

# Paediatric gait abnormalities

## Normal Gait Development in Children

It's a Euphoric moment as a parent when our child starts walking. Their initial clumsy walk, never fails to bring a smile. But when the child does not start walking when compared to his peers or the manner of walking is different, it causes significant anxiety as a parent. Most occasions, this difference is normal for the individual child. A paediatric Orthopedician like Dr Shravan, will be able to discern the same, with a simple examination and analysis.

Gait, or the manner of walking, undergoes significant changes as children grow and develop. A normal gait cycle consists of a series of rhythmic, alternating movements of the limbs and body that result in forward motion. Key phases of normal gait development include:

1. \*Toddlers (1-3 years)\*:
  - Wide base of support
  - Rapid cadence
  - Short stride length
  - Flat-footed steps
  - Limited arm swing
  - Slightly out-toed foot progression angle
2. \*Preschoolers (3-6 years)\*:
  - Narrowing base of support
  - Increasing stride length
  - Heel-to-toe pattern begins to develop
  - Improved balance and coordination
3. \*School-Aged Children (6 years and older)\*:
  - Gait becomes more adult-like
  - Heel-to-toe walking is well established
  - Arm swing and trunk rotation become more coordinated

# Common Gait Abnormalities in Children

## 1. \*Toe Walking\*:

- Persistent walking on the toes or balls of the feet beyond the toddler years.
- Often idiopathic but can be associated with neurological conditions such as cerebral palsy or muscular dystrophy.

## 2. \*In-Toeing (Pigeon Toes)\*:

- Feet turn inward while walking.
- Common causes include femoral anteversion, tibial torsion, and metatarsus adductus.

## 3. \*Out-Toeing\*:

- Feet point outward while walking.
- Less common than in-toeing, can be due to external tibial torsion or femoral retroversion.

## 4. \*Limping\*:

- An asymmetrical gait pattern indicating pain, weakness, or structural abnormalities.
- Causes include infections, trauma, juvenile idiopathic arthritis, or developmental dysplasia of the hip.

## 5. \*Antalgic Gait\*:

- A limp that develops to avoid pain in one leg.
- Shortened stance phase on the affected side.

## 6. \*Trendelenburg Gait\*:

- Dropping of the pelvis on the contralateral side during the stance phase.
- Indicates weakness in the hip abductor muscles, often due to developmental hip dysplasia or neurological disorders.

## 7. \*Spastic Gait\*:

- Stiff, awkward movements, often with scissoring of the legs.
- Typically seen in children with cerebral palsy.

## My Child is toe-walking!!

- Most children, usually begin walking between, 12 to 15 months of age
- In the initial stages of walking, they try different foot positions and walking on their toes may be part of this
- By around 24 months, they should walk with their feet flat on the ground
- By 3 to 5 years of age, children should have a near-normal walk



### TOE WALKING By the Numbers

Idiopathic toe walking has been estimated to occur in 7 PERCENT TO 24 PERCENT of the childhood population.

Most children begin walking at 12 TO 15 MONTHS of age.

By 3 YEARS OF AGE, children should walk with a heel/fore pattern.

Your calf is formed by TWO MAJOR MUSCLES - the gastrocnemius muscle and the soleus muscle.

More than HALF OF YOUNG CHILDREN who toe walk stopped doing so on their own by about AGE 6.



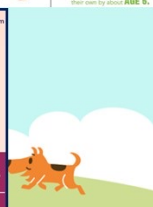
### When to be concerned?

- Walks on toes most of the time
- Has stiff muscles
- Is uncoordinated
- Walks awkwardly and stumbles all the time
- Was born prematurely
- Avoids eye contact or exhibits repetitive behaviour such as rocking or spinning

Contact your Paediatric Orthopaedic Surgeon if in doubt!!



**Dr. SHRAVAN Y.C**  
M.B.B.S., M.S. (ORTHO)  
Fellowship In Paediatric Orthopaedics, BJWHC ( Mumbai)  
Consultant Paediatric, Adolescent & Reconstructive Orthopaedician  
Clinic Address : 59/1, 6th Main Road,  
Between 17<sup>th</sup> & 18<sup>th</sup> Cross, Malleswaram, Bangalore - 560 055.  
Phone : 080 - 2334 1512 | Mobile: 98863 70134



## When to Consult a Pediatric Orthopedic Surgeon

Consultation with a pediatric orthopedic surgeon is advisable when:

1. **\*Persistent or Severe Gait Abnormalities\*:**
  - Abnormal gait patterns that do not resolve by age 3-4 or that worsen over time.
2. **\*Associated Symptoms\*:**
  - Pain, swelling, or tenderness.
  - Noticeable asymmetry or deformity.
  - Frequent falls or difficulty walking.
3. **\*Underlying Conditions\*:**
  - Suspected neuromuscular disorders (e.g., cerebral palsy, muscular dystrophy).
  - Developmental abnormalities (e.g., hip dysplasia, clubfoot).
4. **\*Impact on Daily Activities\*:**
  - Gait abnormalities that significantly interfere with the child's ability to engage in normal activities.
5. **\*Referral from Primary Care Provider\*:**
  - If a primary care provider or pediatrician identifies concerns during routine examinations.

Early evaluation and intervention by a pediatric orthopedic specialist like Dr Shravan, can help address and manage gait abnormalities, potentially preventing long-term complications and improving the child's overall mobility and quality of life



- *A baby's first steps are far from being picture perfect!*
- *Its quite common for children to walk with their foot and toes turned at an angle!*



A tendency to walk with the feet turned inward is called "In-Toeing" gait or 

## IS YOUR LITTLE ONE PIGEON TOED??

<b>What could be the cause?</b> <ul style="list-style-type: none"><li>• <i>Though it can be upsetting, most children tend to get better as they grow older</i></li><li>• <i>Causes could range from rotational and positional discrepancies in the femur(thigh), the tibia(leg) or the foot</i></li><li>• <i>Contact your Paediatric Orthopaedician for a thorough rotational profile analysis</i></li></ul>	<b>What can I do?</b> <ul style="list-style-type: none"><li>• <i>Avoid 'w' sitting</i></li><li>• <i>NO evidence of benefit from splits/shoes/inserts</i></li><li>• <i>Contact a Paediatric Orthopaedic Surgeon</i></li></ul>
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**Ph: 9886370134**



**Dr. SHRAVAN Y.C**  
M.B.B.S., M.S. (ORTHO)  
Fellowship in Paediatric Orthopaedics, B.M.H.C. (Mumbai)  
Consultant Paediatric, Adolescent & Reconstructive Orthopaedician  
Asst. Professor, Ramiah Medical College & Hospitals

