

Treating Pain, Tracking Impact

The cry of a child stirs the emotions of anybody in earshot. When the suffering child is a premature baby, our hearts and thoughts go out to these tiny newborns. Invasive machinery and various medical procedures are needed to keep these children alive and growing, separating them from their mothers. There is no maternal touch, only clinical forms of stimulation. Without a calming connection, the most vulnerable of pediatric patients are exposed to increasing stress or pain. The alternative to alleviate the pain is powerful drugs—a controversial and difficult choice.

Imagine being a parent faced with this choice for not just one child but for two premature babies. In June 2000, that was Laura's situation. "I had an emergency C-section," she recalls, "Cameron and Carlie were born at 27 weeks, and neither had lung development. They were just so small, 2 pounds...they needed respirators." At this time, the two babies were enrolled in a neonatal pain study. Babies in the study were given morphine to control pain or a placebo. The study explored questions about babies treated by analgesia: Would stress decrease? Would survival increase? Would conditions such as cerebral palsy, cognitive delay, and bleeding in the brain decrease?

Laura remembers the first time she saw her babies, "Cameron was telling it; he was loud. Carlie was out of it: quiet, calm, still." During their two months at ACH, the babies grew stronger. "Cameron was strong enough to pull out his tube three or four times, but he wasn't strong enough to breathe without the tube," his mother says. Laura holds ACH in high regard, "They cared about the kids and were considerate of the kids' and parents' feelings...They explained everything to us."

Cameron and Carlie were among the children involved in the NEurologic Outcomes and Preemptive Analgesic In Neonates (NEOPAIN) study—the now-classic study of pediatric pain management in newborns. Dr. Sunny Anand directed this NIH-funded research project centered at ACH. It involved 16 centers (12 in the US and 4 in Europe) from 1999 to 2002. It revealed a decreased pain response in babies receiving analgesia but did not show a change in effects such as brain damage. Some of the babies with higher morphine doses had side effects similar to those of adults using morphine—a fact not previously documented for premature babies.

Five years later, NIH has agreed to fund a follow up to begin later this year on the babies in the NEOPAIN study. The main objective is to learn the long-term impact on the babies, now ages 6 to 8. At age 8, Dr. Anand's team will give these children outpatient tests regarding behavior, cognition, stress response, executive brain function, growth, vision, hearing, and visual-motor coordination. In preparation, Dr. Anand has conducted preliminary studies with 20 local patients from the original study. Cameron and Carlie have each returned to ACH for this testing. Dr. Anand's initial results show that NEOPAIN children that received morphine may have increased



Born prematurely, Cameron and Carlie now happily play on their trampoline and gladly participate in the NEOPAIN study follow up.

cognition and behavior scores compared to children that received the placebo. He hopes to learn if there are differences later in life, with increased IQ or decreased atypical behaviors among premature babies receiving analgesia.

The treatment of Laura's family years ago was only one influence in the decision to participate in the follow up and in any future studies. Most of all, she states, "The more research, the more we can learn...if it will help anybody else you know, you don't mind."



Established in 1989, Arkansas Children's Hospital Research Institute provides an on-site research environment for faculty of the University of Arkansas for Medical Sciences working on the Arkansas Children's Hospital campus. Over 120 pediatric researchers with expertise and experience that span the breadth of medical disciplines comprise ACHRI's roster of investigators who work to fulfill its mission to improve children's health, development, and well-being through high quality research. For more information, visit <http://achri.archildrens.org>.