The first few weeks of fatherhood don't just change lives—they rapidly rewire men's brains in ways few expected

May 20 2026, by Sayan Tribedi

Credit: Unsplash

While motherhood's impact on the brain is well-studied, what happens to new fathers' minds has remained largely a mystery. Now, a new study

reveals profound, unexpected changes in the paternal brain.

Almost all parenting neuroscience has focused on mothers. We know pregnancy and childcare dramatically reshape women's brains. Dads don't bear the baby, but their bodies change too: new fathers show shifts in hormones (lower testosterone, higher prolactin/cortisol) that seem to promote bonding.

Yet until now, evidence of brain changes in men was sparse and inconsistent. Small studies hinted at changes but painted mixed pictures. For example, one brain-imaging study scanned 16 new dads around two and three to four months postpartum and found increases in subcortical motivation circuits (hypothalamus, amygdala, striatum) even as some cortical areas shrank.

Another study (on fathers two to nine months post-birth) saw widespread cortical volume loss with little change deep in the brain. These conflicting results suggested timing matters.

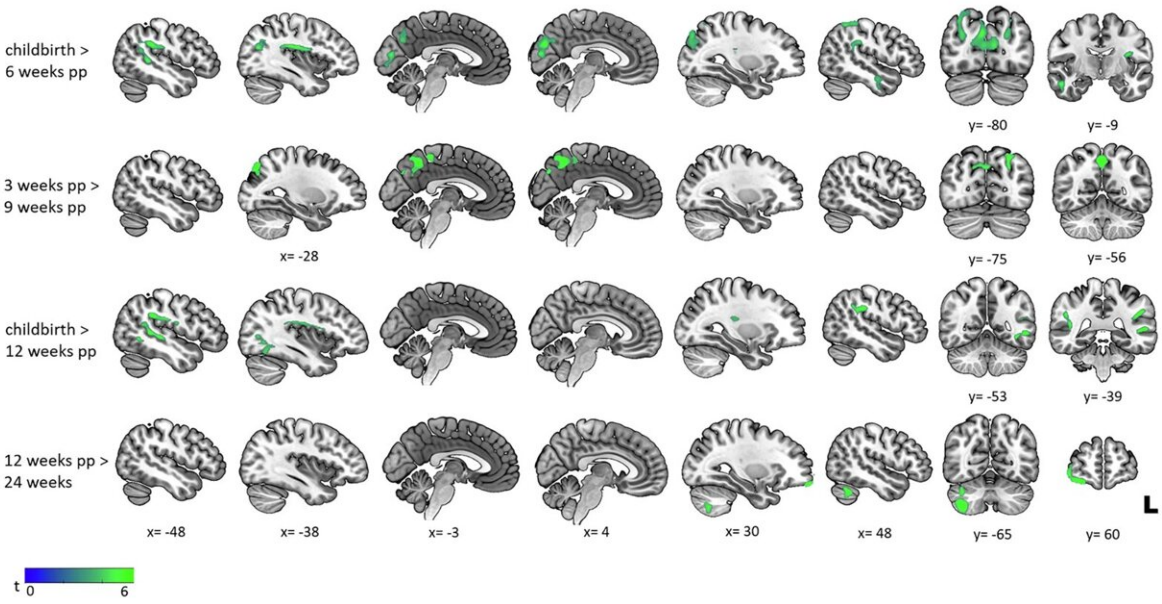
In order to identify such changes that occur in the brains of new fathers, Negin Daneshnia and colleagues conducted a carefully timed research project. Specifically, a sample of 26 new fathers (25 of whom completed the experiment) was examined by MRI on six occasions—one week after the birth of the child and a further three, six, nine, 12, and 24 weeks later. The attachment of the father to his baby was measured every time.

This study is published in Translational Psychiatry.

Shrinkage (and then a surge)

The MRI images tell the story. In the first six weeks after childbirth, the brains of the new fathers show rapid shrinkage in gray matter across

many regions (occipital, frontal, temporal, parietal lobes, insula, and hippocampus). By about week six, this drops off. Then, around 12 weeks, the pattern flips: by 24 weeks, some areas (notably parts of the frontal cortex and cerebellum) begin to grow again.

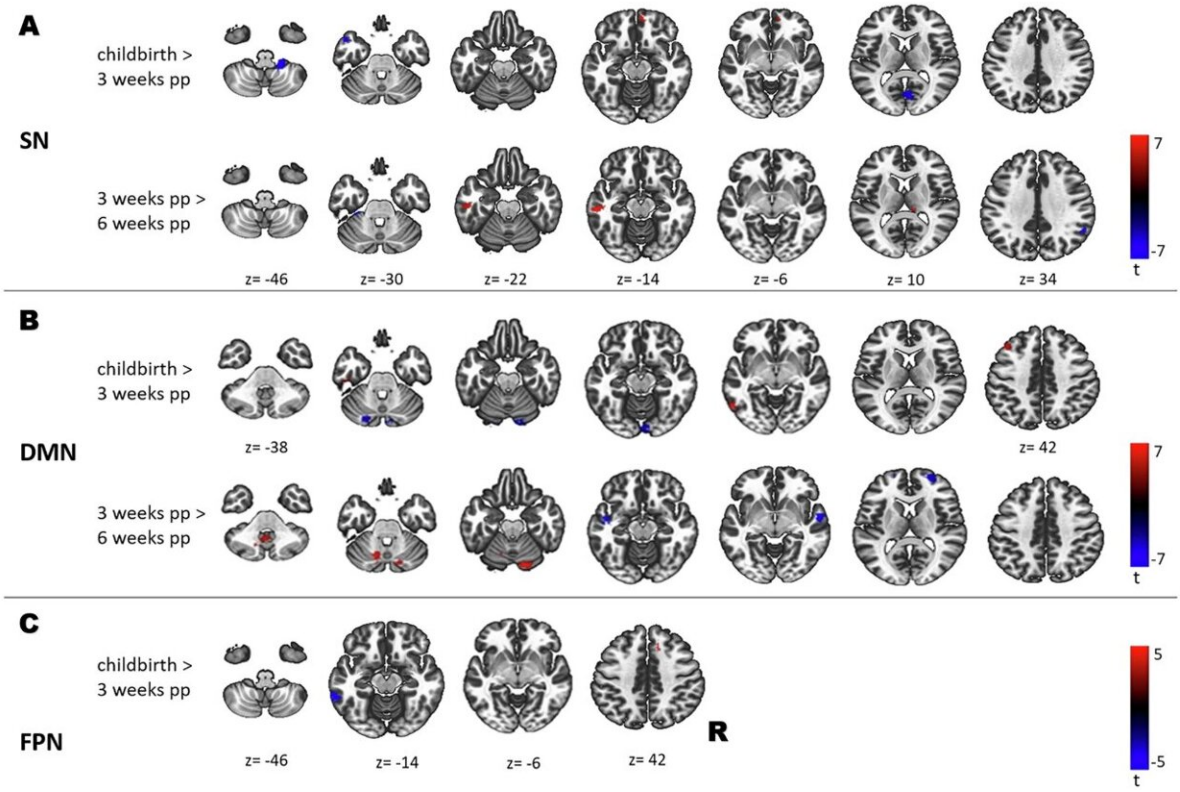


Longitudinal decreases in gray matter volume in fathers across the first 24 weeks postpartum. Credit: Negin Daneshnia et al, The paternal brain: longitudinal insights into structural and functional plasticity and attachment over 24 weeks postpartum, *Translational Psychiatry* (2026). DOI: 10.1038/s41398-026-04082-7

In the authors' words, "Our findings reveal significant morphological and functional connectivity changes in the male brain following childbirth, with the first six to nine weeks postpartum emerging as a critical period for paternal neuroplasticity." Basically, those early weeks are when a dad's brain is most actively rewiring itself.

New connections build attachment

It isn't just brain volume that changes—the connections change too. Over the first nine weeks, fathers' brain networks shift away from raw sensory processing toward higher-order cognitive and emotional systems.



Longitudinal alterations in resting-state functional connectivity across large-scale networks in fathers during the early postpartum period. Credit: Negin Daneshnia et al, The paternal brain: longitudinal insights into structural and functional plasticity and attachment over 24 weeks postpartum, *Translational Psychiatry* (2026). DOI: 10.1038/s41398-026-04082-7

In particular, the amygdala (an emotion hub) becomes more strongly

linked to areas such as the anterior cingulate and hippocampus. Crucially, fathers who showed bigger jumps in amygdala connectivity also reported feeling more attached to their baby.

As the study notes, "the early postpartum period is a crucial window not only for paternal neural reorganization, but also for the development of paternal attachment itself." In short, the brain changes align with dads forming deeper bonds with their child.

What does this mean for new dads?

This study isn't without caveats. It lacked a non-father control group and any pre-birth scans, so we can't prove every change was caused by parenting. The sample (25 men, mostly first-timers) was small. Still, the clear timeline of change is compelling. Future work will compare dads to non-dads and even track hormones or genetics alongside brain scans.

For now, the real-world takeaways are exciting. We already know that involved fathers boost their children's social and emotional development; these findings hint at a neural basis.

The realization that the dad's brain undergoes physical changes could inform how new families are helped out. Programs in parenting that promote early bonding between dads and infants, such as the practice of having dads place their infants on their chests, may take advantage of this period of brain plasticity.

All in all, being a dad is not only an emotional process, but it is also a biological one.

More information: Negin Daneshnia et al, The paternal brain: longitudinal insights into structural and functional plasticity and attachment over 24 weeks postpartum, *Translational Psychiatry* (2026).

DOI: 10.1038/s41398-026-04082-7