Welcome to RSDSA:

The RSDSA is a 34-year old not-for-profit organization. RSDSA’s mission is to provide support, education, and hope to everyone affected by CRPS/RSD while we drive research to develop better treatment and a cure.

We invite you to join our community dedicated to working for you and your future. Being part of our RSDSA community is important. There is power in numbers. We have a community of more than 22,000. But we must increase our community so that Congress, The National Institute of Health, pharmaceutical corporations, and insurers hear our collective voice!

We published Complex Regional Pain Syndrome: Treatment Guidelines in 2013. The Guidelines are available at http://rsds.org/clinical-guidelines/. I would also recommend you sign up for our free electronic e-Alerts if you haven’t done so already at http://rsds.org/joinmembership/ to receive not only the RSDSA Community Update but information on upcoming RSDSA fundraisers and other important information.

If you have CRPS, please join our Internet-based study entitled Long-term Health Effect of CRPS: A 20-year Cross-sectional and Longitudinal, Observational Cohort Study, funded by a grant from the Brodsky Family Foundation. Anyone with the diagnosis of CRPS Types I and II can participate by visiting http://crps20yearstudy.com/.

RSDSA has state-by-state listings of healthcare professionals interested in treating CRPS. Please call us to obtain a listing in your state.

We also have 141 educational videos on our YouTube channel: RSDSA of America.

It is easy to join our community even if you do not have an email. Just provide us with your mailing address, telephone numbers, and we will gladly enroll you. We have eliminated membership dues; however we will periodically ask our community for their financial support to help us achieve our educational and research initiatives. You are not alone in your fight against this horrific disorder. Please donate to RSDSA today (please use the enclosed envelope or call us at 203.877.3790). If you choose not to join our community, please consider making a good-will donation to cover the cost of this mailing. We will not sell or rent your name.

Sincerely,

James W. Broatch, MSW
Executive Vice President and Director
RSDSA Launches Major Study on the Natural History and long-Term Health Effects of CRPS

The Reflex Sympathetic Dystrophy syndrome Association (RSDSA) is conducting an Internet-based study entitled Long-Term Health Effects of CRPS: A 20 year Cross-sectional and longitudinal, Observational Cohort Study, funded by a grant from the Brodsky Family Foundation.

Anyone with the diagnosis of CRPS Types I and II can participate via a link on RSDSA’s website, http://www.rsds.org/3/research/RSDSAStudy_1019_197.html or from the study website at http://crps20yearstudy.com/.

Potential participants, who are not familiar or comfortable with Internet-based communication can contact the study’s Project Manager to obtain paper forms for registration, consent and enrollment.

All questionnaires and records are confidential and securely held according to HIPAA and WIRB provisions.

Any questions, please e-mail crpsregistry@gmail.com.

If you are interested to becoming a participant, please go to ... http://crps20yearstudy.com/.
One of the most comprehensive, Up-to-Date Guidebooks on RSD/CRPS is now available!

This highly recommended Guidebook from Medifocus contains over 90 pages of vital information including a clear description of the syndrome, treatment options, access to the latest peer-reviewed research and a worldwide direction of RSD/CRPS physicians and researchers. This information is updated quarterly online only.

This unique guidebook is a must have for anyone interested in RSD/CRPS!

For each Guidebook purchased through RSDSA, 30% of the proceeds is donated to our organizations.

The guidebook is available electronically for $24.95 and in print for $29.95 plus $6.00 S&H.

To order the Guidebook, go to http://www.rsds.org/4/resources/index.html.

To order either the electronic or printed of the guidebook go to https://www.medifocus.com/2009/order2.php?ordertype=mail&gid=NR015&a=a&assoc=rsds.org and charge to your credit card.

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CRPS CLINICAL TRIAL

Now Enrolling: Phase 3 CRPS Clinical Trial of an Oral Non-Opioid Investigational Medication CREATE-1 (CRPS Treatment Evaluation 1 Study) is a Phase 3 multinational, multicenter, randomized, double-blind, placebo-controlled trial designed to evaluate the efficacy and safety of AXS-02 for the treatment of pain associated with CRPS. AXS-02 is an oral, non-opioid, investigational drug that has been granted Fast Track and Orphan Drug Designation by the U.S. FDA, and Orphan Medicinal Product Designation by the European Medicines Agency for the treatment of CRPS. AXS-02 is not approved by the FDA. The study is enrolling patients at sites in the United States, Canada, the United Kingdom and Australia. Eligible patients must be at least 18 years of age with recently diagnosed CRPS type 1 related to a traumatic injury. Eligible patients will be randomized to receive either AXS-02 or placebo by mouth once weekly for six weeks. The primary efficacy measure is the change in patient-reported pain intensity at the end of Week 12. Secondary outcome measures include assessments of the change in the Brief Pain Inventory (BPI) score, Patient and Clinician Global Impression of Change (PGI-C and CGI-C, respectively) and other quality-of-life measures. More information about the CREATE-1 study is available at www.clinicaltrials.gov. To learn about eligibility and to find a study site, patients can visit www.CRPStrial.com.
Pain and Activity  
By: Michele Gargan, Ph.D.

The human body is meant to move. Yet a person who experiences intense, persistent pain will probably move less and less over time. He or she is also likely to develop a number of “pain behaviors” such as lying down for long periods, using unusual postures to brace against the pain, or favoring one side of the body over another when moving. After a while, these pain behaviors take on a life of their own and actually add to the pain.

Long periods of immobility disrupt the body’s pain sensing mechanisms because pain perception relies on feedback from normal muscle activity, particularly the larger muscle groups of the body. Avoidance of activity under stimulates the large sensory nerves and results in more pain when movement is resumed. The habitual use of unusual postures results in secondary pain in other areas of the body as certain muscle groups go into chronic spasm while other muscle groups atrophy from lack of use. So rather than decreasing pain by avoiding certain patterns of movement, a person is actually increasing his or her pain as well as creating new pain.

A common pattern that I see in my pain patients is a burst of activity on a good day followed by several days of increased pain and immobility. As much as I preach consistently moderate activity, my patients habitually try to get everything done when they feel good. But when they do this, they get nothing at all done in the following two or three days. A prudent and effective pattern to follow is to do the approximately the same amount of physical activity each day. On “bad” pain days, you will have to push yourself, while on “good” days you will have to hold yourself back. If you do this, you will see that you get the same amount done as when you do a burst on Monday and nothing on Tuesday and Wednesday. If you do a little each day, you will get the same amount done without misery on Tuesday and Wednesday.

The following are some suggested techniques you can use to maximize your functioning:

- Keep an activity log for a two day period. Write down everything you do including quantity (how many dishes you washed) and how long you spent at it. You will probably be surprised at how much you do accomplish even though it feels to you as if you are doing little or nothing. Keeping this type of log will make you more aware of your patterns as well as help you set reasonable expectations. Challenge the artificial deadlines you set for yourself. What does it matter if the whole task is completed in one hour or one day, or in three hours or three days? How perfect does the work have to be? Learn to say, “That’s good enough.”
- Breathe while you move. Be aware of using your breath to support physical exertion instead of holding your breath again pain. Also be aware of the amount of energy you are using to accomplish a task as well as the quality of your movement. Replace short, quick intense movements with longer, slower, lighter movements. Elongate the muscles when dusting, scouring, or reaching, and low down to allow a full range of motion.
- Take frequent breaks. Every twenty minutes or so, change positions, change activity, or just rest. It may take you longer to do what you used to do in the blink of an eye. So What? It is important to learn to pace yourself.
- Schedule a rest period in the middle of the morning and the middle of the afternoon. A half-hour is usually effective, but some people take an hour or longer. If you have to nap, go ahead. But many people find that just relaxing, listening to music, taking a bath, daydreaming, or meditating is effective in extending their ability to function throughout the day. Go back to your activity log and find the natural breaks where you can insert rest periods. If you think there is not time to rest, you are trying to accomplish too much.
- Make conscious transitions between tasks. For example, if you are cooking dinner, take a few seconds to breathe and stretch between peeling the potatoes and molding the meat loaf. This allows you to release muscle tension and adjust your posture as well as tune into your physical effort in order to maintain a steady, easy pace.

- Put some type of regular physical exercise into your life. Don’t deprive your whole body of exercise and fitness because part of you is in pain. Yoga is excellent for person with pain because it increases flexibility and strength while focusing on breathing to support movement. Most yoga instructors will modify the poses to fit your needs. Walking and swimming are also good activities to keep the whole body healthy.

- Explore new recreational activities. If you used to play soccer or go skydiving for fun, you have to find new pursuits. Music, painting, gardening, creative writing, and handicrafts do not offer the same physical thrills, but they are relaxing and rewarding. Make time for fun even if you have not completed all the chores that need to be done.

If you have a chronic pain condition, you have to accept that much of your life has changed permanently. This does not mean your life is over. It just means that you can’t do things the way you used to before the pain set in. If you set realistic goals, learn to pace yourself, maintain a moderate level of daily activity, and engage in pleasurable pursuits, you will be able to have a full life.
How to Obtain the Best Medical Care for CRPS

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If you are reading this, it unfortunately means you or a friend or loved one have been diagnosed with complex regional pain syndrome (CRPS). This article is not about diagnosing and treating CRPS but rather about how to obtain the best medical care for this diagnosis.

There are lots of good reasons to obtain the best medical care possible for this diagnosis. First and foremost is that early quality treatment has the best chance of resulting in the best outcome. Second, the wrong treatment can actually lead to a worsening of this condition. Third from a practical standpoint your insurance coverage may be limited and thus getting the right treatment first which is covered is very important.

There is both good and bad news. We will start with the bad news. Many of you will not have adequate insurance coverage to provide the absolute best care for CRPS. Problematic as well is that even with good insurance coverage, treatment available in your local community may not be ideal or even available. With that said, the good news is that if you will take time to educate yourself about your CRPS condition, you have a much greater chance of getting what you need to get better and to manage this condition.

While some treating physicians may focus on medications and interventional procedures (i.e., injections, device implantation, etc.), and these can certainly be an important part of treatment, the best treatment is approached from a biopsychosocial perspective by an interdisciplinary team of treaters. This means treating you as a whole person and paying attention to both the physical and psychological aspects of chronic pain. This approach involves coordinated medical care with a treatment team, other than yourself and significant others, including a physician pain specialist, a physical and/or occupational therapist and a psychologist.

In this type of biopsychosocial approach, it is critical that the person with CRPS, become educated about the condition and be the "Caption of the Ship" when it comes to managing medical care. Being passive and leaving it all up to the doctors and therapists just won’t work. The person with CRPS needs to understand about his or her condition and how to treat it. That means becoming informed and educated. Whatever therapy is provided, it will not be enough if the CRPS patient doesn't "practice" what they are taught 24/7 both at home and away from the doctor and the therapy center.

The ideal setting for treatment is where the physician is a rehabilitation oriented pain specialist and not just a doctor focused on prescribing pills and doing procedures (i.e., nerve blocks, implanted devices, etc.). This means ideally, that the physician works closely with a physical and/or occupational therapist and a psychologist with expertise in treating CRPS. It is always best if they work out of the same facility as a team (this is called interdisciplinary) but even if they are in separate offices, it is important that they communicate and work together as a team (this is called multidisciplinary).

Getting back to the issue of education, while some physicians and therapists feel threatened by an educated patient who is knowledgeable and asks questions- and you need to be careful not to make the treater feel uncomfortable- it is perfectly okay to be educated about your problem and ask questions. High qualities treaters enjoy questions and are not threatened by knowledgeably patients. Have you read up about CRPS? Have you made yourself familiar with the usual medications and treatments prescribed for this condition?
Here are some other things to consider when you are evaluating obtaining the best treatment for CRPS.

1. Identify other individuals with this condition in your community to find how they have done with their treatment and who they have treated with. Does their physician, physical therapist and psychologist listen to them and provide effective treatment? Are they being provided education about the condition and a good home program to expand and work on what they are learning when they're in therapy?

2. Tell your primary care family physician that you are familiar with the diagnosis and want to make sure you are being referred to a pain physician who is rehabilitation oriented and not someone who focuses on prescribing medications and injections and other invasive treatments.

3. Interview the doctor and therapist to see if they are truly familiar with and experienced in treating CRPS. Is the medical care provided truly coordinated between the various disciplines?

4. Ask the physical therapist how commonly they treat people with CRPS and if they are familiar with some of the more recent graded motor imagery approaches such as mirror box therapy.

5. If there is no physical therapist in your community that consistently treats people with CRPS, ask to treat with the therapist that sees the most people with chronic pain. Many of the same pain management skills can be applied to managing CRPS.

6. As you speak with the physical therapist, see how willing they are to provide full answers to your questions. Quality CRPS treatment requires a lot of education and your therapist should be eager to provide you with the answers to your questions.

7. Many psychologists deal with symptoms like depression and anxiety, but ideally, the psychologist needs to be trained in pain management. It is very important that they use cognitive behavioral therapy (CBT) as part of their therapy as CBT has been found to be highly effective for managing pain. Cognitive behavioral therapy is a form of psychological treatment that focuses on examining and changing the relationships between maladaptive or faulty thoughts, feelings and behaviors.

Tips for Managing Complex Regional Pain Syndrome

September 11, 2015 by Jim Ducharme MD CM FRCP

Complex regional pain syndrome (CRPS), previously known as reflex sympathetic dystrophy (RSD), is a chronic neuropathic pain condition that can arise from trauma of any kind. It can be the result of something as minor as a blood draw that initiates a reaction. The condition arises more frequently than many emergency physicians may realize: roughly 3 percent of patients suffering a Colles fracture develop CRPS. Often the traumatic event cannot be remembered, and CRPS has been associated with trauma happening anywhere from a day to a year after the event. Its most consistent feature, however, is how often physicians fail to make the diagnosis on initial presentation. Furthermore, our lack of understanding about how to manage the severe pain that occurs during acute flare-ups of this chronic condition worsens the suffering that many patients with CRPS endure over decades.

Early Diagnosis Is Key

As can be seen with diabetic neuropathy, CRPS has both a sensory and an autonomic dysfunction. Unlike patients with diabetic neuropathy, both will be present from the start. Not only do patients suffer from intense pain that does not correspond to a specific nerve distribution, they also suffer visible changes as the result of their autonomic dysfunction.

Initially, the involved painful area (usually part of an extremity) becomes red, warm, and edematous; it is often initially misdiagnosed as cellulitis. The presence of severe allodynia (pain induced with a nonpainful stimulus such as light touch) should make the physician consider the true diagnosis. It is very important that CRPS be diagnosed early on because active treatment can reverse and eliminate the condition. Treatment includes neuropathic analgesics (eg, tricyclics, gabapentinoids) combined with active physiotherapy and mindfulness. Many patients who develop this condition will come to the emergency department with their painful condition when it begins, so the emergency physician needs to be able to diagnose and refer appropriately. I personally diagnose two to three new cases per year in my emergency medicine practice.
Failure to treat within the first weeks of symptom onset will allow the physical changes to start. The involved area will develop dystrophic skin changes: a shiny, thin, erythematous appearance. Underlying muscles atrophy so that the involved area becomes wasted in appearance over time. Typical burning neuropathic pain persists. If left untreated (or if poorly treated), CRPS can spread, involving larger parts of the body.

**Treating Flare-ups**

Patients will also present to the emergency department because of an acute flare-up of their chronic pain. CRPS can become acutely more painful because of N-methyl-D-aspartate (NMDA) activity and hyperresponsiveness to NMDA. NMDA is a neurotransmitter present in the dorsal horns and spinothalamic tracts, and it is the number-one initiator of wind-up in acutely painful conditions. With CRPS flare-ups, it is almost as if wind-up starts over again. The burning pain becomes acutely worse; pain is severe and unresponsive to almost all analgesics. Opioids will not control the pain of a flare-up unless given in a quantity that would make the patient somnolent. Opioids should not be considered a first-line treatment in this situation. It is recognized that many patients with CRPS ask for opioids for their severe pain. As with any patient asking for opioids when suffering from a chronic pain condition, this can create distrust and a stressful environment. Increasingly, national patient groups are educating patients that opioids will not be effective.

Given the cause of the pain flare-up, the treatment needs to be directed at stopping the NMDA activity. This is best accomplished with ketamine, an NMDA antagonist. A patient can only receive intravenous ketamine in a hospital environment, so emergency physicians need to be able to recognize and treat these severe pain flare-ups.

**Treatment Is Straightforward:**

1. Initial bolus of 0.2–0.3 mg/kg of ketamine infused over 10 minutes. Giving this dose as an IV push will produce a high rate of dissociative side effects (up to 75 percent of patients) and should be avoided. Almost diagnostic is the patient’s response: severe pain should be resolved by the end of the 10-minute bolus.

2. An infusion of ketamine (0.2 mg/kg/hr) for four to six hours. Although the medical literature for this is almost nonexistent, clinical experience has shown that an infusion of this duration resets the NMDA activity to baseline. Patients can return home on their usual medications, with the expectation that the flare-up, which can normally last weeks, will be over. Return rates for the same flare-up after ketamine treatment approach zero. For readers who feel four to six hours is too long, I encourage them to try shorter periods (two or three hours) and publish their results. No discharge prescription from the emergency department will be required.

Patients do not require admission, and they should not receive opioids. They do require the acute ketamine intervention, or they will suffer severe pain for weeks as a result of the flare-up. To date, there is no other effective treatment for a CRPS pain flare-up. Some researchers have studied an infusion of 5 mg/kg of lidocaine over a 60-minute period as an alternative treatment plan, but results are variable. Referral of newly diagnosed patients to physiotherapy and a comprehensive pain program is critical.

With better understanding of CRPS, emergency physicians will know when and how to intervene. Concern over drug seeking should be allayed, allowing appropriate care to be provided.
The following blog post was written on 11/6/16 by Nancy Sajben, MD for her website. You can visit her website by https://painsandiego.com/2016/11/06/medication-summary-for-intractable-pain-crpsrsd/.

I spoke only briefly this morning at the RSDSA conference but there is so much to add. Most importantly, thanks to RSDSA for helping so many people with CRPS. They fund pain research, they are starting a free children's camp, and now offer physicians one hour free CME (http://rsds.org/accredited-course-on-crps-for-mds-ph-d-s-and-rns/) teaching about CRPS.

Holistic view, 36 points – that’s how I view caring for brain and nerves, very similar to the details used by UCLA Alzheimer's Research Unit. In June 2015, I posted on their work on memory loss, dementia (https://painsandiego.com/2015/06/27/dementia-memory-loss-brain-atrophy-not-always-alzheimers-disease-we-are-all-at-risk/). We know chronic pain means inflammation in the brain, excess of proinflammatory cytokines. CT scans show memory loss and brain atrophy in those with chronic low back pain. Can this inflammation lead to Alzheimers? Even if it doesn't, why not maximize what we know we can do to help brain. As I view it, simply be meticulously detailed in giving the central nervous system (CNS) the best chance to relieve or prevent pain or disease.

Below is a *brief* list.

To find detail and sometimes depth, check the alphabetical lists on either side column [on Nancy Sajben’s website] until you see the category or tag when I first posted on that. Or simply plow through 7.5 years of detail with references. You do the work to check the side columns as I have no time to embed links below, taken from throughout this site.

For now just a list of medication players that may be strikingly important in trying to bring intractable pain into remission even after 20 years. Yes, even chronic for decades. The list applies to intractable pain of all causes. I omitted listing standard interdisciplinary approaches commonly used by every pain specialist around the world. My patients have failed all those.

Some patients with CRPS combine my medications with ketamine infusions.

For those who remain on opioids, ultra-low dose naltrexone (10 to 60 mcg three times daily) can significantly reduce pain, reduce opioid induced hyperalgesia, reduce windup, and thus reduce the dose of opioid needed to give improved relief. Opioids cause pain and trigger pro-inflammatory cytokines that create more pain. I strongly recommend slowly, gently tapering off opioid, and remaining off for 3 weeks before the following is trialed:

1. Vitamin D is anti-inflammatory. Important. Helps pain, depression. If bone loss is an issue, you will not absorb calcium from food if D is low. Mayo Clinic’s publication in 2012 showed more morphine is needed for pain if D is low. Huge literature of its benefit for depression. First topic I posted on – it is that important.
2. Vitamin B6 can cause burning pain from scalp to toe, a toxic neuropathy. It can be toxic to brain. It is loaded in tons of soft drinks, “energy” drinks, and supplements.
3. MTHFR mutation may be present. Body cannot process the B12 and folic acid you are eating or taking in supplement. A simple blood test, costly. Treatment is as simple as buying methyl folate and methyl B12 – no prescription needed. Folic acid in particular is profoundly important for one of the major energy cycles in the body. Can cause multiple conditions, some fatal, all from one single cause.
4. Minocycline 100 mg/day is the dose I use but higher doses could be given. It is used daily for decades for acne. I may prevent spread of CRPS if given before surgery, dental work, even minor procedures. I start 24 hours before, and continue for days after full recovery from surgery.
5. Testosterone in either male or female is depleted by opioids, it may be depleted by stress. Low T is a risk for depression, weakness and osteoporosis.
7. Dextromethorphan – reduces hyperexcitable glutamate
8. Oxytocin
9. Memantine – double the Alzheimers dose for CRPS. Like ketamine, it blocks the NMDA receptor.
10. Lamotrigine
11. Palmitoylethanolamide (PEA, PeaPure) a glial modulator, also acts on mast cells. A food supplement. No Rx. Your body makes it. Plants make it. Capsules & cream
12. Ketamine via nasal spray, under tongue combined with IV or not, works on glutamate-NMDA receptor. Not an essential drug. Where ketamine has stopped working, patients have become pain free after years of CRPS.
13. Creams combinations, so many. Most of my CRPS pts very much like Mg++/guai 10% each. You may or may not trial various combinations lido/keto/keta, etc. Numerous. DMSO 50%.
14. Medical Marijuana (CBD, THC, terpenes) [Marijuana saves lives](https://painsandiego.com/2016/11/06/medical-marijuana-proven-to-save-lives-science-november-4-2016/). Entire issue of Science, November 4, 2016, devoted to pain. NAC and alpha lipoic acid are noted by research from the Netherlands.

Appendicitis

If it has not burst, treat it like the infection that it is. Surgery may never be needed. I posted details of publications early 2016 with a case report. That young man was being rolled into the OR, instead was discharged 100% better without surgery 2 days later.

Medications target 3 main systems, as discussed at the conference

The opioid receptor – opioids create pain. They trigger glia to produce pro-inflammatory cytokines. Opioid induced hyperalgesia may occur. Cannot be used with low dose naltrexone.

The glutamate NMDA receptor – ketamine, memantine.

Glia, the innate immune system – glial modulators.

Before they see me, my patients have failed all prior therapies even ketamine coma. I view it like football. You have one guy running down the field with one ball. Do you want to win the game? You’ve dealt with this for years. Let’s not prolong it. Hit it with my main choice of meds all at once. Jump on it. What if you get 10% relief – will you even notice 10% after many years of severe pain? But if you get 10% from each of 5 meds, then you are talking 50% relief as a start. Address those 3 main pain systems – even without ketamine – and I have posted a case report after 20 years and 3 suicide attempts before seeing me, she has been pain free for about 4 years as I recall. A surgeon nicked her sciatic nerve when she was 27. Two years ago, pain free, running on her treadmill, she twisted her ankle. She has permanent foot drop from the sciatic nerve injury, but even spraining her ankle did not flare her CRPS. Twenty years of CRPS, pain free for about 4 years. And ultimately, years ago, she was tapered off all the drugs with one exception: LDN lifelong.

Most importantly, I did not have time to relay a very special message from my patient in Brooklyn: “Surround yourself with friends and family who love you. Never give up hope.” She had her first 2 or 3 pain free days this week, as she slowly increases doses of medication. She’s not yet at maximal effect and even then there can be increases. Sending love and courage.

**MOVEMENT**

Watch this on the RSDSA video [to be posted soon], afternoon speakers, the parents of young ones who had RSD discussed today all the toys and games they had to devise to slowly force yourself to move through the pain, every single day, several times a day, all day, begin to move the body as much as you can. Set goals and slowly, at a pace you set, do the work. Make progress. Go forward. Keep moving. Do whatever you can to keep moving.

RSD support groups are essential and I am glad to see the [RSDSA list](http://rsds.org/find-a-support-group-near-you/) of so many throughout the country. There is so much more. Indeed, at least 36 points discussed on June 2015.

**Disclaimer**

The material on this site is for informational purposes only.

It is not legal for me to provide medical advice without an examination.

It is not a substitute for medical advice, diagnosis or treatment provided by a qualified health care provider.
By Guest Bloggers Bobby and Lauren Geller

The Gellert’s daughter, Zoe, has faced CRPS head on. She has been inspired to do some great things. See what Zoe and the Gellert family are doing and what they learned about pediatric CRPS.

“Dad! You need to come home. The doctor said nothing is broken or torn, but I still can’t put my foot on the floor. It feels like someone is sticking a knife through my heel and it’s burning inside”.

These were the words of our 11-year-old daughter, Zoe Gellert, who the day before was involved in a crush injury to her right ankle. Zoe was immediately non-weight bearing and was describing pain symptoms that made no sense based on the findings from her X-rays and MRI. She was diagnosed with Complex Regional Pain Syndrome six weeks later. For my wife and I, this was the first moment in our lives that ‘brought us to our knees’. Having a child that is constantly in pain with symptoms that got worse over time was a devastating situation that immediately threw us into acute survival mode to obtain the best and most immediate treatment for our daughter.

Zoe is very intelligent, passionate and determined – a born leader. Over the past nine months since her injury, Zoe has learned an incredible amount about herself and her disorder. Today, although Zoe is fully functional and playing sports, she continues to manage her daily pain with techniques that she has learned and that she is enthusiastic about sharing with other kids that are suffering. Zoe is committed to creating overall awareness about pediatric CRPS and to raising money to help fund vetted treatment and research projects and to help support parents seeking financial assistance for their child’s necessary treatments. Attached below is a detailed video of Zoe’s story that we would like to share. We hope that you enjoy it and that it is inspirational for you or someone that you know with CRPS. If you would like to email Zoe, please contact her at zoesheroes@icloud.com. We hope to hear from you!

My wife and I are very grateful that within three months of Zoe’s injury she was diagnosed, admitted into the hospital for intensive multi-disciplinary treatment and was released from the hospital walking without any support. However, the feeling of being ‘a fish out of water’ is still very fresh for us. Being thrown into the abyss of CRPS – whether during the pre-diagnosed, treatment or recovery stages – is completely overwhelming. Throughout our research, it was very important to us to consider treatment options that were non-narcotic, non-invasive – but aggressive and appropriate for a child. There were always many things to consider and everyday brought new challenges. So below, we feel compelled to highlight and share what we have learned about pediatric CRPS and what has worked for us and our family thus far in our journey…

Top 20 dos, DON’Ts, SUGGESTIONS AND PRACTICALITIES FOR PEDIATRIC CRPS*

- Do not apply ice
- Do not cast or immobilize
- Do not get a flu shot
- CRPS can spread throughout the body over time without treatment
- Emotional stress can increase the baseline pain endured daily
- Blood tests do not support or exclude the diagnosis – which is clinical and primarily based through observation of a variety of classic symptoms
- Thermography may be the most effective non-invasive diagnostic tool
• If your child must have an IV or get a shot, use the smallest needle possible – sometimes called a butterfly needle
• Discuss with your doctor administering an appropriate dosage of Ketamine along with any anesthesia during surgery
• Your child must be encouraged to stay engaged in everyday life activities while in pain – endure as much daily physical activity or physical therapy as your child can tolerate
• Continually touch, rub and desensitize the affected area – this will facilitate the circulation of blood and oxygen flow and eventually reduce pain
• Recovery is mostly about function over pain – explain to your child that he/she will not hurt himself/herself – if your child can function while in pain he/she will feel in control of the pain and the pain level will be reduced
• Do not ask your child about the pain he/she is feeling
• If your child complains about the pain, be sensitive, acknowledge the pain and distract him/her with homework, chores, physical or social activity – but move on from the conversation
• Your child must accept and surrender to the pain without letting the pain identify who he/she is – do not allow your child to mentally cut off the affected area from his/her body
• Seek a Cognitive Behavioral therapist so your child has someone other than you to talk with about what they are going through and to learn visual pain management techniques
• All family members should be encouraged to discuss with a therapist how they are coping with the affected family member’s diagnosis
• Do not allow CRPS to take over the household or to be the main topic of conversation with family, friends and work colleagues
• Consider Osteopathy and Homeopathy as regular, not alternative, treatment options
• Five books to read:
  • Get Out of Your Mind and Into Your Life – Spencer Smith and Steven C. Hayes
  • Conquering Your Childs Chronic Pain – Lonnie K. Zeltzer M.D.
  • The Mind Body Prescription – John E. Sarno M.D
  • The Power of Now – Eckhart Tolle
  • Fulford’s Touch of Life – The Healing Power of the Natural Life Force – Dr. Robert Fulford

* We are parents, not doctors; hence, we are not making any representations or warranties regarding the above information which is based solely on the results of our own research and experiences.

As you saw in the video, Zoe created a GoFundMe site. Please click on the link if you are able to make a tax-deductible donation and/or please share the GoFundMe site on your Facebook page or any other social media outlet. We thank you in advance for your support and for your donation.

We also have an Instagram account – called “Zoesheroes” – that it would be super if you would “like” and follow us on our journey!

With appreciation and gratitude,

Lauren and Bobby Gellert
Outcomes of Children With Complex Regional Pain Syndrome After Intensive Inpatient Rehabilitation

Valerie Brooke, MD, Steven Janselewitz, MD

Objective: To examine the effectiveness of an inpatient treatment program on eliminating pain and increasing function for children with complex regional pain syndrome.

Design: A retrospective chart review and follow-up telephone survey.

Setting: A tertiary care hospital.


Intervention: Intensive inpatient physical and occupational therapy in conjunction with psychological counseling, art therapy, recreational therapy, and child life specialists who focused on improving physical function and conditioning, stress management, and the development of self-efficacy related to pain and stress.

Main Outcome Measurements: Resolution of pain and restoration of full function by patient or family report.

Results: All of the children had failed various prior treatment approaches: 34% had resolution at the time of discharge; 78% of admissions and 89% of those with follow-up had eventual resolution of pain; and 95% had full restoration of physical function at a median time from start of treatment of 2 months. Seven had recurrence and 5 were able to resolve the recurrence without further intervention from the medical community.

Conclusions: Intensive inpatient rehabilitation is effective for children with complex regional pain syndrome. Additional studies are necessary to compare this treatment with other approaches.

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INTRODUCTION

Children with pain out of proportion to any initiating injury, or amplified pain, can pose both a diagnostic and therapeutic challenge for physicians. Some children have autonomic signs such as swelling or changes in skin temperature or color, which lead to a diagnosis of complex regional pain syndrome type 1 (CRPS-1), formerly referred to as reflex sympathetic dystrophy (RSD) [1]. Other physicians have also used the term reflex neurovascular dystrophy (RNVD) [2-7]. Pain conditions in children without autonomic signs have been referred to as diffuse idiopathic pain syndrome, localized idiopathic pain syndrome, psychogenic pain, psychosomatic pain, pseudodystrophy, growing pains, primary fibromyalgia syndrome, or fibromyalgia [7-15].

Many different treatment approaches have been attempted for these pain conditions in children, including nonsteroidal anti-inflammatory drugs [16-20], steroids [16,19,21-23], prostacyclin analog [12], pamidronate infusion [24], splinting or immobilization [18,20,25,26], transcutaneous electrical nerve stimulation (TENS) [17-19,26-30], sympathetic nerve blocks [6,19,22,25,26,30,31], and spinal cord stimulation [14], all with varying degrees of pain resolution and functional restoration. The most commonly used treatment for children with CRPS-1 is physical therapy (PT). A few studies show the effects of a single treatment modality for the treatment of these pain conditions. Frequently, multiple modalities are used simultaneously, which make it difficult to determine the effectiveness of any single treatment.

The few previous studies of children treated primarily with inpatient or outpatient therapy show rates of long-term full resolution that ranged from 60% to 100% [2,32-34].

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Bernstein et al [2] reviewed charts of 23 children with RSD who had been treated with intensive outpatient PT of 2 to 3 PT sessions per day. Twelve patients had resolution of their pain, and 20 patients had full functional restoration after a mean follow-up time of 2.4 years. Blau [32] indicated full resolution of pain and function in 10 children with RSD after PT, with no patient spending more than 2 days in the hospital. The mean follow-up time was 1.1 years.

Sherry et al [33] studied children with CRPS-1 with either home-based exercises or inpatient therapy. Outcomes after a mean of 5.25 years showed pain resolution in 88% and functional restoration in 98%. Sherry did not elaborate on how many patients received inpatient versus outpatient therapy and drew no conclusion as to whether one was better than the other. A later study by Sherry [10] also included children with more diffuse musculoskeletal pain as well as patients with CRPS-1. Treatment consisted of an average of 2 weeks of intensive inpatient or outpatient PT, followed by a 1-hour daily home program performed for another 2-8 weeks. He reported that 80% of children had no pain and were fully functional after 1 month of treatment, with 15% having some pain but full function, and 5% with no improvement at all. At the 5-year follow-up, 90% of patients were free of pain and fully functional.

Lee et al [34] provided treatment of 1-hour weekly outpatient PT with cognitive behavioral therapy for 6 weeks or 3 hours of outpatient PT per week with cognitive behavioral therapy for 6 weeks. At follow-up, both groups had improvements in pain and function, with no significant difference between the groups, which suggests that more hours of PT may not improve outcomes. All the patients contacted at a mean follow-up of 2.5 years had resolution of their pain and restoration of function.

Although some of these studies used inpatient treatment, the studies did not look at this treatment approach exclusively. The aim of our study was specifically to evaluate the outcome of an inpatient rehabilitation treatment program of intensive rehabilitation therapies followed by a home program for children with complex regional pain syndrome.

METHODS

After institutional review board approval was obtained, a retrospective chart review included 33 admissions for inpatient treatment of complex regional pain syndrome at a tertiary care hospital between February 2007 and July 2010. Exclusion criteria limited data collection to first-time admissions, which eliminated 1 repeat admission for a total of 32 unique admissions and subjects for this study.

The diagnosis of CRPS-1 was made by 1 of 3 pediatric physiatrists working at the clinic and hospital with experience in diagnosing and treating children with CRPS-1. The diagnosis was based on symptoms of pain, focal or diffuse, hyperesthesia or allodynia, swelling, changes in skin color or temperature, decreased mobility or function, effects of prior treatment approaches, and lack of other diagnoses. These signs and symptoms form the basis for the diagnosis of pediatric CRPS-1 as suggested by Stanton et al [20], which include pain out of proportion to the inciting event combined with evidence of neurovascular dysfunction as manifested by dependent edema, dependent rubor, skin motting, hyper-sensitivity to light touch, skin temperature changes, altered perspiration, and/or changes in patterns of hair growth. Patients were admitted for treatment based on diagnosis, patient and family willingness to enter treatment, and approval from insurance.

Admission and discharge data for pain and functional status were obtained by chart review. Pain was rated on a 0-10 numerical rating scale, with 0 being no pain and 10 being the worst possible pain. Data on long-term outcomes were obtained by a follow-up telephone survey completed 6 months or more after discharge. The telephone questionnaire included questions regarding the number of recurrences, resolution methods for any recurrences, any further treatment provided after discharge, and pain and functional levels on the day of the telephone interview. The parents were interviewed, unless the child was older than age 18 years at the time of the telephone interview, in which case the patient was interviewed.

TREATMENT

Inpatient lengths of stay varied depending upon the needs of the child and response to treatment, but all children participated in 5 hours of therapy per day, 5 days per week. The 3 hours of daily PT included timed, high-intensity aerobic activities, lower and upper extremity strengthening, core strengthening, stretching or yoga, and balance or coordination activities. Aerobic activities included the treadmill, stationary bike, step-ups on a bench, sprints, and various nontypical mobility activities. The patients were required to beat the previous day’s timed aerobic activities by 1 second before moving to the next activity. Daily occupational therapy included 2 hours of exercises such as push-ups, sit-ups, plank exercises, or using an upper extremity bike. Desensitization exercises, such as brushing, toweling, lotion rubbing, or fluidotherapy, were performed on the affected extremity for 15 minutes twice a day. Also, during the weekdays, the patients performed school activities for 30 minutes, had psychological counseling that taught stress management and pain coping skills, and had 30 minutes of self-directed PT on their own in the evenings. Additional services included art therapy, recreational therapy, and child life therapy. A few children were referred for a psychiatric consultation. Week-end therapy included 2.5 hours of PT and occupational therapy on Saturday, plus 45 minutes of self-directed therapy on both weekend days. Family visitation was limited. Each patient was given an individualized home therapy program.
after discharge, with the expectation to perform 45 minutes each weekday, and 90 minutes on each weekend day, until full functional activity was established.

Either before or shortly after admission, the patients were weaned off any medications being taken for CRPS-1. The patients were allowed to take acetaminophen or ibuprofen for headaches or soreness. The patients were discharged once they had reached their best performance on the above activities and demonstrated an ability to perform their home program.

**RESULTS**

Patient characteristics are depicted in Table 1. The mental health diagnoses at admission included depression (6 children), anxiety (9), attention-deficit/hyperactivity disorder (3), somatization or conversion disorder (2), eating disorder (1), and posttraumatic stress disorder (2). An additional 4 children were seen by a psychiatrist during their inpatient treatment and were diagnosed with general anxiety disorder (3), dysthymia (2), and depression (2). School absences were recorded for 28 children (88%), which ranged from missing several days due to the pain, to being home schooled secondary to pain and immobility. Five children (16%) had a previous diagnosis of chronic headaches or migraines.

Signs and symptoms on the day of admission include pain, location of pain, and previous treatments are listed in Tables 2, 3, and 4, respectively. All the children had at least 1 prior treatment approach, although typically more. Functionally, 8 children (25%) required the use of crutches for ambulation, and 4 (13%) used a wheelchair, and 3 (9%) were non-weight-bearing secondary to pain. The admission median pain rating was 8.5 (range, 5-10). The average length of stay was 19 days, with a range of 8-32 days.

### Table 1. Patient characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>Girls, n (%)</td>
<td>26 (81)</td>
</tr>
<tr>
<td>Boys, n (%)</td>
<td>6 (19)</td>
</tr>
<tr>
<td>Mean age (range), y</td>
<td>14.3 (8-18)</td>
</tr>
<tr>
<td>Mean duration of symptoms before treatment (range), mo</td>
<td>9 (0.5-48)</td>
</tr>
<tr>
<td>History of injury or trauma, n (%)</td>
<td>17 (53)</td>
</tr>
<tr>
<td>History of psychological diagnosis, n (%)</td>
<td>14 (44)</td>
</tr>
<tr>
<td>Perfectionalist or overachiever personality traits, n (%)</td>
<td>16 (50)</td>
</tr>
</tbody>
</table>

### Table 2. Signs and symptoms on day of admission

<table>
<thead>
<tr>
<th>Sign</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>32 (100)</td>
</tr>
<tr>
<td>Hyperesthesia</td>
<td>27 (84)</td>
</tr>
<tr>
<td>Skin color changes</td>
<td>15 (47)</td>
</tr>
<tr>
<td>Temperature changes: hot or cold</td>
<td>13 (40)</td>
</tr>
<tr>
<td>Swelling</td>
<td>5 (16)</td>
</tr>
</tbody>
</table>

### Table 3. Pain location

<table>
<thead>
<tr>
<th>Location</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower extremity only involved</td>
<td>14 (44)</td>
</tr>
<tr>
<td>Neck, back, abdomen, or torso involvemnt</td>
<td>10 (31)</td>
</tr>
<tr>
<td>Upper extremity only involved</td>
<td>5 (16)</td>
</tr>
<tr>
<td>Both upper and lower extremity involved</td>
<td>3 (9)</td>
</tr>
</tbody>
</table>

All the children completed inpatient treatment. At discharge, the pain rating dropped to a median of 2 (range, 0-10). Eleven children (34%) had complete resolution of their pain at discharge (Figure 1). No child required the use of crutches or wheelchairs, although 5 (16%) were unable to participate in physical or sports activities. One of these 5 had limitations secondary to focal atrophy, not due to pain, and one had limitations due to hemiplegic cerebral palsy. Nine families (59%) were successfully contacted for the follow-up telephone survey. The remaining 13 families were lost to follow-up due to disconnected telephone numbers (3), failure to answer telephone calls (6), or nonresponse to messages (4). The average time to survey follow-up was 21 months, with a range of 6-43 months.

Of the 21 children who continued to have pain on discharge, 14 (67%) had resolution of their pain at a median of 2 months (range, 1-11 months) (Figure 1). Four children who had pain on discharge were lost to follow-up. Of the 19 children who participated in the follow-up telephone survey, 3 never had pain resolution, with 2 reported a current pain level of 2, and one reported a level of 6. These ratings were less than their admission ratings, with reductions of 7, 3, and 2. Overall, 25 children had resolution of their pain. This is 78% of admissions and 89% of those with known outcomes.

Relapses occurred in 7 children (37%), including 1 relapse, or flare, in a patient whose pain improved but did not resolve after treatment. Six patients achieved full resolution of the recurrence. Five achieved resolution with home-based exercises learned during their inpatient treatment. One patient required additional outpatient therapy. The child with the flare was admitted for a second intensive therapy program, which resulted in reduction of the pain but still failed.

### Table 4. Previous treatments

<table>
<thead>
<tr>
<th>Medication</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>Nonsteroidal anti-inflammatory drugs</td>
<td>21 (66)</td>
</tr>
<tr>
<td>Outpatient physical therapy</td>
<td>20 (66)</td>
</tr>
<tr>
<td>Opiates</td>
<td>17 (53)</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>16 (50)</td>
</tr>
<tr>
<td>Gabapentin</td>
<td>13 (41)</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>10 (31)</td>
</tr>
<tr>
<td>Cast or splint of extremity</td>
<td>5 (16)</td>
</tr>
<tr>
<td>Muscle relaxants</td>
<td>5 (16)</td>
</tr>
<tr>
<td>Oral steroids</td>
<td>3 (9)</td>
</tr>
<tr>
<td>Local injections</td>
<td>2 (6)</td>
</tr>
<tr>
<td>Sympathetic nerve block</td>
<td>2 (6)</td>
</tr>
<tr>
<td>Epidural injection</td>
<td>1 (3)</td>
</tr>
</tbody>
</table>
to achieve resolution. Although counseling was recommended for nearly all the children after discharge, only 5 participated, all of whom had eventual resolution of their pain.

Three children had additional treatment for their CRPS-1 after discharge. One child began with a personal trainer after discharge as well as treatment by a naturopath and an acupuncturist, with eventual full resolution of pain. Two children saw other allopathic physicians after discharge for their pain. One child had full resolution of pain 11 months after discharge and after seeing a pediatric rheumatologist who used the same therapeutic techniques as in this study. The other child saw a pain center physician, attempted biofeedback with no resolution of pain, received a diagnosis of non-epileptic seizures, and never had pain resolution. One child continued with outpatient PT after discharge for focal muscle atrophy. Of the 5 children who reported functional limitations on the day of discharge, 3 children continued to report physical activity limitations on the day of the follow-up survey. However, one was due to hemiplegic cerebral palsy, one to new knee instability, and one to CRPS-1.

**DISCUSSION**

CRPS-1 occurs in both the adult and pediatric populations, but it differs in several respects. Pediatric CRPS has a 6:7:1 female:male ratio, whereas adults have a female predominance of 2:4:1 [14,35]. Children also tend to have symptoms in the lower extremities 3-6 times more frequently than in the upper limbs, whereas adults more frequently have upper extremity involvement [14,35]. In addition, children tend to have less pronounced neurologic or sympathetic symptoms [35]. In our experience, children have not developed nail or hair growth changes. Adults have quite variable rates of recovery and frequently have long-term disability, whereas children are more likely to have complete resolution.

Many of our pediatric patient characteristics follow the pattern of previous reports and studies of children with complex regional pain syndrome, including the female predominance of patients [2,4,6,13,15,16,19,20,23,31-34,36-38], lower extremity involvement greater than upper extremity [2,5,8,13,15,18-20,23,33,34,36,37,39], and not always having an inciting event or trauma [2,3,5,6,15-17,20,23,31,33,34,36,38,39]. Previous reports showed an average age of 10.7 years at onset of CRPS-1 symptoms, whereas others reported median ages of 12, 13, or 14 years [4,23,33,38]. Previous reviews also reported an average duration of CRPS-1 before treatment of 6.3 months, or medians of 2, 4, 5, and 12 months [4,17,20,33,38]. In our sample population, the average age of onset of CRPS-1 was 13.3 years, and the median number of months before inpatient treatment was 9 months, both of which were higher than most previous published reports. The higher duration of symptoms before inpatient treatment could be explained by a delay in diagnosis, attempts at other treatments, or a delay in getting approval for inpatient treatment.

Our pain resolution rate is similar to prior studies on outpatient and inpatient therapy intervention, which ranged from 60%-100% [2,32-34]. Our high functional restoration rate is also similar to these studies but lacks a validated and thorough measure. We found a median time to resolution of pain of 2 months (range, 1-11 months) (Figure 1). For studies that reported time to resolution, the range was 2 weeks to 2.5 years [16,17,20,21,25-29,31,36,40,41,42].

Recurrences of CRPS-1 symptoms occurred in 7 of the 19 children contacted for follow-up in this study. This percentage of recurrences (37%) is not uncommon, and falls within a similar percentage range reported in previous studies [2,3,5,6,10,17,20,26,30,33,36-38,41,42]. Recurrences were found to occur either in the original area or the limb, or occasionally occurred in a new location. Regardless, the skills learned in inpatient rehabilitation were effective in resolving pain and dysfunction in 5 recurrences and kept these children from having to seek out further medical interventions.

Many researchers in previous studies have suggested that there is a strong psychological association in children who have complex regional pain syndrome [2,4,20,23,30,32,37-39]. Despite this association, causality cannot be substantiated, for several reasons. As noted by Bruehl and Carlson [43] and Lynch [44], the previous studies were not prospective trials, and they lacked control groups, had small sample sizes, and did not always have valid Diagnostic and Statistical Manual of Mental Disorders—III (DSM-III) diagnoses, which relied instead on statements of personality characteristics. Our study found the same associations but also had the same limitations. It also was difficult to make any assumptions regarding the relationship of mental health to complex regional pain syndrome, because depression and anxiety can occur as a result of chronic pain. Sherry et al [38] notes this in their reviews, with understanding that a preceding depression can lead to chronic pain or that the distress of a chronic pain syndrome can lead to depression. The high prevalence
of psychological diagnoses in children with CRPS-1 require skilled professionals to treat the mental issues at the same time the therapy is working to decrease pain and increase function.

Three children in our study with known outcomes did not resolve their pain, which limits the ability to compare them with the children who did resolve their pain. However, it is interesting to note the characteristics of the 3 children who seemed to have failed our inpatient treatment program. First, these children had unusual pain distributions. The first one with diffuse pain covering the face, chest, back, and bilateral legs, as well as complaints of chronic fatigue. She had no initiating injury, no known history of a psychiatric diagnosis but did have a history of hyperflexibility. At discharge, this child reported a change in pain rating from 5 to 2, and, at follow-up, a pain rating of 2, which suggests at least an initial response to treatment. At follow-up, she also continued to report functional limitations, including an inability to sit or move for long periods of time.

The second child had right upper quadrant abdominal pain after a resection of a local nodular hepatic hyperplasia. In addition, this child also had autonomic changes in her feet, as well as numbness on her abdomen. She went on to receive treatment at another clinic and was subsequently found to have nonepileptic seizures. Unlike the first patient, she did not report any immediate decrease in her pain; she reported both an admission and discharge pain rating of 8. After long-term follow-up, her pain rating had decreased to 6, although she continued to miss school and participated in very limited physical activities. The third child had back and bilateral posterior leg pain with significant headaches. His back and leg pain, but not his headaches, improved after treatment, with a reported change from 9 to 2. However, his pain did not resolve, and he was readmitted for a second inpatient stay after injury resulted in worsened CRPS-1. His pain improved after the second stay but did not fully resolve.

The limitations of our study are similar to those in earlier studies on children with CRPS-1. The number of study participants is small; there are no control groups for comparison; and not all children participated in the follow-up survey. Even though our rates of resolution of pain and restoration of full function are encouraging, further study is required to determine whether outpatient therapy is more or less effective than intensive inpatient therapy or other treatment approaches.

CONCLUSION

The results of our study suggest that intensive inpatient rehabilitation, which consists of physical, occupational, and psychological therapy, without the use of other medical intervention and followed by a home program, is effective for children with complex regional pain syndrome even when other approaches have failed. Additional studies are necessary to compare this treatment with other approaches.

UNCITED REFERENCES

This section consists of references that are included in the reference list but are not cited in the article text. Please either cite each of these references in the text or, alternatively, delete it from the reference list. If you do not provide further instruction for this reference, we will retain it in its current form and publish it as an “un-cited reference” with your article [40].

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REFERENCES

Management of Pediatric Patients With Complex Regional Pain Syndrome

Robert T. Wilder, MD, PhD

Abstract: This review summarizes current information about diagnosis and treatment of complex regional pain syndrome (CRPS) in children. Although it has been widely held that CRPS in children is intrinsically different from adults, there appear to be relatively few differences. However, there is a marked preponderance of lower extremity cases in children. Historically, psychological factors have been invoked to explain the genesis and persistence of CRPS in children, but the evidence is not compelling. Treatment outcome studies are limited but indicate that children generally respond to a primary focus on physical therapy. Multidisciplinary treatment reports are particularly encouraging. The general perception that children have a milder course may relate to the potentially greater willingness of children to actively participate in appropriately targeted treatment rather than to innate differences in the disease process itself. Recurrence rates appear higher in adults, but response to reinitiation of treatment seems to proceed efficiently. Clinical judgment dictates the extent of medication or interventional therapy added to the treatment to facilitate rehabilitation. In many ways, the approach to the treatment of children mirrors that of adults, with perhaps greater restraint in the use of medications and invasive procedures. The rehabilitation of children with CRPS, like that of adults with CRPS, needs further rigorous investigation.

Key Words: complex regional pain syndrome, pediatric


DEMOGRAPHICS

In children less than 18 years of age, complex regional pain syndrome (CRPS) type 1 develops most commonly in girls, with the incidence rising at or just before puberty.\(^1\) The lower extremity is more commonly affected than the upper, with a ratio of about 5:1. Type 1 CRPS seems to be more common among Caucasian children. I have noted this association in my practice at both Children's Hospital, Boston, and at the Mayo Clinic, Rochester. To exclude sampling bias, physicians at Children's Memorial Hospital in Chicago and Children's Hospital Medical Center in Cincinnati were also polled (personal report from S. Suresh, Children's Memorial Hospital, Chicago, IL, and K. Goldschneider, Children's Hospital Medical Center, Cincinnati, OH). Although these hospitals have a substantial proportion of minority patients, the same association was seen there. Bernstein et al\(^6\) also reported this association: 18 of 23 patients in their report were Caucasian, 4 Hispanic, and 1 black. This may not be unique to children, however as Allen et al reported a similar distribution in adult patients: 91% (107 of 118) of their population was Caucasian.\(^6\)

CRPS type 2 is found with roughly equal incidence in both boys and girls and has been noted in children as young as 3 years of age.\(^7,8\) Interestingly, however, even though brachial plexus injury during delivery is common and can lead to longstanding motor weakness, neonates with Erb's palsy do not generally develop pain in the extremity.

DIAGNOSIS

The diagnosis of CRPS remains a clinical one based on appropriate findings in the history and physical examination. Pain, particularly with allodynia, and signs of autonomic instability either historically or on examination are required to make this diagnosis. The pain should be out of proportion to the inciting event, if any, and is usually distally generalized in the extremity.\(^7\) Pathologic processes that might explain the pain must be excluded. There are no laboratory tests that can absolutely confirm or exclude this diagnosis.

A group from Belgium including Herregods,\(^10\) Francx,\(^11\) Chappel, and others has argued that disturbed vascular scintigraphy with increased pooling in the initial phase and hyperfixation on bone scintigraphy is necessary on bone scan to make the diagnosis of CRPS. In contrast, most other authors find that bone scans are quite nonspecific for the diagnosis of CRPS. Multiple authors have found that in patients meeting the clinical diagnosis, bone scan may show either hypofixation or hyperfixation or may be normal.\(^3,5,12,13\) This is not to say that bone scans are not useful in working up the patient with signs and symptoms of CRPS; however, the primary utility is in ruling out some underlying orthopaedic abnormality that might be triggering the neurovascular changes rather than diagnosing CRPS.
TREATMENT

CRPS in pediatric patients has always been considered different from CRPS in adults. Early large series of CRPS (or reflex sympathetic dystrophy, as it was known at the time) suggested that the syndrome was extremely rare in children. Sporadic early reports of children with CRPS first appeared in the 1970s. Several of these patients had spontaneous resolution. This led to the suggestion that no treatment should be performed for children with CRPS. The rationale was that all treatments carry risks and side effects, and for a self-limited disease these should be avoided. Other authors used treatment strategies very similar to those used in adults, including sympathetic blocks, antidepressants, vasodilators, steroids, and so forth, generally with complete resolution of the disease. Between these two extremes was a group of authors recommending conservative treatment consisting primarily of physical therapy (PT) either with or without concomitant use of transcutaneous electrical nerve stimulation (TENS). The overall impression is that CRPS is more easily treated in children than in adults. This impression is challenged by later reports from Wilder et al, Stanton et al, and Greipp showing that a percentage of children will have long-term pain and disability even with aggressive therapies such as sympathetic-chain catheters, and antidepressant and anticonvulsant medications.

Physical Therapy

A recent report by Sherry et al contradicts this pessimistic viewpoint. Using a program consisting exclusively of PT up to 6 hours per day, without any blocks or medications, they reported a cure rate of over 90%. These impressive results are similar to those Bernstein et al reported for PT alone two decades earlier. Murray et al also reported similar results using PT as the primary treatment modality: 40 of 46 patients resolved with intensive PT alone.

A major school of thought is that PT is the treatment modality that offers a chance for resolution of CRPS in either adults or children. All other therapies, when used, should be prescribed with the goal of facilitating the basic PT regimen. From this hypothesis one would predict that more intensive PT would provide faster and more complete resolution of CRPS. Although nonrandomized trials of intensive PT by Sherry et al, Murray et al, and others would seem to support this, a recent prospective randomized trial by Lee et al does not. In this study patients were assigned to once-weekly or three-times-weekly outpatient PT along with a baseline of weekly cognitive-behavioral sessions. Results for both groups were good, with pain scores decreasing to near zero and function improving, but no statistically significant difference was found between the two groups. This may have been limited by small sample size (13 per group) or because the actual amount of exercise performed may have been similar between the two groups. Curiously, the trend was for more complete resolution in the once-weekly group.

TENS

TENS is a noninvasive physical modality that may provide excellent analgesia for some patients. It has been described in several case reports and series. None of these series describe TENS as universally effective, and there are no prospective, blinded trials of efficacy. In view of the modest cost, generally high acceptance by children, and remarkable safety of this device, it is almost always worthwhile giving a trial of TENS as part of a multidisciplinary approach to CRPS.

Biobehavioral and Psychological Treatments

Much has been written about psychological aspects of children with CRPS. Authors have invoked psychological contributions to the disease since the earliest case reports of CRPS in children appeared. Carron and McCue, in their 1972 description of a child with CRPS, stated that they made “the usual referral to psychiatry and for sympathetic blocks.” Some authors have even presumed that CRPS is entirely a psychological or psychosomatic disease process. Presumably they are confused because CRPS crosses dermatomes and areas of innervation by single nerves to form a distally generalized stocking-and-glove distribution. The marked allodynia and pain far out of proportion to the original inciting injury, if any, have also caused many practitioners to question whether CRPS has an organic basis or is purely psychosomatic.

There is scarce evidence that children with CRPS are psychologically unique. Sherry and Weisman studied 21 families of children with CRPS. These were generally high-achieving, compliant children. They found that in virtually all cases there was significant parent-child enmeshment with the patient. Beyond that, they found that multiple different stressors were present in these children, including marital conflict between the parents (n = 12), significant school problems (n = 13), and sexual abuse (n = 4). Testing revealed no major psychopathology, except for one child who scored high in somatization. Sherry and Weisman suggested that CRPS is frequently a stress-related disease, and the therapeutic approach must take these psychosocial factors into account. One difficulty with this study is that appropriate control groups were not tested with equal thoroughness. Children with new-onset arthritis were compared in terms of global assessment, but the other psychological tests were not reported for this control group. A healthy control group was not included.

A case series by Brommel et al also found psychological dysfunction in children with CRPS. They concluded that the despair of the patients about their reflex sympathetic dystrophy expressed unsolved fears of future pain. In their series, none of the children showed a significant emotional dysfunction. This was not further defined, although they also noted a great deal of stress in the lives of the patients. In contrast, Vieira et al performed a preliminary study comparing

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patients with CRPS to children with migraine headaches and 21 normal controls. Contrary to expectations, no differences in family functioning were found among the three groups. Unfortunately, this work was never published in a peer-reviewed journal. A literature review by Lynch \(^3\) in 1992 and recent prospective psychological studies of CRPS in adults also support that these patients are not psychologically unique from others with chronic pain. \(^38,39\)

In isolated cases, psychological factors may indeed have a predominant role in the etiology of CRPS. Jaworowski et al.\(^40\) reported CRPS in a 12-year-old who developed simultaneously a conversion disorder; her identical twin also developed an identical conversion disorder. Whether or not psychological dysfunction exists prior to the onset of CRPS, psychological, cognitive, and behavioral strategies are often used as part of the treatment of children with CRPS. Case reports of successful treatment of CRPS with cognitive and behavioral strategies began to appear in the 1980s. \(^41,42\) There are no prospective placebo-controlled trials of cognitive and behavioral therapies in the treatment of CRPS, either in adults or children. Their use is extrapolated from case reports and prospective series for other pain states, notably headache. \(^43,44\) Wilder et al.\(^45\) reported that 57% of their patients who received such training benefited from it and continued to use this treatment modality. Stanton et al.\(^3\), however, found that psychological interventions were not consistently effective. This was felt to be due to the short time for interactions with the therapist during the patient’s inpatient admission. Lee et al.\(^25\) used cognitive and behavioral therapy as part of their baseline treatment of CRPS patients who were randomized to receive one or three sessions per week of PT. Compliance with attending the sessions was good and overall results were good, but the specific effect of the cognitive and behavioral treatments was not broken out. Sherry et al.\(^5\) did not use formal cognitive or behavioral treatments in his series of 103 patients treated with intensive PT, but they did refer 77% for psychological counseling, either individual or family. The results from the counseling were not measured or studied.

**Sympathetic Blocks**

In previous years many authors have equated sympathetically mediated pain with CRPS. During the 1993 consensus conference that eventually led to the new taxonomy of CRPS, there was widespread agreement that the pain of CRPS could be sympathetically maintained, sympathetically independent, or some combination of both that could change over time. \(^45\) Sympathetic blocks may help define the proportion of pain that is sympathetically mediated at that time and may be of therapeutic benefit, but they do not confirm or revoke the diagnosis of CRPS. When sympathetic blocks are used in the treatment of childhood CRPS, several authors have proposed the use of indwelling catheters rather than repeated single injections. \(^1,25,46\) There are several reasons to prefer this technique. First, accurate placement of a lumbar sympathetic block is facilitated by use of fluoroscopy. Minimizing radiation exposure is appropriate for children. Second, many children and adolescents require heavy sedation or a brief anesthetic for the placement of these blocks. Minimizing the number of anesthetics required is also useful. Third, the goal of the sympathetic block is not to “treat” the CRPS per se, but rather to provide adequate pain relief that the patient can effectively engage in PT. An indwelling sympathetic-chain catheter, when effective, provides continuous pain relief without motor or sensory dysfunction and can be highly effective in allowing PT to proceed. These patients are generally hospitalized. Indeed, one advantage of the indwelling catheter is that it mandates hospitalization, which may allow more intensive PT than is available on an outpatient basis. Single-shot sympathetic blocks need to be coordinated with the PT sessions so that the patient is pain-free during the sessions. Indwelling epidural catheters, although often effective in relieving the pain, cause sufficient motor and/or sensory block that the patient cannot effectively participate in PT. This may be counterproductive, as any immobilization of the limb appears to worsen CRPS. Use of clonidine or opioids along with low concentrations of local anesthetic in the epidural catheters may avoid this problem, but this may not provide adequate analgesia. Several authors who emphasize intensive PT as the sole treatment modality for childhood CRPS actually recommend against the use of sympathetic blocks. \(^3,5,23\) They have reported success motivating their patients to participate in PT despite ongoing pain and allodynia. Others\(^1,25,47\) have used blocks to improve compliance in patients unwilling or unable to participate in PT secondary to pain. At present there are no prospective trials directly comparing outcomes in pediatric CRPS with or without sympathetic or epidural blockade.

**Medications**

There are also no prospective randomized clinical trials of any medications in the treatment of CRPS in children. Case reports and case series have reported success with tricyclic and other antidepressants, \(^1\) tricyclics (particularly gabapentin), \(^48,49\) steroids, \(^50-54\) (either systemically or as part of an intravenous regional technique) \(^55\) nonsteroidal anti-inflammatory agents, \(^56\) and opioids, both systemic and neuraxial. A good deal of controversy exists about drug therapy for this condition. Many authors have found steroids to be of no benefit. \(^1,4,57\) Those who stress the value of intensive PT suggest that no medications are appropriate. \(^5,23\) The rationale is that all medications may have side effects and the potential for morbidity. As they are not necessary in the view of these authors, they should be avoided. Sherry et al stopped all medications at the start of the PT program. \(^5\) A direct comparison of intensive PT with or without any of these medications is lacking.
Neurosurgical Techniques

A few children with CRPS fail to respond to multiple treatment approaches, including the stepwise multidisciplinary approach used by Wilder et al. and Lee et al. and the intensive PT approach used by Sherry et al. These children and their parents will often seek multiple medical opinions and undergo increasingly invasive and dangerous procedures in their quest for pain relief. Two types of neurosurgical procedures have been used in these patients: spinal cord stimulation (SCS) and sympathectomy. There is moderate evidence supporting the use of SCS in the treatment of CRPS in adults. Retrospective series by Kumar et al. and Kemler et al. and a later prospective series by Kemler et al. all show efficacy in terms of sustained pain reduction of modest proportions. Pain thresholds are not changed by SCS. No series of children undergoing SCS have been reported, although I know of at least a half-dozen children who have undergone SCS for CRPS. Results have been mixed, ranging from modest improvement in pain and function to a worsening of pain, with explantation of the system. SCS has an advantage over sympathectomy in that it is nondestructive and completely reversible.

Sympathectomy, either chemical or surgical, has been reported in children with CRPS. Disadvantages of this procedure include the fact that it is appropriate only for the sympathetically mediated portion of the patient’s pain, that it is irreversible and may cause sympathetic dysfunction, and that long-term physiologic effects of lumbar sympathetic ganglionectomy on adolescent girls are not well characterized. In a mixed series of adults and children, Bandyk and Johnson reported an initial 10% failure rate. With 30-month follow-up, long-term results showed a reduction in pain relief overall to 25% excellent relief (pain scores < 3 of 10), and 50% with pain that was moderately reduced from before the block. Wilder et al. reserved the use of sympathectomy for patients with impending loss of function from cellulitis complicating massive peripheral edema. The three patients undergoing these procedures did not have improvement in pain scores despite improvement in circulation and edema.

Complementary and Alternative Medicine

Randomized, blinded trials showing the efficacy of acupuncture are also lacking in CRPS. One such study has been performed, but there was improvement in both groups, with no statistical difference between groups. There are studies showing a surprisingly high acceptance rate for acupuncture therapy among children. There are also case reports of benefit to this therapy. It is rational to think that acupuncture, by its mechanisms of raising endogenous opioids and acting as a counter-stimulant to “close the gate” on spinal cord transmission of pain signals, might be of benefit in this disorder. Well-blinded studies are difficult to design, however, so obtaining definitive proof of efficacy may be slow in coming.

Although many patients may have used herbal remedies and nutritional supplements, there are no studies or even case reports of their efficacy. Most herbal remedies contain active biochemicals. They may indeed benefit some patients, but they may also have significant interactions with any medications that might be prescribed, and may have toxicity in their own right.

CONCLUSIONS

CRPS in children has been widely held to be intrinsically different from that in adults. This has been based on both demographics and a perception that children may have a milder course or a better response to conservative treatments. Other than the marked preponderance of lower extremity CRPS in children and adolescents, the demographics do not seem all that different for children than adults. A female preponderance exists for both groups. Both appear to have Caucasian predominance. Psychological factors are often invoked in pediatric CRPS, including enmeshment of the patient and parents and a degree of overachievement. Although this certainly may play a predominant role in some cases, the available evidence is not compelling that children with CRPS are unique compared with either other children with chronic pain or adults with CRPS. Finally, as regards the perception that children have an easier course than adults do, the evidence is not strong. Certainly, several series have reported children responding to courses of intensive PT alone. Nonetheless, the consensus is that PT is the definitive treatment of adults with CRPS as well as children. I have been unable to locate any series of intensive (5–6 hours per day) PT programs for adult patients analogous to that reported by Sherry et al. Series using less-intense PT, as reported by Wilder et al. or Lee et al., give results similar to a stepwise multidisciplinary treatment plan in adults. The apparent mildness of pediatric CRPS may be due to a greater willingness of children to actively participate in appropriate PT more than to an innate difference in the disease process itself.

The potential for recurrence of CRPS is often of great concern to children with this syndrome and to their parents. Studies have shown a fairly high rate of recurrence in the same limb after successful treatment or spread to another limb concurrent with the initial diagnosis. Recurrence occurred in approximately 30% to 50% of patients, a much higher rate than the rate of 1.8% per patient-year reported for adults. Although recurrence is common, it generally seems to respond more readily to physical therapy and related treatments than the initial episode. A case report by Tong and Nelson illustrated that for some children the recurrent bouts of CRPS may be as severe as or even more severe than the original.

In summary, although not definitively proven, PT leading to active normal use of the involved extremity is generally held to be the single most effective therapy in the treatment of CRPS. Children may be willing to participate in PT, despite the associated pain, with proper motivation. In general, however, the clinician’s job is to
help provide adequate analgesia to speed progress in PT. A stepwise, multidisciplinary approach is generally in the patient's best interest, starting with minimally invasive modalities such as TENS and biobehavioral pain management techniques. Acupuncture may be useful at this point, too, if there is a practitioner available in the community who has experience working with children. If needed, medications with a proven track record in neuropathic pain management can be added, such as the tricyclic antidepressants (nortriptyline or amitriptyline) or anticonvulsants (gabapentin and others). Children taking these medications need to be monitored carefully for side effects to optimize the risk/benefit ratio. Sympathetic blocks can be useful to accelerate recovery; they are unlikely to be effective monotherapy for CRPS, but they do play a role as a way to help a patient work more actively in an ongoing PT program. Using the above approach, most patients will have an excellent response. For those who cannot sustain improvement despite an ongoing exercise program, neurosurgical techniques such as SCS or, in highly selected cases, sympathectomy may be useful. These techniques are not guarantees of success, and they should be used only as part of a multi-disciplinary program stressing exercise and rehabilitation.

REFERENCES


Children and adolescents suffering from complex regional pain syndrome (CRPS), also known as reflex sympathetic dystrophy (RSD), need understanding and support to maintain a sense of normalcy. A student’s condition may vary from day to day, and the persistent pain associated with CRPS is invisible, so many health care professionals and school personnel may assume the child is faking and may doubt his or her pain.

If you visit the RSDSA website, there are several stories from young women who, in spite of the terrible pain caused by CRPS, are achieving their goals and living fulfilling lives. Yvonne writes, “My life is going to be full of adjusting and changing, but I will never let CRPS stop me from living my life.”

We want to help you understand how you can help children who have CRPS, either by simply being supportive or helping make accommodations and modifications in the school environment. Your support and understanding can determine whether our children succeed or fail.

**Individual Education Plan**

An Individualized Education Plan (IEP) is developed in accordance with the Individuals with Disabilities Education Act (IDEA), which governs special education. IDEA has a number of eligible categories, including Otherwise Health Impaired (OHI). The criteria for an OHI designation is “limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that (a) is due to chronic or acute health problems... and (b) adversely affects a child’s educational performance.”

**Section 504**

Section 504 of the Rehabilitation Act of 1973 is a civil rights law that prevents discrimination against individuals with disabilities from any institution that receives federal funds from the U.S. Department of Education. Some private schools that do not receive federal funding may be exempt from Section 504. According to the United States Department of Education, a student qualifies for Section 504 protection if he or she has “a physical or mental impairment that substantially limits one or more major life activities.”

**More Information**

**US Department of Education, Office of Civil Rights**

Protecting Students With Disabilities: http://www.ed.gov/about/offices/list/ocr/504faq.html

**National Dissemination Center for Children with Disabilities (NICHCY)**


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3 http://www2.ed.gov/about/offices/list/ocr/504faq.html#protected


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Reflex Sympathetic Dystrophy Syndrome Association, 99 Cherry Street, Milford, CT 06460, www.rbsd.org. Tel: (203) 877-3790 Toll free: (877) 662-7737 Email: info@rbsd.org

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“Hate CRPS. I hate the pain. I get from it. But, I am done letting it run my life. From now on, it is not in charge. I am. Life is to be lived.”

—Karen Richards, age 11

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“Children and adolescents suffering from complex regional pain syndrome (CRPS), also known as reflex sympathetic dystrophy (RSD), need understanding and support to maintain a sense of normalcy. A student’s condition may vary from day to day, and the persistent pain associated with CRPS is invisible, so many health care professionals and school personnel may assume the child is faking and may doubt his or her pain.

If you visit the RSDSA website, there are several stories from young women who, in spite of the terrible pain caused by CRPS, are achieving their goals and living fulfilling lives. Yvonne writes, “My life is going to be full of adjusting and changing, but I will never let CRPS stop me from living my life.”

We want to help you understand how you can help children who have CRPS, either by simply being supportive or helping make accommodations and modifications in the school environment. Your support and understanding can determine whether our children succeed or fail.”

—Dorothy Swiatlowski
What is CRPS?
CRPS is a neuroinflammatory syndrome characterized by pain in one or more limbs and/or ankles, feet, abdomen, or hands though virtually any part of the body can be affected. The pain, described as burning or sharp, typically appears after a traumatic event, such as a broken bone, sprain, sports injury, automobile accident, or bad fall. There is often coldness and swelling in the affected limb(s) as well as allostacia (a painful response to a normally innocuous stimulus). The pain is disproportionate to the original injury and is present long after the original trauma has healed. CRPS is more common among pre- and adolescent girls than boys by about 5 to 1. It is usually seen in girls who engage in sports, dancing, or gymnastics.

Although the cause of CRPS is unknown, overuse injuries, trauma, psychological stress, nutritional factors, and hormones are possible contributors. CRPS is thought to reflect overreaction of the autonomic nervous system, leading to transmission of pain signals after the initial injury. As there is no single test for CRPS, the diagnosis is made clinically by patient history, thorough examination, and the results of numerous tests to rule out other serious conditions.

CRPS is not life-threatening, but it can become chronic and even spread to other parts of the body. It can be highly disruptive and interfere with daily activity, leading to many as 25% of school days missed. Early diagnosis and treatment, with an emphasis on movement, behavioral approaches, and rehabilitation, offer the highest probability of remission, which may be achieved in almost 90% of those treated.

Treatment options
Physical/exercise therapy of the affected body part is the most effective treatment for pediatric CRPS. This therapy desensitizes and restores function—strength, endurance, and range of motion. Mind-body techniques, such as relaxation, biofeedback, and self-hypnosis, are helpful for pain management and can alleviate the fear of movement often seen in people with CRPS. Psychological interventions to help with coping and emotional responses, and family therapy, to promote adaptive parental/familial responses, can also be valuable. Medications, nerve blocks, and interventional measures, such as a tunneled epidural catheter or spinal cord stimulator, can also be used to facilitate and accelerate progress in physical therapy. A comprehensive coordinated interdisciplinary approach for CRPS management will provide the best results in the majority of children.

When Students Require Special Accommodations
Some students may not be able to resume activities as normal. Some accommodations that have helped students with CRPS are listed below:

1. Because the slightest bump can cause lasting flare-ups of this very painful syndrome, every effort should be made to see that the child is not exposed to the bumping and jostling of school hallways. The student’s desk in each classroom should be positioned away from traffic patterns to avoid inadvertent bumping.
2. Determine whether the student needs ergonomic seating/adjustable desk.
3. Designate another student as a helper who can carry the student’s books/belongings during the day, help at lunch, and during the changing of classes.
4. Because students with CRPS in their upper extremity may have difficulty writing, allow the student to record lectures, use a keyboard with a portable word processor, or use another student’s notes.

Limiting Stress
Because stress is a known cause of exacerbation of this syndrome, academic schedules and curricula may have to be modified, including:

1. Schedule all classes on one level or provide student with key to the elevator.
2. Implement flexible homework and make-up policies (homework and tests are a major cause of additional stress).
3. If a student is unable to write, modify normal test taking, and allow additional time for tests.
4. Reduce school time if necessary (students may be late due to pain flare-ups) and supplement with home-based instruction and tutoring.
5. If mobility is impaired, credit the student’s physical/occupational therapy as the requirement for gym (if the school has a pool, allow the student to use the pool during gym).
6. Ask before touching the student—a simple pat on the back can cause increased pain.
7. Allow a student with CRPS to sit in a quieter area of the cafeteria if the noise is bothersome; however, do not isolate the student from others.
8. Students with CRPS are also sensitive to noise and vibrations. Please take this into consideration when fire drills, assemblies, and pep rallies are planned. Allow students to position themselves away from loudspeakers/intercoms—even the classroom bell for beginning and end of class may affect a student with CRPS.

“arerebneW — “Your “Life is going to be full of adjusting and changing, but I will never let CRPS stop me from living my life.”

For those students who are able, we recommend the following:

✔ Attend school daily whenever possible
✔ Permit the student to go to the nurse when needed (may be experiencing a pain flare-up)
✔ Limit the use of over-the-counter medications
✔ Be allowed to walk in the back of the classroom or in the hallway periodically without disruption to others to stretch and move for pain reduction
✔ Establish routines and schedules for learning and extracurricular activities
✔ Be as independent as possible in completing assignments
✔ Be encouraged to practice normal activities
✔ Use a word processor, or use another student’s notes.

Other interventions that can be practiced as needed include:

✔ Psychological intervention for child and family to assist with adjustment to home and community, behavioral interventions, and emotional support
✔ Relaxation techniques and cognitive-behavioral exercises/strategies
✔ Monitoring for “overachiever” behaviors, over-scheduling, apathy and reduced motivation and/or initiation, and anxiety, depressed mood, and/or inactivity.
A DAY IN THE LIFE  by Caroline Bert
https://rsds.org/professional-patient-photographer/

INTRAVENTOUS KETAMINE INFUSION FOR COMPLEX REGIONAL PAIN SYNDROME (page 7)
CALL FOR AUTHORS & IDEAS
Do you have a personal story, art, or knowledge to share with the CRPS community? Did one of these articles resonate with you? Is there a special topic you would like to see included in the RSDSA Community Update? We would love to hear from you. Please email your thoughts to info@rsds.org.

SPECIAL THAKNS
We would like to acknowledge our Corporate Partners whose generosity has helped to underwrite this issue of the RSDSA Community Update. Our Corporate Partners include Abbott, Aetna, Axsome Therapeutics, Baker Family Charitable Trust, Pope/Taylor, Neurologic Relief Center, NoPainHanna.com, Oska and Relax Release Relief.
The Director’s Letter - A Summer Update

BY JIM BROATCH, RSDSA’S EXECUTIVE VICE PRESIDENT, DIRECTOR

JENKINS AWARDS TOP $100,000

Since 2012, RSDSA, with the financial assistance of the RSDSA community, has awarded over $100,000 dollars in grants via our Brad Jenkins Patient Assistance Program. We have directly helped 167 individuals and families struggling with the financial devastation caused by having CRPS. Weekly, we receive desperate calls to help pay for utility cut-off notices, transportation to out-of-state consultations with CRPS specialists or travel to treatment programs, emergency grants to individuals whose SNAP benefits have been cut, car payments to stop repossessions, help pay for scooters and power wheelchairs, and much more. Just last week, we purchased a used power wheelchair on Craigslist and then purchased a battery & van ramp on Amazon and I personally delivered it to a local family. Need emergency financial help? We will send you an application. Call toll-free 877-662-7737. Every dollar donated to our Jenkins fund is invested directly in helping individuals. Please consider making a gift to our Jenkins Fund by mailing a gift to RSDSA, PO Box 502, Milford, CT 06460 or by clicking here, https://rsds.org/donate/

TREATING THE WHOLE PERSON: OPTIMIZING WELLNESS CONFERENCE IN CHARLOTTE, NC ON SEPTEMBER, 29,

RSDSA is returning to our southeast coast this September. We are partnering with the Stillitano family, founders of Fight the Flame 5K to sponsor an exciting full-day conference: Amberly Largo, author of True Grit and Grace will share her inspiring journey of survival and transformation after a horrific motorcycle/SUV accident. Jenny Picciotto’s riveting interview of Ms. Largo is on page 5. Dr. Robert Schwartz of the Piedmont Physical Medicine and Rehabilitation in Greenville, SC will share his out-of-the box innovative insights which guide his treatment of complex cases of CRPS. Phil Parker, founder of The Lightening Process is will be traveling from England to talk about his three-day program which is helping many people with CRPS(watch Amanda Ashley present about the program at our Arkansas conference: https://www.youtube.com/watch?v=8mDPT-g6bzo Our San Jose conference videos are now posted on our website: https://rsds.org/educational-presentations/

RSDSA COMMUNITY UPDATE

We hope that you enjoy the summer issue of the RSDSA Community Update. Michael Sullivan of the Bay Pain & Wellness Center has written an excellent, helpful article, Rehab of CRPS on the neuroscience of pain and the critical importance of movement. His goal is, “In writing is to convince you that movement, while it may be painful, is good, and to share some strategies for restoring function. His guiding principle is “that if you can do tomorrow what you did today, you are heading in the right
direction. If you can’t do tomorrow what you did today then you did too much. Adjust your activity level accordingly.” Tracy Coral’s interview with Cornell University’s Professor Won highlights a promising virtual reality pilot study in CRPS. Jenny Piccotto’s interview with Dr. Xu of the Cleveland Clinic reports on RSDSA’s international survey on use of IV ketamine to treat intractable CRPS and the development of reference protocols which can utilized to prove the safety and efficacy of IV ketamine for CRPS treatment.

MEDICAL EQUIPMENT

EXCHANGE PROGRAM

RSDSA is creating a program that will facilitate the donation of durable medical equipment such as wheel chairs, shower aids, hospital beds, walkers, etc. We will list the equipment available and where each piece is located. Although we cannot pay for shipping, we will connect the donor and the individual interested in obtaining the equipment.

RSDSA’S ACCREDITED MEDICAL EDUCATIONAL PROGRAMS

Too many health care professionals have no clue about CRPS and how to treat it. Please help us change this distressing situation. We have developed three free accredited courses on the diagnosis and treatment of pediatric and adult CRPS. Please help us educate health care professionals about CRPS. We can provide you with flyers promoting these courses for distribution in your community. Here is an online link to the courses, https://rsds.org/accredited-course-on-crps-for-mds-ph-d-s-and-rns/

3RD ANNUAL LONG ISLAND AWARENESS WALK EVENT

I invite all metro New Yorkers to gather with RSDSA on September 15 at Eisenhower Park in East Meadow, New York for our third annual fundraising walk event. This year’s walk will take place from 8:00 a.m. until 2:00 p.m. at Eisenhower Park’s 1K and 2.5K paths, which will be reserved for this event. Last year’s event attracted nearly 450 walkers and 50 volunteers and raised $56,000 for RSDSA. Please come and meet others with CRPS and their family members. We will have food, crafts for children, educational exhibits, an incredible raffle, and much more. For more information, register, or to donate, please visit https://rsds.org/event/3rd-annual-long-island-crps-rsd-awareness-walk-event-east-meadow-ny/ or call us 877-662-7737.

5TH ANNUAL COLOR THE WORLD ORANGE DAY IS NOVEMBER 5, 2018

Help us Color The World Orange™ on November 5 by turning the night orange! A number of buildings and landmarks have the ability to turn orange, so let’s request that they turn orange for CRPS/RSD Awareness. In 2017, more than 100 buildings and landmarks around the world turned orange last year.

Want to get involved. Visit Color The World Orange on Face Book: https://www.facebook.com/ColorTheWorldOrange/

Easy Ways to Give

- Make RSDSA your charity of choice on GoodSearch.com and use that instead of Google.

- Use AmazonSmile.com and make RSDSA your charity of choice while shopping online.

- If you’re selling things on eBay, you can give a portion of the profits straight to RSDSA.

- Set up a collection canister in your local grocery store.

- Plan an event with the help of RSDSA by emailing us at info@rsds.org.
Healing From Within
Amberly Lago’s recently released book

BY JENNY PICCIOTTO

True Grit and Grace: Turning Tragedy Into Triumph chronicles her journey following a severe motorcycle accident in 2010. Her life as a professional dancer, fitness trainer, and athlete was shattered when she was struck by an SUV. The impact broke the bones in her right leg and severed her femoral artery. She was placed in an induced coma while the doctors considered amputation. After months in the hospital and extensive surgeries, she was diagnosed with Complex Regional Pain Syndrome. Her story is one of inextinguishable hope, overcoming insurmountable pain and suffering. She now devotes herself to inspiring others by sharing the lessons she learned on her path toward accepting herself, her scars, and her new normal.

I was honored to have the chance to talk to Amberly, who still appears young, athletic, vibrant, and healthy. She had just finished teaching a fitness class and was recovering in the parking lot with her shoes and socks off, her foot propped up on the dashboard, throbbing and swelling. As anyone who lives with CRPS/RSD has can affirm, we learn to put on a brave face and mask the pain inside our bodies. She told me about her road from denial and desperation to claiming her resilience. It is a message she shares with as many people as she can, through social media, her book, interviews, articles, and as a motivational speaker.

Amberly, a mother of two, spent 3½ months in the hospital fighting to save her leg. She drew strength from her Texan upbringing, which taught that showing vulnerability equaled weakness. So, she did her best to “cowgirl up.” She stuffed it down and worked hard to regain the use of her leg, motivating herself with the athletic mantra: “No pain no gain.” That approach would only take her so far.

After being diagnosed with CRPS, she would have to unlearn these attitudes and embrace self compassion. “Vulnerability does not mean you are weak,” she tells me. “It shows that you have courage and the ability to grow.” However, arriving at a place of acceptance was a path through darkness and self doubt.

Today Amberly describes herself as a “dignified disabled person.” Learning how to live with CRPS was the most challenging transformation of her life.

Elisabeth Kubler-Ross, a psychologist working with terminally ill patients, pioneered the concept of five stages of grief - denial, anger, bargaining, depression, and acceptance. Her work has subsequently been broadly applied to any major life loss. I asked Amberly how she navigated her path to acceptance, and why it is important to her to share her story with others.

The ultimate lesson all of us have to learn is unconditional love, which includes not only others but ourselves as well.
– Elisabeth Kubler-Ross

Amberly’s first response to the diagnosis of CRPS was denial. She searched for a doctor who would give her a different diagnosis. It was inconceivable that she had survived the crash and all of those surgeries only to be facing a life of unrelenting pain. Desperate for relief, she tried anything and everything the traditional and alternative medical communities had to offer including spinal blocks, radio frequency ablation, pain medications, spinal stimulator trial, ketamine infusions, Chinese medicine, dietary changes, and homeopathic medications. The family took out a lien on their home and borrowed money from friends to help cover the costs of her treatments.

When nothing helped, she began a downward spiral. Although she never seriously considered suicide, she found herself thinking that her children could find a better mom; her spouse could find a different wife, one like she used to be, when fitness was her life. Her leg, scarred, riddled with unexplainable pain, no longer felt like it belonged to her. She dissociated from her physical body, and began to hate her leg, the pain, muscle spasms, and scars. She covered it, and tried to ignore the way it looked, the way it felt. “I was in denial for 2 years,” she tells me. “I couldn’t wrap my mind around it.”

The road to acceptance ran through a deep, dark valley. As she tried to tough it out, Amberly sank into...
She started a gratitude practice, way to love and respect her body. That she was going to have to find a toward her leg, accepting the fact first step was readjusting her attitude began to adopt a new outlook. Her Still in the hospital bed in the ICU, she solution. Her body was sending, was not a physical pain, ignoring the messages up call. I was scared.” She recognized Amberly describes this moment as the moment she began to embrace her pain and reclaim her passion for life. She searched her heart for the little light that flickered in the shadow of nearly losing her life. She fed that flame by focusing in the shadow of nearly losing her heart for the little light that flickered passion for life. She searched her embracing her pain, she rekindled her love of life, and discovered a path to healing from within. In the process, she developed new coping skills such as mindfulness, meditation, self-love, and self-compassion. She began journaling and sharing her experiences on social media and, later, as a motivational speaker. She also returned to the gym and her work as a fitness trainer while still in her wheelchair.

Expressing and acknowledging what she was going through felt like a relief from the struggle to bury the painful reality of living with CRPS. In the process, she developed new coping skills such as mindfulness, meditation, self-love, and self-compassion. She began journaling and sharing her experiences on social media and, later, as a motivational speaker. She also returned to the gym and her work as a fitness trainer while still in her wheelchair.

“I am grateful I have my leg,” she says. “I decided I will love it until it feels better. Our bodies converse with us, whisper, talk, and if ignored, finally they scream. I let my body go until it screamed. I was in the ICU for 3 days and realized I have to listen to my body and have compassion for myself. If my daughter had pain, I would not ask her to ignore it and suck it up. Today, I stop and rest when I need to. I have learned to be gentle with myself. I celebrate the small victories. If I have to stop, that doesn’t mean I can’t, or that I am not successful, it just means I am taking care of myself.”

Amberly describes this experience as the moment she began to embrace her pain and reclaim her passion for life. She searched her heart for the little light that flickered in the shadow of nearly losing her life. She fed that flame by focusing on what she could do, rather than what she was no longer able to do. She began to write exercise and diet plans for friends and family from her hospital bed.

Accepting her new normal meant replacing each negative though with a positive one.

“My light was so dim,” she told me, “but when I stopped fighting it and learned to surrender and accept that this is what I have and figure out what I can do to make the best of it, I was able to truly begin to grow.”

Gratitude turns denial into acceptance, makes sense of our past, brings peace for today, and creates hope for tomorrow. - Amberly Lago

When we meet true tragedy in life we have two choices; we can either give up and give in to the pain or use the challenge to claim our innermost resilience and thrive.

- Amberly Lago, “True Grit and Grace”

A couple of years into her struggle, Amberly developed pain in her back, pain that she ignored. It eventually became so severe that it masked her CRPS. Not taking her condition seriously, she nearly paid the ultimate price.

When she went into convulsions, her husband took her to the Emergency Room for treatment, but they immediately redirected her to the Intensive Care Unit. She was diagnosed with sepsis, a life threatening toxic infection, secondary to the kidney stone that had been causing so much pain in her back. The doctors told her that if she had delayed treatment even another day, she could have died.

Amberly describes this moment as her turning point: “It was a huge wake up call. I was scared.” She recognized that covering over her emotional and physical pain, ignoring the messages her body was sending, was not a solution.

Still in the hospital bed in the ICU, she began to adopt a new outlook. Her first step was readjusting her attitude toward her leg, accepting the fact that she was going to have to find a way to love and respect her body. She started a gratitude practice, replacing each negative though with a positive one.

Expressing and acknowledging what she was going through felt like a relief from the struggle to bury the painful reality of living with CRPS. In the process, she developed new coping skills such as mindfulness, meditation, self-love, and self-compassion. She began journaling and sharing her experiences on social media and, later, as a motivational speaker. She also returned to the gym and her work as a fitness trainer while still in her wheelchair.

“I am grateful I have my leg,” she says. “I decided I will love it until it feels better. Our bodies converse with us, whisper, talk, and if ignored, finally they scream. I let my body go until it screamed. I was in the ICU for 3 days and realized I have to listen to my body and have compassion for myself. If my daughter had pain, I would not ask her to ignore it and suck it up. Today, I stop and rest when I need to. I have learned to be gentle with myself. I celebrate the small victories. If I have to stop, that doesn’t mean I can’t, or that I am not successful, it just means I am taking care of myself.”

Amberly describes this experience as the moment she began to embrace her pain and reclaim her passion for life. She searched her heart for the little light that flickered in the shadow of nearly losing her life. She fed that flame by focusing on what she could do, rather than what she was no longer able to do. She began to write exercise and diet plans for friends and family from her hospital bed.

Accepting her new normal meant allowing herself to be vulnerable, giving herself permission to take recovery time, develop her pain management toolbox, and cultivate a strong support network. “When I admitted to myself that I had CRPS I was able to talk about it, to reach out and ask for help.”

You can learn more about Amberly Lago at amberlylago.com

By Jenny Picciotto
Intravenous Ketamine Infusion for Complex Regional Pain Syndrome

BY JENNY PICCIOTTO

RSDSA is pleased to announce the publication of Intravenous Ketamine Infusion for Complex Regional Pain Syndrome: Survey, Consensus, and a Reference Protocol, which was published March 9, 2018 in *Pain Medicine*, a multidisciplinary pain journal. This original research, which was funded by RSDSA, studied the usage of intravenous ketamine for the treatment of CRPS and developed reference protocols for use in future comparative studies.

The first phase of the study was a survey to gather data about what protocols are in use among physicians who currently offer ketamine infusion therapy to their CRPS patients. Then a team of experts convened for a professional conference entitled “Ketamine: The State of the Art and the Science.” Presentations covered the history and pharmacology of ketamine, its use in the treatment of CRPS, a panel discussion, and a day of break-out sessions which kicked off the development of two reference protocols through a process of consensus among clinical experts.

According to their paper, “Ketamine is being used increasingly in intravenous (IV) infusion clinics to manage CRPS pain, but without guidance, standard protocols, or guidelines.” Although “many case series have suggested that IV ketamine infusion is effective in reducing pain in CRPS/RSD,” the lack of rigorous controls and the small size of the studies, in addition to the various protocols followed, have not produced high quality evidence. “The current level of evidence is 2B (i.e., moderate evidence, positive but weak recommendation).”

Complex Regional Pain Syndrome, previously known as Causalgia and Reflex Sympathetic Dystrophy, is a poorly understood, severe pain disorder. According to the National Institutes of Health:

The exact trigger of CRPS after an injury is not known, but it may be due to abnormal interactions between the central and peripheral nervous systems, and/or inappropriate inflammatory responses. Unfortunately, published research studies validating the efficacy of these treatment options are limited and no single drug or therapy (or combination) has shown consistent, long-lasting improvement.

CRPS patients face a complicated array of treatment options, most of which are not FDA approved and/or have been borrowed from other conditions. Because few evidence-based studies have been done, care providers and patients rely on a trial and error approach to treatment. “Formulating an evidence-based approach to CRPS management is difficult given the lack of high-quality evidence supporting efficacy of most available therapies.”

This research is a critical step in the right direction. The “reference protocols, one for inpatient ketamine treatment and one for outpatient ketamine treatment, do not represent guidelines for ketamine infusion for CRPS; rather, they are a reference/orientation by which practitioners can access the consensus of highly experienced practitioners. Importantly, this consensus result can provide a starting point for statistical validation of formal guidelines and a more uniform approach to research protocols that will validate the safety and efficacy of ketamine through controlled clinical trials.”

RSDSA is in the forefront of CRPS research. We are dedicated to funding studies for treatment and a cure.

ABOUT THE AUTHOR

Jenny Picciotto is a writer and CRPS patient who enjoys reading and playing the piano. She was a yoga instructor and massage therapist before CRPS changed her trajectory. She currently lives in Hawaii, where she facilitates the Oahu CRPS Support Group.
Virtual Reality for CRPS

BY TRACY CORAL

What would you think if there were a treatment modality which combined virtual reality with relieving acute pain? Meet Andrea Stevenson Won, a researcher who believes that a facilitated environment, like that provided by virtual reality, offers real hope for those in pain. She is the Director of the Virtual Embodiment Lab at Cornell, where she is an Assistant Professor of Communications with the College of Agriculture and Life Sciences at Cornell. She holds a Masters in Science in Biomedical Visualization from the University of Illinois at Chicago and has completed a PhD in the Virtual Human Interaction Lab in the Department of Communication at Stanford.

Professor Won became interested in virtual reality and how it could be used as a treatment modality for patients living with physical pain. In pilot studies, encouraging results show that virtual reality can help with both acute pain and Post Traumatic Stress Disorder (PTSD). Of particular interest to readers of this newsletter is that Dr. Won’s own pilot studies on pain dealt with the use of virtual reality to treat Complex Regional Pain Syndrome (CRPS) and Persistent Idiopathic Facial Pain. I had the opportunity to speak with Professor Won, and to learn more about her work. I was anxious to discover what had influenced her to study CRPS. Dr. Won explained that CRPS was a condition close to her heart, as she has a family member who was diagnosed with it at a young age. She also spoke about her mother, a nurse practitioner, whose work focused primarily on non-opiate options to treat pain. Ms. Wong stated, ‘they are my two motivators’.

In essence, virtual reality is a computer gaming system, in which a person can be completely immersed in a three-dimensional environment, and engaged in specific settings during the game. In her lab at Cornell, Professor Won is exploring how physical and social exchanges in facilitated environments affect the perceptions of individuals. In regards to physical pain, virtual reality will distract the mind. The individuals using virtual reality are performing movements during the course of the game which may be extremely difficult to do on a typical day. Won stated “when patients see themselves moving in ways they can’t in real life, their brains use that feedback to create their body image.” Won has stated in a previous article that “visual feedback can effectively change the way people with chronic conditions move. By tricking the brain with virtual experiences, the results could prompt lasting relief in the real world” (Kelly, 2018).

When speaking with Dr. Won, she opened up about how she speaks to her students about CRPS, and the future for virtual reality. “When I am describing CRPS to students, I say that it is a difficult-to-treat chronic pain condition. I explain the reason why we think it might be a target for virtual reality therapy is that it has some things in common with phantom limb pain, which have made both targets for mirror visual feedback. In particular, there are similar changes in the brain that might indicate visual feedback on movement could be helpful. The future for virtual reality is broad, but we really need systematic research before making recommendations.

ABOUT THE AUTHOR
Tracy Coval has lived with CRPS for 15 years, as well as Dystonia and Ehler-Danlos Syndrome(EDS). She is a committee member for the Jenkins Patient Assistance Fund. When she is not doing work for the grant, she is advocating and educating others about cannabis, and how it can be a beneficial treatment option for individuals living with chronic illnesses. In her spare time you can find her painting, spending time with her family and friends, and two dogs.
I would like to see it reach the point where it could be easily and cheaply deployed in homes.” As Professor Won and I were wrapping up our interview, I asked my final question: ‘Is virtual reality currently available for patients who are interested in trying it?’ She responded, “This depends where you live, and what your condition is. Weill Cornell has the PATSS clinic; Stanford has a virtual reality clinic in Psychiatry running a trial for Functional Neurological Disorder (FND); I hope to follow up on a pilot study with Stanford Neuroscience and Pain to run a RCT shortly. There are a lot of people exploring virtual reality, but – it’s not a standard care yet for many conditions, just a promising area of investigation.”

If you have CRPS, you may already realize that exiting treatments do not work as well as we would like. The best hope for improved treatments will come from a better understanding of what is going wrong in CRPS, so that we are better able to fix it. In this column, new developments in our understanding about CRPS, and implications for treatment are reviewed.

Basic scientific research into the cause and mechanism of a condition is important so that appropriate treatments can be devised. Thanks to such research, it is now known that CRPS is caused by inflammation in the nervous system, resulting in increased transmission of pain signals. This knowledge has led to the use of various anti-inflammatory treatments for CRPS; these corticosteroids, high dose intravenous immunoglobulin, anti-tumor necrosis factor, plasma exchange immunosuppressants, such as mycophenolate. Still, these treatments are not universally effective.

A group in France has come up with a different way that may predict ketamine response, involving a test that is generally available, known as three phase bone scintigraphy. This type of bone scan was used in CRPS patients and it was shown that ketamine response correlated with the ratios of fixation of tracer compound in the second and third phases versus the first phase of the scan.

Basic scientific research into the cause and mechanism of a condition is important so that appropriate treatments can be devised. Thanks to such research, it is now known that CRPS is caused by inflammation in the nervous system, resulting in increased transmission of pain signals. This knowledge has led to the use of various anti-inflammatory treatments for CRPS; these corticosteroids, high dose intravenous immunoglobulin, anti-tumor necrosis factor, plasma exchange immunosuppressants, such as mycophenolate. Still, these treatments are not universally effective.

GETTING ACCESS TO THE BRAIN AND SPINAL CORD WITH ANTI-INFLAMMATORY BIOLOGIC AGENTS.

One of the problems with treating CRPS is that there is inflammation in the central nervous system (i.e., the spinal cord and brain), and many agents cannot reach these areas because of the blood-brain barrier, which prevents entry of certain substances into the brain. Normally, this is a good thing as it protects the brain from noxious chemicals, but it also prevents therapeutic agents from entering the brain as well. In previous columns, I have outlined some novel ways that are being investigated to overcome this challenge.

Interesting work from the lab of the late Dr. Ben Barres at Stanford shows that microglial cells (which have been shown to be activated
in CRPS) secrete factors that increase inflammation, including interleukin 1 (IL-1), tumor necrosis factor (TNF) and one of the first complement components, C1q. They show that it is possible to block the inflammation by treating with antibodies to all three of these substances (anti-IL-1, anti-TNF and anti-C1q) in the lab. Excitingly, antibodies to IL-1 and TNF are already approved for clinical use and are readily available, often referred to as “biologics” that are often used to treat autoimmune disorders like rheumatoid arthritis, and Crohn’s disease. At present, there are no clinically available antibodies to C1q, however.

The problem with administering these antibodies to CRPS patients is that they are fairly large molecules, and do not readily pass the blood-brain barrier. It has been shown in rodents, for example, that if one gives anti-IL-1 systemically in the acute phase of CRPS, there is reduction in pain, but that is not the case in the chronic phase. That is likely because initially, the inflammation occurs outside, in the periphery. By the time CRPS becomes chronic, the inflammation has spread to the central nervous system, where the antibodies cannot reach. However, if the anti-IL-1 is given intrathecally (directly into the central nervous system) in the chronic phase, then there is reduction in pain.

So why not just administer the antibodies intrathecally to CRPS patients? This does involve some risk, including introduction of infection and damage to the spinal cord. However there may be a less invasive way of getting substances into the brain by administering the substances by peri-spinal injection. There is some evidence that this can be done safely, and it has been shown to be effective in treating stroke, and one case of post-operative dementia. This technique has been used only by a few investigators, and is not universally practiced. There are still risks, including infection, which may be heightened since neutralizing IL-1 and TNF impairs the immune system. But if it is proven to be effective and relatively safe, it may open up the possibility of new treatments for CRPS. Would a single agent, like anti-TNF be sufficient, or would there need to be both anti-TNF and anti-IL-1? Would just these two work, as there are no currently available antibodies to C1q? Only further research will tell.

**A BETTER WAY TO PREDICT KETAMINE RESPONSE?**

Not all CRPS patients will respond to ketamine. Ketamine infusions are time and resource consuming, expensive, and can have unpleasant side effects (but may be worth it if it helps your CRPS). In a previous column, I outlined work done by the Philadelphia group that showed they could predict which patients would respond to ketamine by analyzing the pattern of micro-RNAs in their blood. Micro-RNAs are small molecules that help control the expression of proteins in the cells. However, this type of analysis is not widely available. A group in France has come up with a different way that may predict ketamine response, involving a test that is generally available, known as three phase bone scintigraphy. This type of bone scan was used in CRPS patients and it was shown that ketamine response correlated with the ratios of fixation of tracer compound in the second and third phases versus the first phase of the scan. If this result can be replicated and verified, it is a relatively simple way to predict response to ketamine. It may spare some patients the unnecessary time, expense and side effects of ketamine infusions if they are not going to be effective for them. And for others, it will give them some reassurance that they will likely benefit, and the time and expense will likely be worthwhile.

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Five years ago, a group of Charlotte teenagers started an organization that was dedicated to promoting awareness of and raising funds for CRPS. Twelve-year-old Landon had no idea that what he started in 2013 would turn into an annual event that would be ranked as the second largest CRPS fundraising event in 2017. Thanks to our amazing sponsors we had an extremely successful day.

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As of today, Fight the Flame has raised over $110,000 for the RSDSA. Fight the Flame has worked hard to become an active voice in the Charlotte community. They organize and sponsor a local support group for families and individuals in the Charlotte area who are living with CRPS. In addition, every year Fight the Flame awards a CRPS Awareness college scholarship to local high school student. Applicants for the scholarship must educate others about CRPS to be considered for the award.

This year, Fight the Flame will be hosting its 6th annual Fight the Flame 5k Race and 1k Roll & Stroll on Sunday, September 30, 2018 at the McAlpine Creek Park in Charlotte, NC. Those who will not be in the area for the event can also participate as a virtual walker.

Please consider helping us Fight the Flame. You can register for the race, the virtual walk, or make a donation to RSDSA at [https://runsignup.om/Race/NC/Charlotte/FightTheFlame](https://runsignup.om/Race/NC/Charlotte/FightTheFlame).
Needle Stick Can Cause CRPS/RSD - What You Need to Know

BY BRIAN POPE, ESQUIRE
POPE/TAYLOR - NATIONAL CRPS/RSD LAWYERS

As an attorney who has been reviewing potential CRPS/RSD liability cases for the last 20 years, I have a pretty good feel of trends in the causes of CRPS. Unfortunately, I have noticed a growing number of people who have contacted me complaining of developing CRPS as a result of an IV needle stick. There are very few actual cases of nursing/medical malpractice that can be brought as a result of developing CRPS from a needle stick.

First, it is always foreseeable that if you are getting a needle stuck into a part of your body, you may develop CRPS as a result. The nurse could do everything by the book in a correct needle stick procedure and you could still develop CRPS. In this case, there is not a potential nursing/medical malpractice case to be pursued. The vast majority of cases I review fall into this category.

However, if a nurse violates the standard of care during a needle stick procedure, then it is a different analysis. The most common needle stick injury I see is when a nurse sticks the needle directly into a nerve, such as the median nerve, and damages the nerve. Usually, when this happens, the patient feels an immediate jolt of “electric” pain and reacts by crying out in pain. Unsurprisingly, there are very few medical records I have reviewed where this reaction is documented, allowing for plausible deniability if there are any subsequent complications from the needle stick.

If there is direct nerve damage due to a careless needle stick, usually the person will follow up with a doctor. The doctor may then do exploratory surgery to determine the extent of damage to the nerve. I have had a few cases where the subsequent treating doctor will take pictures and document the damage done to the nerve. Obviously, these are the best legal cases as the documentation and pictures provide compelling evidence of the damage done to the nerve. This also helps with proving causation in that the needle stick caused direct damage to the nerve, which resulted in the development of CRPS Type II.

Our law firm reviews potential CRPS/RSD cases, whether the CRPS is caused by a trauma (car accident, workplace injury, slip/trip and fall) or medical/nursing negligence (unnecessary surgery/procedure performed incorrectly that damages the nerve). If you have any questions regarding what you think may be a potential CRPS/RSD legal case, please contact our office for a free consultation.

WANTED
Individuals to:

✓ Set up a collection canister in your local grocery/convenience store.
✓ Plan an event with the help of RSDSA by emailing us at info@rsds.org.
✓ Fill up a Penny pig with your spare change to help RSDSA sponsor children in pain at summer camp
✓ Help educate health care professionals by promoting the availability of our accredited courses on adult and pediatric CRPS
✓ Blog for our weekly Tuesday’s Burn. Do you have a story or experience to share?
✓ Write an article for the RSDSA Community Update
✓ Promote awareness of CRPS by sharing your story TV or newspapers (we can help you)
✓ Share your story of hope. Inspire others who are struggling as you have.
✓ Join our peer-to-peer program (see our back cover.)
How important is movement to our health and wellbeing? A dark lesson starting in medieval times and running into the mid-1800s is provided by the numerous inquisitions, the most famous being the Spanish Inquisition. For over 700 years torture was used to induce people to confess to their heresies, recant their heathen ways and profess their faith in God. Torture was used to speed up the process. One of the most effective means of torture was the use of constraints to restrict a person’s ability to move. Stocks, barrels, metal cages, ropes and chains were used to prevent movement. The tighter a person is bound, the less they can move, the greater the pain. Complete restriction of movement can lead to excruciating and unrelenting pain within twenty-four hours. People were known to go mad in a matter of days. My apologies if the thought of this alone is enough to make you cringe or feel discomfort (you can thank the mirror neurons in your brain) but this illustrates the importance of movement and highlights that pain is a consequence of immobilization.

One of the many issues that people with Complex Regional Pain Syndrome struggle with is that movement is painful, to the point where they don’t feel they have the choice to be active. Essentially, pain itself becomes the constraint that restricts movement resulting in more pain. As a result of this vicious cycle, CRPS sufferers can get into a downward spiral of functional decline that not only exacerbates their pain but seriously diminishes their quality of life. Fear of movement as a result of pain leads to avoidance of movement. My goal in writing today is to convince you that movement, while it may be painful, is good, and to share some strategies for restoring function. First, let’s look a little more closely at the pros and cons of not moving.

One of our responses to pain is to avoid movement to protect the injured area from further harm. In the early stages of injury this type of guarding is an adaptive response that helps us to heal. Depending on the injury, your doctor may even use immobilization to set up the conditions under which the damaged tissues heal. The simplest example would be casting a broken bone. In deciding how long to immobilize an injury there is always a tradeoff between the time that is needed for the tissue to heal and the deleterious effects of immobilization. Not only can immobilization be painful in of itself, it also is not healthy for many of our tissues. Muscles need to move and work to remain strong and flexible. Moving joints distributes synovial fluid that helps to lubricate and provide nutrition to joint surfaces. Nerves elongate and glide relative to the surrounding tissues when we move. Movement and interaction with our environment activates nerve endings, sending a constant stream of information to our brains for processing that are essential to brain health. Part of the healing process is the laying down of scar tissue as a means of repairing damage. Unfortunately, scar tissue is not very smart and while it strengthens the damaged tissue, it also can form cross-links to tissues that need to move in relationship to each other. The longer these cross-links remain in place the stronger they get and the more they can restrict normal movement. Importantly, movement is also necessary for the final phase of healing, a remodeling process that allows injured tissues to reorganize and gain maximum strength. When we continue to guard against movement after the initial healing process is complete, we are doing more harm than good, and the protective response becomes maladaptive. It is no longer helping us to heal. In short, our muscles, fascia, joints, nerves and brain all need movement to remain healthy and any immobilization, even of an isolated body part, beyond the minimum required for healing is not good for us. The consequences are most extreme when people take to bed rest to cope with their pain. We then add cardiovascular deconditioning, arterial constriction, blood clots and the possibility of pressure sores to the list of adverse consequences. Studies demonstrate that there is no known medical condition that is helped by prolonged bed rest.

Rehabilitation of CRPS/RSD

BY MICHAEL SULLIVAN, PT - DIRECTOR OF FUNCTIONAL RESTORATION PROGRAM
BAY AREA PAIN AND WELLNESS CENTER
When faced with the dilemma that it ‘hurts’ to move and accepting the fact that it is bad for your health and exacerbates pain to not move, I am hoping you will choose the latter. I recognize that this is no small task. So how should you proceed?

**ARM YOURSELF WITH KNOWLEDGE;**

Pain neuroscience education is key. Know that pain is not synonymous with tissue damage. In a normal functioning nervous system, pain is an early warning system of potential tissue damage. With CRPS both the peripheral and central nervous system function can become sensitized resulting in pain with non-painful stimuli (allodynia), exaggerated pain with a painful stimulus (hyperpathia) or pain in the absence of any stimulus, i.e. spontaneous pain. To use a smoke alarm analogy, this is the equivalent of every smoke alarm in your house going off when you blow out a single birthday candle in addition to your smoke alarms going off randomly all day and night. With the smoke alarm, eventually you would come to the conclusion that the system is malfunctioning, and if you are anything like me, you would start cleaning them off the ceiling with a broom stick. The smoke alarm is no longer providing you with useful information. The same could be said of the sensitized nervous system. Common sense tells you that touching your hand lightly should not result in a burning sensation, but it does and patterns of activation in the centers of the brain that process this information look about the same as if you were touching a hot burner on your stove. There is nothing imagined about this, it is real. The good news is that you can change this experience.

**LEARN WAYS TO MODULATE YOUR PAIN.**

While knowing how pain is processed is not an absolute requirement to learn pain modulation, most people just don’t take our word for it when we tell them they can make their pain better or worse. The receptors in our body that collect information about actual or potential tissue damage are called nociceptors and the process whereby information about unpleasant stimuli is transmitted to the brain for processing is called nociception. Your brain takes this information, puts it into context of your past experiences, psychosocial factors, your personal beliefs, your cultural identity, your current health and demographics and your spiritual beliefs among other factors and does a threat assessment. Your brain will produce pain in proportion to the perceived threat not necessarily in proportion to the actual threat. If your conclusion is that what you are experiencing is not very dangerous then you will experience less (or no) pain. Thoughts and expectations do matter. If you have catastrophic thoughts and expect that you will never get better your pain will be worse. Your brain will ratchet up the threat assessments unless these thoughts are addressed. A psychologist with experience in chronic pain management is most helpful in addressing these issues.

Nociception need not be present to experience pain. Emotional and cognitive stressors can both produce pain responses in areas of the brain identical to those produced by the nociceptive process. Learning techniques to manage these stressors can down regulate pain. Meditation and relaxation exercises quiet activity in areas of the brain that process pain. Conversely, you can have nociception but not experience pain. There is an abundance of functional magnetic resonance imaging studies that allows observation of brain activity in real time that support these assertions.

**IT’S TIME FOR GRADED MOTOR IMAGERY.**

The ground breaking work being done by Butler and Moseley with the Neuro Orthopedic Institute (NOI) addresses the neuroplastic changes that occur in the brain as a result of the central nervous system being bombarded by nociceptive information. Brain health is promoted through a series of three activities: laterality tasks, imagining/thinking about movement and mirror box therapy. These activities can help to reduce pain and increase motor control for better quality movement. NOI has many good online resources that can help get you started. We generally recommend five minutes of GMIB-10 times per day spread out across your waking hours. If you are going to be working with a physical therapist, make sure the person you are working with has experience with these techniques. Pairing these with desensitization exercises can help with allodynia.
ADDRESS THE BUILDING BLOCKS OF FUNCTION.

Once you have developed some skills to better manage your pain, you are more likely to have success progressing into the active portion of your treatment program. Our goal up to this point in addition to understanding and reducing pain has been to reduce the fear associated with movement by better understanding pain. Given that you will be able to down regulate pain in the event that it increases you will be able to look past those previous experiences of trying to increase your activity level that did not go so well. Gentle exercises to improve joint mobility, improve muscle flexibility and increase cardiovascular endurance are key. Start slow, increase slowly but don’t be deterred by discomfort that you are likely to experience in the moment. As you add more. Activities to your program, the guiding principal is that if you can do tomorrow what you did today, you are heading in the right direction. If you can’t do tomorrow what you did today then you did too much. Adjust your activity level accordingly. Once you have established a baseline you can start slowly increasing the duration of your cardiovascular activities. Studies demonstrate that cardia above all other forms of exercise helps to regulate health in the nervous system, decrease depression, and reduce stress in addition to promoting cardiovascular health.

In addition to neuropathic pain associated with dysfunction in the nervous system people with CRPS experience a combination of orthopedic consequences associated with the original injury or disuse. Almost universally, one of these consequences is myofascial pain associated with guarding the injured area and adjacent areas. Learning skills to self-manage myofascial pain are essential to reducing pain in the periphery. Releases and stretches are essential to managing flare ups.

When you are experiencing some success with the above it is time to move on towards addressing specific deficits identified on your physical therapy evaluation. Exercises for building strength, addressing postural imbalances, improving balance, practicing good body mechanics are a good lead in to functional training.

PUTTING THE FUN BACK IN FUNCTIONAL:

Ultimately, everything up to this point is pursued with individual functional goals in mind. What are the most important activities for you to regain quality of life? For some, self-care and the ability to live independently is the most important thing. For others it is playing with their children or dancing with their partner. For some, it is getting back to work and regaining financial independence. Getting back into your normal daily routine involves sitting and standing tolerance, safe ambulation, the ability to transfer from standing to floor and back and may involve components of lifting, carrying, pushing and pulling, fine and gross motor skills. These should all be incorporated where appropriate to meeting your functional goals. Engaging in activities that you enjoy unlocks your body’s natural pain relieving ability and is another step towards a more healthy life.

THE RSDSA provides support, education and hope to everyone affected by the pain and disability of CRPS/RSD while we drive research to develop better treatment and a cure.

EVENTS CALENDAR

2018 CALENDAR OF EVENTS THROUGH NOVEMBER

August 25- CRPS Awareness Day At Dodger Stadium - Los Angeles, CA
September 15- 3rd Annual Long Island CRPS/RSD Awareness Walk Event - East Meadow, NY
September 23- Knock Out Pain 5K - Easton, PA
September 29- Treating the Whole Person: Achieving Wellness, Charlotte, NC
September 30- Fight The Flame 5K 2018 - Charlotte, NC
October 21- 2018 CRPS Awareness Walk - Pennsauken, NJ

NOVEMBER IS CRPS AWARENESS MONTH

November 3 - Thompson Park Walk Lincroft, NJ
November 4 - Zumbathon Charity Event in Freeport, NY
November 4 - Fight the Flame 5K in Mentor, OH
November 5 - 5th Annual Color The World Orange

PEER-TO-PEER THOSE IN NEED OF SUPPORT:

If you wish to take advantage of this program, please do the following.

• Please contact LindaLang@rsds.org
• Please provide your email, phone number and a little bit about yourself.

Don’t see an event near you? Contact Jim Broatch info@rsds.org to discuss planning an event in your area!
WHEN YOUR CHILD’S PAIN WON’T GO AWAY

It could be Complex Regional Pain Syndrome

RSDSA is committed to assisting those who suffer from CRPS as well as the people who support them.

RSDSA offers emotional, financial and medical support to people suffering with CRPS. We can also provide referrals to pediatric rehabilitation programs.

Please visit our website, www.rsds.org, if you are in need or have questions.

If you think you or someone you know has CRPS/RSD, please visit your physician and provide him or her with educational information about the disease.

Much more can be accessed through our website. You may also contact us at 877-662-7737.

Stay connected with us by subscribing to our bimonthly newsletter, joining our community email news blasts, or visiting our Facebook page.

TREATMENT OPTIONS

Ultimately your physician will prescribe the best program to meet your child’s needs, but research has shown that physical therapy can be one of the most effective treatments for CRPS.

Other treatments, such as psychological support or medication may be needed, so consult your family physician as to the best course of action.

ADDITIONAL RESOURCES

CRPS is not life-threatening, but it can be highly disruptive and lead to excessive school absences if left untreated. Early diagnosis is key.

Once diagnosed, some students may require special school accommodations, such as ergonomic assessments, additional travel time between classes, revised schedules and possibly a helper’s aide.

Students who find their CRPS too painful to allow them to attend school may qualify for special services, such as a 504 plan or Individual Education Plan (IEP).

For more information on available accommodations, contact your school’s health services coordinator.
YOU ARE YOUR CHILD’S BEST ADVOCATE

Your child frequently experiences severe pain following an accident, injury or other trauma. It may be accompanied by swelling, changes in skin color, temperature, or limited mobility. He or she is suffering, and other treatments have been ineffective. Worst of all, he or she may not be able to tell you what’s wrong. *Your child could have CRPS (Complex Regional Pain Syndrome) which is also referred to as RSD (Reflex Sympathetic Dystrophy).*

CPRS is a neurologic syndrome characterized by severe and often burning pain. While it affects nearly 200,000 people in the U.S., it is rarely mentioned in an initial diagnosis.

There is no gold standard for diagnosing CRPS. Only a careful and thorough exam and review of medical history by your physician can produce the proper diagnosis and recommended treatment. *Pediatric CRPS is typically under-recognized and misdiagnosed by physicians, and you may have to advocate for proper testing.*

JUST BECAUSE YOU CAN’T SEE IT, DOESN’T MEAN IT DOESN’T EXIST. BUT TO RECEIVE HELP, YOUR CHILD MUST BE HEARD.

THE FACTS

**What is CRPS/RSD?**

CRPS/RSD is a rare neurological disorder that causes severe inflammation in the sympathetic nervous system.

**What Causes It?**

It occurs after a trauma, such as a musculoskeletal or nerve injury, surgery or broken bone. Sometimes there isn’t an initiating event.

The trauma causes the sympathetic nervous system and immune system to malfunction. The nerves throughout the body misfire, overwhelming the brain with pain signals.

**What Are the Affects?**

CRPS is devastating. It causes severe pain, swelling and sensitivity. Many people are unable to walk, work, go to school, or wear clothes.

**Who Can Develop CRPS?**

Anyone can develop CRPS, regardless of race, age or gender. However, research shows that it is most common in women.

SIGNS & COMMON SYMPTOMS

This is not an exhaustive list, but symptoms may include:

- Constant pain described as deep, aching, burning or stinging
- If the pain is getting worse, not better, and if the pain is more severe than one would expect from the original injury it may be CRPS
- A prior trauma (fracture, sprain, surgery, etc.)
- Abnormal swelling
- Excessive sweating in the affected area
- Changes in skin color
- Noticeably altered skin temperature in the affected limb
- Weakness in affected limb
- Limited range of motion
- Paralysis or dystopia (muscle contractions resulting in abnormal positions)
- Allodynia (pain from stimuli that is not normally painful, such as the touch of fabric or wind blowing across skin)
- Hyperalgesia (excessive sensitivity to pain)
- Hair growth changes (coarser, darker, rapid growth, loss of hair)

WHAT TO TELL YOUR PHYSICIAN

During your child’s exam, ask your physician if he or she is familiar with CRPS. Also tell your doctor or clinician about any sprains, falls, surgery or other trauma your child has had recently. Provide them with information on timing, severity of pain and any other triggers you may notice.
What People with CRPS Should Expect from Therapy

By Anita A. Davis, PT, DPT, MSM, D-AAPM

Before developing CRPS, chances are you have never had a major injury or illness, but now you may find yourself going from doctor to doctor and have a shelf full of medications. Some have worked, some have not, and others had such side effects that you had to stop taking them. The doctors have talked about injections and maybe neurostimulators—and, by the way, now you need to start physical therapy.

The intent of therapy is to help you regain your strength and mobility, and even reduce your pain. There will be days you would rather not follow the home program or go to therapy, and moments that your pain increases and you question the reason for making yourself hurt even worse. In those moments, let your hope of recovery and the support of close ones cheer you to continue.

Therapeutic activities that involve walking, stepping, carrying, or lifting present their own challenges. The goal of these types of tasks is to simulate a normal, functional motion while allowing your nerves to adapt to the sensation by readjusting their sensitivity. The pain will increase with these tasks, since your nerves have become so sensitive that they overreact to what was normal. It takes time and repetition to retrain this response. Medical literature and clinical experience tell us that this ultimately leads to less pain within 10 to 14 days.

In the midst of performing these painful activities, you should have strategies to reduce the flare-up. Your therapist may share relaxation techniques, imagery, breathing, or other movements that can ease the pain. Learn these and use them—for in this you can gain confidence in your ability to control what has otherwise seemed uncontrollable.

Home Exercise Programs

A home exercise program is a select group of exercises or activities that a therapist designs. Frequency/participation in therapy sessions may vary from one week to the next, but what is done outside of therapy can have a significant impact on the patient’s overall progress. Following an individualized home exercise program can be an important component of treatment as it helps the patient continue to make progress in strength, endurance, movement and function in between therapy sessions.

Home exercise programs vary depending on your individual needs. Often home exercise programs will initially focus on scrubbing/weight bearing and desensitization techniques to begin actively engaging the muscles in the affected area and help you manage your pain better. After the initial phase of scrubbing and desensitization, the home exercise program may be upgraded to focus on increasing range of active movement and improving strength.

Many home exercise programs will include functional activities in addition to stretches and exercises. Such activities may include drinking from a cup with the affected hand or wearing a shoe on the affected foot. Often these activities are based on tasks that the patient currently has difficulty performing. They may be things that you do for short periods of time frequently throughout the day to help you incorporate the affected area back into routine activities. Consistent participation in exercises/activities outside of therapy sessions, as directed by a therapist, may help the patient achieve his or her goals more quickly.
What is Complex Regional Pain Syndrome

Complex Regional Pain Syndrome (CRPS) is a chronic pain syndrome. CRPS generally involves a dysfunctional response of the nervous system and may develop after a traumatic injury or a period of immobilization.

CRPS is divided into two categories: Type I (formerly known as Reflex Sympathetic Dystrophy) and Type II (formerly known as Causalgia).

What Does CRPS Look Like?

CRPS pain is often described as deep, aching, cold, and/or burning and is frequently associated with increased skin sensitivity. Pain is generally rated moderate to severe and is disproportionate to any inciting event.

Symptoms of CRPS can include abnormal swelling, alteration in hair or skin color or temperature changes, abnormal sweating, limited range of motion, and movement disorders.

Evaluation of CRPS for Functional Rehabilitation

Principal areas to evaluate are range of motion, strength, edema, dexterity, skin/vasomotor changes, pain/sensation, the presence of abnormal guarding or protection postures/movements and active use of the affected extremity during daily activities. Barriers to movement that are important to assess include fear and avoidance, reliance on passive coping tools, lack of education on CRPS and motivation/readiness for change. If psychological distress such as depression and/or anxiety is noted, a psychological evaluation may be required.

Treatment Protocols

Treatment objectives for CRPS are to minimize edema, normalize sensation, promote normal positioning, decrease muscle guarding, promote use of active pain management skills and increase independence in all areas—mobility, work, leisure and activities of daily living (ADL). Education on CRPS, chronic pain and appropriate goals should be an emphasis early on and throughout treatment. Active movement and weight bearing exercises are emphasized. Treatment of CRPS can be painful and both mental and physical active coping tools are useful.

Edema is managed using specialized garments (Jobst® garments, Isotoner® gloves, Coban™) and walks on the affected leg. Stretching and AROM (active range of motion) activities are also fundamental in managing edema. Elevation of the extremity can be effective; however, it can sometimes become part of a cycle of guarding and disuse.

Desensitization techniques are implemented to assist with normalizing sensation to the affected area. This consists of progressive stimulation with very soft material to more textured fabrics or materials. Stimulation can be graded from light touch to deep pressure and can be performed from the palm to the back of each hand. Wearing jewelry, clothes and shoes on the affected areas are also ways to normalize sensation. Contrast baths that gradually broaden the temperature difference between the two can work toward tolerance of heat or cold.

Posture is an important component to consider in treating CRPS. Proper posture and alignment can minimize protective guarding of the extremity, promote balanced use of muscles and facilitate improved functional use of the affected extremity. Relaxation breathing and awareness can help to decrease guarded posturing.

Stress Loading consists of two principles: scrubbing and carrying. A stress loading program promotes active movement and compression of the affected joints for a minimum of 3-5 consecutive minutes, 3 or more times each day. Though stress loading may initially cause pain or discomfort, the extremity, after several days a decrease in symptoms will begin to be evident. Use of the affected extremity in daily tasks is encouraged throughout rehabilitation to inhibit muscle guarding and disuse atrophy.

Scrubbing consists of affected extremity in a back-forth motion while weight bearing through the extremity. The patient scrubs a hard surface, keeping the bristles of the brush in constant contact with the surface, while maintaining constant pressure on the brush. The amount of weight placed through the affected extremity and the duration of the activity are gradually increased. Scrubbing is performed with the patient in quadruped for upper extremity involvement and in seated sitting or standing for lower extremity involvement. For upper extremity involvement to use control of the brush with the affected hand. For lower extremity involvement, a longer Veleron® strap can assist in fastening the brush to the bottom of the affected foot.

Modifications can be made to enhance performance or compliance. For example, upper extremity scrubbing may occur while standing at a table or counter. Persons with limited wrist extension may benefit from using a handled brush. The Dystrophile® can be used to gauge reliable performance. It is a device designed to facilitate consistent weight bearing and compliance during scrubbing by activating a light when the patient has reached the preset load.

Carrying or loading, is the second component in the stress-loading protocol. Small objects are carried in the hand on the affected side, progressing to a handled bag loaded with increasingly heavier weight. Carrying should be performed once or twice a day, whenever the patient is standing or walking. The lower extremity can be loaded in a variety of ways.

Walking is an important loading technique if care is taken to ensure weight bearing through the affected leg during gait, especially when an assistive device is used. Increased weight bearing can be accomplished with verbal/physical cueing or by having the patient carry a weighted object or bag on the affected side. Loading can also be facilitated by engaging the patient in activities that promote weight shifting and balance (i.e. carrying a loaded backpack or bag or walking with a foot on a small footstool during static standing tasks).

Mind-Body Interventions facilitate stress reduction, desensitization of the nervous system and provide coping tools for dealing with pain. They include relaxation, meditation, guided imagery, biofeedback, hypnosis, and mind-body stress reduction (MBSR) and is a form of meditation practices that is commonly used to help treat chronic pain. The practice of these interventions should begin immediately.

Bracing/Bracing is a set of rehabilitation processes used to treat pain and movement problems related to an altered nervous system, including the brain. The three different treatment techniques include limb laterality training, graded motor imagery exercises, and mirror therapy. These techniques are delivered sequentially, or individually. This type of treatment is done over a long period of time and fast results should not always be expected.

Splinting/Bracing is used in severe cases of CRPS. Splinting or bracing may be utilized to provide immobilization of the affected extremity and facilitate normal tissue length, and improve functional positioning.

Functional Training begins once the patient is actively engaged in an edema management and stress-loading program. As the pain and edema decrease, the patient will be better able to tolerate and participate in AROM, coordination, dexterity, and strengthening tasks. Proprioceptive neuromuscular facilitation (PNF) patterns are often well tolerated during treatment.

The therapist can help the patient to gradually improve AROM and flexibility through gentle progression of active and active-resistive exercises or gait training. The patient should be encouraged to gradually return to daily life activities. These treatments and activities can be very painful and the therapist must understand and be able to explain the differences between pain and damage to alleviate the fear of the patient. While these treatments should be done within the patient’s tolerance, the patient must understand that they will have to push through pain to achieve their goals. Care must be taken to ensure safety of the anatomical structures in insensitive situations (as after a nerve block). Pacing and pain management techniques, such as appropriate rest breaks, alternating tasks, thermal or electrical, feedback, diaphragmatic breathing, and relaxation techniques, can assist the patient in minimizing pain flares while participating in intensive rehabilitation.

Treatment Summary

The overall role of the therapist during rehabilitation of CRPS is to guide the patient through a program designed to minimize pain, edema and improve functional use of the extremity. As CRPS varies greatly in severity and duration, it is very important for the therapist to demonstrate enthusiasm, support and encouragement of the patient during the treatment process.

The patient, in turn, must be actively involved in integration of treatment techniques into all daily activities to achieve optimal function of the affected extremity.

References

CRPS is a multifaceted medical condition best managed by an interdisciplinary team coordinated by a physician or pain specialist with a special interest and experienced in treating CRPS. You must become the “captain” or CEO of your team. No one treatment works for everyone. Your first step is to educate yourself. RSDSA’s website has a very informative section, Diagnosed: Now What?

Your treatment goal is to reduce your pain while focusing on improving function. Other members of your team may include physical or occupational therapists, psychologists or counselors trained to help individuals learn how to manage their pain, anesthesiologists or interventional pain specialist (when warranted), and your support people.

Treatments may include: medications, topical medications, interventional therapies such as nerve blocks, intrathecal drug infusion, warm-water-therapy, physical and occupational therapies, psychological support, neurostimulation, IV ketamine or IVIG infusions or, participation in a clinical trial (clinicaltrials.gov).

RSDSA is committed to assisting those who suffer from CRPS as well as the people who support them.

RSDSA offers emotional, financial, and medical support to people suffering with CRPS. Please visit our website if you are in need.

If you think you or someone you know has CRPS/RSD, please visit your physician and provide him or her with educational information about the disease. Much more may be accessed on our website. You may also contact our organization.

WE ARE HERE TO SUPPORT YOU
- YOU ARE NOT ALONE -

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Raising awareness of CRPS since 1984
HOW CRPS CHANGED A CHILD’S LIFE
Once a successful swimmer and a student council member, fourteen-year-old Natalia is now trapped in her body.

After a mild wrist sprain, Natalia’s fingers swelled into blood-red sausages. The pain prevented her from even holding a pencil.

Exactly a week after her thirteenth birthday, a neurologist finally diagnosed her with CRPS after many ER visits. In the following months, she was hospitalized more than a dozen times.

Just as she began to show improvement, a car collided with her school bus, and her CRPS spread. Pain covered every inch of her body; Natalia has not walked since.

Her parents have been unable to hold her hand or hug her for over a year.

Natalia’s story is not unique. In the U.S. alone, nearly 200,000 people suffer from CRPS, the most painful medical disorder. Like Natalia, these people need help.

To receive help, they must be heard.

THE FACTS

WHAT IS CRPS/RSD?
CRPS/RSD is a rare neuro-inflammatory disorder that causes severe inflammation in the sympathetic nervous system.

WHAT CAUSES IT?
It occurs after a trauma, such as a musculoskeletal or nerve injury, surgery, or broken bone.

The trauma causes the sympathetic nervous system and the immune system to malfunction—the nerves throughout the body misfire, overwhelming the brain with pain signals.

WHAT ARE THE EFFECTS?
CRPS is devastating. It causes severe pain, swelling, and sensitivity. Many people are unable to walk, work, or wear clothes.

WHO CAN DEVELOP CRPS/RSD?
Anyone may have CRPS, regardless of race, age, or gender. However, research shows that it is most common in women.

WORKING FOR A CURE
Since the Federal Drug Administration classified CRPS as a rare disease, RSDSA has been committed to finding a cure.

In 2014, RSDSA established the International Research Consortium, uniting forty-seven CRPS clinics and specialists worldwide to develop better treatments for the disease and to work toward a cure.

COMMON SYMPTOMS

- Pain described as deep, aching, burning, or stinging
- A prior trauma (fracture, sprain, surgery, etc.)
- Abnormal swelling
- Excessive sweating in the affected area
- Changes in skin color
- Noticeably altered skin temperature (increased or decreased) in the affected limb
- Weakness of affected limb
- Limited range of motion
- Paralysis or dystonia (muscle contractions resulting in abnormal positions)
- Allodynia (pain from stimuli that is not normally painful—the touch of fabric or the wind blowing)
- Hyperalgesia (excessive sensitivity to pain)
I have Complex Regional Pain Syndrome (CRPS), also known as Reflex Sympathetic Dystrophy Syndrome (RSD).

- Physicians do not know why it develops or what causes it, but CRPS is a nerve disorder that usually occurs after a traumatic injury, surgery, sprain, fracture, or a period of immobilization. The principal symptom is pain dramatically disproportionate to the injury.

- More than 140 years ago Dr. Silas Weir Mitchell, a Union Army surgeon, first described the excruciating pain that we know as CRPS.

- CRPS can lead to disability. CRPS can spread.

- I may look “healthy,” but I often suffer unbearable, unrelenting, and burning nerve pain. The McGill Pain Scale rates the pain of people with CRPS higher than that of people with cancer.

- My skin may swell, sweat, change colors, change temperature, or hurt to the slightest touch.

- Often it is difficult for me to sleep so I may have trouble with attention and concentration.

- I may be taking powerful medications prescribed by my physician with many side effects that may affect how I feel or how I react.

- It is often hard to move easily or keep my body steady.

- Chronic pain, like that caused by CRPS, often leads to depression because we undergo significant, and often negative, life changes.

- I have good and bad days; my pain may even change hourly. Stress increases my pain.

- Presently, there is no cure for CRPS. I always have hope because of the support of my family and friends and ongoing research.
Here's How You Can Help Me.

- My pain is real even though it is invisible and may not be readily apparent in my demeanor or activities.

- I am learning various coping mechanisms to get through the day, but the chronic pain is always there. I have good and bad days; my pain may even change hourly, and I cannot predict how I will feel each day.

- Sometimes it hurts to be touched anywhere so please ask before you touch me.

- It is OK to ask me about CRPS. Better yet, visit www.rdsds.org and learn all you can.

Pain Scale

The RSDSA provides support, education and hope to everyone affected by the pain and disability of CRPS/RSD while we drive research to develop better treatment and a cure.

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Thank you for considering a donation to RSDSA. Your unrestricted gift is vital to RSDSA because it gives us the crucial flexibility to respond to immediate needs and opportunities as they arise. Such contributions also help build a strong RSDSA financial foundation. To fulfill our mission, RSDSA must be able to meet the changing needs of the CRPS/RSD community, in order to continue improving the quality of life for people with CRPS. By making an unrestricted gift, you enable RSDSA to provide financial assistance, conferences, grants, support programs and much more to people across the United States.

RSDSA is a 501(c)3 not-for-profit organization. All donations are tax-deductible.

Thanks to the generosity of donors like you, RSDSA has been fighting CRPS/RSD and supporting the CRPS/ RSD community for more than 30 years. We are grateful for your support!