

Focused Review of Interdisciplinary Pain Rehabilitation Programs for Chronic Pain Management

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Abstract Interdisciplinary pain rehabilitation programs (IPRPs) are based on a functional restoration approach to treating complex chronic pain conditions. With a greater appreciation for a biopsychosocial approach to more effectively manage patients with chronic pain has come the development of more comprehensive treatment programs with less of a biomedical emphasis (i.e., interventional therapy, unimodal physical therapy, and passive modalities) and more of a biopsychosocial one. Interdisciplinary programs involve the use of multiple disciplines such as physical and occupational therapy, pain psychology, medical pain management, vocational rehabilitation, relaxation training, and nursing educations. Multiple psychometric tools are used in the assessment process and along treatment to better assess outcomes. This article will examine components of IPRPs, discuss desirable features of successful programs and teams, and more closely review four established outpatient pain programs in the United States. A greater understanding of the unique features and shared values of successful programs will help one better understand how these programs can be more widely used and available. The review will also highlight common psychometric outcomes tools used in assessing patients and monitoring outcomes. Most importantly, the review will help to answer a common question, even among pain physicians: “What goes on in those chronic pain programs?”

Keywords Pain rehabilitation · Multidisciplinary care · Interdisciplinary care · Chronic pain · Functional restoration

Introduction

Interdisciplinary pain rehabilitation has remained an important growing area in the evolution of modern comprehensive pain management. The classic descriptions of a “multidisciplinary pain program,” first championed by John Bonica at the University of Washington and Ben Crue at the City of Hope hospitals, were the first to integrate “multiple” disciplines in a more collaborative manner in treating the complexities of individuals’ chronic pain conditions. With the advancements in health psychology and the cognitive-behavioral approach, a proliferation of these multidisciplinary pain programs emerged. The American Pain Society (APS) recently published evidence-based guidelines specific to interdisciplinary treatment and demonstrated strong evidence for interdisciplinary pain treatment in patients with axial low back pain that have failed conservative measures. The guideline also supported the consideration of interdisciplinary treatment in patients with ongoing low back pain and related disability before pursuing surgical intervention [1••].

There has been an effort to redefine these programs as “interdisciplinary.” Interdisciplinary, as a treatment model, includes multiple disciplines working together, usually in one facility, to facilitate communication and goal setting and to improve outcomes. Less integrative, but more commonly seen, are multidisciplinary treatment centers, where multiple disciplines may be involved in the care, but many times, not in the same facility, with varying amounts of communication [2]. With the growing cost of treating chronic pain, many times with suboptimal outcomes, and an appreciation

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for a more biopsychosocial approach versus biomedical to assessing and treating chronic pain, interdisciplinary pain rehabilitation programs (IPRPs) based on a functional restoration approach seem like a more likely treatment paradigm for success. Despite numerous studies supporting the outcomes of pain rehabilitation programs, availability of programs, funding support, and administrative issues continue to be barriers to their more widespread use from both a clinical and financial perspective. This article will focus on defining critical components of interdisciplinary functional restoration programs, review recent outcome data related to efficacy of such programs, and describe three established academic (Mayo Clinic, Rehabilitation Institute of Chicago [RIC], and Cleveland Clinic) and one privately run (Brooks Rehabilitation) IPRPs as a means of better understanding the evaluation process, team and treatment components, work flow, program description, and psychometric tools used in screening patients and studying pain reduction and psychosocial and functional outcomes.

Program Structure

IPRPs combine individual and group-based therapies such as physical and occupational therapy, pain psychology, relaxation therapy, counseling, vocational rehabilitation services, nursing education, and aerobic conditioning. Closely based on the “functional restoration” approach, a significant focus of treatment includes aerobic conditioning and strengthening in a goal-oriented graded exercise progression. Many programs incorporate the use of a private or hospital-based gym facility for group exercise, strengthening, and pool-based therapies. Although patients are seen by multiple disciplines, an emphasis is placed on integrating skills learned in individual disciplines into others (e.g., applying focused breathing or mindfulness while in active physical therapy session) [3]. Mind–body techniques commonly used include biofeedback relaxation therapy, meditation, and guided imagery. Common relaxation techniques include biofeedback-assisted deep breathing, diaphragmatic breathing, imagery, and autogenic training. Patients are taught to monitor and appreciate muscle tension and use specific techniques as tools to self manage pain and stress. Occupational therapy focuses on identifying functional deficits, improving body mechanics, ergonomics, activity tolerance, and pacing. Physical therapy individually assesses strength, range of motion, and musculoskeletal impairments, instructing patients in developing their own home exercise, strengthening, and stretching program. Most importantly, all disciplines share common values and group goals. McCracken and Turk [4] described common components of cognitive-behavioral treatments. These same principles are shared by all team members in their interaction with

patients, and include promotion of a self-management perspective, relaxation skills training, cognitive restructuring, behavioral activation (i.e., goal setting and pacing strategies), problem solving, skills training, habit reversal (i.e., unlearning maladaptive pain behaviors), and maintenance and relapse prevention.

Desirable Features of an Interdisciplinary Program

The success of any IPRP rests upon a number of important clinical and nonclinical or administrative features. The APS recently organized a group of clinical experts including physicians, psychologists, and nurses, in developing a white paper examining the “desirable” features of an interdisciplinary program [5]. The white paper has been approved by the board of the APS and is awaiting formal publication. It is noted that not all of these features may be useful in developing and maintaining a successful IPRP. The importance of a patient-centered approach cannot be overemphasized, with goal-oriented treatments focusing on patient education and cognitive-behavioral changes. Treatment should include both individual treatment, where better customization of individual treatment can be achieved, as well as support of a group setting. Short- and long-term treatment goals should be discussed and reviewed regularly on an individual basis, with clear discharge plans after completion of formal training. Expectations of not only the patient but also family members, employers, and treating clinicians need to be discussed and adjusted on an ongoing basis.

Attributes of a well-functioning interdisciplinary team include clinicians working in a collaborative, integrative environment with ongoing open communication between staff as well as appropriate consensus building and conflict resolution (Table 1). Communication is an aspect not only of team members in the facility, but also in communicating with referrals, family members, case managers, and other third party payers. Communication building will help to improve individual patient outcomes and transfer of care, and to educate the lay public and medical community about the program.

Mayo Clinic Pain Rehabilitation Center (Rochester, MN)

The Mayo Clinic IPRP is a tertiary hospital-based outpatient program. The program has been in existence since 1974, and admits approximately new patients per year with an ongoing active daily census of 25 patients in formal treatment. The IPRP at Mayo Clinic includes a pain physician (Dr. W. Michael Hooten, board certified in anesthesiology, psychiatry and internal medicine) and pain psychologist (Cynthia Townsend, PhD, board certified in clinical health psychology) with

Table 1 Attributes of a well-functioning interdisciplinary pain team

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- Shared philosophy, mission, objectives
 - Patient and family centered
 - Working together for common, agreed upon goals
 - Integrated, interdependent approach
 - Mutual respect and open communication, often in team meeting format
 - Frequent, direct, clear, and reciprocal communication among team members as well as with primary care providers and referral sources
 - Quality improvement efforts are ongoing and the responsibility of all team members
 - Collaborative approach to clinical care, education, quality improvement, and research
 - Effective communication within team and between team and referral sources, primary care providers, and stake holders
 - Multimodal treatments
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additional physical and occupational therapists, certified nurse specialists (CNS), nurse care coordinators (registered nurses [RN]), doctors of pharmacy (PharmD), and mental health therapists (master's level) who discuss and meet each patient two times per week. Additional treatment support members include a vocational psychologist, dietician, tobacco cessation specialist, reverend, and recreational therapist.

The formal treatment program includes a 3-week intensive (120 h) outpatient rehabilitation adult program that includes two admission evaluation days plus 15 treatment days (8 am to 5 pm), daily supervised physical exercise to reverse deconditioning, and 10 h of family/support group education sessions per week. Patients are divided into two treatment teams including rehabilitation treatment focused on functional restoration or rehabilitation plus substance use education for pain patients at high risk for substance use disorders.

Additional programs include a 3-week adolescent program with intensive parent training, 2-day cognitive-behavioral pain management group program (once monthly), and a 1-day aftercare program for graduates. Group therapy (6 h per day, 5 days per week) includes cognitive-behavioral topics, such as goal setting, behavior activation, stress management, activity pacing, and catastrophizing among others. A strong emphasis is placed on elimination of all opioids and reduction of polypharmacy (including benzodiazepines, sedative hypnotics, stimulants, and muscle relaxants). Medication management while in treatment is provided by the MD, PharmD, CNS, and RN.

The program admission pre-candidacy evaluation includes assessment of physical and emotional stability; review of treatment goals; medication reconciliation; discussion and planning related to withdrawal of opioids and simple analgesics; and agreement that no pursuit of further medical and surgical interventions will be made. The Mayo Clinic IPRP has published inclusion and exclusion criteria that help clinicians in the sometimes difficult process of determining who is a candidate for treatment. While in treatment, there is a strong emphasis on assessing and developing treatment plans for pain-related depression, anxiety, and catastrophizing.

Assessment of physical and emotional functioning upon admission and discharge includes the Multidimensional Pain Inventory (MPI), a measure of pain severity and suffering, pain interference, perceived control, level, general activity level, and significant other pain response; Short Form-36 Health Status Questionnaire (SF-36) subscales; the Center for Epidemiologic Studies-Depression (CES-D) scale (measures presence and severity of depressive symptoms); Pain Catastrophizing Scale (PCS); Pain Self-Efficacy Questionnaire (PSEQ); and Pain Anxiety Symptom Scale (PASS). The program admission process also includes the Canadian Occupational Performance Measure (COPM); a personality assessment (NEO-Personality Inventory); and Mini-International Neuropsychiatric Interview (MINI), a brief structured interview to identify major DSM-IV axis I psychiatric disorders.

The program has published outcomes related to efficacy of treatment and medication use [6]. Treatment involved participation in their 3-week IPRP that incorporates opioid withdrawal. Patients with longstanding pain (average 9 years) on daily chronic opioid therapy were taking an average daily morphine equivalence of 99.0 mg/day. On admission, patients taking low- and high-dose opioids reported higher levels of depression and pain severity than the nonopioid group. Significant improvements were found in all outcome variables ($P < 0.001$) at the conclusion of the program, and improvements in pain severity and functioning were maintained 6 months posttreatment regardless of opioid status at admission. An example of a typical weekly patient schedule for the formal Mayo IPRP program is included (see Table 2).

Brooks Rehabilitation Pain Rehabilitation Program (Jacksonville, FL)

Brooks Rehabilitation is a private not-for-profit rehabilitation company that includes a large acute inpatient rehabilitation hospital, long-term care services, and a pain rehabilitation

Table 2 Sample of Mayo Clinic interdisciplinary pain rehabilitation program weekly schedule

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|-------|----------------------------------|------------------------------|------------------------------|------------------------------|--------------------------------|
| 8:00 | PT Stretch | PT Stretch | PT Stretch | PT Stretch | PT Stretch |
| 8:30 | Community: Expectations/Concerns | Openers (Daily Goal Setting) | Openers (Daily Goal Setting) | Openers (Daily Goal Setting) | Openers (Daily Goal Setting) |
| 9:00 | Physical Therapy | Physical Therapy | Physical Therapy | Physical Therapy | Physical Therapy |
| 10:00 | Biofeedback | Meet with Treatment Team | Biofeedback | Meet with Treatment Team | CBT: Group Family Session |
| 11:00 | CBT: Overview of Stress | CBT: Fears and Chronic Pain | CBT: Pain Catastrophizing | CBT: Activity Pacing | CBT: Individual Family Session |
| 12:00 | Lunch | Lunch | Lunch | Lunch | Lunch |
| 1:00 | OT: Kitchen and Shopping | OT: Yard work, Driving | OT: Time Management | OT: Computer Ergonomics | OT: Weekend Planning |
| 2:00 | CBT: Cycle of Pain | CBT: Difficult Day Planning | CBT: Problem Solving | CBT: Goals Setting | CBT: Maintaining |
| 3:00 | Pharmacist: Pain Medications | Chaplain: Spirituality | CBT: Assertive Communication | CBT: Sleep Hygiene | CBT: Chemical Health |
| 4:00 | Advanced Relaxation | Advanced Relaxation | Advanced Relaxation | Advanced Relaxation | Advanced Relaxation |

PT physical therapy, *OT* occupational therapy, *CBT* cognitive behavioral therapy

program (PRP). The Brooks PRP is a division of Brooks Behavioral Medicine located in an outpatient facility. Payer mix is approximately 60% workers compensation and 40% private/commercial insurance.

The PRP is staffed with seven full-time equivalent (FTE) clinicians, including a program director (PhD), pain medicine physician (MD), pain psychologist (PhD), biofeedback therapist, two physical therapists (DPT), a therapy assistant (PTA), and nurse case manager (RN). The Brooks PRP has full-day (6 h, up to 5 weeks) and partial-day (3 h) daily programs. Aftercare individual services are also available. The average daily census is about eight patients.

The program focuses on functional restoration with a “de-emphasis” on medical procedures. Therapy focuses on reactivation, reducing catastrophizing and fear avoidance behavior, and enhancing internal locus of control. A strong emphasis includes detoxification of patients from opioid medications. In some instances, inpatient detoxification from opioids takes place in the inpatient hospital before starting formal treatment. Of patients weaned from opioids, 25% did so on an inpatient basis and then completed the program. Average morphine equivalent was approximately 265 mg/day. Most patients are billed on a “per diem” basis but a small percentage may be treated by CPT (current procedural terminology) codes.

The Brooks PRP examines outcomes preprogram, post-program, and follow-up measures (3 months, 6 months, 9 months, 12 months, 24 months) via an SPSS database for analysis. Functional Capacity Evaluations are also completed during the final week of the program. Patient satisfaction at discharge is quantified. A specific follow-up tool

that measures change since completion of the program was developed. Range-of-motion change scores for specific parts of the body are also included in the database. According to 6-month follow-up data on those patients that completed the program, an overall level of activity and ability to perform daily activities of life progressed or continued at improved levels in nine of ten patients, pain levels decreased or stayed the same for three out of four patients, and emotional distress caused by chronic pain decreased by nearly 50%. Only 6% of patients who were weaned from opiates resumed taking opioid medications after treatment (data from Brooks PRP). Most importantly, pre- and postprogram outcomes are updated and disseminated to third party payers, insurance companies, and referring providers and have contributed to the growth and success of the program.

The PRP has established individual contracts with a number of insurance companies and established per diem rates. An extensive website, www.brookshealth.org/pain, has been developed to better educate patients and insurance providers about the benefits of the treatment program.

Rehabilitation Institute of Chicago Center for Pain Management (Chicago, IL)

The Center for Pain Management Chronic Pain Program (CPM) has evolved from its inception as an inpatient-based pain program at the RIC, founded by Robert Addison, MD in 1976. As the program has grown, it more recently moved to a 14,000 square foot outpatient facility in downtown Chicago. A private gym adjacent to the clinic is

utilized for group aerobic conditioning, pool therapy, and various group studio classes. The CPM evaluates approximately 1,000 new patients per year. The payer mix includes 25%–30% workers compensation, 45%–50% commercial insurance, and 20% Medicare/Medicaid. The comprehensive evaluation includes individual pain psychology evaluation, pain medicine evaluation by a physiatrist and pain management specialist, and, for those patients with active workers compensation cases, a vocational rehabilitation assessment. From the 3- to 4.5-h evaluation, those patients found to be candidates for treatment may participate in a formal 4-week (full program), 8 h per day, Monday through Friday pain program, or various “modified” 4 h, 2 half-day a week, 4-week-long programs that include one half day of individual physical and occupational therapy, relaxation training, pain psychology, nursing education, and medical management and a half day of group with the same disciplines.

The CPM also offers a 4- to 8-week, 2 half-days per week adolescent pain program. The CPM carries an active ongoing census of 15–20 patients in the full program, and 12–20 patients in one of the modified adult or adolescent programs. The CPM also has a large ongoing active outpatient practice and monthly pain management support group for patients that have completed formal treatment. The entire staff is made up of approximately 28 FTEs and includes physical and occupational therapists, pain psychologists, relaxation therapists, pain physicians, nurses, a vocational rehabilitation counselor, clinic manager, and clerical staff under one cost center within a larger outpatient day rehabilitation continuum for the RIC.

One half-time FTE is dedicated to a clinical outcomes manager, and the CPM is a training site for physical medicine and rehabilitation residents, multidisciplinary pain fellows, and psychology practicum and postdoctoral fellows. Patients are staffed on a weekly basis and seen by the pain physician 2 days per week to monitor medication changes, give feedback on progress, and counsel and encourage patients as they progress through the program.

Opioid detoxification, for the patients found not to be appropriate candidates, may be accomplished during the program or in an inpatient detoxification facility (average 3–4 days), usually during the first week of the program through a collaboration of the RIC CPM with a large inpatient behavioral health hospital. A significant amount of clinical work is done in improving medication management regimen (i.e., anticonvulsants, antidepressants, sleep aids, analgesics) with short- and long-term goals of improving function, mood, and pain.

Most patients seen under worker’s compensation coverage do complete a functional capacity evaluation at the conclusion of the program, and, based on these results and their progress in treatment, are released to return to work. All patients follow up 4 weeks after completing any form of treatment program. Full-program patients are seen by the physical and occupational therapist, relaxation therapist, pain psychologists, and vocational therapist to monitor adherence and make any adjustments in their home program. Patients continue to be seen by the physician after discharge from the formal program. In many instances, patients are later referred back to their primary care provider for long-term management.

Our program has continued to grow at the RIC in that we, as a team, have nurtured an adequate and knowledgeable referral base to justify staffing and maintain therapy volumes and revenue streams. Physicians and staff have worked to champion the program nationally, locally, and within the system of care. Stakeholders involved in treating patients need to understand our philosophy on an ongoing basis, and maintain realistic and agreeable injured worker goal outcomes. We have learned we cannot take or treat all comers, and have developed a network to support referral for psychiatry and addiction medicine (in or out of system). We actively monitor patient progress and discharge those patients early if they cannot demonstrate progress. When patients are discharged early we help complete transfer of care, closure of case, and, many times, establish maximum medical improvement when appropriate.

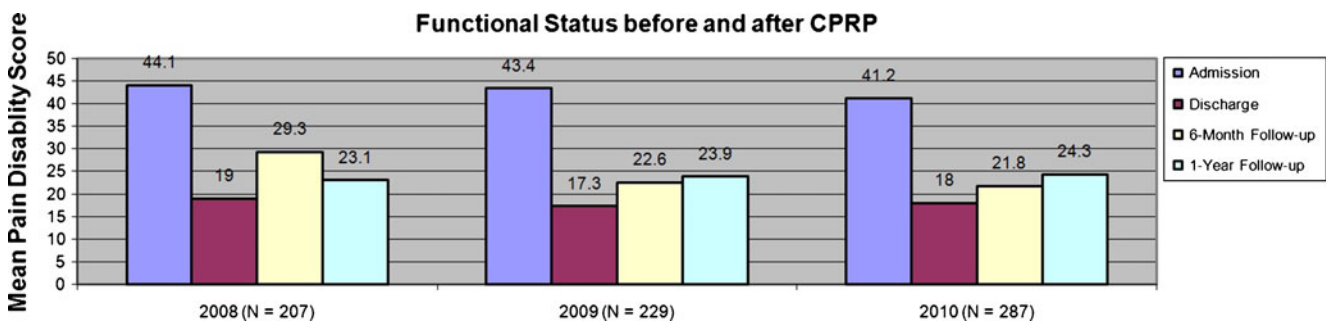


Fig. 1 Functional status before and after CPRP. Functional status, as measured with the Pain Disability Index, improved at discharge, and at 6 months and 1 year after participation in the CPRP compared with

before treatment. Higher scores on the 0–70 scale indicate greater disability. *CPRP* Chronic Pain Rehabilitation Program

Cleveland Clinic Foundation, Chronic Pain Rehabilitation Program (Cleveland, Ohio)

The Chronic Pain Rehabilitation Program (CPRP), within the Neurologic Institute at the Cleveland Clinic, is a comprehensive, interdisciplinary program designed to treat patients with disabling chronic pain. This program has been successfully treating patients for the past 31 years.

The CPRP has been an active program for 31 years. The program is staffed with 14 FTE staff (physicians, nursing, pain psychologists, physical and occupational therapist, master's level counselors, and tai chi instructor) and the large consulting staff from the Cleveland Clinic Foundation (anesthesia, physical medicine and rehabilitation, neurosurgery, and rheumatology).

The program is located in a rehabilitation facility with state-of-the-art equipment, including fluidotherapy, Alter-G, and a large therapy pool. A strong emphasis is placed on comprehensive assessment and treatment of comorbid substance abuse disorders. A unique educational track recently was designed specifically to help patients with both pain and addiction. Although this is not a chemical dependency treatment program, patients in this track receive education about addiction and the role it has played in their lives and their pain. This education helps them start to plan the substance abuse treatment that follows completion of the CPRP. The CPRP comprehensive program is an outpatient group and individual treatment program, usually 7:30 am to 5 pm. Billing is fee for service with some contracted group rates.

Since 1999, a large clinical outcomes data registry has been developed, and acquires data from admission, discharge, 6 month, 12 month for >2,500 patients. Outcome studies demonstrate marked, sustained improvements in pain, function, mood, substance use. Functional status improvements are maintained not only from discharge, but at 10-year follow-up (see Fig. 1).

Conclusions

IPRPs can be effective treatment options for patients with chronic pain and related affective distress and loss of function. Programs are usually 3–6 weeks in duration, 6–8 h per day. Although patients are seen by various care providers, the key to successful outcomes lies in the shared attributes of the treating teams, which focus on helping patients unlearn maladaptive behaviors, foster optimism, combat demoralization, and promote a self-management approach. Various psychometric tools can be used for the assessment and ongoing patient monitoring. Communicating program-

specific outcomes may help to educate and better serve referring bodies (i.e., physicians, nurse case managers, adjusters). The four programs reviewed are a small sample of the programs presently available in the United States. Although heterogeneous with respect to actual treatment model, therapy disciplines, referral sources, and acuity, many, like the four programs reviewed, demonstrate similar treatment outcomes in relation to pain reduction, medication usage, and psychosocial function. Careful selection of patients, close monitoring, and flexibility in treatment approaches may help to improve overall treatment successes.

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