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Complex Regional Pain Syndromes: Guidelines for Therapy

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Abstract:

This report aims to present an orderly approach to the treatment of Chronic Regional Pain Syndrome (CRPS) types I functional restoration: a coordinated but progressive approach that introduces each of the treatment modalities neede Reaching objective and measurable rehabilitation goals is an essential element. Specific exercise therapy to reestablish functional restoration. Its application to CRPS is more contingent on varying rates of progress that characterize the rest various modalities that may be used, including analgesia by pharmacologic means or regional anesthesia or the use of n qualitatively different approaches that are unique to the management of children with CRPS, are provided only to facil methodical manner. Patients with CRPS need an individual approach that requires extreme flexibility. This distinguishes described medical conditions having a known pathophysiology. In particular, the special biopsychosocial factors that ar emphasized. This algorithm is a departure from the contemporary heterogeneous approach to treatment of patients wi mobilization, and desensitization facilitated by the relief of pain and the use of pharmacologic and interventional proce management techniques are emphasized, and functional rehabilitation is the key to the success of this algorithm.

The nature of Chronic Regional Pain Syndrome (CRPS) until recently suffered from a lack of precise definition of wh pathophysiology, and the lack of a mechanism. The epidemiology of CRPS is unknown. Only Sweden, with a population records that document the incidence of relevant conditions. Causalgia (354E) in 1990 was found in 27 cases; in 1991, in cases. Reflex sympathetic dystrophy (RSD; 337X) in 1990 was reported in 67 cases; in 1991, in 44 cases; in 1992, in 40 c proportion, the condition described as *pain in an extremity* (729F) was reported in 1990 in 1,249 cases; in 1991 in 1,374 cases. These figures are the number of patients who were hospitalized under these main diagnoses and probably repres

It would appear from the foregoing statistics that those conditions referred to as Complex Regional Pain Syndrome entity. In an attempt to define a taxonomy that more accurately describes conditions that fall under the umbrella term

Committee on Taxonomy recently revised its previous description and published those clinical features consistently fou type I (RSD), the clinical findings include regional pain, sensory changes (e.g., allodynia), abnormalities of temperature abnormal skin color that occur after a noxious event. CRPS type II (causalgia) includes all of the foregoing features in a

Because the pathophysiology of these syndromes is poorly understood and treatment will be directed of necessity t constitutes CRPS is required. The term CRPS was chosen for the following reasons:

* Complex expresses the varied clinical features found in these conditions.

* Regional emphasizes that in the majority of cases it involves a region of the body, usually an extremity, but may occu areas of the body.

* Pain is considered essential to the diagnosis of CRPS types I and II and includes pain that is spontaneous or evoked suc resembling CRPS, pain may be minimal or absent.

Although motor symptoms and signs are not directly included in the classification, tremor, dystonia, and weakness recognized that some patients may not have all of the criteria that will clearly classify them as having CRPS type I or II. might constitute a third type of CRPS by categorizing them as *not otherwise specified*. The definitions of CRPS types I a inclusion of patients with pain and clinical findings that are temporarily proportionate anatomically and physiologically myofascial pain syndrome are also excluded. Furthermore, a diagnosis of CRPS would be precluded by the existence of symptoms and signs present in the distal parts of an extremity but outside of the territory of an injured nerve. These sy innervation, but this is not an absolute requirement. The names *reflex sympathetic dystrophy* and *causalgia* are retaine communication and understanding.

DIFFERENTIAL DIAGNOSIS

Although CRPS types I and II typically describe disorders in the distal part of an extremity, pain may occur in a regi the site of an initial lesion including changes in skin blood flow, edema, and sudomotor activity in the vicinity of a peri type II (causalgia).1 However, a similar situation might prevail in which the absence of allodynia or hyperalgesia and th edema would prevent a diagnosis of CRPS. Also, many pain dysfunction syndromes that present with some features (e.g vasomotor changes typical of CRPS would not be sufficient to satisfy this diagnosis. Malingering and factitious disease a or II may suffer from psychological or psychiatric disturbances. Neuropathic pain such as sympathetically maintained pa phenomenon associated with the underlying pathophysiology that in the case of causalgia includes neurologic damage b disorder.

Before proposing a coordinated approach to the treatment and management of patients with these syndromes, it is constitute CRPS.

Pain

Pain generally follows a known initiating noxious event, which at first seems to be physically quite minor. It may al The pain is disproportionate in duration, severity, and distribution to that which would be expected in the normal clinic

event may occur peripherally, in the central nervous system, or in the viscera, or may be a psychological/psychiatric di
aching in quality aggravated by orthostasis and touch or solely evoked by either mechanical or thermal stimuli giving ris

Vasomotor abnormalities

Swelling occurs in most instances and affects joints and other soft tissues. Eighty percent of CRPS cases have temp
warmer than the contralateral extremity 3 and are associated with changes in skin color.

The vasomotor and sudomotor abnormalities tend to be more obvious early in the course of the disorder.

Trophic changes

Although these are generally described as occurring late in the disorder, they may appear within weeks of its onset
seen. In some cases, allodynia may be so severe that the extremity is held in a protective posture further accelerating
and deeper structures.

Motor changes

Weakness, tremor, and reduced movement are frequent accompaniments of CRPS.

What follows is a proposal for a coordinated approach to functional restoration built around a treatment algorithm
therapy.4-7 The primary philosophy is that medications, analgesics including regional anesthesia, neuromodulation, anc
these goals. This patient population is dysphoric and requires sympathetic understanding and encouragement to achiev
algorithm is the basis for achieving functional improvement by using physical therapy, which in itself is specific and foll
function without exacerbating autonomic dysfunction and symptoms. The algorithm aims at functional improvement by
contingent. Other modalities are added to achieve graded but methodical progress. The dynamic and unique nature of
and application of treatment protocols and the variable use of exercise therapy. Only an interdisciplinary team approac
fundamental to the delivery of treatment of which the patient must become a key member. Self-management is empha
should prevail, regional anesthetic procedures or neuromodulation are recommended if there is any failure to achieve p
physiotherapeutic algorithm, basic scientists and physicians drawn from many disciplines took part in a consensus works

Group	Topic	Participants
I	Exercise-specific therapy and behavioral management of Chronic Regional Pain Syndrome types I and II: role of analgesia	Harold Merskey, Canada P. Prithvi Raj, United States, group leader Angela Mailis, Canada Richard Rauck, United States Elliott Krames, United States Gunnar Olsson, Sweden Edward Covington, United States
II	Novel routes, new agents, and combined pharmacotherapy to facilitate rehabilitation	Samuel Hassenbusch, United States, group leader Michael Cousins, Australia Nelson Hendler, United States Gabor Racz, United States Wen-Hsien Wu, United States Ralf Baron, Germany Donald Price, United States Wilfrid Jänig, Germany Joshua Prager, United States
III	Neuroaugmentation with or without adjunctive pharmacotherapy for rehabilitation or maintenance analgesia	Peter Wilson, United States, group leader Torsten Gordh, Sweden David Niv, Israel Michael Rowbotham, United States John Oakley, United States Robert Wilder, United States
IV	Management of CRPS—Early and late: Development of treatment algorithm	Robert Boas, New Zealand, group leader Norman Harden, United States Michael Stanton-Hicks, United States Christopher Glynn, United Kingdom Giancarlo Barolat, United States Martin Koltzenburg, Germany Nagy Mekhail, United States

TABLE 1. Members and their topics of the consensus workshop to develop a physiotherapeutic algorithm

PHYSICAL THERAPEUTIC ALGORITHM

Early intervention is paramount, and ideally each step in the algorithm should be accomplished within 2-3 weeks. C each step with the proviso that any lack of progression, after 3 weeks, would necessitate more aggressive intervention weeks be adopted because of the severity of the disease or psychological difficulty or pathology, the importance of adh Incremental goals are psychologically advantageous but require substantial attention in support of the patient. Patients should be encouraged and allowed to advance within the limits of their symptoms.

The first step primarily involves the development of a therapeutic alliance and rapport. Motivation, mobilization, a desensitization may involve both a pharmacologic approach to reduce pain and sensitivity and a process of gentle contr pressure, cold, vibration, movement, etc., to help restore normal sensory processing.

It is essential that movement phobia be overcome and the patient begin to actually move and allow the limbs to be

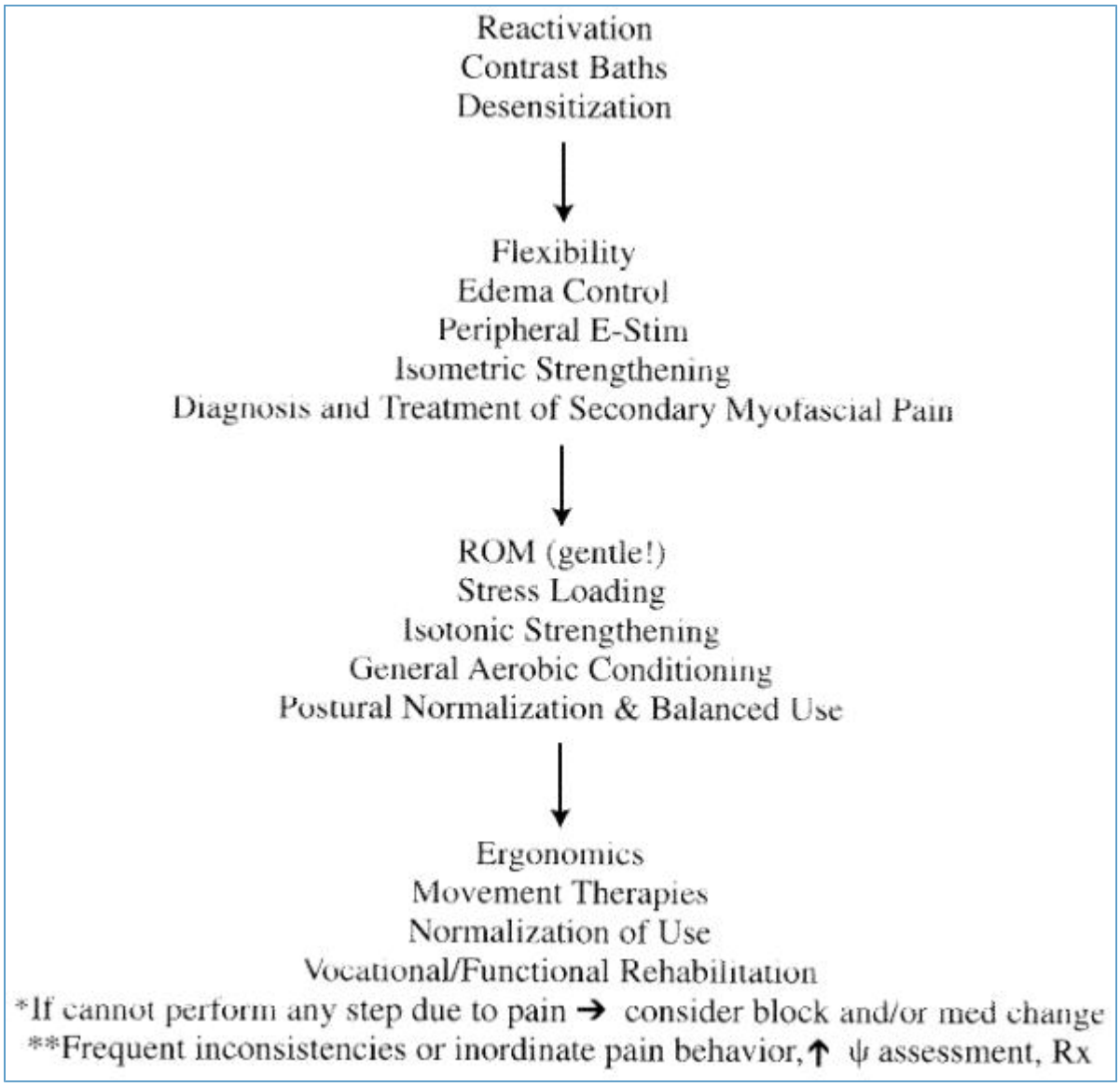

FIG. 1. Compound diagram of the physiotherapeutic algorithm and modalities that are used to achieve movement towar does not imply a specific order or priority. The use of any intervention is determined by the rate of progress at the time

To overcome barriers to movement and initiate muscle activity, isometric strengthening and electrode stimulation secondary myofascial pain syndromes affecting supporting joints should receive treatment.

The third step is made up of isometric strengthening and stress-loading (i.e., scrubbing, walking, and carrying weig consolidate general reactivation, is encouraged.

Range of motion

It is particularly important to avoid aggressive or passive range of motion (ROM) tests, especially in an extremity th Maintenance of and a gentle gradual increase in active ROM is the goal. Attention is directed to achieving postural norm

The fourth and last step aims at complete functional recovery. This emphasizes normalization of function in the af residual disability are appropriate and include autonomic assessment and intervention, vocational rehabilitation with w written instructions. Modifications are appropriate in adult patients who are working. Return to school, homemaking, o specifically facilitated and integrated with a daily occupational therapy and/or therapeutic recreation. Any psychologic impediments to a patient's progress through the algorithm require standard behavioral management and supportive psy pain avoidance, overprotection, movement phobia, and bracing is in order. Depression, anxiety, inappropriate anger, a pharmacotherapy and psychotherapy (see Psychological Management).

Where the severity of pain is the main limiting factor in any progress through the algorithm, then aggressive treatn order. The use of pharmacologic, regional anesthetic, or neuromodulation techniques is paramount. The best guide to c identified by history and physical examination with special emphasis on those factors that contribute to disability: role socioeconomic should be clearly catalogued. The combination of medications, psychotherapeutic interventions, regiona (i.e., electrostimulation) is selected to allow progression through the algorithm (see Regional Anesthetic Techniques).

Difficulties of treatment

Severe cutaneous allodynia may be a limiting factor and requires specific treatment. An amplified course of cutane textures for massage, proprioceptive challenge that include scrubbing, and weight-bearing should be instituted. This wi (either pharmacologic or regional) or an escalation of analgesic pharmacotherapy or both. Dependent edema is treated garments or pumps and diuretics.

The presence of contractures will limit progress through the algorithm.[12] It is essential to examine the extremity, determine the degree of any fixed limitation to joint movement. Only active or very gentle passive manipulation can be required for the initial stretching maneuvers with the proviso that the patients determine their own physical limits, the work done by the patient will be sufficient, however, sometimes dynamic splinting and serial splinting are used and ma that results in immobility of the limb is counterproductive and may be contraindicated unless required for stabilization night. It is critical to progress slowly and within patient defined limits when using these techniques. Adequate and liber be used to facilitate these steps (Fig. 2).

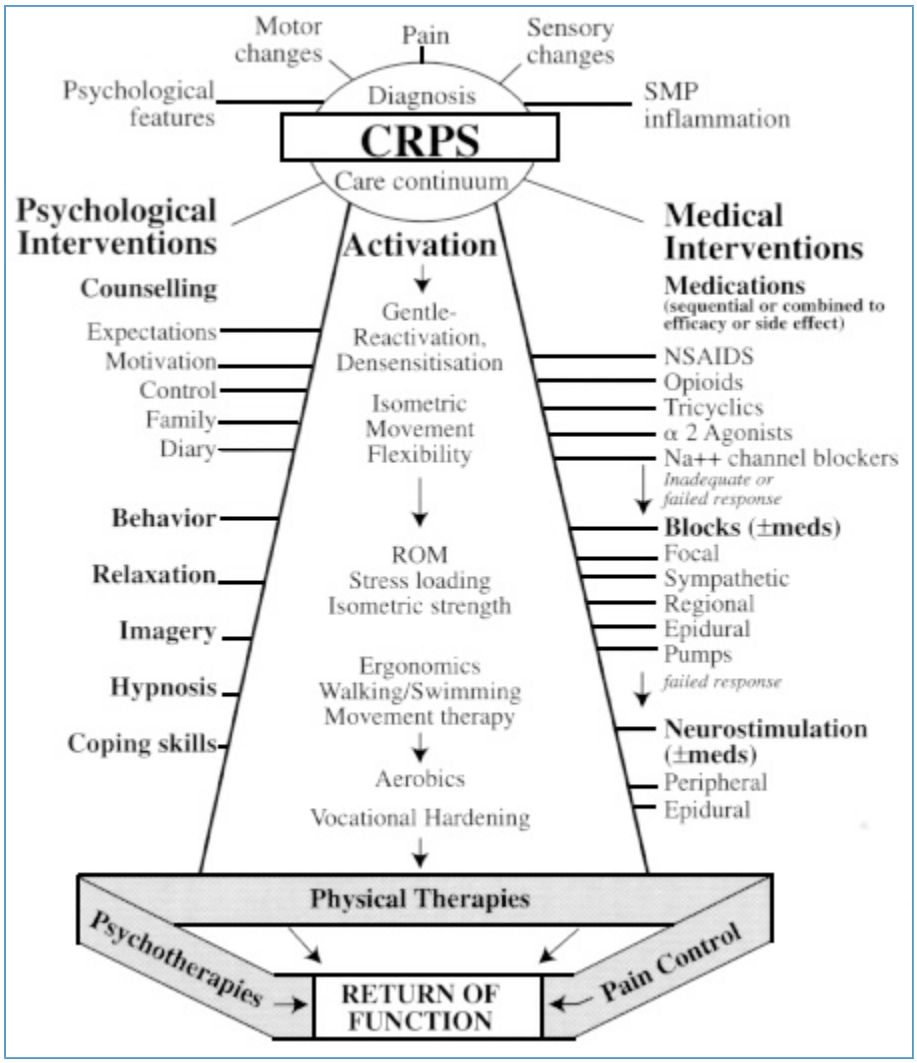

FIG. 2. Essential levels of physical therapy governed by progress that is limited only by the degree of pain and successfu pharmacological or interventional modalities. CRPS, Chronic Regional Pain Syndrome.

For CRPS in the lower extremities, weight-bearing can be the rate limiting step in the latter stages of the algorithm be extremely useful. This therapy should proceed through a graduated weight-bearing program. Key therapies at this p the upper extremities and modified scrub-loading (e.g., PABS board) techniques in the lower. In the lower extremities, encouraged as much as tolerated. For the upper extremities, weight-bearing using progressively heavier weights is salu

When progressing into the last stages of the algorithm, it is important to focus on self-management techniques and and technical modalities. As vocational rehabilitation proceeds, the use of those medications that can impair cognition vocational opportunities. Careful attention to the continuing need for restrictions and modifications that will ensure vo reintegration.

PHARMACOLOGIC MANAGEMENT

There are few well-designed treatment trials of neuropathic pain. This is especially the case for CRPS. Most descrip with few experimental findings. Without adequate predictors for the choice of therapy, current practice is chaotic and

What follows is a list of medications that have been found useful, to a greater or lesser degree, in the treatment o any form of priority but rather acknowledges the report of their usefulness in managing CRPS.

Nonsteroidal anti-inflammatory drugs (NSAIDs)

NSAIDs and metamizole that irreversibly inhibit cyclooxygenase and therefore reduce production of algesic substan manifestation or mild stage of CRPS types I and II.13 Although pain relief is frequently far from satisfactory, as an adju and tendon involvement in the inflammatory process, their early application is suggested. After reaching what would b symptoms, the drug should be replaced by a second member of the series (e.g., Nabumetone). Because the potential fo gastrointestinal ulceration, is high, the risk-benefit ratio must be carefully weighed before persisting with this therapy. their efficacy in children is low.

Opioids

Use of opioids is controversial. Although opioids are considered to be ineffective in neuropathic pain 14 and there h in nonmalignant pain states, more recent novel studies have demonstrated that they can be extremely useful in selecte neuropathic pain syndromes.15,16 However, their efficacy varies widely.

No controlled studies of opioid use in CRPS exist. Opioids should be tested early in the course of CRPS types I and II inadequate, and any trial of therapy should not be delayed to a "last resort" status. An intravenous trial such as by patie earliest application of opioids requires extreme caution in patients who have a history of chemical dependence. Physici must be avoided. The efficacy of opioids in children with CRPS has not been demonstrated.

Tricyclic and "heterocyclic" antidepressants

The efficacy of some serotonin/norepinephrine reuptake blockers (amitriptyline, desipramine, maprotiline) has bee diabetic neuropathy and postherpetic neuralgia (PHN).17-21 The exact mechanism of action of these drugs is not known spontaneous pain, shooting pain, and allodynia) may be improved. The mean dose that is required for pain reduction m antidepressant actions. Some antidepressants demonstrably improve sleep, mood, and anxiety in addition to pain. An in and side effects, is important. Selective serotonin reuptake inhibitors (SSRI) are no more effective than placebo in patie of amitriptyline or clomipramine in neuropathic pain depends on an as yet unidentified mechanism. In CRPS, however, now, however, no controlled studies have been initiated.

Membrane stabilizers

If shooting or paroxysmal pain is present, "membrane-stabilizing," anticonvulsants, local anesthetics, and antiarrhy of these drugs in patients with neuropathic pain are rare. Among the anticonvulsant drugs, carbamazepine and, to some commonly used in equivalent anticonvulsant dosage.22,23 In recent studies, gabapentin, a selective voltage-gated Ca^{2+} the management of pain in CRPS.24

Mexilitine (Boehringer, Ingel, Germany), an oral antiarrhythmic lidocaine analogue, has shown promise for alleviati mg/kg.25 The benefits of systemically administered local anesthetics (e.g., intravenous lidocaine, 125 mg/kg) have bee diabetic neuropathy.16,26 Intravenous application may predict the response to oral analogues.27,28 Transdermal appli to produce a statistically significant reduction of PHN pain.29

The topical application of local anesthetics [e.g., lidocaine and prilocaine in combination (eutectic mixture of loca the administration of a local anesthetic for localized neuropathic pain with hyperalgesia or allodynia.29 The value in pa

Gamma-aminobutyric acid (GABA) is a widely distributed, primarily inhibitory neurotransmitter. Drugs that interact reported to alleviate different neuropathic pain conditions, but their use in CRPS has not been studied.

Corticosteroids

Corticosteroids have been advocated in those cases of early CRPS that present with rubor, edema, and heat. Steroi the disease.30 Recent scintigraphic investigations with radiographically labeled immunoglobulins have shown an intraos I that in part combines an inflammatory component in the disorder.31 In particular, a trial of corticosteroids is recomm and have no effect on pain that is due to joint movement and/or trophic changes. The efficacy of steroids has not been

Calcitonin biophosphonates

Subcutaneous injection of calcitonin has a mild effect on spontaneous pain. No differences in anti-edema efficacy Any analgesic effects should be demonstrated after a few injections, thereby obviating the need for a long therapeutic

Capsaicin

Topical capsaicin cream previously reported to be efficacious in postherpetic neuralgia and painful diabetic neurop nociceptive C-fiber function.34-36 The chronic cutaneous application of capsaicin leads to a reversible depletion of pep peptide from the C-fiber nerve terminals, resulting in activation and subsequent reversal of C-fiber function. Should loc worth considering a therapeutic trial using concentrations of 0.025-0.075% solutions.37

Adrenergic drugs

Alpha-blockers (terazosin, prazosin, phenoxybenzamine) tend to have little clinical utility but significant cardiovas been demonstrated in approximately 30% of patients who dramatically respond to either a trial of phentolamine infusio anesthetic sympatholysis. The transdermal application of topical alpha-2 agonists such as clonidine is useful when appli Intraspinally and epidurally administered clonidine has also been shown to relieve pain in CRPS.41 Beta-adrenergic bloc

REGIONAL ANESTHETIC TECHNIQUES

There are two reasons to consider the use of regional anesthetic techniques to facilitate the management of CRPS. with a program of functional restoration. Second, sympatholysis can be provided in those cases that either by phentolar

have demonstrated unequivocal evidence of SMP.42,43 In the absence of any clinical trial to demonstrate the relative e sympathetic blockade, there is a historical preference to use the latter technique regardless of whether the upper or lc nervous system interrupt nociceptor visceral and somatic afferents and vasomotor, sudomotor, and visceromotor fibers

Once it is established that sympatholysis is effective in relieving not only the burning dysesthesia but also allodynia procedure to determine whether an increasing duration of effect can be expected in any particular patient. If this is th necessary to enable a patient to regain function by using a specific stress-loading physical therapy. Determining the eff that in addition to the signs of Horner's syndrome (e.g., myosis, ptosis, and enophalmous), there must be a relief of syn measured at the finger pulp. In the lower limbs, signs of successful sympatholysis are venodilatation and a temperature sympatholysis completely relieves the symptoms and facilitates exercise therapy but is limited in its duration of effect, using one of the neurolytic techniques. The simplest method is that with a neurolytic agent such as phenol prepared wi Malingckrodt, St. Louis, MO) or by using radiofrequency lesions. Duration of effect from 3 to 6 months may be achieved continue.

In those countries where guanethidine is available, intravenous regional block can provide alpha-adrenoceptor bloc Although the mechanism of the improvement of symptoms has been questioned,45 recent results with this treatment in efficacy. These investigators demonstrated that allodynia to vibration was completely normalized in responders but not pain.

Continuous conduction block of the brachial or lumbar plexus can be successfully used for periods of up to 6 weeks techniques are dislodgment of the catheter or infection. However, in those cases that progress rapidly through the step may only be needed to accelerate their progress to a point where oral medication will suffice. Central neural infusions help greatly in managing severe allodynia, pain of joint movement, and continuous pain.

Epidural catheters that are implanted for a long duration should be treated as minor surgical procedures requiring accomplished by using fluoroscopic imaging during their introduction into the ipsilateral epidural space. Instability of th dislodgment will require the catheter to be surgically retained to paraspinous tissues. Depending on the severity of pain provide satisfactory analgesia in most cases without any unacceptable proprioceptive or motor effects. These latter sid incompatible with functional restoration. Therefore, it may be necessary to use an opiate that, together with the local analgesia that is commensurate with exercise therapy demanded at the time. Although fentanyl is one of the most succ may necessitate the use of alternative agents such as morphine, dilaudid, or sufentanil.

A short (2-5 days) hospitalization will be necessary to determine the clinically most effective dose in each case. On of agents is achieved, it also may be necessary to provide the patient with self-dose (bolus) increments at the time of t

Epidural catheters may be retained for as long as they are required. However, after 6 months of use, consideration either spinal cord stimulation (SCS) or peripheral nerve stimulation (PNS), whichever modality is considered more appro may be limited by considerations such as occupation, repeated infection, and in those cases of lower extremity CRPS in choice. The main complication associated with continuous epidural infusion is local infection, which is almost invariably with systemic antibiotics. It is generally not necessary to remove the catheter, but if paraspinous or spinal infection is s examination and magnetic imaging or computed tomography with myelography.

The foregoing regional anesthetic techniques are used to promote the course of functional restoration in conjuncti necessary. Regional analgesia will provide an appropriate level of analgesia and sympatholysis for this purpose. Other t tricyclic antidepressants, membrane stabilizers (either anticonvulsant or antiarrythmic), and adrenoceptor antagonists. found to be particularly useful when administered intraspinally together with a local anesthetic or opiate. The concurre dose of local anesthetic and opiate respectively.41

NEUROMODULATION IN THE TREATMENT OF CRPS

SCS and PNS

Although spinal cord stimulation has been in use since 1967, few investigations have attempted to determine its ef Only one paper has prospectively looked at outcome in a small group of patients with CRPS. Several small studies have SCS in treatment of pain due to CRPS. Robaina et al.49 reviewed eight patients with CRPS involving the upper extremity by a 10-day trial of a percutaneously externalized electrode. On reevaluation after 27 months of permanent implantati eight patients, had good to excellent results. Excellent referred to 90-100% pain relief, and good referred to 75% pain r Broseta et al.50 studied 11 patients who fulfilled the description consistent with a definition of CRPS, including sympto nerve injury or amputation and pain localized to either the lower or upper extremities. During the 13-month follow-up, free without the need for analgesics and return to work), two patients had continued good relief of pain and one fair re work), and two had poor results (i.e., <25% pain relief and still using strong opiate analgesics).

The only other study in the literature is that by Barolat et al.51 This study described 18 patients with clinical featu refractory to more conservative intervention. Four of these had no benefit during a 1-week externalized screening trial blockade, spinal anesthetics, intrathecal opiates, or intravenous guanethedine. Fourteen patients were subject to perm reported good pain relief, and five moderate relief of their symptoms. None of the patients was free of pain after the p were able to discontinue their use of opiates, whereas the remaining three had a significant reduction in their opiate re CRPS type I (RSD) and CRPS type II (causalgia) studied by Sanchez Ladezma et al.52 provided the following results. Eigh their symptoms to justify implantation, whereas 11 of 13 CRPS type II patients had implantation. The value of this study 89% still reported excellent relief (75-100% pain relief) and 10% reported good pain relief (50-70% pain relief). The only of long-standing CRPS 53 demonstrated good to fair efficacy in 63% of the 32 patients studied.

Twenty percent of those previously unemployed or employed part time returned to work, and all patients in the su analgesics. Although selection criteria are paramount when evaluating modalities such as SCS and PNS, it is apparent th types I and II will in fact respond sufficiently to permit their participation in the treatment algorithm. It should be emp that provides both analgesia and sympatholysis to facilitate functional restoration after all other modalities have failed necessary to provide this level of analgesia and sympatholysis by neuromodulation as the first rung of the physiotherape officer with CRPS type II (causalgia) who continues to work], the patient would satisfy these criteria and at the same ti

CRPS IN CHILDREN

CRPS is found in children, adolescents, and adults.54,55 CRPS in children, although essentially carrying the same cl differences from CRPS in the adult and is much more responsive to conservative treatment.8,56-58 Children are more li sympathetic block. Only a few require the intensity and scope of treatment frequently needed in the case of the adult.

However, a very small percentage of children do develop a severe debilitating form of the disease requiring progre present study.55,59 Like adults, the initial treatment for children should be physical therapy. This may be difficult to i do any exercises that will cause pain in the limb. This advice is often given by well-meaning health care providers who should endure a progressive desensitization and exercise therapy program may be sufficient if commenced early in the patient and the family of the nonprotective nature of neuropathic pain in CRPS.

Many children will have already received some type of physical therapy before the diagnosis has been made. This n physical therapy simply because "it doesn't help" or because it is overly painful. The addition of analgesics may overcom stimulation (TENS) will frequently afford adequate analgesia in more than half of pediatric patients with CRPS.55 In the needed analgesia with virtually no side effects. Useful medications include nonsteroidal anti-inflammatory drugs, tricyc administered with strict attention to the possibility and degree of any side effects. Given the potential need for treatm having the least noxious side-effect profile are desirable. Similarly, the choice of tricyclic antidepressants will depend of the patient. Amitriptyline is the most effective in the patient who is unable to sleep at night, although desipramine, preferable in those patients who have little difficulty in sleeping and who are unable to tolerate those medications that

The use of cognitive, behavioral, and psychological strategies is particularly germane for pediatric patients with CR control of pain but help the child to manage the stress of the condition. Psychological counseling may also be necessary of their child's condition. A high degree of family dysfunction is associated with this disorder.60 In a small number of ca provide the level of pain relief commensurate with their physical therapy. These children may benefit from sympatheti technique rather than repeated single shots. A greater percentage of children with CRPS of the lower than of the upper Because this is uncomfortable, it is appropriate to use sedation, and the procedure requires the accuracy provided by f will avoid the need for repeated procedures. Although the lumbar sympathetic catheter may provide a more specific bl epidural catheter to become dislodged. In either case, the maximum benefit of regional anesthesia will only be achieve are undertaken while the infusion is running.

It is rare for more invasive treatment of CRPS in children to be required. There are also few data that suggest whic failed the foregoing strategies. Given the proviso that it is preferable to use the least invasive and most reversible mod preferable to a PNS simply because of the ease of placement, the simplicity of a percutaneous trial, and the subsequen later date. As a last resort, after all efforts have failed and one has reached the bottom of the treatment algorithm, a should be considered for those patients with impending tissue loss, edema, recurrent infection, or ischemic necrosis. In preferable to surgical sympathectomy. It should be remembered, however, that, although immediate benefit may be re

In summary, the treatment of CRPS in children should commence use with the least invasive measures and progress therapy fails. More than half of these patients will respond to physical therapy in combination with TENS, cognitive and medication. The use of early sympathetic block in children is usually not needed. It is rarely required, it increases medi mistaken idea that CRPS may be cured by absolving the patient of responsibility for progressing through the physiothera

PSYCHIATRIC AND PSYCHOLOGICAL MEASURES

Whereas a number of diseases, such as ileitis, colitis, chronic back pain, temporomandibular pain syndromes, vagin patient personality profiles, most of the studies that have attempted to show this correlation with a particular disease longitudinal perspective 61-64 and are subject to problems of selection bias. Thus, the physician is faced with a critical

1. Did the disease cause the psychological problem?

2. Do predisposing psychological problems facilitate the expression of complaints that may or may not have a physical b

3. Has the patient developed psychological illness as a result of pain and disability?

In one study, of 76% of patients who had both chronic pain and depression, only 11% with premorbid depression cor of this issue depends on knowing the patient's premorbid condition, history of prior painful illness,66,67 and the influen current independent sources of distress for the patient.65,68-71 It also depends on deciding if there is adequate eviden

In most cases, onset of pain would be defined as the precipitating event, and objective clinical features would be f temperature side differences using thermometry or passive infrared thermography and cold-pressor testing, X-ray appe sensory testing.

Earlier in the disease (0-2 months), no psychological counseling is needed because no psychological changes have y Psychological instruments including the MMPI, the Suicide Risk Test,73 the Beck Inventory, and the SCL-90 are all norma the MMPI and similar scores in the SCL-90.

From 2 to 6 months, however, patients become anxious and concerned about why they are not getting well. There shows further elevations in scales 1 and 3, the Suicide Risk Test is usually normal, the Beck Inventory shows mild depre depression. In addition to progression through the algorithm, treatment requires confirmation of the diagnosis, the nee patient about the disease once the diagnosis is confirmed. The integration of patient care is now essential, and the use normalization of diurnal rhythms is indicated. Biofeedback for relaxation, temperature control, and the reduction of m

Beyond 6 months, all patients demonstrate varying degrees of depression, the result of chronic pain, disturbed slee The Suicide Risk Test is usually normal, but because there is a 10 times higher chance of suicide in chronic pain patient indicated. The Beck Inventory begins to show moderate to severe depression and the SCL-90 has elevated states of dep interpersonal sensitivity. If not already established, treatment consists of becoming the patient's advocate, identifying education regarding the disease. At this stage, antidepressants are required in higher doses, but a single antidepressant combination of different antidepressants. Amitriptyline may be preferable to the newer SSRIs. Biofeedback for relaxati tension are indicated. Group therapy with other chronic pain patients, the spouse, or family is now useful as is family c release morphine (MS Contin, Roxane, Columbus, OH) or methadone is controversial at this stage. In the late stages of C depressed, are resigned to their disease, and do not expect to return to their former vocation. Sleep disturbances are s The MMPI shows elevated scales 1 and 3. This can be wrongly interpreted as a conversion reaction. The Suicide Risk Tes moderate depression, and the SCL-90 has elevated states of hostility, "somatization," anxiety, and interpersonal sensiti adjust to a new lower set of life goals. Antidepressants and sedatives are indicated. Education regarding the disease pr with the problem and helps to strengthen the patient's own defenses against the consequences of the disease. Group th spouse or family in attendance, is particularly useful.

The McGill-Melzack pain questionnaire is a useful tool along with the visual analogue scale or verbal digital scale n the progress of treatment. Psychological interventions for patients with reactive depression from chronic pain are nume regarding the disease process are probably as effective as any adjuncts to facilitate progression through the algorithm c

1. Onset of pain [go to 2].
2. If pain is treated—STOP. If pain persists more than 2 months, [go to 3].
3. Administer BDI, SRT, HARS, or other preferred short psychological evaluation [go to 4].
4. If any of the tests in [3] are abnormal, [go to 5]. If all tests are normal, [go to 6].
5. Institute appropriate psychotherapy [go to 7].
6. Institute low-dose antidepressants and [go to 7].
7. If pain persists longer than 6 months, [go to 8].
8. Administer MMPQ [go to 9].
9. If the MMPQ shows that the patient is objective, [go to 10]. If the MMPQ shows that the patient is exaggerating, [go to 11].
10. Increase antidepressants, readminister the BDI, HARS, or alternative, SCL-90, and SRT [go to 12].
11. Readminister the BDI, SCL-90, and SRT [go to 13].
12. Institute group therapy, seek psychological review, biofeedback, and antianxiety medication if SRT is abnormal; consider psychiatric hospitalization [go to 14].
13. Focus on psychotherapy, not medical treatment, unless there is compelling medical evidence for continued medical care [go to 14].
14. Ongoing psychiatric support until the patient is stable and then STOP.

BDI, Beck Depression Inventory; SRT, Suicide Risk Test; HARS, Hospital Anxiety and Depression Scale[74]; MMPQ, McGill–Melzack Pain Questionnaire.

TABLE 2. Visual psychiatric treatment algorithm for Chronic Regional Pain Syndrome

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Key Words: Complex Regional Pain Syndrome (CRPS) types I and II; Reflex sympathetic dystrophy; Causalgia; Treatr

IMAGE GALLERY

Select All

Group	Topic	Participants
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II	Novel routes, new agents, and combined pharmacotherapy to facilitate rehabilitation	Samuel Hassenbusch, United States, group leader Michael Cousins, Australia Nelson Hendler, United States Gabor Racz, United States Wen-Hsien Wu, United States Ralf Baron, Germany Donald Price, United States Wilfrid Jänig, Germany Joshua Prager, United States
III	Neuroaugmentation with or without adjunctive pharmacotherapy for rehabilitation or maintenance analgesia	Peter Wilson, United States, group leader Torsten Gordh, Sweden David Niv, Israel Michael Rowbotham, United States John Oakley, United States Robert Wilder, United States
IV	Management of CRPS—Early and late: Development of treatment algorithm	Robert Bruce, New Zealand, group leader Norman Harden, United States Michael Stanton-Hicks, United States Christopher Glynn, United Kingdom Giancarlo Barolat, United States Martin Koltzenburg, Germany Nagy Mekhail, United States

Table 1

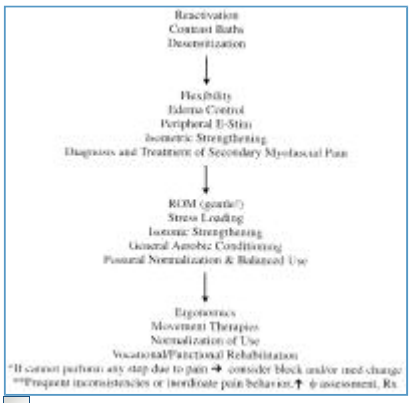

Fig. 1

Fig. 2

1. Onset of pain [go to 2].
2. If pain is treated—STOP. If pain persists more than 2 months, [go to 3].
3. Administer BDI, SRT, HARS, or other preferred short psychological evaluation [go to 4].
4. If any of the tests in [3] are abnormal, [go to 5]. If all tests are normal, [go to 6].
5. Institute appropriate psychotherapy [go to 7].
6. Institute low-dose antidepressants and [go to 7].
7. If pain persists longer than 6 months, [go to 8].
8. Administer MMPQ [go to 9].
9. If the MMPQ shows that the patient is objective, [go to 10]. If the MMPQ shows that the patient is exaggerating, [go to 11].
10. Increase antidepressants, readminister the BDI, HARS, or alternative, SCL-90, and SRT [go to 12].
11. Readminister the BDI, SCL-90, and SRT [go to 13].
12. Institute group therapy, seek psychological review, biofeedback, and antianxiety medication if SRT is abnormal; consider psychiatric hospitalization [go to 14].
13. Focus on psychotherapy, not medical treatment, unless there is compelling medical evidence for continued medical care [go to 14].
14. Ongoing psychiatric support until the patient is stable and then STOP.

BDI, Beck Depression Inventory; SRT, Suicide Risk Test; HARS, Hospital Anxiety and Depression Scale™; MMPQ, McGill–Melzack Pain Questionnaire.

Table 2

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