

Physiotherapy management of paediatric flat feet

Presented by Julie Allen and Sharon Solan



Who we are

- Paediatric Orthopaedic Specialists Physiotherapists
- Where we work – ward, outpatients and triage clinics

Introduction

Referral pathways

Physiotherapy assessment and management

Pathways and proforma used locally and nationally

Our Referrals

- Through choose and book
- Triage clinic
- Direct to physiotherapy department from GPs/consultants.

Paediatric Flat feet

Universal finding –flexible flat feet is the flattening of the medial longitudinal arch on weight bearing (Harris et al 2004)

Distinguished from rigid flat foot using the great toe extension test or standing on tip toes if able /co-operative

Opinions

- Flexible flat foot is physiological and will self correct (Echarri and Forriol, 2003; Forriol and Pascual, 1990; Staheli1987, Volpon,1994)
- Flexible flat foot may cause gait disorders in the future and is a precursor of foot dysfunction (Cohen- Sobel et al 1995 and D'Amico 1984)

Associated Factors

- Age is a predictive factor in determining the prevalence of flexible flat feet
- Increased joint laxity, reduced walking speed and poor locomotion skills are associated with flexible flat feet
- Therefore flexible flat feet may be considered to be part of musculoskeletal maturity

Assessment

- History – age, symptoms, trauma, family history, activity level.
- Objective examination – L.L. alignment, tenderness, ROM.
- Toe raise test.
- Suspected flexible flat foot –consider risk factors.

Management

- Painfree flexible flat feet –advice and reassurance given
- Orthoses improve the structural alignment of the foot – determined by X ray (Bordelon 1980, Kuhn et al 1999)

Management Contd

- Randomised control trial found that orthoses did not alter the natural progression of flexible flat feet (Wenger et al 1989 and Gould 1989)
- Orthoses may be useful in alleviating symptoms of pain associated with FFF (Mortazavi et al 2007)

Exercises and activities for flexible flatfoot

Aim	Exercises and activities
Flexibility	Passive ROM exercise of ankle and all foot joints Global movement (to approximate anterior and posterior foot columns) Stretching of gastrocnemius soleus complex and peroneus brevis muscles (to induce varus and adduction of the foot).
Strengthening	Anterior and posterior tibialis muscles and the flexor hallucis longus (to neutralize valgus) Intrinsic, interosseus plantaris muscles and the abductor hallucis (to prevent anterior arch flattening) Global activation/movement of the muscles involved in maintaining the medial longitudinal arch and the varus with and without load Single leg weight bearing Toe walking
Proprioception and balance	Toe and heel walking Single leg weight bearing (to make the foot cavus after dynamic pronation of the forefoot) Descending an inclined surface

Pathways...

- Gateshead
- South Tyneside
- Cornwall
- Warwickshire

Paediatrics – Pathway for the flexible flat foot

Physiotherapy subjective and objective assessment

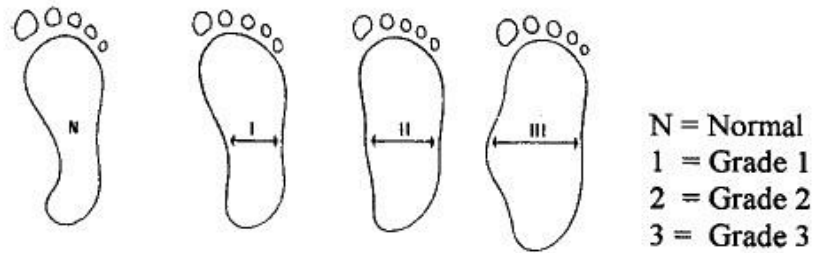


Fig 1. Classification of plantar footprint according to Denis described in "Methods."

Normal foot position

*No intervention required

Grade 1

- * Intrinsic foot muscle exercises
- * Advice regarding supportive footwear

Grade 2

- * Intrinsic & extrinsic foot exercises
- * ? Referral to orthotics for insoles

Grade 3

- * Intrinsic and extrinsic foot exercises
- * Referral to orthotics for insoles
- * Referral to orthotics for ? boots

Orthopaedic corrective footwear confines the foot in a rigid mould that limits the normal function of the extrinsic and intrinsic muscles of the foot. Furthermore insoles remove the alternating stimuli that strengthen the foot muscles that maintain the arch and without this exercise the muscles tends to lose tone and weaken. Thus unnecessary orthopaedic arch support can cause twofold damage and perpetuate the problem. Always seek advice from the orthotist.

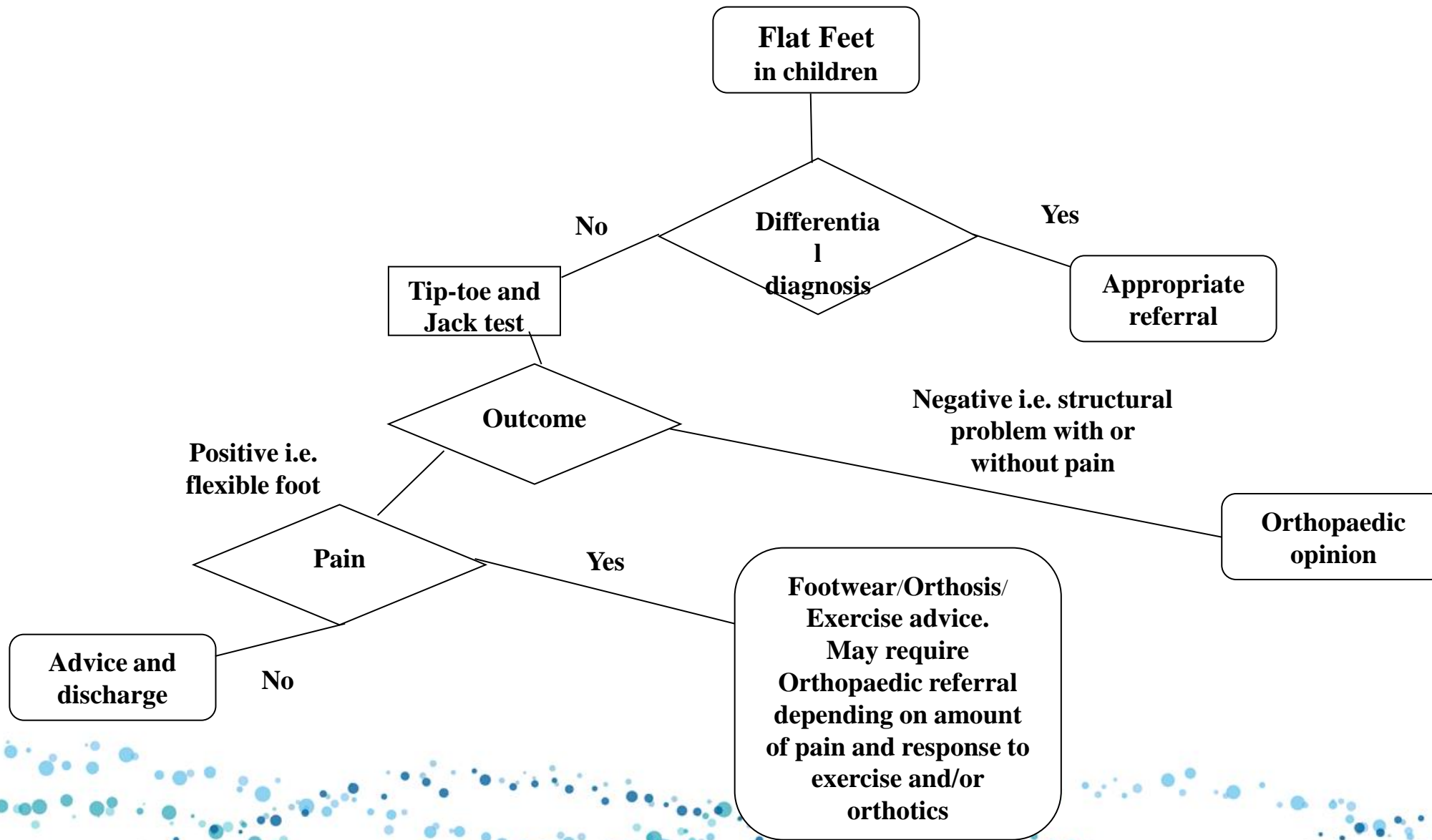
Denis et al (1974) & Garcia-Rodriguez et al (1999)

Grade 1 – The support of the lateral edge of the foot is half that of the metatarsal support.

Grade 2 – The support of the central zone and forefoot are equal.

Grade 3 – The support of the central zone of the foot is greater than the width of the metatarsal support.

Review Date: April 2015



2.2.1.1. **Asymptomatic** flexible flat feet do not require treatment but an advice leaflet titled” flat feet in young children” is available that can be given in primary care if there is parental concern. The link is available on the referral management system website.

2.2.1.2. **Symptomatic** flexible flat feet in children are appropriate for referral depending on age. See table below

<p>Able to easily (and bilaterally) go up onto tiptoes (age appropriate) Arch present on tip toe No tightness on ankle dorsiflexion Normal neurology No painful symptoms No poor function, eg tripping / falling Absence of associated syndromes eg. Downs, Marfans, Ehlos Danlos , hypermobility syndrome</p>	<p>No treatment required. Referral to physiotherapy or podiatry is not appropriate. If there is parental concern, consider issuing the flat feet advice leaflet from the link on the referral management system.</p>
<p>Abnormal neurology</p>	<p>Refer to Consultant Paediatricians RCHT</p>
<p>Arch not present on tip toe Asymmetrical flat foot Significant pain affecting activities of daily living</p>	<p>Refer to Consultant Orthopaedic Surgeon via Referral Management Service</p>
<p>Tightness on ankle dorsiflexion Difficulty rising onto tip toes Marked tripping / falling Pain in knees or hips Painful feet in child under 5 years of age</p>	<p>Refer to Paediatric Orthopaedic Physiotherapist via Referral Management Service</p>
<p>If child 6 years of age and older and any of following: Pain in feet / ankles Skin pressure lesions of feet / ankles Excessive medial shoe wear causing poor function</p>	<p>Refer to podiatry department</p>

“2 – 10 YEAR OLD FLAT FOOTED CHILD”

TWO TYPES

Flexible ↑ (painless, physiological)

Stiff and fixed ↑ (pathological, usually painful)

HISTORY

Same + pain history

EXAMINATION KEY POINTS

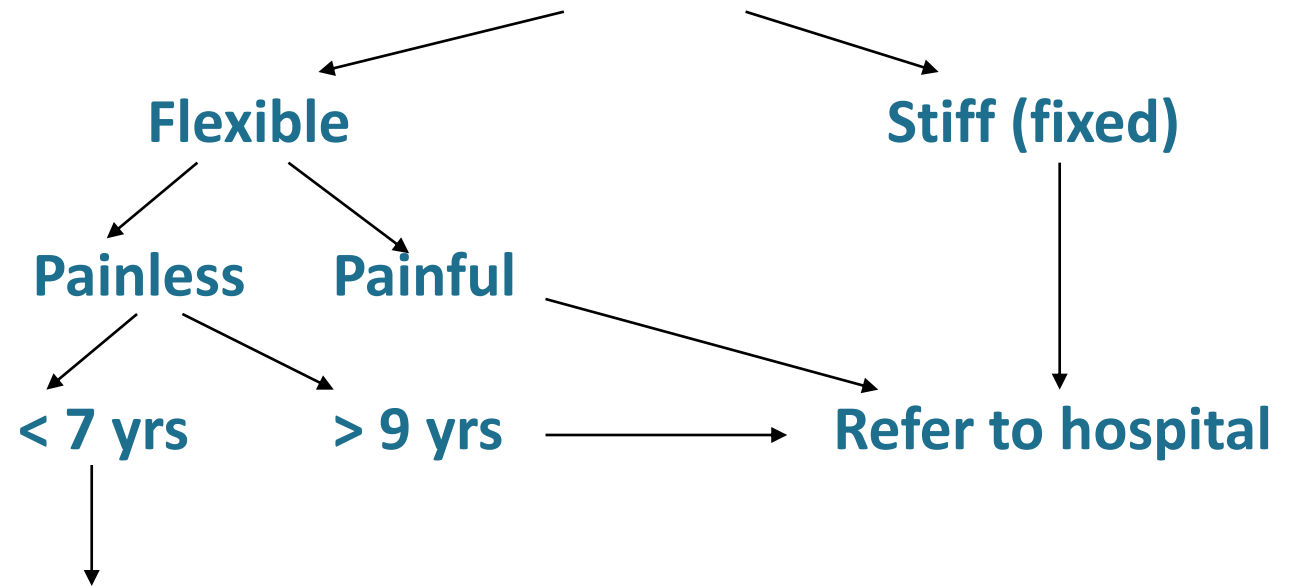
Flexibility (re-formation of the arch during sitting and tip-toeing)

Exclude tightness in tendo-achilles

Check if the foot is painful

Check passive ROM in sub-talar joint

MANAGEMENT



Reassurance as it is physiological stage in development.
(However, if associate with tight T.A.)

NB: (Foot orthosis and shoe wear adjustment has no effect on physiological flat foot and does not affect its natural course)

Paediatric flat foot proforma

Suggested to use a simple traffic light framework to identify 3 subtypes of paediatric flatfoot.

1. Treat symptomatic PFF **RED**
2. Monitor or with discretion simply treat asymptomatic non-developmental PFF **AMBER**
3. Identify and advise asymptomatic PFF **GREEN**

paediatric Flat Foot Proforma (p-FFP)

Child's name: _____ Age: _____

History

- Family Hx
- Associations
- Symptoms
- Trauma
- Activity
- Systems review
- Previous Tx

Findings

- Tender areas
 . y/n
 . site/s
- Gait
 barefoot
 shoes on
 . limp y/n
 . AOG
- Obesity (ok / + / ++)

DIAGNOSIS

A. Typical flexible flatfoot +/- other factors

Neurological eg Cerebral palsy, hypotonia
Muscular eg Muscular dystrophies
Genetic eg Down's, Marfan's
Collagen eg Ehler's Danlos, ligament laxity

B. Rigid flatfoot

Vertical talus
Tarsal coalition
Peroneal spasm
Iatrogenic
Trauma

C. Skewfoot

Metatarsus adductus

A. Typical flexible flatfoot

1. Symptomatic*

or

Asymptomatic

2. Non-developmental*

(Structural deformity progressing with age)

or

3. Developmental

(Structural deformity reducing with age)

Observe			Measure		
	L	R		L	R
Medial arch height (ok / reduced)			Navicular height (mm)		
Heel eversion (ok / more everted)			RCSP ($^{\circ}$ inv/ev)		
Heel inversion with tip toe (y / n)			Consider		
Tibial, knee positions (med / 0 / lat)			Muscle tone, ligament laxity (y / n)		

Action plan:

Date:

1	TREAT
2	MONITOR
3	LEAVE ALONE

What does this tell us?

- The prevalence of flexible flat foot decreases with age
- The alignment of the foot can be changed with foot orthoses
- Foot and leg pain symptoms associated with FFF can be alleviated with foot orthoses

Leaflets



Association of Paediatric
Chartered Physiotherapists

Flat Feet in Young Children



Association of Paediatric
Chartered Physiotherapists

Choosing Footwear for Children



Association of Paediatric
Chartered Physiotherapists

Symptomatic Hypermobility

