

Does the Ameda Elite™ breast pump have the ability to bring in and maintain the milk supply of mothers whose babies are in the Neonatal Intensive Care (NICU)?

Libby Rosen, RN, BSN, IBCLC • Katherine Shuster, MPH, CBE
Carol Cornsweet Barber, PhD

Stormont-Vail Regional Health Center, Topeka, Kansas, USA

PURPOSE

The purpose of this research is to evaluate the efficacy of the Ameda Elite medical grade breast pump for establishing and maintaining milk supply for mothers whose non-suckling,



premature infants are under care in the Neonatal Intensive Care Nursery (NICU) at Stormont-Vail HealthCare. Our hospital has chosen to make available lightweight portable pumps for our Level III NICU families. As a staff that believes in quality control and evidence-based practice, we decided to examine whether this pump could facilitate breastfeeding success.

Some of the questions explored include:

- If used within 12 hours of birth, can this breast pump initiate lactogenesis in a mother whose non-suckling infant is under care in the NICU?
- How long does it take for a mother to establish an adequate milk supply if she pumps exclusively?
- If used 8 to 10 times in 24 hours, and at least 100 minutes per 24 hours, can this breast pump help a mother to maintain her milk supply, once established?

BACKGROUND

It is well established that breastfeeding is the optimal nutrition source and method of feeding infants. This is especially true of high need and premature infants. Early and effective suckling contact between mother and baby is crucial in order to *establish* an adequate milk supply with which a mother can nourish her baby. Infants in the NICU are often unable to initiate this suckling contact for medical reasons. A medical grade breast pump may serve as an effective substitute in such a situation.

The *maintenance* of a mother's milk supply is facilitated by frequent and effective emptying of the breasts by the infant's suckling (8-12 times in 24 hours). Frequent and regular use of a medical grade breast pump (8 to 10 times and 100 minutes in 24 hours) has been shown to be an effective alternative for mothers whose infants are unable to suckle and empty the mother's breasts.



MOM INSPIRED. HOSPITAL TRUSTED.

LITERATURE REVIEW

In order to evaluate the Ameda Elite breast pump, a comparison was made to standards that have been set forth in the following literature:

Lawrence, RA, *Breastfeeding: A Guide for the Medical Profession.* Fifth Edition Fig 3-17. Mosby 2000.

- Milk volume during the first week postpartum for full-term nursing infants of multiparous Caucasian women averaged 200cc/day on day 2, and 500-600cc/day (16.6-20oz) on days 4-8.

Riordan J, & Auerbach K, *Breastfeeding and Human Lactation* First edition p107. Jones and Bartlett 1993.

- Volume of milk produced is approximately 500cc/day (16.6oz) by day 5.

Hill et al., **Journal of Human Lactation** 15(3) 1999, 209-215 "Effects of pumping style on milk production in mothers of non-nursing preterm infants."

- Milk volume at week 2 is a strong predictor of success in establishing and maintaining the milk supply at week 4-5.
- This study assumed that moms need to produce 16.6 oz or 500cc to be ready to bring the NICU baby home.
- There was a positive correlation between pumping frequency per day and milk volume.
- The Hill et al study cited Paula Meier, PhD, a leading authority on breastfeeding and premature babies. Dr. Meier and her colleagues advise establishing a milk supply of 750-1000 cc/day (25-33oz) provides a reserve protecting against a diminishing volume of milk when the premature baby is ready to leave the hospital.

SUBJECT POPULATION

Participants for this study were recruited from the population of mothers who delivered infants requiring neonatal intensive care, at Stormont-Vail HealthCare between April and December 2000. The breast pump for this study is used at Stormont-Vail HealthCare by any mother who requires use of a breast pump while in the hospital. This pump is also available for rent from Breastfeeding Support Services at Stormont-Vail HealthCare. In order to be sure that a representative sampling of mothers participated, regardless of ability to

pay, mothers were given the pump kit and one month of pump rental, free of charge. For the purpose of this study, Breastfeeding Ameda Products, loaned us 15 breast pumps for the length of this study.

Data were analyzed from 28 mothers and infants whose gestational age [at birth] ranged from 25-36 weeks.

PROCEDURE



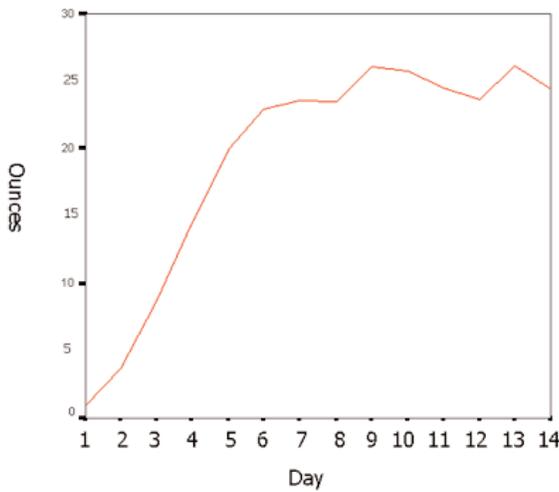
Consistent teaching and support is needed for moms with babies in NICU.

Participants were asked to use the breast pump according to study guidelines, i.e. initiating pumping within 12 hours of the baby's birth, pumping 8 to 10 times in 24 hours for 10 to 15 minutes each time, for a minimum of 100 minutes per 24 hours. Mothers pumped both breasts simultaneously using the Ameda Dual HygieneKit® Collection System. A video tape, with our staff member providing the instruction, was provided to assure consistent information on pumping procedures was imparted to the participants.

Participants were asked to record start times, minutes pumped per session and ounces pumped from each breast. Record sheets were collected weekly at a mothers' support group. Participants' progress was monitored and questions were addressed by telephone.

STUDY RESULTS

Graph 1



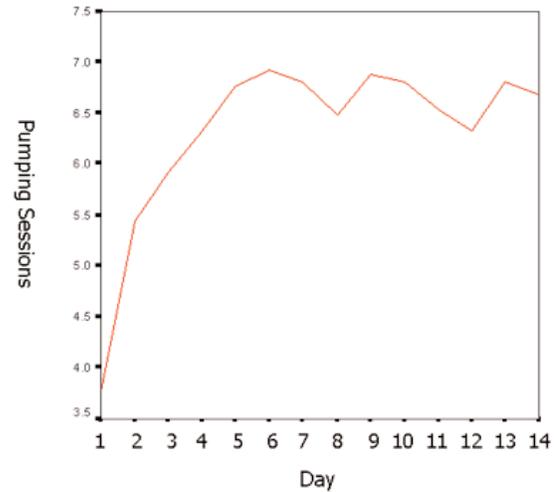
Graph #1: Mean ounces per 24 hours.

Mean ounces pumped well exceeded the benchmark 500 cc (16.6oz) mark beginning on day 5.

Mean number of ounces produced for days 10-14 was 23.7oz.

By day 14 of the study, 64% of moms were producing 20 or more oz/day, 72% of mothers who were partially breastfeeding at this point were excluded.

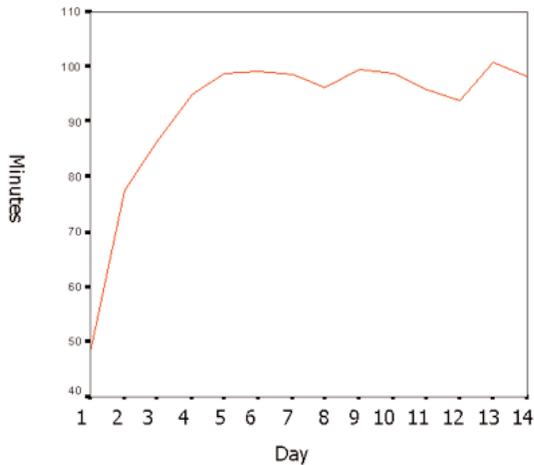
Graph 2



Graph #2: Mean pumping sessions per 24 hours.

Even though instructed to pump 8-10 times in 24 hours, no participant ever pumped more than 9 times in 24 hours with the mean never exceeding 7.00 times in 24 hours.

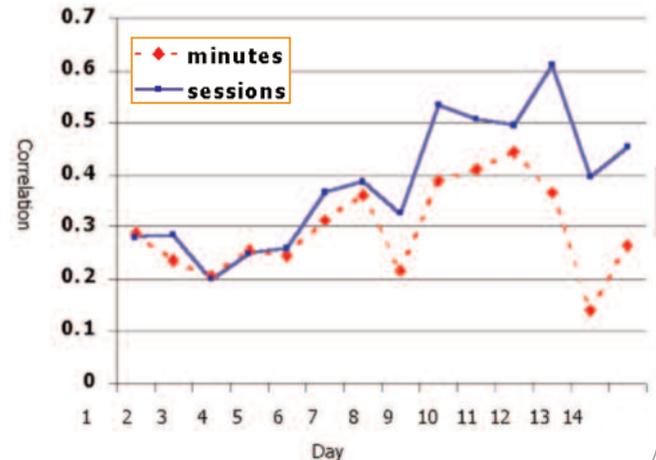
Graph 3



Graph #3: Mean pumping minutes per 24 hours.

Study participants were slightly better at following the guideline to pump at least 100 minutes in 24 hours, even though they did it in less than the recommended 8-10 pumping sessions.

Graph 4



Graph #4: Direct correlation between mean pumping minutes, sessions and mean ounces pumped. This graph illustrates the significant relationship between pumping minutes and ounces pumped as well as pumping sessions and ounces pumped. While both correlations are significant, the stronger relationship is between pumping sessions and ounces pumped. This supports our practice of advising mothers to pump at least 8 times in a 24-hour period.

CONCLUSION

Based on our findings, the Ameda Elite medical grade breast pump can be effective for establishment and maintenance of an adequate milk supply for mothers of non-suckling infants.



The Ultimate Goal. Melissa and Tyler still nursing strong at 9 months after initiating and maintaining her milk supply with an Ameda Elite Breast Pump during a 4 week stay in the NICU.

Variables not addressed:

We did not evaluate the following variables, which may have played a role in the outcomes, either positively and negatively.

- Condition of the infant
- Socioeconomic background
- Individual motivation and support
- Level of Education
- Amount of contact with the infant, both overall and around pumpings (i.e. kangaroo care)

Special Thanks

To all the staff at the breastfeeding and follow-up clinic: Deb Gottschalk, BSN, CBE; Heather Cox, CBE; Karon Clark, LPN, CBE; Maire Fowler, Volunteer. Also appreciation to all the mothers who were willing to document their pumping experience during a stressful time. To Ameda Breastfeeding Products, for the use of the pumps and support in the study and the development of this handout. And to the Stormont-Vail Regional Health Center administration and staff for the support to have a free, walk-in clinic for patients to receive help and information and to work with the moms and babies in a way that benefits their health and health of the community.