

Diagnosis and Treatment of Post-Amputation Pain

An Interview with R. Norman Harden, MD

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Post-amputation pain is a form of neuropathic pain, and is often a chronic and disabling condition. Chronic neuropathic pain after amputation is a significant problem, with a reported incidence during the first year as high as 70% (1). Phantom limb pain, the perception of sensations, including pain, in a limb that has been amputated is common. Patients feel as though the limb is still attached to their body as the brain continues to receive nerve impulses that originally relayed messages from the missing limb. In light of the number of returning veterans with amputations, we talked with R. Norman Harden, MD, about the challenges of managing this kind of neuropathic pain.

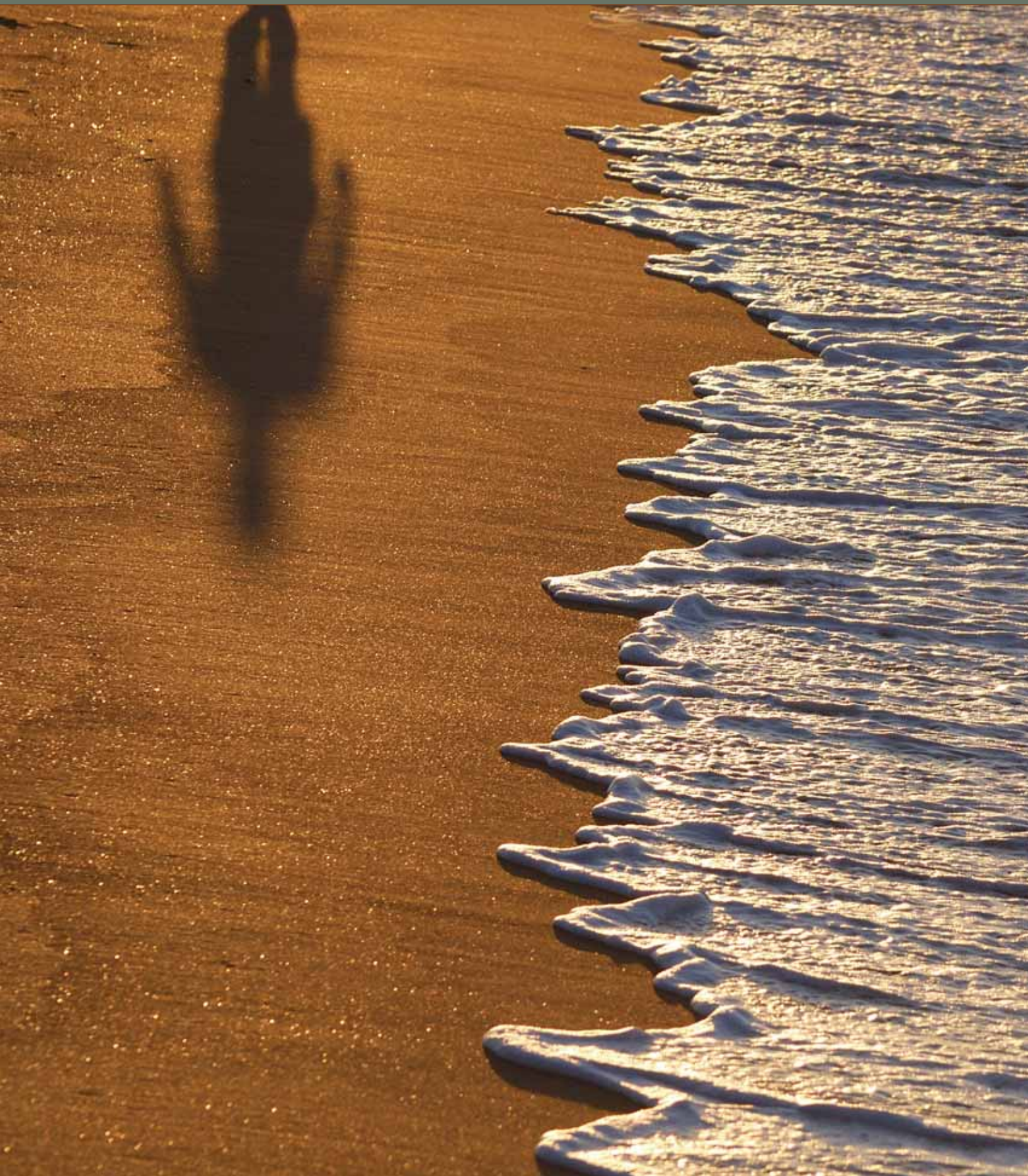


R. Norman Harden, MD, is the Medical Director for the Center of Pain Studies at the Rehabilitation Institute of Chicago and is board-certified in Chronic Pain Management. He is currently researching medication trials for pain, post-amputation pain, psychological aspects of pain, Complex Regional Pain Syndrome (CRPS), fibromyalgia, headache, back and neck surgery, spinal cord injury, and Multiple Sclerosis. Dr. Harden is the Chairman for the Clinical Affairs Committee of the Reflex Sympathetic Dystrophy Association. He serves on the editorial board for *Clinical Journal of Pain*, *Current Pain and Headache Reports*, and the *Journal of Neuropathic Pain*. He is Editor of the Innovations Section of the *American Pain Bulletin* and the *Journal of Back and Musculoskeletal Rehabilitation*, and is the Robert G. Addison Chair in Pain Studies for the Rehabilitation Institute of Chicago.

Q. In light of the number of veterans returning from Afghanistan and Iraq, what do clinicians need to know about phantom limb pain?

DR HARDEN. First of all, the key to proper diagnosis and effective overuse treatment is a good history and examination. Phantom limb is not the only type of pain that occurs post-amputation. In fact, phantom limb is probably not the most common pain in amputees. The first message is that you have to be thoughtful and cognizant about the diagnostic possibilities, and how these subsets of post-amputation pain are treated differently.

There are three basic types of pain that occur post-amputation, which are not mutually exclusive. Under the general rubric of post-amputation pain (PAP), you have phantom limb pain (PLP) and residual limb pain (RLP). Under RLP there are two subsets, the first being clinically significant



neuroma. By definition, people have macro-neuromas post-amputation. If these are spontaneously painful, the symptoms are likely caused by abnormal ectopic discharges, which is an important therapeutic consideration. Mechanically sensitive neuroma might represent a similar pathophysiology, and they both might be best treated as a traditional peripheral neuropathy. The other subset of RLP is actually rare in our experience and could be called ‘sympathetically maintained pain of the residual limb.’ Its characteristics—cold and blue appearance, allodynia, and sweaty residual limbs—closely resemble Complex Regional Pain Syndrome (CRPS) symptoms.

Phantom pain is primarily a cortical phenomenon. Nature abhors a vacuum, and the sensory pathways and cortex begin to fire spontaneously, causing phantom sensations and pain in the missing part.

Q. What about the development of additional pain syndromes?

DR HARDEN. There are several other common pain complaints in amputees. The heavy prostheses used by amputees can cause myofascial pain in the supporting joints. For instance, people with upper extremity amputations may develop Myofascial Pain Syndrome (MPS) of the shoulder. Or, a heavy, bulky prosthesis of the lower extremity can cause MPS of the hip. This pain can refer to the phantom or it can refer to another site and so it may become difficult to diagnose. There is also what is considered ‘old-fashioned stuff,’ such as the ‘crutch palsy’ developed by people with lower extremity amputation who have the wrong kind or a poorly fitting orthotic, which then pinches the nerves in their underarm. Clinicians should pay a lot of attention to the supporting joint because it is actually more common than not that people will develop MPS there.

It is also common that people with bilateral lower extremity amputations choose to use a wheelchair. They can get around quicker and easier with an advanced wheelchair than they can with prostheses. These amputees may develop overuse phenomena of the upper extremity.

Q. What if it is myofascial pain of the supporting joint?

DR HARDEN. We treat that in the usual fashion with physical therapy, stretching, strengthening, and postural balancing. The physical therapist must be knowledgeable about MPS, and willing to work with the rehabilitation

team. Occupational therapists are the orthotic experts and psychologists play a crucial role, as in all pain treatment.

Q. How do you treat PLP?

DR HARDEN. Very thoughtfully. The rule is that interdisciplinary treatment is far better than any unidisciplinary treatment, such as drugs or injections. This might be the *modus operandi* of many clinicians in pain situations, but what really works in all chronic pain conditions is a coordinated, comprehensive, and structured team, where everybody is involved in the plan, assessing the progress, and accommodating the problems that occur in the treatment process. The education of the team is crucial to assure everyone is ‘on the same page.’

Sometimes there is a role for injection therapy (nerve blocks), particularly if you have sympathetically maintained pain in a residual limb, but there’s little role for other interventions. I personally think that Spinal Cord Stimulation is wrong in PAP, on many levels. There has never been any science to support that kind of intervention in PAP; then again, there isn’t any evidence to support *any* treatment for PAP. It is wrong to say, ‘Well, we don’t have any randomized data, so let’s start out with the most high-tech, expensive, dangerous intervention we can think of,’ which is Spinal Cord Stimulation.

Q. What are some of the particular circumstances of returning veterans?

DR HARDEN. Veterans often return with multiple traumas in addition to amputation, and they’re treated with a little Neurontin® and nobody understands why they’re not getting better. The problem is that we are dealing with somebody who is not only severely traumatized by the situation to begin with (the war), but then had this horrible thing happen, where their life was transformed. There is a lot of comorbidity in the types of injuries that veterans have. For instance, they have Post Traumatic Stress Disorder (PTSD), almost by definition. They get hit by Improvised Explosive Devices (IEDs) while sitting in a little armored box, and the compression wave often causes significant concussive damage to their brains. Traumatic brain injury, plus PTSD, as well as injuries like an amputation, and you have somebody who is going to usually require a prolonged course of rehabilitation treatment. Certainly, aggressive, upfront, and cognitive behavioral psychotherapy should be the absolute standard of care. Anything less than that, in my mind, is doomed to failure.

Q. What have you found works?

DR HARDEN. The most potent therapy I've found for PLP is thermal biofeedback. This may be due to an active, subclinical role of the sympathetic nervous system in maintaining the pain. It is more potent and has larger effect sizes than any drug I've studied. Biofeedback is the purview of the behavioral psychotherapist and should be included early in the treatment regimen. There is also an important place for MDs and DOs because drug therapies often work to a certain degree. There are no randomized controlled trials for PAP, but we extrapolate from other neuropathic conditions, and have picked up some tools that work well in some cases. There is no drug that works for everyone and no drug that works for no one. So you must keep trying. If someone comes in depressed, with insomnia, and has a lot of pain, it is clear that you are going to use a sedative antidepressant with significant analgesic properties. Hopefully, clinicians are thorough with the history and physical exam, and will let their patients 'tell' them what they need to know.

There are also a lot of practitioners who 'can't be bothered.' They see there are no randomized trials and they tell patients to 'just live with it.' There are therapies that work, and there is a role for drugs. The need to continue trying is the absolute responsibility of every clinician. There are also other important treatment areas, like nursing education, social work, vocational rehabilitation, and recreational therapy, which are important, but often payors don't share that view.

Q. What misconceptions would you like to change?

DR HARDEN. As a rehabilitationist, I get tired of hearing that amputees can't or don't want to work; that's not my experience. I look at my amputee athletes running or wheeling across the finish line, and conclude that there's not a lot that people with amputation cannot do. Most returning veterans really want to get back into the workforce. Work is wrapped up in our sense of self-efficacy and self-esteem. I was reading about some big race in South America. One of the categories was 'bilateral amputees,' and the bilateral amputee was ahead of some guys with both legs, so please don't tell me that amputees can't compete at any level, in anything they choose.

Q. What about clinicians who don't have access to an interdisciplinary team?

DR HARDEN. Doctors have a responsibility to pull together a team in their community, and it is always possible to create a quasi-interdisciplinary team. For example, establish a relationship with a good psychologist, physical therapist, and occupational therapist in the area. Send the patient to those people and chat about it after four or five sessions. It is loose and multidisciplinary, but is still coordinated. Many things can evolve if you are willing to pick up the phone and make a call.

REFERENCE

1. Rasmussen S and Kehlet H. Management of nerves during leg amputation - a neglected area in our understanding of the pathogenesis of phantom limb pain. *Acta Anaesthesiologica Scandinavica*. 2007;51(8):1115-1116.

