

# Clinical audit to assess the use of a chairside 1st phase orthotic system in a community clinical setting

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In the past, much scepticism has been shown towards chairside orthoses. However, waiting times for specialist biomechanics treatment and provision of casted orthoses can lengthen into a number of months. Our aim was to assess the feasibility of a chairside / 1st phase orthotic system in a normal community clinic setting. The patients treated in the study all presented with lower-limb pain, and both biomechanical and palliative pathologies were treated using either simple pressure relieving devices or functional insoles.

Visual analogue pain scores were taken from patients before treatment and again 10 weeks after wearing the insoles. The audit results were correlated for a six-month period. The results showed that 80% of patients showed an improvement in their initial pain scores, with 38 % showing an improvement of 50% or more, and 42% showing a moderate improvement of 49% or less.

Our conclusion is that a chairside orthotics system could be a useful 1st phase treatment system if brought in to a modern podiatry practice, offering an immediate cost-effective alternative to prescriptive devices.

**T**here is a need to investigate current waiting times for prescription orthoses within the NHS.<sup>1</sup> How do we address this? Perhaps we could respond by improving best practice, introducing new ways of working and triaging patients away from potential delays in the system. A chairside orthotics system could help us to do this.

If we look at past studies into casted functional devices used to reduce the magnitude of a pronatory motion, the following characteristics may be derived:<sup>1</sup>

1. Medial wedge to tilt heel.
2. Reformation of arch (by infilling)
3. Cupping of the heel, to resist eversion

These features are all amenable to delivery via a simple non-casted chairside orthoses or functional insole,<sup>1</sup> although it must be noted that not all devices are designed to be anti-pronatory. Hopefully, what this example demonstrates is the idea that simple non-casted orthoses may alter the forces beneath the foot where required. These can take the form of Frelon (moulded EVA) insoles and EVA wedges, or the pre-posted and modifiable AOL™ type (preformed EVA device.)<sup>2</sup> This option gives the clinician a tool to cut waiting times, using a 1<sup>st</sup> phase treatment.

Studies into casted vs non-casted devices suggest that casted orthoses are two-and-a-half to three times more expensive than chairside orthoses, the latter having the added advantage of being immediately available to the

patient, giving a very cost-effective anti-pronatory device.<sup>1,3</sup> Therefore, chairside orthoses could be effective in reducing the magnitude of a pronatory motion and improving symptom relief.<sup>3</sup>

Simple wedge systems have been used to treat osteoarthritis of the knee, and significantly greater improvements in pain scores have been noticed.<sup>4</sup> Genu-valgum and genu-varum have been treated (using medial and lateral wedge systems respectively), gaining improvement in pain and knee angulation.<sup>5</sup> Even when treating palliative problems with simple insoles, in-shoe foot pressures can be lowered.<sup>6</sup>

Currently most devices are made on a prescriptive (custom-made) basis. This requires measurements to be taken down and sent to a laboratory for manufacture, a process that means that a device can take between five days and six weeks to be delivered.<sup>2</sup> However, by definition a chairside device is one that can be measured for, manufactured, issued and, if needs be, subsequently adapted, all in a clinical environment. It was our aim therefore to perform a straightforward audit into a chairside system.

## METHODOLOGY

Fifty patients were treated with bespoke chairside devices in a routine podiatry clinic over a six-month period. Patients were asked to complete a visual analogue pain scale (VAS) at their first appointment, this being one of the most used measurements for recording pain intensity<sup>7</sup> as well as being easy to

administer.<sup>8</sup> The data were collected on a chairside prescription form (Figure 1).

A biomechanical assessment of the patient was then carried out using subjective and objective assessment forms, and templates were taken of the patients' feet. A suitable device was then constructed in the clinic using a wide range of materials. These included pre-formed valgus pads, wedge strips 3–5 degrees, metatarsal pads and various EVA-moulded bases. For health and safety reasons no contact adhesives or grinding machinery were used. Materials were constructed with double-sided sticky tape, and all bevelling was done with scissors.

Patients were then asked to try out their insoles. If they reported any problems (such as toleration of the device), adjustments were made before they left the clinic. Patients were also given advice regarding footwear fitting, stretching exercises or icing etc where appropriate (it was deemed unethical to withhold such advice).

Patients returned after 10 weeks for review. Their VAS scores were completed again and any patient comments were noted. The patients were asked to contact the clinic if their devices needed replacing in the future.

## RESULTS

All of the patients treated were a cross-section of patients presenting with pain at a normal community clinic.

All chairside devices manufactured and issued cost under £5 in materials.

**E.g. Functional device**

Pair Frelon insoles	£1.60
Pair of 5 degree wedges	£1.35
Pair preform valgus	£0.75
<u>Double sided tape</u>	<u>£0.30</u>

Total £4.00

**Palliative device**

Plain poron 94 insole(size 9) 2.08

Time taken to manufacture these devices was under 20 minutes in most cases. It was found that the manufacture and covering of complicated palliative devices was too time consuming (i.e. a plantar pad with cavity and covering), so any palliative padding added to a single insole was bonded to the underside of the device.

Figure 2 shows that patients presented with pain from more than one source, the pain being associated with varying anatomical structures (i.e. ankle, knee) and pathologies (plantar fasciitis and hallux adductor valgus). Knee and back pain were the most common presenting symptoms. Patients who presented with more than one source of pain, i.e. knee and ankle pain, were categorised under the more predominant presenting pathology.

Improvements in VAS scores are demonstrated in Figure 3. It can be seen that 80% of patients showed an improvement in their VAS score, with 38% showing an improvement (of 50% or more) in their score and 42% showing a moderate improvement (49% or less) in their score.

Figure 3 shows that 76% of patients found their insoles comfortable. Table 1 shows VAS scores pre/post treatment. The mean overall change in pain levels of the 50 patients was -2.75. This outcome was tested for significance, with the results showing  $t = 8.697$ , which, with this sample size, gives an outcome of  $p = 0.001$ . The conclusion can therefore be drawn that the difference in pain levels post-treatment were significantly lower than those pre-treatment.

**DISCUSSION**

From the results it can be shown that 80% of patients showed an improvement in their VAS scores, with the remaining 20% of VAS scores unchanged. We consider the results to be encouraging and indicative of potential for future study. However, it must be noted that the chairside orthoses were given as part of a package of care that included, for example, advice on stretching and icing. Therefore, these factors could be seen as confounding variables, which

## NORWICH PRIMARY CARE TRUST CHAIRSIDE ORTHOTIC PRESCRIPTION FORM

<b>Name</b>	<b>Referrer</b>	<b>Date Prescribed</b>
<b>Address</b>	GP <input type="checkbox"/>	
	Physio <input type="checkbox"/>	
	Podiatry <input type="checkbox"/>	
	Self <input type="checkbox"/>	
	Other <input type="checkbox"/>	
<b>Date of Birth</b>		

<b>Footwear</b>	Poor	Suitable	Very good
<b>Pathology</b>			
Please ask patient to fill in analogue pain scale			<input style="width: 40px; height: 20px;" type="text"/>
<b>Relevant Medical History</b>			
<b>Type of Insole/Orthotic</b>			
<b>Base, Padding etc.</b>			
<b>Advice or Other Treatment Given</b>			

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**RETURN SHEET TO BE FILLED IN AFTER 10 WEEKS**

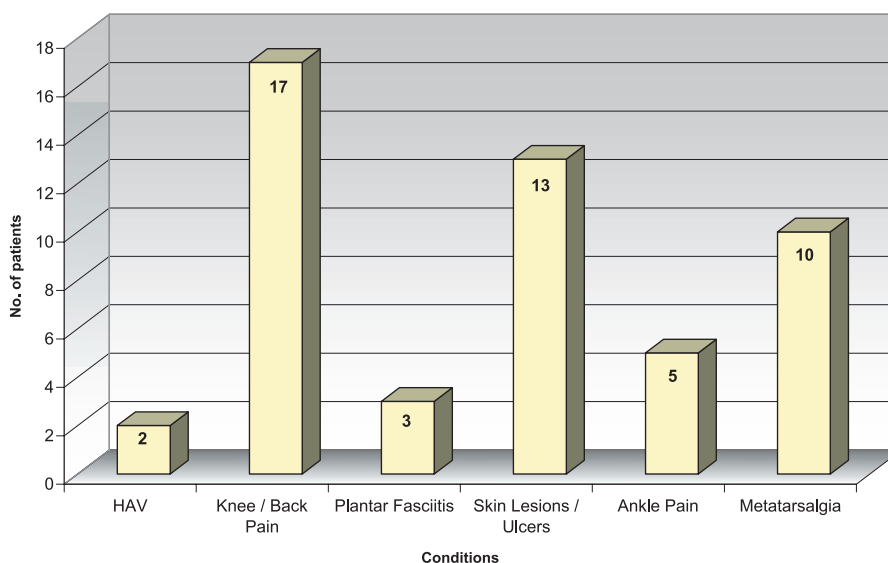
**Date Returned**

**Pain Index**  
(1=No pain, 10 = Excruciating pain)

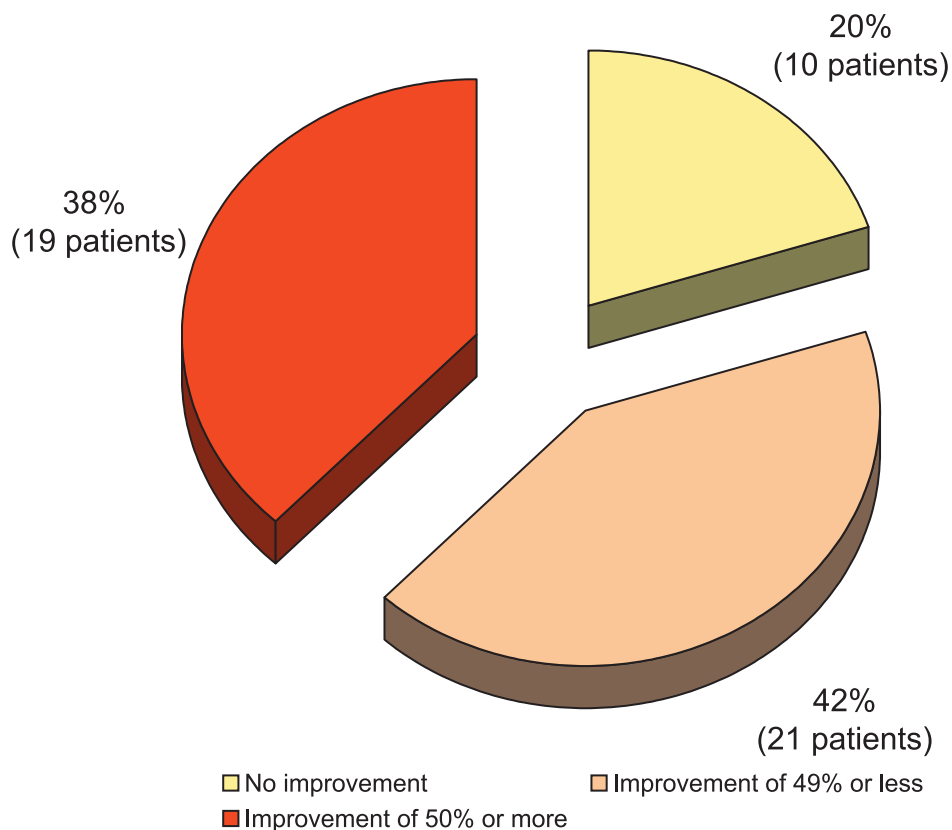
**Patient Comments** (Tolerance etc.)

**Practitioner Comments** (Has device been effective, undue wear etc.)

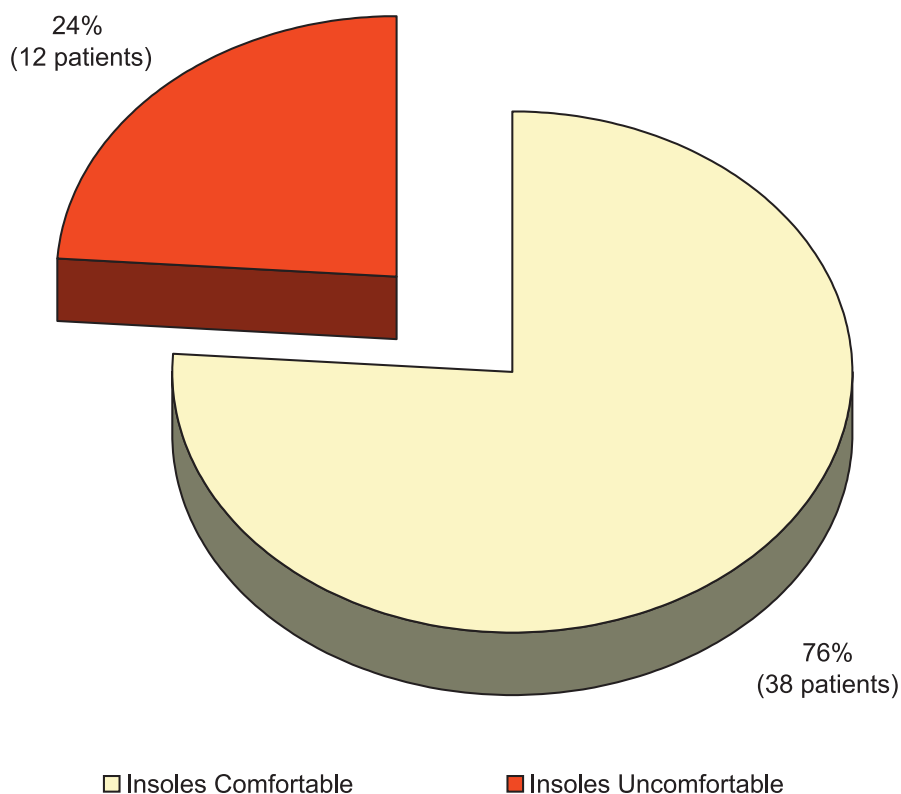
**Figure 1. Sample chairside orthotic prescription form.**



**Figure 2. Conditions treated with chairside devices**



**Figure 2. Percentage of patients showing Improvement (Analogue Pain Scale).**



**Figure 3. Patients comments on chairside devices.**

ultimately, although difficult to exclude in a realistic clinical environment, could influence VAS outcomes. However, these results seem to compare well with McCourt *et al.*,<sup>9</sup> in which 239 patients were treated with either casted devices, simple insoles or pre-formed devices. It was found that simple insoles and pre-formed devices could be over 80% effective.

The results could be improved upon by using a wider range of devices, e.g. chairside preforms, which are now widely available both for functional problems and at-risk groups such as people with rheumatoid arthritis and diabetes. However, this would increase the cost of materials. The chairside system we used was a very cost-effective one (all materials for each device cost under £5 to make).

No account was taken of the placebo effect – some patients may have experienced spontaneous resolution of day-to-day variations in symptoms. These considerations must be taken into account given the relative subjectivity of using VAS. Yet in a clinical environment it was thought better to test the effectiveness of the chairside devices subjectively. For example, in an objective trial a device may show impressive pressure-plate study results, but if the patient cannot tolerate the device it becomes useless.

Therefore the practice of using pre and post measurements of subjective pain, to gauge the success of an individual treatment modality, could arguably be seen as the most clinically realistic approach to take.

The duration of our audit has been six months so far, the sample group being limited in number. However, the audit is ongoing and we are looking forward to re-evaluating our results 12 months down the line. After a longer period of time the durability of chairside devices will have to be assessed.

It is hoped that in the future we can broaden the chairside pilot study by involving other community clinics in our trust, using a selection of different devices. This would increase our sample group and also involve more senior II podiatry staff with biomechanical experience. In future studies, we would hope to carry out a qualitative trial using a wide range of devices, comparing efficiency, time to manufacture and materials costs.

**CONCLUSION**

When looking at our results it can be concluded that the use of a chairside/1<sup>st</sup> phase orthotic system is very effective over a six-month period in a routine community clinic. Devices showed no excessive wear. As practitioners we believe the one-to-one

Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
6.7	6.7	5.0	2.0	6.3	4.6	4.0	2.0	10.0	10.0
3.0	3.0	7.5	0.0	7.0	0.0	6.3	4.0	8.0	1.0
8.0	5.0	4.6	3.0	7.6	7.6	9.0	5.0	6.5	1.0
5.3	5.3	9.0	1.0	8.2	2.2	8.5	7.0	7.5	4.5
6.0	6.0	3.0	0.0	3.5	2.5	7.0	2.5	6.0	2.0
7.6	5.0	7.4	7.0	6.0	5.0	7.0	2.5	6.5	6.5
5.5	4.0	4.5	2.5	5.0	5.0	7.5	5.5	5.5	2.2
5.0	1.0	4.0	0.5	5.0	4.0	8.0	3.0	4.5	1.0
7.0	3.0	9.0	9.0	7.0	4.0	5.0	5.0	6.0	3.5

**Table 1. Pre/post VAS scores taken from patients displayed in chronological order.**

nature of assessment and manufacture is a more holistic method of treating patients. Casted orthotics can be an effective form of treatment, but chairside devices play an important part in the treatment of some biomechanical pathologies, which in turn reduces the waiting time for more expensive casted devices.

It must be noted that transferring patients from 'specialist biomechanics' waiting lists into community podiatry clinics for treatment by senior II practitioners has several potential advantages. It can lower waiting lists, which in itself is a very important factor, but it also uses the resources of senior II staff, keeping their biomechanical skills and experience updated. This not only has great implications for the staff and their future CPD, it also nurtures knowledge

within the profession as a whole.

A chairside system can be highly versatile; adaptations can be made to existing insoles or shoe inserts, limiting wastage of materials. They are simple to manufacture and customise in a routine clinical environment, not requiring contact adhesives or grinding machinery, which has implications for health and safety of staff in the future.

Perhaps if chairside orthoses are proved to be a cost-effective therapy, more health authorities and private practitioners could introduce them to improve patient management. It is hoped that with further study and the use of evidence-based practice chairside orthoses will show an increased momentum in their advancement into the podiatrist's clinical setting.

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