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What Are the Primitive Reflexes and How Are They Useful?



Medically reviewed by [Karen Gill, M.D.](#) — Written by [Rhona Lewis](#) on May 19, 2020

[Palmar grasp](#) [Plantar grasp](#) [Sucking](#) [Rooting](#) [Galant](#) [Moro](#)

[Stepping](#) [ATNR](#) [TLR](#) [STNR](#) [Reflex integration](#) [Reflex retention](#)

[f](#) [Appearance](#) [Takeaway](#)



As soon as your baby's born, you'll notice their primitive reflexes — although you might not know them by name.

Case in point: Nothing in the world produces the same amount of wonder that you feel when your newborn baby wraps their teeny fingers determinedly around your pinky. So what if it's only a primitive reflex? Your heart is aflutter.

These reflexes — also called newborn reflexes — help babies survive and thrive. The grasping reflex described above is one of the motions that babies produce involuntarily: Your baby's central nervous system (CNS) — their brain and spinal cord — automatically orders your baby's

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muscles to react.

By the time your baby reaches 4 to 6 months of age, their brain should have matured and replaced these involuntary movements with voluntary ones. Here’s a list of primitive reflexes that you can look out for in the meantime.

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Palmar grasp

The grasping reflex that we already spoke about is one of the first reflexes that you’ll notice. See how your baby’s fingers close around your pinky? The palmar grasp reflex (that’s what your doc calls it) disappears at around 5 to 6 months of age. The grasp is so strong that they will hang onto something even as you pull it gently away!

Lay your baby on a safe, flat surface (like their crib mattress), offer both your pinkies for your baby to grasp, and slowly lift them up a couple of inches. Because this reflex is involuntary, your baby won’t let go at will. (But watch out, because when they get tired, they’ll suddenly let go and fall back!)

Plantar reflex

The plantar reflex is actually present in most people. But in babies, it’s known as the extensor plantar reflex. What happens when you stroke the bottom of your newborn’s foot? Keep your stroke firm as you run your finger up the outer part of their sole. You’ll notice your baby’s big toe flex up and out. The other toes follow suit. This is called the [Babinski sign](#).

You’ll notice this reflex in this form from the time your baby is born until they reach about 1 to 2 years. After that, thanks to your baby’s developing central nervous system, this reflex evolves into what’s called the normal plantar reflex, or the toe curling down.

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Sucking

Here’s another reflex that you’ll notice right after birth. Put a nipple or your clean finger into your baby’s mouth, and they’ll start to suck rhythmically. It’s no surprise — your baby started

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practicing in the womb as a 14-week-old embryo.

Getting the [sucking reflex](#) right is important not only because your baby needs to eat to survive, but also because it helps your baby to coordinate breathing and swallowing. By the time your baby reaches 2 months old, they'll have learned to control this sucking reflex, and it will become more voluntary.

Rooting

Your baby needs to be able to find their food source. Since about 32 weeks gestation, they've been practicing doing just that. As a newborn, your baby will turn their head toward anything that touches their cheek — a nipple or a finger.

[This reflex](#) comes in especially handy for breastfed babies. Watch how they turn their head in search of your nipple when their cheek touches you breast.

As your baby becomes more aware (at about 3 weeks), they'll stop rooting and will be able to move towards your breast without the failed attempts at honing in. By 4 months old, the only thing that will remain of this reflex is a cute memory.

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Galant

This is another reflex you may notice at birth, but it's also hard to elicit unless you watch your pediatrician do it. Until your baby reaches 4 to 6 months, when, say, a doctor holds your baby face down over the doctor's hand and strokes the skin along the side of baby's back, your baby will shift toward the side that was stroked.

This reflex helps to develop range of motion in your baby's hip so that they'll be ready to crawl and then walk. Thank Russian neurologist Galant for pointing it out.

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Moro (startle)

It's easy to see how the [Moro reflex](#) (take a bow, Ernst Moro) helps your baby survive. Although you'll only notice this reflex at birth, your baby has been hard at work perfecting the moves since 28 weeks gestation.

The reflex — also known as the startle reflex — reaches a peak when your baby reaches 1 month and begins to disappear when they turn 2 months old.

Several things may set off this reflex:

- a sudden change in the position of your baby's head
- an abrupt temperature change
- a startling noise

Watch how your baby's legs and head stretch out and how their arms jerk up and out. Then your baby brings their arms together, clenches their hands into fists, and may yell in protest. If it seems your baby got a fright — give them a hug.

By the time your baby reaches 3 to 4 months of age this reflex will have disappeared. Late bloomers will hold on to the reflex till about 6 months of age.

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Stepping

Yes, as long as you support your newborn, they can actually walk! You'll have to help your baby by holding them up under the arms. Remember to support the head too. And then, watch what happens when the soles of their feet touch a flat surface. They'll put one foot in front of the other in an attempt to walk.

This reflex disappears at around 2 to 5 months old. But it doesn't mean that it's forgotten. Your baby draws on the residual memory of this reflex when they learn to walk at about a year old.

Asymmetrical tonic neck reflex (ATNR)

ATNR is present at birth. In fact, your baby has been doing this since 35 weeks gestation.

Turn your baby's head sideways and watch how the arm and leg on that side straighten while the opposite arm and leg bend. This reflex helps your baby turn their head when they're lying on their stomach. It's also the start of hand-eye coordination, so thank ATNR when your baby starts reaching for their rattle.

By 3 months old, this reflex will have disappeared.

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Tonic labyrinthine reflex (TLR)

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TLR is also present at birth. There are two parts to this reflex — forward and backward.

To see this reflex at work, lay your baby on their back and tilt their head forward above the level of the spine. See their arms and legs curl in? For the backward TLR, lay your baby on their back, supporting their head over the edge of a bed. Tilt their head backward below the level of their spine. Watch their arms and legs flail out.

This is your baby's response to gravity. Thanks to this reflex, your baby learns how to straighten out from the fetal position. The reflex disappears at around 2 to 4 months old.

Symmetric tonic neck reflex (STNR)

You're used to these initials, right? The STNR, symmetric tonic neck reflex, normally peaks

when your infant is 6 to 9 months old — around the same time that the ATNR disappears.

When your infant's head moves forward, their arms bend and their legs straighten. The opposite happens when their head flexes backward: The arms straighten and the legs bend back.

What's all this contortion leading to? Your baby is now learning to use the upper and lower parts of their body independently. These movements help them push up onto their hands and knees.

Now comes the surprise: For your infant to progress to true crawling, they'll have to let go of this reflex. By the time they reach their first to second birthday, the STNR should have fully disappeared.

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What is reflex integration?

When your pediatrician speaks about reflex integration, they're talking about the disappearance of these reflexes as they are folded into more voluntary movements. Yup, in medical jargon, "integration" equals "disappearance."

A reflex that outstays its welcome is labeled "unintegrated" or "persistent." An unintegrated reflex may signal that your baby's central nervous system has been damaged. It may also show that this system hasn't taken over sufficiently for the reflex to become a voluntary motor movement.

What happens when primitive reflexes are retained?

Ideally, as a child's CNS matures, the involuntary movements become controlled motor responses. If this doesn't happen, the child will struggle with both motor and cognitive skills.

A [2016 study](#) suggested that preschool children who retained the TLR and ATNR reflexes had difficulty with motor skills such as running, cycling, throwing, or catching a ball. For these children, even rolling, bringing their hands together, or bringing their hands to their mouth can be awkward. In the long run, an unintegrated ATNR may also lead to spinal deformities.

And there's more. An unintegrated ATNR reflex may also lead to poor eye tracking. (Now you know why reaching for a rattle is a cause for celebration.)

The same study of 35 children concluded that children with an unintegrated STNR reflex showed poor posture, poor eye-hand coordination, and focusing difficulties. They also had difficulty sitting still at a desk, learning to swim, and playing ball games. Ditto for children who retained the plantar, palmer, and Galant reflexes.

Researchers suggested that when primitive reflexes aren't integrated, children may face not only motor challenges, but also cognitive challenges related to [attention deficit hyperactivity disorder \(ADHD\)](#).

What happens when primitive reflexes

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Yes

No

reappear?

It's a long way till you get there, but keep in mind that primitive reflexes can reappear in older adults. Usually, this is a sign of neurological disease.

In an older [2005 study](#), people with [dementia](#) showed an abnormality in the plantar reflex. It was no longer integrated and the adults showed the reflex in the same way that babies do.

A [2013 study](#) found that nursing home residents with a sucking reflex that had reappeared had a greater risk of malnutrition and pneumonia.

The takeaway

Now you're ready to have fun tracking your child's progress. Enjoy the milestones!

If you feel that your older infant has retained one or more of their primitive reflexes, discuss your concerns with your pediatrician. As these reflexes are integrated and disappear, your child's development will progress, and they'll be on their way to active toddlerhood.

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