

A LINE ON LIFE

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Soothing Infant Pain *

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Until the last decade, most physicians believed that newborn infants could not feel pain. Their nervous systems had not developed enough. The crying or fussing of newborns was related to the emotional distress of being handled – not physical pain.



Some may brand this as foolish. However, it is difficult to scientifically separate pain responses of newborns from those of distress. When stuck with a needle, they cry. Their heart rates soar, and their breathing becomes shallow. This physical response to a needle stick can indicate fear, anxiety and/or stress.

Researchers are more concerned with *soothing the babies* than the emotion being expressed. There is some evidence that newborns' painful experiences can make them oversensitive to future pain. This may affect their temperaments.

When mothers nurse, infants become calmer and more relaxed. Is this caused by the sucking, the holding (contact comfort), the food or a combination of these factors? Studies seem to support all three factors. Methodical, step-by-step scientific inquiry led to this conclusion.

Over a decade ago, researchers found that adult rats react less to painful stimuli, when they are drinking saccharine. In adult rats, *sucrose* (a type of sugar) was found to increase normal brain *endorphins* – opium-like pain blockers. In later research by psychologist Elliott Blass, similar results were found for younger rats. Rat pups were separated from their mothers to induce crying. However, the crying stopped, when the pups were given a sucrose solution. When the pups are given *naltrexone* – a drug that blocks the effect of endorphins – crying was not reduced by the sugar solution.

Was this also true with human babies? When being circumcised or given a routine heel lance (for a blood sample), babies cried less when they were given sucrose. Blass studied babies of mothers who were given an opiod (opium-like) substance – *methadone* – during their pregnancies. With these opiods in babies while they are in the uterus, their bodies failed to produce it naturally until several weeks after birth. During that time, sucrose failed to soothe crying babies.

However, with these "*methadone*" babies, a pacifier reduced crying almost as well as sugar did with other newborns. Since pacifiers cannot produce endorphins in the "*methadone*" newborns, we don't yet know exactly what causes the calming effect.



A pediatrician, Ronald Barr (McGill University), found that being held also reduced crying. The reduction in crying was greatest, when babies were given sucrose *and* held.

So far, we have explored reducing crying responses to pain. According to psychologist Megan Gunnar (University of Minnesota), reduction of crying may not reduce the child's

physiological stress. Under stress, both adults and babies produce more stress hormones – *cortisol* and *adrenaline*. Although pacifiers reduce crying in newborns, their stress hormones "*are still responding like crazy*." While performing circumcisions, several pediatricians compared the effects of an anesthesia, sucrose or a pacifier. The sucrose and pacifier had no effect on heart rate and stress hormones. According to Gunnar, "*We're seeing behavioral change but no physiological change*."

When only *lidocaine* (a local anesthesia) is given, the opposite occurred. Pain was blocked, so stress hormones were not produced. However, the lidocaine had little or no effect on the crying. In Gunnar's words, "*Babies simply don't like being fussed with*."

A combination of remedies seems the best. While being circumcised, it is best if the baby is swaddled in a towel on a board – similar to being held – and given lidocaine and sucrose. Under these conditions, most babies sleep during the circumcision.

However, the *skill and experience* of those doing the circumcision is another significant factor. One study followed medical residents through their experiences in giving circumcisions. As the residents became more experienced, the babies' stress hormones were lower. Novices elicited severe stress reactions from newborns. Some reactions were as severe as babies in high-risk deliveries – when the babies' lives are in danger. In contrast, some experienced pediatricians work so smoothly, babies barely respond to procedures at all.

**Even with newborns,
having stressful experiences
can make them more sensitive in later situations.**

There is some evidence that early experiences may lead to hyperarousal later in life. Babies dislike being "*handled*." ("*Handling*" involves grasping the baby and repositioning it several times.) Some short-term indication of this was found by psychologists Fran Porter and Cynthia Wolf (Washington University). If premature babies were handled before having a routine heel stick, they had a more severe reaction. In other words, they showed more distressed behavior, and their heart rates rose more than those who were not handled. This increased response occurs, even if the babies have rested as much as 15 minutes after being handled.

Another study compared circumcised and uncircumcised male babies. Twenty-four hours later, those who had been circumcised responded more extremely when receiving heel sticks.

Porter is currently studying 200 newborns. She wants to know if the number of stressful procedures the babies endure in their first few weeks will affect their temperaments six months later. Given enough time, we may find whether the effects last until adulthood.

Regardless of what results these studies produce, we need to minimize the stress that infants experience. Western pediatricians have not traditionally concerned themselves with pain in infants. However, in Barr's words, "*reduction of physical and behavioral stress is a very appropriate goal, and we should do that*."

* Adapted from Beth Azar's "Research seeks to soothe infant pain," [*The APA Monitor*](#), December, 1996, page 21.