Diagnostics for PT

ISSUE 2

THE REVOLUTION OF PHYSICAL THERAPY

DEFINITIVE STEPS TOWARDS PROFESSIONAL AUTONOMY

THE USE OF ELECTRODIAGNOSTIC STUDIES

AND MUSCULOSKELETAL SONOGRAPHY IN CARPAL TUNNEL SYNDROME

DOOR TO THE FUTURE OF PHYSICAL THERAPY

INTRODUCING...

THE FIRST EVER MSKUS FELLOWSHIP IN THE WORLD

HIGHEST QUALITY PATIENT CARE | GREATEST GROWTH IN INCOME

WINNING. WINNING. WINNING.

NEW YORK, NEW YORK If you don't like winning, I want to personally warn you in advance– this is not the magazine you want to pick up. Why? Because lately it just feels that everything connected to this diagnostic revolution for physical therapy is in a season of winning.

I hate to say it, but we're getting tired of winning. Not really, but figuratively.

From a landmark decision that gives a virtual green light for PTs to essentially qualify for 100% reimbursements on MSKUS... to the brand new, first-of-it's-kind Fellowship Program we launched... there is no better time to take embrace this golden opportunity with Hands-On Diagnostics.

If you're looking to grow your practice or trying to figure out a retirement solution, you've come to the right place at the right time.

Or maybe you're really just looking to learn more about diagnostics and see if "all the hype is real." Still, you've come to the right place.

Then maybe you're already a franchise partner with Hands-On Diagnostics and you're just looking to sharpen up your skills and get a little extra motivation to keep changing lives and making a difference in your city... there is no better time than the present.

There are so many "firsts" that accompany being connected to a pioneering organization like Hands-On Diagnostics that it's very easy to take them for granted. And one of the purposes of this magazine is to help make sure that we celebrate the "small wins" as well as the huge, breakthrough that seem to be happening every other week.

As it pertains to this diagnostic revolution, everyone wins. Be it the patient who is now able to *see* what hurts and receive treatment that produces a faster and bigger positive outcome, he/she wins.

Or if it's the part-time PTA who you almost had to layoff due to a shortage of revenue, but now because you're able to get reimbursed at 5-10x your average rate, they win as well.

These are wins we want to celebrate. Wins that we could actually never get tired of. This is why there is *Diagnostics for PT*.

Winning.

Bryson G. Baylor

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Diagnostics for PT

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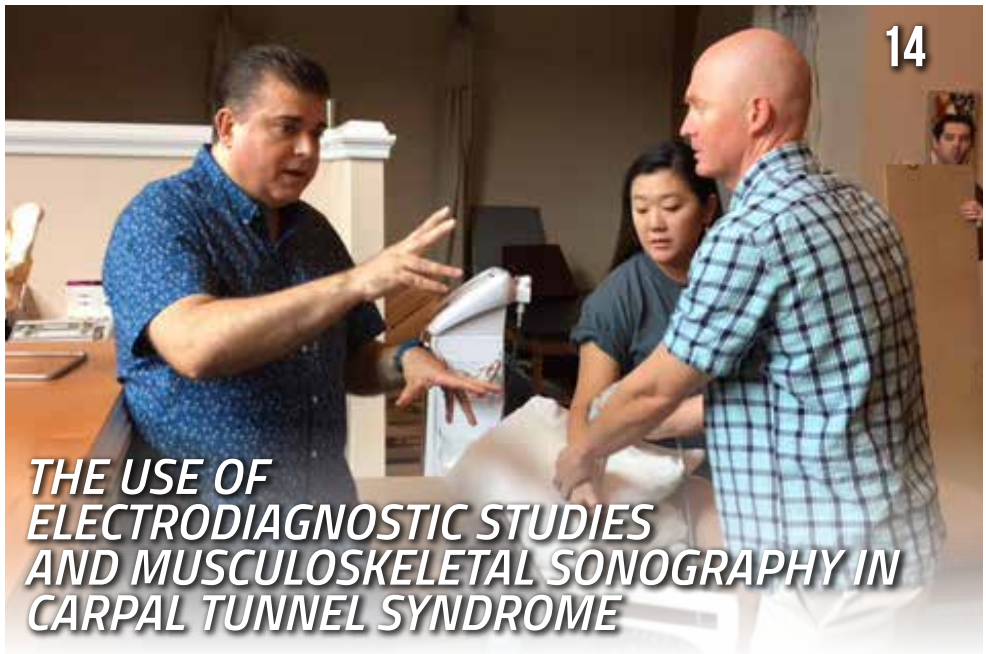


THE REVOLUTION OF PHYSICAL THERAPY

A Message From the Hands-On Diagnostics Board of Directors...

NEW YORK, NEW YORK Constant improvement is one of the fundamental foundations we have as the Board for Hands-On Diagnostics. If there are any constants that we can assure you of in our organization, it is that of a constant quest for improvement. Our aim is to create true professional autonomy for the private practice physical therapist and the way we'll get to that is through constant improvement, innovation and leverage.

As a relatively young franchising company pioneering a brand new paradigm into the physical therapy world, we are constantly innovating and thinking of new and better ways for our franchise partners to truly be successful. Our desire is to equip their practice for providing top-notch care to their patients while being able to generate as much revenue as possible.

Whether it be constantly improving our weekly mentorship webinars, exploring the best methods and techniques for diagnostic testing or creating world-class training events, we are creating a culture of excellence and awe.

Right next to constant improvement, is establishing the foundation for tremendous leverage. Growing at our current rate enrolling new partners and opening new territories across the country, we are building an organization that will have tremendous leverage. And that leverage directly benefits you, our franchise partners.

FROM LEFT: DR. DIMITRIOS KOSTOPOULOS, MR. CRAIG FERREIRA, DR. KOSTAS RIZOPOULOS

Such leverage has already been demonstrated by striking nationwide exclusive contracts with some of the top Worker's Compensation carriers, reversing to our favor insurance company policies, achieving huge price breaks for equipment, supplies and lots more.

As we continue opening HODS participating facilities around the country, we are building towards optimal leverage that will allow us to approach large insurance carriers and get exclusive reimbursement rates to HODS providers. The effects of further such acknowledgements would significantly boost the value of your franchise on multiple levels.

Concerning innovation, we recently provided one of our greatest achievements thus far as an organization– the Hands-On Diagnostics MSKUS Fellowship. It's the first of its kind in the entire world. If you sit back and consider how big that is, it should make each and every one of our partners extremely proud because the results are so multi-faceted. From what it means for your franchise, your team of professionals, and your leverage for hiring new talent.

This fellowship provides an even greater level of credibility for Hands-On Diagnostics when dealing with insurance companies, other PT-related organizations and even for prospective franchise partners. And like all of our initiatives at Hands-On Diagnostics, it's only going to continually get better and better over time.

We're looking forward to the first group of participants we can award with our patent-pending recognition as "FMSK"– a fellow of MSKUS. You can read more about the HODS Fellowship in this issue to learn more about it.

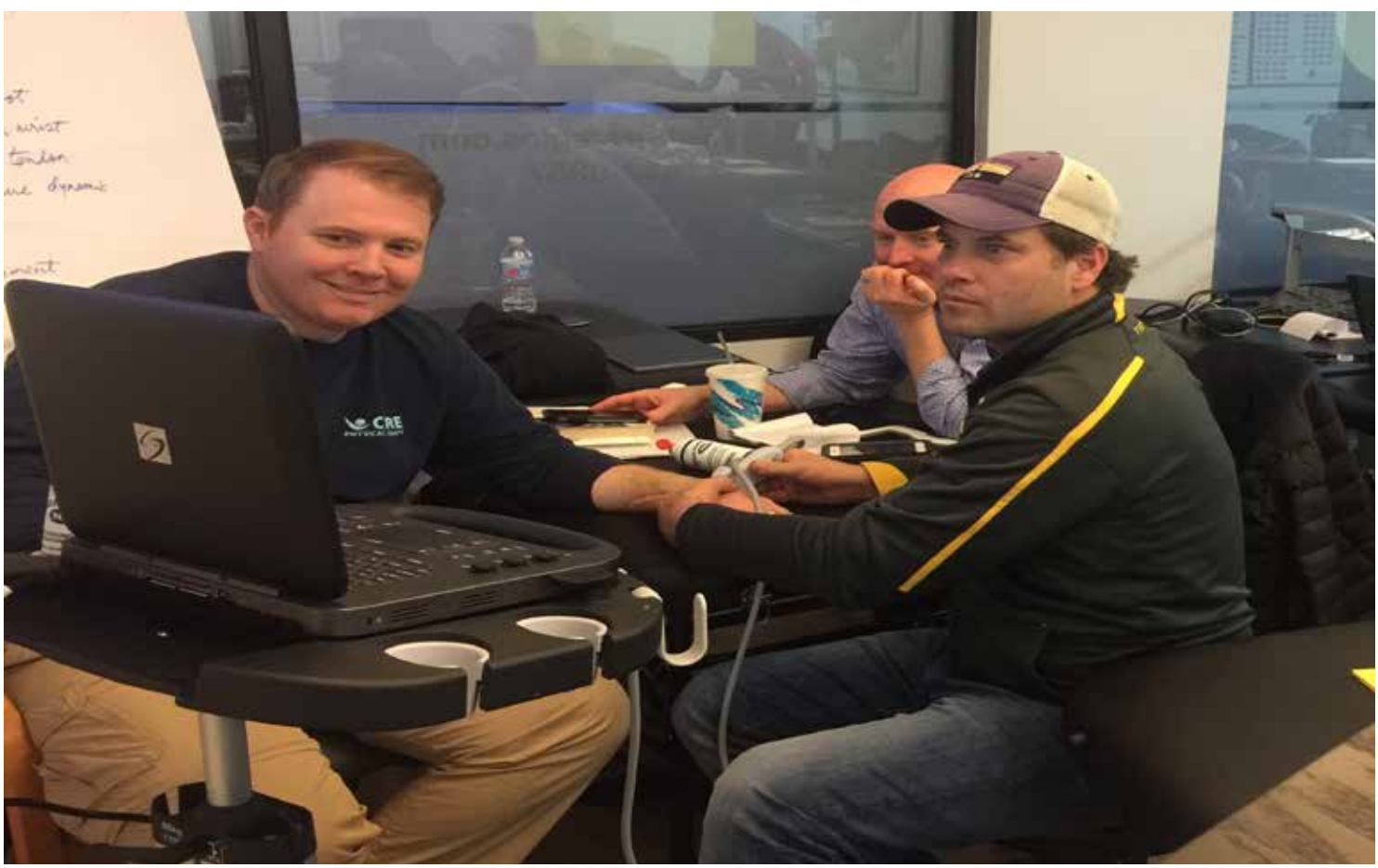
In addition to these leverageable initiatives we're developing for HODS, we are working on several more we wanted to touch on.

For one, we are launching a brand new nationwide marketing campaign that will give your practice even more exposure and preeminence in your territory. At this phase of our company's growth, we've done a pretty good job making PTs aware of the potential and possibilities diagnostic testing can provide for their practice. Now, we want to make the *public* aware that there's a better, more accurate and advanced way to recover– and that's diagnostic testing… only with a HODS approved facility

Imagine for a moment, patients asking their physicians for referrals to a PT that uses the advanced technology provided exclusively by our HODS partners. How awesome would that be? We'll be creating a demand for diagnostic testing from the consumer-side making us the leading choice for physician referrals.

What would this mean for our partners? It would mean more new patients for your practice. But those new patients aren't just limited to utilizing diagnostics, but they'll take advantage of all the other services you offer. It also means more potential referral sources from physicians that you possibly have been unable to access. It also means the chance for more partnerships and collaborations to further expand the diagnostic testing capability of your practice.

Leverage is what we're really looking to capitalize upon for the organization in the upcoming year and we are on pace for big results. Pioneering in the diagnostic field as we are inevitably comes with a few bumps and bruises, but we're here for the ride. Hands-On Diagnostics is committed to creating an environment for private practice owners to thrive and have autonomy in their profession, but also in creating the life they envision for themselves. We're extremely excited at what the future holds.



A PASSION FOR THE PRIVATE PRACTICE

How Hands-On Diagnostics is establishing a company culture that puts the PT first.

BY
DIMITRIOS KOSTOPOULOS
DPT, MD, PHD, DSC, ECS

NEW YORK, NEW YORK. I became a Physical Therapist over 30 years ago and a lot has changed since then. I've been on just about every side of the life of a PT. From working in a hospital all the way to owning a sprawling empire of clinics throughout New York City. In fact, at one point in time we operated the 2nd largest private practice in all of New York state. Trust me, I've seen it all.

At this stage of my career and with all the accolades, all the accomplishments and recognitions I've been afforded, I've developed a keen desire to help physical therapists. More than simply doing a few talks here and there, I really have a passion to see the profession grow in respect and honor...and of course to see PTs compensated more closely to what they deserve.

Having been a part of this fraternity for the majority of my life, I've gained a perspective on the practice and on it's practitioners. This is what makes my role with Hands-On Diagnostics so valuable and what makes our organization so special. Unlike many franchising companies, so many are only in it to make a quick buck off of PTs who are "in it" for an honorable purpose.

I know what it's like to provide treatments that will never see the light of any reimbursement from insurance companies yet do it anyways. Not because we're martyrs, but because we genuinely want to see our patients achieve the best possible outcomes.

It may sound like a cliché' but I wholeheartedly believe our profession is foundational to the success of our cities and our nation. We put people back to work, back to chasing their passions and dreams... back to their life again.

That's why I look at my relationship with PTs as more of a fiduciary-based relationship. Obviously, to the Hands-On Diagnostic franchise partners, I have a more stricter and defined fiduciary relationship. Yet and still, when it comes to all the articles, emails, lectures, interviews, videos and other means of communication with PTs (especially private practice owners), I feel I have a valid responsibility as a trusted advisor.

These small, but significant factors contributes to making Hands-On Diagnostics such a special company for private practice owners to be a part of. Our entire agenda and motivation is built around uplifting the profession and engendering true, professional autonomy.

When we developed our ground-breaking system for successfully (and profitably) implementing diagnostics into a physical therapy practice, we did so with physical therapists in mind. We built it knowing that if it doesn't meet our criteria of uplifting the profession and helping PTs earn more of what they deserve, it would

be hard (if not impossible) for us to build it like we desired.

And that's why I'm so proud of what we've been able to do as an organization in the short time we've been a national franchise. Our message is resonating with more and more private practice owners all over the nation because they see beyond the normal noise they hear about growing their practice and helping patients.

More specifically, lately I've been in dialogue with private practice owners showing how they can develop a very solid retirement blueprint using our diagnostics system. When PTs purchase a franchise, they are purchasing an asset that not only can produce significant revenue for the practice, but one that also drives up the value of the practice as a whole.

For one, having a HODS entity in your practice gives you additional leverage if you want to sell the practice. A second entity that is highly-profitable (like HODS franchises are designed to be) will help inevitably boost the value in a big way.

What we are providing through HODS is a viable retirement solution that virtually any private practice owner can implement

I'M IN FREQUENT DIALOGUE WITH PRIVATE PRACTICE OWNERS SHARING HOW THEY CAN DEVELOP A SOLID RETIREMENT BLUEPRINT WITH DIAGNOSTICS.

and scale to match their retirement goals. It's so much bigger than just providing advanced testing for patients and adding a new skill set to your tool belt.

While most investments may take several years to break even, the HODS opportunity provides a viable break even point within just a few months after joining the franchise and then keeps on building financial viability, stability and prosperity.

Here's the point I'm endeavoring to leave with you... Hands-On Diagnostics was created by PTs for PTs to help guide the profession and support private practice owners in ways once considered impossible until now. We are paving the way for a future in our profession that levels the playing field for physical therapists.

"Hands-On Diagnostics was created by PTs for PTs to help guide the profession and support private practice owners in ways once considered impossible... until now."

AIUM BREAKING NEWS...

The association for medical ultrasound aium AMERICAN INSTITUTE OF ULTRASOUND IN MEDICINE | Official Statements

HOW THIS RECENT ANNOUNCEMENT FROM THE AIUM IS BIGGER THAN YOU MAY REALIZE.

BY
CRAIG FERREIRA

LOS ANGELES, CALIFORNIA. What you're about to read is literally worth thousands and thousands of dollars in your pocket and a HUGE step towards professional autonomy.

The biggest and most-noble motivation for Hands-On Diagnostics is accomplishing one thing: totally elevating the Physical Therapy profession to levels of unfathomable professional autonomy.

The recent, special statement from the AIUM– the organization that works directly with insurance companies– is a big deal towards that. The statement will directly aid in the quest for PTs to achieve autonomy (not to mention greater profitability) in their practice.

What makes this announcement so special lies in the fact that it directly and unequivocally provides explicit validation for the PT to be recognized as a provider of Musculoskeletal Ultrasound Imaging. In other words, it validates the qualified physical therapist in the eyes of the insurance carriers when it comes to the test.

The most commonly asked question by PTs before becoming a HODS Partner is this: "Is it reimbursable by the insurance companies? "

And of course, yes it is... for the most part.

You see, different insurance carriers often have different criteria they use to judge the merit of a claim. And every so often a carrier would seek to deny the claim due to the fact they argued that a physical therapist was ineligible to provide the testing and as a result... the reimbursement request was rejected.

But now, with the new language in this landmark statement by the AIUM, physical therapists are recognized by this board to provide these kind of testings for patients. As a result, insurance carriers will no longer be able to successfully deny claims based on that argument.

This is tremendous news for HODS franchise partners as it will significantly increase claim approvals and further provide the professional validation of diagnostic testing.

The association for medical ultrasound
aium
AMERICAN INSTITUTE OF ULTRASOUND IN MEDICINE

Official Statements

Training Guidelines for Physicians, Chiropractors and Other Licensed Medical Providers* Who Evaluate and Interpret Diagnostic Musculoskeletal Ultrasound Examinations

Approved November 4, 2017

Physicians, chiropractors, and other licensed medical providers who perform and/or interpret diagnostic musculoskeletal (MSK) ultrasound examinations should be licensed medical practitioners who have a thorough understanding of the indications and guidelines for MSK ultrasound examinations as well as a familiarity with the basic physical principles and limitations of the technology of ultrasound imaging. They should be familiar with alternative and complementary imaging and diagnostic procedures and should be capable of correlating the results of these other procedures with the ultrasound findings. They should have an understanding of ultrasound technology and instrumentation, ultrasound power output, equipment calibration, and safety. Physicians, chiropractors and other licensed medical providers responsible for diagnostic MSK ultrasound examinations should be able to demonstrate familiarity with the anatomic, physiologic, and pathophysiologic characteristics of the anatomic areas that are being examined. These individuals should provide evidence of the training and competence needed to perform and/or interpret diagnostic MSK ultrasound examinations successfully. The training should include methods of documentation and reporting of ultrasound studies.

Diplomate status granted by the American Chiropractic Board of Radiology or the American Chiropractic Board of Sports Physicians and the supervision and/or performance, interpretation, and reporting of 150 diagnostic MSK ultrasound examinations, plus 30 hours of *AMA PRA Category 1 Credits*™ or *AOA Category 1-A Credits* specific to MSK ultrasound within the previous 36 months, including at least 1 MSK ultrasound course that provided hands-on training.

Other licensed medical providers who perform and/or interpret diagnostic MSK ultrasound examinations should meet the following criteria:

1. Completion of an accredited Doctor of Physical Therapy (DPT) program (or has earned the t-DPT) or an accredited PA program and documentation of involvement in the performance, interpretation, and reporting of 150 diagnostic MSK ultrasound examinations within the previous 36 months. Ultrasound examinations must be under the supervision of a licensed medical provider(s).

and

2. Completion of 30 *AMA PRA Category 1 Credits*™ specific to MSK ultrasound and at least 1 ultrasound course that provided hands-on training in diagnostic MSK ultrasound within the previous 36 months.

*Licensed medical providers, for the purposes of this document, include physicians, chiropractors, advanced clinical providers, and physical therapists.

Maintenance of Competence

All licensed medical providers who perform and/or interpret diagnostic MSK ultrasound examinations should demonstrate evidence of continuing competence in the interpretation and reporting of those examinations. A minimum of 50 diagnostic MSK ultrasound examinations per year is recommended to maintain the physician's skills.

Continuing Medical Education

All licensed medical providers who perform and/or interpret diagnostic MSK ultrasound examinations must complete 10 hours of *AMA PRA Category 1 Credits*™, *AOA Category 1-A Credits*, or CPME-approved credits specific to MSK ultrasound every 3 years.

See the full article... http://diagnosticsforpt.com/aium

THE FELLOWSHIP:

HODS MAKES MSKUS HISTORY YET AGAIN.

BY
KOSTAS RIZOPOULOS

NEW YORK, NEW YORK We are proud to say that the Hands-On Diagnostics Fellowship Program in MSKUS is the first and only non-physician fellowship program in MSKUS worldwide. There is no other organization that offers a fellowship program in MSKUS in the world for non-physicians to complete.

The program, aside from its extensive classroom time, requires the completion of over 200 sonography studies performed under mentorship environment. Students are assigned a mentor who works with them throughout the completion of the program. "Mentorships help students become truly competent in musculoskeletal ultrasound and guarantee their success," says program director Dr. Mohini Rawat, DPT, MS, CMP, RMSK, ECS, OCS.

HODS has filed (and is pending approval) with the United States Patent and Trademark Office, the title of FMSK– Fellow in MSKUS. Someone who becomes an RMSK and completes the fellowship program will be able to carry both credentials, RMSK and FMSK.

Here are two frequently asked questions...

#1. What is the program and how long is the program?
For someone to join the fellowship program, they have to join Hands-On Diagnostics. Then, in terms of the duration of the program, you can complete the program within 6 months to a year, depending on how fast you complete the courses.

There is constant feedback via phone, email and video conference. The insight provided through the mentorship is second-to-none.

After 200 mentored studies (which is 50 more than the ACPA requirement), you can attend the advanced module which is another mentorship module and get ready to take the exam. This coincides with you getting prepared to receive your RMSK credentials.

Having the luxury of a mentor working along with you, where they can look at your data, look at your images, provide you feedback and look at your reporting, is invaluable. It's of critcal importance to your development and you can't measure that.

> **"The Fellowship gives the PT an immediate edge when it comes to training and mentorship."**

#2 What will being a fellow accomplish for me professionally?
First of all, you'll be able to have the initials FMSK, in addition to the RMSK. Our organization will allow you to put in your resume as well as part of your credentials, FMSK- which means fellow of MSKU. And that would be a very high accomplishment and something to be proud of.

With MSKU you're essentially creating a totally different paradigm of practice. Just imagine with the various stages within that patient experience, you can now implement the diagnostic testing whether that is the MSKU, the electrodiagnostics or a combination of the two. Now through the incorporation of these testings, you are able to create much more effective and efficient treatment plans.

And at the same time, you can augment your revenue significantly while you are setting your practice apart from the competition.

Both the clinical benefits for your patients, the benefit for the practice and the business benefit to you is unfathomable.

What makes being apart of HODS special is that HODS isn't just a continuing education company. We stand by you in our mentorship to make absolutely certain you know the techniques, you're providing a quality product and, by extension, that you are able to be very well paid for that.

If you're interested in becoming a fellow, visit this link to learn more and apply... **diagnosticsforpt.com/fellowship.**

"50 - 60% PROFIT MARGINS!

Skeptics said we couldn't successfully integrate EMG's and other diagnostics into our practice, but we saw the future and we were right. Big time!

Nathan Shields, P. T. - Co-Owner,
Rise Diagnostics, Wasilla & Anchorage, Alaska
Rise Rehabilitation Specialists, Arizona

Photo Courtesy of Whitny Shields Photography

"DIAGNOSTICS doubled our practice ...and this is how I did it!"

Before HODS, me and my partner, Will Humphreys, were looking for something different within physical therapy. We were searching for something that would set our clinics apart and make us a little more niche.

"Because physical therapy has become so commoditized, we needed to do something different that could increase revenues but stay within the physical therapy realm."

We mulled over several options that piqued our interest, but nothing really excited us. We even considered a partnership with CrossFit, but since we knew *nothing* about starting a gym nor had the passion, we wanted no parts of it.

Needless To Say... We Were *Stuck*!

That's when a friend introduced Will to Dr. Kostopoulos and his training, *"Diagnostics for PTs,"* and Will "saw the light." He rushed back to share what he learned with me and I was hungry for more- **especially since I always thought (and was taught) "PTs can't do diagnostics!"...**

Boy, Were They Wrong!

We were convinced this was exactly what our practice needed- something with a practically unlimited earning potential, was simple to implement and provided us the distinction we so craved.

Not too long after, Will and I flew out to New York and met with Dr. Kostopoulos to learn more about HODS. **Right away we knew it was a fit for us**, so we decided to make the jump and become a HODS partner.

"The past 3 years with HODS has been game changing for our practice and for me personally!"

Since joining HODS, things have been moving fast for us and we've been growing very rapidly.

About 18 months ago, we considered opening an EMG-based clinic that wasn't dependent upon us providing physical therapy (something new for us) so...

We *Opened Another Practice* Exclusively For EMGs In Alaska (of all places)!

I volunteered to focus on building that new concept in Alaska and it's been a blast. We've been at it now for over a year and we've got a successful business simply doing EMGs and diagnostic ultrasound. **And my family loves it here, too!**

Over the next 3-5 years, we're going to create a new physical therapy business model that incorporates electrodiagnostics and diagnostic ultrasound into everyday physical therapy.

This alone will set us apart from other physical therapists and diagnostics in Arizona *and* Alaska...

"Not to mention how it's going to drastically improve patient care."

So considering the general decline in reimbursements, HODS has been our way to survive. They've made it possible for us to set our clinics apart and embrace a new way of practicing physical therapy. -- Nathan Shields

"Discover How Diagnostics Allows PTs To Provide Better Patient Care And *Easily Earn 5 -10 Times More* Per Patient Visit!"

With the HODS program you will get:

Effective Hands-On Mentoring - Better Patient Outcomes - Higher Reimbursements
Stand Out from the Competition - Expansion of Your Practice

diagnosticsforpt.com/report

THE USE OF ELECTRODIAGNOSTIC STUDIES

AND MUSCULOSKELETAL SONOGRAPHY IN CARPAL TUNNEL SYNDROME

BY
BESHOY GHALY, HODS PARTNER
NEW YORK, NY

NEW YORK, NEW YORK. Carpal tunnel syndrome is the number one reason for referral to Electrodiagnostic practices and can be considered as the most common peripheral focal mononeuropathy.[1,2] Carpal tunnel syndrome is simply an injury to the median nerve at the wrist where the nerve can face a potential entrapment in the tunnel that is formed by the carpal bones.

Differential diagnosis of carpal tunnel syndrome from C6-C7 radiculopathy and, less often, brachial plexus injuries may be challenging particularly in very mild or early cases.[1] According to CPG on CTS adopted by American Academy of Orthopaedic Surgeons (AAOS), there is no one gold standard test to diagnose CTS.[3] Using nerve conduction studies (NCS), electromyography (EMG) and neuro-ultrasound will offer the best combination of tests that help in diagnosing and classifying the severity of the condition.

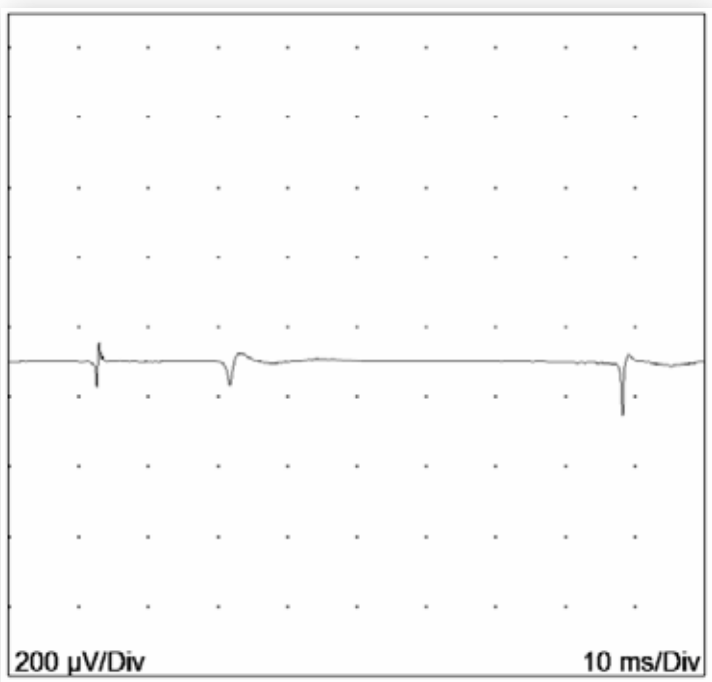
Para-nodal demyelination of the median nerve at the wrist is the early underlying pathology in CTS.[2] Focal slowing across the wrist and increased distal latencies of sensory and motor portions are common.[2] Reduced amplitude of the median sensory nerve action potential (SNAP) at the wrist compared to the palm can be the only early sign in CTS cases implying a possible conduction block and myelin sheath compromise.[4] Assessing the electrical stability of the membrane of Abductor pollicis brevis muscle using needle EMG helps identifying moderate to severe cases where possible axonal loss of the median nerve may occur. (Figure1) Quantifying the percentage of possible axonal loss may be obtained by comparing the compound muscle action potential (CMAP) of the affected nerve to the unaffected opposite nerve.

A reasonable scheme, out of many, to be considered when it comes to classifying the severity of the syndrome is GEHS neurophysiological system.[5] Prolonged sensory latencies, present sensory response, and normal motor latencies are considered a mild injury.[4, 5] Add to the previous prolonged motor latencies will be considered as a moderate injury.[4, 5] Reduced motor amplitudes and/or signs of axonal loss and denervation on EMG can be considered as a severe injury.[4, 5]

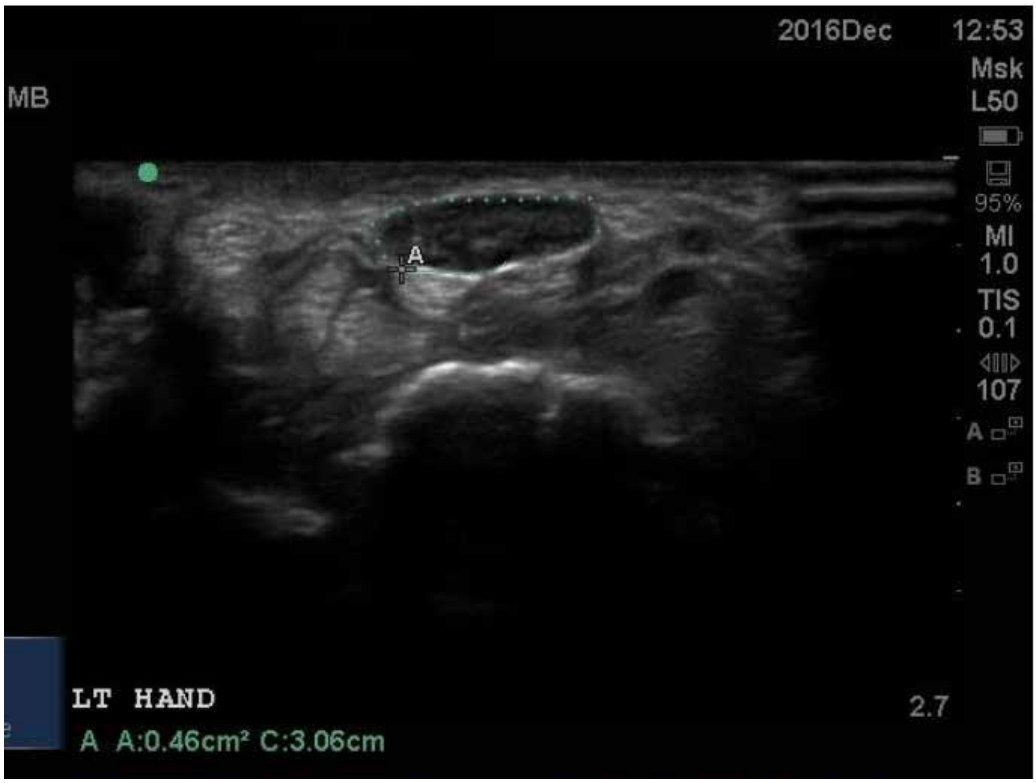
In general, Electrophysiologic evaluation should be focused toward showing the focal neuropathy or the conduction block of the median nerve at the wrist, ruling out the rare proximal median nerve injury and excluding brachial plexus and cervical radiculopathy injuries.[1]

The AAOS CPG rates NCS 2 out of 4 and all physical signs combined (Phalen's, Tinel's etc.) as 4 out of 4.[3] American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) CPG for NCS/EMG mentioned that specific NCS methods are "valid and reproducible clinical laboratory studies"[8] and "confirm a clinical diagnosis of CTS with a high degree of sensitivity (>85%) and specificity (95%)."[8]

Using neuro ultrasound, one can visualize and measure the diameter of the median nerve at the carpal tunnel. Swelling of the median nerve and loss of the honey comb appearance on the ultrasound image indicate possible positive findings toward diagnosing the syndrome.



+ Figure 1: Positive sharp waves and fibrillation potentials detected by needle EMG marking electrical instability of the membrane of the abductor pollicis brevis muscle and possible denervation process.



+ Figure 2: Loss of the honey comb appearance of the median nerve at the wrist and significant increase of the nerve diameter to reach up to 0.46 cm²

Measuring the size of the median nerve, the vast majority of the studies suggest a cutoff of 0.09 to 0.12 cm² as a sign of a carpal tunnel syndrome.[6] (Figure 2)

Measuring the median nerve at the carpal tunnel area and comparing it to the pronator quadratus area can be of a great value. A difference of median nerve area of more than 2mm2 may diagnose the syndrome with an accuracy of 99%.6 (Figure 2 and 3)

The validity and a reliability of the test are accepted and recommended by the CPG adopted by AAOS and were given 2 out of 4.[3] The American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) issued an evidence based guideline for MSKUS diagnosing CTS.[7] Recommendation1 is "neuromuscular ultrasound measurement of median nerve cross-sectional area at the wrist may be offered as an accurate diagnostic test for CTS (Level A)"[7] and it was based on consistent class 1 and 2 evidence.

Finally, using diagnostic tools such as nerve conduction studies, electromyography, and neuro ultrasound help the diagnostician to accurately identify and classify the carpal tunnel syndrome. One study in AANEM CPG for CTS MSKUS showed 100% sensitivity and 92.5% specificity when combining neuro ultrasound and NCS/EMG in diagnosing CTS.[7] Proper diagnosis, understanding, and analysis of a medical condition can lead to a proper management and hence a better patient care can be achieved.

+ Figure 3: Median nerve at the area of the pronator quadratus. The image was taken for the same patient in figure 2. Significant reduction of the nerve diameter that is clearly more than 2mm² difference.

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Atypical Heel Pain: A Case Presentation

BY
MARK BROOKS
HODS VP OF CLINICAL EDUCATION

Introduction

Heel pain is a common complaint for which patients seek medical attention from physicians and physical therapists. There are a wide variety of differential diagnoses including heel spur, calcaneal stress fracture, plantar fasciitis, inflammation and fat pad atrophy.[1]

Among the most commonly diagnosed etiologies of heel pain is plantar fasciitis. Typically, plantar fasciitis causes symptoms that are often worse after sitting or getting up from bed and the symptoms are worse with the first few steps. This is known as "post static dyskinesia". Symptoms of plantar fasciitis are often aggravated by activity and walking, but subside after sitting or non-weightbearing. The pathophysiology of plantar fasciitis is from repetitive stretching of the plantar fascia, a structure that maintains the normal arch in the foot. With excessive repetition, the fascia becomes irritated and inflamed and in chronic conditions may tear or rupture.

Diagnosis of plantar fasciitis starts with a medical history and physical exam. Imaging studies include x-rays, which may show heel spurring, musculoskeletal ultrasound (MSKUS), which may show inflammation, swelling and tearing, and magnetic resonance imaging, which can reveal small details of pathology not seen in x-ray or MSKUS.

Common treatment include rest, anti-inflammatory medications, physical therapy, splinting, orthotics, steroid injection extracorporeal wave therapy and surgery. Generally, these modalities are effective, but in up to 20% of cases of heel pain which are refractory to these treatments, involvement of the Baxter's nerve should be considered.[2] Baxter's nerve impingement often produces symptoms that are indistinguishable from plantar fasciitis. However, in Baxter's nerve impingement, symptoms of continue unabated after sitting or lying and patients often indicate the symptoms radiate from the heel to the medial or lateral heel edges.

Diagnosis of Baxter's neuritis include MSKUS, which may show enlargement or swelling of the nerve and MRI may show muscle denervation and fatty degradation. The advantage of MRI is that it can exclude other etiologies of heel pain including fasciitis, fracture or neoplasm. The most sensitive technique for diagnosis of neural pathology, however, are electrodiagnostic studies (EDX). Although invasive, it is the only technique which can quantify the severity of pathology and degree of neural involvement.

Anatomy

As the posterior tibial nerve passes through the tarsal tunnel with branches into both medial and lateral plantar branches. The medial plantar nerve travels anteriorly, has motor innervation of the flexor digitorum brevis, abductor hallucis, flexor hallucis brevis and 1st lumbrical. The medial plantar sensory fibers provide cutaneous sensory innervation of the medial 2/3 of the foot.[3]

The lateral plantar nerve provides motor innervation of intrinsic foot muscles not innervated by the medial branch and sensory cutaneous innervation of the lateral plantar foot, 5th toe and lateral half of the 4th toe.[3]

Baxter's nerve is the 1st branch of the lateral plantar nerve. It is also known as the inferior calcaneal nerve. It courses deep and through the fascia an under the calcaneus. It provides motor innervation of the abductor digiti minimi, occasionally the flexor digitorum brevis and lateral half of the quadratus plantae. Sensory innervation is to the periosteum of the calcaneus, long plantar ligament and adjacent vessels. There is typically no cutaneous sensory innervation. There is also a wide variety of variation of branching patterns of the Baxter's nerve.[4, 5]

Case Presentation

A 47 year old male presented in clinic with a 2-3 year history of left heel and plantar foot pain and burning. He denies any disturbance of skin sensation. There is no history of injury or specific trauma, but is a competitive runner and runs 20-25 miles per week. His symptoms are worsened by standing, walking and running and non-weightbearing often does not alleviate his symptoms. He has sought treatment from multiple podiatrists and a foot and ankle orthopedics. X rays showed calcaneal heel spurring, but no MSKUS, MRI or EDX has been performed. Treatment has been for plantar fasciitis including medications, splinting, taping, steroid injection and activity modification. None have been of help. After being seen by a 3rd podiatrist, the treating podiatrist ordered MSKUS and EDX studies.

MSKUS imaging indicated a partial tear of the proximal plantar fascia attachment with intrasubstance edema.

EDX studies showed no evidence of tarsal tunnel syndrome or radiculopathy, but did show involvement of the Baxter's nerve. Nerve conduction studies (NCS) revealed both prolongation of the distal motor latency and a diminished CMAP amplitude response when compared to the unaffected side. Needle electromyography (EMG) revealed muscle membrane instability

Nerve / Sites	Latency ms	Amp mV	Amp %	Distance cm	NCV m/s
L COMM PERONEAL - EDB					
Ankle	5.05	5.9	100	8	
Fib Head	11.65	5.7	96.6	28	42.4
Knee	13.55	5.7	95.9	8	42.1
L TIBIAL (KNEE) - AH					
Ankle	5.45	10.3	100	8	
Knee	14.45	8.8	85.6	38	42.2
L TIBIAL (KNEE) - Baxter's					
Ankle	5.85	2.8			
R TIBIAL (KNEE) - Baxter's					
Ankle	4.55	6.7			

Figure 1. NCS studies of the Baxter's nerve show a prolonged motor distal latency, 5.85ms, and a diminished CMAP amplitude, 2.8mV, when compared to the unaffected (right) side.

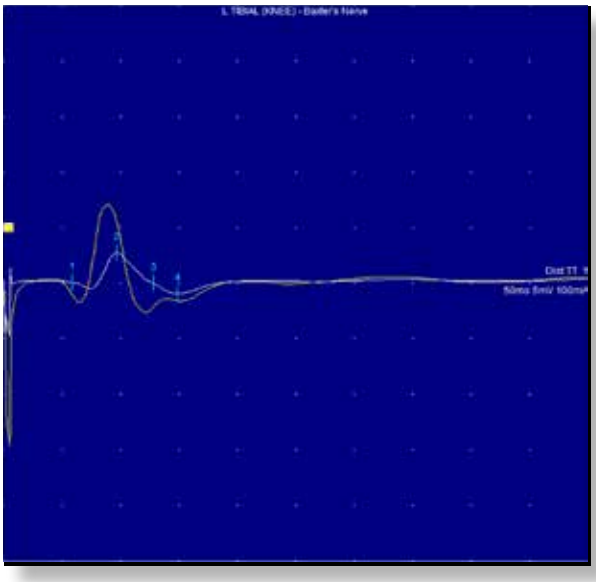

Figure 2. Comparison of Baxter's nerve responses side to side, left (white), right (yellow). Note the significant side to side CMAP amplitude difference.

EMG Summary Table									
	Spontaneous Activity					Motor Unit Analysis			Recruitment
	Insert Act	Fib	PSW	Fasc	HFD	Amp	Dur	Poly	Pattern
L. VAST MEDIALIS	Normal	None	None	None	None	Normal	Normal	None	Normal
L. BIC FEM (S HEAD)	Normal	None	None	None	None	Normal	Normal	None	Normal
L. GASTROCN (MED)	Normal	None	None	None	None	Normal	Normal	None	Normal
L. TIB ANTERIOR	Normal	None	None	None	None	Normal	Normal	None	Normal
L. TIB POSTERIOR	Normal	None	None	None	None	Normal	Normal	None	Normal
L. PERON LONGUS	Normal	None	None	None	None	Normal	Normal	None	Normal
L. ABD HALLUCIS	Normal	None	None	None	None	Normal	Normal	None	Normal
L. ABD DIG QUIN PED	Increased	1+	1+	None	None	Normal	Normal	Inc	Reduced
L. LUMB PSP (M)	Normal	None	None	None	None	Normal	Normal	None	Normal
L. LUMB PSP (L)	Normal	None	None	None	None	Normal	Normal	None	Normal

Figure 3. EMG findings showing muscle membrane instability and evidence of axon loss pathology in the left abductor digiti minimi.

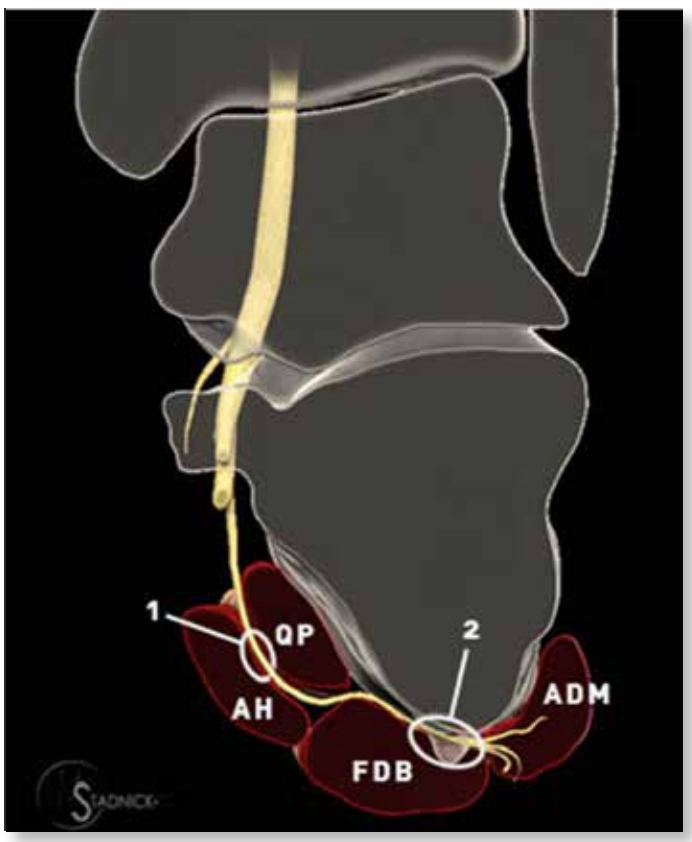

Figure 4. Common sites of axter's nerve impingement.

secondary to axonal pathology, increased numbers of polyphasic motor units and reduced numbers of functioning motor units in the left abductor digiti minimi.

Treatment

Initial treatment of Baxter's neuritis is conservative, including rest, activity modification, orthotics, anti-inflammatory medications and corticosteroid injection. In cases that are refractory to conservative treatment, operative management has been proven effective. Operative management includes neurolysis, deep fascia release and radiofrequency ablation techniques.[8, 9]

Pathophysiology

Two primary sites of Baxter's nerve entrapment are typically described.[6, 7] The first is in the interspace between the deep fascia of the abductor hallucis and quadratus plantae. The second is more distal as the nerve passes at the anterior aspect of the medial calcaneal tuberosity. Calcaneal plantar enthesophyte and inflamed tissues of the plantar fasciitis have also been described as a source of Baxter's nerve pathology.

As with most entrapment neuropathies, the effects from nerve compression is dependent on both severity and chronicity of the entrapment. Consequently, early diagnosis is important and may result minimal or no permanent nerve damage. Late diagnosis with severe compression often is not reversible.

Risk factors for Baxter's nerve impingement include advancing age, calcaneal heel spur, plantar fasciitis, obesity, muscular enlargement (typically seen in athletes) and hyperpronation of the foot.[1, 8]

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MRI VS MSKUS

BY
CINDI PRENTISS, HODS PARTNER
LONG ISLAND, NY

LONG ISLAND, NEW YORK. In May of 2014 while sitting at a red light, I was hit from behind. Jolted, I was confused as to how this could happen, since last I looked, there were cars stopped for what seemed like miles behind me.

For such a minor impact, I couldn't believe the immediate pain I felt in my neck & left shoulder. After months of physical therapy, massage therapy & acupuncture, my neck felt better yet my shoulder was getting progressively worse. I had a MRI which was reported as negative, yet the orthopedist clinically diagnosed me with a superior labral tear.

I continued to rehab my shoulder but my bicep region was getting more & more painful. I received 2 cortisone guided injections into my bicep which gave me temporary relief for approximately 3-4 weeks each time. It was a year since my car accident & I wasn't improving. I had limited mobility in my shoulder & began to experience elbow pain due to shoulder compensation.

The doctor wanted to do surgery by year 2. He believed that since the cortisone shots worked, it indicated that a bicep tenodesis would be helpful. He also recommended a sub acromial decompression & posterior capsular release as I lost approximately 50% of my shoulder internal rotation.

I begrudgingly agreed but while awaiting the surgery, my shoulder was getting progressively weaker. The surgeon was puzzled, since the MRI was negative for a tear. Since my symptoms were conflicting with the MRI results, my staff decided to perform an MSKUS to see the cause of the weakness. The result was a supraspinatus & subscapularis tear.

I shared these results with the surgeon; however he was not interested, stating the MRI was negative. The plan was to perform an arthroscopy followed by immediate post-op physical therapy for aggressive stretching, while the anesthetic was still actively working.

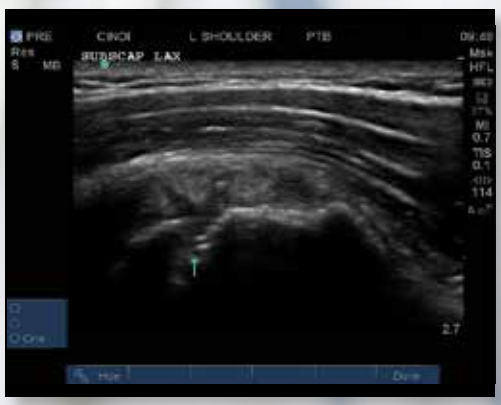
"Good news & bad news" were the words I groggily remembered once I was awake in recovery. The good news… you're alive & the surgery planed was successful. Bad news…"we found a 95% rotator cuff tear & made the decision to repair it with one anchor".

Post-op plans had significantly changed to include immobilization in airplane splint for the next 8 weeks. No physical therapy was allowed, as per this MD's protocol, until 8 weeks. What a blow this was. By post-op month 3, I was diagnosed with post-op adhesive capsulitis.

By post-op month 6 the doc wanted to perform a manipulation under anesthesia as my ROM was less than before the surgery!

Moral of the story, MSKUS revealed the true condition of my shoulder, as x-ray vision would have! MRI was falsely negative & resulted in a surgery that ended in a non-optimal way. Would this have been the surgery of choice knowing what we knew in hind-sight?

A true believer in MSKUS,
Cindi



DIRECT ACCESS:
WITH GREAT FREEDOM COMES EVEN GREATER RESPONSIBILITY

BY
VICKI BUCHANAN , HODS PARTNER
MIDWEST CITY, OK

MIDWEST CITY, OKLAHOMA. Clinicians in Oklahoma have just been able to have direct access within the last 18 months, and with that freedom comes a great responsibility. I find that having the ability to utilize musculoskeletal ultrasound as a tool to assess the condition of the joints and soft tissue is extremely helpful in deciding if the patient is appropriate for physical therapy intervention.

We recently had a 17 year old athlete who was seen at one of our clinics for bilateral knee pain. Her initial injury was two years ago, caused by a direct fall onto her left knee while running stairs as a conditioning drill for sports.

She was seen by her family physician shortly following the fall with X-rays that were negative for any fractures. The patient had progressive pain in the left knee over the next two years. This patient also developed right knee pain from suspected overuse as a result of protecting the left knee.

The patient was initially seen by a newly graduated physical therapist who felt that her left knee pain was getting worse with the first few treatments of physical therapy intervention. The treating physical therapist asked if a musculoskeletal ultrasound would be indicated for the patient based on the fact that the physical therapy treatment seemed to make the patient worse.

An MSKUS was performed and the patient was found to have normal joint/soft tissue findings on the right knee. However, the left was noted to have cortical changes over the femoral condyle, unusual for the patient's age. The sonographic study suggested a possible osteochondral defect. The patient was sent to an orthopedic physician for a consult that included a follow up MRI. The patient continued with conservative physical therapy treatment to the right knee for strengthening while waiting for her left knee intervention.

The patient's mother was very relieved to find that the physical therapist took the extra step to investigate her daughter's condition. The mom expressed that we seemed to be more concerned with accurately assessing all aspects of her condition rather than continuing to attempt the same treatment.

A WORD FROM THE FRANCHISE SERVICES DIRECTOR

BY
JERRY GORDON
FRANCHISE SERVICES DIRECTOR

TAMPA, FLORIDA. I wanted to briefly review the purpose of this position within Hands-On Diagnostics and to discuss how it operates.

The FSD is here:

To fully establish a great relationship with all franchisees, assisting them to...

- *create,*
- *Establish,*
- *Maintain and*
- *Expand their franchise area*

This is all so that your franchise is in the best possible position to **consistently producing the highest quality patient care resulting in an abundance of growth in your income.**

This is all so that your franchise is in the best possible position

The way this spreads out is:

We are a team. Most Partners have a lot to do with their PT practice and it is possible to get too focused on that and not put some time on creating their dream with HODS to reap the benefits of implementing diagnostic testing. So our meetings help balance the focus. The approach I think is constructive is a consultative approach.

The cycle bulleted above is a repetitive cycle. As you expand, we will determine the next helpful part of the HODS business that needs to be created/implemented and work out the steps to create, establish and keep it maintained to create stable expansion and the goals you set.

Note; Establish means to assign the responsible people, setup the flow of things, start it going and revisit it as needed to maintain that production.

So let's look at an example: Say a Partner is ready to start outside testing. We would create a plan, determine what posts need to be filled and who are the people to run the various posts with one person with overall responsibly. Then how will everything flow, i.e. who will get the mailing list and do the marketing. Then, who will follow up on the mailings and schedule the appointments, etc.. This is establishing the area. Then we would graph the out flow of promo, appointments set and attended, etc. to monitor the area and help maintain it.

It's not that you couldn't do this yourself. It's that it is easier to have an external teammate to talk with and the input from what are successful actions that have been proven to work

The end result of all this is: a HODS practice **consistently producing the highest quality patient care resulting in an abundance of growth in your income.**

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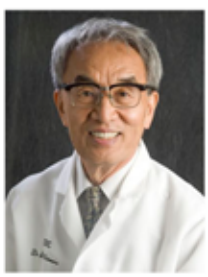

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Notable Publications and Presentations...

Kostopoulos, D. (2017). The use of Neuro-Ultrasound to identify and treat nerve pathology. Journal of bodywork and movement therapies, 21(3), 692-693.

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Kostopoulos, D. (2017). PPS APTA 2017. Presentation. The New Paradigm In Physical Therapy Private Practice.

CSM 2018: New Orleans: TITLE: Opportunity KNOCKS: Merging Diagnostics into Clinical Practice
PRESENTERS: David Hutchinson, Deyle Gail, Rick McKibben, David Greathouse, Mohini Rawat, Dimitrios Kostopoulos

CSM 2018: New Orleans: TITLE: Diagnosis, Treatment and Outcomes of Three Common Lower Extremity Nerve Injuries
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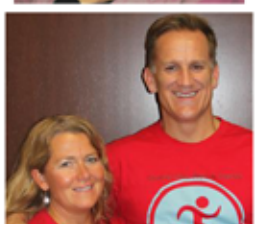

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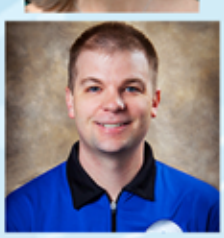

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BOARD CERTIFICATIONS & MODULE COMPLETIONS

Congratulations are in order to those who have progressed in their professional development with HDOS.

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(In 2016 out of all 9 new ECS professionals, 5 were from the HODS family)

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Sarah Quintillan
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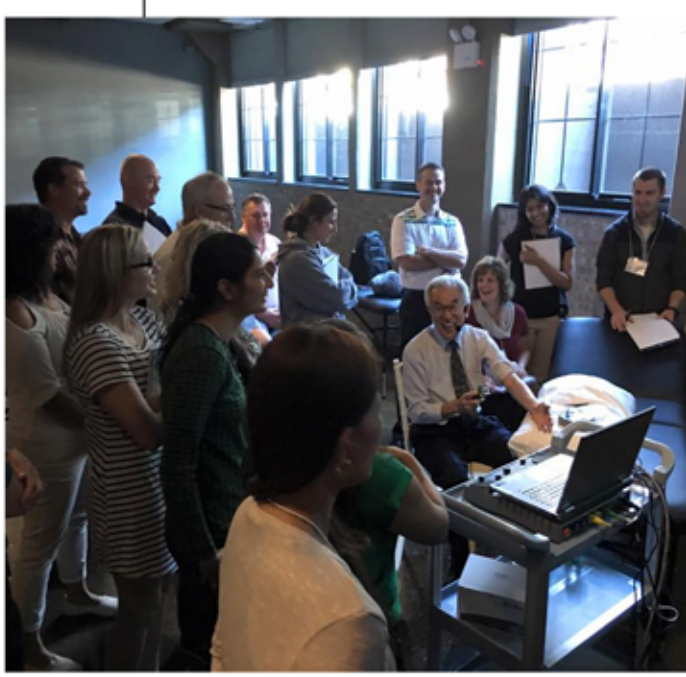

TESTIMONIAL BY JULIE BYRT
HOW HODS HELPS PEOPLE HEAL FASTER

I am a manually certified orthopedic PT with 21 years experience and 18 years owning a private practice. I first became interested in diagnostic testing in order to build the services my clinic could offer and improve the income of our clinic and our staff. I have completed enough training to begin to routinely do diagnostic US and EMGs on our appropriate patients. I have been absolutely floored and very humbled by what I am finding! In at least 60% of my cases I have found pathology that I did not find with clinical testing and could not even find with clinical testing after the diagnostic revealed the pathology.

This tells me that while our clinical special testing is helpful to diagnose and create a Plan of Care for PT patients, It is not sensitive nor specific enough to fully diagnose the actual pathology in 60% of my routine cases! These diagnostic findings have all lead to a definite change in my treatment plan and the patient's education about their condition which lead to an efficient effective outcome.

Being humbled by the fact that I have literally been missing the boat on the exact location and severity of neural compression, inflammation and tissue strain on at least 50% of my patients for all these years, has made me committed to having all of my patients get diagnostic testing at the start of their care as a part of my evaluation to create the most effective and efficient treatment plan I can. My patients are so excited and impressed that I can evaluate them both physically and diagnostically. Their trust in my clinic to be the place they go first to care for their musculoskeletal pain and injury has increased significantly!

Thank you so much to the HODS team for making diagnostic training accessible to the field of PT. It will help our field become even more well known as the musculoskeletal expert of Health Care and help all people who reach for PT heal as fast as they can!

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Diagnostics for PT

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