**Responses to questions arising from Forth Conference**

Below are my thoughts on some of the questions raised during the Forth conference. Unfortunately there was not time on the day but I hope you find the following helpful. I must stress, these are my own personal responses. Having nagged our excellent speakers into presenting for us, I felt it unfair to pester them further.

Q for panel discussion at the end: nice guidelines say orthotic invention in first week/ soon as possible but polls mention most are been seen after 2 months. What do the panel feel about this?

A. Frustrated as an orthotist. I suspect some physiotherapists are unaware of the guideline and some chose not to engage with orthotic treatment as an option. Some may wish to engage but may struggle with access to services. At present there are no guidelines as to how orthotic intervention should be used relative to other interventions. This is why I felt it was refreshing to hear from the St George’s service where this does happen

Q How does bringing the shank 10-12 degrees forwards impact on standing balance?

A. Good practical point, this angle is to optimise gait quality but in stance they will have flexed knees which can be hard work if you spend a long time standing. Regarding standing balance, having fixed ankles can help considerably as it minimises sway at the ankles. In a small unpublished study, normal subjects reduced excursion of centre of pressure in fixed AFOs. From a bio-engineering perspective it reduces the degrees of freedom. From a neuro-muscular control perspective it means the subject can concentrate control proximally as ankles are already stable.

Q If trying to restrict spasticity or clonus with orthotics does pressure on the skin become an issue? How is this managed?

A. Pressure from orthoses is always a challenge, generally that’s how they work by applying corrective forces and one of the skills of the orthotist is to manage these pressures. As you rightly suggest, these forces and subsequent pressures are potentially higher in the presence of spasticity and clonus. Fortunately, often once alignment and position is corrected and the calf which is often the driver is held in a stretched position, the increased tone settles within the AFO and hopefully is not a problem. Clonus is a great example of that and I have posted a case study with video on the web page. For increased tone that does not settle, there are other options. Increasing the area over which the force is applied using broader straps will reduce pressure. If using and AFO and inversion is the problem, we often use what we call three point pressure correction where we make the AFO specifically to deflect pressure above the lateral malleolus. I have added a brief article on the web page to illustrate this.

Referral to spasticity management is also a consideration.

Q When serial casting do you use any gaiters or other knee braces to keep the knee straight in order to engage the gastrocnemius MTU?

Could you use an off the shelf knee gaiter instead of the back slab.

1. In walking with a plaster you get a really good active stretch of gastrocnemius. Non-weight bearing, gaiters and back slabs would increase that stretch. Gaiters have quite a bit of give in them and it is difficult, even when they are reinforced to get a good fix into extension. Back slabs are better however bandages stretch and sag. A rigid back slab with a pull down knee cap is more effective. The treatment KAFO described is a great way of getting a good weight-bearing stretch with the ankle dorsi-flexed, knee extended and makes it easier for the physiotherapist to facilitate a really good stretch of hip flexors.

Q. Do you ever use insoles within the casts for patients with patients with weakness within the foot?

A. Insoles can be made to be built into casts. Alternatively, depending on your plastering and handling skills, the correction could be built into the cast.

Q. From the poll 83% of physiotherapists make the decision on orthotics and not the orthotist.. This may be due to access, this the main reason why they make the decision on orthotics. If anything happens to a patient that is prescribed an orthotic device. The liability lies with the prescriber. Orthotist are trained to prescribe orthotic devices. Have the physios raised this within the trust and/or with trust bosses to get more access to orthotic input from orthotist. In an ideal world we would want an MDT setup.

A. Generally physiotherapists lead on the rehabilitation of gait following stroke so establish the approach to be taken, including involvement of orthotic intervention. I believe orthotists have a huge amount to offer and should be involved early as in the St George’s model where there are three half day dedicated sessions per week. At the moment access is a challenge but demand and recognition may start to change this. Regarding provision and liability, my understanding is that so long as you can demonstrate competency then you are ok. As an orthotist, I teach stretches and strengthening and do FES (functional electrical stimulation). I would agree, MDT involvement is an ideal.

Q. Could you suggest some makes of ankle splints for inversion of foot.

A. There are a variety on the market, those shown in the presentation were the push auqui and Aircast A60, a simple on line search will show a number of providers. If there is a strong pull into inversion they may not have sufficient leverage and I would suggest an orthotic referral.

Q. Many speakers have the idea that propulsion at terminal stance is important yet there is plenty of evidence of subjects walking effectively with rigid AFO where plantar flexion is blocked. Where is the evidence that terminal stance propulsion is important?

A. I am aware of a long running debate as to whether the activity of gastrocnemius at terminal stance is to propel the body forward or to stabilise and prevent collapse into dorsiflexion as the propulsion is transmitted from hip and knee extension. If the latter, then the stability of a rigid AFO would replace the stabilising effect of muscular activity with minimal disruption to gait. I am not however aware of any evidence to support this. I am hoping some light may be shed in a follow up eventI am organising with The International Society for Prosthetics and Orthotics (ISPO) on 7th July.

Normal and pathological gait and its relevance to rehabilitation following stroke”

Please visit www.**ispo**.org.**uk** for details.

Q. Any ideas of role of AFO's in ankle/foot dystonia? is there anything on the market that is sufficiently firm but dynamic - different materials.

A. If it is a true strong dystonic pull, a flexible material will just flex with it. Similarly a rigid block may cause excessive pressure. This may be a situation where a conventional external calliper with correction being applied by a leather strap rather than hard plastic may be a compromise. There are many manufacturers producing reinforced compression garments such as lycra claiming to have an impact on control by proprioception, sometimes with spectacular results however predicting outcome with this approach I believe is speculative.

Q. How much time should you spend with someone out of the AFO and in the AFO in the long term? If it is important to have time working muscles in both - is there a recommended proportion of the day?

A. Great question, I wish we knew. I am hoping to pull a group together to try and create some guidelines based on best clinical reasoning. I am unaware of any research to give us evidence to guide us on this.

Q. You need more than 90 to sit to stand - therefore a hinged solid AFO is useful.

A. Hinges may be useful however in early stage, you do not get the same stability or stretch at calf as the knee may flex prematurely to escape stretch. You are quite correct, getting good movement from sit to stand within a rigid AFO or cast is problematic. In the early stages this may be facilitated by undoing or loosening the calf strap (allowing free dorsiflexion) or having a block by the chair to effectively raise the heel thereby inclining tibia forward whilst they go from sit to stand and then walking off it to have optimal alignment for gait.

Q. What options may you consider for patients for whom swelling is a problem? I am lucky enough to have a joint clinic with an orthotist and we often use a calliper in this case. What are others thoughts.

A. My first suggestion would be to manage the swelling if compression hosiery may be an option. Casting when swelling is at a maximum may be an alternative. Callipers can be an option however I would strongly advise having an extended plate and fixed spurs as traditional backstops do bend and footwear distort with the forces involved.

Q. When using the "piggy backs" is there a plantar-flexion ankle angle you would consider this option as not suitable.

A. For those not familiar, for patience with subtalar joints which are very difficult to control, either due to increased tone and inversion or weakness and collapse into eversion, then a thin plastic anklet moulded to fit inside the AFO can be helpful. I have consulted with my colleagues and we have used these in extreme angles of plantar-flexion.

Q. How can we access the treatment KAFO described in the presentation?

A. Please contact me directly on paul@peacocks.net