

ACFAP Quarterly

American College of Foot and Ankle Pediatrics



Spring 2018

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American College of Foot and Ankle Pediatrics

The American College of Foot & Ankle Pediatrics is excited and proud to announce its 3rd Annual ACFAP Pediatric Foot & Ankle Seminar. The Seminar will take place at Snake River Lodge & Spa, Jackson Hole WY, May 31-June 2, 2018.

This CME event will feature leading authorities on pediatric foot & ankle conditions. It will cover topics ranging from pediatric H&P, flatfoot, equinus, sports medicine, surgery, and rotational conditions. The meeting will be preceded on Thursday May 31 by a one day national park excursion.

Featured at this meeting will be spectacular Grand Tetons National Park.

At the Conclusion of this meeting, the attendee shall be able to:

- Develop effective Protocols for treating the pediatric patient.
- Effectively evaluate surgical vs. non-surgical options for many common Pediatric foot & ankle pathologies.
- Improve patient outcomes in the pediatric patient for common conditions such as flatfeet, juvenile HAV, and Equinus.

For Conference details or to register online: please go to acfap.org/events.html

12.5 CE Contact Hours

No commercial interest provided financial support for this continuing education activity

Lecture Schedule

Friday June 1

- | | |
|----------------|--|
| 7:00-7:45 am | Registration, Breakfast & Visit Exhibitors |
| 7:45-8:00 am | Louis J. DeCaro, DPM Welcome Address |
| 8:00-8:40 am | Dock Dockery, DPM Pediatric Dermatology & Warts! |
| 8:40-9:20 am | Roberta Nole, MA, PT, CpEd Flatfoot & Forefoot Posting in the Pediatric Patient |
| 9:20-10:00 am | John Grady, DPM Pediatric Tarsal Coalitions |
| 10:00-10:40 am | Break & Visit Exhibitors |
| 10:40-11:20 am | Mitzi Williams, DPM Pediatric Digital Deformities |
| 11:20-12:00 pm | Ed Harris, DPM The Pediatric Cavus Foot |
| 12:00-12:40 pm | Theresa J. Ruggiero, OD, FCOVD Do Your Patients Feet Need Eyeglasses? |
| 12:40-1:40 pm | Lunch & Visit Exhibitors |
| 1:40-2:40 pm | Harold van Bosse, MD & Kaye Wilkins, MD Pediatric Fractures |
| 2:40-3:20 pm | Emily Splichal, DPM The Importance of Sensory Stimulation in Pediatric Development |

Lecture Schedule (cont.)

Friday June 1 (cont.)

- 3:20-4:00 pm Break & Visit Exhibitors
- 4:00-4:40 pm **Patrick Deheer, DPM** Pediatric Equinus
- 4:40-5:20 pm **Al Armstrong, DPM** Pediatric Radiology
- 5:20-6:00 pm **All Speakers Q&A**
Moderator: Louis J. DeCaro, DPM



In the event of cancellation ACFAP is unable to assume risk or responsibility for the exhibitor's and/or registrant's time or expenses should an act of God, government action, disaster, weather or other force beyond ACFAP's control make it inadvisable or impossible to conduct this event. The exhibitor and/or registrant may wish to consider purchasing personal travel insurance to insure their expenses.

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Becoming a member of ACFAP for \$150 instantly saves \$150 off the conference registration fee

Go to acfap.org/membership.html

Lecture Schedule (cont.)

Saturday June 2

- 7:00-8:00 am Breakfast & Visit Exhibitors
- 8:00-10:00 am **Harold van Bosse, MD & Kaye Wilkins, MD** Clubfoot Lecture & Workshop
- 10:00-10:45 am Break & Visit Exhibitors
- 10:45-11:30 am **Louis DeCaro, DPM** Marketing (non-CME)
- 11:30-12:30 pm **All Attendees** Pediatric Speed Pearls
Moderator: Louis J. DeCaro, DPM
- 12:30-1:30 pm Lunch & Visit Exhibitors
- 1:30-2:30 pm **Roberta Nole, MA, PT, CPed** Pediatric Gait Video Analysis
- 2:30-3:30 pm **Tracey Toback, DPM & Patrick Agnew, DPM** Measuring the Child Workshop
- 3:30-4:00 pm Break & Visit Exhibitors
- 4:00-5:15 pm **Phil Bresnahan, DPM** Extraosseous Talotarsal Stabilization Workshop (Non-CME)

This conference is intended for podiatric physicians and other medical specialties dealing with the pediatric lower extremity. No prerequisite levels of skill, knowledge, or experience required of learners.

This activity has been planned and implemented in accordance with the standards and requirements for approval of providers of continuing education in podiatric medicine through a joint provider agreement between the William L. Goldfarb Foundation as a provider of continuing education in podiatric medicine. The William L. Goldfarb Foundation will be seeking approval this activity for a maximum of 12.5 continuing education contact hours.

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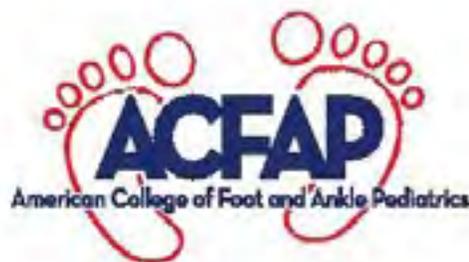
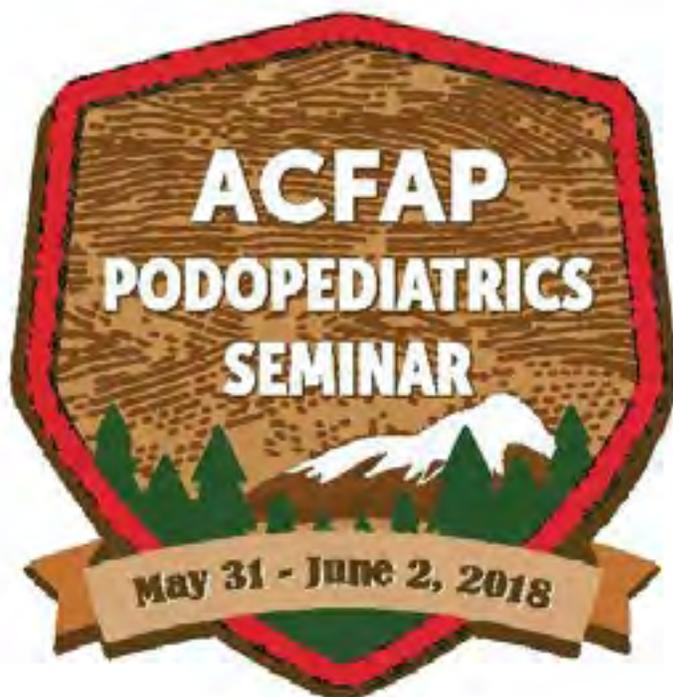
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Full refunds given for cancellation on or before Jan. 1, 2018. No refunds after Jan. 1, 2018.

Please detach and mail form with payment



is proud to present the

4th Annual

**ACFAP
INTERNATIONAL
PEDIATRIC FOOT & ANKLE
SEMINAR**

to be held at

**Grand Tetons National Park
Snake River Lodge & Spa
Jackson Hole, WY**

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Presidents Message



Hello fellow ACFAP members!

ACFAP 2018 Annual Scientific Meeting is 1 month away! We are continuing the National Park “tradition” at the Snake River Resort & Spa in Jackson Hole, WY, May 31 – June 2, 2018. Once again we will precede the meeting with a group outing in the Grand Tetons National Park on May 31st. Back by popular demand we have once again lined up professional photographer and tour guide, Mr. Don Toothaker (toothakerphoto.com) who has conducted expeditions in the Grand Tetons over 10 times.

The scientific part of the conference will take place in Jackson Hole, WY on Friday and Saturday June 1-2, 2018. This CME (12 CME’s) event will feature leading authorities on pediatric foot and ankle conditions. It will cover topics both conservative and surgical. As well the seminar will feature new and exciting panels and workshops. There will be all new topics including radiology, dermatology, vision assessment, and the importance of sensory stimulation.

This year’s ACFAP conference will be at the gateway to Grand Teton National Park in Teton Village, Wyoming.

Teton Village is a small gathering of hotels in an unincorporated district of Teton County at the base of world famous Jackson Hole Mountain Resort. The busy side of Grand Teton National Park is in Moose, Wyoming- 14 miles north of the town of Jackson and nearly 1 hour from Teton Village. Teton Village boasts the “quiet” entrance to the park. Far fewer vehicles/people access the park from the HWY 390 entrance.

At this years meeting we are excited to welcome Stephen and Christy McDonald. They will be attending ACFAP 2018. Stephen McDonald, C. Ped. and his wife Christy have worked in the ski business for years and own a ski shop in town. They are 25-year locals and are happy to take calls (307) 413-5745 & emails Stephen.mcdonald@hotmail.com about nearly anything Jackson Hole related.

Things to do in Jackson Hole:

Riding Jackson Hole’s iconic tram is not just for the winter! Breathtaking views of seven mountain ranges await those who travel to another ecological world in an alpine environment. Light snacks and beverages are available at the top of the tram, but packing your own lunch is the way to go. Many hotels and restaurants in Teton Village offer a “box lunch” (also known as a “Guide’s Lunch”). These are very popular with local guides and visitors alike and will keep you fueled up and ready for the action.

There are several hiking trails from the top of Rendezvous Mountain. Make sure to bring a sweater or jacket. The elevation at the top of the tram is 10,451 feet and will be considerably chillier than the valley floor. Hiking down from the tram is a popular activity. Seven miles of downhill hiking will bring you through gorgeous and wild alpine meadows. Most

locals hike up and ride the tram down. It takes about four hours and the ride down is free.

Cocktails on the Terrace: Depending on weather and snow pack, the Terrace at the top of Bridger Gondola may be open for afternoon beverages and light food. Sometimes there is a local band playing music. This is an extremely popular activity with the locals. The view is excellent; the ride is free- even if you don't order off the menu! Very scenic. It's possible to spot deer, moose and even bear living happily on ski runs in the summer months.

Bike Paths Everywhere: While the conference is at the base of some of the most rugged mountains on North America, the valley is as flat as a pancake. It is possible to quietly pedal for hours on a bicycle and never have to ride on a public road or navigate a hill. Christy and Stephen will be hosting an evening ride (tbd) and will talk about the history and culture of Jackson Hole. It's very popular to ride to the most excellent Pearl Street Bagels in Wilson for morning coffee and breakfast. "Downtown Wilson" is what locals call a gathering of shops at the base of Teton Pass- it's home to some fun shops and places to eat.

Paragliding: One of the more adventurous activities is paragliding off the top of the tram in the summer months. Experienced pilots will fly you in a tandem rig as you silently sail around the mountains and canyons of the Tetons. Very safe, yet on the edge, this one is a winner. Soar like an eagle in Jackson Hole. You won't forget it.

Float the River: From mild to wild, Jackson Hole has whitewater. For families with young or old, scenic floats are absolutely delightful. For those seeking a white-knuckle experience, any of the local companies can arrange to bring you down the whitewater section of the Snake River. Class II and III rapids and depending on snowmelt, a few Class IV rapids may be present. Very fun.

Guided Fishing Trips: Is that a fishing trip or a quiet and private float down one of the prettiest rivers anywhere? You be the judge. Also popular is taking a private fly fishing trip in a drift boat- and not fishing. It's a great way to spend the day with a local on the quiet sections of the river. You may even catch a Cut Throat Trout to bring back to the chef at your hotel!

And More... So much more....see you soon! And if your not coming I will see you in the Smokey's next year!!

Once again, I want to again welcome all past, future, and current members of the American College of Foot and Ankle pediatrics to this new era not only in this organization, but also in the education of pediatric foot and ankle medicine. Thank you to each and every one of you for making this all possible!

Louis J. DeCaro, DPM
President, ACFAP
www.acfap.org

An Anecdotal Journey of Effective Wart Therapy

Michelle Kim, DPM

My first exposure to the word verruca was from the book *Charlie and the Chocolate Factory*, and the incessant and stubborn whining associated with Veruca Salt's demands was actually an accurate depiction of warts and their tenacious ability to remain rooted in the skin. Studies in our medical program did not focus on these pesky viruses, but rather on grander topics such as the radiographic appearance of giant cell tumors or the peaks and troughs associated with aminoglycosides. Little did I know at the time, treating these sixty plus strains of the human papilloma virus during my residency years would not only become a regular occurrence, but a source of dread as well.

"Dr. Kim, this is an eight year old male presenting with warts on his left foot."

Hearing those words would give me mild anxiety.

I had my weak arsenal of a greenish-blue and slimy salinocaine concoction that had the efficacy rate of a whopping zero percent. Most likely that jar of paste had been there for thirty or more years, when my attending had first opened his practice. Instead of the everlasting gobstopper, it became the bottomless wart cream. Then there was the limited prescriptions available at that time: Lazerformalyde (too drying), Carac (indicated for actinic keratoses), Tagamet (heartburn pills), duct tape (what can't duct tape fix, apparently?), Compound W/salicylic acid patches (OTC and most likely already failed). All of these were pretty much hit or miss. I would start with one and go down the line, while crossing my fingers when the patient came back in a few weeks, in hopes that some improvement was seen.

Cryotherapy was not available to me at the time. Pulse dye laser was though. I had a love-hate relationship with the PDL. Loved

when it worked fifty percent of the time, and hated it the other fifty percent when several painful treatments later there was no change in the lesions. It was difficult to explain to the patient why they had endured five minutes of rubber-band-like snapping sensations to their foot for naught.

Another attending cut to the chase and went straight for CO2 laser excision. This works. We burned holes in the patient's foot, and their warts were quite obviously ablated for good. However, this required bringing the patient to the operating room for equipment purposes and creating wounds in the foot that necessitated post-op care. Most patients were not enthused about surgery as first-line therapy for their wart.

It was not until my first post-residency job that I discovered the magical liquid called Cantharone Plus. This potent combination of cantharidin, podophyllin, and salicylic acid was like a dream come true. *Why had I not been exposed to this before?* I wondered. I would apply a small dab of this every two weeks until the warts were gone. It worked a majority of the time. Finally, I had found a treatment plan that I could convey to the patient with more than an iota of confidence.

During the next several years I dabbled with cryotherapy, imiquimod, vitamin therapy, foot hygiene, compounding creams, and sharp excisions. All became adjunctive therapies to the Cantharone Plus. My practice was fortunately able to purchase an Nd:YAG 1064 nm laser for onychomycosis, which was also programmed for wart-targeted therapy. This does require local anesthesia, but it leaves the patient with a stable eschar instead of an open wound--a much more favorable outcome from the patient's viewpoint. With this full cache of remedies available, the wart patient no longer brings me feelings of trepidation. Instead I am

able to assure the patient of ridding them of their unpleasant skin virus with certainty.

For the pediatric population, the general protocol in our practice is:

1. Apply Cantharone Plus to debrided lesion. Patient is to leave bandage intact for at least 4 hours. A 1/2"-27 gauge needle is given to the parent in case a painful bulla is to form. Generally piercing the site and expressing even a drop or two of the serous fluid is enough to relieve any pressure. Only on the rare occasion does a deep bulla form which requires an in-office lancing. The key is not to be too heavy-handed on that first application to test the patient's skin response. Cantharone Plus is a great tool for children because it is absolutely painless at the time of application. As we all know, pain is generally the child's biggest fear. It is only available to medical professionals.
2. For new and superficial lesions, we have the parent apply vinegar and duct tape to the site once daily. For older and deeper lesions, a prescription for Aldara (imiquimod 5%) is given for patients ages twelve and up. For the younger population, a compounding cream with Cimetidine 10%, DDG 0.2%, Ibuprofen 2%, Lidocaine 5%, Tea Tree Oil 2.5% (or equivalent combination) is prescribed. An in-office retail product can also suffice.
3. Disinfection of shoes and showers daily.
4. Vitamin boost. Patients are encouraged to take double their multivitamin dose for one month. For more severe cases, zinc and vitamin A are added as well.
5. If there is significant hyperhidrosis which leads to a wet and unfavorable environment, frequent sock changes and antiperspirants to the feet are also recommended. Foot soaks with Domeboro or Sweat Stop are advised should the condition be severe.
6. Return to clinic every 2-3 weeks until lesions are completely resolved.

Patient participation is highly encouraged. It is explained how skin viruses such as HPV can oftentimes be recalcitrant to treat-

ment, and usually a consistent series of visits are required.

Inconsistency or lapse in treatment will lead to full regrowth of the lesions. With this protocol, the average pediatric patient will have full resolution of their condition in approximately four to five office visits. If the verrucae are not clearing as expected, then the other aforementioned adjunctive treatment options are introduced based upon the patient's tolerance for pain and extracurricular activities.

It baffles me when other physicians tell their patients to purchase OTC medication and not to come back to the office. Having follow-up visits every few weeks is not only important to properly debride and evaluate the progress of the condition, but it is also a practice booster. As a perfectionist, it is important for me to give the patient the best and fastest outcomes possible.

I am sure my journey will continue to evolve as new medications and technology emerge. This baseline treatment plan, one formulated through trial and error over my twelve years in practice, would have been extremely helpful when I was just a newbie.

If there are any other pearls to be added, I would love to hear them.

Dr. Michelle Kim is a Chicago native. She graduated from the Dr. William M. Scholl College of Podiatric Medicine and had residencies at St. Mary of Nazareth and Loretto Hospitals. She has a joint private practice in Lemont, IL, which provides general medical and surgical foot and ankle care, with an emphasis on aesthetics.

Sensory Stimulation in Childhood Motor Development

Emily Splichal, DPM, MS

Our whole body is designed for collecting and interpreting sensory information. From our eyes and ears to the skin on the bottom of our feet, sensory input collectively helps shape our ability to learn, move and express our emotions.

Our sensory input systems are so vital to learning that their formation begins developing in utero at just 23 days post-conception.¹ Neural pathways grow out of each unique sensory experience, laying the foundation to higher levels of brain development.

As Podiatrists, we are able to help children in their sensory development through optimizing stimulation of the skin on the bottom of the feet. Our footwear and orthotic recommendations for pediatric patients could potentially benefit or interfere with their motor and learning potential.

The Power of the Plantar Foot

The glabrous skin of the plantar foot houses hundreds of mechanoreceptors which are sensitive to two-point discrimination, deep pressure, skin stretch and vibration.² When we walk, climb and explore our environments, the sensory stimulation of the foot goes through the brain stem to the thalamus and then to the somatosensory cortex of the cerebrum to shape motor development and coordination.³

Jean-Ayres, the founder of Sensory Integration Theory, has demonstrated that when touch is lacking in children, as in the case of chronic sock and footwear use, it can be associated with depressed motor and mental functioning. She has further found that a lack of sensory nerve stimulation can

negatively affect the Reticular Activating System (RAS) which is critical in awakening the neocortex. This can lead to impaired muscular movements, overreaction to stress, emotional disturbances and learning deficits.

The Impact of Children's Footwear

The decision of early footwear use in a child that is in their peak window of neuroplasticity could potentially interfere with the development of balance and locomotion. Successful movement requires balance, which depends on the sophisticated proprioceptive and mechanoreceptive system to constantly auto-adjust for every shift in the center of gravity.

Unfortunately little research exists on the impact of footwear and interfering with the touch stimulation of the plantar foot in children, however if look at adult-based research there is a lot of supportive data suggesting the potential impact in pediatric patients.

Robbins et al. has demonstrated that as cushion in shoes increases older subjects demonstrated an increased medial lateral sway or impaired dynamic postural control.⁴ Robbins et al. further demonstrated an impaired foot position sense as shoe midsole hardness decreased. It was concluded that softer midsoles created a perceptual illusion of impact forces and surface structure. This altered stimulation and responses by the nervous system.

The Advent of Sensory Rich Children's Footwear

With the association between touch and sensory stimulation with optimal learning and motor coordination, many parents are now opting for more minimal footwear choices for their children. Manufacturers such as [VivoBarefoot](#) and [SoftStar Shoes](#) are creating soft leather-soled shoes that provide full foot stimulation with minimal support and are on a mission to bring the awareness back to the plantar foot.

In the child that has hypermobility and flexible pes planovalgus, where a more supportive shoe and UCBL is desired, Naboso Technology may be the answer to optimizing sensory stimulation. [Naboso Textured Insoles for children](#) bring the sensory stimulation of a barefoot environment into all footwear, allowing Podiatrists to provide support and control to an unstable foot while still maintaining touch stimulation.

Another great option for all children is, regardless of footwear, to incorporate barefoot play into their daily routine. As Podiatrists, we have a responsibility to help ensure future movement coordination and motor programming in our pediatric patients. The balance between biomechanics and sensory should always be at the forefront of our decisions and recommendations to parents.

This is an exciting area of childhood development and Podiatric management. I am sure we will begin to see future research related to the impact of footwear, foot stimulation and brain optimization in children.

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[Dr. Splichal](#) believes that our experiences in this world are built around sensory stimulation and our ability to process, perceive and integrate this information effectively. Since 2012, Dr. Splichal has been traveling the world to share her unique approach to human movement, foot function and barefoot science. Having taught in 35 countries and to over 20,000 professionals, Dr. Splichal has quickly become a global leader in barefoot training and rehabilitation.

The Kidner Procedure: Surgical Techniques in the Pediatric Patient

Stephanie Varghese, DPM

Arch pain among our pediatric patient population is a common complaint. Many children who have decreased arch height can also arch fatigue and pressure to the bones of the medial arch, the most common of which is the navicular. In approximately 15% of the population the navicular is enlarged or has accessory bone called an os tibiale externum or accessory navicular.⁵ This is a condition more commonly seen in females. The majority of patients with this finding on imaging are asymptomatic but especially those with larger, more prominent accessory navicular bones find that the enlargement can cause pressure or friction

resulting in pain in shoes.⁵

The navicular bone normally has a one center of ossification that ossifies at age 3 in girls and 5 in boys and fuses at 13 years of age in both sexes. An accessory navicular forms when a secondary ossification site occurs at the navicular tuberosity and fails to unite to the rest of the bone.

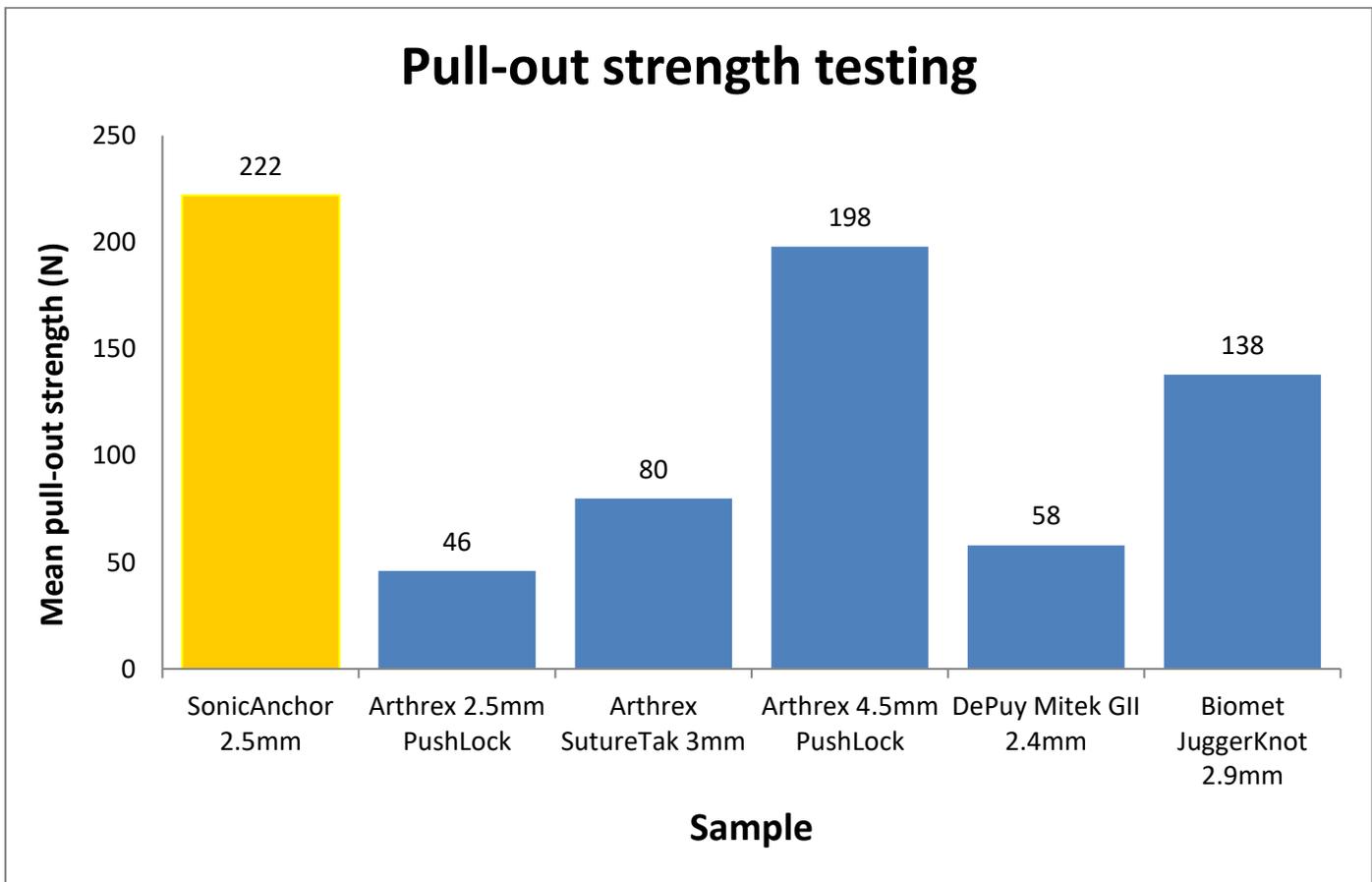
Accessory navicular syndrome symptoms typically begin in the teens, when cartilage is developing into mature bone tissue. Physical examination will often show bony protrusion on the inside middle of the foot



13 year old female patient with Geist type I accessory navicular



13 year old female patient with Geist type III accessory navicular



just above the arch, accompanied by edema and erythema and patient complaint of persistent or throbbing pain in the arch especially during or after activity.

Radiographs should be performed including a medial oblique view to assess the navicular. To determine if the navicular is enlarged medially, draw a line connecting the medial edges of the talus and the medial cuneiform. If the navicular extends over this line, there is enlargement present. The Geist classification system divides accessory naviculars into 3 categories:

- Type I: Discrete 2-3mm sesamoid bone found within the insertion of the posterior tibial tendon, usually asymptomatic
- Type II: Separate accessory bone attached to navicular via synchondrosis, typically 12mm

- Type III: Complete bony enlargement, gorillaform or cornuate navicular³

Also use your imaging to rule out differentials including Kohler's disease or avascular necrosis of the navicular characterized by flattening of the navicular accompanied by increased bone density. If the patient also presents with flatfoot deformity, signs of posterior tibial tendonitis or if you suspect inflammation of the synchondrosis, consider ordering an MRI.

Conservative treatment options should always be exhausted. The use of arch supports or pads over the bony prominence may be helpful as long as the orthotics have accommodation for an enlarged navicular or it may cause further pressure and increase in pain. Another option is a UCBL orthosis which can invert the heel during ambulation and decrease pain. Activity restriction is also recommended with oral NSAIDs as needed.



16 year old female patient with Geist type II accessory navicular and flexible flatfoot deformity surgically treated with Kidner and STJ arthroereisis

for inflammation. If the pain persists, consider a CAM boot immobilization for a few weeks.

When conservative measures fail, surgical excision should be considered. This involves a medial approach creating an incision from distal third of talus to medial cuneiform, identifying the posterior tibialis and then reflect the tendon, identify the synchondrosis between the accessory navicular and native navicular and resect the accessory navicular through the synchondrosis typically with an osteotome and mallet. The remaining body of the navicular is then remodeled restoring the navicular medial border to medial border of the medial cuneiform.⁵

The classic kidner procedure requires advancement of the posterior tibial tendon, inferior to the navicular bone or modified onto the medial cuneiform to increase its adductory force on the forefoot.⁴ However, this advancement of the posterior tibial tendon should not be performed unless flatfoot is the primary pathology because it increases downtime and morbidity. I prefer to reattach the posterior tibial tendon into it's anatomic site of insertion at the medial navicular using a Sonic Anchor. I find it to be the ideal option for the pediatric foot due to small size (2.5mm) and ability to allow for the interdigitation of the implant within cancellous bone structure as well as superior pull out strength.^{6,7}

Case series review by Nakayama et al cites that that percutaneous drilling of the synchondrosis in symptomatic type II accessory navicular is effective especially in patients with an immature proximal phalanx. The study looking at 31 feet in 29 patients that underwent percutaneous drilling of their type II accessory navicular bone resulted in 96.8% with good or excellent results and an 80% union rate postoperatively in patients with immature proximal phalanx.¹ This is a great surgical option with vastly reduced post-operative recovery for our pediatric/adolescent population which is especially important for young athletes who want to remain active and wish to return quickly to their sport.

If the accessory ossicle present sin a child whose main concern is flatfoot deformity, there may be other necessary concomitant procedures such as a Kidner-Cobb, a sub-talar joint arthroereisis to restrict motion at the STJ or an Evans to correct transverse plane deformity.^{2,3}

The Kidner procedure is a relatively low risk surgery with good outcomes and high chance of normal functioning after rehabilitation. Post-operatively, the patient will need to be in surgical cast for about 2-3 weeks, transitioned to weight bearing in

a boot for an additional 2-4 weeks. After 6 weeks, patients can begin full weight bearing and start rehabilitation, returning to their normal functioning after 3-4 months of therapy.⁵

References:

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Dr. Stephanie Varghese is a member of the American Podiatric Medical Association (APMA) and an associate of the American College of Foot and Ankle Surgeons (ACFAS). She is in private practice at Barking Dogs Foot and Ankle Care in Plymouth Meeting, Pennsylvania.

Hypophosphatemia and Pediatrics: Is it always Rickett's?

Nicholas Pagano, DPM, FACP, FAS

In dealing with pediatrics, common bone deforming diseases like Rickett's, Early Osteoarthritis and Osteogenesis Imperfecta are recognized, but hypophosphatemia can also lead to bony abnormalities in our pediatric patients. Due to a lack of knowledge and recognition of the symptoms, this diagnosis in the milder forms is often overlooked and not diagnosed until adulthood.

Hypophosphatemia is a rare inherited metabolic disorder with a finding of non-specific alkaline phosphatase. Due to this, bone production is decreased due to defective mineralization of bones and teeth. This leads to weakness and in its most extreme forms mortality in infancy primarily from respiratory complications. NSALP is critical to the formation of hydroxyapatite and bone mineralization is decreased leading to the manifestations of this disease.

Upon evaluation and management, HPP presentation is variable. The clinical presentation can include bone deformity, rickets, osteomalacia, non-healing fracture, dental abnormalities especially early tooth loss before the age of 6 year, pain, seizures, respiratory compromise (leading to mortality), muscle weakness, and functional impairments (leading to disabilities in adulthood).

That lack of bone mineralization can lead to multiple non-traumatic fractures. With the lack of regulation of calcium and phosphate, there can be findings of hypercalcemia, hyperphosphatemia, ectopic calcification, nephrocalcinosis, and calcium pyrophosphate dehydrate (CPPD) arthroses (pseudogout/ chondrocalcinosis).

Currently, incidence rate is unknown.

When there is a suspicion of HPP, a low serum alkaline phosphatase (ALP) can be seen on labwork, and HPP can be diagnosed with confidence when an age and gender-adjusted low serum ALP level is accompanied by evidence from medical history and physical/radiologic findings.

To separate from Rickett's, patients do not have the expected low serum calcium and serum levels of the bioactive forms of vitamin D and parathyroid hormone (PTH) are typically normal. However, some HPP patients may exhibit hypercalcemia with an accordingly low serum PTH level, and low serum PTH levels may be evident when there is only hypercalciuria.

On radiographic studies, cupping and fraying of the metaphyses of long bones with widened growth plates and spotty demineralization of the epiphyses.

A radiolucent "tongue" shape is commonly seen projecting from the epiphysis into the metaphysis of long bones.

In infants and children, several organ systems may be affected: Pulmonary is characterized by respiratory failure, neurologically; there are increased cranial pressures and seizures. In the skeletal system, increased fractures, rickett's osteomalacia, skeletal deformities can be seen. A trademark finding is loss of deciduous teeth prior to the age of 6. In the child's development, there will be the presence of missed milestones or delay in milestones.

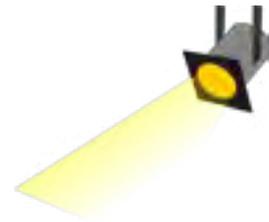
Differential Diagnosis include: nutritional rickets, osteogenesis imperfecta, Chondrodysplasia with bone mineralization defects, Dentinogenesis imperfecta, Osteoarthritis, Osteopenia/osteoporosis, and Periodontal disease.

When evaluating your pediatric patient, it is always important to get a good family history and developmental history. With the knowledge of HPP, it is important to not just focus on the developmental landmarks, it is important to discuss the dental history as well. Early loss of teeth is a clinical indicator in pediatric patients when presenting with the symptoms discussed above.

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Altra Footwear

Altra Footwear wasn't started in some corporate office, but in the back room of a Wasatch Mountain running store. Our founders, —elite athletes and running store managers, — wanted a shoe that let you run the way you were born to. They noticed that the design of most running shoes was hurting runners more than helping them. Elevated heels promote high-impact landing and narrow toe boxes squeeze the toes out of their natural position. They also knew that many foot problems developed at a young age when little ones' feet were crammed into traditional toe boxes.

What began as experimental shoe alterations has transformed into the only shoe company to provide a cushioned Zero Drop™ platform and FootShape™ toe box, as well as a female-specific Fit4Her™ design. This innovative trio promotes low-impact technique and allows your feet to remain in a natural, relaxed position across every terrain, and in every aspect of your life.

Our Zero Drop™, FootShape™ shoes are particularly beneficial for children, especially prior to the age of 12. Before age 12, children's feet are very malleable and most susceptible to take on the shape of their footwear. Too often, this means creating an unnatural, tapered shape to their foot and developing foot maladies including bunions and neuromas from a young age. Think of the natural wedge shape of a newborn's foot and compare that to a child's foot that has worn traditional shoes, sadly you often see a huge difference in the two and it is not a good one.

The good news is this; although foot health starts from day one, it is never too late to help your or your children's feet! Whether you are looking for shoes for your 10 year old child, or yourself, take charge of your and your family's foot health and posture and try Altras today!



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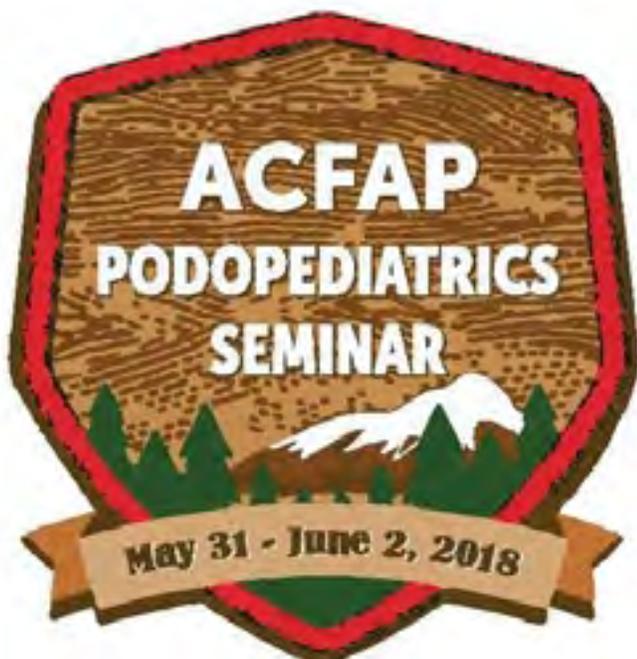
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