kent L. Thornburg,⁵ and Jonathan Q. Purnell⁵



Key Points

- BMI has limitations in its utility for discriminating differences in percent body fat
- Be intentional about the use of weight in clinical practice
- While it is clear that breastfeeding persons with elevated BMI are less likely to meet exclusive breastfeeding goals, the reason why and how to best support their journey deserves study
- Language matters
- Be aware of our own biases

OBSTETRICS

Maternal superobesity and perinatal outcomes

Nicole E. Marshall, MD, MCR; Camelia Guild, MPH; Yvonne W. Cheng, MD, MPH;
Aaron B. Caughey, MD, PhD; Donna R. Halloran, MD, MSPH

OBJECTIVE: The purpose of this study was to determine the effect of maternal superobesity (body mass index [BMI], ≥ 50 kg/m²) compared with morbid obesity (BMI, 40-49.9 kg/m²) or obesity (BMI, 30-39.9 kg/m²) on perinatal outcomes.

STUDY DESIGN: We conducted a retrospective cohort study of birth records that were linked to hospital discharge data for all liveborn singleton term infants who were born to obese Missouri residents from 2000-2006. We excluded major congenital anomalies and women with diabetes mellitus or chronic hypertension.

RESULTS: There were 64,272 births that met the study criteria, which included 1185 superobese mothers (1.8%). Superobese

women were significantly more likely than obese women to have preeclampsia (adjusted relative risk [aRR], 1.7; 95% confidence interval [CI], 1.4–2.1), macrosomia (aRR, 1.8; 95% CI, 1.3–2.5), and cesarean delivery (aRR, 1.8; 95% CI, 1.5–2.1). Almost one-half of all superobese women (49.1%) delivered by cesarean section, and 33.8% of superobese nulliparous women underwent scheduled primary cesarean delivery.

CONCLUSION: Women with a BMI of ≥ 50 kg/m² are at significantly increased risk for perinatal complications compared with obese women with a lower BMI.

Key words: pregnancy outcome, superobesity

Cite this article as: Marshall NE, Guild C, Cheng YW, et al. Maternal superobesity and perinatal outcomes. Am J Obstet Gynecol 2012;206:417.e1-6.
