



## Pyramid Insoles According to Pomarino

Pyramid Insoles D. Pomarino

Since 2000 the author has been working in the Centre for Infantile Development, which is directed by Dr. med. I. Flehmig; for several years he has been teaching in courses for sensory integration as well as in schools for physio therapy. Moreover, he is currently practicing, applying therapies particularly to toe-walking children. During his intensive work with the young patients, however, he has become unsatisfied with the common therapeutic options. To improve permanently posture and gait of the children, he started developing his idea of pyramid insoles, which became eventually named after him.

### Introduction

It was the 'idiopathic,' or 'habitual' toe walking the author has been dealing with thoroughly, because conventional therapies did not prove to be sufficiently successful. Encouraged by his professional experiences, he put the commonly accepted opinion into question, according to which toe walking were of lesser significance to the future development of your body. As if to prove this point, before they had been administered a toe walking therapy, three of his young patients had suffered a herniated vertebral disk.



*Fig. 1, Idiopathic toe walking.*

### Conventional Therapy of Toe Walking

To make toe walkers exert pressure more naturally and onto the entire foot,

conventional medicine applied was used to revert to five consecutive therapies:



*Fig. 2, Toe walkers wear conventional insoles away only in the tiptoe area.*

1. Shoe Insoles
2. Conventional Physiotherapy Combined with Stretching
3. Botox Therapy
4. Serial Casting
5. Operation

#### 1. Shoe Insoles

The shoe insoles that have been applied so far are, according to the author, hardly of any use. Since toe walkers exert pressure to the forefoot only and because the supporting elements of conventional insoles are usually put slightly behind this region, the patient's foot would never touch the insole, simply because pressure is exerted somewhere else. This is indicated by the marks left by the wearing off patterns of these insoles (see Fig. 2).



**Fig. 3,** Insoles from the area around the hindfoot show no signs of wear.

## 2. Conventional Physiotherapy Combined with Stretching

Conventional ways of treatment not only included the administration of insoles, but also specific stretching methods were added, bringing about a temporary recovery in many cases (Fig. 4). Long term improvements could however be obtained by only a very small number of patients.

## 3. Botox Therapy

Injected subcutaneous, botulinum toxin leads to a therapeutically desired atony of muscles in the problematic areas, forcing the young patient to get down to their hindfoot. In Germany, Botox is approved for special indications, such as spastic therapy, since 1993.

## 4. Serial Casting

Though serial casting is a static therapeutic method, toe walking is essentially a dynamic gait deviation. Therefore, this approach will not succeed, and a temporary immobilization of the foot will not necessarily translate into a sustained therapeutic success.

## 5. Operation

Severe cases require an achillotenotomy; but this surgical proceeding should only be the patient's last resort.



**Fig. 4,** Stretching may provide toe walkers temporary relief.

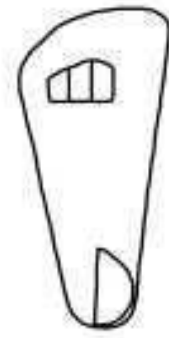
## Description of Pyramid Insoles

Every insole is fabricated in a way to fit perfectly the patient's foot. At the side facing the foot, involves consist of dermatologically tested and durable materials and are therefore well accepted by children. Supporting elements are worked into the forefoot and around the heel bone, the latter of which is meant to sustain the position of the hindfoot. Toe walkers put their weight onto the forefoot (Fig. 5). The elements supporting the forefoot have different heights and are placed with regard to the exact positions of the bones and joints. Their build resembles a pyramid, thus the name given to them. These insoles consist of flexible material that keeps its shape even after a long and enduring exertion of pressure.

## The Workings of Pyramid Insoles

The functioning of pyramid insoles differs from those of conventional insoles as the primary focus is laid upon the forefoot, the area most extremely exposed during toe walking.

The insoles, as developed by the author, work passively because the different heights of the supporting insoles re-correct the feet toward their normal position. But they also work in an active way as they change the build of the foot by pressing muscles and ligaments into their 'normal' position. Additional insoles around the heel bone are meant to support the hindfoot and therefore affect the planetary torsion there.



**Fig. 5,** Schematic depiction of a pyramid insole.

The handling of pyramid insoles is made very simple through easily fixable insoles that are just need to be laid upon therapeutically determined points of support.

## Physiotherapy and Pyramid Insoles

### 1. Anamnesis and Surveys

Pyramid Insoles, as developed by the author, have already been applied on many occasions. To verify this therapy, atients wearing these insoles have been monitored and the results documented by Mr. Pomarino over an extended period of time. 60 toe walking patients between the age of 16 months and eleven years took part in this study. Relevant for the study was an anamnestic questionnaire for the parents and the respective physiotherapeutic diagnosis.

The anamnestic questionnaire was intended to provide background information regarding the case history. Parents were asked to answer following questions:

- Are there any other illnesses besides toe walking?
- Has your child been diagnosed with a hip dysphasia?
- Has any member of your family walked on his or her toes over a long time?



**Fig. 6, A pair of pyramid insoles.**

## 2. Physiotherapeutic Diagnosis

A physiotherapeutic checkup of the patient included a number of different aspects, which are somehow related to toe walking:

- diagnostic findings for the lower extremities
- diagnostic findings for the spinal column
- diagnosis of chronic blockades

## Physiotherapeutic Therapy

The most crucial element of aphysiotherapy which is applied in combination with pyramid insoles is sensory integration. It helps stimulate the perceptive faculty of the children, comprises tonusregulating measures, provides deep information, and enhances the children's sense of balance. Integral part of any therapy that

is intended to cure toe walking is the so-called 'loosening-technique.' This technique is a rather gentle way of loosening blockades as a prerequisite for preparing children to wear insoles. Blocked joints have a fundamentally egative effect on the whole static and dynamic of the body and should therefore be loosened.

The loosening technique can be applied not only in the context of insoles; rather it may be regarded as a unique therapeutic technique that could be used separately.

During the survey time, all 60 patients wore pyramid insoles and they were parted into two groups. Group A comprised 30 patients with no additional physiotherapeutic support. Patients in group B were treated by way of physiotherapy, loosening-technique, and sensory integration.

## Results

After six months of permanent and consistent therapy, group A showed the following results:

- posture and gait significantly improved in 50% of patients
- posture and gait slightly improved in 17% of patients
- withdrawal from survey due to lack of time or disinterest in 6% of patients
- no improvements at all in 27% of patients

Group B showed following results:- posture and gait significantly improved in 73% of patients

- posture and gait slightly improved in 17% of patients

- withdrawal from survey due to lack of time or disinterest in 3% of patients
- no improvements at all in 6% of patients

## Conclusion

Any treatment of toe walking should start early to avoid future damages to static and dynamic of the body.

The application of pyramid insoles and the administration of physiotherapy are gentle methods with a high probability to succeed. By that, most children can be spared a surgical operation with all its stress and risks.

The same can be said about serial casting, with its unpopularity and its limited scope of achievement. A combined application of insoles and physiotherapy provides toe walking children with greater chances of therapeutic success than the wearing of insoles alone.

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