

## ABM Clinical Protocol #35: Supporting Breastfeeding During Maternal or Child Hospitalization

Melissa Bartick, MD, MS,<sup>1</sup> Maria Teresa Hernández-Aguilar, MD, MPH, PhD,<sup>2</sup> Nancy Wight, MD,<sup>3</sup>  
Katrina B. Mitchell, MD,<sup>4</sup> Liliana Simon, MD, MS,<sup>5</sup> Lauren Hanley, MD,<sup>6</sup>  
Samantha Meltzer-Brody, MD, MPH,<sup>7</sup> and Robert M. Lawrence, MD<sup>8</sup>;  
and the Academy of Breastfeeding Medicine

*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.*

### Introduction

LACTATING MOTHERS OR BREASTFEEDING INFANTS and children may require hospitalization for medical or surgical reasons, either at birth or later in an infant's life, and lactating mothers may sometimes require psychiatric hospitalization. Unfortunately, hospitalization of a breastfeeding mother or child can result in disruption of breastfeeding and unintended weaning,<sup>1–3</sup> as well as other complications such as mastitis.<sup>4</sup> However, few formal guidelines exist for management of lactation during hospitalization.<sup>5–11</sup> This protocol outlines recommended care for the hospitalized lactating mother and breastfeeding child, and serves to set the standards to implement these model policies.

Staff outside of obstetric, pediatric, or neonatal units may have limited experience caring for lactating mothers and may have limited knowledge of lactation physiology or management. Furthermore, they may not understand the short-term and long-term risks of disruptions to lactation.<sup>4,12–14</sup> Inadequately trained staff may substitute their own experiences around breastfeeding for evidence-based practices.<sup>5</sup> In addition, the presence of a breastfeeding

infant or young child on an inpatient adult medical or surgical unit, perioperative area, or intensive care unit (ICU) may prompt concern for the child's safety and may raise questions regarding hospital liability. Management of breastfeeding with respect to medications, procedures, and fluids may also require special attention. Finally, staff may be unfamiliar with how to best assess a breastfeeding mother's own desires for initiating or continuing lactation, and how to best help her meet those needs through shared decision making.<sup>15</sup>

ABM Protocols #7 (Model Maternity Policy to Support Breastfeeding),<sup>16</sup> #15 (Analgesia and Anesthesia for the Breastfeeding Mother),<sup>17</sup> #25 (Preprocedural Fasting for the Breastfeeding Infant),<sup>18</sup> and #31 (Radiology and Nuclear Medicine for the Breastfeeding Mother)<sup>19</sup> may serve as useful adjuncts to this protocol.

### Background

Breastfeeding is the biologically normative way to feed human infants. Risks of early cessation of breastfeeding include increased infectious and chronic diseases in children,

<sup>1</sup>Department of Medicine, Mount Auburn Hospital and Harvard Medical School, Cambridge and Boston, Massachusetts, USA.

<sup>2</sup>Breastfeeding Clinical Unit, Dr. Peset University Hospital, Valencia, Spain.

<sup>3</sup>Retired; Neonatology, Sharp Mary Birch Hospital for Women and Newborns, San Diego, California, USA.

<sup>4</sup>Breast Surgical Oncology, Ridley Tree Cancer Center at Sansum Clinic, Santa Barbara, California, USA.

<sup>5</sup>Department of Pediatrics, University of Maryland School of Medicine, Baltimore, Maryland, USA.

<sup>6</sup>Department of Psychiatry, UNC Center for Mood Disorders, University of North Carolina Chapel Hill School of Medicine, Chapel Hill, North Carolina, USA.

<sup>7</sup>Department of Obstetrics and Gynecology, Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts, USA.

<sup>8</sup>Division of Pediatric Infectious Disease, Department of Pediatrics, University of Florida, Gainesville, Florida, USA.

and increased risk of type 2 diabetes, cardiovascular disease, and breast and ovarian cancer in women.<sup>20</sup> Worldwide, it is estimated that scaling up breastfeeding to a near universal level could prevent 823,000 annual deaths in children <5 years of age.<sup>12</sup> On an annual basis, optimal breastfeeding has the potential to prevent an additional 98,243 maternal deaths from cancers and type 2 diabetes worldwide.<sup>14</sup> The World Health Organization and most health authorities recommend exclusive breastfeeding for the first 6 months of life, followed by continued breastfeeding with complementary foods for at least the first 2 years of life.<sup>21</sup> Human milk feeding is particularly important for preterm infants, who have a higher risk of necrotizing enterocolitis and related mortality if fed preterm formula instead of human milk.<sup>22,23</sup> Exclusive breastfeeding is specifically important for reducing risk of infection-related mortality, otitis media, gastrointestinal infection, and hospitalization for lower respiratory tract infection.<sup>20,24</sup>

### Physiology

A basic review of lactation physiology is important as a basis for understanding the management of the hospitalized lactating mother and breastfeeding child. Breastfeeding is a complex intertwined relationship between the lactating mother and the child who may be negatively affected by external interferences, stress, and negative cultural influences.<sup>25,26</sup> Rooming-in and having the infant within arms' reach allow for frequent feedings at the earliest signs of hunger.

Newborns and young infants can be expected to nurse 8 to 12 times in each 24-hour period. In about the second or third day of life, they may feed extensively as milk transitions from colostrum to mature milk. Oxytocin is secreted by the mother in response to infant suckling, skin-to-skin contact, and infant hand movements on the breast,<sup>27</sup> and also by seeing, hearing, smelling, or thinking about one's infant.<sup>28</sup> Oxytocin secretion stimulates active milk flow to the milk ducts ending at the nipple and areola (the "let down reflex"), where it is removed by the infant by sucking.<sup>29</sup> This hormone has many psychological and physiological effects, including increasing bonding between mothers and infants, producing a feeling of well-being and calm, increasing relaxation, raising of the pain threshold, and lowering of pulse and blood pressure.<sup>30</sup> Conversely, medical interventions during childbirth, fear, and anxiety may inhibit oxytocin release, potentially interfering with breastfeeding.<sup>28,30,31</sup>

Research indicates that mother–infant separation causes significant stress in newborns.<sup>32,33</sup> Furthermore, breastfeeding dyads share circadian physiology with respect to cortisol levels.<sup>34,35</sup>

Separation is associated with undesired early weaning and decreased breastfeeding exclusivity.<sup>3</sup> Prolactin stimulates milk production initially after birth. Within a few weeks, the effect of prolactin becomes less relevant and "supply and demand" determines ongoing milk production. Night feedings are particularly important for maintaining copious milk production.<sup>36</sup> If the breasts remain full, milk production will be slowed down; conversely, if mothers nurse frequently, milk production will increase. Thus, frequent breastfeeding sessions, including throughout the night, ensure adequate milk production.<sup>36</sup>

Sudden interruption of breastfeeding due to mother–infant separation may cause breast discomfort and engorge-

ment.<sup>4,29,37</sup> Furthermore, nonphysiological breastfeeding using a pump is a risk factor for decrease in milk production as well as mastitis.<sup>37</sup>

Separation hinders immune protection for the child against infectious disease.<sup>38,39</sup> This is because mother pass antibodies and other immunomodulatory substances to the child in response to pathogens to which she is exposed.<sup>38</sup> Milk leukocytes and secretory IgA<sup>38</sup> also increase in response to a child's infection,<sup>39</sup> indicating communication from child to mother, which is thought to occur during direct breastfeeding.<sup>38</sup> Keeping mother and child together is particularly important to protect against nosocomial infections for a hospitalized child.<sup>38</sup>

Breast pumping or hand expression may be a useful tool to maintain milk production when breastfeeding is not possible.<sup>40</sup> However, pumping or hand expression should only be utilized after careful evaluation of the necessity of mother–child separation. A healthy child is able to remove milk more efficiently than a breast pump or hand expression.<sup>41</sup> Pumping, therefore, can reduce milk production and also cause a mother to lose confidence in her ability to successfully nourish her child by breastfeeding.<sup>42</sup> Furthermore, research indicates that expressed milk may not provide the same immunological protection as milk fed directly at the breast, because cells and cell activity in milk are reduced by storage and freezing.<sup>43,44</sup>

### Recommendations

For each recommendation, the quality of evidence (levels of evidence 1, 2, and 3) and the strength of recommendation (A, B, and C) are noted as defined by the strength of recommendation taxonomy criteria.<sup>45</sup>

1. *Create a policy to support the lactating mother and breastfeeding child.*
  - a. Any institution admitting women of child-bearing age or children <2 years of age should have such a policy in place. A facility should have a written policy about breastfeeding management in the hospitalized lactating mother or breastfeeding child whenever they are hospitalized outside a maternity or neonatal ward.<sup>6,8</sup> A policy should include elements that allow a child and their breastfeeding mother to be together as much as possible, barring no medical contraindications. It should specify where the infant is permitted to be, which staff can routinely handle the infant, who takes responsibility for the care of the infant if the mother is the patient, and what allowances are made for an infant caregiver who must have unrestricted visitation. It may specify the preferred type of room for the dyad (e.g., private room if available). The policy should also include instructions concerning safe sleeping equipment for the infant (e.g., specifying that the facility will provide such equipment and whether parents can bring their own). If the facility does not routinely provide maternity care or inpatient pediatric services, or does not have access to qualified lactation support staff and basic equipment that would ordinarily be available in other local hospitals (e.g., breast pumps and human milk storage containers, bassinets or cribs, and qualified lactation support staff), then a policy should

consider including arrangements for transfer to a nearby facility where the patient(s) needs could best be met.<sup>8</sup>

Lactating mothers may also find themselves hospitalized far from home or far from their child. If the mother and child both require hospitalization, the policy should include expedited efforts for them to be at the same facility, even if this requires transfer. If the child requires hospitalization, a facility should ideally be able to provide for the basic needs of their lactating mother (food, hygiene, accommodation, etc.).

Key stakeholders from the hospital should be involved in creating the policy.<sup>8</sup>

Level of evidence: 3. Strength of recommendation: C.

- b. The policy should include elements necessary for adequate lactation support. In addition to a policy about keeping mothers and children together, a policy should include access to lactation support; plans that include milk expression, storage, and handling whenever needed<sup>5,8</sup>; equipment<sup>4</sup> and staff access to high-quality resources on medication safety.<sup>5</sup> The policy should also include communication strategies for handoffs to ensure all members of the patient's health care team are aware of the breastfeeding or milk expression plan.<sup>5</sup> For example, if surgery is planned, the multidisciplinary team from the inpatient unit should be communicating the mother's breastfeeding or pumping plan to the surgical and anesthesia teams, particularly if the mother is the patient.<sup>5,17</sup> Documentation of the last breastfeeding or milk expression, and the expectation for the time of the next breastfeeding or milk expression should be part of the routine handoff between shifts or care teams, and should be communicated with the mother if the child is the patient.

Level of evidence: 3. Strength of recommendation: C.

2. *Keep breastfeeding mothers and infants together.*

Breastfeeding infants should have unlimited access to their lactating mothers,<sup>29,33,34,38,41</sup> whose food and basic needs should be accommodated by the facility as much as possible. The mother is the infant's source of nutrition and her milk has therapeutic effects. Breastfeeding is vitally important in a situation in which infants are outside their usual surroundings, and are ill, injured, or require any medical or surgical procedure.

The younger the infant, the more essential it is for mother and infant to be together as much as possible to establish and maintain breastfeeding.<sup>16,21,46,47</sup> Keeping breastfeeding mothers and infants together is important to directly breastfeed,<sup>38,39,43,48</sup> respond to feeding cues,<sup>21</sup> share immune response to pathogens,<sup>38</sup> prevent engorgement and mastitis,<sup>29</sup> prevent maternal and infant distress,<sup>35,49</sup> preserve maternal milk production,<sup>29</sup> preserve shared circadian rhythms,<sup>34</sup> and, ultimately, maintain exclusive breastfeeding.<sup>1,2</sup> If both the mother and infant are hospitalized, they should be hospitalized in the same facility, and share a room if possible.

Levels of evidence: 1–3. Strength of recommendation: B.

3. *Use evidence-based guidelines for milk expression and storage.*

- a. Direct breastfeeding is preferable to pumping or hand expression: Whenever possible, direct breastfeeding is preferred to pump use or hand expression of milk for those dyads who normally directly breastfeed.<sup>38,39,43</sup> Holding a child to breast to nurse can be performed even by a mother who is weak and debilitated by illness, especially if breastfeeding is already established. Some lactating mothers may be too weak or debilitated to manage a breast pump without assistance, as doing so requires some setup with each session, cleaning of equipment, and then storing of expressed milk. This activity may pose an additional challenge if the pump provided is unfamiliar to the mother, and knowledgeable staff should be available to demonstrate its use. Some lactating mothers may have varying results with pumping or milk expression, including difficulty eliciting milk let down, or inefficient milk extraction,<sup>42</sup> making direct breastfeeding especially important.

Levels of evidence: 1–2. Strength of recommendation: B.

- b. Frequency of milk expression: A lactating mother should be expected to breastfeed or express milk as often as she would normally breastfeed if she and/or the child were not hospitalized or separated. Maintaining a similar frequency is important to maintain ongoing milk production, to prevent discomfort and engorgement,<sup>29,50</sup> and to provide milk for the child.<sup>51</sup> An exclusively breastfed infant <6 months old may typically nurse 8 to 12 times per 24 hours, whereas a 6- to 12-month-old infant may nurse 5 to 6 times daily, and a 12-month old infant may nurse only 3 to 4 times daily.<sup>52</sup> It is also important to provide guidelines of a range of normal volumes for goals of milk expression, typically 700–980 mL a day (25–35 oz) by days 10–14 and this volume is expected to be maintained for the first 6 months of life.<sup>53</sup>

Level of evidence: 2. Strength of recommendation: B.

- c. Type of breast pump: A hospital-grade double electric pump is considered the ideal way to express milk for lactating mothers who are separated from their infants and require full replacement of breastfeeding by pumping.<sup>40,41</sup> Breastfeeding mothers may own their own pumps and may prefer to use them. Cleaning of parts should be performed according to evidence-based guidelines,<sup>54,55</sup> and/or by manufacturers' instructions. Pumps designed for single users should not be used by more than one person. Pumping combined with gentle breast massage may increase expression of milk.<sup>40</sup> If neither the infant nor a pump is available, hand expression can be performed, but alone it is not as effective in removing milk as a breast pump.<sup>41</sup> Video resources for hand expression exist and are available.<sup>56</sup>

Ideally, a hand pump should be made available as a backup, as the lactating mother may not always have access to an electric pump. Although less efficient, it is portable and easy to use, and gives the mother more flexibility to express breast milk in case she needs to leave the hospital during a prolonged hospitalization. If the mother will be at home for much of the time, provisions should be made for a double electric pump to be used in that setting, if possible.

Levels of evidence: 1–2. Strength of recommendation: A.

d. Aides to increase milk expression: Relaxation, warmth, gentle massage, and music may also help increase milk volume.<sup>40</sup> Images, sounds, or smells of one's child can help elicit let down.<sup>28</sup> Moreover, it is important to reduce stress and distractions as much as possible.<sup>31</sup>

Level of evidence: 2. Strength of recommendation: B.

e. Storage of expressed milk: Human milk can be stored at room temperature (20–22°C, 68–72°F) for up to 4 hours, after which time it should be refrigerated.<sup>56</sup> Ideally, milk should be stored in the room of the lactating mother or breastfeeding child (if not in a nursery) in a refrigerator. It may also be stored in an insulated cooler bag with gel packs (or ice that gets replaced when it melts), where it can be kept for up to 24 hours until it can be transported to its desired destination.<sup>10,57</sup> Storage protocols may vary from country to country. All expressed milk should be labeled with the date of expression and patient identifying information, and storage should be compliant with local regulations, or those of relevant hospital accrediting organizations. Milk should be transported in chilled containers such as cooler bags with gel packs (or ice as already described). Once expressed milk arrives at its destination, it should be promptly refrigerated, frozen, or used.

Level of evidence: 3. Strength of recommendation: C.

#### 4. Support care for the child of the lactating mother.

A hospitalized lactating mother may be too sick to care for her child other than to breastfeed, or may be unavailable to care for the infant due to procedures or tests. If a mother wishes to continue breastfeeding, a dedicated caregiver should care for the infant at the mother's bedside. Often, the presence of an infant caregiver may be required by hospital policy.<sup>5</sup> Hospital staff are not responsible for the care of the breastfeeding infant. As such, unrestricted visitation and accommodation for a support person for the infant will be essential.

Level of evidence: 3. Strength of recommendation: C.

#### 5. Provide necessary equipment.

Facilities should provide a double electric breast pump to hospitalized lactating mothers,<sup>40,41</sup> if that is the standard of care in local maternity facilities. (Double electric pumps are the ideal pump for this situation, but may not be available in all parts of the world.) The infants of hospitalized lactating mothers require a safe place to sleep, such as a bassinet or crib, and facilities caring for lactating mothers should be expected to provide the same types of equipment as would be found in local hospitals that provide maternity or inpatient infant services. Many hospital beds are not conducive to bed sharing and specific hospital policies may need to address the details of their hospital beds to provide a safe environment for infant sleep. Car seats, strollers, or baby seats are not considered safe or adequate sleeping devices.<sup>58</sup> Equipment to feed an infant may be necessary if the infant is hungry while the mother is away at a test or procedure or the infant is not able to breastfeed directly. It is generally recommended that newborns who have not yet established breastfeeding avoid being fed using artificial nipples or teats,<sup>21</sup> instead using finger feeding or devices such as small spoons, syringes, or feeding by a supplemental nutrition

system if unable to breastfeed directly with adequate milk transfer. Families may wish to supply their own feeding equipment and other materials. They should be allowed to do so unless there is a medical contraindication for the breastfeeding mother or infant. An infant scale may be helpful to ensure the infant is appropriately thriving while the lactating mother is hospitalized, with the infant's weights evaluated by the infant's health care provider or by a knowledgeable professional such as the mother's lactation provider.

Levels of evidence: 1–2. Strength of recommendation: B.

#### 6. Use evidence-based safety recommendations for medications, including radiological diagnostic agents.

Most medications are safe in breastfeeding. Several factors affect medication management, including the current and gestational age of the infant, and the amount and proportion of breast milk in the infant's diet. The risks of a medication should be weighed against the risks of not breastfeeding to mother and child, and alternative medications or treatments should be considered if appropriate. It is thus essential that medical staff are aware of reliable resources from which to find lactation safety information. Reliable resources may vary among global regions but include LactMed,<sup>59</sup> the InfantRisk Center,<sup>60</sup> and e-lactancia.<sup>61</sup> Note that medications can potentially affect the infant and/or milk production and providers should be aware of both potential effects.

Intravenous iodinated contrast and intravenous gadolinium contrast do not require interruption of breastfeeding or discarding of expressed milk.<sup>19,62</sup> However, diagnostic or therapeutic radioactive agents generally necessitate interruption of breastfeeding or withholding of the expressed milk until sufficient radioactivity decay, depending on the agent.<sup>61</sup> Please refer to ABM Protocol #31, "Radiology and nuclear medicine studies in lactating women," for details.<sup>19</sup> In some cases, alternatives to a diagnostic test that uses radioactive agents can be used. For example, a stress echocardiogram can be considered instead of a radionuclide stress test for evaluation of cardiac ischemia.

Medication recommendations, including radiological agents, should be given according to high-quality resources. A lactating mother should be reassured that each medication given has been investigated for safety.<sup>10,63,64</sup>

Level of evidence: 2. Strength of recommendation: B.

#### 7. Consider that fluid needs may differ for the lactating mother.

The fluid needs for a lactating mother will typically be higher than for a nonlactating mother. A mother exclusively breastfeeding a 6-month old infant may be producing ~800 mL of milk per day, ranging from 450 to 1200 mL per day,<sup>53</sup> whereas those not breastfeeding exclusively may produce less milk. In calculating a mother's fluid needs, particularly if she is not allowed food or drink by mouth, it is important to add these figures to the total. For mothers who are allowed to drink, it is important that they be allowed to drink to satisfy thirst, which is triggered by oxytocin release.

Level of evidence: 2. Strength of recommendation: B.

#### 8. Ensure infants of lactating mothers can remain in acceptable locations.

a. Medical–surgical units and perioperative areas: It is safe for the lactating mother to have her infant in her

room with her on a medical–surgical unit unless specific infection control protocols related to maternal infection preclude it. Doing so is important to avoid separating the dyad (see “Keep breastfeeding mothers and infants together”). If available, a private room would provide a calm environment, and allow space for a support person to care for the infant.<sup>10</sup> It is acceptable for an infant to be in a perioperative area as well, unless specific infection control protocols related to maternal infection preclude it. Some hospitals may not allow visitors in perioperative areas, but the infant of a lactating mother and the infant’s caretaker should be considered exceptions.

Level of evidence: 2. Strength of recommendation: B.

b. Adult ICU: In an ICU, there are additional concerns about equipment, infection control, maintaining adequate vital signs, and other ongoing care of the lactating mother that may make an infant’s presence challenging. At the same time, the presence of the patient’s infant may help calm her stabilize her vital signs, and inspire a strong desire to recover for the sake of her child.<sup>8</sup> Release of oxytocin from breastfeeding and skin-to-skin contact with the infant may have therapeutic physiological effects on the lactating mother. Conversely, a mother’s ongoing separation from her infant may add additional anxiety to existing anxiety about her critical illness. Even a mother who is not fully conscious may benefit from awareness of her infant’s touch, smell, and sounds.<sup>8</sup>

Level of evidence: 2. Strength of recommendation: B.

#### 9. Consider infection control and prevention.

Infants who are separated from their mothers may be exposed to different pathogens for which the lactating mother is not making specific antibodies.<sup>38</sup> Similarly, the lactating mother will be unable to produce leukocyte-rich milk in direct response to a specific infant infection if the dyad is separated.<sup>38</sup> With few exceptions, infants do not require separation from their mothers, nor interruption of breastfeeding due to infection.

Infections for which breastfeeding or feeding with expressed milk is contraindicated are untreated brucellosis (until treated), Ebola virus, and active herpes simplex of an affected breast (it is acceptable to feed or give expressed milk from an uninvolved breast if all lesions are covered).<sup>65</sup> Authorities generally recommend against breastfeeding or feeding expressed milk with maternal infection in human T cell lymphotropic virus type 1 or 2, but there may be situations wherein benefit outweighs risk.<sup>65,66</sup> Infections for which a patient can give expressed milk but not breastfeed include maternal perinatal varicella (specifically chicken pox) that developed within 5 days before delivery or 2 days postpartum.<sup>65</sup> For HIV, the World Health Organization has issued infant feeding guidelines that are dependent upon circumstances.<sup>67</sup> For tuberculosis that is untreated or for which the mother is still infectious, giving expressed milk is safe (if the drug she is taking is not contraindicated), but guidelines on separation vary depending on whether the dyad lives in a low-resource setting, and whether the mother is likely to have a drug-resistant infection.<sup>68</sup>

Breastfeeding may continue with respiratory hygiene and hand hygiene with SARS-CoV-2.<sup>69</sup> A support person

may be necessary to help care for the infant if the mother is too ill. Note that some infections, including forms of viral hepatitis, and infections for which staff use contact precautions such as *Clostridium difficile* and vancomycin-resistant enterococci, are not infections for which breastfeeding is contraindicated, nor are these infections such that any special infant precautions need to be taken. Other patients on the inpatient unit would not be expected to cause contagion concern to the infant. However, out of an abundance of caution, hospital staff should minimize their handling of the infant, except for those providers whose care necessitates it (e.g., lactation or pediatric providers).

Level of evidence: 3. Strength of recommendation: C.

#### 10. Provide lactation support for the surgical adult patient.

Lactating mothers may undergo scheduled or emergency surgical procedures.

a. Scheduled procedures: Planned surgical procedures should include attention to maintenance of lactation, as outlined in the perioperative care plan by Simon et al. and Rieth et al. at Memorial Sloan Kettering Cancer Center (New York).<sup>5,6</sup> This requires preoperative identification of lactating mothers; specific attention to infant feeding and/or milk expression in the preoperative holding area, judicious intraoperative fluid management and non-narcotic pain medication when feasible, and reuniting mother and infant in the recovery room when medically safe. The lactating mother can breastfeed the infant as soon as she is awake and alert, as the anesthetic has cleared the milk when it has cleared the central nervous system.<sup>59</sup> Anesthesiologists should be familiar with the safety of anesthetic agents with breastfeeding, and use analgesics favored for lactation (see ABM Protocol #15, Analgesia and Anesthesia for the Breastfeeding Mother).<sup>17</sup>

In addition, for complex inpatient procedures that may require postoperative intubation and/or surgical ICU stay, the surgeon should coordinate with the patient’s team to create a plan for supporting lactation and minimizing complications. This team would include, but is not limited to, the following physicians and staff: anesthesiologists, perioperative nurses (preoperative and recovery room), operating room nurses, surgical intensivists, intensive care nurses, floor nurses, breastfeeding medicine physicians, and lactation consultants. For patients requiring intensive medication management (e.g., transplant patients), a pharmacist familiar with medication resources in lactation (e.g., LactMed,<sup>59</sup> e-lactancia,<sup>61</sup> InfantRisk Center<sup>60</sup>) should be identified. Care providers should be familiar with the safety of antibiotics in breastfeeding (see “Medications” section). Other common perioperative drugs, such as anticoagulants, should be reviewed on a case-by-case basis. For example, heparin safety is established, but newer novel anticoagulants lack clear data at this time.

*Other considerations for the team include the following:*

- Calculation of estimated complete time of separation of mother from infant and/or breast pump, with attention given to transport, intubation, positioning, and preoperative

preparation. In cases expected to result in a time of separation >4 hours, a plan for intraoperative milk expression should be made.

- Incision placement relative to lactating breasts should be considered. For example, thoracic procedures may require incisions that could impact vascular flow to and drainage from a breast. Surgeons should be prepared for robust vascularity resulting from the lactating breast.
  - If artificial grafts (e.g., vascular procedures) are anticipated, care should be taken to avoid graft contamination with breast milk.
  - ICU management is as outlined hereunder.
- b. Urgent or emergent procedures (e.g., trauma surgery): Urgent or emergent conditions ranging in acuity from cholecystitis to bowel obstruction to multisystem trauma represent challenging scenarios for management of lactation. As already mentioned, if possible, attention should be given to maintenance of milk expression, understanding of medication safety in lactation, and reuniting mother and infant as soon as medically safe. Trauma surgeons should be aware that due to the vascularity of the lactating breast, lactating women may be at higher risk for breast hematoma in seatbelt or airbag trauma. In addition, women may have robust vascular collaterals throughout the chest wall and attention to bleeding should be given when placing central lines, chest tubes, and other interventional and/or monitoring devices (see previous sections on “Medications,” “Keep breastfeeding mother and infant together,” and “Milk expression”).

Level of evidence: 2. Strength of recommendation: B.

#### 11. Support the unconscious lactating mother immediately postpartum.

As already described in urgent or emergent procedures, if a mother is unable to communicate or is unconscious, it cannot be assumed that breastfeeding is not important to her or would be unimportant to them in the future. Her health care proxy, if she has one, should be expected to make the decisions they believe the mother would make for herself if she were able. In addition, if the mother is immediately postpartum and milk removal does not begin promptly, it may be difficult or impossible for her to exclusively breastfeed.<sup>51,70</sup> Visits with the infant may take coordinated efforts from lactation and pediatric staff, but may ultimately benefit the patient’s immediate recovery, as well as benefit the infant.<sup>8</sup> A sedated or unconscious mother may benefit from her infant’s presence with improvements in her vital signs, and may be inspired to recover.<sup>71</sup> Preparations should be made to have an experienced person perform the milk expression, if the mother is unable to do it herself. Proper education for staff caring for patients who are pumping or who require pumping assistance should include knowledge of pump settings, flange fit, and signs of nipple damage. Neglecting these considerations can result in significant anatomical damage, pain, and potential infection.<sup>72</sup>

Level of evidence: 2. Strength of recommendation: B.

#### 12. Support the lactating mother admitted to inpatient psychiatry.

The indications for a lactating mother to have an acute psychiatric admission are numerous. However, regardless of the type of psychiatry unit, the standard protocol should be that the hospital team supports continuation of lactation, per the patient’s wishes.

- a. Have a written policy or a protocol specifically for the psychiatric unit to support these patients. Having a written policy for all inpatients is important to successful breastfeeding and maintenance of lactation,<sup>6,8</sup> but operationalizing the support of a lactating mother on a psychiatric unit is particularly complex and requires additional staff support and patient supervision. Having a written policy or a protocol specifically for the psychiatric unit to support these patients is very important to successful maintenance of their lactation. Protocols wherein visitation of the child is possible can also help promote mother–infant bonding and may improve the well-being of the mother overall and improve attachment. Visitation should be a goal when it can be safely supported. (See sections on “Keep breastfeeding mothers and infants together” and “Create a policy to support a lactating mother”).

Level of evidence: 2. Strength of recommendation: B.

- b. Favor inpatient mother–baby units. Around the world, there are a wide range of types of psychiatric units where perinatal women may receive treatment for psychiatric illness that is severe enough to warrant hospitalization. This may include a general psychiatric unit, a psychiatric unit that only treats women, or a specialized perinatal psychiatric unit. The latter is the best option for perinatal women.<sup>73</sup> Specialty psychiatric units for women during the perinatal period, often called Mother–Baby Units (MBUs), were first developed in 1948 in the United Kingdom. Currently, they are found in Belgium, France, Germany, the Netherlands, the United States, Australia, New Zealand, and other parts of world.<sup>74–76</sup> Inpatient MBU treatment formulation addresses mental illness within the context of maternal functioning and with particular attention to maternal–infant attachment.<sup>74,76–78</sup> Importantly, specialized inpatient units for perinatal women are much more likely to result in preservation of breastfeeding.<sup>79</sup> In the United States, the first specialized perinatal psychiatric unit opened in 2011. Furthermore, in contrast to most other MBUs, the U.S. perinatal psychiatry units do not allow for infants to room-in overnight with the mother, but extensive visitation, provision of hospital-grade breast pumps, and a safe place to visit and breastfeed are available.<sup>77</sup>

Level of evidence: 2. Strength of recommendation: B.

- c. Support contact of the mother with her child during hospitalization. MBUs are ideal.<sup>73</sup> In their absence, visitation should be a goal when it can be safely supported. (See sections on “Keep breastfeeding mothers and infants together” and “Create a policy to support a lactating mother”). The ability for the child to safely visit the hospitalized psychiatric patient will depend upon several factors that primarily focus on safety. This includes the ability of the mother to interact appropriately with the child and the availability of an appropriate setting for mother–child visits on or near the psychiatric unit. In many cases, supervised visitation by staff will need to be recommended to ensure the safety of the mother–child interaction. On many psychiatric units, visitation of minors is prohibited but consideration of a breastfeeding dyad should still occur in a separate location if possible. Thus, the goal should

be for all lactating patients to have safe supervised visitation when appropriate.

Level of evidence: 2. Strength of recommendation: B.

- d. Provide help for mother to express her milk whenever direct breastfeeding is not possible. A double electric breast pump should be accessible (if that is the standard of care in local maternity units, given that such pumps are not available in all parts of the world). Staff should be familiar with the use of such pumps, or other staff within the hospital should be consulted to help support the lactating mother who is hospitalized on a psychiatry unit. Milk should be labeled and stored as already noted in an appropriate refrigerator on the unit (see “Milk expression and storage”).

One of the challenges with expressing milk on a psychiatric unit is the risk of self-harm by the patient. The tubing of a breast pump is considered a ligature risk because it can be used for attempted suicide by strangulation. Therefore, lactating women on inpatient psychiatry units will often need supervision while pumping, which may be perceived as uncomfortable given that this is an activity that women prefer to do in private. Psychiatric teams should be aware of this challenge and weigh the risks of self-harm carefully against the right to privacy, the latter of which will generally be preferred by the patient while pumping. After pumping is complete, the tubing should be removed from the patient’s possession until the next session. Using a hand pump or teaching hand expression of milk may be options if use of an electric pump poses a safety risk to the mother and supervision during pumping is not possible.

Level of evidence: 2. Strength of recommendation: B.

- e. Assist with milk expression if the mother is not able to do so. The lactating mother admitted with a psychiatric diagnosis may also be unable to express milk herself due to the nature of her diagnosis. For example, she may be acutely psychotic, disorganized, or catatonic. If this is the situation, her breastfeeding goals should be discussed with the health care proxy to help best support her during this time. It may be necessary to have a member of the lactation staff or other knowledgeable staff member assist her with milk expression. If milk expression does not occur for prolonged periods of time, other lactation-related complications may ensue (see “Support for the unconscious patient”).

Level of evidence: 2. Strength of recommendation: B.

- f. Consider breastfeeding when planning psychotropic medication regimens. A thoughtful evaluation of the risk and benefits of psychotropic medications that are both effective and have the most favorable safety profile for breastfeeding women should be an important part of the treatment plan. The robust treatment of psychiatric illness is paramount and must be a top priority. Although many of these medications may be considered safe in lactation, sometimes combinations of many psychiatric medications can be concerning for the child. The safety of the medications should be evaluated both individually and in the context of their entire medication regimen, and the child should be observed for adverse effects. (See “Medications” for suggested resources) In addition, antipsychotic medi-

cations can increase prolactin levels and thereby increase milk production.

Level of evidence: 2. Strength of recommendation: B.

13. *Facilitate breastfeeding for hospitalized breastfeeding infants and children.*

Breastfeeding is very important for hospitalized infants and children. However, loss of appetite due to a child’s illness, fasting for tests or procedures, and separation from the lactating mother may create significant challenges. If breastfeeding infants or children are hospitalized, all efforts should be made to allow unlimited access to their lactating mother, whose food and basic needs should be accommodated. Maternal stress from a hospitalized infant has been shown to impact breastfeeding.<sup>4,26</sup> If separation or loss of infant appetite occurs, the lactating mother should ideally express milk with a double electric pump as often as the infant would normally nurse, to maintain milk production and have milk available for the infant. Qualified lactation support may be necessary (see “Milk expression”). Mothers may require reassurance, encouragement, and guidance if pumped volumes appear low. Skin-to-skin contact may help facilitate direct breastfeeding as well as maintain expressed milk volumes if the infant is unable to directly breastfeed.<sup>80</sup> Online resources are available.<sup>81,82</sup> Children’s chronic conditions may pose additional challenges and may require special support, health care staff training and skills, and equipment.<sup>4</sup>

At times, the pediatric patient may be the older sibling of a breastfeeding infant, and the lactating mother may be at the hospital with a breastfeeding infant in tow. In these circumstances, the breastfeeding infant should be allowed to be in the room with the lactating mother and hospitalized sibling, unless specific infection control protocols preclude it. A safe place to sleep for the breastfeeding infant should be provided, such as a bassinet or crib. If the presence of the breastfeeding infant in the unit is not possible due to specific risks to the infant or logistic limitations, qualified lactation support may be necessary for the lactating mother.

Level of evidence: 2. Strength of recommendation: B.

Special considerations:

- a. Children in the pediatric intensive care unit (PICU): Infants and young children may be admitted for treatment of serious illnesses, such as infections, cancers, correction of congenital abnormalities, or trauma, any of which may require complex surgical procedures and/or lengthy hospital stays. Often these infants or children, at least initially, are too sick to breastfeed, and/or too sick to receive any type of enteral nutrition. In addition, the lactating mother may be too overwhelmed with the health of the infant or child to think about issues concerning breastfeeding.<sup>4</sup> Therefore, it is paramount that the lactating mother is fully encouraged and supported to express and maintain milk production<sup>83</sup> (see above). To maintain milk supply, the mother should be encouraged and supported to express milk from the very first contact with the medical system, be it the emergency department or clinic. When a breastfeeding infant or child is being transferred from an outside hospital to a PICU by a transport team, there should be coordination with all teams involved to provide the mother with the ability to complete timely milk expression if needed.

Level of evidence: 2. Strength of recommendation: B.

b. Respiratory support: About a third of the pediatric patients who require intubation and mechanical ventilation may develop some degree of dysphagia. This is even more prevalent in children <25 months of age.<sup>84</sup> Even if the infant was breastfeeding before admission, transitioning back to the breast may be an additional challenge and may require skilled lactation support and guidance.

Infants who were breastfeeding well before the acute illness and who are not yet back to their baseline in terms of respiratory or neurological status sometimes require some respiratory support such as nasal cannula or high-flow nasal cannula. In children with bronchiolitis who require high-flow nasal cannula, feeding-related adverse events seem to be rare regardless of feeding method.<sup>85</sup> Direct breastfeeding may be preferable as it allows the infant to better regulate the flow of milk at the breast, and also may help calm the infant.<sup>28</sup> In addition, direct breastfeeding is superior to giving expressed milk for other reasons already described (see “Milk expression”).

Level of evidence: 2. Strength of recommendation: B.

c. Infants with congenital diseases. Newborns and infants with severe congenital diseases such as cardiac, renal, digestive, or pulmonary disease may need frequent or prolonged hospitalizations in pediatric units or pediatric intensive care units. These patients are often at increased risk for infectious complications, necrotizing enterocolitis, feeding difficulties, and growth failure, and thus breastfeeding and breast milk may offer them special protection. At the same time, they may have some chronic conditions such as hypotonia, somnolence, poor weight gain, and others that create additional challenges and may require skilled lactation support and/or equipment.<sup>4</sup> Many infants require hospitalization while lactation is still being established and may not be able to directly breastfeed at first. Evidence-based lactation education and care must be provided to mothers and families prenatally and continue throughout the infant’s hospitalization.<sup>21</sup> Infants who are able to directly breastfeed may become clinically more stable while doing so, with decreased stress and need for medications for pain or blood pressure control.<sup>28,30</sup>

Level of evidence: 2. Strength of recommendation: B.

d. Lactation support for the surgical infant or child: Infants undergoing any type of surgery may not be able to feed at all or may be able to be fed only for a limited amount of time. Thus, the mother may need to express milk (see above and ABM Protocol #25, Preprocedural Fasting<sup>18</sup>). When such an infant is admitted for surgery after lactation has been established, direct breastfeeding should be facilitated and encouraged as soon as possible. Some of these infants or children may have several tubes, lines, and drains in the immediate postoperative period. Mothers will need additional qualified support to breastfeed their infants to avoid dislodging lines, tubes, and drains, and attention must be given to the infant’s pain control. Transition back to the breast may be slow. A multidisciplinary team with knowledge of all these aspects is necessary for the care of these dyads.<sup>4</sup>

Level of evidence: 2. Strength of recommendation: B.

e. Strict fluid balance and breastfeeding for the sick infant: Critically ill children often require a very strict fluid balance for maintenance of vital organ function, which is challenging when an infant is breastfeeding directly at the breast. Despite this, it is preferable to allow and encourage the infant to directly breastfeed instead of using other means of feeding that would allow for closer volume measurement<sup>86</sup> (see “Milk expression” and “Respiratory support”). A small study showed that breastfeeding tests weights among infants with congenital heart disease in a pediatric cardiac transitional care unit were helpful in supporting breastfeeding and providing a more accurate evaluation of intake and optimizing fluid balance.<sup>87</sup>

Level of evidence: 2. Strength of recommendation: B.

#### 14. Promote shared decision making

Sometimes a breastfeeding mother’s illness will present her with a difficult decision about discontinuing breastfeeding. Depending on the infant’s age and the mother life circumstances, the mother may have been considering discontinuing breastfeeding before becoming ill. It is important that she has accurate information to make this decision, particularly about the safety of necessary medications to treat her illness. A patient may have incorrectly assumed that she would need to discontinue breastfeeding due to her illness. Occasionally, a health care provider may have erroneously recommended that she discontinue breastfeeding. Mothers should be informed about the risks to their own health and their infant’s health from early cessation of breastfeeding<sup>15</sup> (or if desired, this could be framed as “benefits of continued breastfeeding”). In contrast, a mother may strongly desire to continue breastfeeding but may have assumed it would not be possible. Other mothers may have suffered a severe decrease in milk production as a result of infant separation or other interruptions in milk removal due to the illness. Such mothers will require professional lactation support to resume breastfeeding safely to ensure adequate infant weight gain. Regardless, it is important that the mothers’ decision be made with a full explanation of maternal and infant risks and benefits, and with access to available professional lactation support when necessary.

Level of evidence: 3. Strength of recommendation: C.

## Summary

Supporting a lactating mother or breastfeeding infant or child during a hospitalization is important and may aid in their recovery, especially from critical illness. Even when difficult circumstances, such as the SARS-CoV-2 pandemic, make it necessary to restrict hospital visitors, the presence of a support person for the mother should be strongly considered to allow her to maintain proximity to the child. Whenever possible, care should be delivered at the same facility for the lactating mother and breastfeeding child, and thus facilities should work to adapt their infrastructure to adequately support breastfeeding families.

## Areas for Future Research

Because little has been published on this topic, more published accounts of experiences would be welcome, including sample policies and case series.

## References

1. Courtois E, Thibault P. [Impact of hospitalization of an infant during breast-feeding: Mother-child investigation]. *Rech Soins Infirm* 2010;102:50–58.
2. Heilbronner C, Roy E, Hadchouel A, et al. Breastfeeding disruption during hospitalisation for bronchiolitis in children: A telephone survey. *BMJ Paediatr Open* 2017;1:e000158.
3. Bartick MC, Valdes V, Giusti A, et al. Maternal and infant outcomes associated with maternity practices related to COVID-19: The COVID mothers study. *Breastfeed Med* 2021;16:189–199.
4. Hookway L, Lewis J, Brown A. The challenges of medically complex breastfed children and their families: A systematic review. *Matern Child Nutr* 2021:e13182.
5. Simon JA, Carabetta M, Rieth EF, et al. Perioperative care of the breastfeeding patient. *AORN J* 2018;107:465–474.
6. Rieth EF, Barnett KM, Simon JA. Implementation and organization of a perioperative lactation program: A descriptive study. *Breastfeed Med* 2018;13:97–105.
7. Australian Breastfeeding Association. Breastfeeding and hospitalisation. Australian Breastfeeding Association. 2017. <https://www.breastfeeding.asn.au/bfinfo/breastfeeding-and-hospitalisation> (accessed January 29, 2021).
8. Watson J, Hermann S, Johnson B. Developing a policy to support breastfeeding in women who are hospitalized and acutely ill. *Nurs Womens Health* 2013;17:188–196.
9. Dumphy D. The breastfeeding surgical patient. *AORN J* 2008;87:759–766; quiz 767–770.
10. Wenner L. Care of the breastfeeding mother in medical-surgical areas. *Medsurg Nurs* 2007;16:101–104.
11. Shanahan H, Ashton J. Breastfeeding Women Admitted to Hospital Clinical Guideline V3.1. Truro, United Kingdom: NHS Royal Cornwall Hospitals, 2020.
12. Victora CG, Bahl R, Barros AJ, et al. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *Lancet* 2016;387:475–490.
13. Bartick MC, Jegier BJ, Green BD, et al. Disparities in breastfeeding: Impact on maternal and child health outcomes and costs. *J Pediatr* 2017;181:49–55 e46.
14. Walters DD, Phan LTH, Mathisen R. The cost of not breastfeeding: Global results from a new tool. *Health Policy Plan* 2019;34:407–417.
15. Haiek LN, LeDrew M, Charette C, et al. Shared decision-making for infant feeding and care during the coronavirus disease 2019 pandemic. *Matern Child Nutr* 2021:e13129.
16. Hernandez-Aguilar MT, Bartick M, Schreck P, et al.; Academy of Breastfeeding Medicine. ABM clinical protocol #7: Model maternity policy supportive of breastfeeding. *Breastfeed Med* 2018;13:559–574.
17. Reece-Stremtan S, Campos M, Kokajko L, et al. ABM clinical protocol #15: Analgesia and anesthesia for the breastfeeding mother, revised 2017. *Breastfeed Med* 2017;12:500–506.
18. Academy of Breastfeeding Medicine. ABM clinical protocol #25: Preprocedural fasting for the breastfeeding infant: “NPO” guidelines. *Breastfeed Med* 2012;7:197–202.
19. Mitchell KB, Fleming MM, Anderson PO, et al. ABM clinical protocol #31: Radiology and nuclear medicine studies in lactating women. *Breastfeed Med* 2019;14:290–294.
20. Bartick MC, Schwarz EB, Green BD, et al. Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs. *Matern Child Nutr* 2017;13:3–6; Erratum in *Matern Child Nutr* 2017;2013(2012):null.
21. World Health Organization. Guideline: Protecting, Promoting, and Supporting Breastfeeding in Facilities: Providing Maternity and Newborn Services. Geneva: World Health Organization, 2017.
22. Colaizy TT, Bartick MC, Jegier BJ, et al. Impact of optimized breastfeeding on the costs of necrotizing enterocolitis in extremely low birthweight infants. *J Pediatr* 2016;175:100–105 e102.
23. O’Connor DL, Gibbins S, Kiss A, et al. Effect of supplemental donor human milk compared with preterm formula on neurodevelopment of very low-birth-weight infants at 18 months: A randomized clinical trial. *JAMA* 2016;316:1897–1905.
24. Khan J, Vesel L, Bahl R, et al. Timing of breastfeeding initiation and exclusivity of breastfeeding during the first month of life: Effects on neonatal mortality and morbidity—A systematic review and meta-analysis. *Matern Child Health J* 2015;19:468–479.
25. Gyamfi A, O’Neill B, Henderson W. Black/African American breastfeeding experience: Cultural, sociological, and health dimensions through an equity lens. *Breastfeed Med* 2021;16:103–111.
26. Foligno S, Finocchi A, Brindisi G, et al. Evaluation of mother’s stress during hospitalization can influence the breastfeeding rate: Experience in intensive and non intensive departments. *Int J Environ Res Public Health* 2020;17:1298.
27. Matthiesen AS, Ransjo-Arvidson AB, Nissen E, et al. Postpartum maternal oxytocin release by newborns: Effects of infant hand massage and sucking. *Birth* 2001;28:13–19.
28. Uvnäs-Moberg K. Oxytocin effects in mothers and infants during breastfeeding. *Infant* 2013;9:201–206.
29. Boss M, Gardner H, Hartmann P. Normal human lactation: Closing the gap. *F1000Res* 2018;7:F1000 Faculty Rev-801.
30. Uvnäs-Moberg K, Ingemar A, Magnusson D. The psychobiology of emotion: The role of the oxytocinergic system. *Int J Behavioral Medicine* 2005;12:59–65.
31. Dewey KG. Maternal and fetal stress are associated with impaired lactogenesis in humans. *J Nutr* 2001;131:3012S–3015S.
32. Vetulani J. Early maternal separation: A rodent model of depression and a prevailing human condition. *Pharmacol Rep* 2013;65:1451–1461.
33. Feldman-Winter L, Goldsmith JP, Committee On Fetus and Newborn, Task Force On Sudden Infant Death Syndrome. Safe sleep and skin-to-skin care in the neonatal period for healthy term newborns. *Pediatrics* 2016;138:e20161889.
34. Jonas W, Bisceglia R, Meaney MJ, et al. The role of breastfeeding in the association between maternal and infant cortisol attunement in the first postpartum year. *Acta Paediatr* 2018;107:1205–1217.
35. Crenshaw JT. Healthy birth practice #6: Keep mother and newborn together—It’s best for mother, newborn, and breastfeeding. *J Perinat Educ* 2019;28:108–115.
36. Kent JC, Mitoulas LR, Cregan MD, et al. Volume and frequency of breastfeedings and fat content of breast milk throughout the day. *Pediatrics* 2006;117:e387–e395.
37. Johnson HM, Mitchell KB. Lactational phlegmon: A distinct clinical entity affecting breastfeeding women within the mastitis-abscess spectrum. *Breast J* 2020;26:149–154.

38. Hassiotou F, Hepworth AR, Metzger P, et al. Maternal and infant infections stimulate a rapid leukocyte response in breastmilk. *Clin Transl Immunology* 2013;2:e3.
39. Riskin A, Almog M, Peri R, et al. Changes in immunomodulatory constituents of human milk in response to active infection in the nursing infant. *Pediatr Res* 2012;71:220–225.
40. Becker GE, Smith HA, Cooney F. Methods of milk expression for lactating women. *Cochrane Database Syst Rev* 2016;9:CD006170.
41. Meier PP, Patel AL, Hoban R, et al. Which breast pump for which mother: An evidence-based approach to individualizing breast pump technology. *J Perinatol* 2016;36:493–499.
42. Felice JP, Geraghty SR, Quaglieri CW, et al. “Breast-feeding” without baby: A longitudinal, qualitative investigation of how mothers perceive, feel about, and practice human milk expression. *Matern Child Nutr* 2017;13:e12426.
43. Felice JP, Rasmussen KM. Breasts, pumps and bottles, and unanswered questions. *Breastfeed Med* 2015;10:412–415.
44. Lawrence RA. Storage of human milk and the influence of procedures on immunological components of human milk. *Acta Paediatr Suppl* 1999;88:14–18.
45. Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): A patient-centered approach to grading evidence in the medical literature. *J Am Board Family Pract* 2004;17:59–67.
46. Jaafar SH, Ho JJ, Lee KS. Rooming-in for new mother and infant versus separate care for increasing the duration of breastfeeding. *Cochrane Database Syst Rev* 2016:CD006641.
47. Ng CA, Ho JJ, Lee ZH. The effect of rooming-in on duration of breastfeeding: A systematic review of randomised and non-randomised prospective controlled studies. *PLoS One* 2019;14:e0215869.
48. Fewtrell M, Kennedy K, Lukoyanova O, et al. Short-term efficacy of two breast pumps and impact on breastfeeding outcomes at 6 months in exclusively breastfeeding mothers: A randomised trial. *Matern Child Nutr* 2019;15:e12779.
49. Silberman SL. Pioneering in family-centered maternity and infant care: Edith B. Jackson and the Yale rooming-in research project. *Bull Hist Med* 1990;64:262–287.
50. Lee S, Kelleher SL. Biological underpinnings of breastfeeding challenges: The role of genetics, diet, and environment on lactation physiology. *Am J Physiol Endocrinol Metab* 2016;311:E405–E422.
51. World Health Organization.(2009). Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. World Health Organization. <https://apps.who.int/iris/handle/10665/44117>.
52. Centers for Disease Control and Prevention. Table 3.2. Median number of feedings of each food in the past 7 days by infant age, among babies who consumed each food. U.S. Department of Health and Human Services. Infant Feeding Practices Survey II Web site. 2008. [https://www.cdc.gov/breastfeeding/pdf/ifps/data/ifps2\\_tables\\_ch3.pdf](https://www.cdc.gov/breastfeeding/pdf/ifps/data/ifps2_tables_ch3.pdf) (accessed February 20, 2021).
53. Institute of Medicine (US), Committee on Nutritional Status During Pregnancy and Lactation. 5: Milk volume. In: Nutrition During Lactation. Washington, DC: National Academies Press (US), 1991.
54. Centers for Disease Control and Prevention. How to keep your breast pump kit clean: The essentials. US Department of Health and Human Services. 2020. <https://www.cdc.gov/healthywater/hygiene/healthychildcare/infantfeeding/breastpump.html> (accessed January 29, 2021).
55. Flores-Antón B, Martín-Cornejo J, Morante-Santana MA, et al. Comparison of two methods for cleaning breast pump milk collection kits in human milk banks. *J Hosp Infect* 2019;103:217–222.
56. Stanford Medicine Newborn Nursery, Morton J. Hand expression of breastmilk. Stanford University. 2006. <http://med.stanford.edu/newborns/professional-education/breastfeeding/hand-expressing-milk.html> (accessed January 29, 2021).
57. Centers for Disease Control and Prevention. Proper storage and preparation of breast milk. Department of Health and Human Services. 2020. [https://www.cdc.gov/breastfeeding/recommendations/handling\\_breastmilk.htm](https://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm) (accessed January 29, 2021).
58. Task Force On Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: Updated 2016 recommendations for a safe infant sleeping environment. *Pediatrics* 2016;138:e20162938.
59. LactMed: Drugs and Lactation Database. <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT> (accessed September 20, 2006).
60. Texas Tech University Health Sciences Center. InfantRisk Center at Texas Tech University Health Sciences Center: Breastfeeding. Texas Tech University Health Sciences Center. 2021. <https://www.infantrisk.com/category/breastfeeding> (accessed January 29, 2021).
61. e-lactancia. Is it compatible with breastfeeding? Association for the Promotion of and Scientific and Cultural Research in Breastfeeding of Partnership for Maternal, Newborn & Child Health (World Health Organization). 2021. [www.e-lactancia.org/](http://www.e-lactancia.org/) (accessed February 20, 2021).
62. Sachs HC, Committee On Drugs. The transfer of drugs and therapeutics into human breast milk: An update on selected topics. *Pediatrics* 2013;132:e796–e809.
63. Odom EC, Li R, Scanlon KS, et al. Reasons for earlier than desired cessation of breastfeeding. *Pediatrics* 2013;131:e726–e732.
64. Brown A, Finch G, Trickey H, et al. ‘A Lifeline When No One Else Will Give You the Answer’: An Evaluation of the Breastfeeding Network kdrugs in Breastmilk Service. Scotland: Breastfeeding Network, 2019.
65. Centers for Disease Control and Prevention. Contraindications to breastfeeding or feeding breast milk to infants. US Department of Health and Human Services. 2019. <https://www.cdc.gov/breastfeeding/breastfeeding-special-circumstances/contraindications-to-breastfeeding.html> (accessed January 29, 2021).
66. Carneiro-Proietti AB, Amaranto-Damasio MS, Leal-Horiguchi CF, et al. Mother-to-child transmission of Human T-Cell Lymphotropic Viruses-1/2: What we know, and what are the gaps in understanding and preventing this route of infection. *J Pediatric Infect Dis Soc* 2014;3 Suppl 1:S24–S29.
67. World Health Organization. Updates on HIV and Infant Feeding. Geneva: World Health Organization, 2021.
68. Loveday M, Hlangu S, Furin J. Breastfeeding in women living with tuberculosis. *Int J Tuberc Lung Dis* 2020;24:880–891.
69. World Health Organization. Breastfeeding and COVID-19. Scientific Brief. 2020. <https://www.who.int/news-room/commentaries/detail/breastfeeding-and-covid-19#:~:text=>

- WHO%20recommends%20that%20mothers%20with,confirmed%20COVID%2D19 (accessed October 16, 2020).
70. Auerbach KG, Avery JL. Relactation: A study of 366 cases. *Pediatrics* 1980;65:236–242.
  71. Turner T. Why North Carolina mom believes newborn saved her life. ABC News [Internet]. 2015. Available from: <https://abcnews.go.com/Health/north-carolina-mom-believes-newborn-saved-life/story?id=34836156> (accessed August 22, 2021).
  72. Eglash A, Malloy ML. Breastmilk expression and breast pump technology. *Clin Obstet Gynecol* 2015;58:855–867.
  73. Wisner KL, Jennings KD, Conley B. Clinical dilemmas due to the lack of inpatient mother-baby units. *Int J Psychiatry Med* 1996;26:479–493.
  74. Cazas O, Glangeaud-Freudenthal NM. The history of Mother-Baby Units (MBUs) in France and Belgium and of the French version of the Marce checklist. *Arch Womens Ment Health* 2004;7:53–58.
  75. Galbally M, Sved-Williams A, Kristianopoulos D, et al. Comparison of public mother-baby psychiatric units in Australia: Similarities, strengths and recommendations. *Australas Psychiatry* 2019;27:112–116.
  76. Kimmel MC, Lara-Cinisomo S, Melvin K, et al. Treatment of severe perinatal mood disorders on a specialized perinatal psychiatry inpatient unit. *Arch Womens Ment Health* 2016;19:645–653.
  77. Meltzer-Brody S, Brandon AR, Pearson B, et al. Evaluating the clinical effectiveness of a specialized perinatal psychiatry inpatient unit. *Arch Womens Ment Health* 2014;17:107–113.
  78. Buist A, Minto B, Szego K, et al. Mother-baby psychiatric units in Australia—The Victorian experience. *Arch Womens Ment Health* 2004;7:81–87.
  79. Hill R, Law D, Yelland C, et al. Treatment of postpartum psychosis in a mother-baby unit: Do both mother and baby benefit? *Australas Psychiatry* 2019;27:121–124.
  80. Vittner D, McGrath J, Robinson J, et al. Increase in oxytocin from skin-to-skin contact enhances development of parent-infant relationship. *Biol Res Nurs* 2018;20:54–62.
  81. Children’s Hospital of Philadelphia. Maintaining your milk supply while your baby is hospitalized. Children’s Hospital of Philadelphia. 2021. <https://www.chop.edu/pages/main-maintaining-your-milk-supply-while-baby-hospitalized> (accessed February 15, 2012).
  82. Children’s Wisconsin. Breastfeeding your hospitalized child. Children’s Wisconsin. 2021. <https://childrenswi.org/medical-care/neonatology/breastfeeding-resources/breast-feeding-your-hospitalized-child> (accessed February 15, 2021).
  83. Ben Gueriba K, Heilbronner C, Grimaud M, et al. Simple actions to support breastfeeding can avoid unwanted weaning in infants younger than 6 months hospitalized for bronchiolitis: A before/after study (Bronchilact II). *Arch Pediatr* 2021;28:53–58.
  84. Hoffmeister J, Zaborek N, Thibeault SL. Postextubation dysphagia in pediatric populations: Incidence, risk factors, and outcomes. *J Pediatr* 2019;211:126–133 e121.
  85. Shadman KA, Kelly MM, Edmonson MB, et al. Feeding during high-flow nasal cannula for bronchiolitis: Associations with time to discharge. *J Hosp Med* 2019;14:E43–E48.
  86. Combs VL, Marino BL. A comparison of growth patterns in breast and bottle-fed infants with congenital heart disease. *Pediatr Nurs* 1993;19:175–179.
  87. Gregory C. Use of test weights for breastfeeding infants with congenital heart disease in a cardiac transitional care unit: A best practice implementation project. *JBHI Database System Rev Implement Rep* 2018;16:2224–2245.

ABM protocols expire 5 years from the date of publication. Content of this protocol is up to date at the time of publication. Evidence-based revisions are made within 5 years or sooner if there are significant changes in the evidence.

*Melissa C. Bartick, MD, MS, FABM, lead author*  
*Maria Teresa Hernández-Aguilar, MD, MPH, PhD*  
*Nancy Wight, MD, FABM*  
*Katrina B. Mitchell, MD*  
*Liliana Simon, MD, MS*  
*Lauren Hanley, MD*  
*Samantha Meltzer-Brody, MD, MPH*  
*Robert M. Lawrence, MD*

The Academy of Breastfeeding Medicine Protocol  
 Committee Members:  
*Elizabeth Stehel, MD, Chair*  
*Lawrence Noble, MD, FABM, Translations Chair*  
*Melissa C. Bartick, MD, MS, FABM*  
*Sarah Calhoun, MD*  
*Laura Kair, MD, MAS, FABM*  
*Susan Lappin, MD, FABM*  
*Ilse Larson, MD*  
*Yvonne LeFort, MD, FABM*  
*Nicole Marshall, MD, MCR*  
*Katrina Mitchell, MD*  
*Susan Rothenberg, MD, IBCLC, FABM*  
*Tomoko Seo, MD, FABM*  
*Gina Weissman, DMD, RN*  
*Nancy Wight, MD, FABM*  
*Lori Feldman-Winter, MD, MPH*  
*Adora Okogbule-Wonodi, MD*  
*Michal Young, MD, FABM*  
*Deena Zimmerman, MD, MPH*

For correspondence: [abm@bfmed.org](mailto:abm@bfmed.org)