

Parental touch reduces pain responses in babies' brains

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Being held by a parent with skin-to-skin contact reduces how strongly a newborn baby's brain responds to a painful medical jab, finds a new study led by researchers at UCL and York University, Canada.

The scientists report in the *European Journal of Pain* that there was more activity in the brains of newborn babies in reaction to the pain when a parent was holding them through clothing, than without clothing.

Joint senior author, Dr. Lorenzo Fabrizi (UCL Neuroscience, Physiology & Pharmacology) said: "We have found when a baby is held by their parent, with [skin-on-skin contact](#), the higher-level brain processing in response to pain is somewhat dampened. The baby's brain is also using a different pathway to process its response to pain.

"While we cannot confirm whether the baby actually feels less pain, our findings reinforce the important role of touch between [parents](#) and their newborn babies."

The study involved 27 infants, 0-96 days old and born premature or at term age, at University College London Hospitals. The researchers were measuring their response to a painful but clinically required heel lance (blood test). Brain activity was recorded with EEG (electroencephalography) electrodes placed on the scalp.

The babies were either held by their mother skin-to-skin (wearing a diaper, against their mother's chest), or held by their mother with clothing, or else lying in a cot or incubator (most of these babies were swaddled).

The researchers found that the initial brain response to the pain was the same, but as the heel lance elicited a series of four to five waves of [brain activity](#), the later waves of activity were impacted by whether the baby was held skin-to-skin or with clothing.

Joint senior author, Professor Rebecca Pillai Riddell (Department of Psychology, York University, Canada) said: "The slightly delayed response was dampened if there was skin contact with their mother, which suggests that parental touch impacts the brain's higher level processing. The pain might be the same, but how the baby's brain processes and reacts to that pain depends on their contact with a parent.

"Our findings support the notion that holding a [newborn baby](#) against your skin is important to their development."

The brains of the babies that remained in the cot or incubator also reacted less strongly to the pain than those held in clothing, but the researchers say that may be because the babies were not disrupted by being picked up before the procedure, or else due to the success of the sensitive, individualized care they were provided.

The babies' behavior was not significantly different

between the groups, although the skin-to-skin group did exhibit slightly reduced responses in terms of facial expression and heart rate. Other studies have found that skin-to-skin contact with a parent does affect baby behavior, and may reduce how strongly they react to [pain](#), but those studies did not investigate the brain response.

In the current study, the babies' [brain](#) responses were not only dampened in the skin-to-skin group, but also followed a different neural pathway.

First author, Dr. Laura Jones (UCL Neuroscience, Physiology & Pharmacology) said: "Newborn babies' brains have a high degree of plasticity, particularly those born preterm, and their development is highly dependent on interactions with their parents. Our findings may lend new insights into how babies learn to process threats, as they are particularly sensitive to maternal cues."

Co-author Dr. Judith Meek (University College London Hospitals) said: "Parents and clinicians have known for many years how important skin to skin care is for [babies](#) in NICU. Now we have been able to demonstrate that this has a solid neurophysiological basis, which is an exciting discovery."

More information: Laura Jones et al, The impact of parental contact upon cortical noxious?related activity in human neonates, *European Journal of Pain* (2020). [DOI: 10.1002/ejp.1656](https://doi.org/10.1002/ejp.1656)

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