



# Primitive Reflexes

Primitive reflexes are involuntary motor responses that can be elicited after birth. Although these reflexes are important for survival, they gradually disappear within the 1st year of life due to their inhibition by the developing frontal lobe. Lesions in this area of the CNS may cause the restoration of primitive reflexes as a result of loss of inhibition.

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# Moro Reflex

- Also known as the “startle reaction”
- Stimulus: sudden drop of an infant’s head (sudden movement) or loud noise
- Reaction: Infant extends arms and then pulls them in as if grasping; usually accompanied by crying.
- Disappears normally by the age of 3 months but can last until 6 months of age
- Absence could mean injury during birthing trauma (clavicle fracture or injury in the brachial plexus) or damage in the central nervous system.



Moro reflex:

Sudden drop of an infant’s head causing the infant to extend their arms and then flex them as if grasping

*Image by Lecturio.*

## Rooting Reflex

- Stimulus: stroking infant's cheek or mouth
- Reaction: Infant orients toward the side of the face touched, turning neck and eyes in that direction.
- Assists with breastfeeding
- Disappears by 4 months of age



## Rooting reflex

Rooting reflex:

When the infant's cheek or mouth is stroked, they turn toward the side of the face that has been touched.

*Image by Lecturio.*

## Suck-Swallow Reflex

- Stimulus: touching roof of the mouth
- Reaction: suckling
- Associated with the rooting reflex in assisting with breastfeeding
- Disappears by 4 months of age



## Suck-swallow reflex

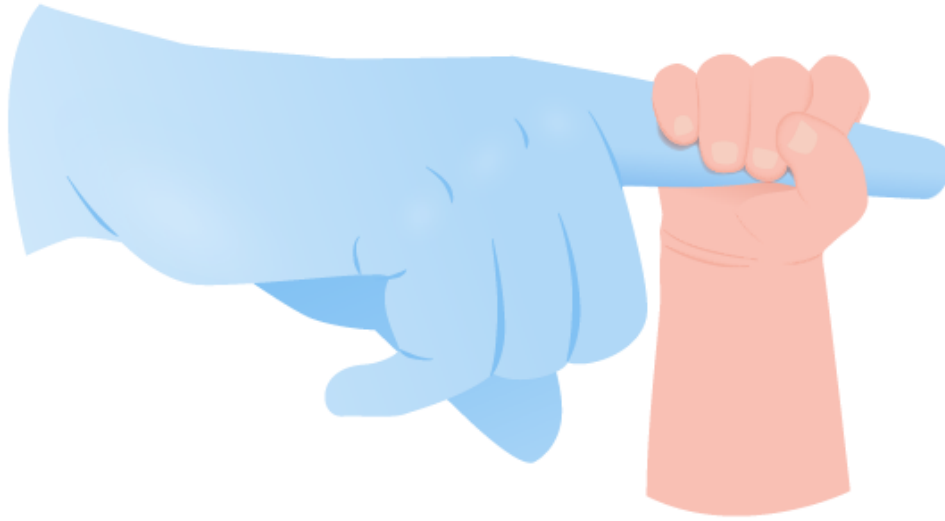
Suck-swallow reflex:

Contact with the infant's soft palate stimulates suckling.

*Image by Lecturio.*

## Palmar Grasp Reflex

- Stimulus: Slide the finger across the palm from lateral border.
- Reaction: Infant closes their hand around the finger.
- Disappears by 6 months of age
- Replaced by voluntary grasp at 45 weeks of age



## Palmar grasp reflex

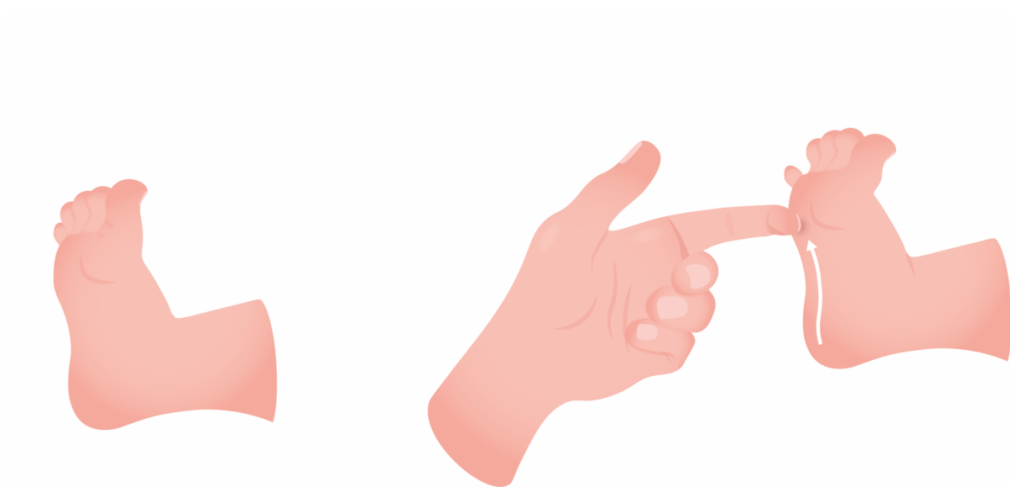
Palmar grasp reflex:

Sliding fingers across the infant's palm elicits flexion of their fingers and grasping of the examiner's finger.

*Image by Lecturio.*

## Plantar Reflex (Babinski Sign)

- Stimulus: plantar stimulation by firmly stroking the lateral aspect of the sole of the foot
- Reaction: dorsiflexion of the large toe and fanning of the other toes
- Disappears by 12 months of age
- Also seen in patients with upper motor neuron lesion



Babinski sign:

Plantar stimulation by firmly stroking the lateral aspect of the sole of the foot causes dorsiflexion of large toe and fanning of the other toes.

*Image by Lecturio.*

## Stepping Reflex

- Stimulus: holding the infant so that only the soles of the feet touch the ground flat
- Reaction: Infant places 1 foot in front of the other in a “walking pattern.”
- Disappears by 2 months of age

## Tonic Neck Reflex

- Stimulus: Infant turns neck to 1 side.
- Reaction: Arm on the side to which the infant turns straightens, contralateral arm bends in “fencing” posture
- Disappears by 5–7 months of age
- Reflex should be equal on both sides; asymmetric reflex may be a sign of pathology.



Asymmetrical tonic neck reflex in a 2-month-old baby:

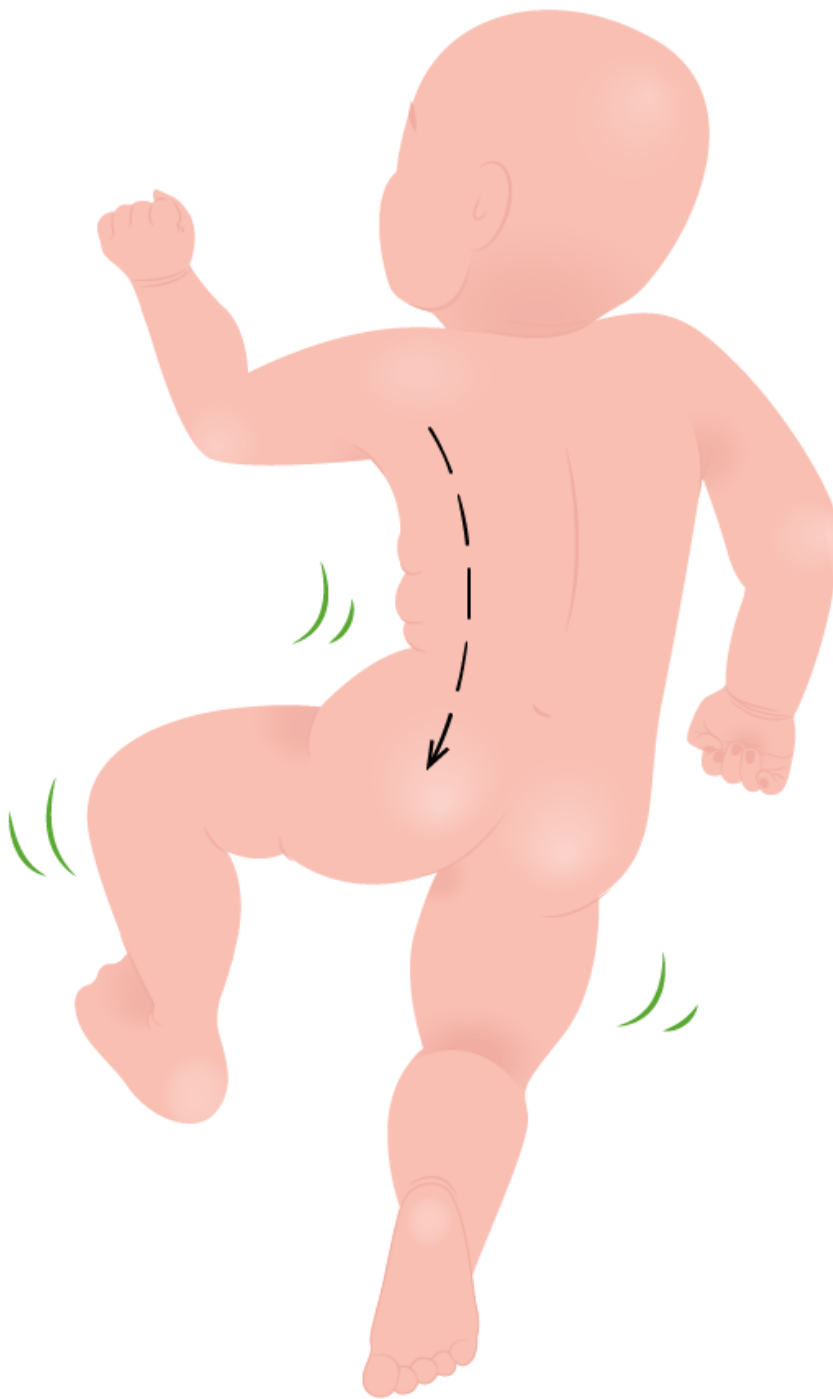
Extension of the arm and leg on the face side with flexion of the arm and leg on the skull side

*Image: "Asymmetrical tonic neck reflex (ATNR) at Two Months" by Mjllissner. License: [Public Domain](#)*

## Galant Reflex

- Stimulus: stroking along 1 side of the spine while the infant is held facing down
- Reaction: lateral flexion of the lower limbs toward the side of stimulation
- Disappears by 6 months of age





## Galant reflex

### Galant reflex

Stroking along one side of the spine while the infant is held facing down causes lateral flexion of the lower limbs towards the side of stimulation.

*Image by Lecturio.*

# Summary

Table: Summary of primitive reflexes

| Reflex       | Stimulus                                                    | Reaction                                             | Disappears |
|--------------|-------------------------------------------------------------|------------------------------------------------------|------------|
| Moro         | Pull up → drop                                              | Spreads arms → pulls them back                       | 3–6 months |
| Rooting      | Stroke cheek/mouth.                                         | Orients mouth toward the stimulus                    | 4 months   |
| Palmar grasp | Slide finger across the palm.                               | Infant closes <u>hand</u> around finger.             | 6 months   |
| Babinski     | Firmly stroke the sole of the <u>foot</u> .                 | Dorsiflexion of large toe; fanning of the other toes | 12 months  |
| Stepping     | Placing infant's soles flat on surface while holding infant | Walking motion                                       | 2 months   |
|              |                                                             |                                                      |            |

|                   |                                                                  |                                                      |            |
|-------------------|------------------------------------------------------------------|------------------------------------------------------|------------|
| <b>Tonic neck</b> | Turning <u>neck</u> to side                                      | Fencing posture                                      | 5–7 months |
| <b>Galant</b>     | Stroke along 1 side of the <u>spine</u> while infant faces down. | Lateral movement of the limbs toward stimulated side | 6 months   |

## Clinical Relevance

**Upper motor neuron lesions** can cause disinhibition and deficits in judgement, orientation, and concentration. This type of lesion is also characterized by the restoration of primitive reflexes. The various reflexes manifesting in an adult can be helpful in identifying the location of the lesion in the CNS.

## References

1. Modrell AK, Tadi P. Primitive Reflexes. (2021). StatPearls. Treasure Island (FL): StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK554606/>
2. HealthyChildren.Org. (2021). Newborn Reflexes. <https://www.healthychildren.org/English/ages-stages/baby/Pages/Newborn-Reflexes.aspx>