

## Interview Questions by Paul Swiech, Health Reporter for the Bloomington/Normal IL Pentagraph

### Interviewing Dr. Brenda Lessen on the PIOMI

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**You are an Assistant Professor in nursing at IWU?** Yes. I am also an alum (class of 1989). I was a full-time visiting prof here for several years, and when I completed my PhD in I was hired as a tenure line faculty for OB.

**Why are you focusing on the area of pre-term infancy nutrition?** During my doctoral work at UIC, I had a research focus on neonatal science and became interested in preterm infant feeding. The summer of 2003 I did a summer study at Oxford University in the UK that focused on connectionist modeling, a form a predictive neural networking, or “brain wiring” as a response to certain stimuli. I was intrigued about ways to train the brain in a preterm infant whose normal intrauterine development was cut short by being born preterm. So I joined that intrigue with my interest in feeding, and began the study and development of an intervention that activates neurons in and around the mouth to prepare the preterm infant for feeding. **What is the problem?** See, when they are still in utero, they get optimal stimulation in their mouths from the presence of amniotic fluid filling their cheeks and moving over their tongues, and even from sucking on their hands. This prepares them for using those muscles and senses to be able to suck and swallow efficiently for their feedings once they are born at 40 weeks (9 months). But when they are born before that, this normal trajectory of development is interrupted. They lay in our neonatal intensive care unit with a dry mouth hanging open, and most stimulation in their mouths is actually negative! Such as suctioning, intubating, inserting feeding tubes, etc. So this intervention, the Premature Infant Oral Motor Intervention (PIOMI) is designed to provide muscle and sensory activation in and around the mouth, to their cheeks, gums, tongue, palate and lips, so they can continue to increase functional strength, range of motion, and control of movement until they are old enough to breast or bottle feed. **This is for infants 29 to 39 weeks?** My original study did this intervention for one week only at 29 weeks, when they were about 2.2 pounds. This is because it was designed as something one does BEFORE they ever bottle feed...remember this is to train the brain to be more prepared for feeding. I did this for only a week to also establish its safety on infants that small. However, the intervention CAN be used on infants of older gestations, and be continued simultaneously as they are learning feeding. And parents are being taught how to do the PIOMI. **How many infants does this impact? Why is this issue important? What are the consequences if it isn't addressed? How can you quantify the degree of the problem?** The preterm infant birth rate has steadily increased in the last 2 decades, nearly doubling the Healthy People 2020 goal. The survival rate of preterm infants has also increased, with younger preterm infants requiring a lengthy and costly hospital stay. Our National Vital Statistics Reports state that the prolonged hospital stays for premature infants averages about \$80,000 (2007 data—probably higher now). The sooner we can get them healthy enough to be discharged, the better. Feeding is usually the last milestone for a preemie before they can be discharged home, so when the PIOMI improved their feeding skills to the point that they attained full feedings 5 days faster than the babies who didn't get it, that translated into them being discharged home 2-3 days sooner! With over half a million preterm infants born each year, a 3 day decrease in hospital stay would save more than 2 billion dollars annually. **(What is gavage?)** Gavage feeding is another word for tube feeding. Until an infant is old enough to suck from a nipple (about 32 weeks gestation), we place a feeding tube into their stomach and infuse nutrition through the tube. At around 32 weeks, they are beginning to display readiness to suck, swallow and breathe all at once, which allows them to suck a feeding down through a nipple safely. They tire easily, however, and can only do this maybe once per day for the first few days, and the rest of the feedings are still infused through the tube. As they grow stronger and develop further, more and more bottle feedings replace the tube feedings, until they don't need tube feedings anymore at all. Once they are taking total bottle feedings, they can be discharged.

**What is your program?** My program is the PIOMI, the Premature Infant Oral Motor Intervention. **When did you start it?** I started it during my doctoral study at UIC, which I completed in 2009, and published in 2011. **How did you develop it? How is it different?** I knew after studying oral motor development that the experts were not within the discipline of nursing. These researchers were mostly Speech Language Pathologists (SLP's). So in studying literature in that field, I came upon an oral motor program that had steps in it that didn't require the cognitive participation of the patient (they didn't have to respond to commands or instructions), and I thought it might work for preterm infant's if I could modify it to be done in the few minutes of stimulation that preterm infants can handle. So I consulted that SLP and we used her

expertise on oral motor therapy along with my expertise on the preterm infant, and created an 8 step program that only takes 4-5 minutes to do, but still targets the most important areas in and around the mouth for feeding. There were NO other oral motor interventions in the literature that were specifically for preterm infants, and more importantly had been tested in a tight triple blinded clinical study on preterm infants this small, BEFORE they ever start to bottle feed. This was the first PRE-feeding oral motor intervention that produced data that it worked against controls. **How does it work/Describe it to me?** I can show you on the training DVD where I demonstrate it on a live preterm infant, and then have a segment where the user can practice it along with me in real time. **Why does this work?** The PIOMI is an oral motor program that provides assisted movement to activate muscle contraction and provides movement against resistance to build strength in the areas of the mouth necessary for feeding. It is designed to increase the maturation of neural structures, improving their ability to suck and swallow. **Who is this open to?** Certainly preterm infants before they attempt bottle feedings, but also to infants throughout their hospital stay who are learning bottle feeding. Ideally, it is done early before any attempt to bottle feed, when we can leverage that high degree of plasticity in the developing brain. Basically, train the brain to feed before we allow the infants to practice poor feeding skills. The tool proved to be very reader-friendly, and simple to learn, so parents are being taught to do it on their infants while in the NICU, which is a GREAT thing for parent-infant interaction, and gives parents a way to participate in their infants care that is truly impactful, especially when it can result in getting to take their infant home sooner. And Easter Seals is using it on another population of infants who come into the outpatient clinic with poor feeding skills. They are the ones in fact who requested that I develop a “parent-friendly” version of the tool so they could send it home with parents. So I did work with my production team from TwinStar Media here in Bloomington, to create a tool with less medical jargon and photo’s of each step. The response has been good. **How are people trained?** The training can be done either with me coming to their agency in person, like I just did in Bethlehem, PA for a NICU there who is beginning a research study with me on the PIOMI... or with the global agencies that have requested training, I send a training DVD that was produced with Twin Star Media, along with what I call a “bundle” containing the printed instruction tool, a laminated summary of the PIOMI for the bedside, and several other materials to continue to test and evaluate it. One agency wished they had a little “cheat sheet” of the 8 step PIOMI hanging on their ID badge, so TwinStar Media created that for me and I now include those in the bundles.

**Tell me about the results of the research study?** Babies who got the PIOMI (just once a day for 7 days) learned to get to full bottle feedings 5 days sooner than controls (ones who did NOT get it). They were also discharged home 2.6 days sooner. A group in Tehran, Iran just completed a replication study with twice my sample size and had almost identical results. I’ve just been asked to review their manuscript and they are now ready to submit it for publication. **(What was the sham intervention?)** The sham intervention was just me standing at the side of the incubator, opening the doors, and laying my hands inside the bed not touching or waking the infant for the same 5 minutes that it would take if I WERE doing the PIOMI. The curtains were pulled around the bed, so the parents, nurses, and doctors could not see if I was actually doing the PIOMI or not. **Reaction to results?** My reaction was actually surprise. I did not think that only doing 5 minutes of PIOMI a day for only 7 days would make much difference. But I needed to start very conservatively in order to establish safety in such a small infant. But surprisingly, it seemed to make a huge difference! The most reaction has come from SLP’s. I have had a steady stream of emails and calls from SLPs saying they have been trying to do oral motor in preterm infants, but had no evidence-based protocol to use until the publication of my study on the PIOMI. I would say 90% of the requests for PIOMI materials has come from that discipline. The other 10% has come from RNs in graduate school wanting to study the PIOMI for their doctoral work, which I love! There are many opportunities for future study on the PIOMI: I want to know if it would benefit other populations of infants, such as cardiac infants, or those who we diagnose as poor feeders. Every time I get asked to present this at a professional conference, I get asked by lactation consultants about its effect of breastfeeding, which I am very interested in. I would also like to see if doing it more often or for a longer duration is more effective, or if at some point we maximize its benefit.

**Tell me about the reaction you’ve received nationally and internationally? Which states/countries? What is done there? Where have you done training and set up research studies?** I have had inquiries from many practitioners in several different states and countries on how to implement the PIOMI. They either find me through my publication, or heard me at a conference, or more recently I have learned that my work has been cited by others at their professional conference. I have done training for about 10 centers in 9 different states, either in person or by sending the training bundle. This summer a NICU in Bethlehem, PA had me come out to train both their SLP staff and their nursing staff. Those 20+ persons are now the “super-users” who will train the rest. We had been working on a research proposal together as well, so I also used that visit to meet with the medical staff to finalize those plans. Data collection is planned to begin Jan 1. Internationally, I have provided training materials for 11 centers in 8 different countries (3 in China, Iran, Argentina, Canada, 2 in France, Taiwan, Brazil, and Thailand). Most of those found me through my publication. The center in Iran used it to conduct a research study that I just consulted on throughout the year, and the center in Thailand is using it for a research study that I am a co-investigator on. That data collection should also begin around the first of the year.

**What is the cost of training?** I only charge a small fee for the Training Materials, enough to cover my production costs, less than \$100. But if the center contracts to do research on the PIOMI, I send it for free, and use research/grant monies to cover those costs. So far, I have used IWU faculty development monies to take me to centers for in-person training. If I write a grant to get more funds, I would love to do more in person training. I find it especially necessary to travel to the international centers that I am beginning research in, to evaluate their standard of care compared to the US, and oversee the implementation and data collection.

**Why is this so popular?** I have been told by many SLPs that as oral motor therapy has become increasingly considered in the NICU population to improve feeding, that they are looking for evidence based interventions specific for preterm infants, and evidently the PIOMI is one of the few if only ones out there with evidence to support its use in this small of preterm infants. I also think its popular because it is essentially free...it uses no fancy equipment, just your gloved hand. And it's also quick and easy to use. It is only 8 steps, and takes only 4-5 minutes **What is your reaction to this?** Surprising! What was just some dissertation work, has turned into something benefitting a large population across the globe. Not exactly something I knew I was signing up for! It's very exciting that something I have spent so many years working on and developing has a positive impact on my patients, and on their families. And that others can use this intervention to hopefully have the same or better effect on theirs. As a researcher, however, I remain cautious in over-generalizing this work. The replication studies are very important, as are those that expand the intervention to other types of preterm infants.

**What happens next?** Well, after the first publication, I was planning to begin a large follow-up study. But when I began getting so many requests for training and I realized the level of interest, I decided to respond. I switched gears and put my research time and monies into the development of the training materials, including a professionally produced DVD that includes a live recording of me demonstrating the technique in the NICU on a preterm. I knew I couldn't quit my teaching position and start traveling everywhere to train, so this was the next best option. But as this was being planned, I realized the need to TEST the training before recording it and disseminating it on such a broad scale. So I partnered with an IWU Nursing Honors Research Student in conducting an intervention fidelity study on the PIOMI, which helped us make small revisions on the training methods, and reach 98% interuser and intrauser reliability. (That manuscript is about to be submitted for publication with the IWU student as a co-author). So once that was established, I was comfortable using those materials and methods in training, and as I get feedback from centers I train, I continue to develop revisions and additional tools to meet their needs. **In the academic world, publication in peer reviewed journals is considered the gold standard. But I have been very lucky to have moved into the realm of "translating published evidence into PRACTICE", which has a more immediate impact on my field, and also have been fortunate to have to cross disciplines into the world of speech language pathology practitioners. Now my professional presentations have moved past the data from the PIOMI, and the reliability study, to the PROCESS of translating evidence into practice and how to do this in an interdisciplinary milieu.** (I just completed that very presentation in Vegas last month at the Academy of Neonatal Nurses conference.) Now I am ready to move back into the research mode again, and am collaborating on two new research studies on the effect of the PIOMI on different aspects of feeding; one in Pennsylvania and one in Thailand. I am also anxious to follow others who have been trained and are doing research on it to publish their results, such as the group at the Tehran University of Medical Sciences in Iran. I am also going to begin having the PIOMI translated into other languages by the international community that is using it, and hopefully some of our own international students on my IWU campus.

**What is your advice to parents/caregivers/medical professionals regarding pre-term infancy nutrition? Can/should non-medical professionals learn this? YES! Who can buy your training materials?** Anyone can request training materials, although I usually try to dialogue somewhat with them first to know where they are from, what type of NICU, and what their plans are for using it. **Can parents buy it?** They actually could, and as I develop the PIOMI.com website past the landing page, it could contain links to research studies on oral motor therapy, the PIOMI tools and instructions, sample unit protocols, etc. **What does it cost?** Right now, nothing other than to cover production. This is not a business for me, it is scholarship and service.