

Footwear - A Clinical Perspective: What Is The Best Shoe?

By: Mr. Kevin Shopland B.Sc. Kin., C.O. (c)



Kevin has a passion for running and running shoe technology. He has completed two Ironman's and many other endurance distance events. His passion for running is equal to his passion with respects to custom foot orthotics and understanding how we move.

In regards to footwear, common questions we get asked are: what is the "best shoe" or "best brand of shoe" on the market? The easy answer to these questions is...it doesn't exist! We are constantly bombarded with shoe companies marketing new technology that will make us run faster or eliminate

our pain, but the truth is, many of these shoes will only suit a small portion of the people they are targeting. There are a couple important factors to keep in mind when searching for new footwear. You should try to understand how your feet move and their unique characteristics prior to beginning your footwear search.

Searching for new footwear can be a daunting task when faced with the seemingly endless options that can be found in shoe stores. It's very easy to associate higher prices with footwear that will be good for your feet, but what it really comes down to is how those shoes will fit the demands you are going to place on them. A very expensive shoe made with high quality materials can be just as likely to cause foot issues as a pair you can find for \$20 on a discount shelf.

Before heading out shopping, it's important to consider how you will be using your new shoes and what their primary function is. Some questions to consider are: are they going to be an everyday walking shoe, are they going to be a high mileage running shoe, are they going to be used daily for work on a concrete surface or out in the field? Just as there isn't an ideal shoe for foot shape alone, there isn't a shoe that that is going to be able to perform well in all scenarios. Begin your search for footwear by identifying the primary function of the footwear and be ready to consider the need for additional shoes for different activities if required.

The next important factor to consider is what the unique characteristics of your foot shape are. This may include things like having a narrow heel but a wide forefoot, wide feet with a bunion on one side, or even a narrow foot with a prominence along the lateral border of the foot. Certain brands may cater better to different foot shapes and it's crucial to find a shoe that fits the shape of your foot and is comfortable. Finding a wide shoe that fits your forefoot but leaves your heel sliding around isn't going to be an ideal solution long term. Keep in mind that many shoes can be adjusted for



areas of discomfort and pressure. A common modification for footwear is stretching the inside border of the shoe and adjusting the lacing pattern to accommodate a bunion, this can be an easy solution to provide a suitable fit for the front of the foot without compromising the fit at the heel.

The final component of footwear selection comes down to how your feet move. What may seem like the perfect shoe for you based on the fit may end up being an incompatible match because of the motion of your foot. The movement of our feet throughout the gait cycle is dependent on a wide range of variables. Overall weight, range of motion, strength, foot shape,

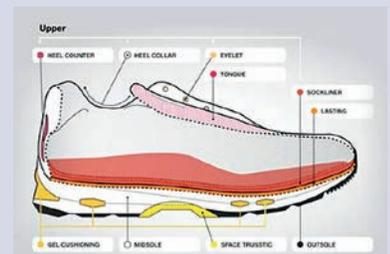


sensation, and prior injuries will all play a role. How important is dynamic movement on shoe design and footwear selection? Early running shoe designs incorporated large flares at the heel that provided increased stability when the foot was flat on the ground standing still, but it was

later realized that they actually caused greater instability when the foot was in motion! Due to the wider base of the heel, the lateral border of the shoe contacted the ground earlier and the flare acted as a lever arm to accelerate the foot into pronation. The movement of your feet will highly dictate the best shoe option for you so it is imperative that you test the shoes out on surfaces and speeds that are going to be similar to the conditions you will be using them in.

With all the complicating factors that arise in selecting suitable footwear, a few common characteristics do come up that can help to guide your selection. One of these characteristics is a strong semi rigid heel counter in the shoe (Figure 1). This support will stabilize the heel and help to provide stability during motion. An easy way to check for this is to squeeze the heel of the shoe at about the middle of the heel. You should feel stiffness in this area. If the shoe is easy to compress inwards, there is likely a soft heel counter or it is completely absent. The midsole of the shoe should also have torsional stiffness. If you grab the heel and forefoot of the shoe and twist in opposite directions you should meet resistance. If you can wring the shoe out, the midsole is very flexible and could present problems if you are prone to foot trouble. A variety of other key characteristics may be involved in selecting the most suitable shoe for you, but they will take into the account the components of function, fit, and movement that were discussed above.

Being assessed by a foot care professional is a great start if you have uncertainty about the specifics of the motion of your feet or what considerations need to be made for your foot shape. You only get one pair of feet, take care of them by finding footwear that is suited to your unique foot shape and movement patterns.



Pediatric Clubfoot Treatment

Clubfoot, or talipes equinovarus, is a treatable birth defect that affects approximately 150,000-200,000 children each year¹. It is one of the most common congenital deformities. One or both feet may be affected and the affected feet can range from relatively flexible to stiff and rigid. The condition is not painful for the new born, though when a child gets to walking age, walking with an uncorrected clubfoot can be very painful and difficult, if not impossible. For years clubfoot has been treated by casting and/or surgery. Over fifty years ago Dr. Ignacio Ponseti developed a method for treating clubfoot that requires the use of over the knee casts and special protocol. The method consists of using a series of casts, gentle manipulation, and the use of special ankle foot orthoses (AFOs) with adjustable bar. This treatment is 95+% effective and it is the most cost effective treatment with no side effects. Treatment should start soon after birth.

The Stollery Children's Hospital has opened a Rehabilitation Lead Clubfoot Clinic, directly supported by orthopedic surgeons. The Clubfoot clinic team consists of Occupational Therapists, Physical Therapists, Orthopedic Technicians, Orthopedic Surgeons and community Orthotists. **Karl Hager Limb & Brace** was pleased to accept an invitation to participate in this clinic. Providing treatment for children with Clubfoot was another opportunity for us to expand our pediatric

treatment offering. An Orthotist is an important member of the team as bracing is a vital component of maintaining the corrected position. The bracing stage of the Ponseti method is integral to the prevention of a recurrence of clubfoot. Braces are worn until the age of four to five years to ensure there is no recurrence of clubfoot.

The standard AFOs are available in grey, pink, or blue while other variations of the AFOs are only available in grey. These AFOs are typically attached to a straight bar which is adjustable as the child grows. If supported by the Stollery Clubfoot clinic team another bar option is the Dobbs bar. This specially designed bar is a new dynamic design that allows active movement, preserves muscle strength in the foot and ankle, and is less restrictive to the child than the traditional straight bar version.

With our head office in Edmonton and seven regional clinics throughout Central and Northern Alberta we hope to make trips to Edmonton less often for young busy families. When visiting our head office in Edmonton children and their families often take interest in our 200 gallon salt water aquarium located in our reception area which features "Nemo" and many other interesting corals and ocean life.

Source: ¹ <http://www.ponseti.info/>



Ponseti AFO's on Adjustable Bar



Ponseti AFO's on Dobbs Bar



Adjustable Bar



Ponseti AFO's

Bracing Demonstration & Evaluation Days

Images courtesy of Otto Bock



C-Brace KAFO

Carbon IQ Joint System KAFO

Our goal with these newsletters is to provide an insight in regards to new treatment options and related details. The most recent newsletters had a strong theme around Ankle Foot Orthoses (AFOs) and Knee Ankle Foot Orthoses (KAFOs). There are many options when treating a patient who requires an AFO or KAFO. Through our lightweight prepreg carbon fiber bracing options we offer systems which are not offered anywhere else. Bracing design options often include considering what plastic, carbon fiber, joint system, strapping system, etc. to utilize within the final bracing device. We often look at what benefits each design may offer but overall we want to achieve one thing. We want to provide something to the patient that will allow them to have the freedom to move with confidence.

In the coming weeks we may be contacting your office to arrange a presentation of what is new within KAFO bracing options. This would include reviewing the various materials and designs we offer but more importantly the knee and/or ankle joint systems within these complex designs. We

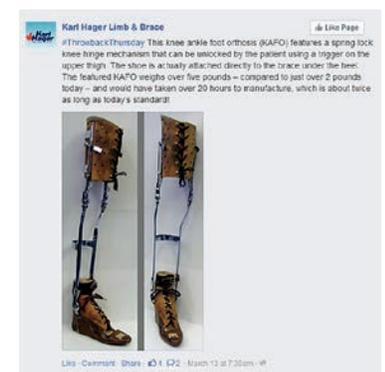
are planning to have some trial KAFO systems that feature some unique stance phase joints where you can actually wear the device and feel and see how these stance phase joint systems function. We have the ability to use these same demonstration systems with patients so they themselves can determine if these specially designed systems would meet or exceed their needs. We are also planning to have the brand new C-Brace KAFO on hand. The C-Brace is a computer controlled orthosis which is an entirely new approach to walking when back injuries or leg muscle weakness exist. If you are interested in participating in this hands on learning exercise please contact Nolan Hayday at 780-452-5771 ext. 206.



E-Mag Active KAFO

Karl Hager Limb & Brace Facebook Page

Since December 2013 when our Facebook page launched we have been able to feature various posts from acknowledging various bracing designs, clinician perspectives, patient profiles, Paralympics posts, and much more. As it stands today we have almost 600 "Likes" to our page. This number has continuously grown which is very positive for the page. The two unique posts found to the right of this article relate to "Throwback Thursday" and "Flashback Friday" which are very common topics within social media. The "Throwback Thursday" post featured a very old KAFO design with footwear built right into the design. The "Flashback Friday" post featured a very unique Double X which was produced for research in 1989. We invite you to "Like" our page as we share details that are relevant to Orthotics & Prosthetics and **Karl Hager Limb & Brace!**



Pediatric WalkAide System – International Meeting: Luxembourg

By: Nolan Hayday – Business Manager & WalkAide Advisor

Recently I had the privilege of travelling to Luxembourg City within the Grand Duchy of Luxembourg for a two day International WalkAide System Distributors meeting. This meeting had global representation from 16 countries and was all based around pediatric use of the WalkAide System. The meeting was hosted at the Rehazenter which is a wonderful rehabilitation centre.

There were three main consistent themes around the meeting which were:

- 1) Update and discussion around current research presented by Laura A. Prosser PT, PhD
- 2) Discussing the best practices when using the WalkAide System with children who have cerebral palsy (CP)
- 3) Expanding the acceptance of using the WalkAide System with children with cerebral palsy



Luxembourg City

The WalkAide System is a functional electrical stimulation (FES) device that can be used with patients who have an upper motor neuron condition. There are many differences when treating a child compared to an adult. Since the WalkAide has been used with children for over two years we are now able to more effectively use this knowledge and generate some recommendations.

After completing a Pub Med search for FES related research, there was an obvious gap between adults and pediatrics. There were 1490 adult studies compared to only 51 pediatric studies with no guidelines for pediatric FES use. Laura Prosser and her team have started to prove through their research that the WalkAide System is a viable treatment option. Most of their research is using the WalkAide System with children who are within either class one or two of the Gross Motor Function Classification System (GMFCS). Some of the key points from their research are as follows:

- Ultrasound measures of tibialis anterior anatomic cross-sectional area and muscle thickness increased in the intervention compared with baseline²
- Maximum ankle dorsiflexion improved or was maintained during use²
- Average daily use was 5.6 hours³
- Improved dorsiflexion was observed during swing (mean and peak) and at foot-floor contact, with partial preservation of ankle plantarflexion at toe-off when using the FES at self-selected and fast walking speeds³
- Gait speed was unchanged³

- 18 of 21 participants decided to continue using the WalkAide System³
- The WalkAide System was well accepted and effective for foot drop in those with mild gait impairments from CP³



Pediatric WalkAide System

From this meeting there was a great outcome in regards to best practices and recommendations when using the WalkAide System with children. The youngest patient known using the WalkAide was three years old. Age is not so much the determining factor but rather the size of the leg(s) of the child. There is an extra small Bi-Flex cuff that is available for children and a 1.25" electrode. It was agreed that children with mild CP would benefit from the system the most. A strong part of that is because many of these children would prefer to not be braced. The WalkAide has many adjustment options which include changes to the stimulus parameters. We are able to adjust the pulse width and frequency to a level that the child can tolerate the stimulation but is effective in eliciting an appropriate dorsiflexion response. This adjustment is one of the most important aspects to cover. The other relates to the clinician to patient interaction and more specifically the treatment process. Overall the process needs to be gradual and the setup process needs to occur over weeks not days like an adult. Over time children tend to accept the technology better and are engaged in using this new technology. They need to accept the technology on their terms not ours! It is also recommended to use the new silicone cover to better protect the system.



Pediatric WalkAide with Silicone Cover

The next step is to have children use the WalkAide and have the system considered as a viable treatment. The team at **Karl Hager Limb & Brace** is experienced with the WalkAide System for both adults and children. We do not charge for any pre-screening for the technology and patients can trial the system within the clinic for free. For more information on the pediatric use of the WalkAide System please visit www.walkaide.com or contact our office.

Source: ² Muscle Plasticity and Ankle Control after Repetitive Use of a Functional Electrical Stimulation Device for Foot Drop in Cerebral Palsy, Diane L. Damiano, Laura A. Prosser, Lindsey A. Curatalo and Katharine E. Alter, Neurorehabilitation and Neural Repair

³ Acceptability and potential effectiveness of a foot drop stimulator in children and adolescents with cerebral palsy, Laura A. Prosser, Lindsey A. Curatalo, Katharine E. Alter, and Diane L. Damiano, Developmental Medicine & Child Neurology

WalkAide System – Graduated Treatment Program



WalkAide System Relieves Footwear Restrictions!

As stated above **Karl Hager Limb & Brace** does not charge for any pre-screening for the WalkAide System and patients can also trial the system within the clinic for free. We have established a graduated program that promotes the assessment and potential trial of the system both within the clinic and in the patient's home environment. Patients can schedule a complimentary screening appointment to ask specific questions with one of our speciality WalkAide trained Orthotists. The patient would be presented the system and review its key benefits including watching applicable videos if requested. The Orthotist would complete a peripheral nerve screening test to determine

a viable nerve. The next step if a positive test occurs is education and information about the Home Assessment Program. If a patient is not a WalkAide candidate other treatment options are explained. Again, there is no charge for the initial screening.

If the patient chooses to proceed further they would schedule a secondary screening. The secondary screening includes further questions as required, fitting the Bi-Flex cuff including disposable cuff liner, electrode placement, and initial walking program creation. Patients can trial the system within

the clinic. Again, there is no charge for this secondary screening if they do not want to pursue the Home Assessment Program.

If the patient decides to access the Home Assessment Program the patient would schedule two follow up appointments within two weeks (three weeks if schedule does not allow) at the time when Home Assessment program begins. Additional appointment(s) can be made if required. The patient would pay a "security fee" while they are trialing the system. Following the Home Assessment Program the patient will decide if they wish to pursue their own unit or not. If the patient does not decide to purchase the WalkAide other options would be explored (custom made AFO, custom fit AFO, etc.). If no treatment is provided to the patient, the Home Assessment Program fee is not refunded. If patient pursues a custom made AFO, custom fit AFO, etc. \$250.00 will be applied to patient costs while the remaining \$250.00 is applied to the home trial. If the patient decides to pursue their own definitive brand new unit the entire cost of the Home Assessment program (\$500.00) is applied to the cost of the new system.

In summary, this graduated program promotes the recommendation and trials of the WalkAide System where the patient can better validate which treatment option they would like to pursue. The costs associated with this graduated program can be applied to the treatment option selected. For more information in regards to this program please contact our office.

Clinic Locations

Cold Lake

Orthotist: Al Heaver
Cold Lake Health Centre
314 - 25 Street
Cold Lake, AB T9M 1G6

St. Paul

Orthotist: Al Heaver
St. Paul General & Auxiliary Hospital
4713 - 48 Avenue
St. Paul, AB T0A 3A3

Westlock

Orthotist: Kevin Shopland
Westlock Healthcare Centre
10220 - 93rd Street
Westlock, AB T7P 2G4

Vermilion

Orthotist: David Mueller
Vermilion Health Care Complex
5720 - 50 Avenue
Vermilion, AB T9X 1K7

Peace River

Orthotist: Al Heaver
Peace River Health Centre
1010 - 68 Street
Peace River, AB T8S 1T6

Camrose

Orthotist: Kevin Shopland
Smith Clinic in Duggan Mall
6601 - 48 Avenue
Camrose, AB T4V 3G8

Fort McMurray

Orthotist: Kevin Shopland
Northern Lights Regional Health Centre
7 Hospital Street
Fort McMurray, AB T9H 1P2

Please Note:

To book an appointment
for these regional clinics
please call 1-800-387-5053 x 0

If you would like literature on the following please contact our office.

Free Literature:

- Double X Knee Orthosis
- Accelerator Knee Orthosis
- Bladerunner Knee Orthosis
- Neutralizer O.A. Knee Orthosis
- Flex X Knee Orthosis
- Victory Knee Orthosis
- Who Pays For What Guidelines
- Patient Orthotic/Prosthetic Referral Form
- WalkAide® System
- Clinic Brochure
- Viscosupplements: Synvisc, Durolane, NeoVisc
- Foot Orthotics

NOTE TO OUR READERS

Mention of specific products or procedures in our newsletter neither constitutes endorsement nor implies that we will recommend selection of those particular products for use with any particular patient or application. We offer this information to enhance professional and individual understanding of the Orthotic and Prosthetic disciplines and the experience and capabilities of our practice. Please feel free to contact Nolan Hayday at (780) 452-5771 ext 206 in regards to any newsletter content.

2014 Clinic Dates Karl Hager Limb & Brace and The Knee Centre

Clinic	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Fort McMurray	1	5	3	7	4	2	13	4
St. Paul	6	10	8	12	9	7	4	9
Cold Lake	7	11	9	13	10	8	5	10
Peace River	13	17	15	19	16	21	18	16
Westlock	21	18	16	20	17	15	19	17
Camrose	27	24	22	26	23	28	25	23
Vermilion	29	-	31	-	25	-	27	-



Karl Hager Limb & Brace and The Knee Centre

10733 - 124 Street, Edmonton, AB T5M 0H2

Local (780) 452-5771, Fax (780) 452-2752

Toll Free 1-800-387-5053 www.khager.com

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