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EMG SOLUTIONS NEWSLETTER

THE SYNAPSE

Editor : Cathy Digiacomo

In this Issue:

BEYOND THE MUSCLE: How Electrodiagnostic Testing Expands the PT's Role in Patient Care

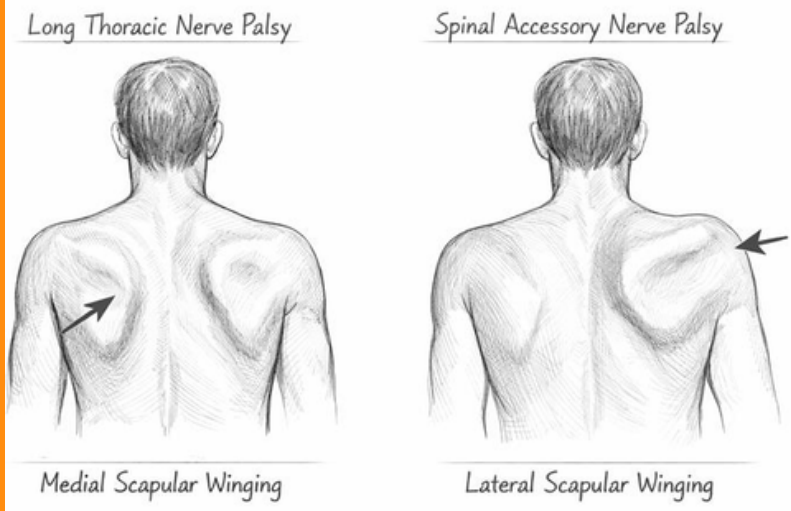
Most physical therapy students begin their training focused on the world of orthopedic movement and musculoskeletal mechanics. They learn how muscles, joints, and connective tissues interact and what happens when those systems break down. But sometimes, what looks like an orthopedic problem actually starts somewhere entirely different: within the peripheral nervous system.

That idea was at the center of a recent lecture I gave to the second-year Doctor of Physical Therapy students at the **William Carey University College of Health Sciences.** The session, titled *Introduction to Electrodiagnostic Testing: Nerve Conduction Studies (NCS) and Electromyography (EMG),* was given as a part of their *Physical Agents and Modalities* course and aimed to introduce them to electrodiagnostic (EDX) testing as

By Drayton Perkins PT, DPT, ECS

both a clinical tool and as a growing area of specialty practice within physical therapy.

My goal was to help these students see how NCV/EMG testing connects to the types of patients they will soon encounter in the clinic. Many orthopedic cases that seem straightforward on the surface can actually have a neurogenic origin. Recognizing when that might be the case is one of the most important aspects of clinical reasoning.



When "Orthopedic" Isn't Orthopedic

As physical therapists, we have all seen it. The patient with persistent shoulder pain that does not respond as expected with standard interventions. Or the one with lingering dorsiflexion weakness after what seemed like a routine ankle sprain. Maybe the strength and range of motion improve, but function does not. Maybe the pain persists in a pattern that doesn't match the anatomy of a specific muscle or joint.

When that happens, we have to start asking different questions. Is this really a tendon or joint problem? What am I missing? Should I expand my differential diagnosis to include a nerve root problem? Plexus involvement? Or could the findings be related to an injured peripheral nerve?

Electrodiagnostic testing helps answer those questions**.**

By combining **nerve conduction studies (NCS)** and **electromyography (EMG)**, clinicians can evaluate how well nerves are conducting electrical signals and how muscles respond to those signals. EDX testing allows clinicians to assess the functional integrity of the peripheral nervous system, from the level of the spinal nerve roots all the way to the smallest peripheral branches of the motor and sensory nerves.

Nerve studies and EMG testing give clinicians information that imaging alone cannot provide. For example, a shoulder MRI might show a perfectly intact rotator cuff, yet the patient is unable to lift their arm because the axillary nerve is compromised, affecting the ability of the deltoid muscle to activate properly. A lumbar MRI might show several vertebral levels with disc bulges, but only one of those may be causing the radiculopathy symptoms. EDX can identify exactly which nerve root is affected and to what extent. This precision can change the entire course of care.

Case Example: Shoulder Pain, Scapular Winging, and a Hidden Nerve Root

During the lecture, we discussed a case that perfectly illustrates this point.

A patient presented with a gradual onset of shoulder pain with scapular winging. At first glance, the findings suggested a local musculoskeletal problem such as serratus anterior weakness or a long thoracic nerve palsy. However, EMG testing revealed denervation in multiple muscles innervated by the C5 and C6 nerve roots. The real source of the problem was a cervical radiculopathy.

That finding changed everything – the diagnosis, the prognosis, and the plan of care.

Now, rather than focusing solely on shoulder strengthening or scapular stabilization, the emphasis shifted to protecting the affected nerve root(s), avoiding mechanical aggravation, and coordinating with the referring physician to monitor neurological recovery. It also guided the referring physician toward appropriate imaging studies, medications options, and potential surgical interventions.

This case reminded students that a patient's symptoms may not always match their pathology or their referral diagnosis. And we, as physical therapists, are uniquely positioned to recognize when those do not align and when EDX testing may be utilized to help to provide the missing link between the clinical presentation and the underlying pathology.

Bridging Anatomy and Physiology

Students often view electrodiagnostic testing as something separate from traditional physical therapy practice; something "only neurologists do." But, in reality, it is a natural extension of what PTs already do every day. Our musculoskeletal and neuromuscular examination provides us with mechanical information: range of motion, strength, reflexes, special tests, and movement quality. Electrodiagnostic testing adds a physiological perspective, revealing what is happening at the cellular level. It helps localize the area of damage and determine if it's demyelinating, axonal, or both, as well as whether it is acute, subacute, or chronic?

That information becomes especially valuable when establishing prognosis and when providing patient education.

A **demyelinating injury,** such as a mild carpal tunnel syndrome, typically responds quickly to conservative treatment once the cause of compression is removed. In contrast, an **axonal injury**, such as a severe fibular neuropathy, may require months of neural regeneration before strength can return. Once signs of reinnervation appear, therapists can confidently progress exercise intensity knowing that recovery is already underway.

These distinctions allow therapists to give patients clear, evidence-based expectations. Instead of vague encouragement like "let's see how this goes," we can say, "here's what your nerve is doing, here's what recovery usually looks like, and here's how your rehabilitation plan supports that process." This combination of objective testing and individualized education builds trust and confidence for both the therapist and the patient.

PTs as Diagnostic Collaborators

Electrodiagnostic testing also expands the PT's role within the interdisciplinary care team. When a physical therapist who holds the Electrophysiologic Clinical Specialist (ECS) credential performs an EDX study, the results contribute directly to the work of physicians, surgeons, and other providers.

- **Physicians** gain precise localization of the pathology, which helps determine whether imaging findings are clinically significant.

- **Physiatrists** and neurologists use the information to confirm or rule out suspected neuropathies or myopathies.

- **Surgeons** rely on EDX data to determine whether a decompression or nerve repair procedure is warranted, and to track recovery afterwards.

- **Physical therapists** integrate those same results into treatment planning and patient education; helping us to set functional expectations and appropriate progression of recovery for goal-setting.

In this way, ***EDX-trained PTs act as diagnostic collaborators, a link between diagnostic medicine and rehabilitation***. They help clarify what type of pathology exists, estimate prognosis, and influence the overall plan of care. This diagnostic partnership strengthens communication across the healthcare team and ensures that patients receive the most targeted, efficient, and effective interventions possible.

A Niche Specialty with Growing Demand

Clinical electrophysiology remains one of the most niche and specialized areas of physical therapy practice, but it is one that is growing rapidly. The American Board of Physical Therapy Specialties (ABPTS) recognizes it as an advanced practice area and awards the **ECS credential** to PTs who meet rigorous educational and clinical requirements and pass a comprehensive board exam.

The most direct path to board eligibility is through an **ABPTRFE-accredited residency program.** At **EMG Solutions**, our Clinical Electrophysiology Residency provides structured mentorship, hands-on patient experience, and focused study in nerve conduction and EMG testing. Our residency graduates are fully prepared to sit for the ECS exam and to practice independently in collaboration with referring physicians.

For PT students who enjoy clinical reasoning and puzzle-solving, neuromuscular anatomy and physiology, and interdisciplinary work, this specialty can be an incredibly rewarding career path. It offers intellectual challenge, direct impact on patient care, and the opportunity to operate at the intersection of diagnosis and rehabilitation.

Why Every PT Should Understand EDX

Even therapists who never perform NCV/EMG testing themselves benefit from understanding the fundamentals of electrodiagnostic testing. Even a basic understanding of NCV/EMG report helps clinicians make better decisions about treatment progression, referral timing, and prognosis. It also helps therapists recognize when symptoms do not fit a purely orthopedic pattern and when further diagnostic evaluation is appropriate.

EDX awareness strengthens collaboration between PTs and physicians and enhances the overall quality of patient care. ***It is another reminder that physical therapists are not simply movement experts but integral members of the diagnostic team who bring a unique perspective on how structure, function, and physiology interact.***

Looking Forward

One of the ongoing goals of **EMG Solutions** is to build partnerships with physical therapy programs across the country. By offering guest lectures, lab demonstrations, and clinical rotations, we hope to introduce more students to the clinical and professional opportunities within electrodiagnostic practice.

Our mission is to empower physical therapists to take a leadership role in diagnostic science, bridging the gap between medical evaluation and functional rehabilitation.

When PTs understand and apply electrodiagnostic principles, they enhance not only their own practice but also the effectiveness of the entire healthcare team. They become clinicians who can explain not just how movement is limited, but why it is limited and what can be done about it.

Conclusion

Whether in an academic setting or a busy outpatient clinic, the value of electrodiagnostic testing lies in its ability to reveal the unseen. It allows us to move beyond symptom management and truly understand pathology at its source.

As I told the students at William Carey University, when you encounter weakness, paresthesia, or pain that doesn't follow a typical orthopedic pattern, pause and consider whether the problem might be neurogenic. The insight gained from that perspective can completely change the trajectory of care.

EDX testing reinforces what makes physical therapists so essential within modern healthcare. We don't just restore motion; we interpret the systems that make movement possible. We identify the source of dysfunction, help define the diagnosis, and build the pathway toward recovery.

To learn more about EMG Solutions' Clinical Electrophysiology Residency or to explore student clinical rotation opportunities, visit www.emgsolutions.com.

Drayton Perkins
PT, DPT, ECS

Thank you

Thank You to Drayton!

We extend our gratitude to Drayton for his ongoing leadership and the excellence he shares with us each day!

Drayton is one of EMG Solutions' cherished mentors, since completed the EMG Residency in 2022. He is a graduate of Mercer University in 2014, and continues to flourish as both a clinician and a leader in the electrodiagnostic field. Drayton has recently branched into guest lecturing on the topic of EMG for DPT programs.

MEET THE MENTOR

JOHN LUGO
PT, DPT, ECS

Clinical Education and Residency Coordinator.

Auburn, AL

- **How did you become interested in electrodiagnostic testing?**

In my entry level PT program, I took an elective class on EMG/NCS with Roger Nelson and Arthur Nelson, two physical therapist pioneers in clinical electrophysiology. After that semester, Roger Nelson offered to support me with continued education and training in EMG/NCS, so I followed that through PT school and after graduation.

- **What was your learning process to become certified in clinical electrophysiology? How long did this take you to complete to achieve ECS?**

There were no approved residency programs in clinical electrophysiology but there were several post graduate continuing education programs available. I completed training in the program that was coordinated by Roger and Art and started performing NCS/EMG tests part time in addition to working in other areas of physical therapy practice. After 5 years of part time practice, I had accumulated enough studies and hours of practice to sit for the certification exam offered by the ABPTS.

- **How many years of experience do you have as an ECS Physical Therapist?**

I obtained initial ECS Certification 15 years ago and was recertified 5 years ago.

- **What do you love most about this specialty practice?**

Being able to provide information to the patient and the referring provider that will help guide the patients management.

- **If there is one thing that you would change within the specialty of EDX, what would that be?**

Increase the exposure of clinical electrophysiology to students in physical therapy school and provide more opportunities for students to practice clinical electrophysiology during clinical experiences.

- **Do you see Physical Therapists specializing in EDX as a growing need?**
  Yes, since the number of physician practitioners of EMG is decreasing but patients with suspected neuropathies and myopathies will still need the results of the test to help guide their management so this will be a needed area of practice.

- **What would be your words of advice/wisdom/inspiration to PTs who are interested in becoming certified in clinical electrophysiology?**
  Establish a connection with good mentor(s) but do not be afraid to ask them for their rationale of why they practice the way they do.

- **Any additional thoughts or comments?**
  Practice and repetition are key elements to learning skills but do not forget the importance of thinking about what you are doing and what it means.

Thank You

John Lugo, PT, DPT, ECS came to EMG Solutions with an extensive background as an adjunct and substitute lecturer, a clinical research associate, and the Director of Clinical Education for the *City University of New York/College of Staten Island*.

EMG Solutions is grateful for John as he shares his knowledge and experience as an educator to each of our residents for the initial didactic training of the residency, and for SPTs completing clinical rotations.

Thank you, John, for your time and the excellence you provide to the EMG Solutions family. We are so grateful to have you leading our students and residents to make the specialty of clinical electrophysiology a strong foundation among the profession of Physical Therapy!

Resident Spotlight

WELCOME

Ben Wynn, PT, DPT

to the EMG Solutions Residency

Ben Wynn, PT, DPT joined the EMGS residency after his May graduation from Mercer University.

Congratulations!! We are thrilled to have you joining the EMG Solutions Family!!

Ben Wynn PT, DPT
Mercer University

1. **Where did you receive your DPT degree and what led you to the PT profession?**

I received my DPT from Mercer University in Atlanta, GA in May 2025. I have many reasons why I chose physical therapy, The number one reason being that it is a profession in which you get a lot of one-on-one time with patients where you can influence their health and make sure, they feel seen and cared for in every encounter. Additionally, it is a profession that challenges you to learn and improve continually. There is always ways room to improve and better yourself for your patients in this field.

2. **When did you first learn about clinical electrophysiology offered as a specialty for Physical Therapists and at what point did you decide EMG was the direction you wanted to take your career?**

I knew I wanted to advance my skills beyond my DPT degree and so I looked into all specialties of physical therapy. Then I stumbled across ACEWM on the APTA site and thought EMG looked interesting. EMG Solutions then presented to my cohort during a job fair and offered observation days. So, I set up days to observe and loved it.

3. What made you decide to go the Residency route vs. independently completing study and earning mentor hours?

The residency through our company seemed like the most efficient way to learn the skills and meet the requirements for boards. I also know that I need a more structured learning environment and mentoring to be successful and this company offers that.

4. What have you loved most about the residency?

I love the variety and complexity of the patient cases. There is rarely a day where I do not learn or see something new. Each patient has a unique presentation and story and it is our job to sort the pieces of the puzzle. There is never a boring day in EMG.

5. Is there anything you have disliked about the residency?

A point of difficulty for me has been switching between mentors as frequently as I have. It is overall a good thing because I get to experience many different styles and learn what I do and do not like. However, it is difficult at times to switch between what each mentor prefers.

6. What is the most interesting case you have tested so far and what did you learn?

We had a baseball player who damaged a small sensory nerve in his hand because he holds the knob of the bat in his hand when batting. This was a unique case because the nerve that was damaged is rarely the only one involved, so testing had to be very specific. My mentor had never done a study on that specific spot before but was able to put a test together and isolate the point of compromise effectively. It was a cool moment where I thought "I can't wait to be that good at this". It really showed how being an expert in anatomy and highly skilled in electrodiagnostics can be so useful for patients and Physicians.

7. What are words of advice you would like to share with potential or future residents?

This is a very rewarding and challenging setting. You will have great days/weeks where you feel that you are performing well and then you will have tough days/weeks. It is important to understand that it is a process and not get down on yourself during the tough weeks. Also this company is very tight knit so reaching out to mentors/colleagues will be your greatest resource during the tough days/weeks.

8. Has the residency met your expectations? How?

It has met and exceeded expectations. I enjoy going to work each day and having a new challenge and opportunity to learn and improve. This residency has given me that each day and through strong mentorship I have rarely felt completely overwhelmed.

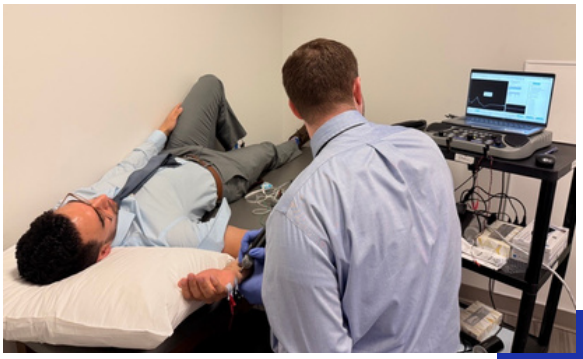
9. If you previously completed a clinical rotation in the EMG field, what benefits did you discover if any, before deciding to join the residency?

I did not complete a clinical rotation

10. Is there anything else you would like to share with potential residents or those considering the EMG Solutions Residency?

Definitely set up observation days if you have not yet. I believe it gives you the best idea of what we do and if you're a good fit for this setting.

Thank you, Ben, for your response and insight for future residents.
We are so happy to have you join us!



Student Spotlight

Cameron Palmer, SPT
Marshall University

1. How would you rate your clinical experience 0-10? If you have any feedback we would appreciate sharing so that we can continue to pay it forward to future students.
9/10: A great introduction to the field of clinical electrophysiology; if any student is considering work in this field this is the perfect rotation for them to make that decision.

2. Do you feel that the material you learned helped you to be successful? Was it too much or too little information?

I certainly think the information learned will help me to be successful in the field of electromyography. I believe I could have handled more information towards the end, but I understand the rotation curriculum is meant for a shorter rotation length whereas mine was slightly stretched to fit a 12 week rotation.

3. **Do you feel the information you learned in your clinical is applicable to Physical Therapy and will it help you in your practice as a PT? If so, how?**

The information learned helps me to be much more comfortable in differentiating between a neuropathic process verses musculoskeletal, and would greatly improve my evaluative reasoning in a traditional PT setting.

4. What was the best part of the clinical rotation?

The best part of the experience, in addition to learning the techniques required for electrodiagnostics, would be the questions my CIs would ask me to assess understanding and competence in these new topics.

5. What was the most difficult aspect of the clinical rotation? What did you learn from this?

The most difficult aspect is probably processing the data as it's recorded to decide what modifications need to be applied to the study at hand.

6. **What is the most important thing you learned in your clinical rotation?**

I feel the most important thing I learned is how to interpret data from the NCS/EMG.

7. What would you say to future students considering a clinical rotation with EMG Solutions? Good and Bad?

I would say if they believe they are interested in the field of clinical electrophysiology, this would be the perfect rotation for them to do. Consider that it may involve a lot of driving, but that it would be worth it if it's a field they truly want to get into. I would also say they don't need to do a ton of preparing for this rotation, as all required information, other than basic anatomical knowledge, is presented during the rotation itself either during clinical or during lecture time at the beginning/middle of the rotation.

Thank you, Cameron, for taking the time to provide us with your valuable feedback!

Cameron attends Marshall University and completed his clinical rotation with us from September 29th through December 19th.
He has applied to the
EMG Solutions Residency and will be starting in May after graduation!
We are thrilled to have you join us, Cameron! Welcome to the family!!

Happy New Year

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From all of us at EMG Solutions!

2026

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APTA CSM 2026

Come see us in Anaheim California
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booth # 1245

Visit us at the APTA Residency and Fellowship Reception
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EMG Solutions is hiring for:
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Residency page at www.emgsolutions.com.

For any questions feel free to contact me:
cathy.digiacomo@emgsolutions.com

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