

The science of fatherhood: How your body and brain change when you become a dad

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When women become mums, they go through a lot of obvious biological changes. But did you realise that men’s bodies change when they become dads too?

“The only thing I’ve noticed physically is putting a load of weight on, I’m getting a bit of a dad bod!” says Tom, dad to 6 month-old Otis.

But no, we don’t just mean putting on a few extra pounds. “Mum and dad are as biologically primed to parent as each other”, says Dr Anna Machin, author of *The Life of Dad: The Making of the Modern Father*. “That’s the big new understanding about parenthood – in the past we thought only women underwent bodily changes, mainly as a product of [pregnancy and childbirth](#), but actually men go through similar things too”.



Mums go through a lot of physical changes. Changes in dads aren't quite so obvious.

Ok, so men don’t carry babies for 9 months, give birth or produce milk. But they do go through some changes that aren’t obvious to the naked eye. “There are two major changes that happen, generally the first time you become a dad: hormonal changes and brain changes”, explains Dr Anna.

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Hormonal highs and lows

The main hormonal change is a drop in testosterone, the male sex hormone.

“Testosterone is great when you’re in the mating/dating game because it makes you more competitive, more motivated to look for a mate”, says Anna.

But when you become a dad, this drop is one way your body prepares you for your new role.

“Men with lower testosterone are much more sensitive towards their children and empathetic. It makes them motivated to care for their child. If you were to play baby cries to a group of men, those with really high testosterone would probably find it really irritating whereas men with low testosterone would become anxious”.



This rings true for Mark, who recently became a dad for the first time. “I’ve been around my baby nephew crying and I’d be like ‘can someone sort this out?’. The minute it’s your baby, you know when a cry is something you can sort out yourself”.

Drops in testosterone also make dad more patient too, which is helpful with a baby or toddler. “I’ve not felt frustrated in any way. I was in the car the other day and someone was taking ages to get out of a spot, but I was like, ‘whatever’. Things like that just aren’t a big deal any more”, says Mark.

Mark and baby Albert.

A drop in testosterone comes with a major pay-off for dads’ relationships with their children too. “High testosterone levels block the positive effects of oxytocin and dopamine”, says Anna – two of the major chemicals involved in bonding with your baby. They’re produced when you cuddle and interact and give you that warm, fuzzy feeling. “Because your testosterone is low when

you're a new dad, the impact of oxytocin and dopamine is much greater, so you will enjoy chatting and playing much more".

Tom has been experiencing this rush regularly, "when he's laughing, there's no better feeling, really".

It's not all good news though, Anna warns. "Testosterone is protective against low mood. So a drop, when coupled with high risk factors like work-life balance, a partner going through [postnatal depression \(PND\)](#) or issues with bonding can increase the likelihood of male postnatal depression".

Knowing more about your hormones and their effects could help you be more aware of your mental wellbeing, says Anna. "As a woman, you can think: 'I know this is probably my hormones speaking, I know there's a hormonal element to feeling this crap', which can sometimes help. For men, knowing how hormonal changes could also leave you vulnerable to something like PND, will hopefully nudge you to keep an eye on your own mental health".

Mutual benefits for dad and baby

Children also experience the same rush of dopamine and oxytocin as dads through cuddling and playing. So from early on, dads can start building bonds through [touch, hugs, skin-to-skin contact and massage](#). However, the biggest rushes of oxytocin come as baby grows and the relationship with dad becomes even more interactive.

"If a dad asks me 'what's the one thing I can do to bond with my child?', I'll say 'play with them'", Anna tells us. "What's fascinating is there's been this coevolution between dads and babies. They both get their biggest peak of oxytocin when they play together".



Now that he and Otis are able to play together regularly, Tom's mum has spotted something. "She reckons he's got a different laugh for me than he has for his mum. When I play with him, I move him around and I'm a bit more physical. And I do the same things every time, the things that I know will work to make him laugh".

Tom and 6-month-old Otis.

This sort of rough and tumble play is common with dads and something that Anna says is crucial to children's development. "Not only does it give your child a massive hit of oxytocin but it teaches them how to deal with risks and challenges, how to fail and pick themselves up, dust themselves off and carry on. And children who have engaged in this sort of play tend to be more physically and emotionally resilient and have better mental health as they get older".

Anna is keen to stress that dads' role as a playmate is therefore key. "In the past, being termed 'the fun parent' might have seemed like a put-down for dads, but play is actually really important for your child's development".

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Positive brain changes

As well as changes in hormone levels, when you become a dad, your brain physically changes too.

"We see changes in those areas which we need to be able to parent well", says Anna. "So, for example, in the outer brain we see increases in areas needed for skills such as planning, focussing without distraction and problem solving. In the unconscious brain, we see activity in areas related to nurturing and risk detection, which are needed to know your baby is safe".

The latter is something that Tom has definitely experienced first-hand. "You're just worrying all the time. Definitely more than before. If I'm walking down the road, I'll look behind me when cars are coming to see if they're randomly going to veer off the road towards me whenever I've got the baby!".

As well as being more risk-aware, dads often become more sensitive, particularly when it comes to children. "You become much more empathetic to others' pain", says Anna. "Many dads I speak to will say 'I can't watch news reports about children any more, I just become this heap of tears and blubber'". Tom's been feeling this too, particularly when watching the BBC's [Life and Birth series](#). "It brings me to tears. It wouldn't have affected me before, but now it really does".

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Knowledge is power

Anna is hopeful that by being clued up on their biology, men will gain confidence in their instincts as a dad.

“What I tend to hear a lot from men before they become parents is that mum is the gold standard of parenting. She instinctively knows what to do because she’s gone through pregnancy, childbirth and breastfeeding, whereas men have to learn. That’s not true. Women and men are just as instinctive as parents as each other, because they’re both biologically primed to do it”.



"Your instincts are there, you just need to be confident that they're there."

She has some words of advice for dads: “Your instincts are there, you just have to be confident that they’re there. Try to see yourself as the equal co-parent rather than the assistant parent who is there to learn on the job”.

- For plenty of play ideas, visit our [Activities section](#)
- If you're concerned about low mood, sadness or depression, check out the [NHS guide here](#).